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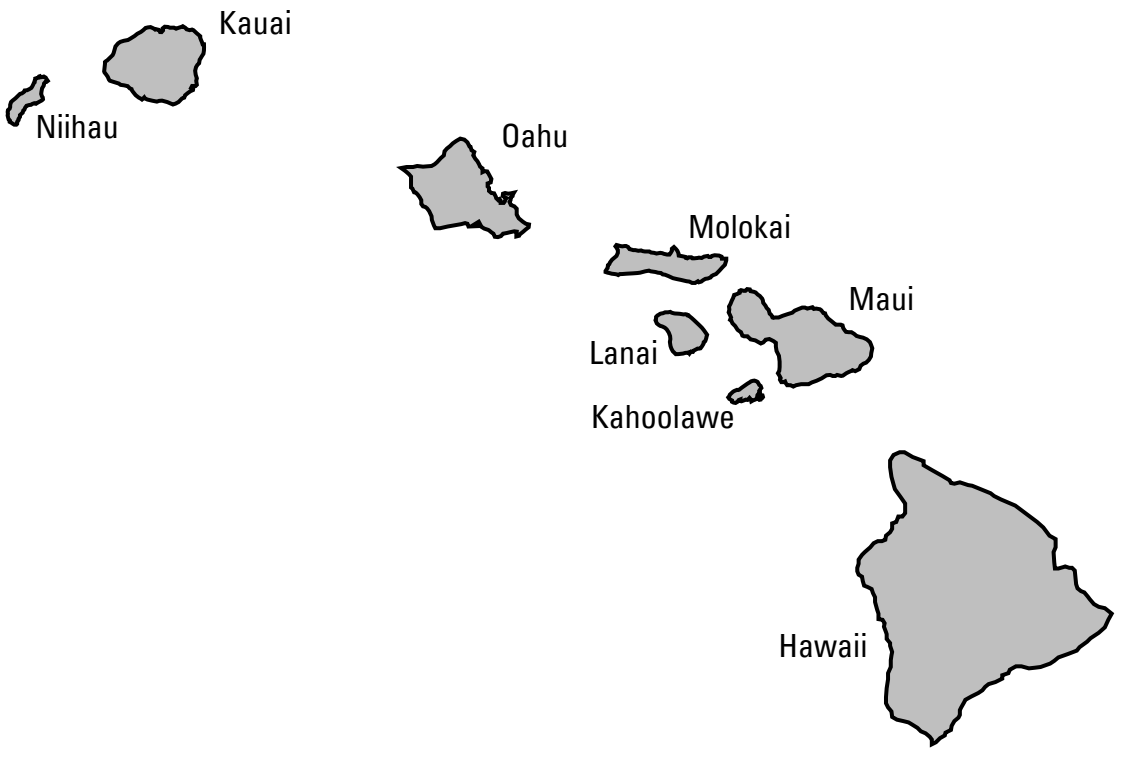
Water Resources Data
Hawaii and other Pacific Areas
Water Year 2001

Volume 1. Hawaii

Water-Data Report HI-01-1



U.S. Department of the Interior
U.S. Geological Survey

Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Commission on Water Resource Management and with other agencies

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By R.I. Taogoshi, M.F. Wong, D.C. Nishimoto, and P.C. Teeters

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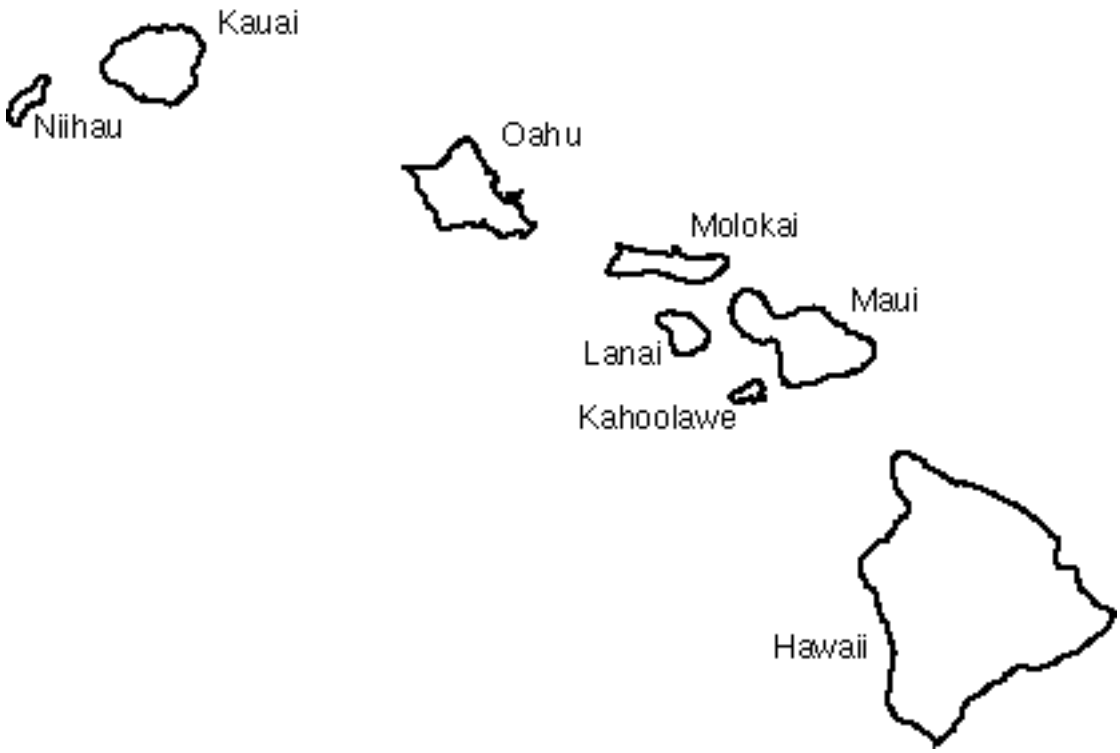

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UNITED STATES DEPARTMENT OF THE INTERIOR

GALE A. NORTON, Secretary

U.S. GEOLOGICAL SURVEY

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2002

PREFACE

This annual hydrologic data report of Hawaii is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface and ground-water data collection networks in each State, Puerto Rico, American Virgin Islands, selected islands in the Caribbean, Commonwealth of the Northern Mariana Islands, Guam, American Samoa, Republic of Palau, and selected islands in the Pacific. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report contains hydrologic data for Hawaii. It is the culmination of a concerted effort by personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to U.S. Geological Survey policy and established guidelines, the Hawaii District discipline specialists, Stephen Anthony, Rick Fontaine, and Stephen Gingerich, reviewed and verified the data, and the following individuals contributed significantly to the collection, processing, and tabulation of the data:

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This report was prepared in cooperation with the State of Hawaii, and with other local and Federal agencies under the general supervision of Gordon Tribble, District Chief, Hawaii.

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for the 2001 water year for Hawaii consist of records of stage, discharge, and water quality of streams and springs; water levels and quality of water wells; and rainfall totals.

- Water discharge for 71 gaging stations on streams, springs, and ditches.
- Discharge data for 92 crest-stage partial-record stations.
- Water-quality data for 5 streams, 24 partial-record stations, and 103 wells.
- Water levels for 87 observation wells.
- Rainfall data for 38 rainfall stations.

These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating Federal, State, and other local agencies in Hawaii.

14. SUBJECT TERMS
*Hawaii, *Hydrologic data, *Surface water, *Water quality, *Ground water, Gaging stations, Flow rate, Chemical analyses, Sediment, Water temperature, Sampling sites, Water analyses, Water levels, Rainfall accumulation.

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NOTE.--Data for partial-record and miscellaneous sites are published in separate sections of the data report. See references at the end of this list of page numbers for these sections.

Letters after station name designate type of data: (d) discharge, (c) chemical, (m) microbiological, (t) water temperature, and (s) sediment.

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

Letters after well number designate type of data: (c) chemical, (t) water temperature, (w) water level

HAWAII

ISLAND OF OAHU--Continued

ISLAND OF MOLOKAI

ISLAND OF MAUI

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

ISLAND OF HAWAII

RAINFALL STATIONS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

Letters after station number designate type of station: (r) recording, and (n) non-recording

HAWAII

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS

The following continuous record streamflow or stage-only stations in Hawaii have been discontinued or converted to partial-record stations. Daily records were collected and are stored in NWIS for the period of record shown for each station.

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF KAUAI			
16011000	Waikoali Str nr Waimea	1.58	1909-13, 1919-25
16012000	Kauaikinana Str nr Waimea	0.84	1919-25
16013000	Mohihi Str at alt 3,420 ft nr Waimea	1.68	1920-26, 1936-71
16014000	Kokee Ditch nr Waimea	--	1926-82
16015000	Mohihi Str nr Waimea	2.20	1909-17
16016000	Waimea River at alt 840 ft nr Waimea	20.0	1916-18, 1925-68
16017000	Koaie Str at alt 3,770 ft nr Waimea	1.68	1919-32, 1954-68
16018000	Koaie Str nr Waimea	9.97	1916-18
16020000	Waialae Str nr Waimea	2.81	1910-16
16021000	Waialae Str at alt 800 ft nr Waimea	7.87	1917-21
16022000	Kekaha Ditch at Camp 1 nr Waimea	--	1908-68
16024000	Kekaha Ditch at siphon nr Waimea	--	1910-12
16025000	Kekaha Ditch at flume 2 nr Waimea	--	1910-12
16027000	Kekaha Ditch below tunnel 12 nr Waimea	--	1908-34
16028000	Waimea River below Kekaha Ditch intake near Waimea	44.2	1921-55
16029000	Waimea Ditch nr Waimea	--	1912-14 1916-21
16029100	Waimea Ditch below wasteway nr Waimea	--	1960-72
16031000	Waimea River nr Waimea	57.8	1910-18, 1919, 1943-68, 1969-72, 1975-96
16033000	Olokele Ditch at weir nr Makaweli	--	1912-17
16034000	Olokele River nr Waimea	4.85	1915-16
16035000	Halekua Str nr Waimea	0.56	1912-14
16037000	Poowaiomahaihai Ditch nr Waimea	--	1911-13
16037100	Makaweli R bl Poowaiomahaihai Ditch nr Waimea	25.0	1911-17
16039000	Hiloa Ditch nr Eleele	--	1911-15
16042000	Hanapepe Ditch at Hanapepe Falls nr Eleele	--	1911-15
16043000	Hanapepe Ditch below intake	--	1930-38
16044000	Hanapepe Ditch at Koula nr Eleele	--	1910-21, 1927-49
16045000	Hanapepe Ditch below makai siphon nr Eleele	--	1929-32
16046000	Hanapepe Ditch at weir nr Hanapepe	--	1912-13, 1915-17
16047000	Koula River at Koula nr Eleele	12.6	1910-16
16048000	Manuahi Str at Koula nr Eleele	5.44	1917-20
16050000	G Ditch at makai siphon nr Eleele	--	1929-32
16051000	Hanapepe River at makai siphon nr Eleele	20.5	1929-32
16053000	Kamoolao Str nr Koloa	1.30	1939-41
16053400	Upper Haiku Ditch nr Puhi	--	1963-71
16053600	Lower Haiku Ditch nr Puhi	--	1963-71
16053800	Kamooloa Str nr Puhi	5.79	1963-70
16054000	Kuia Str nr Puhi	0.40	1939-41
16054200	Koloa Ditch nr Koloa	--	1964-71
16054400	Koloa tunnel nr Koloa	--	1966-71
16054500	Kuia Str nr Puhi	5.09	1963-66
16056000	Hanamaulu Str at Kapaia nr Lihue	6.41	1911-13
16056800	Waiahi-Kuia aqueduct nr Puhi	--	1964-71
16057000	Lihue Ditch nr Lihue	--	1910-19
16058000	Hanamaulu Ditch nr Lihue	--	1910-20
16058500	S F Wailua River nr rock quarry nr Lihue	20.2	1974-83
16061000	North Wailua Ditch nr Lihue	--	1932-85
16063000	N F Wailua River at alt. 650 ft nr Lihue	5.29	1914-85
16064000	Kanaha Ditch nr Lihue	--	1910-55
16068700	North Fork Wailua River nr Lihue	14.6	1910-14
16070000	Aahoaka Ditch nr Kapaa	--	1966-72
16072000	Konohiki Str at Makakualele mka weir nr Kapaa	0.65	1911-13

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF KAUAI--Continued			
16073000	Konohiki Str at Makakualele mki weir nr Kapaa	0.89	1912
16074000	N F Kaehulua Str at Kainahola weir nr Kapaa	1.39	1911-13
16075000	S F Kaehulua Str at Wainamuamu weir nr Kapaa	0.04	1911-13
16076000	Kaehulua Str at Kuhinoa weir nr Kapaa	1.90	1911-13
16077000	Makaleha ditch near Kealia	--	1936-98
16078000	Kapaa Str nr Kealia	3.05	1910-20
16079200	Tunnel Ditch at Kapahi nr Kapaa	--	1909-11
16079400	Pipe Ditch at Kapahi nr Kapaa	--	1909-11
16079600	Kapaa Ditch at Kapahi nr Kapaa	--	1909-11
16082000	Kaneha Ditch nr Kealia	--	1909-13
16086000	Anahola Ditch above wasteway nr Kealia	--	1915-21
16087000	Anahola Ditch wasteway nr Kealia	--	1936-85
16089000	Anahola Str nr Kealia	4.27	1910, 1913-85
16090000	Lower Anahola Ditch at Kiokala nr Kealia	--	1909-14
16091000	Lower Anahola Ditch nr Kealia	--	1937-83, 1985-95
16092000	Lower Anahola Ditch at makai weir nr Kealia	--	1909-10
16093000	Anahola Str at Kiokala Dam nr Kealia	4.27	1910-12
16093200	Anahola Str at Anahola	9.24	1962-65
16094200	Ka Loko Ditch nr Kilauea	--	1932-68
16095000	Puu Ka Ele Ditch nr Kilauea	--	1932-67
16095200	Ross Ditch nr Kilauea	--	1955-67
16095900	Kalihiwai Ditch above wasteway nr Kilauea	--	1960-68
16096000	Kalihiwai Ditch nr Kilauea	--	1934-67
16097000	Pohakuhonu Str nr Kilauea	1.73	1957-72
16097300	Halaulani Str nr Kilauea	0.12	1922-25
16098000	Kalihiwai River nr Hanalei	3.64	1914-23
16099000	Kalihiwai River nr Kilauea	4.12	1912-13
16099500	Hanalei Ditch nr Kilauea	--	1956-62
16100000	Hanalei tunnel outlet nr Lihue	--	1932-85
16101000	Hanalei River at alt. 625 ft. nr Hanalei	7.17	1914-55
16102000	China Ditch nr Hanalei	--	1911-19
16104000	Kuna Ditch nr Hanalei	--	1912-14, 1917-20
16105000	Waioli Str nr Hanalei	1.81	1914-32
16106000	Lumahai River nr Hanalei	6.95	1914-33
16109000	Wainiha River above intake nr Hanalei	11.6	1914-16
16110000	Wainiha Canal at intake nr Wainiha	--	1910-16
16111000	Wainiha Canal at tunnel 18 nr Wainiha	--	1911
16113000	Wainiha River nr Wainiha	20.6	1912-16
16115000	Hanakapiai Str nr Hanalei	2.73	1931-52
16116000	Hanakoa Str nr Hanalei	0.50	1931-52
16117000	Kalalau Str nr Hanalei	1.55	1931-55
ISLAND OF OAHU			
16201000	RB of NF Kaukonahua Str nr Wahiawa	1.17	1913-53
16203000	Mauka Ditch nr Wahiawa	--	1947-68
16204000	North Fork Kaukonahua Str nr Wahiawa	4.86	1946-68
16206000	South Fork Kaukonahua Str nr Wahiawa	1.93	1913-14, 1915-16,1944-50
16206500	Koolau Ditch at reservoir nr Wahiawa	4.00	1914-15
16207000	SF Kaukonahua Str bl U.S. Army res nr Wahiawa	0.86	1914-17
16208500	RB of South Fork Kaukonahua Str nr Wahiawa	5.26	1957-72
16209000	SF Kaukonahua Str ab Wahiawa res nr Wahiawa	--	1946-58
16210900	Poamoho Tunnel nr Wahiawa	1.79	1958-79
16211000	Poamoho Str nr Wahiawa	--	1947-73
16211850	Puea Mauka Ditch nr Waianae	4.39	1960-67
16211900	Kaupuni Str nr Waianae	0.60	1957-60
16212000	Puhawai Str at Lualualei nr Waianae	1.16	1930-44
16212400	Awanui Gulch nr Barbers Point NAS	13.80	1957-58
16212900	Kipapa Str nr Waipahu	--	1966-68

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF OAHU--Continued			
16217000	Pearl Harbor Spr at Puukapu nr Pearl City	--	1931-35
16218000	Pearl Harbor Springs at Loko Kukona	--	1931-35, 1936-45
16218500	Pearl Harbor Spr at Kaluaoopu nr Pearl City	--	1931-37
16219000	Hawn Elec. Co. tunnel at Waiau nr Pearl City	--	1939-42
16220000	Hawn Elec. Co. wasteway at Waiau nr Pearl City	--	1953-59
16222000	Pearl Harbor Springs at Waiau	--	1913-39, 1942-47
16224000	Pearl Harbor Springs at Kalauoa	--	1931-62, 1964-65, 1966-68, 1970-88
16224500	Kalauao Str at Moanalua Road at Aiea	2.59	1957-82
16225000	Kalauao Str at Aiea	2.61	1953-57
16225800	North Halawa Stream near Kaneohe	1.64	1991-99
16227500	Moanalua Str nr Kaneohe	0.94	1968-78
16227700	Moanalua Str tributary nr Kaneohe	0.62	1968-78
16227900	Moanalua Str tributary nr Aiea	0.03	1972-78
16228900	Kalihi Str nr Kaneohe	0.60	1966-71
16230000	Lulumahu Dit at upper Nuuanu Res nr Honolulu	--	1911-13
16231000	Luakaha weir in upper Nuuanu Valley nr Hon	--	1910-13
16231500	Moole Ditch mauka station nr Honolulu	--	1917-20
16231700	Moole Ditch makai station nr Honolulu	--	1918-23
16232000	Nuuanu Stream below res 2 wasteway, nr Honolulu	3.35	1913-96
16235000	Nuuanu Str at Kuakini Street nr Honolulu	4.39	1911-12
16236000	Kahuawai Spring nr Honolulu	--	1912-14
16237000	Pauoa Str at upper Pauoa Valley nr Honolulu	0.79	1911-13
16238500	Waihi Str at Honolulu	1.14	1913-21, 1925-83
16239500	East Manoa Ditch nr Honolulu	--	1915-16, 1918-20, 1926-39
16241000	Manoa Str at upper Manoa Valley nr Honolulu	2.62	1910-13
16242000	Manoa Str at College of Hawaii nr Honolulu	4.99	1909-10, 1912-18
16243000	Manoa Str at Waialae Road nr Honolulu	5.38	1910-12
16244000	Pukele Str nr Honolulu	1.18	1926-82
16245000	Waiomao Str at upper Palolo Valley nr Hon	0.35	1911-13
16246000	Waiomao Str nr Honolulu	1.04	1911, 1912, 1926-71
16247000	Palolo Str nr Honolulu	3.63	1952-79
16248900	Waimanalo Ditch below main res nr Waimanalo	--	1912-13
16249000	Waimanalo Str at Waimanalo	2.16	1967-70
16249200	Maunawili Str nr Waimanalo	1.28	1912-16
16249400	Main Spring nr Kailua	--	1914-16
16249600	Makawao Spring nr Kailua	--	1914-16
16249800	Makawao Ditch nr Kailua	--	1912-15
16249900	Maunawili Ditch abv Anianinui Tunnel nr Waimanalo	--	1990-2000
16256000	Kamakalepo Str nr Kailua	0.82	1912, 1913-16
16257000	Pohakea Str nr Kailua	0.21	1912-14
16258000	Maunawili Str ab Wong Leongs Ditch nr Kailua	4.60	1922-23
16260000	Maunawili Str nr Kailua	4.60	1912, 1913-16
16260500	Maunawili Str at highway 61 nr Kailua	5.34	1922, 1956-67, 1971-96
16261000	North Branch Kahanaiki Str nr Kailua	0.34	1913-14
16262000	South Branch Kahanaiki Str nr Kailua	0.21	1913-14
16263000	Kahanaiki Str nr Kailua	0.58	1912, 1914-16
16264400	Kawainui Swamp drain canal at Kailua Rd at Kailua	--	1961-65
16264500	Kawainui Swamp canal at Wanaao Rd at Kailua	--	1961-64
16265600	Right Branch Kamooalii Stream	1.11	1983-97
16266000	Kamooalii Str nr Kaneohe	1.48	1914-16
16267000	Hooleinaiwa Str nr Kaneohe	0.61	1914-16
16268000	Piho Str nr Kaneohe	0.43	1914-16
16269000	Kuou Ditch nr Kaneohe	--	1914-16
16270000	Kuou Str nr Kaneohe	0.37	1914-16
16270500	Kamooalii Str below Kuou Str nr Kaneohe	3.21	1967-70, 1971,1972-76
16270900	Luluku Str at alt. 220 ft nr Kaneohe	0.44	1960-63, 1965-98
16271000	North Luluku Ditch nr Kaneohe	--	1914-16

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF OAHU--Continued			
16272000	Luluku Str nr Kaneohe	0.46	1914-16
16273000	Young Mau Ditch nr Kaneohe	--	1914-16
16273900	Kamooalii Str at Kaneohe	4.38	1959-63, 1965-80
16273950	SF Kapunahala Str at Kaneohe	0.40	1983-98
16274000	Ahlo Ditch nr Kaneohe	--	1914-16
16276000	Reservoir Ditch nr Heeia	--	1914-16
16277000	Waipio Ditch nr Heeia	--	1914-16
16278000	Iolekaa Str mauka nr Heeia	0.29	1940-70
16279000	Iolekaa Str nr Heeia	0.52	1914-16
16280000	Wing Wo Tai Ditch nr Heeia	--	1914-16
16281000	Hop Tuck Ditch nr Heeia	--	1914-16
16282000	Lee Ditch nr Heeia	--	1914-16
16283000	Kahaluu Str nr Heeia	0.28	1935-71
16283600	South Fork Waihee Stream near Heeia	0.03	1962-96
16283700	North Fork Waihee Stream near Heeia	0.03	1962-96
16283800	Waihee Str at alt. 260 ft nr Heeia	0.31	1961-66
16284000	Waihee Str nr Heeia	0.93	1935-82
16284500	Waihee Str at Kahaluu	2.26	1966-71
16285000	Waiahole tunnel at Waianu nr Waiahole	--	1950-69
16288000	Halona Str nr Waikane	0.08	1911
16289000	Waihi Str nr Waikane	0.11	1911
16290000	Waiahole Str below powerhouse nr Waiahole	0.46	1915
16291000	Waiahole Str at alt. 250 ft. nr Waiahole	0.99	1955-68
16292000	Waiahole Str nr Waiahole	1.22	1911-16
16293000	Waianu Str nr Waikane	1.28	1911
16294000	Waiahole Str at Waiahole nr Waikane	3.60	1911-12
16295000	Waikane Str nr Waikane	2.35	1912
16296000	Kahana Str nr Kahana	3.20	1914-17
16297000	Kawa Str nr Kahana	2.09	1914-17
16299000	Punaluu Str at alt. 539 ft. nr Punaluu	0.98	1915-18
16300000	Waihoi Str nr Punaluu	0.50	1915-17
16301000	Punaluu Str at alt. 250 ft. nr Punaluu	2.78	1914-18
16304000	Kaluanui Str nr Hauula	0.50	1915-17
16305000	Kaipapau Str nr Hauula	0.21	1906-07
16306000	Koloa Gulch nr Laie	0.90	1914-18
16307000	Wailele Gulch nr Laie	0.50	1914-15, 1916-18
16308000	East Branch Kahawainui Str nr Laie	0.53	1914-18
16308990	Malaekahana Str nr Laie	0.64	1963-71
16309000	Malaekahana Str nr Kahuku	1.66	1914-18
16310000	Middle Branch Malaekahana Str nr Kahuku	0.69	1914-18
16329000	Kaiwikoele Str tributary nr Maunawai	0.97	1967-71
16340500	Anahulu River tributary nr Haleiwa	0.83	1967-71
16343000	Helemano Str at Haleiwa	14.20	1967-82
ISLAND OF MOLOKAI			
16401000	Papalaua Str nr Pukoo	2.00	1919-29
16402000	Pulena Str nr Wailau	4.38	1919-28, 1937-57
16403000	Waiakeakua Str nr Wailau	1.41	1919-29, 1937-57
16403900	Kawainui Stream near Pelekunu	1.17	1968-79, 1980-96
16404000	Pelekunu Str nr Pelekunu	2.59	1919-29, 1937-47,1948-57, 1971-82
16404200	Pilipililau Str nr Pelekunu	0.49	1968-97
16405000	Lanipuni Str nr Pelekunu	1.09	1919-29, 1937-57
16406000	Waikolu Str at alt. 650 ft nr Kalaupapa	2.99	1920-23
16408000	Waikolu Str bl pipeline crossing nr Kalaupapa	3.68	1919-32, 1937-96
16409000	Waihanau Str nr Kalaupapa	1.18	1930-32
16410000	Keolewa Str nr Kalae	0.18	1940-44
16411000	Waialala Spring nr Kalae	--	1940-60
16412000	Mokomoko Gulch nr Kalae	0.23	1940-45

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MOLOKAI--Continued			
16411300	Kakaako Gulch at Hwy 46 nr Mauna Loa	0.18	1964-85
16415000	EF Kawela Gulch	0.45	1946-71
ISLAND OF MAUI			
16416000	Punaula Gulch nr Pukoo	0.24	1947-72
16501000	Palikea Str bl diversion dam nr Kipahulu	6.29	1927-29, 1931-35,1935-38, 1939-83
16501200	Oheo Gulch at dam nr Kipahulu	8.06	1988-97
16502000	Hahalawe Gulch nr Kipahulu	0.43	1927-37, 1938-69
16503000	Kaeluku flume nr Kaeleku	--	1940-45
16504000	Hana flume nr Hana	--	1940-45
16506000	Makapipi Ditch nr Nahiku	--	1948-66
16506500	West Makapipi Spring nr Nahiku	--	1932-45
16507000	Makapipi Str nr Nahiku	1.93	1932-45
16509000	Hanawi Str below government road, nr Nahiku	5.03	1932-47, 1992-95
16510000	Kapaula Gulch nr Nahiku	0.69	1921-63
16511000	Kapaula Gulch below government road nr Nahiku	0.93	1932-47
16512000	Koolau Ditch at Nahiku weir nr Nahiku	--	1919-85
16513000	Waiaaka Str nr Nahiku	0.10	1932-47
16514000	Paakea Gulch nr Nahiku	0.34	1932-47
16515000	Waiohue Gulch nr Nahiku	0.32	1921-63
16516000	Kopiliula Str nr Keanae	4.31	1914-17, 1921-58
16517000	East Wailuaiki Str nr Keanae	3.11	1913-17, 1922-58
16519000	West Wailuanui Str nr Keanae	1.93	1913-17, 1922-58
16520000	East Wailuanui Str nr Keanae	0.51	1914-17, 1921-58
16521000	Wailuanui Str nr Keanae	2.51	1932-36, 1938-47
16522000	Taro patch feeder ditch at Keanae	--	1934-68
16523000	Koolau Ditch nr Keanae	--	1910-12, 1917-85
16524000	Honomanu Str at Haiku-uka boundry nr Kaili	2.54	1919-27, 1932-34,1962-68
16525000	Sevth Br Honomanu Str at Haiku-uka nr Kailiili	0.30	1932-33
16526000	Fourth Br Honomanu Str at Haiku-uka nr Kailiili	0.10	1932-33
16527000	Honomanu Str nr Keanae	3.17	1913-64
16528000	Spreckels Ditch at station 1 nr Huelo	--	1910-13
16529000	Spreckels Ditch at station 2 nr Kuelo	--	1911-13
16530000	Spreckels Ditch at station 3 nr Kuelo	--	1910-13
16531000	Kula diversion from Haipuaena Str nr Olinda	--	1945-85
16531100	Haipuaena Str at Kula pipeline intake nr Olinda	0.27	1946-68
16532000	Haipuaena Str at Haiku-uka bdy nr Kailiili	0.63	1919-26, 1932-34
16533000	Third Br Haipuaena Str at Haiku-uka nr Kailiili	0.06	1932-33
16534000	First Br Haipuaena Str at Haiku-uka nr Kailiili	0.05	1932-33
16535000	Haipuaena div ditch at Kolea Gulch nr Keanae	--	1938-60
16536000	Haipuaena Str above Spreckels Ditch nr Huelo	1.16	1913-67
16537000	Haipuaena Str nr Huelo	1.10	1910-13
16538000	Spreckels Ditch at Haipuaena weir nr Huelo	--	1922-85
16539000	Spreckels Ditch at station 4 nr Huelo	--	1910-13
16541000	Koolau Ditch at Haipuaena nr Huelo	--	1932-87
16541500	Manuel Luis Ditch at Puohokamoa Gulch nr Huelo	--	1917-24
16542000	E Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.14	1919-27, 1932-33
16543000	M Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.48	1919-27, 1932-34,1962-69
16544000	W Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.45	1919-28, 1932-34
16545000	Puohokamoa Str above Spreckels Ditch nr Huelo	2.35	1913-71
16546000	Puohokamoa Str nr Huelo	2.60	1910-13
16547000	Puohokamoa intake of Koolau Ditch nr Huelo	--	1922-30
16551000	Koolau Ditch at Wahinepee nr Huelo	--	1922-29
16552000	Spreckels Ditch at Wahinepee nr Huelo	--	1929-30, 1931-38
16552200	Spreckels Ditch at station 5 nr Huelo	--	1911-13
16552500	Manuel Luis Ditch W of Puohokamoa Str nr Huelo	--	1930-35
16552600	Waikamoi Str at Puuluau nr Olinda	2.10	1949-66
16552800	Waikamoi Str ab res at Kula pl intake nr Olinda	2.50	1953-68

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MAUI--Continued			
16553000	Waikamoi Str bl res at Kula pl intake nr Olinda	2.52	1945-49
16554000	Waikamoi Str at Haiku-uka boundary nr Kailiili	3.46	1918,19-28, 1932-34
16554500	E Br Waikamoi Str at Haiku-uka bdry nr Kailiili	0.07	1918-28, 1932-33
16555000	Waikamoi Str above Wailoa Ditch nr Huelo	3.93	1922-57
16556000	Waikamoi Str nr Huelo	3.98	1910-22
16557000	Alo Str nr Huelo	0.47	1910-57
16558000	Koolau Ditch at Alo diversion weir nr Huelo	--	1908-11
16560000	Spreckels Ditch at station 6 nr Huelo	--	1911-13
16561000	Center Ditch below Kolea reservoir nr Huelo	--	1918, 1919, 1920-24,1925-30
16562000	Center Ditch nr Huelo	--	1910-12
16565000	Kaaiea Gulch nr Huelo	0.58	1921-62
16565500	Spreckels Ditch below Kaaiea Gulch nr Huelo	--	1917-30
16566000	Oopuola Str nr Huelo	0.20	1930-57
16567000	Oopuola Str ab Spreckels Dt crossing nr Huelo	0.58	1910-15
16567500	Spreckels Ditch at station 7 nr Huelo	--	1911-12
16568000	Spreckels Ditch at station 8 nr Huelo	--	1911-13
16569000	Second Branch Nailiilihaele Str at Haiku-uka	0.20	1932-33
16570000	Nailiihaele Str nr Huelo	3.49	1910-11, 1913-18,1919-24, 1925-75
16571000	Nailiilihaele Str bl new Hamakua Dt nr Huelo	3.60	1912
16572000	New Hamakua Ditch at Nailiilihaele weir nr Huelo	--	1910-12
16573000	New Hamakua Ditch at station 1 nr Kailiili	--	1912-13
16574000	Kailua Str at Haiku-uka boundary nr Kailiili	0.80	1918-28, 1932-34
16574500	Kailua Str nr Kailiili	1.10	1963-71
16575000	Tenth Br Kailua Str at Haiku-uka nr Kailiili	0.10	1932-33
16576000	Ninth Br Kailua Str at Haiku-uka nr Kailiili	0.20	1932-33
16577000	Kailua Str nr Huelo	2.41	1910-11, 1912-18,1919-58
16578000	New Hamakua Ditch at station 2 nr Huelo	--	1912-13
16579000	New Hamakua Ditch at station 3 nr Huelo	--	1912-13
16579500	New Hamakua Ditch at station 4 nr Huelo	--	1912-13
16580000	Oanui Str nr Huelo	0.90	1910-11, 1913-16
16582000	New Hamakua Ditch at station 5 nr Huelo	--	1912-13
16583000	Old Hamakua Ditch at Kailua nr Huelo	--	1919-22
16584000	Kailua Str nr Huelo	3.69	1912-13
16585000	Hoolawanui Str nr Huelo	1.34	1910-71
16586000	Hoolawaliilii Str nr Huelo	0.55	1911-57
16588000	Wailoa Ditch at Honopou nr Huelo	--	1922-87
16589000	New Hamakua Ditch at Honopou nr Huelo	--	1918-85
16590000	Old Hamakua Ditch at Honopou nr Huelo	--	1918-22, 1936-65
16591000	Honopou Str at Lowrie Ditch siphon nr Huelo	2.00	1932-47
16592000	Lowrie Ditch at Honopou Gulch nr Huelo	--	1910-27
16593000	Honopou Str above Haiku Ditch nr Huelo	2.20	1930-85
16594000	Haiku Ditch at Honopou Gulch nr Kailua	--	1910-28, 1930-85
16595000	Honopou Str below Haiku Ditch nr Huelo	2.30	1932-47
16596000	New Hamakua Ditch at Halehaku weir nr Huelo	--	1910-14, 1915-23
16596200	Halehaku Gulch nr Kailiili	0.13	1965-71
16597000	Halehaku Gulch weir at New Hamakua Dt nr Huelo	--	1910-12
16598000	Halehaku Gulch nr Huelo	1.40	1910-12
16599000	E Br Opana Gulch at Haiku-uka bdry nr Kailiili	0.60	1932-33
16600000	Opana Ditch nr Huelo	--	1910-12
16601000	Opana Str nr Huelo	3.30	1910-12
16602000	Kauhikoa Ditch at Opana weir nr Huelo	--	1910-13, 1913-15, 1916-28
16602400	Awalau Gulch nr Kailiili	0.23	1965-71
16603000	Kaluanui Ditch at Puuomalei nr Hamakuapoko	--	1910-12
16604000	Iao Str nr Wailuku	--	1910-15
16605000	Maniania Ditch nr Wailuku	--	1910-13
16608000	North Waiehu Str nr Wailuku	0.90	1912-15
16609000	North Waiehu Ditch nr Wailuku	--	1910-11, 1916-17
16609500	North Waiehu Str bl N Waiehu Ditch nr Wailuku	0.90	1910-11

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MAUI--Continued			
16610000	South Waiehu Str nr Wailuku	0.70	1910-17
16611000	South Waiehu Ditch nr Wailuku	--	1913
16612000	Waihee River nr Waihee	3.90	1913-17
16613000	Waihee Canal nr Waihee	--	1910-12
16613500	Waihee Canal at Waiale weir nr Wailulu	--	1911-12
16615000	Spreckels Ditch nr Waihee	--	1910-13
16616000	Spreckels Ditch at Waiale weir nr Wailuku	--	1910-11
16617000	Left Branch Makamakaole Str nr Waihee	0.40	1939-52
16617700	Kahakuloa Str at alt. 1,380 ft. nr Honokohau	1.50	1913-14
16619000	Kahakuloa Str at Kahaluloa nr Waihee	4.00	1912-13
16621000	Honokohau Ditch intake nr Honokohau	--	1907-13
16622000	Honokohau Ditch above Honolua Str nr Honolohau	--	1910-11
16623000	Honolua Str nr Honokohau	2.90	1913-17
16624000	Honokohau Ditch at Honokowai weir nr Lahaina	--	1910-12
16625000	Honolua Ditch nr Honokohau	--	1911-12
16626000	Honolua Str at Honolua Ranch nr Honokahau	3.96	1911
16627000	Kapaloa Str at weir 1 nr Lahaina	1.00	1901
16628000	Kapaloa Str nr Lahaina	1.00	1911-12
16629000	Honokowai Ditch nr Lahaina	--	1912-17, 1918-67
16630000	Honokowai Str nr Lahaina	1.10	1913-17
16633000	Kahoma development tunnel nr Lahaina	--	1911-17
16634000	Kahoma Str nr Lahaina	1.19	1911-12, 1913-17
16635000	Lahainaluna Str at weir 1 nr Lahaina	0.54	1901
16635500	Lahainaluna Str at weir 2 nr Lahaina	0.19	1901
16636000	Kahana Str above pipeline intake nr Lahaina	1.51	1916-25, 1926-32
16637000	Lahainaluna Ditch nr Lahaina	--	1913-14
16638000	Kahana Str nr Lahaina	1.83	1911-16
16638500	Kahoma Str at Lahaina	5.22	1962-89
16639000	North Fork Kauaula Str nr Lahaina	0.52	1901
16640000	South Fork Kauaula Str nr Lahaina	0.18	1901
16641000	Kauaula Str nr Lahaina	1.84	1912, 1914-17
16643000	Kauaula Ditch nr Lahaina	--	1911-17
16644000	Launiupoko Str nr Lahaina	1.13	1911-18
16645000	Olowalu Ditch nr Olowalu	--	1911-16, 1916-20, 1920-58, 1958-67
16646000	Olowalu Str nr Olowalu	4.00	1913-16
16647000	Ukumehame Gulch nr Olowalu	3.75	1911-12, 1913-19
16647100	Ukumehame Gulch at mouth nr Olowalu	4.03	1964-71
16648000	South side Waikapu Ditch nr Waikapu	--	1910-17
16649000	Palolo Ditch nr Waikapu	--	1910-17
16650000	Waikapu Str nr Waikapu	2.76	1910-17
ISLAND OF HAWAII			
16700000	Waiakea Stream nr Mountain View	17.4	1930-95
16700950	Lyman Springs no. 2 nr Piihonua	--	1981-95
16701000	Olaa Flume at Kaumana nr Hilo	--	1917-20
16701200	Waiakea Str nr Hilo	33.60	1957-67
16701700	Wailuku River nr Pua Akala	10.20	1964-65
16701750	Wailuku River nr Humuula	34.80	1965-82
16701800	Wailuku River nr Kaumana	43.40	1966-82
16703000	Wailuku River at Pukamaui nr Hilo	97.20	1923-28, 1929-40
16705000	Hilo Boarding School Ditch at intake nr Hilo	--	1931-40
16706000	Hilo Boarding School Ditch nr Hilo	--	1918-19
16707000	Kapehu Ditch diversion nr Hilo	--	1954-62
16708000	Kapehu Ditch nr Hilo	--	1938-41, 1942-48, 1948-51, 1951-62
16709000	Kapehu Str at Piihonua nr Hilo	4.84	1928-37
16710000	Wailuku River nr Hilo	150.00	1911-13, 1918-19
16713000	Wailuku River at Hilo	256	1977-79, 1980-95
16716000	Honolii Str nr Hilo	8.00	1924-32

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF HAWAII--Continued			
16717500	Kawainui Str nr Pepeekeo	9.20	1912
16717820	Manowaiopae Str nr Laupahoehoe	1.04	1965-71
16718000	Upper Hamakua Ditch at Puualala nr Kukuihaele	--	1913-20
16720300	Kawaiki Stream near Kamuela	0.45	1968-99
16721000	Kawainui Str at alt. 2,120 ft nr Waipio	3.48	1901-02
16721500	Br 3 Kawainui Str at alt. 1,700 ft nr Waipio	3.90	1901-02
16722000	Kawainui Str at alt. 1,435 ft nr Waipio	4.43	1901-02
16722300	Br 3 Kawainui Str at alt. 1,405 ft nr Waipio	0.47	1901-02
16722600	Br 1 Kawainui Str at alt. 1,380 ft nr Waipio	5.19	1901-02
16723000	Kawainui Str nr Waipio	5.55	1901-02
16724000	Kawainui Str at alt. 775 ft nr Waipio	6.00	1901-02
16724800	Upper Hamakua Ditch abv Alakahi Str nr Kamuela	--	1968-2000
16727000	Upper Hamakua Ditch abv Puukapu Res nr Kamuela	--	1977-2000
16728000	Alakahi Str at alt. 1,200 ft nr Waipio	1.49	1901-02
16729000	Alakahi Str at alt. 730 ft. nr Waipio	3.14	1901-02
16730000	Koiawe Str at alt. 1,120 ft. nr Waipio	1.65	1901-02
16731000	Koiawe Str at alt. 610 ft. nr Waipio	2.23	1901-02
16732000	Waipio Str below Koiawe Str nr Waipio	11.70	1901-02
16732100	Waima Str at alt. 790 ft. nr Waipio	0.51	1901-02
16732150	Waima Str at alt. 385 ft nr Waipio	0.77	1901-02
16732200	Wailoa Str nr Waipio	14.30	1901-02, 1911-12, 1964-69
16732300	Upper Hamakua Ditch at Puualala and Res No. 3	--	1913-20
16732600	Lower Hamakua Ditch at Waima flume nr Kukuihaele	--	1910-13
16732900	Lower Hamakua Ditch at main weir nr Kukuihaele	--	1910-20
16733000	Lower Hamakua Ditch wasteway nr Kukuihaele	--	1964-73
16733100	Lower Hamakua Ditch bl main weir nr Kukuihaele	--	1964-73
16733200	Honokaa diversion at Honokaa	--	1964-73
16733300	Lower Hamakua Ditch bl Honokaa div at Honokaa	--	1964-73
16737000	Waiilikahi Str nr Waimanu	0.76	1939-60
16738000	Kaimu Str nr Waimanu	0.90	1939-47, 1950-52
16739000	Punalulu Str nr Waimanu	0.66	1939-52
16740000	Waiaalala Str nr Waimanu	0.12	1939-52
16741000	Paopao Str nr Waimanu	0.32	1939-52
16742000	Kukui Str nr Waimanu	0.22	1939-52, 1959-66
16743000	Awini Ditch at E Honokane iki Gulch nr Niulii	--	1927-38, 1938-49, 1950-72
16744000	E Honokane iki intake to Awini Ditch nr Niulii	--	1927-36, 1937-38, 1939-40, 1940-49, 1951-72
16745000	Awini Ditch above Honokane Gulch nr Kohala	--	1918
16745500	Awini Ditch at Awini Weir nr Kohala	--	1907-17, 1963-72
16747000	E Br Honokane nui Str at alt 1,300 ft nr Honokane	4.53	1901
16747500	East Branch Honokane nui Str nr Niulii	4.96	1963-69
16748000	E Br Honokane nui Str at alt 770 ft nr Honokane	5.41	1901
16749000	W Br Honokane nui Str at alt 1,370 ft nr Honokane	1.81	1901
16749500	W Br Honokane nui Str at alt 775 ft nr Honokane	2.40	1901
16750000	Kohala Ditch at Honokane weir nr Kohala	--	1907-12
16750900	Kohala Ditch at Honokane nr Niulii	--	1963-72
16751000	Kohala Ditch at Pololu nr Niulii	--	1927-38, 1938-72
16752000	Kohala Ditch at Niulii weir nr Kohala	--	1907-17
16755000	Kehena Ditch nr Kohala	--	1917-19, 1928-66
16757000	Waikoloa Str nr Kamuela	0.78	1947-71
16759200	Right Branch Waiaha Str nr Holualoa	1.89	1960-82
16759500	Waiaha Str nr Holualoa	9.35	1957-68
16759800	Kiilae Str nr Honaunau	0.67	1958-82
16761200	Kahilipali nui Gulch at Waiohinu	0.47	1962-65
16764000	Hilea Gulch tributary nr Honuapo	9.17	1966-97
16765000	Hilea Gulch tributary 2 nr Honuapo	1.86	1966-82
16767000	Ninole Gulch nr Punaluu	15.5	1966-82

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

The following continuous water-quality stations in Hawaii have been discontinued. Daily records were collected and are stored in NWIS for the period of record shown for each station.

[Type of record: C (specific conductance), S (sediment), T (temperature).]

Station number	Station name	Drainage area (mi^2)	Type of record	Period of record
ISLAND OF OAHU				
16212800	Kipapa Str nr Wahiawa	4.29	S	1973-82
16213000	Waikele Str nr Waipahu	45.70	C,T	1973-81
			S	1972-93
16227500	Moanalua Str nr Kaneohe	0.94	S	1971-78
16270500	Kamooalii Str blw Kuou Str nr Kaneohe	3.21	S	1972-76
ISLAND OF HAWAII				
16704000	Wailuku River at Piihonua, Hawaii, HI	125.00	C	1975-78
			T	1975-79
16713000	Wailuku River at Hilo, Hawaii, HI	256.00	S	1977-79, 1980-83
			C,T	1982-84, 1984-85

Volume 1--HAWAII

INTRODUCTION

The U.S. Geological Survey (USGS), in cooperation with State, local, and other Federal agencies, obtains a large amount of data pertaining to the water resources of Hawaii each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the U.S. Geological Survey, the data are published annually in this report series entitled “Water Resources Data - Hawaii.”

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 72 stream-gaging stations and 92 crest-stage partial-record streamflow stations; (2) water-quality records for 5 streamflow-gaging stations, and 28 partial-record streamflow stations; (3) water-level records for 87 observation wells; (4) water-quality records for 103 observation wells; and (5) accumulated rainfall records for 37 rainfall stations.

This series of annual reports for Hawaii began with the 1961 fiscal year (State of Hawaii) with a report that contained only data relating to the quantities of surface water. For the 1964 fiscal year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to include, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels. Beginning with the 1993 water year, accumulated rainfall data were included in the report.

Prior to introduction of this series (through June 30, 1960, for Hawaii) and for several water years concurrent with it, water-resources data for Hawaii were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States." The records in Hawaii were contained in the series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled, "Surface Water Supply of Mariana, Caroline, and Samoa Islands." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities in the United States, or if not out of print, may be purchased from the U.S. Geological Survey, Branch of Information Services, Box 25286, Denver, Colorado 80225-0286. For further ordering information, telephone (303) 202-4700.

Publications similar to this report are published annually by the U.S. Geological Survey for all states. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as “U.S. Geological Survey Water-Data Report HI-01-1.” For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. For further ordering information, the Customer Inquires telephone number is (703) 487-4650.

Additional information, including current prices, for ordering specific reports may be obtained from the District office at the address given on the back of the title page or by telephone at (808) 587-2400.

COOPERATION

The U.S. Geological Survey and organizations of the State of Hawaii (and formerly the Territory of Hawaii) have had cooperative agreements for the systematic collection of streamflow and ground water-level records since 1909, and for water-quality records since 1967. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreement with the USGS are:

Hawaii Department of Land and Natural Resources, Commission on Water Resource Management, Linnel Nishioka, Deputy Director.

Hawaii Board of Land and Natural Resources, Land Division, Dierdre Mamiya, Administrator.

Hawaii Department of Transportation, Bryan Minaai, Director.

Hawaii Department of Agriculture, Agricultural Resources Division, Brian Kau, Administrator.

City and County of Honolulu, Board of Water Supply, Clifford Jamile, Manager and Chief Engineer.

City and County of Honolulu, Department of Planning and Permitting, Randall Fujiki, Director and Chief Engineer.

National Tropical Botanical Garden, Charles Wichman Jr., Assistant Director.

Maui County Board of Water Supply, Dave Craddick, Director.

Kauai County Department of Water, Ernest Lau, Director.

Hawaii County Department of Water Supply, Milton Pavao, P.E., Manager.

Hawaii Agribusiness Development Corporation, Alfredo Lee, Administrator.

Assistance in the form of funds or services was given by the U.S. Army Corps of Engineers, U.S. Army Hawaii Garrison, National Weather Service, and Hawaii County Department of Public Works.

The following organizations aided in collecting records:

East Kauai Water Co., Ltd. and East Maui Irrigation Co., Ltd.

SUMMARY OF HYDROLOGIC CONDITIONS

The generally dry trend of 1998–2000 was continued in most parts of the Hawaiian Islands during the 2001 water year. Heavy rains in late October and early November on the island of Hawaii and part of East Maui produced localized flooding.

Surface Water

Substantial variations of stream flow during the 2001 water year were recorded at four index stations (fig. 1). These stations are all on streams that are undiverted or unregulated, so that increases or decreases in stream flow can be considered primarily the result of rainfall fluctuations. Annual mean discharges at stations 16068000, 16229000, 16587000, and station 16717000 were 76 percent, 56 percent, 68 percent, and 98 percent of the 1961–2000 median of annual mean discharges at these stations respectively (fig. 1). Monthly mean flows at all four index stations were below the long-term monthly mean flow for December, January, March, May, July, and September. Streamflow at station 16068000 on Kauai exceeded the median of long-term monthly mean streamflow in February, June, and August. Streamflow at station 16229000 on Oahu exceeded the median of long-term monthly mean in November and June. Streamflow at station 16587000 on Maui exceeded the median of long-term monthly mean in October, November, August, and September. Streamflow at station 16717000 on Hawaii exceeded the median of long-term monthly mean in October, November, February, and April.

Instantaneous peak flows at stations 16068000,16229000, 16587000, and 167107100 during the 2001 water year were much lower than the peak flows for the period of record at these stations (table 1).

Table 1.--Comparison of peak discharge for 2001 water year with the peak discharge for the period of record at four representative stations

Station Number	Station name	Water year 2001		Period of record	
		Date	Peak discharge (ft^3/s)	Date	Peak discharge (ft^3/s)
16068000	East Branch of North Fork Wailua River near Lihue, Kauai	Oct. 30	1,720	Nov. 12, 1955	18,400
16229000	Kalihi Stream near Honolulu, Oahu	Nov. 3	705	Nov. 18, 1930	12,400
16587000	Honopou Stream near Huelo, Maui	Feb. 8	290	Nov. 18, 1930	5,710
16717000	Honolii Stream near Papaikou, Hawaii	Nov. 2	14,300	May 23, 1978	22,600

Ground Water

Ground-water levels are affected by several factors, including rainfall, pumping, evapotranspiration, and, in coastal areas, tides. Ground-water levels at three continuously monitored observation wells in Hawaii fluctuated throughout the year, but remained generally low.

Water levels at well 2-5634-01 (station number 215607159344301) near Hanapepe on Kauai fluctuated within a range similar to the last 4 months of the previous water year, then declined to a minimum in April before recovering later in the year. Water levels at well 3-2256-10 (station number 212238157561101) near Pearl Harbor on Oahu continued the decline that began the previous year, with the sharpest decline during the summer months of June and July. Water levels at well 6-5431-01 (station number 20543715631050) near Wailuku, Maui increased from October to January and then declined for the rest of the year.

Rainfall

The Hawaiian Islands have extreme variability in annual rainfall amounts owing to strong orographic effects. The wettest location is considered to be Mount Waialeale on Kauai, with an average rainfall of approximately 433 inches per year. Areas of very low rainfall are found on the leeward side of the larger islands, particularly Maui and Hawaii.

In water year 2001, rainfall amounts remained below long-term normal amounts. Rainfall at the USGS-National Weather Service gage on Mount Waialeale totaled 377 inches or about 87 percent of the mean annual rainfall of 433 inches per year. The Poamoho 1 rain gage at the crest of the Koolau Range on Oahu recorded 142 inches, about 52 percent of the long-term average annual rainfall of about 275 inches per year. The Kepuni Gulch rain gage on the leeward side of Haleakala on Maui recorded 16 inches or about 55 percent of the mean annual rainfall of about 30 inches.

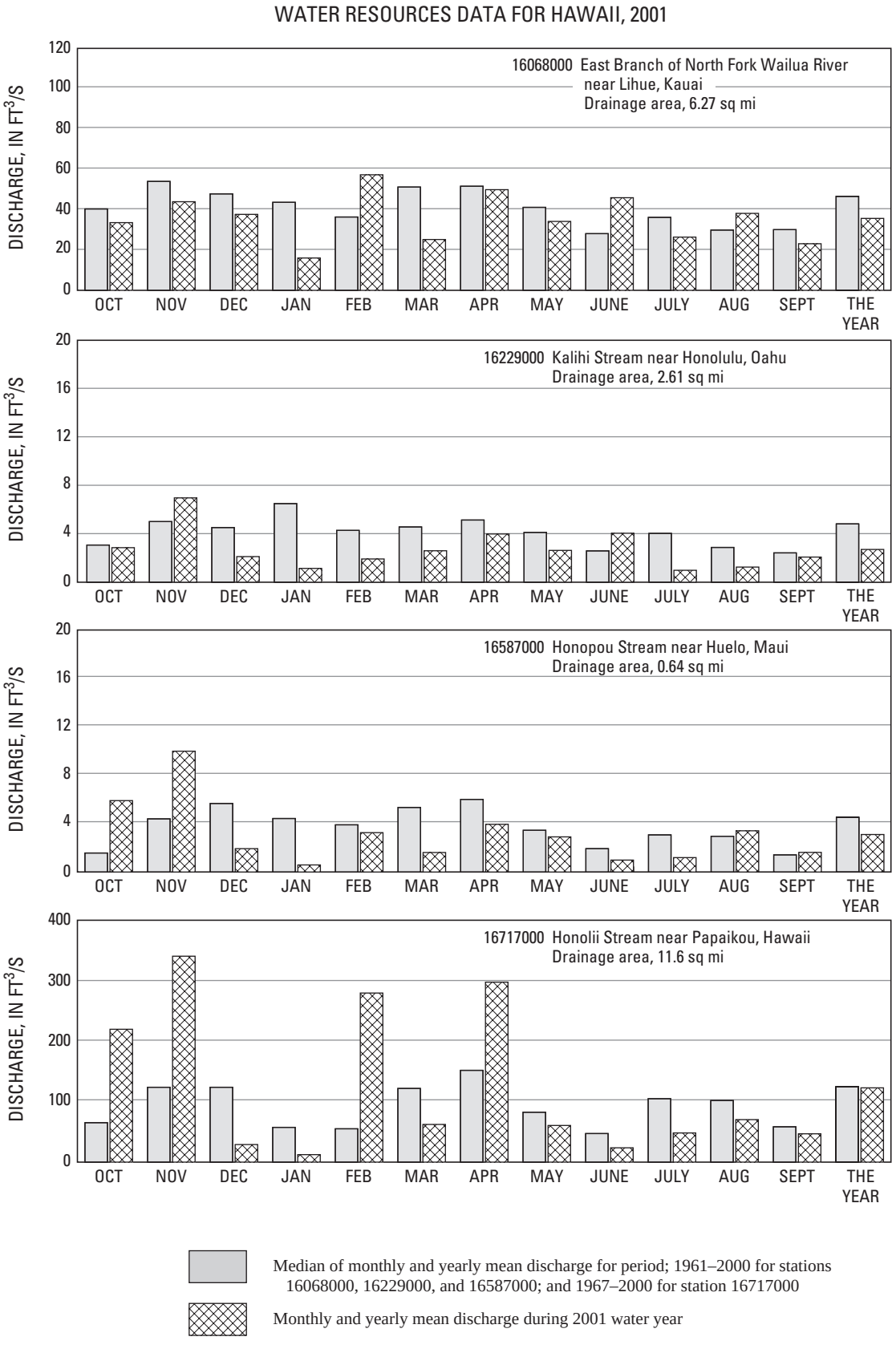


Figure 1. Discharge during 2001 water year compared with median discharge for four representative gaging stations.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

National Stream-Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment Program (NAWQA); (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives; (1) Provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites. (2) Provide the mechanism to evaluate the effectiveness of the significant reduction in SO2 emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred. (3) Provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO2 and NOx scheduled to begin in 2000.

Data from the network, as well as information about individual sites, are available through the world wide web at:

http://nadp.sws.uiuc.edu/

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key federal, State, and local water resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies.

Additional information about the NAWQA Program is available through the world wide web at:

http://wwwrvares.er.usgs.gov/nawqa/nawqa_home.html

Additional information about the island of Oahu NAWQA Program is available through the world wide web at:

http://hi.water.usgs.gov/nawqa

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 2001 water year that began October 1, 2000 and ended September 30, 2001. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, water-quality data for surface water, ground-water, and reservoirs, ground-water level data, and rainfall accumulation data. The locations of the stations and wells where the data were collected are shown in figures 5–25. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station, whether a streamgage, well, or rain gage, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water wells differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Hawaii and other Pacific areas, for surface-water stations where only miscellaneous measurements are made, and for rainfall stations.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in U.S. Geological Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indention in the “List of Stations” in the front of this report. Each indention represents one rank. This downstream order and system of indention show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16200000, which appears just to the left of the station name, includes the two-digit number “16” plus the six-digit downstream order number “200000.”

Latitude-Longitude System

The identification numbers for wells, miscellaneous surface-water sites, and rainfall stations are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a one-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description (see figure 2).

Local Identifier Well-Numbering System

In addition to the latitude-longitude based site identification number, wells in the State of Hawaii are assigned local well numbers. Beginning in 1971, the local well-numbering system was restructured to contain seven digits based on a non-arbitrary, unique one-minute grid system. One-minute parallel lines for both latitude and longitude are drawn on the map resulting in one-minute grids. Each grid is designated by a four-digit number. The first two digits represent minutes of latitude for the grid and the second two digits represent minutes of longitude for that grid. This establishes unique minute-grid numbers within each of the islands in the state except for the island of Hawaii where it encompasses an area more than one degree (60 minutes) of latitude and longitude. To establish unique minute-grid numbers for this island, 30 was added to the minutes of latitude in areas less than 19°00″ of latitude, and 60 was added to the minutes of latitude in areas more than 20°00″ of latitude. For the same reason, 30 was added to the minutes of longitude in areas less than 155°00″ of longitude, and 60 was added to the minutes of longitudes more than 156°00″ longitude (see figures 3 and 4).

To distinguish wells within a minute grid, two digits are added following the 4-digit minute-grid numbers with a dash separator. These two-digit numbers are assigned with the oldest well constructed within the grid as 01 and increase chronologically, with few exceptions, to the latest.

Since it is possible for wells on different islands to have the same 6-digit number, another digit distinguishing each of the islands is added in front of the 6-digit number with a dash separator.

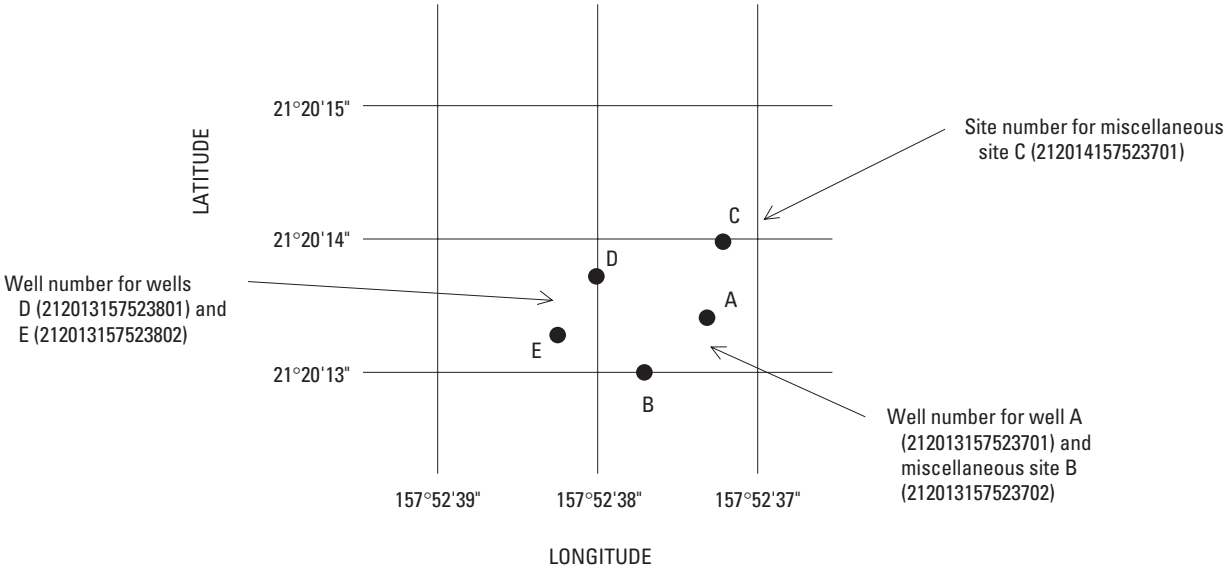


Figure 2. System for numbering wells and miscellaneous sites.

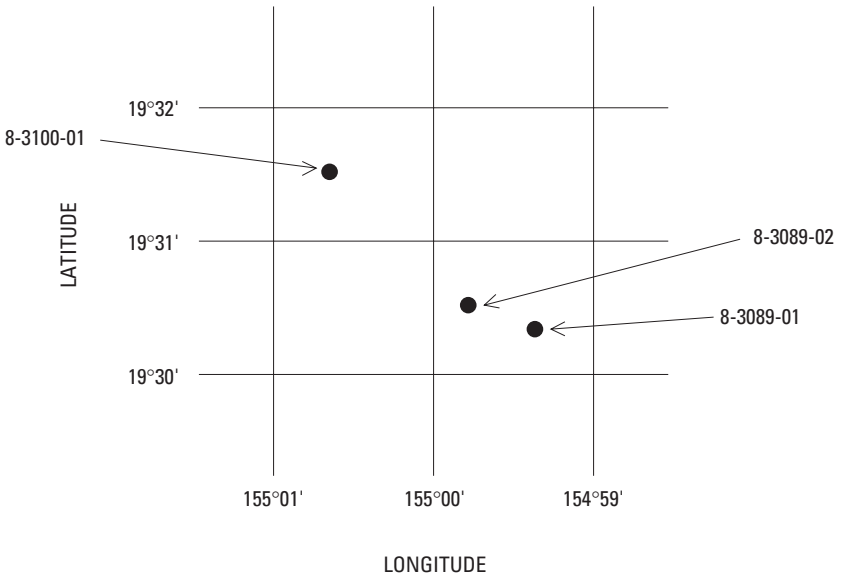


Figure 3. Local well numbering system.

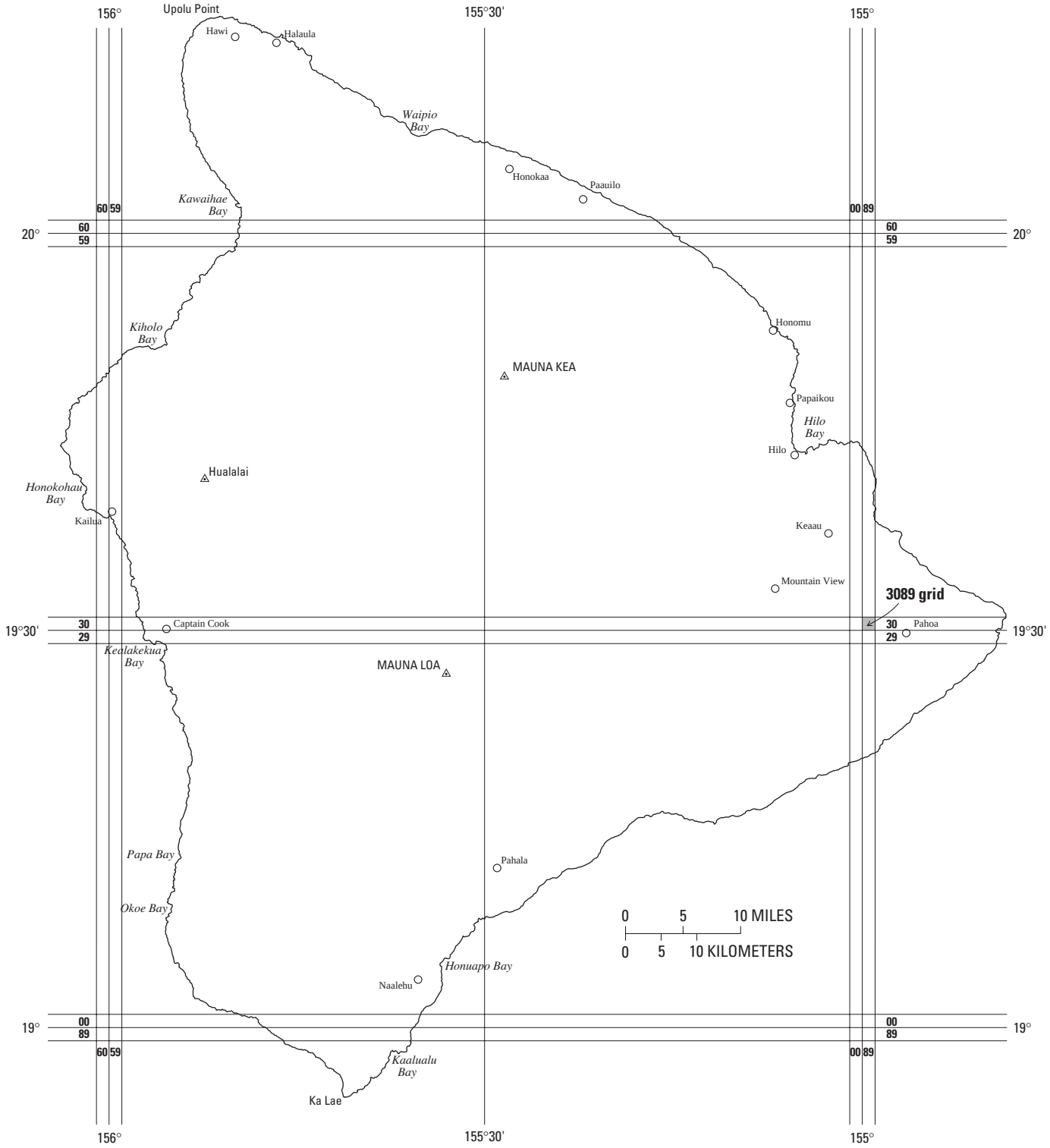


Figure 4. Map of Hawaii showing system for determining local well numbers.

Local State Key Numbering System

In addition to the latitude-longitude based site identification number, rainfall stations in the State of Hawaii are assigned State key numbers. The numbering system was devised in 1948 by the authors of “A Key to Rain Gages in Hawaii.” The numbers run from 1 to 1145, proceeding from south to north up the island chain. However, within each five-minute latitude band, numbers proceed from west to east. Following are the blocks of numbers assigned to each island.

Island	State Key Number
Hawaii	1-223
Maui	248-497
Molokai	500-563
Lanai	650-696
Oahu	700-912
Kauai	925-1145

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figures 5–14.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relations between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relations between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with electronic data loggers, with digital recorders that punch stage values on paper tapes at selected time intervals, or with analog recorders that trace continuous graphs of stage. Measurements of discharge are made with current meters, using methods adapted by the U.S. Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, Water-Supply Paper 2175, and the U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI), Book 3, Chapter A1 to A19 and Book 8, Chapters A2 and B2. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

In computing discharge records, results of individual measurements are plotted against corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control.

At some stream-gaging stations, the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

In computing records of lake or reservoir contents, it is necessary to have information available from surveys, curves, or tables that define the relation of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. Discharges over lake or reservoir spillways are computed from stage-discharge relations much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the validity of the recorded gage height is so questionable that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous and following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous and following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

Streamflow data in this report are presented in a new format that is considerably different from the format in data reports prior to the 1992 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences. In addition, beginning with the 1992 water year, a graphical hydrograph is included for surface-water discharge stations.

The records published for each continuous-record surface-water discharge station (gaging station) now consist of five parts, the station manuscript; the data table of daily mean values of discharge for the current water year with summary data; a tabular statistical summary of monthly mean flow data for a designated period, by water year; a summary statistics table that includes statistical data of annual and daily flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration; and a hydrograph of the daily mean values of discharge for the current water year. Summary statistics were not included for certain sites where these data would be misleading. Contact the U.S. Geological Survey Hawaii District office for information concerning summary statistics for these sites.

Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means the instantaneous maximum discharge was revised; "(m)" the instantaneous minimum was revised; and "(P)" the peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to mean sea level, and a condensed history of the types, locations, and datums of previous gages are given under this heading. In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the National Mapping Division of the U.S. Geological Survey unless otherwise qualified.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station manuscript for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remark statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, special methods of computation, conditions that affect natural flow at the station, and possibly other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the U.S. Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic average of the water-year mean discharges. Average discharge is computed only for stations having at least 5 water years of complete record; water years with incomplete record are not included in the computation. The mean-discharge value that uses all published data may differ from that given in the summary statistics data, which is based only on computer-stored data. The summary data do not include values of monthly or yearly data that were determined by various methods for the series of Water-Supply Papers entitled "Compilation of Records of Surface Water of the United States." The average-discharge value is not computed for stations where diversions, storage or other water-use practices cause the value to be meaningless. If water projects that significantly alter flow at a station are put into use after the station has been in operation for a period of years, the new average is computed as soon as 5 water years of record have accumulated after the project began.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for any canals, ditches, drains, or streams for which the peaks are subject to substantial artificial control. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

Data Table of Daily Mean Values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed "TOTAL" gives the sum of the daily figures for each month. The line headed "MEAN" gives the average flow in cubic feet per second during the month, and the lines headed "MAX" and "MIN" give the maximum and minimum daily mean discharges, respectively, for the month. Discharge for the month also is usually expressed in acre-feet (line headed "AC-FT").

Statistics of Monthly Mean Data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "MIN") of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those figures. The designated period will be expressed as "FOR WATER YEAR ___-___, BY WATER YEAR (WY)," and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript.

Summary Statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, "WATER YEARS ___-___," will consist of all of the station record within the specified water years, inclusive, including months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (See line headings below), except for the "ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the headings. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

ANNUAL TOTAL.--The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.--The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.--The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.--The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.--The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.--The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1 - March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

INSTANTANEOUS PEAK FLOW.--The maximum instantaneous discharge occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are stored in District computer files for stations meeting certain criteria. Those discharge values may be obtained by writing to the District office (see address on back title page of this report).

INSTANTANEOUS PEAK STAGE.--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.--The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.--Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicates the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.--The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.--The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.--The discharge that has been exceeded 90 percent of the time for the designated period.

HYDROGRAPH.--The hydrograph gives a graphical presentation of the mean discharge for each day of the water year. Where possible, the same scale is used in order to facilitate visual comparison between gaging stations.

Data collected at miscellaneous sites are presented in a table following the information for continuous sites. This table summarizes discharge measurements made at sites other than continuous-record sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station manuscript.

Accuracy of the Records

The accuracy of streamflow records depends primarily on: (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of measurements of stage, measurements of discharge, and interpretations of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the published daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair" within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft^3/s; the nearest tenths between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to three significant figures for more than 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge figure. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff because of the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, for changes in contents to reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables are on file in the U.S. Geological Survey Hawaii District office. Also, most of the daily mean discharges are in computer readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the unpublished records may be obtained from the U.S. Geological Survey Hawaii District office.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape or obtained via data collection platform. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figures 5–9 and 15.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-Site Measurements and Sample Collection

In obtaining water-quality data, it is important that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made on site when the samples are taken. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in publications on Techniques of Water-Resources Investigations Book 1, Chapter D2; Book 3, Chapter A1, A3, and A4; Book 9, Chapters A1–A9. These references are listed in the PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS section of this report. These methods are consistent with ASTM standards and generally follow ISO standards. Also, detailed information on collecting, treating, and shipping samples may be obtained from the U.S. Geological Survey Hawaii District office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream-Quality Accounting Network (see "DEFINITION OF TERMS") are obtained from at least five verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurements of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S. Geological Survey office whose address is given on the back of the title page in this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are frequently taken at the time discharge measurements are made for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, maximum, minimum, and mean temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the U.S. Geological Survey Hawaii District office.

Sediment

Suspended-sediment concentrations are determined from samples collected by one of the standard techniques discussed in TWRI, Book 3, Chapter C2, "Field methods for measurement of fluvial sediment," 1985 revision. Samples are obtained using standard depth- or point-integrating samplers, or by means of an approved pumping sampler. Mean concentrations for the sampled cross section are in turn determined from these samples.

For stations with daily suspended-sediment records, mean daily suspended-sediment concentrations and loads are computed and published for each day of the water year. During periods of unchanging flow and sediment concentration, daily suspended-sediment loads are computed as the product of daily mean streamflow, daily mean suspended-sediment concentrations, and 0.0027, a conversion factor. During periods of rapidly changing flow or rapidly changing suspended-sediment concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge. Methods used in the computation of sediment records are described in the TWRI Book 3, Chapters C1 and C3. These methods are consistent with ASTM standards and generally follow ISO standards.

At other stations, suspended-sediment samples were collected periodically. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, periodic measurements of the particle-size distributions for the suspended-sediment, bed-load, and bed-material samples are included for stations where samples were obtained to measure this parameter.

Laboratory Measurements

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance and chloride are analyzed locally. All other samples are analyzed in the U.S. Geological Survey National Water-Quality Laboratory in Arvada, Colorado. The USGS National Water-Quality Laboratory collects quality-control data on a continuing basis to evaluate selected analytical methods to determine long-term method detection levels (LT-MDL's) and laboratory reporting levels (LRL's). These values are re-evaluated each year on the basis of the most recent quality-control data and, consequently, may change from year to year.

This reporting procedure limits the occurrence of false positive error. The chance of falsely reporting a concentration greater than the LT-MDL for a sample in which the analyte is not present is 1 percent or less. Application of the LRL limits the occurrence of false negative error. The chance of falsely reporting a non-detection for a sample in which the analyte is present at a concentration equal to or greater than the LRL is 1 percent or less.

Accordingly, concentrations are reported as <LRL for samples in which the analyte was either not detected or did not pass identification. Analytes that are detected at concentrations between the LT-MDL and LRL and that pass identification criteria are estimated. Estimated concentrations will be noted with a remark code of "E." These data should be used with the understanding that their uncertainty is greater than that of data reported without the "E" remark code.

Methods used to analyze sediment samples and to compute sediment records are described in the TWRI Book 5, Chapter C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapter A1, A3, A4, and A5. These methods are consistent with ASTM standards and generally follow ISO standards.

In March 1989, the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989. Sulfate values in this report have not been corrected for this bias.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES FOR PERIOD OF RECORD.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums and minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, NWIS, and subsequently to its web-based National data system, NWISWeb [http://water.usgs.gov/nwis/nwis]. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from NWIS or NWISWeb to ensure the most recent updates. Updates to NWISWeb are currently made on an annual basis.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given to these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the surface-water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
V	Analyte was detected in both the environmental sample and the associated blanks
&	Biological organism estimated as dominant.

Dissolved Trace-Element Concentrations

*NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (µg/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Data above the µg/L level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994.

Change in National Trends Network Procedures

*NOTE.--Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP Program Office, Illinois State Water Survey, 2204 Griffith Drive, Champaign, IL 61820-7495 (217-333-7873).

Records of Ground-Water Levels

Only water-level data from a basic network of observation wells are given in this report. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers. Locations of the observation wells in Hawaii listed in this report are shown in figures 16–20.

Although, in this report, records of water levels are presented for fewer than 100 wells, records are obtained through cooperative efforts of many Federal, State, and local agencies for several thousand observation wells throughout Hawaii and are placed in computer storage, published in reports, or kept in files. Information about the availability of ground-water data may be obtained from the District Chief, Hawaii District, U.S. Geological Survey, 677 Ala Moana Blvd., Suite 415, Honolulu, Hawaii, 96813.

Data Collection and Computation

Measurements of water levels are made in many types of wells, under varying conditions, but the method of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey TWRI publications referred to in the "On-site Measurements and Sample Collection" and the "Laboratory Measurements" sections in this data report. In addition, the TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected constituents. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Tables of water-level data are presented by islands. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, a 7-digit number based on the local identifier well-numbering system (page 5).

Water-level records are obtained from direct measurements with a steel or electrical tape or from the graph, digital record, or electronic record of a water-stage recorder. The water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported every day. When complete water-level data for a day is not available, the day is noted with three dashes (---).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Data Presentation

Each well record consists of three parts, the station description, the data table of mean daily water levels observed during the current water year, and a hydrograph of water levels observed during the past 5 years. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and (or) screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

INSTRUMENTATION.--This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes the land-surface elevation at the well. The elevation of the land-surface datum is described is described in feet above (or below) mean sea level; it is reported with a precision depending on the method of determination.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-U.S. Geological Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the U.S. Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet above mean sea level and all taped measurements of water levels are listed. For wells equipped with a recorder, only abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

ACCESS TO USGS WATER DATA

Real-time streamflow, water level, and rainfall data collected by the USGS in Hawaii are available at:

http://hi.water.usgs.gov

Some water-quality and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on magnetic tape or 3-1/2 inch floppy disk. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division district offices (see address on the back of the title page).

DEFINITION OF TERMS

Specialized technical terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. Terms such as algae, water level, precipitation are used in their common everyday meanings, definitions of which are given in standard dictionaries. Not all terms defined in this alphabetical list apply to every State. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acid neutralizing capacity (ANC) is the equivalent sum of all bases or base-producing materials, solutes plus particulates, in an aqueous system that can be titrated with acid to an equivalence point. This term designates titration of an "unfiltered" sample (formerly reported as alkalinity).

Acre-foot (AC-FT, acre-ft) is a unit of volume, commonly used to measure quantities of water used or stored, equivalent to the volume of water required to cover 1 acre to a depth of 1 foot and equivalent to 43,560 cubic feet, 325,851 gallons, or 1,233 cubic meters. (See also "Annual runoff")

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes ATP an excellent indicator of the presence of living material in water. A measurement of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Alkalinity is the capacity of solutes in an aqueous system to neutralize acid. This term designates titration of a "filtered" sample.

Annual runoff is the total quantity of water that is discharged ("runs off") from a drainage basin in a year. Data reports may present annual runoff data as volumes in acre-feet, as discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches.

Annual 7-day minimum is the lowest mean value for any 7-consecutive-day period in a year. Annual 7-day minimum values are reported herein for the calendar year and the water year (October 1 to September 30). Most low-flow frequency analyses use a climatic year (April 1-March 31), which tends to prevent the low-flow period from being artificially split between adjacent years. The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

Aroclor is the registered trademark for a group of polychlorinated biphenyls that were manufactured by the Monsanto Company prior to 1976. Aroclors are assigned specific 4-digit reference numbers dependent upon molecular type and degree of substitution of the biphenyl ring hydrogen atoms by chlorine atoms. The first two digits of a numbered aroclor represent the molecular type and the last two digits represent the weight percent of the hydrogen substituted chlorine.

Artificial substrate is a device that is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection. (See also "Substrate")

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500 °C for 1 hour. Ash mass of zooplankton and phytoplankton is expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2). (See also "Biomass")

Bacteria are microscopic unicellular organisims, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Base discharge (for peak discharge) is a discharge value, determined for selected stations, above which peak discharge data are published. The base discharge at each station is selected so that an average of about three peaks per year will be published.

Base flow is sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by ground-water discharge.

Bedload is material in transport that is supported primarily by the streambed. In this report, bedload is considered to consist of particles in transit from the bed to an elevation equal to the top of the bedload sampler nozzle (ranging from 0.25 to 0.5 ft) that are retained in the bedload sampler. A sample collected with a pressure-differential bedload sampler may also contain a component of the suspended load.

Bedload discharge (tons per day) is rate of sediment moving as bedload, reported as dry weight, that passes through a cross section in a given time. NOTE: Bedload discharge values in this report may include a component of the suspended-sediment discharge. A correction may be necessary when computing the total sediment discharge by summing the bedload discharge and the suspended-sediment discharge. (See also "Bedload" and "Sediment")

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed. (See also "Bedload" and "Sediment")

Benthic organisms are the group of organisms inhabiting the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are useful as indicators of water quality.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as mass per unit area or volume of habitat.

Biomass pigment ratio is an indicator of the total proportion of periphyton which are autotrophic (plants). This is also called the Autotrophic Index.

Blue-green algae (*Cyanophyta*) are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water. Concentrations are expressed as a number of cells per milliliter (cells/mL) of sample. (See also "Phytoplankton")

Bottom material (See "Bed material")

Cells/volume refers to the number of cells of any organism that is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample volume, and are generally reported as cells or units per milliliter (mL) or liter (L).

Cells volume (biovolume) determination is one of several common methods used to estimate biomass of algae in aquatic systems. Cell members of algae are frequently used in aquatic surveys as an indicator of algal production. However, cell numbers alone cannot represent true biomass because of considerable cell-size variation among the algal species. Cell volume (μm^3) is determined by obtaining critical cell measurements on cell dimensions (for example, length, width, height, or radius) for 20 to 50 cells of each important species to obtain an average biovolume per cell. Cells are categorized according to the correspondence of their cellular shape to the nearest geometric solid or combinations of simple solids (for example, spheres, cones, or cylinders). Representative formulae used to compute biovolume are as follows:

$$\text{sphere } 4/3\ \pi r^3 \quad \text{cone } 1/3\ \pi r^3 h \quad \text{cylinder } \pi r^3 h.$$

pi is the ratio of the circumference to the diameter of a circle; pi = 3.14159…
From cell volume, total algal biomass expressed as biovolume ($\mu m^3/mL$) is thus determined by multiplying the number of cells of a given species by its average cell volume and then summing these volumes over all species.

Cfs-day (See "Cubic foot per second-day")

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with BOD or with carbonaceous organic pollution from sewage or industrial wastes. [See also "Biochemical oxygen demand (BOD)"]

***Clostridium perfringens** (C. perfringens)* is a spore-forming bacterium that is common in the feces of human and other warm-blooded animals. Clostridial spores are being used experimentally as an indicator of past fecal contamination and presence of microorganisms that are resistant to disinfection and environmental stresses. (See also "Bacteria")

Coliphages are viruses that infect and replicate in coliform bacteria. They are indicative of sewage contamination of waters and of the survival and transport of viruses in the environment.

Color unit is produced by 1 milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Confined aquifer is a term used to describe an aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases, the water level can rise above the ground surface, yielding a flowing well.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Continuous-record station is a site where data are collected with sufficient frequency to define daily mean values and variations within a day.

Control designates a feature in the channel downstream from a gaging station that physically influences the water-surface elevation and thereby determines the stage-discharge relation at the gage. This feature may be a constriction of the channel, a bedrock outcrop, a gravel bar, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of saltwater.

Cubic foot per second (CFS, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point in 1 second. It is equivalent to approximately 7.48 gallons per second or approximately 449 gallons per minute, or 0.02832 cubic meters per second. The term “second-feet” sometimes is used synonymously with “cubic feet per second” but is now obsolete.

Cubic foot per second-day (CFS-DAY, Cfs-day, [$(ft^3/s)/d$]) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.98347 acre-feet, 646,317 gallons, or 2,446.6 cubic meters. The daily-mean discharges reported in the daily-value data tables are numerically equal to the daily volumes in cfs-days, and the totals also represent volumes in cfs-days.

Cubic foot per second per square mile [CFSM, $(ft^3/s)/mi^2$] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area. (See also “Annual runoff”)

Daily mean suspended-sediment concentration is the time-weighted concentration of suspended sediment passing a stream cross section during a 24-hour day. (See also “Mean concentration of suspended sediment,” “Sediment,” and “Suspended-sediment concentration”)

Daily-record station is a site where data are collected with sufficient frequency to develop a record of one or more data values per day. The frequency of data collection can range from continuous recording to periodic sample or data collection on a daily or near-daily basis.

Data Collection Platform (DCP) is an electronic instrument that collects, processes, and stores data from various sensors, and transmits the data by satellite data relay, line-of-sight radio, and/or landline telemetry.

Data logger is a microprocessor-based data acquisition system designed specifically to acquire, process, and store data. Data are usually downloaded from onsite data loggers for entry into office data systems.

Datum is a surface or point relative to which measurements of height and/or horizontal position are reported. A vertical datum is a horizontal surface used as the zero point for measurements of gage height, stage, or elevation; a horizontal datum is a reference for positions given in terms of latitude-longitude, State Plane coordinates, or UTM coordinates. (See also “Gage datum,” “Land-surface datum,” “National Geodetic Vertical Datum of 1929,” and “North American Vertical Datum of 1988”)

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample. (See also “Phytoplankton”)

Diel is of or pertaining to a 24-hour period of time; a regular daily cycle.

Discharge, or flow, is the rate that matter passes through a cross section of a stream channel or other water body per unit of time. The term commonly refers to the volume of water (including, unless otherwise stated, any sediments or other constituents suspended or dissolved in the water) that passes a cross section in a stream channel, canal, pipeline, etc., within a given period of time (cubic feet per second). Discharge also can apply to the rate at which constituents such as suspended sediment, bedload, and dissolved or suspended chemical constituents, pass through a cross section, in which cases the quantity is expressed as the mass of constituent that passes the cross section in a given period of time (tons per day).

Dissolved refers to that material in a representative water sample that passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal and State agencies that collect water-quality data. Determinations of "dissolved" constituent concentrations are made on sample water that has been filtered.

Dissolved oxygen (DO) is the molecular oxygen (oxygen gas) dissolved in water. The concentration in water is a function of atmospheric pressure, temperature, and dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved-solids concentration. Photosynthesis and respiration by plants commonly cause diurnal variations in dissolved-oxygen concentration in water from some streams.

Dissolved-solids concentration in water is the quantity of dissolved material in a sample of water. It is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. In the mathematical calculation, the bicarbonate value, in milligrams per liter, is multiplied by 0.4926 to convert it to carbonate. Alternatively, alkalinity concentration (as mg/L $CaCO_3$) can be converted to carbonate concentration by multiplying by 0.60.

Diversity index (H) (Shannon Index) is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = -\sum_{i \approx 1}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specific location is that area upstream from the location, measured in a horizontal plane, that has a common outlet at the site for its surface runoff from precipitation that normally drains by gravity into a stream. Drainage areas given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the Earth's surface that contains a drainage system with a common outlet for its surface runoff. (See "Drainage area")

Dry mass refers to the mass of residue present after drying in an oven at 105 °C, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass. (See also "Ash mass," "Biomass," and "Wet mass")

Dry weight refers to the weight of animal tissue after it has been dried in an oven at 65 °C until a constant weight is achieved. Dry weight represents total organic and inorganic matter in the tissue. (See also "Wet weight")

Enterococcus bacteria are commonly found in the feces of humans and other warm-blooded animals. Although some strains are ubiquitous and not related to fecal pollution, the presence of enterococci in water is an indication of fecal pollution and the possible presence of enteric pathogens. Enterococcus bacteria are those bacteria that produce pink to red colonies with black or reddish-brown precipitate after incubation at 41 °C on mE agar and subsequent transfer to EIA medium. Enterococci include *Streptococcus feacalis, Streptococcus feacium, Streptococcus avium,* and their variants. (See also "Bacteria")

EPT Index is the total number of distinct taxa within the insect orders Ephemeroptera, Plecoptera, and Trichoptera. This index summarizes the taxa richness within the aquatic insects that are generally considered pollution sensitive, the index usually decreases with pollution.

Escherichia coli (E. coli) are bacteria present in the intestine and feces of warm-blooded animals. *E. coli* are a member species of the fecal coliform group of indicator bacteria. In the laboratory, they are defined as those bacteria that

produce yellow or yellow-brown colonies on a filter pad saturated with urea substrate broth after primary culturing for 22 to 24 hours at 44.5 °C on mTEC medium. Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Estimated (E) value of a concentration is reported when an analyte is detected and all criteria for a positive result are met. If the concentration is less than the method detection limit (MDL), an 'E' code will be reported with the value. If the analyte is qualitatively identified as present, but the quantitative determination is substantially more uncertain, the National Water Quality Laboratory will identify the result with an 'E' code even though the measured value is greater than the MDL. A value reported with an 'E' code should be used with caution. When no analyte is detected in a sample, the default reporting value is the MDL preceded by a less than sign (<).

Euglenoids (*Euglenophyta*) are a group of algae that are usually free-swimming and rarely creeping. They have the ability to grow either photosynthetically in the light or heterotrophically in the dark. (See also "Phytoplankton")

Extractable organic halides (EOX) are organic compounds that contain halogen atoms such as chlorine. These organic compounds are semi-volatile and extractable by ethyl acetate from air-dried streambed sediments. The ethyl acetate extract is combusted, and the concentration is determined by microcoulometric determination of the halides formed. The concentration is reported as micrograms of chlorine per gram of the dry weight of the streambed sediments.

Fecal coliform bacteria are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory, they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5 °C plus or minus 0.2 °C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Fecal streptococcal bacteria are present in the intestine of warm-blooded animals and are ubiquitous in the environment. They are characterized as gram-positive, cocci bacteria that are capable of growth in brain-heart infusion broth. In the laboratory, they are defined as all the organisms that produce red or pink colonies within 48 hours at 35 °C plus or minus 1.0 °C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Fire algae (*Pyrrhophyta*) are free-swimming unicells characterized by a red pigment spot. (See also "Phytoplankton")

Flow-duration percentiles are values on a scale of 100 that indicate the percentage of time for which a flow is not exceeded. For example, the 90th percentile of river flow is greater than or equal to 90 percent of all recorded flow rates.

Gage datum is a horizontal surface used as a zero point for measurement of stage or gage height. This surface usually is located slightly below the lowest point of the stream bottom such that the gage height is usually slightly larger than the maximum depth of water. Because the gage datum itself is not an actual physical object, the datum usually is defined by specifying the elevations of permanent reference marks such as bridge abutments and survey monuments, and the gage is set to agree with the reference marks. Gage datum is a local datum that is maintained independently of any National geodetic datum. However, if the elevation of the gage datum relative to the National datum (North American Vertical Datum of 1988 or National Geodetic Vertical Datum of 1929) has been determined, then the gage readings can be converted to elevations above the National datum by adding the elevation of the gage datum to the gage reading.

Gage height (G.H.) is the water-surface elevation, in feet above the gage datum. If the water surface is below the gage datum, the gage height is negative. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used in reference to a reading on a gage.

Gage values are values that are recorded, transmitted and/or computed from a gaging station. Gage values typically are collected at 5-, 15-, or 30-minute intervals.

Gaging station is a site on a stream, canal, lake, or reservoir where systematic observations of stage, discharge, or other hydrologic data are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is computed.

Gas chromatography/flame ionization detector (GC/FID) is a laboratory analytical method used as a screening technique for semivolatile organic compounds that are extractable from water in methylene chloride.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating “moss” in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample. (See also “Phytoplankton”)

Habitat quality index is the qualitative description (level 1) of instream habitat and riparian conditions surrounding the reach sampled. Scores range from 0 to 100 percent with higher scores indicative of desirable habitat conditions for aquatic life. Index only applicable to wadable streams.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations (primarily calcium and magnesium) and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

High tide is the maximum height reached by each rising tide. The high-high and low-high tides are the higher and lower of the two high tides, respectively, of each tidal day. *See NOAA web site: http://www.co-ops.nos.noaa.gov/tideglos.html*

Hilsenhoff’s Biotic Index (HBI) is an indicator of organic pollution which uses tolerance values to weight taxa abundances; usually increases with pollution. It is calculated as follows:

$$HBI = sum\frac{(n)(a)}{N}$$

where *n* is the number of individuals of each taxon, a is the tolerance value of each taxon, and *N* is the total number of organisms in the sample.

Horizontal datum (See “Datum”)

Hydrologic benchmark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a benchmark station may be used to separate effects of natural from human-induced changes in other basins that have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped benchmark basin.

Hydrologic index stations referred to in this report are four continuous-record gaging stations that have been selected as representative of streamflow patterns for their respective regions. Station locations are shown on index maps.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the former Office of Water Data Coordination and delineated on the State Hydrologic Unit Maps by the USGS. Each hydrologic unit is identified by an 8-digit number.

Inch (IN., in.), as used in this report, refers to the depth to which the drainage area would be covered with water if all of the runoff for a given time period were uniformly distributed on it. (See also “Annual runoff”)

Instantaneous discharge is the discharge at a particular instant of time. (See also “Discharge”)

Laboratory Reporting Level (LRL) is generally equal to twice the yearly determined long-term method detection level (LT-MDL). The LRL controls false negative error. The probability of falsely reporting a non-detection for a sample that contained an analyte at a concentration equal to or greater than the LRL is predicted to be less than or equal to 1 percent. The value of the LRL will be reported with a “less than” (<) remark code for samples in which the analyte was not detected. The National Water Quality Laboratory collects quality-control data from selected analytical methods on a continuing basis to determine
LT-MDLs and to establish LRLs. These values are reevaluated annually based on the most current quality-control data and may, therefore, change. [Note: In several previous NWQL documents (Connor and others, 1998; NWQL Technical Memorandum 98.07, 1998), the LRL was called the non-detection value or NDV—a term that is no longer used.)

Land-surface datum (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

Light-attenuation coefficient, also known as the extinction coefficient, is a measure of water clarity. Light is attenuated according to the Lambert-Beer equation

$$I = I_o e^{-\lambda L},$$

where I_o is the source light intensity, I is the light intensity at length L (in meters) from the source, λ is the light-attenuation coefficient, and e is the base of the natural logarithm. The light attenuation coefficient is defined as

$$\lambda = -\frac{1}{L}\log_e\frac{I}{I_o} .$$

Lipid is any one of a family of compounds that are insoluble in water and that make up one of the principal components of living cells. Lipids include fats, oils, waxes, and steroids. Many environmental contaminants such as organochlorine pesticides are lipophilic.

Long-Term Method Detection Level (LT–MDL) is a detection level derived by determining the standard deviation of a minimum of 24 method detection limit (MDL) spike sample measurements over an extended period of time. LT–MDL data are collected on a continuous basis to assess year-to-year variations in the LT–MDL. The LT–MDL controls false positive error. The chance of falsely reporting a concentration at or greater than the LT–MDL for a sample that did not contain the analyte is predicted to be less than or equal to 1 percent.

Low tide is the minimum height reached by each falling tide. The high-low and low-low tides are the higher and lower of the two low tides, respectively, of each tidal day. *See NOAA web site: http://www.co-ops.nos.noaa.gov/tideglos.html*

Macrophytes are the macroscopic plants in the aquatic environment. The most common macrophytes are the rooted vascular plants that are usually arranged in zones in aquatic ecosystems and restricted in the area by the extent of illumination through the water and sediment deposition along the shoreline.

Mean concentration of suspended sediment (Daily mean suspended-sediment concentration) is the time-weighted concentration of suspended sediment passing a stream cross section during a given time period. (See also “Daily mean suspended-sediment concentration” and “Suspended-sediment concentration”)

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period. (See also “Discharge”)

Mean high or low tide is the average of all high or low tides, respectively, over a specific period.

Mean sea level is a local tidal datum. It is the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; for example, monthly mean sea level and yearly mean sea level. In order that they may be recovered when needed, such datums are referenced to fixed points known as benchmarks. (See also “Datum”)

Measuring point (MP) is an arbitrary permanent reference point from which the distance to water surface in a well is measured to obtain water level.

Membrane filter is a thin microporous material of specific pore size used to filter bacteria, algae, and other very small particles from water.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Method Detection Limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99-percent confidence that the analyte concentration is greater than zero. It is determined from the analysis of a sample in a given matrix containing the analyte. At the MDL concentration, the risk of a false positive is predicted to be less than or equal to 1 percent.

Methylene blue active substances (MBAS) are apparent detergents. The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

Micrograms per gram (UG/G, µg/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per kilogram (UG/KG, µg/kg) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the constituent per unit mass (kilogram) of the material analyzed. One microgram per kilogram is equivalent to 1 part per billion.

Micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in water as mass (micrograms) of constituent per unit volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter. One microgram per liter is equivalent to 1 part per billion.

Microsiemens per centimeter (US/CM, µS/cm) is a unit expressing the amount of electrical conductivity of a solution as measured between opposite faces of a centimeter cube of solution at a specified temperature. Siemens is the International System of Units nomenclature. It is synonymous with mhos and is the reciprocal of resistance in ohms.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in water as the mass (milligrams) of constituent per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

Minimum Reporting Level (MRL) is the smallest measured concentration of a constituent that may be reliably reported by using a given analytical method (Timme, 1995).

Miscellaneous site, miscellaneous station, or miscellaneous sampling site is a site where streamflow, sediment, and/or water-quality data or water-quality or sediment samples are collected once, or more often on a random or discontinuous basis to provide better areal coverage for defining hydrologic and water-quality conditions over a broad area in a river basin.

Most probable number (MPN) is an index of the number of coliform bacteria that, more probably than any other number, would give the results shown by the laboratory examination; it is not an actual enumeration. MPN is determined from the distribution of gas-positive cultures among multiple inoculated tubes.

Multiple-plate samplers are artificial substrates of known surface area used for obtaining benthic invertebrate samples. They consist of a series of spaced, hardboard plates on an eyebolt.

Nanograms per liter (NG/L, ng/L) is a unit expressing the concentration of chemical constituents in solution as mass (nanograms) of solute per unit volume (liter) of water. One million nanograms per liter is equivalent to 1 milligram per liter.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a fixed reference adopted as a standard geodetic datum for elevations determined by leveling. It was formerly called "Sea Level Datum of 1929" or "mean sea level." Although the datum was derived from the mean sea level at 26 tide stations**,** it does not necessarily represent local mean sea level at any particular place. *See NOAA web site: http://www.ngs.noaa.gov/faq.shtml#WhatVD29VD88* (See "North American Vertical Datum of 1988")

Natural substrate refers to any naturally occurring immersed or submersed solid surface, such as a rock or tree, upon which an organism lives. (See also "Substrate")

Nekton are the consumers in the aquatic environment and consist of large free-swimming organisms that are capable of sustained, directed mobility.

Nephelometric turbidity unit (NTU) is the measurement for reporting turbidity that is based on use of a standard suspension of Formazin. Turbidity measured in NTU uses nephelometric methods that depend on passing specific light of a specific wavelength through the sample.

North American Vertical Datum of 1988 (NAVD 1988) is a fixed reference adopted as the official civilian vertical datum for elevations determined by Federal surveying and mapping activities in the U.S. This datum was established in 1991 by minimum-constraint adjustment of the Canadian**,** Mexican, and U.S. first-order terrestrial leveling networks.

Open or screened interval is the length of unscreened opening or of well screen through which water enters a well, in feet below land surface.

Organic carbon (OC) is a measure of organic matter present in aqueous solution, suspension, or bottom sediments. May be reported as dissolved organic carbon (DOC), particulate organic carbon (POC), or total organic carbon (TOC).

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. Organic mass is expressed in the same units as for ash mass and dry mass. (See also "Ash mass," "Biomass," and "Dry mass")

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meter (m^2), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Organochlorine compounds are any chemicals that contain carbon and chlorine. Organochlorine compounds that are important in investigations of water, sediment, and biological quality include certain pesticides and industrial compounds.

Parameter Code is a 5-digit number used in the USGS computerized data system, National Water Information System (NWIS), to uniquely identify a specific constituent or property.

Partial-record station is a site where discrete measurements of one or more hydrologic parameters are obtained over a period of time without continuous data being recorded or computed. A common example is a crest-stage gage partial-record station at which only peak stages and flows are recorded.

Particle size is the diameter, in millimeters (mm), of a particle determined by sieve or sedimentation methods. The sedimentation method utilizes the principle of Stokes Law to calculate sediment particle sizes. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube, Sedigraph) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification, as used in this report, agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)			Method of analysis
Clay	0.00024	-	0.004	Sedimentation
Silt	0.004	-	0.062	Sedimentation
Sand	0.062	-	2.0	Sedimentation/sieve
Gravel	2.0	-	64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native water analysis.

Peak flow (peak stage) is an instantaneous local maximum value in the continuous time series of streamflows or stages, preceded by a period of increasing values and followed by a period of decreasing values. Several peak values ordinarily occur in a year. The maximum peak value in a year is called the annual peak; peaks lower than the annual peak are called secondary peaks. Occasionally, the annual peak may not be the maximum value for the year; in such cases, the maximum value occurs at midnight at the beginning or end of the year, on the recession from or rise toward a higher peak in the adjoining year. If values are recorded at a discrete series of times, the peak recorded value may be taken as an approximation to the true peak, which may occur between the recording instants. If the values are recorded with finite precision, a sequence of equal recorded values may occur at the peak; in this case, the first value is taken as the peak.

Percent composition or **percent of total** is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, weight, mass, or volume.

Percent shading is determined by using a clinometer to estimate left and right bank shading. The values are added together and divided by 180 to determine percent shading relative to a horizontal surface.

Periodic-record station is a site where stage, discharge, sediment, chemical, physical, or other hydrologic measurements are made one or more times during a year, but at a frequency insufficient to develop a daily record.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton are useful indicators of water quality.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

pH of water is the negative logarithm of the hydrogen-ion activity. Solutions with pH less than 7 are termed "acidic," and solutions with a pH greater than 7 are termed "basic." Solutions with a pH of 7 are neutral. The presence and concentration of many dissolved chemical constituents found in water are, in part, influenced by the hydrogen-ion activity of water. Biological processes including growth, distribution of organisms, and toxicity of the water to organisms are also influenced, in part, by the hydrogen-ion activity of water.

Phytoplankton is the plant part of the plankton. They are usually microscopic, and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment and are commonly known as algae. (See also "Plankton")

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactive nuclide represented by a curie (Ci). A curie is the quantity of radioactive nuclide that yields 3.7×10^{10} radioactive disintegrations per second (dps). A picocurie yields 0.037 dps, or 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers. Concentrations are expressed as a number of cells per milliliter (cells/mL of sample).

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Polychlorinated naphthalenes (PCNs) are industrial chemicals that are mixtures of chlorinated naphthalene compounds. They have properties and applications similar to polychlorinated biphenyls (PCBs) and have been identified in commercial PCB preparations.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated (carbon method) by the plants.

Primary productivity (carbon method) is expressed as milligrams of carbon per area per unit time [mg C/(m^2/time)] for periphyton and macrophytes or per volume [mg C/(m^3/time)] for phytoplankton. Carbon method defines the amount of carbon dioxide consumed as measured by
radioactive carbon (carbon-14). The carbon-14 method is of greater sensitivity than the oxygen light and dark bottle method and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period. (See also "Primary productivity")

Primary productivity (oxygen method) is expressed as milligrams of oxygen per area per unit time [mg O/(m^2/time)] for periphyton and macrophytes or per volume [mg O/(m^3/time)] for phytoplankton. Oxygen method defines production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period. (See also "Primary productivity")

Radioisotopes are isotopic forms of an element that exhibit radioactivity. Isotopes are varieties of a chemical element that differ in atomic weight, but are very nearly alike in chemical properties. The difference arises because the atoms of the isotopic forms of an element differ in the number of neutrons in the nucleus; for example, ordinary chlorine is a mixture of isotopes having atomic weights of 35 and 37, and the natural mixture has an atomic weight of about 35.453. Many of the elements similarly exist as mixtures of isotopes, and a great many new isotopes have been produced in the operation of nuclear devices such as the cyclotron. There are 275 isotopes of the 81 stable elements, in addition to more than 800 radioactive isotopes.

Recoverable from bed (bottom) material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. (See also "Bed material")

Recurrence interval, also referred to as return period, is the average time, usually expressed in years, between occurrences of hydrologic events of a specified type (such as exceedances of a specified high flow or non-exceedance of a specified low flow). The terms "return period" and "recurrence interval" do not imply regular cyclic occurrence. The actual times between occurrences vary randomly, with most of the times being less than the average and a few being substantially greater than the average. For example, the 100-year flood is the flow rate that is exceeded by the annual maximum peak flow at intervals whose average length is 100 years (that is, once in 100 years, on average); almost two-thirds of all exceedances of the 100-year flood occur less than 100 years after the previous exceedance, half occur less than 70 years after the previous exceedance, and about one-eighth occur more than 200 years after the previous exceedance. Similarly, the 7-day 10-year low flow ($7Q_{10}$) is the flow rate below which the annual minimum 7-day-mean flow dips at intervals whose average length is 10 years (that is, once in 10 years, on average); almost two-thirds of the non-exceedances of the $7Q_{10}$ occur less than 10 years after the previous non-exceedance, half occur less than 7 years after, and about one-eighth occur more than 20 years after the previous non-exceedance. The recurrence interval for annual events is the reciprocal of the annual probability of occurrence. Thus, the 100-year flood has a 1-percent chance of being exceeded by the maximum peak flow in any year, and there is a 10-percent chance in any year that the annual minimum 7-day-mean flow will be less than the $7Q_{10}$.

Replicate samples are a group of samples collected in a manner such that the samples are thought to be essentially identical in composition.

Return period (See "Recurrence interval")

River mileage is the curvilinear distance, in miles, measured upstream from the mouth along the meandering path of a stream channel in accordance with Bulletin No. 14 (October 1968) of the Water Resources Council, and typically used to denote location along a river.

Runoff is the quantity of water that is discharged ("runs off") from a drainage basin in a given time period. Runoff data may be presented as volumes in acre-feet, as mean discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches. (See also "Annual runoff")

Sea level, as used in this report, refers to one of the two commonly used national vertical datums, (NGVD 1929 or NAVD 1988). See separate entries for definitions of these datums. See conversion of units page (inside back cover) for identification of the datum used in this report.

Sediment is solid material that originates mostly from disintegrated rocks; when transported by, suspended in, or deposited from water, it is referred to as "fluvial sediment." Sediment includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental and land-use factors. Some major factors are topography, soil characteristics, land cover, and depth and intensity of precipitation.

Seven-day 10-year low flow (7Q10) is the discharge below which the annual 7-day minimum flow falls in 1 year out of 10 on the long-run average. The recurrence interval of the 7Q10 is 10 years; the chance that the annual 7-day minimum flow will be less than the 7Q10 is 10 percent in any given year. (See also "Recurrence interval" and "Annual 7-day minimum")

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Sodium hazard in water is an index that can be used to evaluate the suitability of water for irrigating crops.

Specific electrical conductance (conductivity) is a measure of the capacity of water (or other media) to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 °C. Specific electrical conductance is a function of the types and quantity of dissolved substances in water and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stable isotope ratio (per MIL/MIL) is a unit expressing the ratio of the abundance of two radioactive isotopes. Isotope ratios are used in hydrologic studies to determine the age or source of specific waters, to evaluate mixing of different waters, as an aid in determining reaction rates, and other chemical or hydrologic processes.

Stage (See "Gage height")

Stage-discharge relation is the relation between the water-surface elevation, termed stage (gage height), and the volume of water flowing in a channel per unit time.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Substrate Embeddedness Class is a visual estimate of riffle streambed substrate larger than gravel that is surrounded or covered by fine sediment (<2mm, sand or finer). Below are the class categories expressed as percent covered by fine sediment:

0	< no gravel or larger substrate		
1	> 75%		
2	51-75%	4	5-25%
3	26-50%	5	< 5%

Surface area of a lake is that area (acres) encompassed by the boundary of the lake as shown on USGS topographic maps, or other available maps or photographs. Because surface area changes with lake stage, surface areas listed in this report represent those determined for the stage at the time the maps or photographs were obtained.

Surficial bed material is the upper surface (0.1 to 0.2 ft) of the bed material such as that material which is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is operationally defined as the material retained on a 0.45-micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative suspended water-sediment sample that is retained on a 0.45-micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. Determinations of "suspended, recoverable" constituents are made either by directly analyzing the suspended material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent. (See also "Suspended")

Suspended sediment is the sediment maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid. (See also "Sediment")

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L). The analytical technique uses the mass of all of the sediment and the net weight of the water-sediment mixture in a sample to compute the suspended-sediment concentration. (See also "Sediment" and "Suspended sediment")

Suspended-sediment discharge (tons/day) is the rate of sediment transport, as measured by dry mass or volume, that passes a cross section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft^3/s) x 0.0027. (See also "Sediment," "Suspended sediment," and "Suspended-sediment concentration")

Suspended-sediment load is a general term that refers to a given characteristic of the material in suspension that passes a point during a specified period of time. The term needs to be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It is not synonymous with either suspended-sediment discharge or concentration. (See also "Sediment")

Suspended, total is the total amount of a given constituent in the part of a water-sediment sample that is retained on a 0.45-micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. Knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total." Determinations of "suspended, total" constituents are made either by directly analyzing portions of the suspended material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent. (See also "Suspended")

Suspended solids, total residue at 105 °C concentration is the concentration of inorganic and organic material retained on a filter, expressed as milligrams of dry material per liter of water (mg/L). An aliquot of the sample is used for this analysis.

Synoptic studies are short-term investigations of specific water-quality conditions during selected seasonal or hydrologic periods to provide improved spatial resolution for critical water-quality conditions. For the period and conditions sampled, they assess the spatial distribution of selected water-quality conditions in relation to causative factors, such as land use and contaminant sources.

Taxa richness is the total number of distinct species or groups and usually decreases with pollution. (See also "Percent Shading")

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, *Hexagenia limbata*, is the following:

Kingdom:	Animal
Phylum:	Arthropoda
Class:	Insecta
Order:	Ephemeroptera
Family:	Ephemeridae
Genus:	*Hexagenia*
Species:	*Hexagenia limbata*

Temperature preferences:

Cold – preferred water temperature for the species is less than 20 °C or spawning temperature preference less than 16 °C and native distribution is considered to be predominantly north of 45° N. latitude.

Warm – preferred water temperatures for the species is greater than 20 °C or spawning temperature preference greater than 16 °C and native distribution is considered to be predominantly south of 45° N. latitude.

Cool – intermediate between cold and warm water temperature preferences.

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder' is used in the table descriptions and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water resulting from the mixing of flow proportionally to the duration of the concentration.

Tons per acre-foot (T/acre-ft) is the dry mass (tons) of a constituent per unit volume (acre-foot) of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY, tons/d) is a common chemical or sediment discharge unit. It is the quantity of a substance in solution, in suspension, or as bedload that passes a stream section during a 24-hour period. It is equivalent to 2,000 pounds per day, or 0.9072 metric tons per day.

Total is the amount of a given constituent in a representative whole-water (unfiltered) sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined at least 95 percent of the constituent in the sample.)

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. This group includes coliforms that inhabit the intestine of warm-blooded animals and those that inhabit soils. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas formation within 48 hours at 35 °C. In the laboratory, these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35 °C plus

or minus 1.0 °C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also “Bacteria”)

Total discharge is the quantity of a given constituent, measured as dry mass or volume, that passes a stream cross section per unit of time. When referring to constituents other than water, this term needs to be qualified, such as “total sediment discharge,” “total chloride discharge,” and so on.

Total in bottom material is the amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as “total in bottom material.”

Total length (fish) is the straight-line distance from the anterior point of a fish specimen’s snout, with the mouth closed, to the posterior end of the caudal (tail) fin, with the lobes of the caudal fin squeezed together.

Total load refers to all of a constituent in transport. When referring to sediment, it includes suspended load plus bed load.

Total organism count is the number of organisms collected and enumerated in any particular sample. (See also “Organism count/volume.”)

Total recoverable is the amount of a given constituent in a whole-water sample after a sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the “total” amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data for whole-water samples, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures may produce different analytical results.

Total sediment discharge is the mass of suspended-sediment plus bed-load transport, measured as dry weight, that passes a cross section in a given time. It is a rate and is reported as tons per day. (See also “Sediment,” “Suspended sediment,” “Suspended-Sediment Concentration,” “Bedload,” and “Bedload discharge”)

Total sediment load or total load is the sediment in transport as bedload and suspended-sediment load. The term may be qualified, such as “annual suspended-sediment load” or “sand-size suspended-sediment load,” and so on. It differs from total sediment discharge in that load refers to the material whereas discharge refers to the quantity of material, expressed in units of mass per unit time. (See also “Sediment,” “Suspended-Sediment Load,” and “Total load”)

Trophic group:

Filter feeder – diet composed of suspended plant and/or animal material.

Herbivore – diet composed predominantly of plant material.

Invertivore – diet composed predominantly of invertebrates.

Omnivore – diet composed of at least 25-percent plant and 25-percent animal material.

Piscivore – diet composed predominantly of fish.

Turbidity is the reduction in the transparency of a solution due to the presence of suspended and some dissolved substances. The measurement technique records the collective optical properties of the solution that cause light to be scattered and attenuated rather than transmitted in straight lines; the higher the intensity of scattered or attenuated light, the higher the value of the turbidity. Turbidity is expressed in nephelometric turbidity units (NTU). Depending on the method used, the turbidity units as NTU can be defined as the intensity of light of a specified wavelength scattered or attenuated by suspended particles or absorbed at a method specified angle, usually 90 degrees, from the path of the incident light. Currently approved methods for the measurement of turbidity in the USGS include those that conform to EPA Method 180.1, ASTM D1889-00, and ISO 7027. Measurements of turbidity by these different methods and different instruments are unlikely to yield equivalent values. Consequently, the method of measurement and type of instrument used to derive turbidity records should be included in the “REMARKS” column of the Annual Data Report.

Ultraviolet (UV) absorbance (absorption) at 254 or 280 nanometers is a measure of the aggregate concentration of the mixture of UV absorbing organic materials dissolved in the analyzed water, such as lignin, tannin, humic sub-

stances, and various aromatic compounds. UV absorbance (absorption) at 254 or 280 nanometers is measured in UV absorption units per centimeter of pathlength of UV light through a sample.

Vertical datum (See "Datum")

Volatile organic compounds (VOCs) are organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas, such as helium, and subsequently analyzed by gas chromatography. Many VOCs are human-made chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They are often components of fuels, solvents, hydraulic fluids, paint thinners, and dry cleaning agents commonly used in urban settings. VOC contamination of drinking-water supplies is a human health concern because many are toxic and are known or suspected human carcinogens (U.S. Environmental Protection Agency, 1996).

Water table is the level in the saturated zone at which the pressure is equal to the atmospheric pressure.

Water-table aquifer is an unconfined aquifer within which is found the water table.

Water year in USGS reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 2001, is called the "2001 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports. (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976.)

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

Wet mass is the mass of living matter plus contained water. (See also "Biomass" and "Dry mass")

Wet weight refers to the weight of animal tissue or other substance including its contained water. (See also "Dry weight")

WSP is used as an acronym for "Water-Supply Paper" in reference to previously published reports.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers. (See also "Plankton")

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address or calling (888) ASK-USGS. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

Book 1. Collection of Water Data by Direct Measurement

Section D. Water Quality

1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H.H. Stevens, Jr., J.F. Ficke, and G.F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W.W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.

Book 2. Collection of Environmental Data

Section D. Surface Geophysical Methods

2-D1. *Application of surface geophysics to ground-water investigations*, by A.A.R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F.P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.

Section E. Subsurface Geophysical Methods

2-E1. *Application of borehole geophysics to water-resources investigations*, by W.S. Keys and L.M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

2-E2. *Borehole geophysics applied to ground-water investigations*, by W.S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.

Section F. Drilling and Sampling Methods

2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W.E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.

Book 3. Applications of Hydraulics

Section A. Surface-Water Techniques

3-A1. *General field and office procedures for indirect discharge measurements*, by M.A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.

3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M.A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G.L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.

3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H.F. Matthai: USGS-TWRI Book 3, Chapter A4. 1967. 44 pages.

3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.

3-A6. *General procedure for gaging streams*, by R.W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. *Stage measurement at gaging stations*, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.

3-A8. *Discharge measurements at gaging stations*, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. *Measurement of time of travel in streams by dye tracing*, by F.A. Kilpatrick and J.F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

3-Al0. *Discharge ratings at gaging stations*, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

3-A11. *Measurement of discharge by the moving-boat method*, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.

3-A12. *Fluorometric procedures for dye tracing*, Revised, by J.F. Wilson, Jr., E.D. Cobb, and F.A. Kilpatrick: USGS- -TWRI Book 3, Chapter A12. 1986. 34 pages.

3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

3-A14. *Use of flumes in measuring discharge*, by F.A. Kilpatrick and V.R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-A16. *Measurement of discharge using tracers*, by F.A. Kilpatrick and E.D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.

3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.

3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F.A. Kilpatrick, R.E. Rathbun, Nobuhiro Yotsukura, G.W. Parker, and L.L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

3-A19. *Levels at streamflow gaging stations*, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 31 pages.

3-A20. *Simulation of soluble waste transport and buildup in surface waters using tracers*, by F.A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 pages.

3-A21. *Stream-gaging cableways*, by C. Russell Wagner: USGS--TWRI Book 3, Chapter A21. 1995. 56 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

Section B. Ground-Water Techniques

3-B1. *Aquifer-test design, observation, and data analysis*, by R.W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.

3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G.D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J.E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

3-B4. *Regression modeling of ground-water flow*, by R.L. Cooley and R.L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.

3-B4. *Supplement 1. Regression modeling of ground-water flow - Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems*, by R.L. Cooley: USGS--TWRI Book 3, Chapter B4. 1993. 8 pages.

3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction*, by O.L. Franke, T.E. Reilly, and G.D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.

3-B6. *The principle of superposition and its application in ground-water hydraulics*, by T.E. Reilly, O.L. Franke, and G.D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.

3-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow*, by E.J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 190 pages.

Section C. Sedimentation and Erosion Techniques

3-C1. *Fluvial sediment concepts*, by H.P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.

3-C2. *Field methods for measurement of fluvial sediment*, by H.P. Guy and V.W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

Book 4. Hydrologic Analysis and Interpretation

Section A. Statistical Analysis

4-A1. *Some statistical tools in hydrology*, by H.C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. *Frequency curves*, by H.C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

Section B. Surface Water

4-B1. *Low-flow investigations*, by H.C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. *Storage analyses for water supply*, by H.C. Riggs and C.H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. *Regional analyses of streamflow characteristics*, by H.C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

Section D. Interrelated Phases of the Hydrologic Cycle

4-D1. *Computation of rate and volume of stream depletion by wells*, by C.T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

Book 5. Laboratory Analysis

Section A. Water Analysis

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments*, by M.J. Fishman and L.C. Friedman, editors: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.

5-A2. *Determination of minor elements in water by emission spectroscopy*, by P.R. Barnett and E.C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.

5-A3. *Methods for the determination of organic substances in water and fluvial sediments*, edited by R.L. Wershaw, M.J. Fishman, R.R. Grabbe, and L.E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L.J. Britton and P.E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.

5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*, by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L.C. Friedman and D.E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

Section C. Sediment Analysis

5-C1. *Laboratory theory and methods for sediment analysis*, by H.P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.

Book 6. Modeling Techniques

Section A. Ground Water

6-A1. *A modular three-dimensional finite-difference ground-water flow model*, by M.G. McDonald and A.W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.

6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model*, by S.A. Leake and D.E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 pages.

6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual*, by L.J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 pages.

6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions*, by R.L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.

6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details*, by L.J. Torak: USGS--TWRI Book 6, Chapter A5. 1993. 243 pages.

6-A6. *A coupled surface-water and ground-water flow model (MODBRANCH) for simulation of stream-aquifer interaction*, by Eric D. Swain and Eliezer J. Wexler: USGS--TWRI Book 6, Chapter A6. 1995. 125 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

Book 7. Automated Data Processing and Computations

Section C. Computer Programs

7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P.C. Trescott, G.F. Pinder, and S.P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.

7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L.F. Konikow and J.D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

7-C3. *A model for simulation of flow in singular and interconnected channels*, by R.W. Schaffranek, R.A. Baltzer, and D.E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.

Book 8. Instrumentation

Section A. Instruments for Measurement of Water Level

8-A1. *Methods of measuring water levels in deep wells*, by M.S. Garber and F.C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.

8-A2. *Installation and service manual for U.S. Geological Survey manometers*, by J.D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.

Section B. Instruments for Measurement of Discharge

8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

Book 9. Handbooks for Water-Resources Investigations

Section A. National Field Manual for the Collection of Water-Quality Data

9-A6. *National Field Manual for the Collection of Water-Quality Data: Field Measurements*, edited by F.D. Wilde and D.B. Radtke: USGS–TWRI Book 9, Chapter A6. 1998. Variously paginated.

9-A7. *National Field Manual for the Collection of Water-Quality Data: Biological Indicators*, by D.N. Myers and F.D. Wilde: USGS–TWRI Book 9, Chapter A7. 1997. 49 pages.

9-A8. *National Field Manual for the Collection of Water-Quality Data: Bottom-material samples*, by D.B. Radtke: USGS–TWRI Book 9, Chapter A8. 1998. 48 pages.

9-A9. *National Field Manual for the Collection of Water-Quality Data: Safety in Field Activities*, by S.L. Lane and R.G. Fay: USGS–TWRI Book 9, Chapter A9. 1998. 60 pages.

Surface-Water Station Records for Kauai

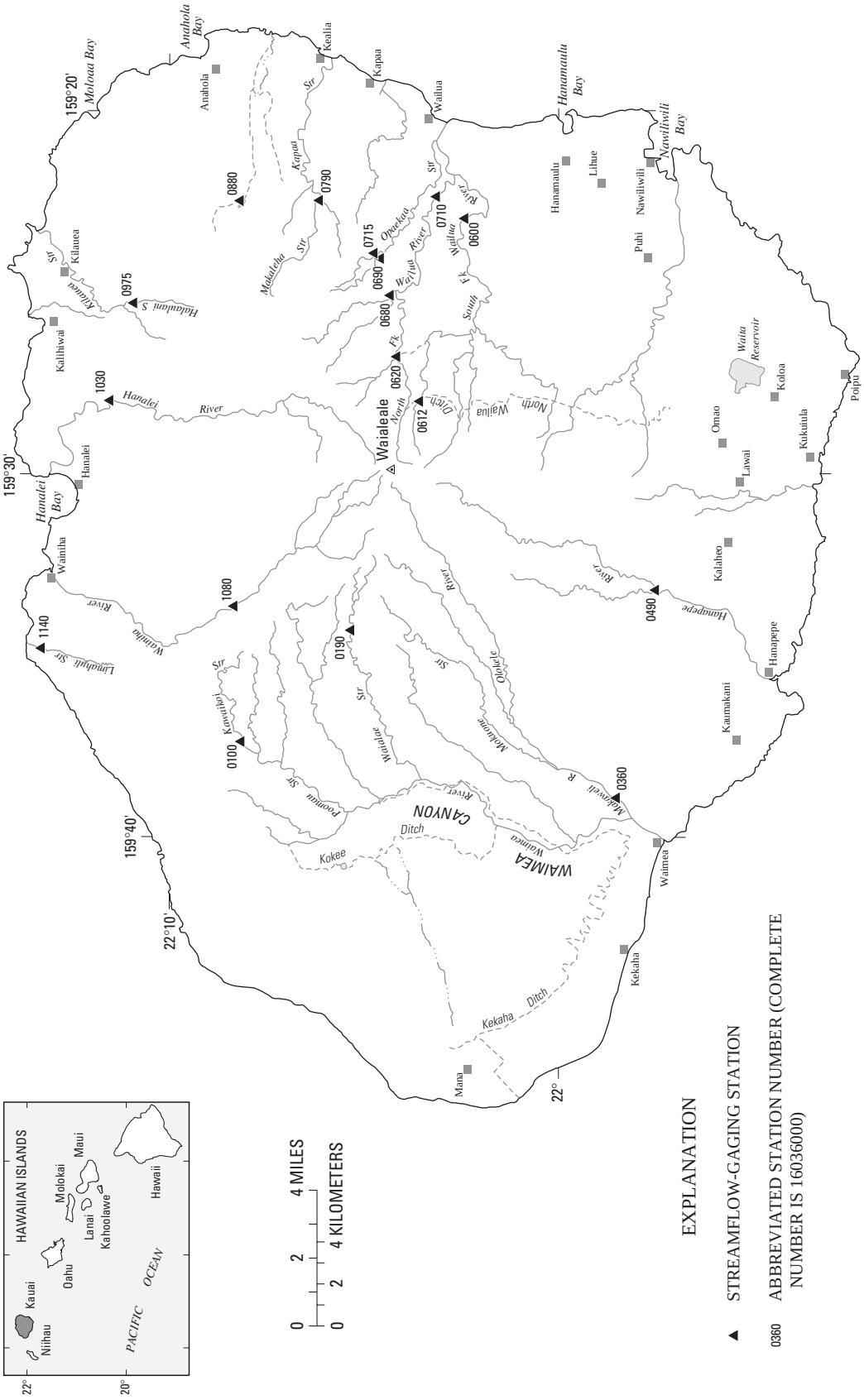


Figure 5. Locations of streamflow-gaging stations on Kauai.

16010000 KAWAIKOI STREAM NEAR WAIMEA

LOCATION.--Lat 22°08'09", long 159°37'22", Hydrologic Unit 20070000, on left bank 0.2 mi upstream from Kokee-Mohihi Road crossing, 2.5 mi east of Kokee Lodge, and 12.5 mi north of Waimea.

DRAINAGE AREA.--3.95 mi^2.

PERIOD OF RECORD.--April 1909 to October 1912, December 1912 to March 1913, May 1913 to June 1915, August 1915 to May 1916, July to December 1916, July 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 555: 1920-21. WSP 1185: 1914-17(M), 1920-38(M), 1940-43(M), 1947(M). WSP 1719: 1912, 1921-25, 1927-32, 1936. WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,420 ft above mean sea level, by barometer. Prior to May 26, 1910, nonrecording gage at site 300 ft downstream at different datum.

REMARKS.--Records computed by Roy Taogoshi. Records good. No diversion upstream.

AVERAGE DISCHARGE.--84 years (water years 1912, 1914, 1920-2001), 34.1 ft^3/s (24,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft^3/s, January 13, 1967, gage height, 15.33 ft, from rating curve extended above 470 ft^3/s on basis of slope-area measurements at gage heights 12.12 ft and 13.43 ft; minimum, 1.14 ft^3/s, September 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr 2	0830	*4,660	*10.67	No other peak greater than base discharge			

Minimum discharge, 2.0 ft^3/s, Oct. 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	5.7	7.4	6.2	2.6	16	5.1	16	5.1	14	66	4.2
2	19	5.7	6.6	14	2.5	18	420	14	6.2	8.7	31	4.1
3	5.0	4.9	6.1	7.2	20	35	22	12	15	7.1	29	4.4
4	3.2	3.9	6.1	5.8	7.4	17	13	23	82	6.2	65	53
5	2.5	3.3	249	5.2	15	13	10	41	23	5.7	17	16
6	2.2	3.0	16	4.8	56	13	12	20	11	5.3	17	7.2
7	2.1	2.7	10	4.6	17	11	10	12	7.2	4.8	12	5.9
8	2.5	2.4	8.4	4.5	7.5	10	9.4	10	6.4	4.4	8.0	5.7
9	8.9	2.3	7.5	4.2	473	16	e105	23	5.7	4.3	6.5	4.8
10	4.8	6.8	6.8	4.2	209	48	e90	30	5.0	4.2	6.0	4.1
11	4.8	4.0	105	4.0	35	12	e30	18	4.5	4.2	5.4	3.8
12	3.8	43	379	3.9	30	9.4	e24	12	4.2	4.1	7.6	3.6
13	7.2	80	22	3.9	272	8.9	54	9.2	4.6	8.9	18	3.7
14	49	34	15	3.9	271	8.2	74	8.2	5.1	6.7	21	3.6
15	8.3	8.6	12	3.6	138	7.7	23	7.7	4.6	6.8	11	3.4
16	4.6	109	10	3.4	64	7.2	21	7.5	4.2	4.9	26	24
17	3.4	60	8.8	3.3	24	7.0	21	10	3.9	4.3	13	11
18	2.8	114	8.0	3.2	17	7.0	15	8.1	3.7	7.1	19	6.9
19	2.6	17	7.4	3.0	17	77	12	10	3.5	8.1	46	5.2
20	2.4	9.9	96	2.9	31	15	19	12	3.4	8.5	16	4.9
21	2.1	7.6	26	2.8	17	9.2	17	7.7	3.4	8.5	11	11
22	2.0	12	35	2.7	17	7.7	11	6.6	18	6.3	8.1	7.0
23	2.2	7.7	15	2.6	28	7.0	17	6.1	16	4.6	8.3	25
24	2.6	8.9	10	2.6	21	6.5	13	5.8	7.0	4.1	15	8.4
25	9.4	9.7	8.6	2.8	212	6.1	11	5.5	90	3.8	10	5.2
26	20	20	7.8	2.7	63	5.9	36	5.2	15	3.7	7.0	5.3
27	7.2	133	7.3	2.6	38	5.5	54	5.1	7.3	3.5	5.8	22
28	4.4	85	6.9	2.8	20	5.1	43	5.1	5.6	3.3	5.2	29
29	18	13	6.4	2.9	---	5.1	86	5.1	140	3.4	4.8	12
30	25	9.0	6.2	2.8	---	5.1	32	4.9	90	55	5.5	22
31	11	---	5.7	2.8	---	5.1	---	5.5	---	73	4.6	---
TOTAL	260.0	826.1	1122.0	125.9	2125.0	424.7	1309.5	366.3	600.6	297.5	525.8	326.4
MEAN	8.39	27.5	36.2	4.06	75.9	13.7	43.7	11.8	20.0	9.60	17.0	10.9
MAX	49	133	379	14	473	77	420	41	140	73	66	53
MIN	2.0	2.3	5.7	2.6	2.5	5.1	5.1	4.9	3.4	3.3	4.6	3.4
AC-FT	516	1640	2230	250	4210	842	2600	727	1190	590	1040	647

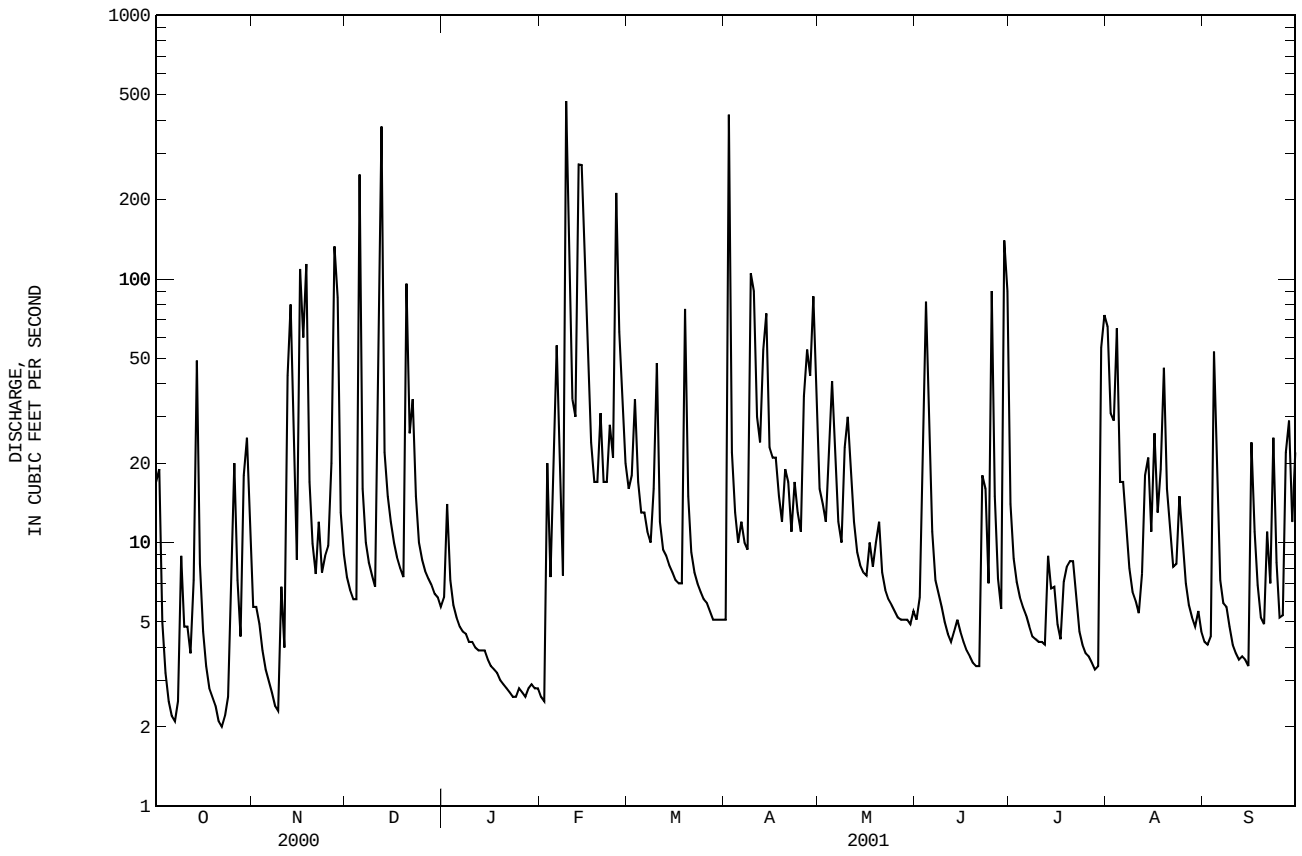
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 2001, BY WATER YEAR (WY)

MEAN	21.3	44.1	52.9	53.1	41.5	48.3	46.1	26.9	17.1	23.3	21.4	14.4
MAX	60.3	170	176	343	165	152	115	86.2	68.7	94.7	195	58.1
(WY)	1917	1929	1968	1921	1956	1951	1980	1927	1978	1989	1950	1992
MIN	3.34	4.16	11.9	3.23	4.26	6.15	5.74	3.38	3.58	5.18	2.54	1.86
(WY)	1985	1964	1923	1945	1945	1926	1992	1966	1951	1922	1984	1953

16010000 KAWAIKOI STREAM NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1911 - 2001	
ANNUAL TOTAL	8811.7		8309.8			
ANNUAL MEAN	24.1		22.8		34.1	
HIGHEST ANNUAL MEAN					60.7	1982
LOWEST ANNUAL MEAN					15.3	1945
HIGHEST DAILY MEAN	946	Apr 3	473	Feb 9	2620	Jan 15 1921
LOWEST DAILY MEAN	1.6	Sep 27	2.0	Oct 22	1.1	Sep 21 1953
ANNUAL SEVEN-DAY MINIMUM	1.8	Sep 21	2.4	Oct 18	1.2	Sep 17 1953
ANNUAL RUNOFF (AC-FT)	17480		16480		24690	
10 PERCENT EXCEEDS	44		51		74	
50 PERCENT EXCEEDS	6.4		8.0		13	
90 PERCENT EXCEEDS	2.9		3.4		4.3	

e Estimated



16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT, NEAR WAIMEA

LOCATION.--Lat 22°05'20", long 159°34'18", Hydrologic Unit 20070000, on left bank 5.0 mi northeast of mouth, 6.4 mi southeast of Kokee Lodge, and 11 mi northeast of Waimea.

DRAINAGE AREA.--1.79 mi^2.

PERIOD OF RECORD.--January 1920 to July 1932, June 1952 to current year. Prior to July 1954, published as Waialae River at altitude 3,700 ft near Waimea.

REVISED RECORDS.--WSP 1937: 1921, 1922-32(M), 1953(M), 1954. WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,820 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records good. No diversion upstream.

AVERAGE DISCHARGE.--60 years (water years 1921-31, 1953-2001), 21.2 ft^3/s (15,380 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft^3/s, January 16, 1921, gage height, 8.44 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.99 ft^3/s, May 17, 18, May 30 to June 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 9	0630	*3,320	*7.24	Apr 2	1300	1,520	4.88

Minimum discharge, 2.0 ft^3/s, January 24, March 29-30, September 14-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

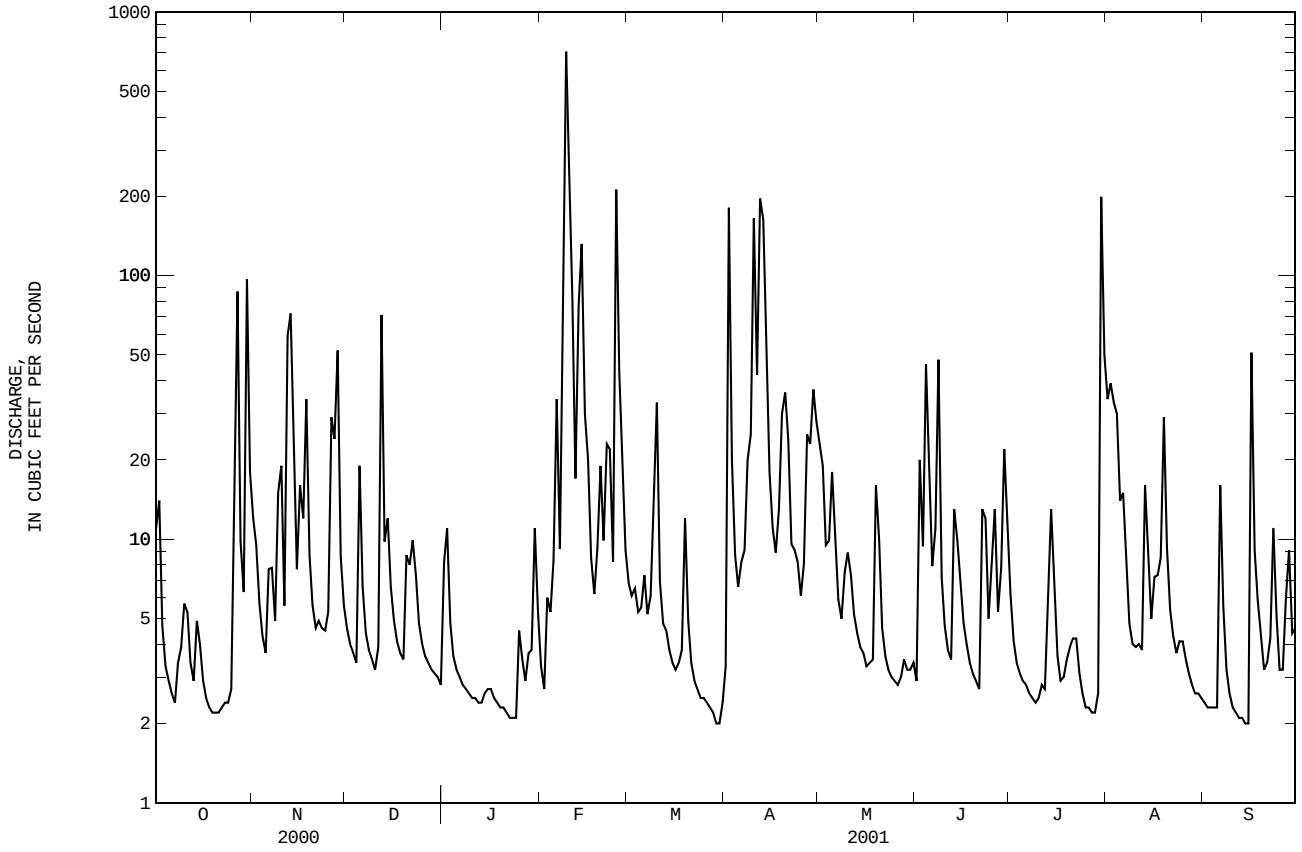
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	12	4.6	8.2	3.3	6.8	3.3	23	2.9	6.2	34	2.4
2	14	9.5	4.0	11	2.7	6.1	181	19	20	4.1	39	2.3
3	4.7	5.7	3.7	4.8	6.0	6.5	20	9.5	9.4	3.4	33	2.3
4	3.3	4.3	3.4	3.6	5.3	5.3	8.7	9.9	46	3.1	30	2.3
5	2.9	3.7	19	3.2	8.3	5.5	6.6	18	16	2.9	14	2.3
6	2.6	7.7	6.6	3.0	34	7.3	8.2	9.4	7.9	2.8	15	16
7	2.4	7.8	4.4	2.8	9.2	5.2	9.1	5.9	11	2.6	7.6	5.6
8	3.4	4.9	3.8	2.7	64	6.1	20	5.0	48	2.5	4.8	3.2
9	3.9	15	3.5	2.6	707	14	25	7.5	7.2	2.4	4.0	2.6
10	5.7	19	3.2	2.5	175	33	165	8.9	4.7	2.5	3.9	2.3
11	5.3	5.6	3.9	2.5	81	6.9	42	7.3	3.8	2.8	4.0	2.2
12	3.4	59	71	2.4	17	4.8	196	5.2	3.5	2.7	3.8	2.1
13	2.9	72	9.8	2.4	77	4.5	163	4.4	13	5.8	16	2.1
14	4.9	21	12	2.6	132	3.8	54	3.9	9.9	13	8.3	2.0
15	4.0	7.7	6.6	2.7	30	3.4	18	3.7	6.8	6.7	5.0	2.0
16	2.9	16	4.9	2.7	20	3.2	11	3.3	4.8	3.6	7.2	51
17	2.5	12	4.1	2.5	8.5	3.4	8.9	3.4	4.0	2.9	7.3	9.1
18	2.3	34	3.7	2.4	6.2	3.8	13	3.5	3.4	3.0	8.5	5.9
19	2.2	8.7	3.5	2.3	9.2	12	30	16	3.1	3.5	29	4.4
20	2.2	5.6	8.7	2.3	19	4.9	36	10	2.9	3.9	9.3	3.2
21	2.2	4.6	8.0	2.2	9.9	3.4	24	4.6	2.7	4.2	5.4	3.4
22	2.3	4.9	9.9	2.1	23	2.9	9.6	3.6	13	4.2	4.3	4.2
23	2.4	4.6	7.3	2.1	22	2.7	9.1	3.2	12	3.1	3.7	11
24	2.4	4.5	4.8	2.1	8.2	2.5	8.2	3.0	5.0	2.6	4.1	5.1
25	2.7	5.3	4.0	4.5	212	2.5	6.1	2.9	8.5	2.3	4.1	3.2
26	28	29	3.6	3.5	43	2.4	8.1	2.8	13	2.3	3.5	3.2
27	87	24	3.4	2.9	19	2.3	25	3.0	5.3	2.2	3.1	5.9
28	9.8	52	3.2	3.7	9.1	2.2	23	3.5	7.8	2.2	2.8	9.1
29	6.3	8.6	3.1	3.8	---	2.0	37	3.2	22	2.6	2.6	4.4
30	97	5.6	3.0	11	---	2.0	28	3.2	13	199	2.6	4.6
31	18	---	2.8	5.3	---	2.4	---	3.4	---	50	2.5	---
TOTAL	344.6	474.3	237.5	112.4	1760.9	173.8	1196.9	213.2	330.6	355.1	322.4	179.4
MEAN	11.1	15.8	7.66	3.63	62.9	5.61	39.9	6.88	11.0	11.5	10.4	5.98
MAX	97	72	71	11	707	33	196	23	48	199	39	51
MIN	2.2	3.7	2.8	2.1	2.7	2.0	3.3	2.8	2.7	2.2	2.5	2.0
AC-FT	684	941	471	223	3490	345	2370	423	656	704	639	356

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 2001, BY WATER YEAR (WY)

MEAN	15.6	32.2	33.7	32.7	27.2	27.3	24.8	13.0	10.0	15.4	12.3	10.9
MAX	52.1	99.2	106	166	155	106	92.4	44.1	39.4	58.0	44.9	56.0
(WY)	1995	1968	1968	1921	1956	1982	1974	1927	1978	1989	1959	1922
MIN	2.49	5.58	4.16	3.63	2.44	2.15	1.87	1.81	1.89	2.56	2.86	1.67
(WY)	1927	1927	1923	2001	1983	1926	1966	1966	1975	1984	1952	1975

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT, NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1920 - 2001	
ANNUAL TOTAL	4935.1		5701.1			
ANNUAL MEAN	13.5		15.6		21.2	
HIGHEST ANNUAL MEAN					40.9	1982
LOWEST ANNUAL MEAN					8.94	1926
HIGHEST DAILY MEAN	347	Apr 4	707	Feb 9	1440	Dec 1 1957
LOWEST DAILY MEAN	1.9	Mar 17	2.0	Mar 29	.99	May 17 1966
ANNUAL SEVEN-DAY MINIMUM	2.0	May 29	2.2	Sep 9	1.1	May 26 1966
ANNUAL RUNOFF (AC-FT)	9790		11310		15380	
10 PERCENT EXCEEDS	26		29		45	
50 PERCENT EXCEEDS	4.6		4.9		6.5	
90 PERCENT EXCEEDS	2.3		2.4		2.6	



16036000 MAKAWELI RIVER NEAR WAIMEA

LOCATION.--Lat 21°58'31", long 159°38'55", Hydrologic Unit 20070000, on left bank 0.7 mi upstream from mouth, and 1.9 mi northeast of Waimea.

DRAINAGE AREA.--26.0 mi^2.

PERIOD OF RECORD.--July 1943 to current year. Records for October 1911 to June 1917 at site 0.2 mi downstream not equivalent owing to intervening diversion.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 18.2 ft above mean sea level (by stadia survey). Prior to June 16, 1959, at datum 1.00 ft higher.

REMARKS.--Records computed by Roy Taogoshi. Records good. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makaweli. A 5 ft^3/s capacity ditch diverts water 0.1 mi upstream of station for irrigation of taro in the vicinity of the station.

AVERAGE DISCHARGE.--58 years (water years 1944-2001), 85.1 ft^3/s (61,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s, January 31, 1975, gage height, 15.51 ft, from rating curve extended above 3,200 ft^3/s on basis of slope-area measurement at gage height 10.65 ft; minimum, 3.15 ft^3/s, July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 9	0730	*11,700	*13.59	Apr 2	1445	4,780	9.22

Minimum discharge, 8.1 ft^3/s, September 12, 13.

REVISIONS.--The maximum discharges and peak discharges above base of 4,700 ft^3/s for water years 1991-2000 have been revised. These figures supercede those published in the Water Data Reports for 1991-2000.

EXTREMES FOR WATER YEARS 1991-2000.--Peak discharges above base discharge of 4,700 ft^3/s and maximum(*):

MAXIMUM DISCHARGE AND GAGE HEIGHT FOR WATER YEARS 1991 THROUGH 2000

Water year	Date	Discharge (ft^3/s)	Gage height (ft)	Water year	Date	Discharge (ft^3/s)	Gage height (ft)
1991	11/18/90	*5,860	*10.01	1995	10/18/94	*11,900	*13.70
	11/22/90	3,690	8.35		11/17/94	7,220	10.94
1992	10/17/91	5,980	10.10		09/30/95	8,900	12.00
	12/14/91	4,310	8.86	1996	11/03/95	*12,000	*13.80
	02/13/92	3,930	8.55		11/09/95	8,870	11.98
	09/11/92	*9,820	*12.55		02/27/96	4,600	9.08
1993	12/03/92	*7,620	*11.20		06/30/96	10,400	12.88
	12/26/92	3,750	8.40	1997	11/12/96	7,470	11.10
	12/29/92	5,600	9.83		12/21/96	7,270	10.97
1994	10/02/93	4,620	9.10		01/19/97	8,330	11.65
	09/01/94	4,780	9.22		03/23/97	*8,460	*11.73
	09/04/94	4,050	8.65		04/11/97	7,870	11.36
	09/19/94	*6,670	*10.57	2000	11/04/99	*6,960	*10.77
1995	10/03/94	5,980	10.10				

16036000 MAKAWELI RIVER NEAR WAIMEA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	90	15	13	11	62	19	172	13	15	83	8.3
2	37	43	13	33	9.7	e52	688	86	197	12	106	8.5
3	18	27	12	15	9.3	e39	198	35	28	11	149	9.2
4	14	19	12	13	9.5	e32	103	29	208	10	128	12
5	13	26	24	12	9.4	e31	55	41	52	10	52	10
6	12	33	15	11	15	30	106	32	172	10	44	101
7	11	28	12	11	16	22	61	22	107	9.9	21	28
8	14	16	11	11	95	69	314	20	382	9.8	16	21
9	15	53	12	10	2740	41	150	34	34	9.8	16	12
10	16	76	12	10	540	135	668	36	23	9.9	20	9.1
11	14	34	14	9.8	547	26	318	22	17	11	18	8.2
12	12	172	133	9.4	208	23	590	18	14	10	13	8.1
13	11	291	26	9.8	102	21	763	16	34	23	72	8.1
14	17	99	48	13	320	18	327	15	39	54	33	8.2
15	12	25	18	15	111	17	113	14	20	43	14	8.4
16	11	26	16	9.8	71	17	70	14	15	16	15	156
17	9.9	23	15	9.5	e45	21	52	15	15	9.6	48	69
18	9.3	65	14	9.4	e42	16	102	15	12	23	58	25
19	9.3	22	13	9.5	e148	16	136	25	11	11	50	12
20	16	17	13	8.9	108	15	214	29	11	9.9	22	10
21	9.7	15	15	8.6	e52	14	235	16	11	10	16	14
22	9.5	17	20	8.5	e74	14	55	14	51	11	24	11
23	11	14	16	8.4	112	14	125	14	21	9.6	25	11
24	9.6	18	13	8.5	e49	14	32	13	14	9.3	12	12
25	11	18	13	25	e1060	17	27	13	22	9.4	12	10
26	105	52	12	13	344	14	26	13	20	14	11	9.8
27	174	30	11	9.8	125	13	99	17	13	11	10	11
28	61	161	12	12	82	13	68	13	36	9.0	9.7	11
29	30	24	11	10	---	13	492	13	34	23	8.3	12
30	405	16	11	86	---	13	145	13	19	460	8.3	11
31	147	---	11	18	---	15	---	19	---	133	8.5	---
TOTAL	1271.3	1550	593	450.9	7054.9	857	6351	848	1645	1017.2	1122.8	644.9
MEAN	41.0	51.7	19.1	14.5	252	27.6	212	27.4	54.8	32.8	36.2	21.5
MAX	405	291	133	86	2740	135	763	172	382	460	149	156
MIN	9.3	14	11	8.4	9.3	13	19	13	11	9.0	8.3	8.1
AC-FT	2520	3070	1180	894	13990	1700	12600	1680	3260	2020	2230	1280

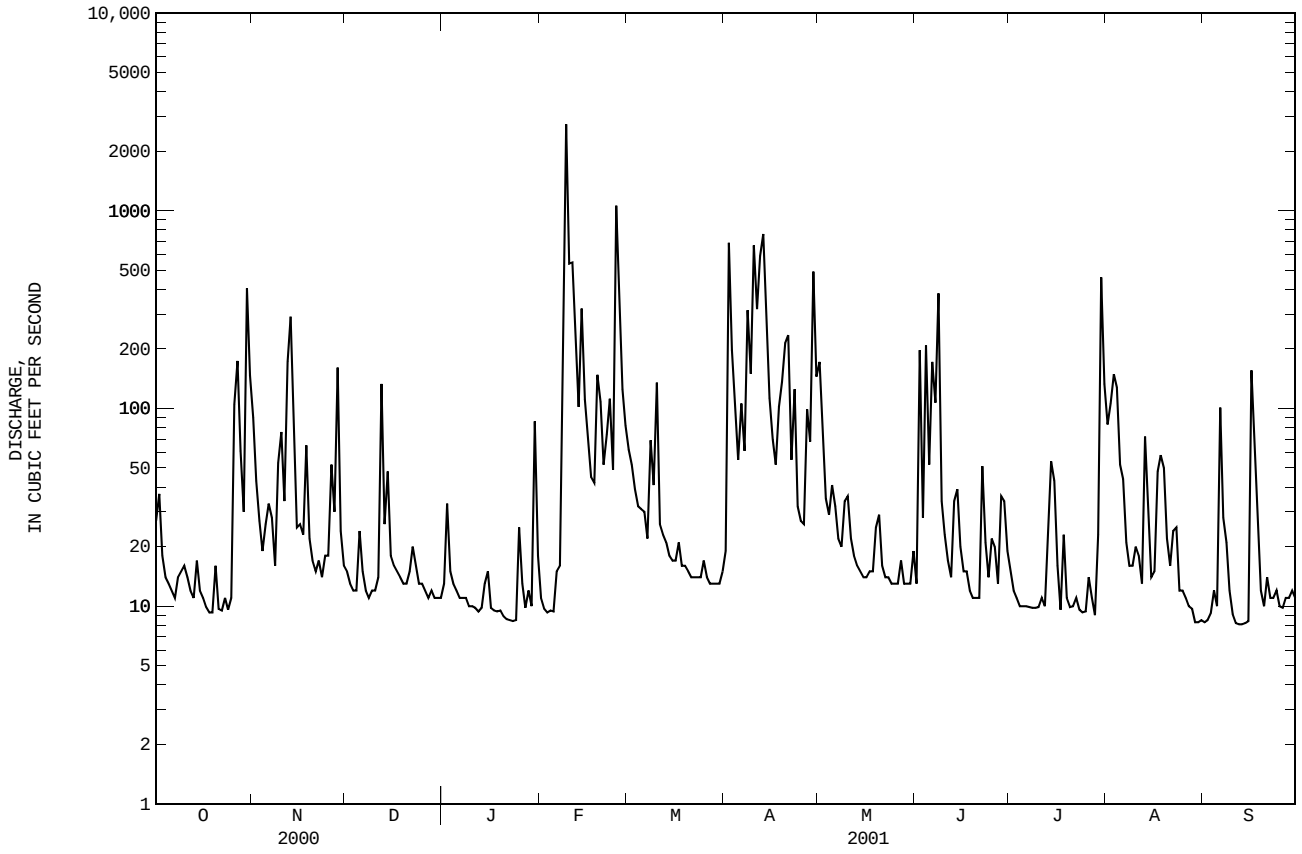
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2001, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	59.2	123	141	127	116	125	98.1	55.2	38.6	53.1	50.7	36.4
MAX	311	491	577	441	774	609	419	283	106	222	328	204
(WY)	1995	1991	1993	1989	1956	1982	1963	1965	1996	1989	1950	1994
MIN	11.7	15.2	18.0	9.49	12.0	10.6	11.6	13.2	9.56	10.0	14.2	9.54
(WY)	1960	1951	1977	1945	1978	1959	1992	2000	1951	1984	1944	1962

16036000 MAKAWELI RIVER NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1943 - 2001	
ANNUAL TOTAL	16196.3		23406.0			
ANNUAL MEAN	44.3		64.1		85.1	
HIGHEST ANNUAL MEAN					204	1982
LOWEST ANNUAL MEAN					31.1	1984
HIGHEST DAILY MEAN	1020	Apr 4	2740	Feb 9	5170	Dec 1 1957
LOWEST DAILY MEAN	8.8	Jun 3	8.1	Sep 12	4.3	Jul 19 1951
ANNUAL SEVEN-DAY MINIMUM	9.1	May 28	8.7	Aug 28	5.7	Oct 21 1944
ANNUAL RUNOFF (AC-FT)	32130		46430		61680	
10 PERCENT EXCEEDS	93		135		170	
50 PERCENT EXCEEDS	16		16		27	
90 PERCENT EXCEEDS	10		9.8		12	

e Estimated



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16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

LOCATION.--Lat 21°57'29", long 159°33'13", Hydrologic Unit 20070000, on left bank 200 ft downstream from Manuahi Stream and 4.0 mi northeast of Eleele.

DRAINAGE AREA.--18.5 mi^2.

PERIOD OF RECORD.--July 1917 to January 1921, December 1926 to current year. Prior to July 1952, published as "at Koula, near Eleele." Records for August 1910 to December 1916 at site 0.5 mi upstream not equivalent owing to intervening inflow.

REVISED RECORDS.--WSP 740: 1931. WSP 1719: 1929-31(M). WSP 1937: 1918, 1919(M), 1920, 1921(M), 1927-28(M), 1930, 1936-37(M), 1941(P), 1943-46(P), 1947(M), 1948-52(P), 1955(M), 1956-57(P), 1958(M), 1960(M). WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 222 ft above mean sea level (by stadia survey). July 1, 1917 to January 22, 1921, nonrecording gage and December 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft higher.

REMARKS.--Records computed by Roy Taogoshi. Records good. Koula ditch diverts water 3.0 mi upstream of station for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--77 years (water years 1918-20, 1928-2001), 83.5 ft^3/s (60,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft^3/s, April 15, 1963, gage height, 14.87 ft, from rating curve extended above 7,600 ft^3/s on basis of slope-area measurement of peak flow; minimum, 5.1 ft^3/s, May 21, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 9	1015	*8,240	8.20	Jun 8	0115	6,880	7.68

Minimum discharge, 11 ft^3/s, Sept. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

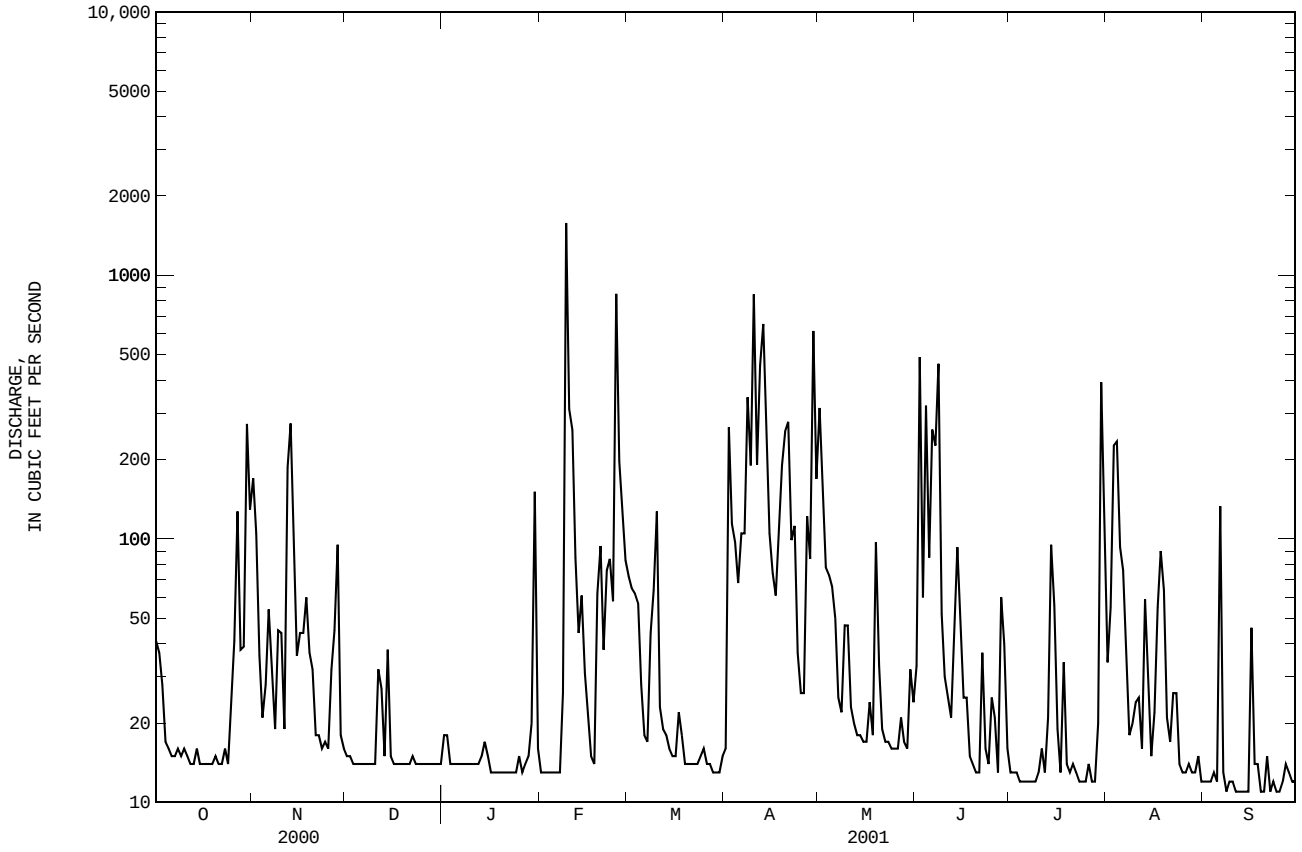
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	170	15	18	13	72	16	314	33	13	34	12
2	37	105	15	18	13	65	265	141	490	13	55	12
3	28	36	14	14	13	62	114	78	60	13	226	12
4	17	21	14	14	13	57	97	73	320	12	234	13
5	16	28	14	14	13	28	68	66	85	12	93	12
6	15	54	14	14	13	18	105	50	260	12	76	133
7	15	31	14	14	13	17	105	25	226	12	42	13
8	16	19	14	14	26	44	345	22	462	12	18	11
9	15	45	14	14	1580	64	190	47	52	12	20	12
10	16	44	14	14	311	127	847	47	30	13	24	12
11	15	19	32	14	259	23	191	23	25	16	25	11
12	14	187	27	14	85	19	455	20	21	13	16	11
13	14	274	15	15	44	18	654	18	47	21	59	11
14	16	84	38	17	61	16	275	18	93	95	27	11
15	14	36	15	15	31	15	105	17	46	56	15	11
16	14	44	14	13	21	15	74	17	25	19	22	46
17	14	44	14	13	15	22	61	24	25	13	55	14
18	14	60	14	13	14	18	116	18	15	34	90	14
19	14	37	14	13	62	14	190	97	14	14	64	11
20	15	32	14	13	94	14	256	33	13	13	21	11
21	14	18	14	13	38	14	278	19	13	14	17	15
22	14	18	15	13	76	14	99	17	37	13	26	11
23	16	16	14	13	84	14	112	17	16	12	26	12
24	14	17	14	13	58	15	37	16	14	12	14	11
25	24	16	14	15	850	16	26	16	25	12	13	11
26	41	32	14	13	197	14	26	16	21	14	13	12
27	127	45	14	14	120	14	122	21	13	12	14	14
28	38	95	14	15	83	13	84	17	60	12	13	13
29	39	18	14	20	---	13	615	16	40	20	13	12
30	273	16	14	151	---	13	169	32	16	393	15	12
31	129	---	14	16	---	15	---	24	---	94	12	---
TOTAL	1089	1661	494	584	4200	883	6097	1359	2597	1026	1392	516
MEAN	35.1	55.4	15.9	18.8	150	28.5	203	43.8	86.6	33.1	44.9	17.2
MAX	273	274	38	151	1580	127	847	314	490	393	234	133
MIN	14	16	14	13	13	13	16	16	13	12	12	11
AC-FT	2160	3290	980	1160	8330	1750	12090	2700	5150	2040	2760	1020

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 2001, BY WATER YEAR (WY)

MEAN	61.3	105	115	108	98.2	112	93.1	64.8	52.8	72.3	70.7	52.4
MAX	240	430	720	578	657	803	470	201	175	202	222	190
(WY)	1995	1991	1920	1920	1932	1918	1963	1965	1978	1989	1931	1994
MIN	11.5	15.3	13.0	11.7	15.0	8.84	13.2	12.9	12.1	13.6	18.4	11.7
(WY)	1954	1977	1986	1986	1986	1959	1941	1958	1959	1953	1953	1953

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1917 - 2001	
ANNUAL TOTAL	17275		21898			
ANNUAL MEAN	47.2		60.0		83.5	
HIGHEST ANNUAL MEAN					182	1918
LOWEST ANNUAL MEAN					30.6	1953
HIGHEST DAILY MEAN	1370	Apr 4	1580	Feb 9	10900	Dec 3 1919
LOWEST DAILY MEAN	12	Jun 2	11	Sep 8	5.3	May 21 1954
ANNUAL SEVEN-DAY MINIMUM	12	May 31	11	Sep 8	6.4	May 10 1954
ANNUAL RUNOFF (AC-FT)	34260		43430		60460	
10 PERCENT EXCEEDS	100		127		172	
50 PERCENT EXCEEDS	16		17		29	
90 PERCENT EXCEEDS	14		13		15	



16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°02'24", long 159°22'58", Hydrologic Unit 20070000, on right bank 0.2 mi upstream from Wailua Falls and 4.3 mi north of Lihue.

DRAINAGE AREA.--22.4 mi^2.

PERIOD OF RECORD.--December 1911 to April 1919, June 1919 to March 1921, May 1921 to June 1957, August, September 1957, November 1957 to February 1958, June 1958 to current year. Monthly discharge only for some periods, published in WSP 1319. Published as "above Waiehu Falls, near Lihue" 1912-13.

REVISED RECORDS.--WSP 1249: 1941-47(M), 1948-51(P). WSP 1719: 1943-49. WSP 1937: 1958-60.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft (from topographic map). Prior to November 18, 1918, at site 0.3 mi upstream at different datum. November 18, 1918 to June 30, 1957, at site 10 ft downstream from present site at datum 2.50 ft higher and July 1, 1957 to June 23, 1958, at present datum.

REMARKS.--Records computed by Roy Taogoshi. Records good. Lihue and Hanamaulu ditches divert water upstream of station for irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--84 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-2001), 116 ft^3/s (84,280 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft^3/s, April 15, 1963, gage height, 22.90 ft, from rating curve extended above 13,000 ft^3/s on basis of slope-area measurement of peak flow; minimum, 1.5 ft^3/s, August 21, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jun 8	0215	*8,410	*15.47	No other peak greater than base discharge.			

Minimum discharge, 14 ft^3/s, Oct. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

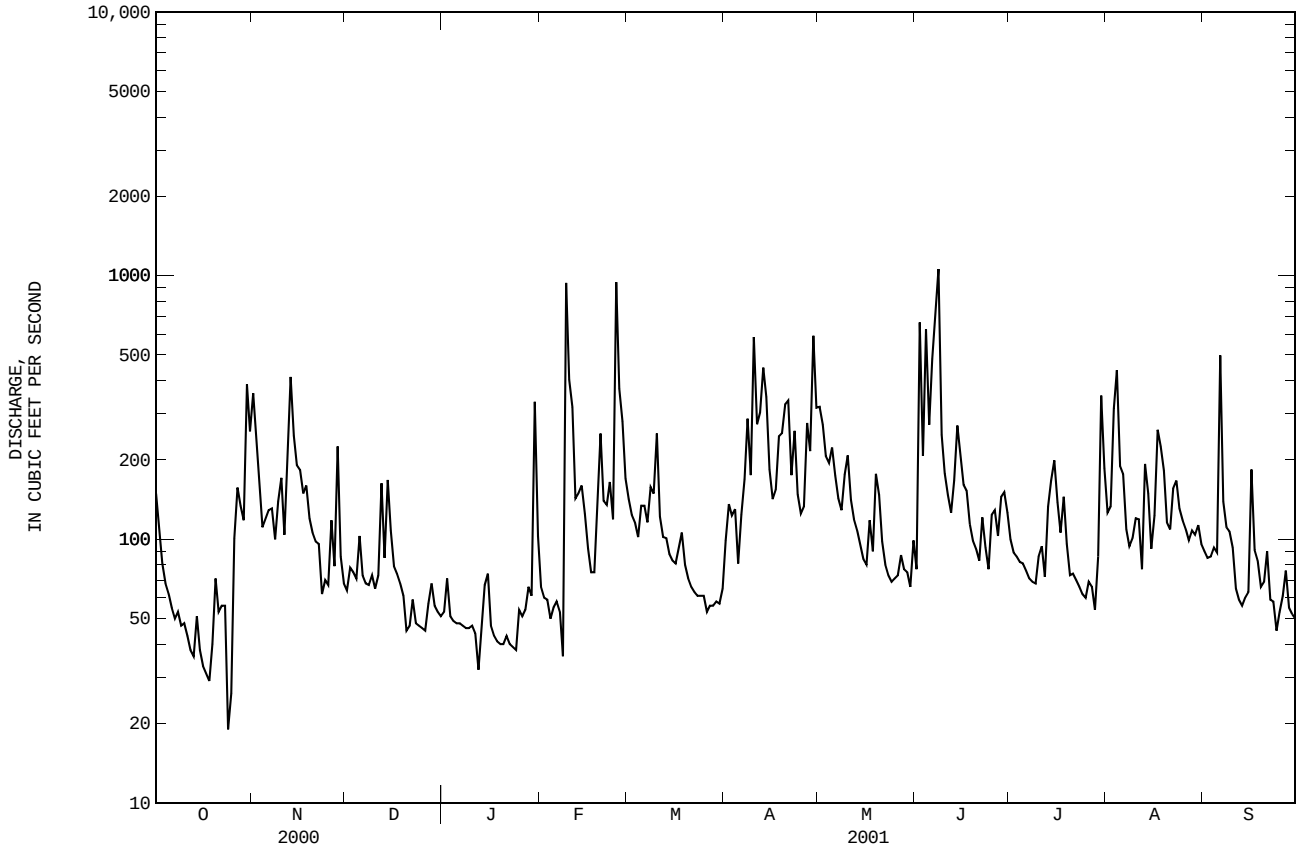
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	149	358	64	53	66	142	99	318	77	100	126	90
2	108	244	78	71	60	124	136	272	664	89	133	85
3	81	166	75	51	59	116	123	207	207	86	313	86
4	68	111	71	49	50	102	130	195	625	82	438	93
5	62	120	103	48	55	134	81	223	272	81	190	89
6	55	129	73	48	58	134	124	174	483	76	177	498
7	50	131	68	47	53	116	169	143	727	71	109	139
8	53	100	67	46	36	158	287	129	1060	69	94	111
9	47	139	73	46	937	149	175	176	249	68	101	107
10	48	171	65	47	403	252	585	208	178	86	120	93
11	43	104	73	44	317	122	273	141	147	94	119	65
12	38	217	163	32	143	102	303	119	126	72	77	59
13	36	413	85	48	150	101	448	108	167	133	193	56
14	51	247	168	67	160	88	347	95	270	167	149	60
15	38	191	108	74	125	83	184	84	211	199	92	63
16	33	183	79	47	92	81	142	80	161	138	123	184
17	31	149	74	43	75	93	154	118	153	106	260	91
18	29	160	68	41	75	106	246	90	114	145	225	83
19	40	120	61	40	141	80	253	177	99	96	182	66
20	71	106	45	40	252	71	325	147	92	73	116	69
21	53	98	47	43	140	66	336	98	83	74	109	90
22	56	96	59	40	135	63	175	80	121	70	156	59
23	56	62	48	39	165	61	258	73	93	66	167	58
24	19	70	47	38	119	61	148	69	77	62	131	45
25	26	67	46	54	945	61	125	71	124	60	118	53
26	101	118	45	51	373	53	133	73	129	69	109	61
27	157	79	57	54	280	56	276	87	103	66	99	76
28	134	225	68	66	170	56	216	77	145	54	108	55
29	118	86	56	61	---	58	592	75	151	86	104	52
30	387	68	53	332	---	57	316	66	126	351	113	50
31	257	---	51	103	---	65	---	99	---	186	96	---
TOTAL	2495	4528	2238	1863	5634	3011	7159	4072	7234	3175	4647	2786
MEAN	80.5	151	72.2	60.1	201	97.1	239	131	241	102	150	92.9
MAX	387	413	168	332	945	252	592	318	1060	351	438	498
MIN	19	62	45	32	36	53	81	66	77	54	77	45
AC-FT	4950	8980	4440	3700	11180	5970	14200	8080	14350	6300	9220	5530

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2001, BY WATER YEAR (WY)

MEAN	92.7	173	172	173	125	145	134	97.7	58.4	78.1	84.0	76.3
MAX	339	866	696	1485	716	830	673	467	271	281	321	650
(WY)	1983	1991	1917	1921	1932	1982	1963	1927	1914	1989	1948	1914
MIN	2.58	3.13	6.61	4.66	3.15	3.46	3.84	3.29	2.82	3.27	4.76	2.59
(WY)	1954	1934	1977	1986	1947	1934	1931	1926	1957	1953	1973	1953

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1912 - 2001	
ANNUAL TOTAL	33094.1		48842			
ANNUAL MEAN	90.4		134		116	
HIGHEST ANNUAL MEAN					284	1982
LOWEST ANNUAL MEAN					17.3	1984
HIGHEST DAILY MEAN	1120	Apr 4	1060	Jun 8	13800	Jan 16 1921
LOWEST DAILY MEAN	2.7	May 31	19	Oct 24	1.8	Sep 17 1953
ANNUAL SEVEN-DAY MINIMUM	2.8	May 26	37	Oct 12	1.8	Sep 16 1953
ANNUAL RUNOFF (AC-FT)	65640		96880		84280	
10 PERCENT EXCEEDS	199		257		263	
50 PERCENT EXCEEDS	56		96		40	
90 PERCENT EXCEEDS	4.2		48		4.8	



16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE

LOCATION.--Lat 22°03'34", long 159°28'00", Hydrologic Unit 20070000, on left bank 380 ft downstream from Waikoko Stream, 8.1 mi west of Wailua, and 8.4 mi northwest of Lihue.

PERIOD OF RECORD.--January 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,070 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records good. Ditch diverts water from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--36 years (water years 1966-2001), 21.8 ft^3/s (15,770 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft^3/s, October 11, 1966; no flow for many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 27 ft^3/s, June 4; minimum daily discharge, 0.08 ft^3/s, April 5, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

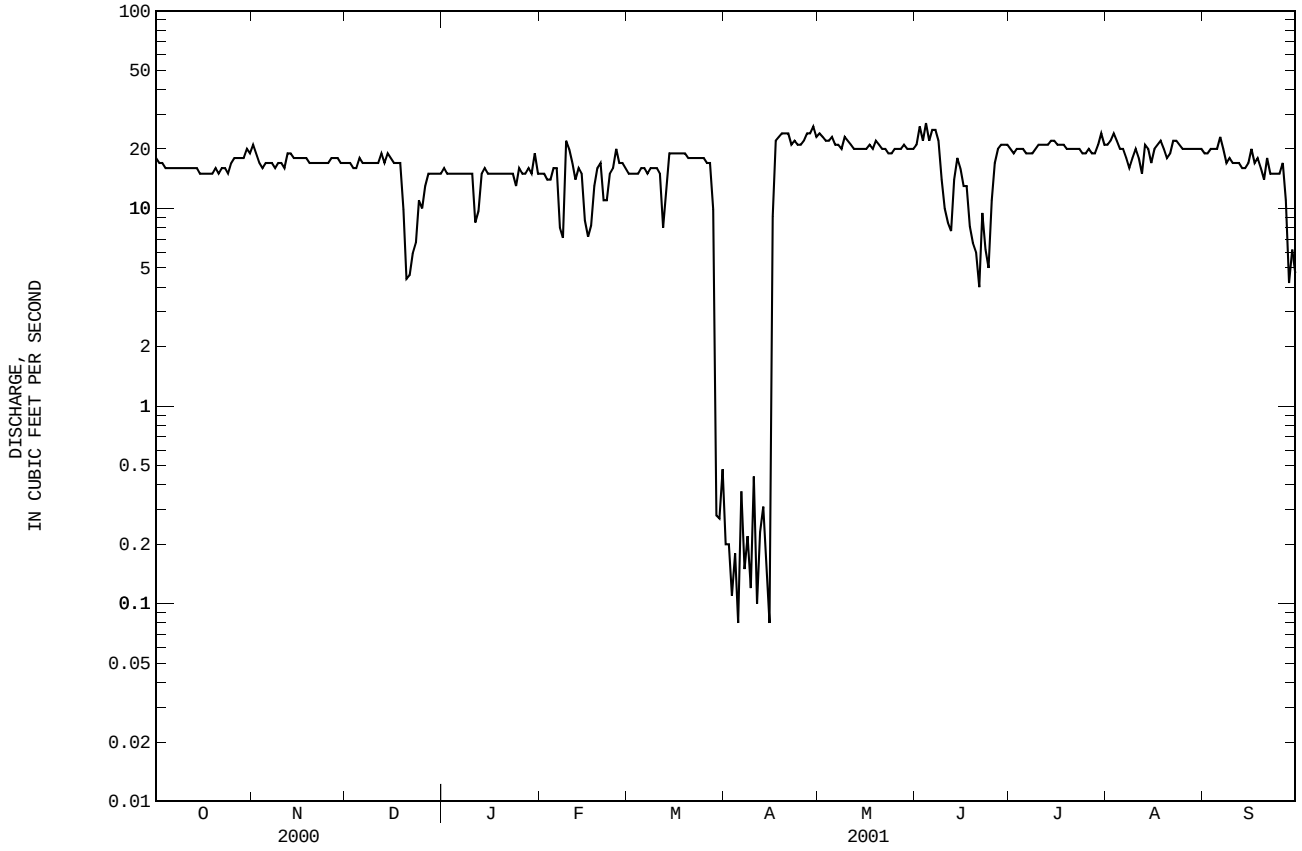
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	21	17	16	15	15	.20	24	21	20	21	19
2	17	19	17	15	15	15	.20	23	26	19	22	19
3	17	17	16	15	14	15	.11	22	22	20	24	20
4	16	16	16	15	14	15	.18	22	27	20	22	20
5	16	17	18	15	16	16	.08	23	22	20	20	20
6	16	17	17	15	16	16	.37	21	25	19	20	23
7	16	17	17	15	8.0	15	.15	21	25	19	18	20
8	16	16	17	15	7.1	16	.22	20	22	19	16	17
9	16	17	17	15	22	16	.12	23	14	20	18	18
10	16	17	17	15	20	16	.44	22	10	21	20	17
11	16	16	17	8.5	17	15	.10	21	8.5	21	18	17
12	16	19	19	9.7	14	8.0	.23	20	7.7	21	15	17
13	16	19	17	15	16	13	.31	20	14	21	21	16
14	16	18	19	16	15	19	.16	20	18	22	20	16
15	15	18	18	15	8.7	19	.08	20	16	22	17	17
16	15	18	17	15	7.2	19	9.1	20	13	21	20	20
17	15	18	17	15	8.2	19	22	21	13	21	21	17
18	15	18	17	15	13	19	23	20	8.1	21	22	18
19	15	17	9.9	15	16	19	24	22	6.7	20	20	16
20	16	17	4.4	15	17	18	24	21	6.0	20	18	14
21	15	17	4.6	15	11	18	24	20	4.0	20	19	18
22	16	17	5.9	15	11	18	21	20	9.5	20	22	15
23	16	17	6.7	15	15	18	22	19	6.2	20	22	15
24	15	17	11	13	16	18	21	19	5.0	19	21	15
25	17	17	10	16	20	18	21	20	11	19	20	15
26	18	18	13	15	17	17	22	20	17	20	20	17
27	18	18	15	15	17	17	24	20	20	19	20	11
28	18	18	15	16	16	9.9	24	21	21	19	20	4.2
29	18	17	15	15	---	.28	26	20	21	21	20	6.2
30	20	17	15	19	---	.27	23	20	21	24	20	4.7
31	19	---	15	15	---	.48	---	20	---	21	20	---
TOTAL	509	525	450.5	459.2	402.2	457.93	333.05	645	460.7	629	617	482.1
MEAN	16.4	17.5	14.5	14.8	14.4	14.8	11.1	20.8	15.4	20.3	19.9	16.1
MAX	20	21	19	19	22	19	26	24	27	24	24	23
MIN	15	16	4.4	8.5	7.1	.27	.08	19	4.0	19	15	4.2
AC-FT	1010	1040	894	911	798	908	661	1280	914	1250	1220	956

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	22.5	22.7	21.3	20.4	20.5	21.4	22.4	22.1	21.8	22.7	22.4	21.6
MAX	29.7	34.0	33.4	30.1	34.4	32.0	31.8	31.3	28.5	34.0	31.7	30.5
(WY)	1969	1966	1969	1968	1969	1969	1986	1969	1986	1969	1966	1966
MIN	11.0	12.3	2.94	.42	.065	.21	.14	.097	.16	3.89	16.2	13.7
(WY)	1993	1983	1991	1993	1991	1991	1991	1991	1991	1991	1994	1991

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	7132.44		5970.68			
ANNUAL MEAN	19.5		16.4		21.8	
HIGHEST ANNUAL MEAN					30.3	1969
LOWEST ANNUAL MEAN					6.64	1991
HIGHEST DAILY MEAN	35	Jan 19	27	Jun 4	58	Oct 11 1966
LOWEST DAILY MEAN	.60	Jul 31	.08	Apr 5	.00	Jan 1 1965
ANNUAL SEVEN-DAY MINIMUM	7.5	Dec 19	.18	Apr 3	.00	Jan 1 1965
ANNUAL RUNOFF (AC-FT)	14150		11840		15770	
10 PERCENT EXCEEDS	25		22		29	
50 PERCENT EXCEEDS	19		17		22	
90 PERCENT EXCEEDS	16		8.2		16	



16062000 STABLE STORM DITCH NEAR LIHUE

LOCATION.--Lat 22°04'09", long 159°26'46", Hydrologic Unit 20070000, on left bank 100 ft downstream from intake, 7.8 mi northwest of Lihue, and 7.9 mi west of Kapaa.

PERIOD OF RECORD.--December 1936 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Elevation of gage is 710 ft above mean sea level, by barometer.

REMARKS.--Records computed by Roy Taogoshi. Records fair. Ditch diverts water from North Fork Wailua River.

AVERAGE DISCHARGE.--64 years (water years 1938-2001), 9.06 ft^3/s (6,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft^3/s, April 3, 1948; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1.8 ft^3/s, October 1; minimum daily discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

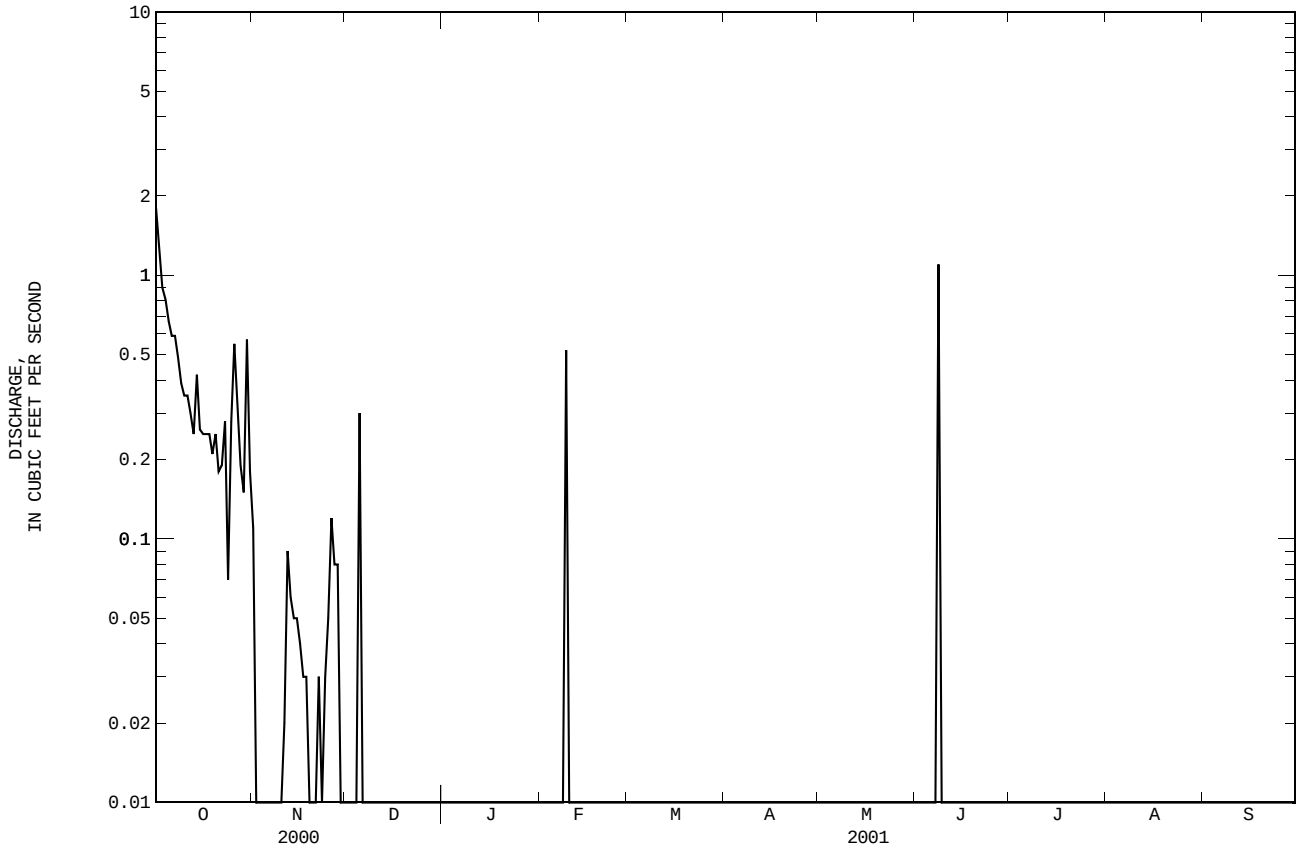
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	.11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	1.3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.90	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.81	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.67	.00	.30	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.59	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.59	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.49	.00	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00
9	.39	.01	.00	.00	.52	.00	.00	.00	.00	.00	.00	.00
10	.35	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.35	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.30	.09	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.25	.06	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.42	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.26	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.25	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.25	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.25	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.19	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.07	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.28	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.55	.12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.30	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.19	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.15	.01	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.57	.00	.00	.01	---	.00	.00	.00	.00	.00	.00	.00
31	.18	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	13.62	0.89	0.31	0.01	0.52	0.00	0.00	0.00	1.10	0.00	0.00	0.00
MEAN	.44	.030	.010	.000	.019	.000	.000	.000	.037	.000	.000	.000
MAX	1.8	.12	.30	.01	.52	.00	.00	.00	1.1	.00	.00	.00
MIN	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	27	1.8	.6	.02	1.0	.00	.00	.00	2.2	.00	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2001, BY WATER YEAR (WY)

MEAN	11.7	5.64	4.17	5.87	8.10	7.12	8.15	8.99	14.2	10.7	10.7	13.4
MAX	37.3	35.7	24.8	31.4	32.3	36.0	34.7	34.4	38.7	36.8	37.0	36.1
(WY)	1951	1951	1984	1946	1991	1947	1954	1954	1953	1953	1970	1950
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1999	1938	1991	1939	1938	1939	1939	1963	1938	2001	1964	2001

16062000 STABLE STORM DITCH NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1938 - 2001	
ANNUAL TOTAL	297.66		16.45			
ANNUAL MEAN	.81		.045		9.06	
HIGHEST ANNUAL MEAN					22.1	1984
LOWEST ANNUAL MEAN					.045	2001
HIGHEST DAILY MEAN	5.0	Jul 12	1.8	Oct 1	71	Apr 3 1948
LOWEST DAILY MEAN	.00	Jan 1	.00	Nov 2	.00	Oct 1 1937
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Nov 2	.00	Oct 1 1937
ANNUAL RUNOFF (AC-FT)	590		33		6560	
10 PERCENT EXCEEDS	2.7		.08		33	
50 PERCENT EXCEEDS	.25		.00		.28	
90 PERCENT EXCEEDS	.00		.00		.00	



16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°04'19", long 159°25'05", Hydrologic Unit 20070000, on right bank 1,200 ft upstream from mouth and 7.2 mi northwest of Lihue.

DRAINAGE AREA.--6.27 mi^2.

PERIOD OF RECORD.--July 1912 to September 1914, December 1914 to March 1915, May 1915 to March 1919, June 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 770: 1932-33. WSP 1719: 1916. WSP 1937: 1918. WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 500 ft (from topographic map). Prior to December 31, 1914, nonrecording gage at site 725 ft downstream at different datum. December 31, 1914 to May 10, 1934, water-stage recorder at site 75 ft upstream at present datum.

REMARKS.--Records computed by Clayton Yoshida. Records good. No diversion upstream.

AVERAGE DISCHARGE.--86 years (water years 1913-14, 1916-17, 1920-2001), 48.0 ft^3/s (34,780 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,400 ft^3/s, November 12, 1955, gage height, 14.7 ft, from floodmarks, from rating curve extended above 2,700 ft^3/s; minimum, 6.8 ft^3/s, July 3, 13, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 30	1000	*1,720	*5.00				

Minimum discharge, 13 ft^3/s, January 22-28, February 2-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

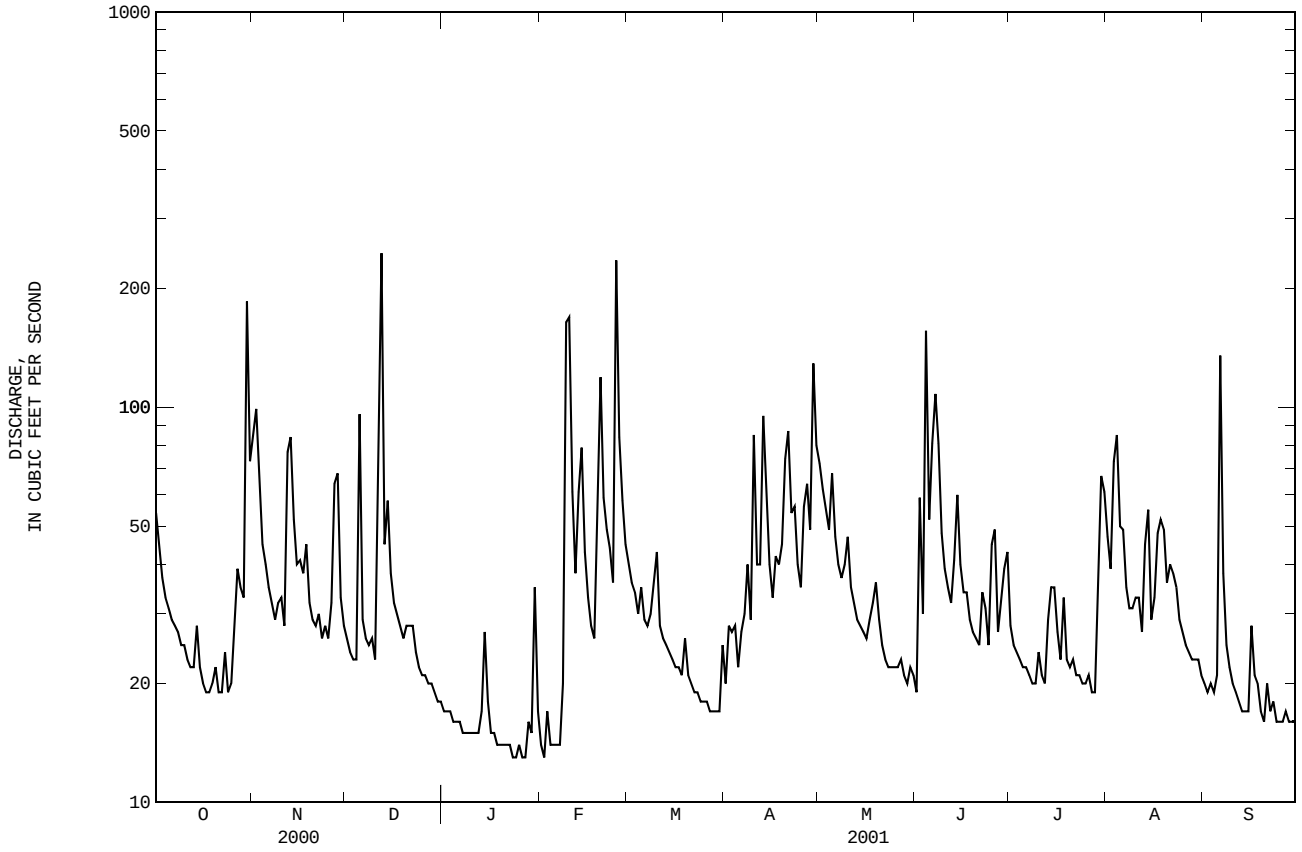
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	85	26	17	14	40	20	72	19	28	47	20
2	45	99	24	17	13	36	28	62	59	25	39	19
3	37	63	23	17	17	34	27	55	30	24	73	20
4	33	45	23	16	14	30	28	49	156	23	85	19
5	31	40	96	16	14	35	22	68	52	22	50	21
6	29	35	29	16	14	29	27	47	81	22	49	135
7	28	32	26	15	14	28	30	40	108	21	35	38
8	27	29	25	15	20	30	40	37	81	20	31	25
9	25	32	26	15	164	36	29	40	48	20	31	22
10	25	33	23	15	169	43	85	47	39	24	33	20
11	23	28	82	15	61	28	40	35	35	21	33	19
12	22	77	245	15	38	26	40	32	32	20	27	18
13	22	84	45	17	61	25	95	29	41	29	45	17
14	28	52	58	27	79	24	67	28	60	35	55	17
15	22	40	38	18	43	23	40	27	40	35	29	17
16	20	41	32	15	33	22	33	26	34	27	33	28
17	19	38	30	15	28	22	42	29	34	23	48	21
18	19	45	28	14	26	21	40	32	29	33	52	20
19	20	32	26	14	58	26	45	36	27	23	49	17
20	22	29	28	14	119	21	74	29	26	22	36	16
21	19	28	28	14	59	20	87	25	25	23	40	20
22	19	30	28	14	49	19	54	23	34	21	38	17
23	24	26	24	13	44	19	56	22	31	21	35	18
24	19	28	22	13	36	18	40	22	25	20	29	16
25	20	26	21	14	235	18	35	22	45	20	27	16
26	28	32	21	13	84	18	56	22	49	21	25	16
27	39	64	20	13	58	17	64	23	27	19	24	17
28	35	68	20	16	45	17	49	21	33	19	23	16
29	33	33	19	15	---	17	129	20	39	32	23	16
30	185	28	18	35	---	17	80	22	43	67	23	16
31	73	---	18	17	---	25	---	21	---	61	21	---
TOTAL	1045	1322	1172	500	1609	784	1502	1063	1382	821	1188	697
MEAN	33.7	44.1	37.8	16.1	57.5	25.3	50.1	34.3	46.1	26.5	38.3	23.2
MAX	185	99	245	35	235	43	129	72	156	67	85	135
MIN	19	26	18	13	13	17	20	20	19	19	21	16
AC-FT	2070	2620	2320	992	3190	1560	2980	2110	2740	1630	2360	1380

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2001, BY WATER YEAR (WY)

MEAN	41.4	60.6	60.0	58.9	47.9	55.3	56.5	46.5	33.1	38.7	39.6	36.8
MAX	94.6	226	157	392	197	270	173	144	84.9	78.4	111	112
(WY)	1983	1991	1988	1921	1994	1982	1927	1967	1978	1980	1948	1994
MIN	12.4	16.8	12.3	11.0	8.88	11.0	10.6	9.81	13.0	12.3	11.5	11.9
(WY)	1954	1934	1964	1986	1986	1970	1926	1926	1969	1926	1984	1953

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1912 - 2001	
ANNUAL TOTAL	12662		13085			
ANNUAL MEAN	34.6		35.8		48.0	
HIGHEST ANNUAL MEAN					95.5	1982
LOWEST ANNUAL MEAN					21.3	1984
HIGHEST DAILY MEAN	322	Jan 19	245	Dec 12	2570	Feb 13 1994
LOWEST DAILY MEAN	11	May 27	13	Jan 23	7.0	Jul 8 1926
ANNUAL SEVEN-DAY MINIMUM	11	May 27	13	Jan 21	8.2	Mar 5 1986
ANNUAL RUNOFF (AC-FT)	25120		25950		34780	
10 PERCENT EXCEEDS	64		62		84	
50 PERCENT EXCEEDS	24		28		31	
90 PERCENT EXCEEDS	13		17		16	



16069000 WAILUA DITCH NEAR KAPAA

LOCATION.--Lat 22°04'34", long 159°24'04", Hydrologic Unit 20070000, on right bank 2,000 ft downstream from Wailua Reservoir, 5.2 mi west of Kapaa, and 7.0 mi north of Lihue.

PERIOD OF RECORD.--November 1936 to current year.

GAGE.--Water-stage recorder. Sharp-crested weir since February 4, 1965. Datum of gage is 462.3 ft above mean sea level (by stadia survey).

REMARKS.--Records computed by Roy Taogoshi. Records good. Ditch diverts water from North Fork Wailua River to reservoir, 2,000 ft upstream.

AVERAGE DISCHARGE.--64 years (water years 1938-2001), 15.8 ft^3/s (11,440 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft^3/s, June 4, 1937; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22 ft^3/s, April 13, 14, 21, July 1, 2, 5-7; minimum daily discharge, no flow, June 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

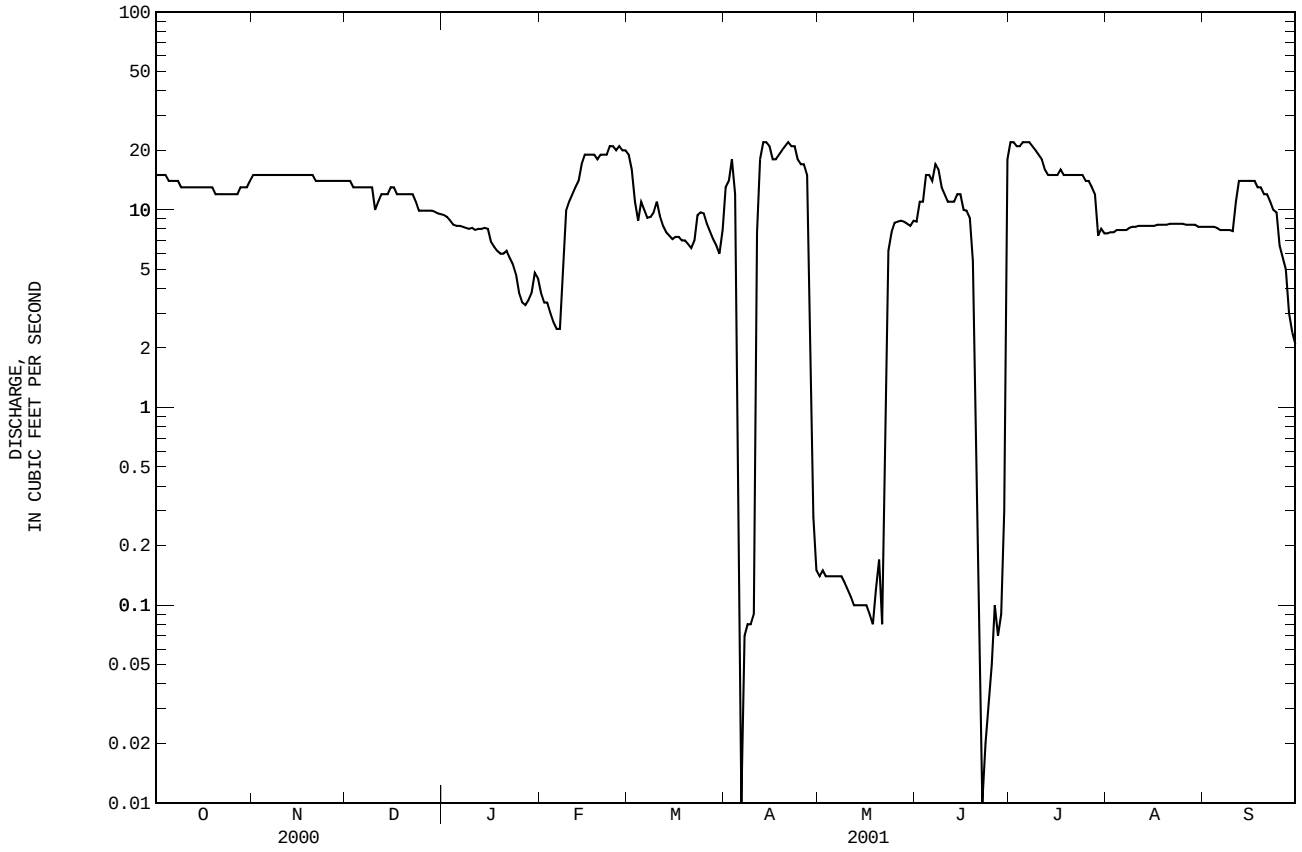
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	15	14	9.4	3.8	19	13	.14	8.7	22	7.6	8.2
2	15	15	14	9.2	3.4	16	14	.15	11	22	7.7	8.2
3	15	15	13	8.8	3.4	11	18	.14	11	21	7.7	8.2
4	15	15	13	8.4	3.0	8.8	12	.14	15	21	7.9	8.2
5	14	15	13	8.3	2.7	11	.14	.14	15	22	7.9	8.1
6	14	15	13	8.3	2.5	10	.01	.14	14	22	7.9	7.9
7	14	15	13	8.2	2.5	9.1	.07	.14	17	22	7.9	7.9
8	14	15	13	8.1	4.8	9.2	.08	.14	16	21	8.1	7.9
9	13	15	13	8.0	9.9	9.7	.08	.13	13	20	8.2	7.9
10	13	15	10	8.1	11	11	.09	.12	12	19	8.2	7.8
11	13	15	11	7.9	12	9.3	7.7	.11	11	18	8.3	11
12	13	15	12	8.0	13	8.3	18	.10	11	16	8.3	14
13	13	15	12	8.0	14	7.7	22	.10	11	15	8.3	14
14	13	15	12	8.1	17	7.4	22	.10	12	15	8.3	14
15	13	15	13	8.0	19	7.1	21	.10	12	15	8.3	14
16	13	15	13	6.9	19	7.3	18	.10	10	15	8.3	14
17	13	15	12	6.5	19	7.3	18	.09	9.9	16	8.4	14
18	13	15	12	6.2	19	7.0	19	.08	9.1	15	8.4	13
19	13	15	12	6.0	18	7.0	20	.12	5.5	15	8.4	13
20	12	15	12	6.0	19	6.7	21	.17	.44	15	8.4	12
21	12	14	12	6.2	19	6.4	22	.08	.09	15	8.5	12
22	12	14	12	5.7	19	7.0	21	1.4	.00	15	8.5	11
23	12	14	11	5.3	21	9.4	21	6.2	.02	15	8.5	10
24	12	14	9.9	4.7	21	9.7	18	7.7	.03	15	8.5	9.7
25	12	14	9.9	3.8	20	9.6	17	8.6	.05	14	8.5	6.6
26	12	14	9.9	3.4	21	8.5	17	8.7	.10	14	8.4	5.7
27	12	14	9.9	3.3	20	7.8	15	8.8	.07	13	8.4	5.0
28	13	14	9.9	3.5	20	7.1	1.0	8.7	.09	12	8.4	3.0
29	13	14	9.8	3.8	---	6.6	.28	8.5	.30	7.4	8.4	2.4
30	13	14	9.6	4.8	---	6.0	.15	8.3	18	8.0	8.2	2.1
31	14	---	9.5	4.5	---	7.9	---	8.8	---	7.6	8.2	---
TOTAL	408	440	363.4	205.4	377.0	275.9	376.60	78.23	243.39	503.0	255.0	280.8
MEAN	13.2	14.7	11.7	6.63	13.5	8.90	12.6	2.52	8.11	16.2	8.23	9.36
MAX	15	15	14	9.4	21	19	22	8.8	18	22	8.5	14
MIN	12	14	9.5	3.3	2.5	6.0	.01	.08	.00	7.4	7.6	2.1
AC-FT	809	873	721	407	748	547	747	155	483	998	506	557

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2001, BY WATER YEAR (WY)

MEAN	18.6	12.3	9.29	10.6	11.8	12.4	13.4	16.1	20.5	21.7	21.4	22.2
MAX	35.2	28.5	33.3	35.3	37.8	27.3	28.8	40.5	40.0	46.5	48.6	53.5
(WY)	1958	1984	1938	1938	1940	1980	1938	1938	1937	1938	1939	1938
MIN	2.80	.19	.009	.20	.071	.41	.90	1.08	2.29	7.09	5.72	3.89
(WY)	1969	1965	1955	1968	1969	1956	1963	1965	1997	1997	1954	1946

16069000 WAILUA DITCH NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1937 - 2001	
ANNUAL TOTAL	5730.4		3806.72			
ANNUAL MEAN	15.7		10.4		15.8	
HIGHEST ANNUAL MEAN					32.9	1938
LOWEST ANNUAL MEAN					5.95	1997
HIGHEST DAILY MEAN	23	Jan 20	22	Apr 13	63	Jun 4 1937
LOWEST DAILY MEAN	6.7	Aug 13	.00	Jun 22	.00	May 15 1940
ANNUAL SEVEN-DAY MINIMUM	8.4	Aug 8	.05	Jun 21	.00	May 15 1940
ANNUAL RUNOFF (AC-FT)	11370		7550		11440	
10 PERCENT EXCEEDS	21		18		30	
50 PERCENT EXCEEDS	15		10		15	
90 PERCENT EXCEEDS	11		.24		.96	



16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

LOCATION.--Lat 22°03'08", long 159°22'22", Hydrologic Unit 20070000, on right bank 1.1 mi upstream from confluence with South Fork, 3.7 mi southwest of Kapaa, and 5.0 mi north of Lihue.

DRAINAGE AREA.--17.9 mi^2.

PERIOD OF RECORD.--July 1952 to current year.

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-75-1: 1974.

GAGE.--Water-stage recorder. Elevation of gage is 18 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Clayton Yoshida. Records good. Wailua ditch (station 16069000) diverts water upstream.

AVERAGE DISCHARGE.--49 years (water years 1953-2001), 117 ft^3/s (85,1100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft^3/s, November 12, 1955, gage height, 19.88 ft in gage well, 20.8 ft, from floodmarks, from rating curve extended above 3,700 ft^3/s on basis of slope-area measurement of peak flow; minimum, 2.1 ft^3/s, October 28, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 08	0145	*3,650	*7.00				

Minimum discharge, 7.2 ft^3/s, June 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

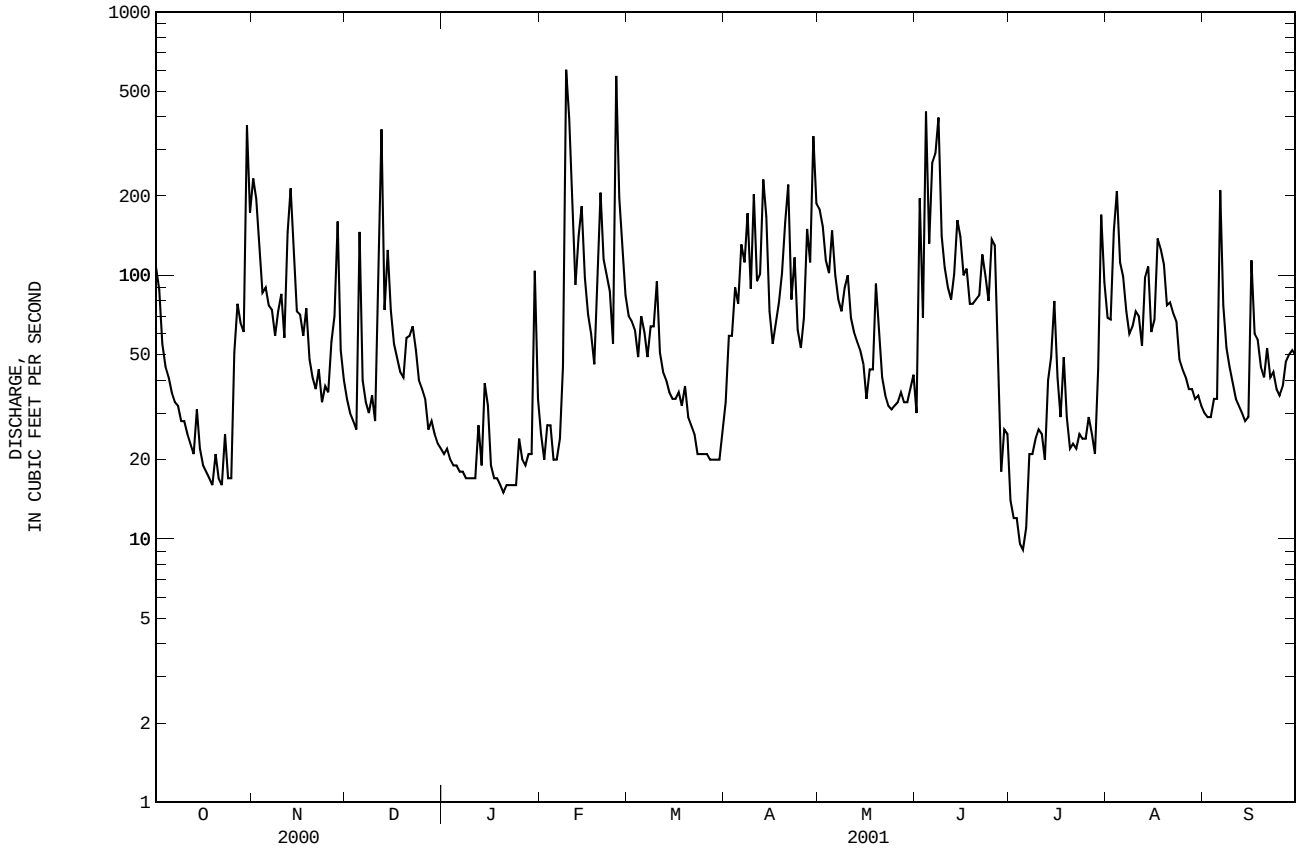
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	107	233	34	21	25	70	33	178	30	14	69	30
2	88	195	30	22	20	67	59	153	196	12	68	29
3	55	124	28	20	27	62	59	114	69	12	148	29
4	45	86	26	19	27	49	90	102	418	9.6	209	34
5	41	90	146	19	20	70	78	148	132	9.1	112	34
6	36	77	40	18	20	61	131	100	267	11	99	210
7	33	74	33	18	24	49	112	81	290	21	73	77
8	32	59	30	17	45	64	172	73	397	21	60	53
9	28	73	35	17	603	64	89	90	141	24	64	45
10	28	85	28	17	396	95	203	100	107	26	73	39
11	25	58	65	17	177	51	95	69	90	25	70	34
12	23	145	358	27	92	43	101	61	81	20	54	32
13	21	214	74	19	141	40	231	56	101	40	98	30
14	31	118	125	39	183	36	167	52	162	49	108	28
15	22	73	74	32	98	34	73	46	140	80	61	29
16	19	71	55	19	71	34	55	34	100	41	68	114
17	18	59	49	17	60	36	65	44	106	29	138	60
18	17	75	43	17	46	32	79	44	78	49	126	57
19	16	48	41	16	100	38	102	93	78	29	110	45
20	21	41	58	15	206	29	159	58	81	22	77	41
21	17	37	59	16	115	27	221	41	84	23	79	53
22	16	44	64	16	99	25	81	35	120	22	72	41
23	25	33	52	16	87	21	117	32	99	25	67	43
24	17	38	40	16	55	21	62	31	80	24	48	37
25	17	36	37	24	571	21	53	32	137	24	44	35
26	51	56	34	20	197	21	69	33	130	29	41	38
27	78	70	26	19	134	20	150	36	37	25	37	47
28	66	160	28	21	84	20	112	33	18	21	37	50
29	61	52	25	21	---	20	337	33	26	44	34	52
30	370	40	23	104	---	20	187	37	25	170	35	50
31	173	---	22	34	---	26	---	42	---	94	32	---
TOTAL	1597	2564	1782	713	3723	1266	3542	2081	3820	1044.7	2411	1496
MEAN	51.5	85.5	57.5	23.0	133	40.8	118	67.1	127	33.7	77.8	49.9
MAX	370	233	358	104	603	95	337	178	418	170	209	210
MIN	16	33	22	15	20	20	33	31	18	9.1	32	28
AC-FT	3170	5090	3530	1410	7380	2510	7030	4130	7580	2070	4780	2970

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	96.8	182	163	144	127	138	147	113	63.3	88.2	84.1	63.0
MAX	255	591	459	529	522	730	474	418	247	230	223	273
(WY)	1983	1991	1993	1956	1979	1982	1971	1967	1980	1980	1958	1994
MIN	2.54	19.1	7.74	6.90	4.43	4.76	15.0	7.45	5.78	5.22	5.80	3.17
(WY)	1954	1977	1984	1986	1978	1978	1966	2000	1957	1953	1984	1953

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	19150.6		26039.7			
ANNUAL MEAN	52.3		71.3		117	
HIGHEST ANNUAL MEAN					262	1982
LOWEST ANNUAL MEAN					25.7	1984
HIGHEST DAILY MEAN	656	Jan 19	603	Feb 9	7350	Jan 25 1956
LOWEST DAILY MEAN	5.5	May 16	9.1	Jul 5	2.2	Oct 21 1953
ANNUAL SEVEN-DAY MINIMUM	6.6	May 2	13	Jul 1	2.4	Oct 20 1953
ANNUAL RUNOFF (AC-FT)	37990		51650		85110	
10 PERCENT EXCEEDS	117		147		247	
50 PERCENT EXCEEDS	28		48		65	
90 PERCENT EXCEEDS	7.2		20		8.6	



16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

LOCATION.--Lat 22°04'44", long 159°23'55", Hydrologic Unit 20070000, on left bank 0.4 mi upstream from mouth, 0.6 mi northeast of Wailua Reservoir, and 4.9 mi west of Kapaa.

DRAINAGE AREA.--0.65 mi^2.

PERIOD OF RECORD.--May 1960 to current year. Prior to July 1960, published as Left Branch Opaikaa Stream near Kapaa.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 458.4 ft above mean sea level (by stadia survey).

REMARKS.--Records computed by Roy Taogoshi. Records good except for estimated days which are poor. Recording rain gage located at station.

AVERAGE DISCHARGE.--41 years (water years 1961-2001), 2.54 ft^3/s (1,840 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,060 ft^3/s, December 14, 1991, gage height, 6.60 ft, from rating curve extended above 415 ft^3/s on basis of slope-area measurement at gage height 5.01 ft; minimum, 0.09 ft^3/s, September 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 70 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	1730	*18	*1.48				

Minimum discharge, 0.59 ft^3/s, on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	.95	.91	.75	.62	1.6	.80	1.3	.80	1.1	.80	e.75
2	1.5	1.3	.87	.75	.59	1.5	.85	1.2	1.0	1.0	.75	e.75
3	1.2	1.1	.87	.75	.65	1.4	.79	1.2	.92	1.0	.85	e.75
4	1.1	.91	.84	.75	.59	1.3	.80	1.1	4.3	.94	1.3	e.75
5	1.1	.89	1.4	.75	.59	1.4	.78	1.4	1.7	.93	.97	e.75
6	.98	.81	.92	.73	.60	1.2	.86	1.2	1.4	.92	.91	e1.5
7	.93	.78	.87	.69	.59	1.1	.85	1.1	1.5	.87	.85	e1.3
8	.91	.75	.87	.68	.77	1.1	.86	1.1	1.8	.87	.80	e.93
9	.87	.78	.87	.68	2.1	1.1	.82	1.1	1.4	.87	.79	e.84
10	.87	.84	.81	.70	1.3	1.2	.92	1.1	1.3	.90	.79	e.81
11	.81	.77	.97	.66	.98	1.0	.88	1.0	1.2	.89	.82	e.75
12	.78	.91	2.7	.59	1.1	1.0	.84	.94	1.2	.92	.76	e.75
13	.75	1.6	1.2	.66	1.6	.99	1.1	.92	1.3	1.0	.84	e.75
14	.88	1.2	1.4	1.0	1.1	.93	1.1	.87	1.4	.92	1.1	e.75
15	.75	.98	1.2	.71	.96	.91	.90	.87	1.3	.98	.81	e.70
16	.73	1.0	1.1	.64	.87	.87	.86	.87	1.2	.93	.83	e.67
17	.69	.96	1.0	.64	.81	.87	.86	.93	1.2	.88	.95	e.64
18	.69	1.0	.98	.60	.81	.87	.81	1.2	1.1	.93	.98	e.64
19	.69	.93	.93	.59	.83	.89	.80	1.2	1.1	.81	1.0	e.64
20	.69	.87	.93	.59	2.5	.81	.86	1.2	1.1	.75	.92	e.69
21	.69	.87	.95	.59	1.7	.81	.82	.97	1.0	.79	.87	e.75
22	.67	.87	.98	.59	1.4	.81	.85	.89	1.2	.78	.87	e.69
23	.69	.85	.89	.59	1.6	.81	1.0	.87	1.1	.83	e.90	e.64
24	.64	.83	.87	.60	1.3	.81	.84	.82	1.0	.76	e.87	e.64
25	.67	.86	.87	.61	6.5	.78	.81	.89	1.1	.75	e.87	e.64
26	.68	1.0	.87	.61	3.6	.75	.88	.87	1.3	.71	e.81	e.64
27	.76	1.0	.83	.60	2.5	.75	1.1	.86	1.0	.69	e.81	e.69
28	.73	1.5	.82	.68	2.0	.75	.92	.84	1.2	.68	e.81	e.69
29	.69	1.0	.81	.65	---	.75	1.9	.81	1.2	.83	e.81	e.69
30	1.5	.93	.81	.84	---	.73	1.5	.81	1.2	.84	e.75	e.69
31	.93	---	.77	.67	---	.91	---	.80	---	.81	e.75	---
TOTAL	27.57	29.04	31.11	20.94	40.56	30.70	27.96	31.23	39.52	26.88	26.94	22.87
MEAN	.89	.97	1.00	.68	1.45	.99	.93	1.01	1.32	.87	.87	.76
MAX	2.0	1.6	2.7	1.0	6.5	1.6	1.9	1.4	4.3	1.1	1.3	1.5
MIN	.64	.75	.77	.59	.59	.73	.78	.80	.80	.68	.75	.64
AC-FT	55	58	62	42	80	61	55	62	78	53	53	45

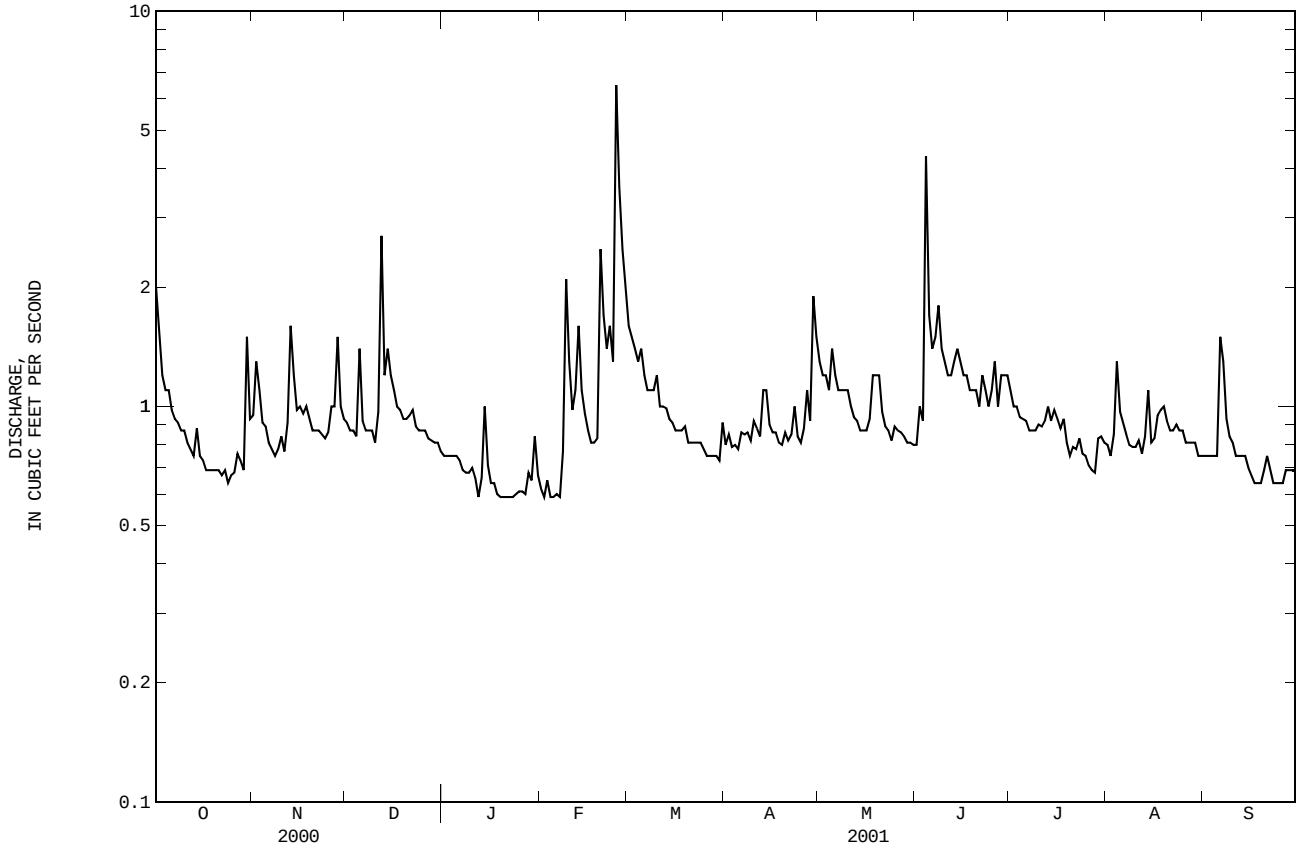
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2001, BY WATER YEAR (WY)

MEAN	2.17	3.82	3.73	3.17	2.53	2.73	3.08	2.68	1.78	1.66	1.60	1.53
MAX	8.29	14.3	11.0	12.4	10.8	14.7	11.8	9.66	5.68	3.80	4.24	4.67
(WY)	1961	1966	1992	1989	1994	1982	1982	1965	1980	1989	1982	1980
MIN	.42	.59	.56	.58	.50	.50	.73	.62	.29	.59	.36	.38
(WY)	1985	1964	1963	1977	1986	1978	1998	1966	1968	1968	1984	1975

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1960 - 2001	
ANNUAL TOTAL	395.05		355.32			
ANNUAL MEAN	1.08		.97		2.54	
HIGHEST ANNUAL MEAN					5.72	1982
LOWEST ANNUAL MEAN					.92	1984
HIGHEST DAILY MEAN	17	Jan 19	6.5	Feb 25	218	Dec 14 1991
LOWEST DAILY MEAN	.46	Aug 10	.59	Jan 12	.09	Sep 28 1968
ANNUAL SEVEN-DAY MINIMUM	.46	Aug 9	.59	Jan 18	.10	Jun 6 1968
ANNUAL RUNOFF (AC-FT)	784		705		1840	
10 PERCENT EXCEEDS	1.8		1.3		4.4	
50 PERCENT EXCEEDS	.87		.87		1.7	
90 PERCENT EXCEEDS	.51		.68		.67	

e Estimated



16079000 KAPAHI DITCH NEAR KEALIA

LOCATION.--Lat 22°06'09", long 159°22'28", Hydrologic Unit 20070000, on right bank 500 ft downstream from intake, and 4.0 mi west of Kealia.

PERIOD OF RECORD.--April 1909 to February 1911, May 1911, July 1911 to May 1914, July 1915 to April 1917, June 1917 to current year. Published as "at Kapahi, near Kapaa" prior to January 1914 and as "at Kapahi, near Kealia" January to December 1913.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 377.1 ft above mean sea level (by stadia survey). Prior to November 26, 1936, at site 61 ft upstream at datum 2.52 ft higher.

REMARKS.--Records computed by Clayton Yoshida. Records good. Ditch diverts water from Kapaa Stream.

AVERAGE DISCHARGE.--83 years (water years 1918-20, 1922-2001), 6.25 ft^3/s (4,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft^3/s, February 6, 1913; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 19 ft^3/s, Sept. 6, 7; minimum daily discharge, 0.05 ft^3/s, Mar. 16-18, 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

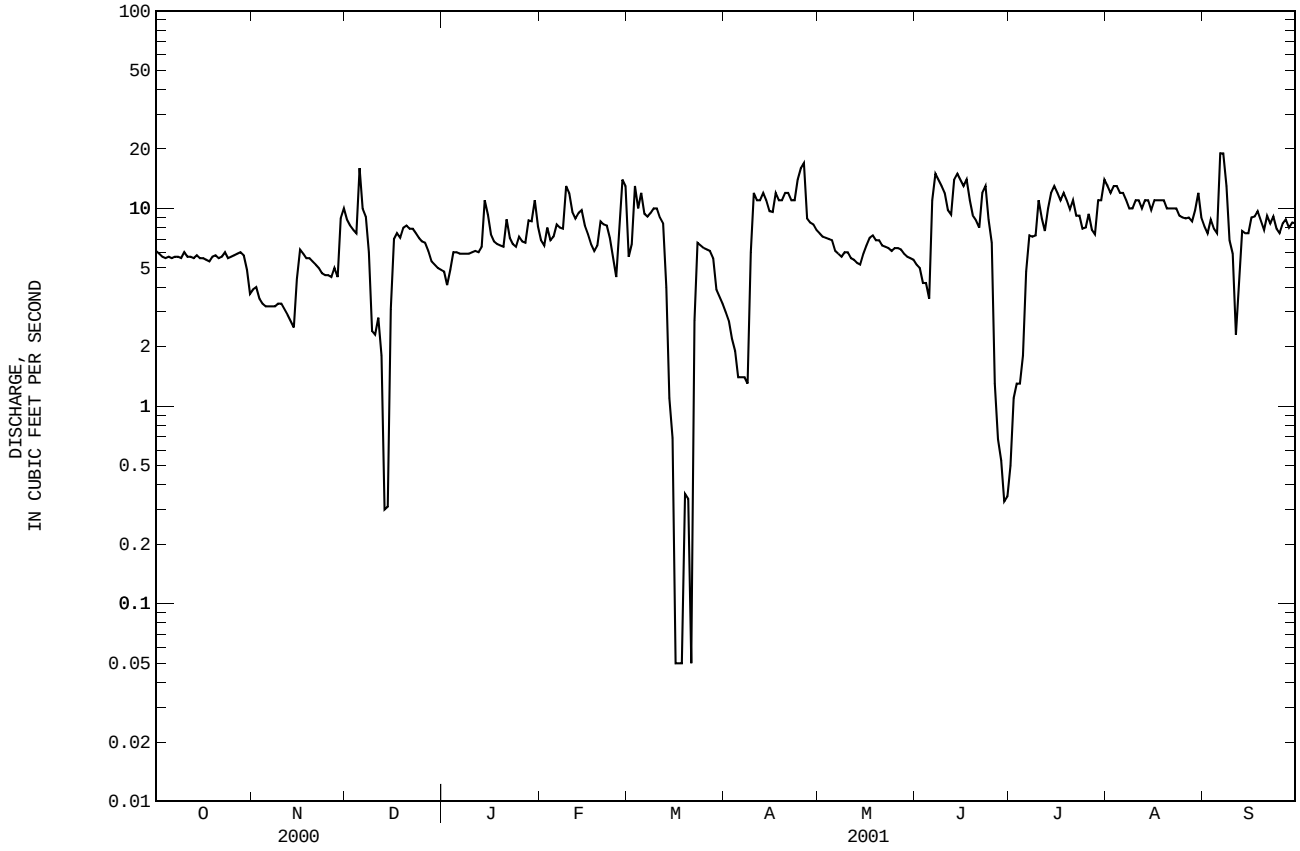
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	3.9	8.8	4.8	6.9	5.7	3.0	7.5	5.2	.50	13	8.1
2	5.9	4.0	8.2	4.1	6.5	6.6	2.7	7.2	5.0	1.1	12	7.5
3	5.7	3.5	7.8	4.9	8.0	13	2.2	7.1	4.2	1.3	13	8.8
4	5.6	3.3	7.5	6.0	6.9	10	1.9	7.0	4.2	1.3	13	7.9
5	5.7	3.2	16	6.0	7.2	12	1.4	6.9	3.5	1.8	12	7.5
6	5.6	3.2	10	5.9	8.3	9.4	1.4	6.1	11	4.8	12	19
7	5.7	3.2	9.1	5.9	8.0	9.1	1.4	5.9	15	7.3	11	19
8	5.7	3.2	6.0	5.9	7.9	9.5	1.3	5.7	14	7.2	10	13
9	5.6	3.3	2.4	5.9	13	10	6.0	6.0	13	7.3	10	6.9
10	6.0	3.3	2.3	6.0	12	10	12	6.0	12	11	11	5.9
11	5.7	3.1	2.8	6.1	9.6	9.0	11	5.6	9.8	8.9	11	2.3
12	5.7	2.9	1.8	6.0	8.9	8.4	11	5.5	9.3	7.7	10	4.5
13	5.6	2.7	.30	6.4	9.5	4.0	12	5.3	14	10	11	7.7
14	5.8	2.5	.31	11	9.8	1.1	11	5.2	15	12	11	7.5
15	5.6	4.4	3.1	9.3	8.2	.69	9.7	5.9	14	13	9.8	7.5
16	5.6	6.2	7.0	7.4	7.4	.05	9.6	6.5	13	12	11	9.0
17	5.5	5.9	7.5	6.8	6.6	.05	12	7.1	14	11	11	9.1
18	5.4	5.6	7.1	6.6	6.1	.05	11	7.3	11	12	11	9.7
19	5.7	5.6	8.0	6.5	6.5	.36	11	6.9	9.2	11	11	8.7
20	5.8	5.4	8.2	6.4	8.6	.34	12	6.9	8.7	9.9	10	7.8
21	5.6	5.2	7.9	8.8	8.3	.05	12	6.5	8.0	11	10	9.2
22	5.7	5.0	7.9	7.1	8.2	2.7	11	6.4	12	9.2	10	8.4
23	6.0	4.7	7.5	6.6	7.1	6.7	11	6.3	13	9.2	10	9.1
24	5.6	4.6	7.1	6.4	5.6	6.5	14	6.1	8.8	7.9	9.2	7.9
25	5.7	4.6	6.8	7.2	4.5	6.3	16	6.3	6.7	8.0	9.0	7.5
26	5.8	4.5	6.7	6.8	7.6	6.2	17	6.3	1.3	9.4	8.9	8.4
27	5.9	5.0	6.1	6.7	14	6.1	8.9	6.2	.68	7.8	9.0	8.8
28	6.0	4.5	5.4	8.7	13	5.6	8.5	5.9	.53	7.4	8.6	8.0
29	5.8	8.9	5.2	8.6	---	3.9	8.3	5.7	.33	11	9.8	8.5
30	4.9	10	5.0	11	---	3.6	7.8	5.6	.35	11	12	8.4
31	3.7	---	4.9	8.1	---	3.3	---	5.5	---	14	9.0	---
TOTAL	174.7	135.4	194.71	213.9	234.2	170.29	258.1	194.4	256.79	257.00	329.3	261.6
MEAN	5.64	4.51	6.28	6.90	8.36	5.49	8.60	6.27	8.56	8.29	10.6	8.72
MAX	6.1	10	16	11	14	13	17	7.5	15	14	13	19
MIN	3.7	2.5	.30	4.1	4.5	.05	1.3	5.2	.33	.50	8.6	2.3
AC-FT	347	269	386	424	465	338	512	386	509	510	653	519

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 2001, BY WATER YEAR (WY)

MEAN	5.95	5.19	4.71	4.53	4.98	5.70	6.58	7.67	7.61	8.13	8.42	7.03
MAX	26.0	21.8	27.5	22.9	19.4	22.6	21.2	28.0	26.1	33.6	30.0	25.8
(WY)	1919	1919	1922	1918	1919	1919	1922	1918	1918	1918	1918	1920
MIN	.27	.044	.073	.012	.042	.22	.27	.32	1.57	1.66	1.88	.72
(WY)	1961	1952	1949	1943	1956	1968	1945	1965	1962	1987	1995	1946

16079000 KAPAHI DITCH NEAR KEALIA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1918 - 2001	
ANNUAL TOTAL	2601.01		2680.39			
ANNUAL MEAN	7.11		7.34		6.25	
HIGHEST ANNUAL MEAN					21.0	1918
LOWEST ANNUAL MEAN					2.23	1965
HIGHEST DAILY MEAN	20	Mar 27	19	Sep 6	94	Oct 25 1926
LOWEST DAILY MEAN	.30	Dec 13	.05	Mar 16	.00	Jun 4 1922
ANNUAL SEVEN-DAY MINIMUM	1.9	Dec 9	.23	Mar 15	.00	Nov 13 1925
ANNUAL RUNOFF (AC-FT)	5160		5320		4530	
10 PERCENT EXCEEDS	10		12		15	
50 PERCENT EXCEEDS	6.7		7.1		4.7	
90 PERCENT EXCEEDS	4.1		3.0		.25	



16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

LOCATION.--Lat 22°08'10", long 159°22'28", Hydrologic Unit 20070000, on left bank at point of discharge into Kaneha Reservoir, 500 ft below wasteway gates, and 4.8 mi northwest of Kealia.

PERIOD OF RECORD.--December 1921 to current year. Records for May 1915 to December 1921 at site 520 ft upstream not equivalent owing to intervening diversion.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 821.8 ft above mean sea level (Lihue Plantation benchmark). December 9, 1921 to June 2, 1934, at site 480 ft upstream at different datum.

REMARKS.--Records computed by Clayton Yoshida. Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Floods are sometimes diverted upstream by Anahola Ditch wasteway.

AVERAGE DISCHARGE.--77 years (water years, 1923-25, 1928-2001), 4.12 ft^3/s (2,980 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 62 ft^3/s, November 12, 1947; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s, Dec. 12; minimum daily discharge, 1.1 ft^3/s, Feb. 2, Mar. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

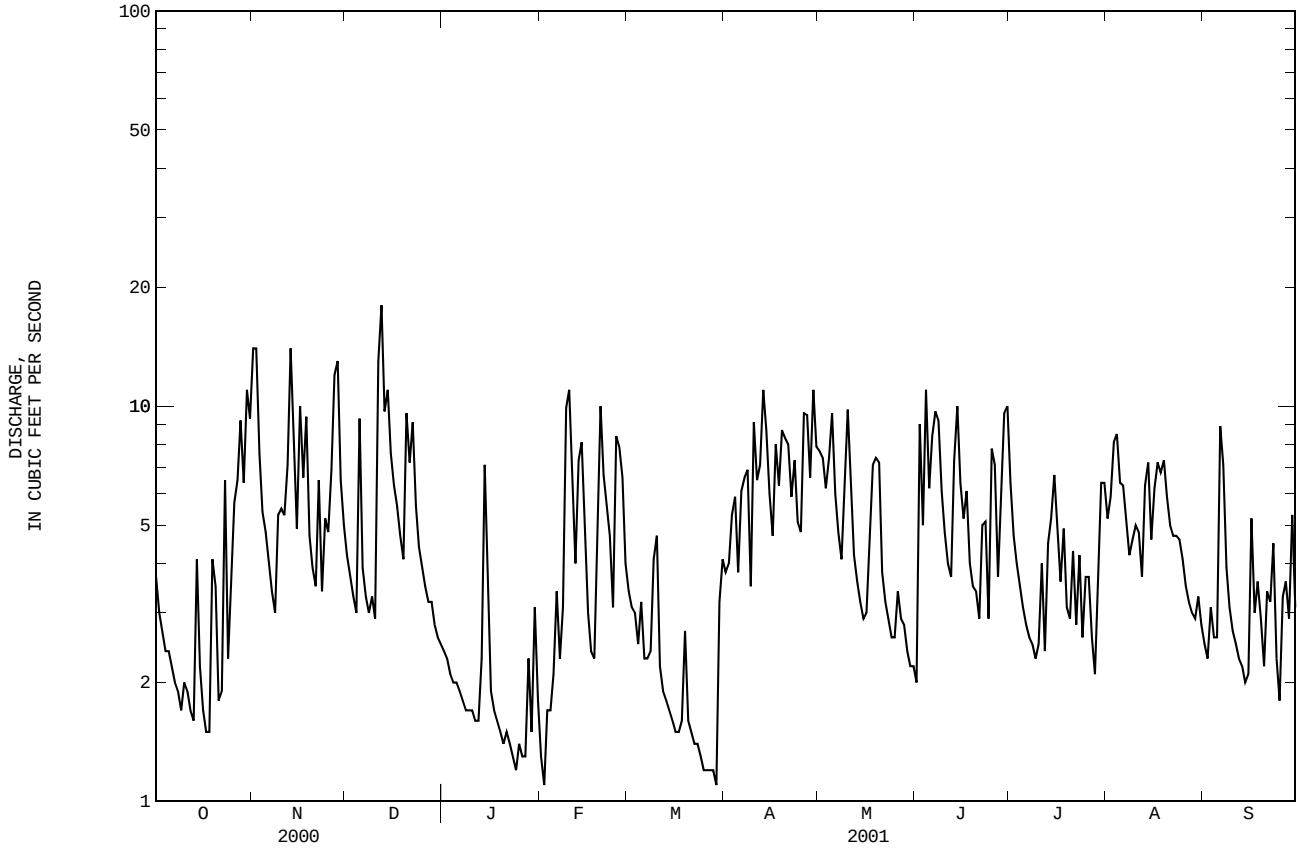
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	14	4.2	2.4	1.3	3.4	3.8	7.7	2.0	6.4	5.2	2.5
2	3.0	14	3.7	2.3	1.1	3.1	4.0	7.4	9.0	4.7	5.9	2.3
3	2.7	7.6	3.3	2.1	1.7	3.0	5.3	6.2	5.0	4.0	8.1	3.1
4	2.4	5.4	3.0	2.0	1.7	2.5	5.9	7.4	11	3.5	8.5	2.6
5	2.4	4.8	9.3	2.0	2.1	3.2	3.8	9.6	6.2	3.1	6.4	2.6
6	2.2	4.1	3.9	1.9	3.4	2.3	6.1	6.0	8.4	2.8	6.3	8.9
7	2.0	3.4	3.3	1.8	2.3	2.3	6.6	4.8	9.7	2.6	5.1	7.1
8	1.9	3.0	3.0	1.7	3.1	2.4	6.9	4.1	9.2	2.5	4.2	3.9
9	1.7	5.3	3.3	1.7	9.9	4.1	3.5	5.9	6.1	2.3	4.6	3.1
10	2.0	5.5	2.9	1.7	11	4.7	9.1	9.8	4.8	2.5	5.0	2.7
11	1.9	5.3	13	1.6	7.0	2.2	6.5	6.0	4.0	4.0	4.8	2.5
12	1.7	7.1	18	1.6	4.0	1.9	7.1	4.2	3.7	2.4	3.7	2.3
13	1.6	14	9.7	2.3	7.3	1.8	11	3.6	7.3	4.5	6.3	2.2
14	4.1	9.1	11	7.1	8.1	1.7	8.7	3.2	10	5.2	7.2	2.0
15	2.2	4.9	7.6	3.2	4.5	1.6	6.0	2.9	6.4	6.7	4.6	2.1
16	1.7	10	6.3	1.9	3.0	1.5	4.7	3.0	5.2	5.0	6.2	5.2
17	1.5	6.6	5.6	1.7	2.4	1.5	8.0	4.9	6.1	3.6	7.2	3.0
18	1.5	9.4	4.7	1.6	2.3	1.6	6.3	7.1	4.0	4.9	6.8	3.6
19	4.1	4.7	4.1	1.5	4.2	2.7	8.7	7.4	3.5	3.1	7.3	2.9
20	3.5	3.9	9.6	1.4	10	1.6	8.3	7.2	3.4	2.9	5.9	2.2
21	1.8	3.5	7.2	1.5	6.7	1.5	8.0	3.8	2.9	4.3	5.0	3.4
22	1.9	6.5	9.1	1.4	5.6	1.4	5.9	3.2	5.0	2.8	4.7	3.2
23	6.5	3.4	5.6	1.3	4.7	1.4	7.3	2.9	5.1	4.2	4.7	4.5
24	2.3	5.2	4.4	1.2	3.1	1.3	5.1	2.6	2.9	2.6	4.6	2.3
25	3.9	4.8	3.9	1.4	8.4	1.2	4.8	2.6	7.8	3.7	4.1	1.8
26	5.7	6.9	3.5	1.3	7.9	1.2	9.6	3.4	7.1	3.7	3.5	3.3
27	6.5	12	3.2	1.3	6.6	1.2	9.5	2.9	3.7	2.6	3.2	3.6
28	9.2	13	3.2	2.3	4.0	1.2	6.6	2.8	6.0	2.1	3.0	2.9
29	6.4	6.5	2.8	1.5	---	1.1	11	2.4	9.6	3.5	2.9	5.3
30	11	5.0	2.6	3.1	---	3.2	7.9	2.2	10	6.4	3.3	3.1
31	9.3	---	2.5	1.8	---	4.1	---	2.2	---	6.4	2.8	---
TOTAL	112.3	208.9	177.5	61.6	137.4	67.9	206.0	149.4	185.1	119.0	161.1	100.2
MEAN	3.62	6.96	5.73	1.99	4.91	2.19	6.87	4.82	6.17	3.84	5.20	3.34
MAX	11	14	18	7.1	11	4.7	11	9.8	11	6.7	8.5	8.9
MIN	1.5	3.0	2.5	1.2	1.1	1.1	3.5	2.2	2.0	2.1	2.8	1.8
AC-FT	223	414	352	122	273	135	409	296	367	236	320	199

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2001, BY WATER YEAR (WY)

MEAN	4.40	3.42	2.21	2.29	3.12	3.48	4.59	4.69	4.66	6.10	5.35	4.74
MAX	12.1	9.93	7.96	10.8	16.1	11.1	12.5	11.1	11.5	11.4	11.8	10.0
(WY)	1987	1950	1987	1975	1989	1986	1986	1986	1952	1969	1951	1941
MIN	.007	.004	.002	.003	.004	.000	.001	.009	.000	.003	.005	.002
(WY)	1995	1992	1961	1933	1969	1993	1993	1993	1993	1993	1993	1991

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1922 - 2001	
ANNUAL TOTAL	1673.68		1686.4			
ANNUAL MEAN	4.57		4.62		4.12	
HIGHEST ANNUAL MEAN					8.00	1987
LOWEST ANNUAL MEAN					.13	1992
HIGHEST DAILY MEAN	24	Apr 2	18	Dec 12	62	Nov 12 1947
LOWEST DAILY MEAN	.14	Feb 25	1.1	Feb 2	.00	Dec 11 1923
ANNUAL SEVEN-DAY MINIMUM	.16	Mar 3	1.2	Mar 23	.00	Dec 15 1923
ANNUAL RUNOFF (AC-FT)	3320		3340		2980	
10 PERCENT EXCEEDS	11		8.8		10	
50 PERCENT EXCEEDS	3.2		3.9		2.8	
90 PERCENT EXCEEDS	.75		1.7		.03	



16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA

LOCATION.--Lat 22°10'54", long 159°25'17", Hydrologic Unit 20070000, on left bank 0.5 mi upstream from confluence with Pohakuhono Stream, and 2.3 mi south of Kilauea.

DRAINAGE AREA.--1.19 mi^2, revised (Drainage area of 1.9 mi^2 published in the data report for water years 1977-94 was in error; the correct figure is 1.19 mi^2).

PERIOD OF RECORD.--November 1957 to current year.

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-95-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 391.8 ft above mean sea level (by stadia survey).

REMARKS.--Records computed by Clayton Yoshida. Records good.

AVERAGE DISCHARGE.--43 years (water years 1959-2001), 11.8 ft^3/s (8,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,140 ft^3/s, February 13, 1994, gage height, 9.76 ft; minimum, 1.8 ft^3/s, September 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 580 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec 11	2200	*690	*4.73	No other peak greater than base discharge.			

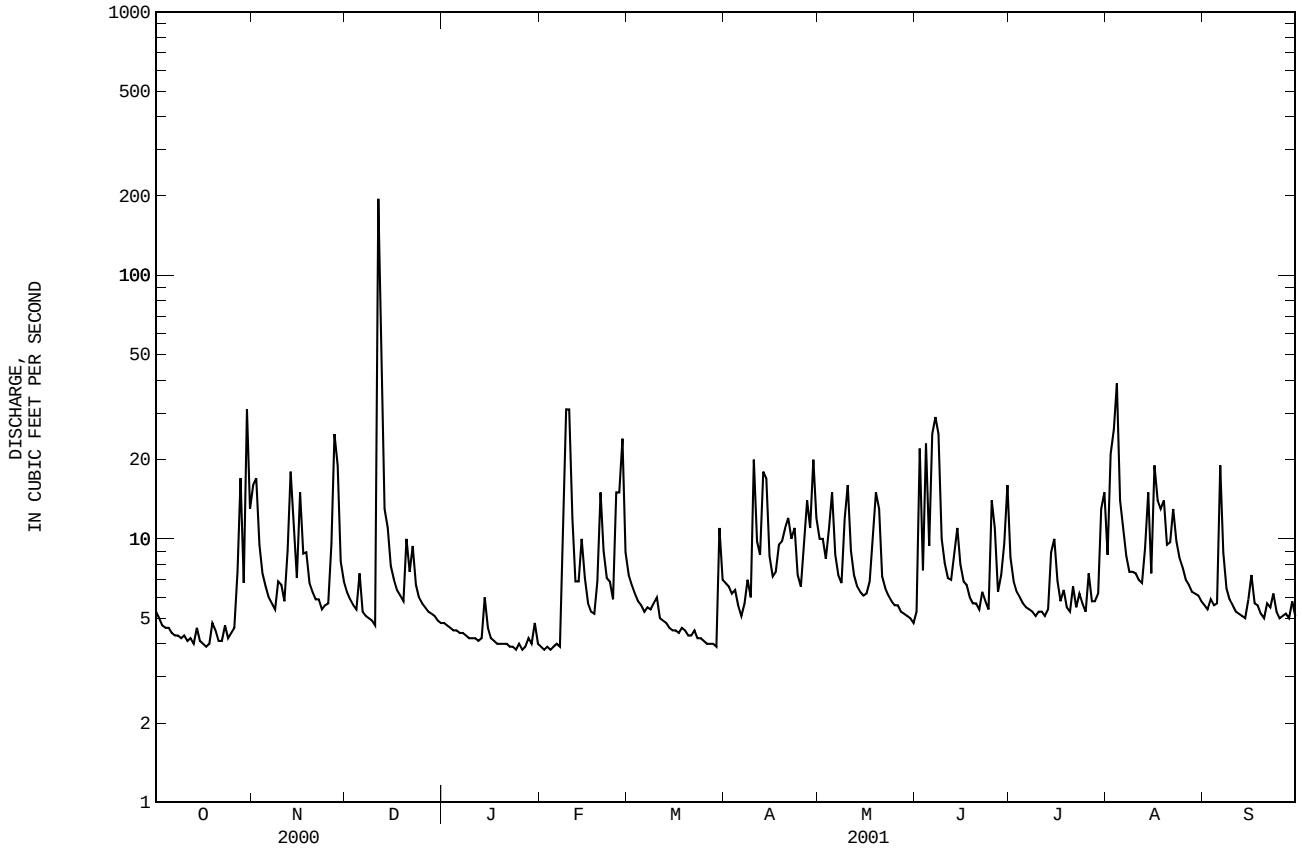
Minimum discharge, 3.7 ft^3/s, January 24, 26, February 2-5, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	16	6.3	4.8	3.9	7.3	6.8	10	5.3	8.5	8.7	5.6
2	5.0	17	5.9	4.7	3.8	6.7	6.6	10	22	6.9	21	5.4
3	4.7	9.5	5.6	4.6	3.9	6.2	6.2	8.4	7.6	6.3	26	5.9
4	4.6	7.4	5.4	4.5	3.8	5.8	6.4	11	23	6.0	39	5.6
5	4.6	6.6	7.4	4.5	3.9	5.6	5.6	15	9.4	5.7	14	5.7
6	4.4	6.0	5.3	4.4	4.0	5.3	5.1	8.7	25	5.5	11	19
7	4.3	5.7	5.1	4.4	3.9	5.5	5.7	7.3	29	5.4	8.6	8.9
8	4.3	5.4	5.0	4.3	13	5.4	7.0	6.8	25	5.3	7.5	6.5
9	4.2	6.9	4.9	4.2	31	5.7	6.0	12	10	5.1	7.5	5.9
10	4.3	6.7	4.7	4.2	31	6.0	20	16	8.1	5.3	7.4	5.6
11	4.1	5.8	195	4.2	12	5.0	9.8	9.0	7.1	5.3	7.0	5.3
12	4.2	9.0	48	4.1	6.9	4.9	8.7	7.3	7.0	5.1	6.8	5.2
13	4.0	18	13	4.2	6.9	4.8	18	6.6	8.8	5.4	9.2	5.1
14	4.6	11	11	6.0	10	4.6	17	6.3	11	8.9	15	5.0
15	4.1	7.1	7.9	4.6	7.1	4.5	8.6	6.1	8.0	10	7.4	5.9
16	4.0	15	7.0	4.2	5.7	4.5	7.2	6.2	6.9	6.9	19	7.3
17	3.9	8.8	6.4	4.1	5.3	4.4	7.5	6.9	6.7	5.8	14	5.7
18	4.0	8.9	6.1	4.0	5.2	4.6	9.5	10	6.0	6.4	13	5.6
19	4.8	6.8	5.8	4.0	6.9	4.5	9.8	15	5.7	5.5	14	5.2
20	4.5	6.3	10	4.0	15	4.3	11	13	5.7	5.3	9.5	5.0
21	4.1	5.9	7.5	4.0	9.0	4.3	12	7.2	5.4	6.6	9.7	5.7
22	4.1	5.9	9.4	3.9	7.1	4.5	10	6.5	6.3	5.5	13	5.5
23	4.7	5.4	6.7	3.9	6.9	4.2	11	6.1	5.8	6.2	9.8	6.2
24	4.2	5.6	6.0	3.8	5.9	4.2	7.3	5.8	5.4	5.7	8.5	5.3
25	4.4	5.7	5.7	4.0	15	4.1	6.6	5.6	14	5.3	7.8	5.0
26	4.6	9.6	5.5	3.8	15	4.0	9.3	5.6	11	7.4	7.0	5.1
27	7.5	25	5.3	3.9	24	4.0	14	5.3	6.3	5.8	6.7	5.2
28	17	19	5.2	4.2	8.9	4.0	11	5.2	7.3	5.8	6.3	5.0
29	6.8	8.2	5.1	4.0	---	3.9	20	5.1	9.6	6.2	6.2	5.8
30	31	6.9	4.9	4.8	---	11	12	5.0	16	13	6.1	5.1
31	13	---	4.8	4.0	---	7.0	---	4.8	---	15	5.8	---
TOTAL	189.3	281.1	431.9	132.3	275.0	160.8	295.7	253.8	324.4	207.1	352.5	183.3
MEAN	6.11	9.37	13.9	4.27	9.82	5.19	9.86	8.19	10.8	6.68	11.4	6.11
MAX	31	25	195	6.0	31	11	20	16	29	15	39	19
MIN	3.9	5.4	4.7	3.8	3.8	3.9	5.1	4.8	5.3	5.1	5.8	5.0
AC-FT	375	558	857	262	545	319	587	503	643	411	699	364
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2001, BY WATER YEAR (WY)												
MEAN	10.2	16.2	13.9	11.7	11.2	13.1	14.9	11.8	8.54	11.2	10.2	8.32
MAX	24.6	49.7	43.1	28.4	54.8	42.7	35.1	22.5	29.1	27.1	23.7	15.7
(WY)	1983	1996	1988	1989	1994	1982	1971	1965	1978	1989	1991	1994
MIN	4.40	5.73	3.79	3.45	3.20	4.15	5.06	4.38	4.27	5.05	3.95	3.93
(WY)	1985	1977	1986	1986	1986	1995	1992	2000	1959	1975	1973	1975

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1958 - 2001	
ANNUAL TOTAL	3178.4		3087.2			
ANNUAL MEAN	8.68		8.46		11.8	
HIGHEST ANNUAL MEAN					19.6	1982
LOWEST ANNUAL MEAN					7.01	1984
HIGHEST DAILY MEAN	195	Dec 11	195	Dec 11	879	Feb 13 1994
LOWEST DAILY MEAN	3.8	Mar 20	3.8	Jan 24	1.9	Sep 5 1968
ANNUAL SEVEN-DAY MINIMUM	3.9	Mar 17	3.9	Feb 1	2.4	Sep 2 1968
ANNUAL RUNOFF (AC-FT)	6300		6120		8530	
10 PERCENT EXCEEDS	13		14		20	
50 PERCENT EXCEEDS	5.4		6.0		7.4	
90 PERCENT EXCEEDS	4.0		4.2		4.6	



16103000 HANALEI RIVER NEAR HANALEI

LOCATION.--Lat 22°11'01", long 159°28'08", Hydrologic Unit 20070000, on right bank 2.6 mi southeast of Hanalei School, and 4.9 mi upstream from mouth.

DRAINAGE AREA.--18.7 mi^2.

PERIOD OF RECORD.--January 1912 to November 1919, water years 1962-63 (annual maximum), December 1962 to current year.

REVISED RECORDS.--WSP 1937: Drainage area. WSP 2137: 1962(M), 1963-65(P). WDR HI-77-1: 1970-76(M), 1975-76.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 60.0 ft above mean sea level (from topographic map). January 1, 1912 to November 20, 1919, nonrecording gage at site 0.3 mi downstream at different datum. January 26 to December 26, 1962, crest-stage gage at site 0.5 mi downstream at different datum. Water-stage recorder and crest-stage gage at site 0.5 mi downstream at different datum from December 27, 1962 to May 10, 2000.

REMARKS.--Records computed by Clayton Yoshida. Records good. No diversion upstream.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel ended).--9 years (water years 1993-2001), 201 ft^3/s (145,600) acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,600 ft^3/s, November 3, 1995, gage height, 15.81 ft, from rating curve extended above 26,600 ft^3/s; minimum, 31 ft^3/s, September 30, October 1, 2, 5, 12, 13, November 3, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 9	1100	*15,900	*10.51	No other peak greater than base discharge.			

Minimum discharge, 64 ft^3/s, January 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	363	116	81	74	125	99	336	86	140	222	94
2	129	297	108	81	70	121	201	259	343	117	297	91
3	105	182	102	78	102	119	148	194	149	107	417	97
4	97	143	97	76	75	105	138	191	580	101	403	99
5	95	141	530	75	78	130	99	274	207	96	234	107
6	90	143	126	74	87	110	265	168	691	92	218	437
7	88	126	111	73	80	104	166	140	672	89	157	140
8	93	112	105	72	271	152	385	e132	558	88	132	112
9	87	169	109	71	2280	158	207	194	192	87	132	102
10	89	156	97	73	1400	176	556	239	150	100	145	95
11	84	127	1470	70	463	108	321	148	130	98	129	90
12	82	403	1570	70	246	99	489	125	121	89	119	87
13	83	522	240	85	439	97	758	115	164	118	250	86
14	118	279	272	133	561	90	402	109	224	267	266	84
15	84	171	164	88	254	88	222	105	162	256	143	138
16	81	394	139	73	179	89	170	105	128	135	281	395
17	77	231	125	70	142	99	190	117	134	109	280	140
18	76	320	115	69	127	87	244	105	107	130	243	126
19	84	167	107	68	394	123	312	196	101	102	254	103
20	99	140	167	67	470	84	433	120	97	98	177	95
21	78	126	145	67	225	80	437	100	93	106	169	109
22	80	139	156	66	176	78	217	94	149	96	191	99
23	96	113	118	66	155	77	246	91	125	93	161	118
24	80	130	104	67	132	75	155	88	96	87	141	94
25	94	116	99	96	448	74	137	89	273	88	126	88
26	182	163	94	72	228	72	243	90	174	109	115	97
27	299	e500	95	72	196	71	386	97	112	88	125	106
28	220	e300	92	89	140	71	280	89	139	89	113	97
29	267	158	88	86	---	70	658	85	227	124	106	104
30	774	130	85	193	---	78	353	100	297	483	105	99
31	392	---	82	86	---	102	---	92	---	263	98	---
TOTAL	4445	6461	7028	2507	9492	3112	8917	4387	6681	4045	5949	3729
MEAN	143	215	227	80.9	339	100	297	142	223	130	192	124
MAX	774	522	1570	193	2280	176	758	336	691	483	417	437
MIN	76	112	82	66	70	70	99	85	86	87	98	84
AC-FT	8820	12820	13940	4970	18830	6170	17690	8700	13250	8020	11800	7400

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2001, BY WATER YEAR (WY)

MEAN	204	281	251	208	197	153	243	166	166	188	155	202
MAX	304	599	459	388	392	342	370	418	251	247	199	523
(WY)	1995	1996	1993	1997	1994	1997	1997	1997	1994	2000	1995	1994
MIN	138	143	185	80.9	79.8	88.0	76.6	84.6	71.5	130	136	77.5
(WY)	1994	1993	1996	2001	2000	1993	1993	1995	1993	2001	1993	1993

16103000 HANALEI RIVER NEAR HANALEI--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1993 - 2001	
ANNUAL TOTAL	63212		66753			
ANNUAL MEAN	173		183		201	
HIGHEST ANNUAL MEAN					258	1997
LOWEST ANNUAL MEAN					152	1993
HIGHEST DAILY MEAN	1570	Dec 12	2280	Feb 9	7100	Nov 9 1995
LOWEST DAILY MEAN	58	Mar 13	66	Jan 22	54	Jul 8 1993
ANNUAL SEVEN-DAY MINIMUM	59	Mar 9	67	Jan 18	57	Jul 3 1993
ANNUAL RUNOFF (AC-FT)	125400		132400		145600	
10 PERCENT EXCEEDS	328		357		371	
50 PERCENT EXCEEDS	110		119		133	
90 PERCENT EXCEEDS	70		78		80	

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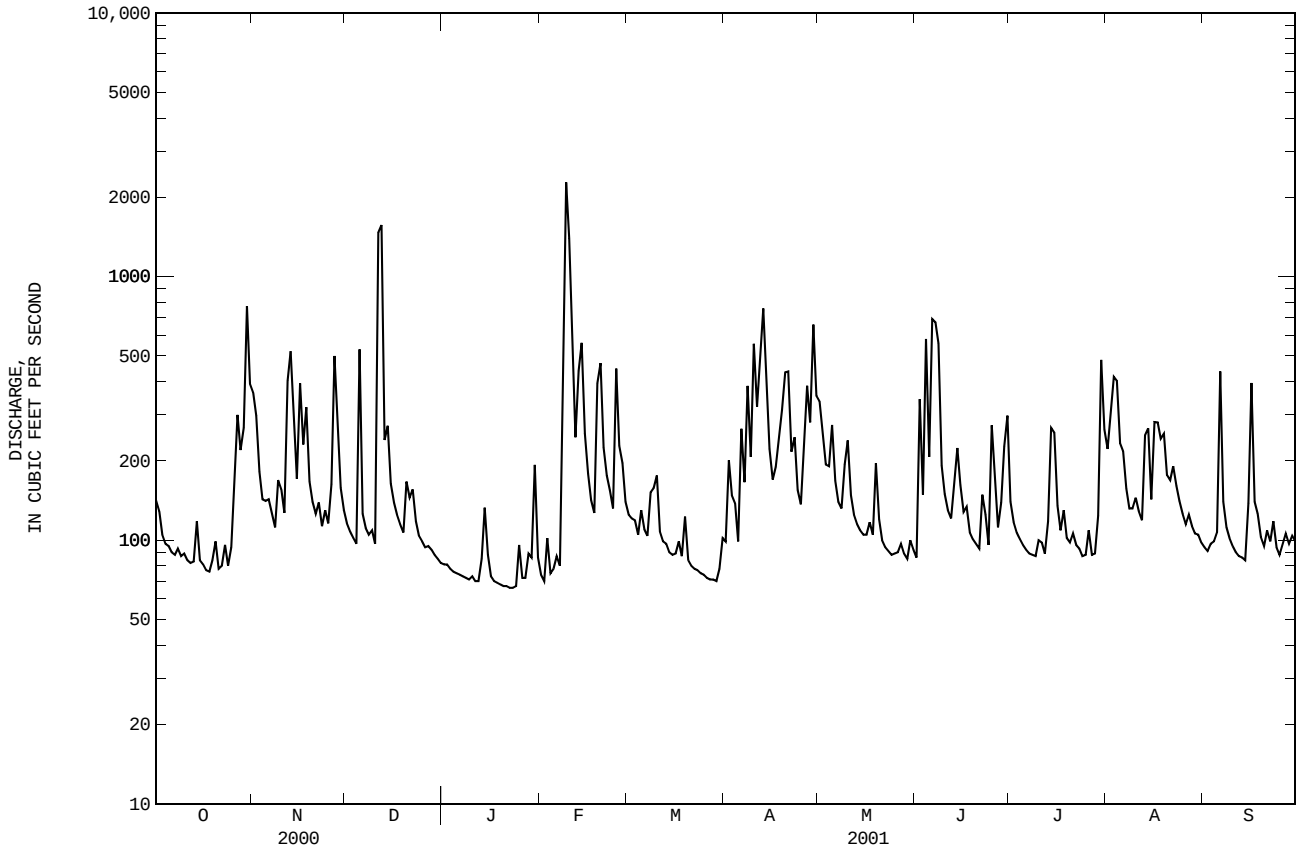


16108000 WAINIHA RIVER NEAR HANALEI

LOCATION.--Lat 22°08'20", long 159°33'38", Hydrologic Unit 20070000, on left bank at Puwainui Falls, 1.5 mi upstream from Wainiha power plant intake, and 6.0 mi southwest of Hanalei.

DRAINAGE AREA.--10.2 mi^2.

PERIOD OF RECORD.--August 1952 to February 1956, October 1957 to current year.

REVISED RECORDS.--WSP 770: 1932-33. WSP 1719: 1916. WSP 1937: 1918. WSP 2137: Drainage area. WDR HI-00-1: 1953-99 (P).

GAGE.--Water-stage recorder. Elevation of gage is 960 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--46 years (water years 1953-55, 1959-2001), 137 ft^3/s (99,350 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,200 ft^3/s, April 19, 1974, gage height, 9.47 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 7.72 ft; minimum, 31 ft^3/s, September 29, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 09	0630	*10,500	*7.10	No other peak greater than base discharge.			

Minimum discharge, 36 ft^3/s, March 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96	193	57	55	45	55	65	258	64	73	163	52
2	87	100	53	57	42	69	375	133	291	60	206	48
3	59	71	50	46	101	76	149	106	97	54	291	60
4	51	60	50	44	57	54	123	108	387	51	216	59
5	49	85	292	43	82	102	65	143	107	49	154	56
6	47	99	75	42	122	78	171	81	371	47	123	169
7	46	82	61	42	69	64	100	65	168	46	76	58
8	69	65	56	41	242	148	331	61	278	46	62	51
9	61	140	58	41	1740	139	172	119	77	46	80	55
10	73	87	50	44	907	154	559	133	63	69	109	48
11	56	74	148	42	341	63	216	78	57	70	82	46
12	50	351	561	41	150	55	503	62	61	59	72	45
13	53	292	122	61	489	61	587	56	134	93	188	46
14	100	141	131	85	656	51	234	53	137	168	124	45
15	53	86	67	53	182	52	120	54	92	168	70	48
16	50	170	62	43	119	64	83	63	73	72	141	244
17	49	148	55	41	72	77	143	88	88	65	126	76
18	45	199	52	40	64	54	191	60	57	100	188	100
19	58	83	50	40	296	129	278	99	51	67	180	60
20	80	65	113	39	196	56	335	65	51	66	97	52
21	52	60	92	39	91	49	254	54	49	78	94	79
22	61	81	108	39	103	45	161	51	127	62	145	58
23	78	57	71	40	90	42	150	49	87	54	101	93
24	52	86	58	40	65	e40	79	48	54	48	76	58
25	82	75	53	98	331	e39	67	55	168	50	64	51
26	161	141	50	56	116	e38	160	54	112	80	55	86
27	250	290	49	58	74	e37	224	78	63	52	53	90
28	120	241	48	78	60	e36	184	58	113	51	52	74
29	109	80	46	99	---	e36	615	51	170	126	55	69
30	412	63	45	139	---	e38	185	60	145	562	64	76
31	242	---	44	54	---	e44	---	56	---	232	53	---
TOTAL	2851	3765	2827	1680	6902	2045	6879	2499	3792	2864	3560	2152
MEAN	92.0	126	91.2	54.2	246	66.0	229	80.6	126	92.4	115	71.7
MAX	412	351	561	139	1740	154	615	258	387	562	291	244
MIN	45	57	44	39	42	36	65	48	49	46	52	45
AC-FT	5650	7470	5610	3330	13690	4060	13640	4960	7520	5680	7060	4270

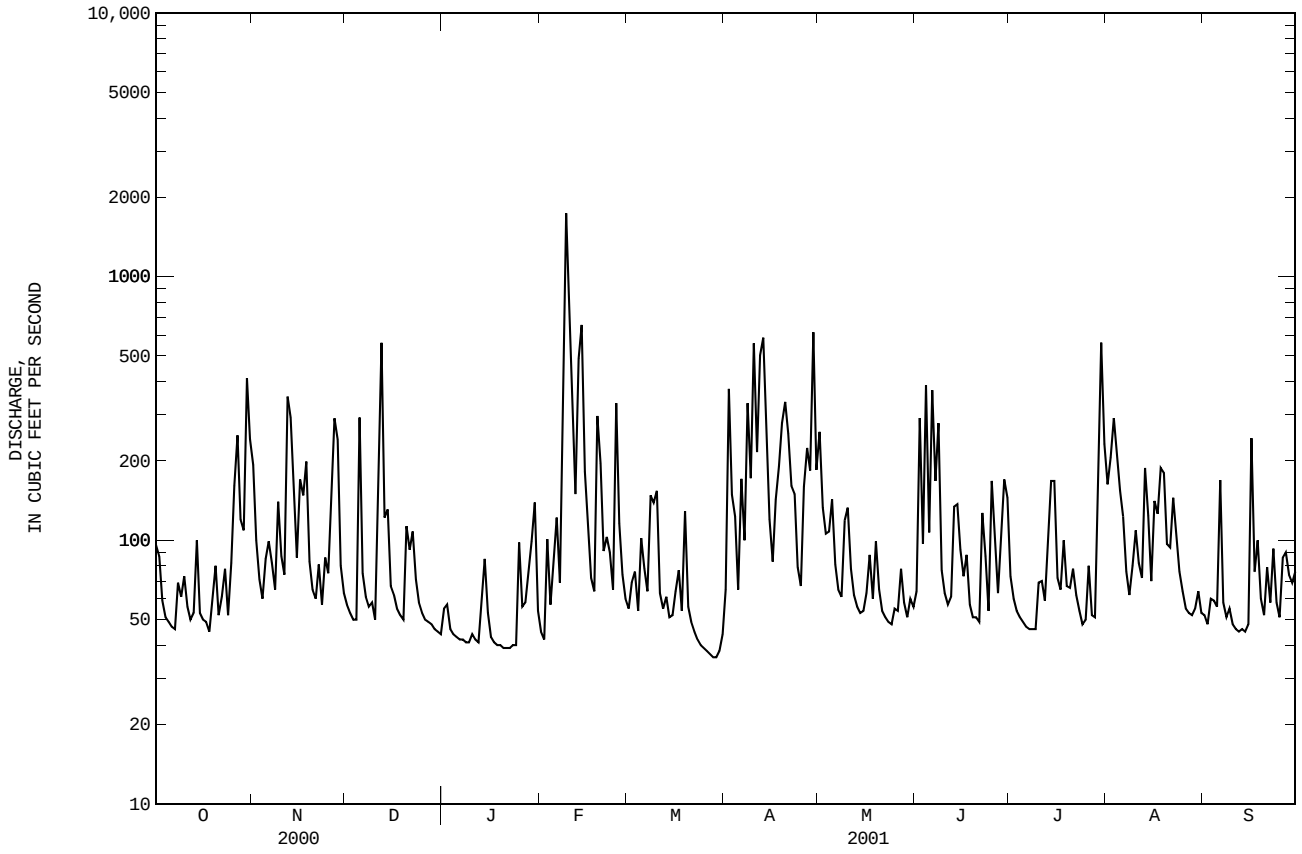
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	113	185	165	142	142	165	176	120	102	131	113	95.1
MAX	228	414	384	371	492	611	504	238	187	315	272	249
(WY)	1983	1991	1968	1989	1969	1982	1971	1967	1978	1989	1982	1994
MIN	42.8	72.7	54.1	44.6	36.5	52.2	52.8	51.9	53.1	50.4	54.6	42.3
(WY)	1985	1964	1984	1986	1978	1970	1992	1966	1993	1984	1965	1965

16108000 WAINIHA RIVER NEAR HANALEI--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	39918		41816			
ANNUAL MEAN	109		115		137	
HIGHEST ANNUAL MEAN					243	1982
LOWEST ANNUAL MEAN					84.8	1984
HIGHEST DAILY MEAN	1470	Apr 3	1740	Feb 9	3650	Nov 21 1974
LOWEST DAILY MEAN	42	Mar 12	36	Mar 28	31	Sep 29 1965
ANNUAL SEVEN-DAY MINIMUM	42	Mar 11	38	Mar 24	33	Sep 24 1965
ANNUAL RUNOFF (AC-FT)	79180		82940		99350	
10 PERCENT EXCEEDS	196		227		260	
50 PERCENT EXCEEDS	66		71		79	
90 PERCENT EXCEEDS	46		46		49	

e Estimated



16114000 LIMAHULI STREAM NEAR WAINIHA

LOCATION.--Lat 22°13'15", long 159°34'48", Hydrologic Unit 20070000, on left bank 0.2 mi upstream from intersection with Kuhio Highway, and entrance to Haena State Park.

DRAINAGE AREA.--1.36 mi^2.

PERIOD OF RECORD.--October 1994 to current year.

GAGE.--Water-stage recorders and natural control. Elevation of gage is 160 ft above mean sea level, by altimeter.

REMARKS.--Records computed by Clayton Yoshida. Records good. Limahuli Gardens diverts water through a 4-inch pipe, upstream of station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 985 ft^3/s, December 11, 2000, gage height, 5.24 ft; minimum, 3.5 ft^3/s, on several days.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec 11	1715	*985	*5.24	Feb 9	0930	918	5.10

Minimum discharge, 3.5 ft^3/s, June 19, 20, July 11, 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

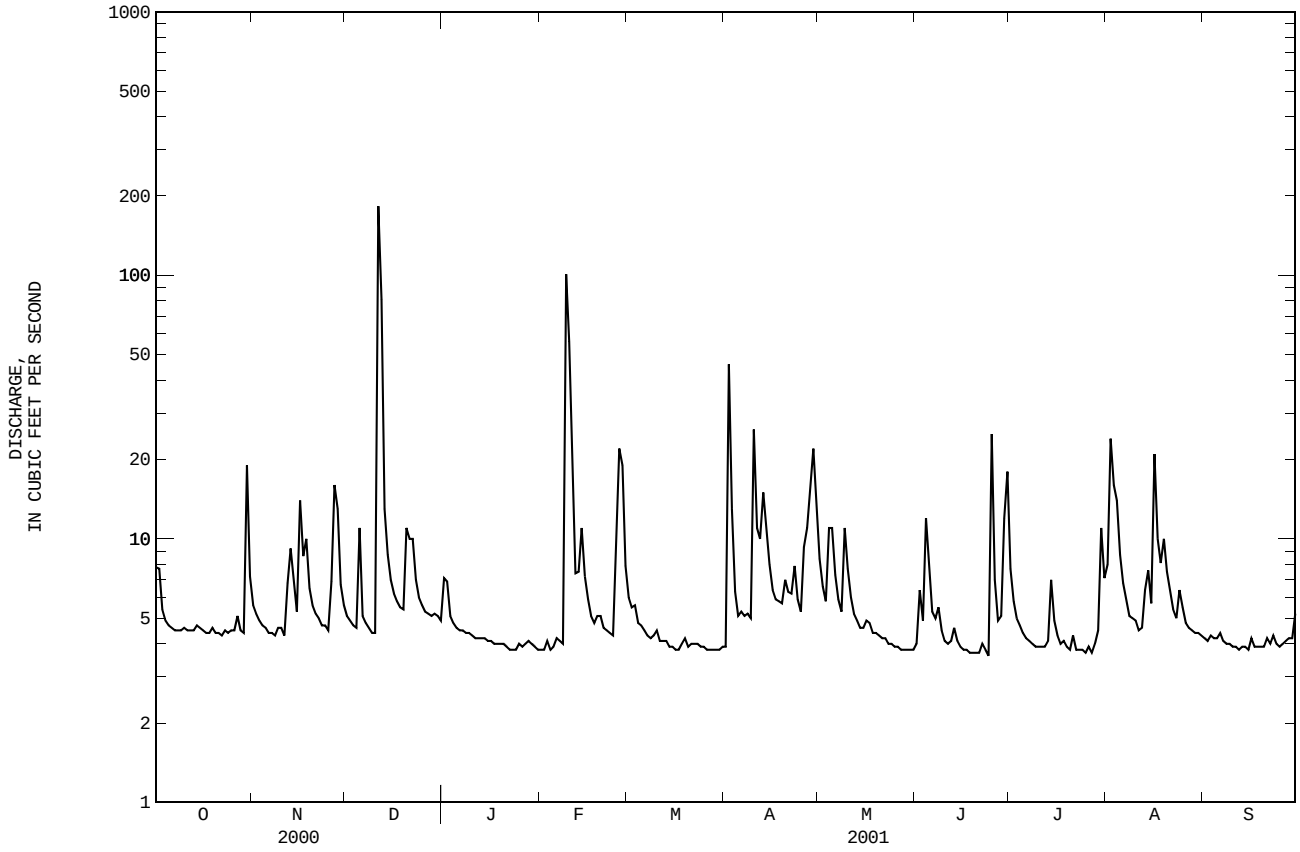
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	5.6	5.1	7.1	3.8	6.0	3.9	8.4	4.0	7.7	8.0	4.2
2	7.7	5.2	4.9	6.9	3.8	5.5	46	6.6	6.4	5.8	24	4.1
3	5.4	4.9	4.7	5.1	4.1	5.6	13	5.8	4.9	5.0	16	4.3
4	4.9	4.7	4.6	4.8	3.8	4.8	6.3	11	12	4.7	14	4.2
5	4.7	4.6	11	4.6	3.9	4.7	5.1	11	7.7	4.4	8.7	4.2
6	4.6	4.4	5.1	4.5	4.2	4.5	5.3	7.3	5.3	4.2	6.8	4.4
7	4.5	4.4	4.8	4.5	4.1	4.3	5.1	5.9	5.0	4.1	5.9	4.1
8	4.5	4.3	4.6	4.4	4.0	4.2	5.2	5.3	5.5	4.0	5.1	4.0
9	4.5	4.6	4.4	4.4	101	4.3	5.0	11	4.5	3.9	5.0	4.0
10	4.6	4.6	4.4	4.3	56	4.5	26	7.7	4.1	3.9	4.9	3.9
11	4.5	4.3	183	4.2	15	4.1	11	6.0	4.0	3.9	4.5	3.9
12	4.5	6.8	81	4.2	7.4	4.1	10	5.2	4.1	3.9	4.6	3.8
13	4.5	9.2	13	4.2	7.5	4.1	15	4.9	4.6	4.1	6.4	3.9
14	4.7	6.8	8.7	4.2	11	3.9	11	4.6	4.1	7.0	7.6	3.9
15	4.6	5.3	7.0	4.1	7.2	3.9	8.0	4.6	3.9	4.9	5.7	3.8
16	4.5	14	6.2	4.1	5.9	3.8	6.4	4.9	3.8	4.3	21	4.2
17	4.4	8.6	5.8	4.0	5.1	3.8	5.9	4.8	3.8	4.0	10	3.9
18	4.4	10	5.5	4.0	4.8	4.0	5.8	4.4	3.7	4.1	8.1	3.9
19	4.6	6.5	5.4	4.0	5.1	4.2	5.7	4.4	3.7	3.9	10	3.9
20	4.4	5.6	11	4.0	5.1	3.9	7.0	4.3	3.7	3.8	7.5	3.9
21	4.4	5.2	10	3.9	4.6	4.0	6.3	4.2	3.7	4.3	6.3	4.2
22	4.3	5.0	10	3.8	4.5	4.0	6.2	4.2	4.0	3.8	5.4	4.0
23	4.5	4.7	7.0	3.8	4.4	4.0	7.9	4.0	3.8	3.8	5.0	4.3
24	4.4	4.7	6.0	3.8	4.3	3.9	5.9	4.0	3.6	3.8	6.4	4.0
25	4.5	4.5	5.6	4.0	9.6	3.9	5.3	3.9	25	3.7	5.5	3.9
26	4.5	6.9	5.3	3.9	22	3.8	9.3	3.9	7.0	3.9	4.8	4.0
27	5.1	16	5.2	4.0	19	3.8	11	3.8	4.9	3.7	4.6	4.1
28	4.5	13	5.1	4.1	7.9	3.8	15	3.8	5.1	4.0	4.5	4.2
29	4.4	6.7	5.2	4.0	---	3.8	22	3.8	12	4.5	4.4	4.2
30	19	5.6	5.1	3.9	---	3.8	14	3.8	18	11	4.4	5.2
31	7.2	---	4.9	3.8	---	3.9	---	3.8	---	7.1	4.3	---
TOTAL	165.1	196.7	449.6	134.6	339.1	130.9	309.6	171.3	185.9	145.2	239.4	122.6
MEAN	5.33	6.56	14.5	4.34	12.1	4.22	10.3	5.53	6.20	4.68	7.72	4.09
MAX	19	16	183	7.1	101	6.0	46	11	25	11	24	5.2
MIN	4.3	4.3	4.4	3.8	3.8	3.8	3.9	3.8	3.6	3.7	4.3	3.8
AC-FT	327	390	892	267	673	260	614	340	369	288	475	243

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2001, BY WATER YEAR (WY)

MEAN	7.20	9.09	11.8	10.4	8.58	7.97	14.3	9.88	7.63	7.99	7.51	6.81
MAX	9.62	12.5	14.5	23.8	12.1	15.7	32.6	22.4	12.2	9.28	9.84	9.32
(WY)	1996	1996	2001	1997	2001	1997	1997	1997	1996	1998	1995	1996
MIN	5.33	6.26	7.43	4.34	4.64	4.22	8.67	4.69	5.04	4.68	5.96	4.09
(WY)	2001	2000	1995	2001	2000	2001	1999	2000	2000	2001	1996	2001

16114000 LIMAHULI STREAM NEAR WAINIHA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1995 - 2001	
ANNUAL TOTAL	2837.9		2590.0			
ANNUAL MEAN	7.75		7.10		9.10	
HIGHEST ANNUAL MEAN					13.5	1997
LOWEST ANNUAL MEAN					7.10	2001
HIGHEST DAILY MEAN	183	Dec 11	183	Dec 11	238	Jan 4 1997
LOWEST DAILY MEAN	4.3	Mar 1	3.6	Jun 24	3.6	Jun 24 2001
ANNUAL SEVEN-DAY MINIMUM	4.3	Mar 1	3.7	Jun 18	3.7	Jun 18 2001
ANNUAL RUNOFF (AC-FT)	5630		5140		6590	
10 PERCENT EXCEEDS	9.7		11		13	
50 PERCENT EXCEEDS	5.0		4.6		6.5	
90 PERCENT EXCEEDS	4.4		3.9		4.5	



Surface-Water Station Records for Oahu

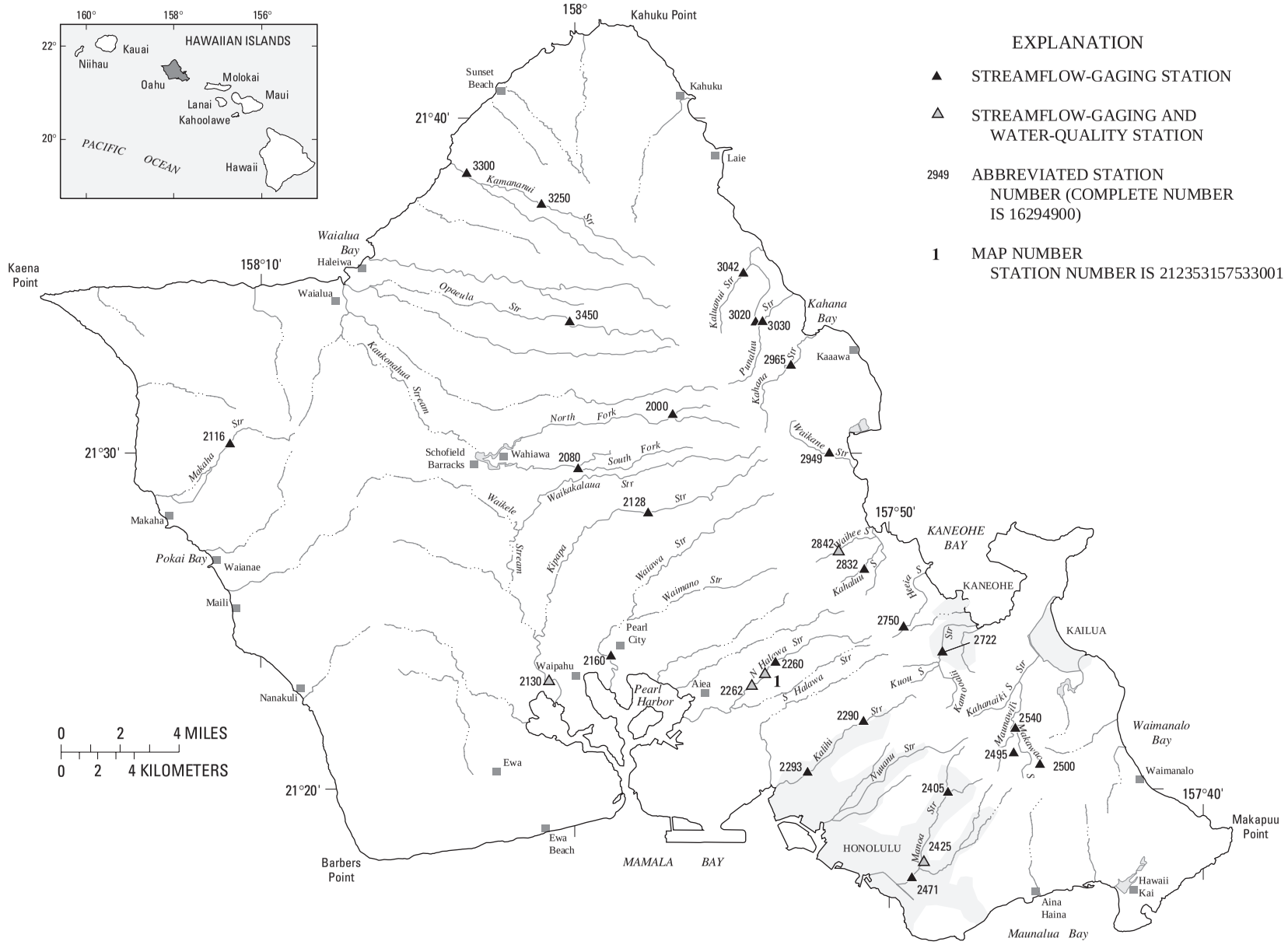


Figure 6. Locations of streamflow-gaging stations on Oahu.

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

LOCATION.--Lat 21°31'09", long 157°56'53", Hydrologic Unit 20060000, on left bank 140 ft upstream from mauka ditch intake and Right Branch, and 4.5 mi northeast of Wahiawa.

DRAINAGE AREA.--1.38 mi^2.

PERIOD OF RECORD.--May 1913 to July 1953, April 1960 to current year. Monthly discharge only for some periods, published in WSP 1319. Prior to August 1953, published as Left Branch of North Fork Kaukonahua Stream near Wahiawa.

REVISED RECORDS.--WSP 1219: 1931-33(M), 1935(M), 1937-38(M). WSP 1319: 1914, 1917-18(M), 1920-23(M), 1925(M), 1927-30(M). WSP 1719: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,150 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records good except for discharges above 200 ft^3/s, which are poor.

AVERAGE DISCHARGE.--78 years (water years 1914-24, 1927-52, 1961-2001), 16.2 ft^3/s (11,730 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft^3/s, October 28, 1981, gage height, 13.2 ft, from rating curve extended above 110 ft^3/s on basis of slope-area measurement at gage height 12.46 ft; minimum, 0.12 ft^3/s, March 2, 13, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0200	*2,200	*7.90	Feb 9	0130	2,180	7.86

Minimum discharge, 0.76 ft^3/s, Feb. 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

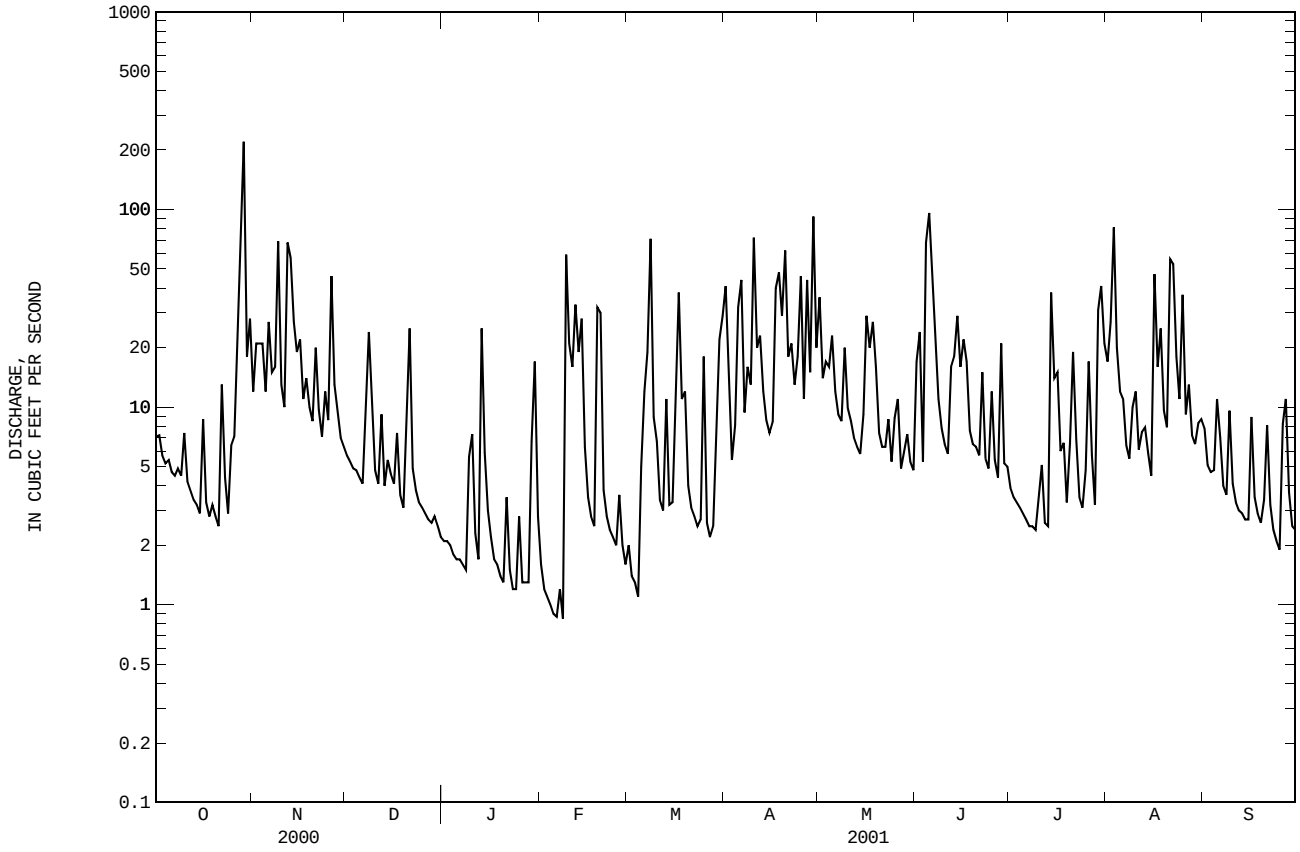
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	12	5.7	2.1	1.6	2.0	41	36	17	3.9	17	7.8
2	7.2	21	5.3	2.1	1.2	1.4	16	14	24	3.5	27	5.1
3	5.7	21	4.9	2.0	1.1	1.3	5.4	17	5.3	3.3	81	4.7
4	5.2	21	4.8	1.8	1.0	1.1	8.1	16	68	3.1	20	4.8
5	5.4	12	4.4	1.7	.90	5.0	32	23	96	2.9	12	11
6	4.7	27	4.1	1.7	.87	12	44	12	40	2.7	11	7.0
7	4.5	15	12	1.6	1.2	19	9.4	9.2	20	2.5	6.4	4.0
8	4.9	16	24	1.5	.85	71	16	8.5	11	2.5	5.5	3.6
9	4.5	69	11	5.6	59	8.9	13	20	7.8	2.4	10	9.6
10	7.4	13	4.8	7.3	21	6.7	72	9.9	6.5	3.5	12	4.1
11	4.2	10	4.1	2.3	16	3.4	20	8.5	5.8	5.1	6.1	3.3
12	3.8	68	9.2	1.7	33	3.0	23	7.0	16	2.6	7.5	3.0
13	3.4	57	4.0	25	19	11	12	6.3	18	2.5	7.9	2.9
14	3.2	27	5.4	5.9	28	3.2	8.6	5.8	29	38	5.8	2.7
15	2.9	19	4.6	3.0	6.3	3.3	7.4	9.2	16	14	4.5	2.7
16	8.7	22	4.1	2.2	3.5	11	8.4	29	22	15	47	8.9
17	3.3	11	7.4	1.7	2.8	38	40	20	17	6.0	16	3.5
18	2.8	14	3.6	1.6	2.5	11	48	27	7.6	6.6	25	2.9
19	3.2	10	3.1	1.4	32	12	29	16	6.5	3.3	9.6	2.6
20	2.8	8.5	10	1.3	30	4.0	62	7.4	6.3	6.6	7.9	3.4
21	2.5	20	25	3.5	3.8	3.1	18	6.3	5.7	19	56	8.1
22	13	9.7	4.9	1.5	2.8	2.8	21	6.3	15	6.9	53	3.2
23	4.4	7.1	3.8	1.2	2.4	2.5	13	8.7	5.5	3.5	18	2.4
24	2.9	12	3.3	1.2	2.2	2.7	18	5.3	4.9	3.1	11	2.1
25	6.4	8.6	3.1	2.8	2.0	18	46	8.8	12	4.8	37	1.9
26	7.1	46	2.9	1.3	3.6	2.6	11	11	5.4	17	9.2	8.2
27	20	13	2.7	1.3	2.0	2.2	44	4.9	4.4	5.7	13	11
28	84	9.3	2.6	1.3	1.6	2.5	15	5.9	21	3.2	7.2	3.7
29	220	7.0	2.8	6.7	---	7.5	92	7.3	5.2	31	6.5	2.5
30	18	6.3	2.5	17	---	22	20	5.3	5.0	41	8.3	2.4
31	28	---	2.2	2.8	---	29	---	4.8	---	21	8.7	---
TOTAL	501.2	612.5	192.3	114.1	282.22	323.2	813.3	376.4	523.9	286.2	567.1	143.1
MEAN	16.2	20.4	6.20	3.68	10.1	10.4	27.1	12.1	17.5	9.23	18.3	4.77
MAX	220	69	25	25	59	71	92	36	96	41	81	11
MIN	2.5	6.3	2.2	1.2	.85	1.1	5.4	4.8	4.4	2.4	4.5	1.9
AC-FT	994	1210	381	226	560	641	1610	747	1040	568	1120	284

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2001, BY WATER YEAR (WY)

MEAN	13.2	17.5	15.1	14.5	12.5	18.6	19.8	15.9	13.4	18.4	18.1	15.1
MAX	32.7	76.5	48.9	126	117	74.4	58.6	53.3	31.3	48.0	50.1	79.1
(WY)	1942	1966	1988	1921	1932	1982	1963	1927	1963	1930	1931	1914
MIN	2.21	1.31	1.57	.36	.40	.28	1.38	.67	2.63	4.22	1.81	1.95
(WY)	1985	1934	1990	1986	1986	1983	1966	1992	1951	1951	1971	1975

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1913 - 2001	
ANNUAL TOTAL	5336.82		4735.52			
ANNUAL MEAN	14.6		13.0		16.2	
HIGHEST ANNUAL MEAN					29.5	1932
LOWEST ANNUAL MEAN					9.11	1984
HIGHEST DAILY MEAN	298	Jan 19	220	Oct 29	975	Feb 27 1935
LOWEST DAILY MEAN	.46	Mar 17	.85	Feb 8	.12	Mar 13 1941
ANNUAL SEVEN-DAY MINIMUM	.53	Mar 12	1.0	Feb 2	.13	Mar 5 1986
ANNUAL RUNOFF (AC-FT)	10590		9390		11730	
10 PERCENT EXCEEDS	35		29		36	
50 PERCENT EXCEEDS	6.4		6.7		7.1	
90 PERCENT EXCEEDS	1.7		2.2		1.6	



16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA

LOCATION.--Lat 21°29'32", long 157°59'54", Hydrologic Unit 20060000, on right bank on upstream side of dam at East Pump Reservoir, 2.3 mi east of Wahiawa Post Office, and 7.1 mi north of Waipahu.

DRAINAGE AREA.--4.04 mi^2.

PERIOD OF RECORD.--July 1957 to June 1963, water years 1963-64 (annual maximum), July 1964 to current year.

GAGE.--Water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level (from U.S. Coast and Geodetic Survey triangulation station).

REMARKS.--Records computed by S.T.M. Young. Records good except for periods of no gage height record which are poor. Prior to 1960, water was diverted from reservoirs upstream of station for use at Schofield Barracks.

AVERAGE DISCHARGE.--39 years (water years 1961-62, 1965-2001), 21.1 ft^3/s (15,280 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft^3/s, April 15, 1963, gage height, 11.33 ft, from rating curve extended above 1,100 ft^3/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 13	0015	*735	*4.30				

Minimum discharge, 0.33 ft^3/s, Feb. 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e8.5	e18	e8.3	e2.3	1.4	2.1	21	20	4.8	4.7	27	e9.0
2	e7.5	e23	e7.8	e2.3	.73	2.7	5.1	18	18	3.8	12	e7.0
3	e5.0	e23	e7.6	e2.2	.59	1.8	5.0	43	7.6	3.4	70	e5.2
4	e5.0	e23	e7.0	e1.8	.59	1.5	3.2	45	84	3.1	60	e5.3
5	e5.5	e17	e6.2	e1.6	.52	4.5	15	38	220	2.9	13	e13
6	e5.0	e30	e6.0	e1.4	.45	7.8	41	24	55	2.6	19	e9.0
7	e4.8	e18	e19	e1.3	.42	6.2	15	14	22	2.4	9.7	e4.2
8	e5.0	e20	e27	e1.2	.37	23	8.7	12	15	2.3	7.2	e6.0
9	e4.9	e102	e17	e9.2	47	19	7.4	19	11	2.2	6.6	e12
10	e8.0	e18	e6.2	e12	12	15	82	18	9.6	2.6	6.4	e6.8
11	e5.0	e14	e5.9	e3.9	13	5.4	21	14	8.5	6.0	6.8	e4.0
12	e4.3	e80	e10	e2.9	49	3.4	22	12	8.4	4.4	6.9	e3.5
13	e3.8	e60	e5.8	e38	94	9.2	16	9.0	11	6.6	6.9	e3.2
14	e3.5	e30	e8.0	e9.6	77	6.1	12	8.0	13	23	e9.5	e3.0
15	e3.3	e25	e6.2	e5.0	18	3.6	12	16	20	7.5	e7.4	e3.0
16	e10	e28	e5.5	e3.7	7.8	3.0	12	25	9.1	7.2	e70	e10
17	e4.5	e15	e8.1	1.7	4.8	17	18	36	12	7.7	e25	e3.8
18	e3.2	e20	e5.2	1.3	3.6	22	34	25	9.5	10	e38	e3.5
19	e3.4	e16	e4.3	1.1	3.6	13	21	20	7.2	6.9	e13	e3.2
20	e3.2	e12	e16	1.0	21	7.0	46	10	6.8	17	e11	e5.0
21	e3.1	e22	e38	1.0	4.6	3.7	38	8.7	6.5	20	e60	e9.0
22	e15	e16	e8.0	1.1	3.0	2.9	12	7.8	22	9.0	e57	e5.3
23	e7.3	e9.5	e5.0	1.1	2.3	2.5	12	9.6	8.7	5.2	e28	e3.0
24	e4.0	e14	e4.0	1.4	1.9	2.4	26	7.4	5.7	4.3	e15	e2.4
25	e10	e12	e3.5	2.1	1.7	48	70	6.9	12	3.9	e40	e2.2
26	e11	e69	e3.2	1.6	1.8	5.4	16	12	8.7	17	e13	e11
27	e31	e21	e3.0	2.2	2.5	3.2	47	6.5	5.0	9.7	e18	e13
28	e123	e15	e2.7	2.7	1.9	2.6	35	6.2	15	5.4	e14	e6.1
29	e310	e11	e3.0	2.7	---	2.4	68	8.7	8.6	4.1	e7.0	e3.0
30	e25	e9.0	e2.7	4.8	---	2.9	23	6.1	4.6	29	e9.0	e2.8
31	e33	---	e2.5	3.7	---	20	---	6.3	---	38	e10	---
TOTAL	675.8	790.5	262.7	127.9	375.57	269.3	764.4	512.2	649.3	271.9	696.4	177.5
MEAN	21.8	26.4	8.47	4.13	13.4	8.69	25.5	16.5	21.6	8.77	22.5	5.92
MAX	310	102	38	38	94	48	82	45	220	38	70	13
MIN	3.1	9.0	2.5	1.0	.37	1.5	3.2	6.1	4.6	2.2	6.4	2.2
AC-FT	1340	1570	521	254	745	534	1520	1020	1290	539	1380	352

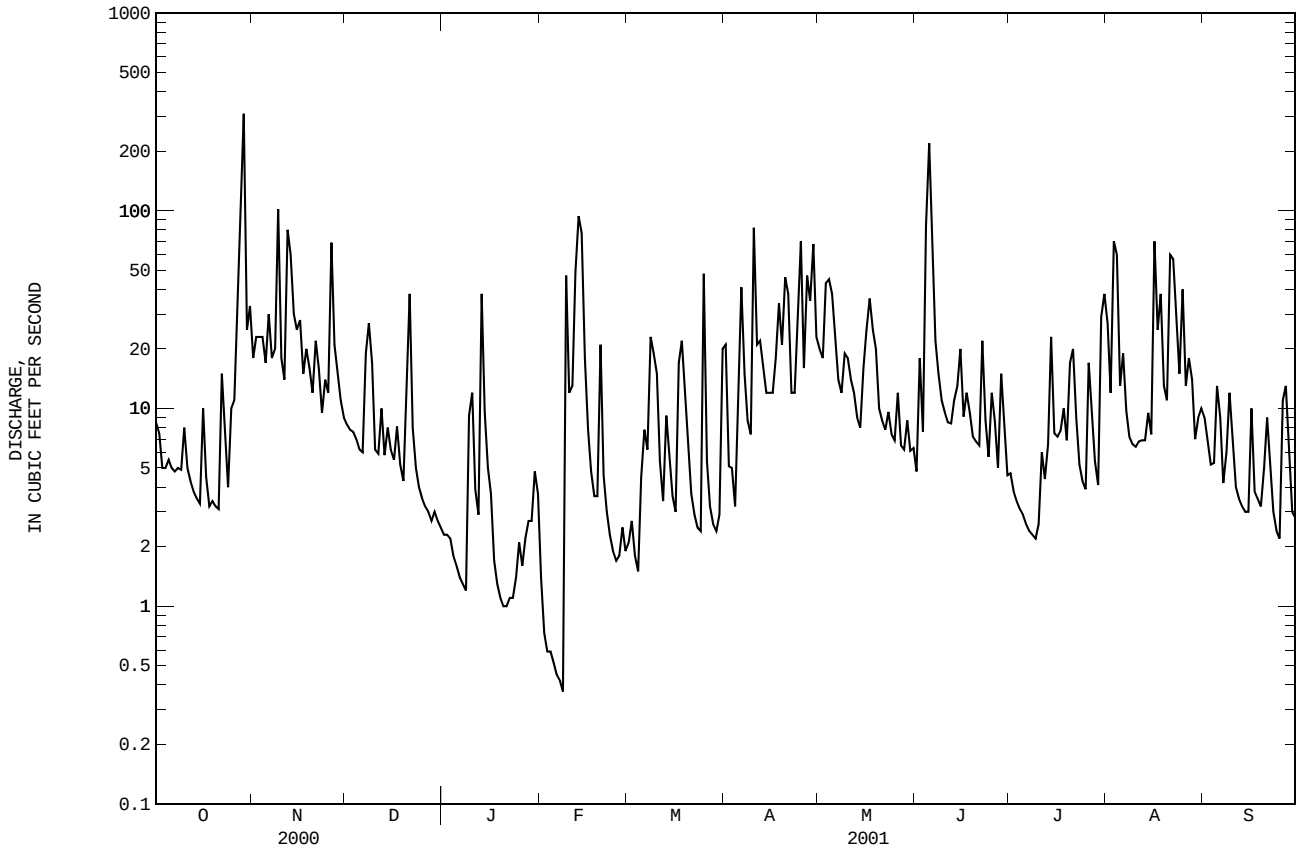
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2001, BY WATER YEAR (WY)

MEAN	17.1	27.7	22.2	19.9	16.3	25.6	29.9	20.1	17.1	25.8	18.4	14.6
MAX	38.0	107	61.7	55.2	99.7	104	90.1	64.9	46.2	60.9	53.7	35.7
(WY)	1967	1966	1988	1989	1969	1980	1963	1963	1987	1989	1967	1990
MIN	.32	3.54	2.07	.38	.11	.66	2.45	.51	3.40	4.25	3.04	1.43
(WY)	1985	1963	1990	1986	1986	1983	1992	1992	1968	1968	1971	1975

16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1961 - 2001	
ANNUAL TOTAL	6437.8		5573.47			
ANNUAL MEAN	17.6		15.3		21.1	
HIGHEST ANNUAL MEAN					37.2	1982
LOWEST ANNUAL MEAN					11.1	1984
HIGHEST DAILY MEAN	360	Jan 20	310	Oct 29	1050	Feb 1 1969
LOWEST DAILY MEAN	1.1	Mar 16	.37	Feb 8	.00	Dec 24 1960
ANNUAL SEVEN-DAY MINIMUM	1.2	Mar 12	.52	Feb 2	.00	Jan 19 1977
ANNUAL RUNOFF (AC-FT)	12770		11050		15280	
10 PERCENT EXCEEDS	34		34		48	
50 PERCENT EXCEEDS	7.8		8.0		9.0	
90 PERCENT EXCEEDS	2.0		2.3		1.8	

e Estimated



16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'16", long 158°10'59", Hydrologic Unit 20060000, on right bank, 1.5 mi northeast of Kaneaki Heiau, and 3.4 mi northeast of Makaha.

DRAINAGE AREA.--2.31 mi^2.

PERIOD OF RECORD.--July 1959 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete-masonry control. Datum of gage is 938.64 ft above mean sea level (Waianae Plantation benchmark).

REMARKS.--Records computed by Vaughn Kunishige. Records poor, except for days of no flow which are fair. Honolulu Board of Water Supply wells upstream of station may influence flows at gage. Recording rain gage located at station.

AVERAGE DISCHARGE.--42 years (water years 1960-2001), 1.75 ft^3/s (1,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,680 ft^3/s, November 14, 1996, gage height, 9.54 ft, from high-water profile of slope-area measurement; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar 31	2000	*20	*1.69				

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	1.6	.50	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.95	.46	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.79	.32	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.69	.26	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.60	.25	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.56	.23	.00	.00	.00	.00
7	.00	.00	.00	e.00	.00	.00	.66	.21	.00	.00	.00	.00
8	.00	.00	.00	e.02	.00	.00	.67	.28	.00	.00	.00	.00
9	.00	e.01	.00	e.03	.00	.00	.60	.31	.00	.00	.00	.00
10	.00	e.19	.00	e.00	.00	.00	1.0	.26	e.03	.00	.00	.00
11	.00	e.11	e.11	.00	.00	.00	.84	.22	.22	.00	.00	.00
12	.00	e.00	e.75	.00	.00	.00	.73	.20	.20	.00	.00	.00
13	.00	.00	e.28	.00	.00	.00	.67	e.09	e.06	.00	.00	.00
14	.00	.00	.53	.00	.00	.00	.56	.00	e.00	.00	.00	.00
15	.00	.00	.76	.00	.00	.00	.47	.00	.00	.00	.00	.00
16	.00	.00	e.58	.00	.00	.00	.30	.00	.00	.00	.00	.00
17	.00	.00	e.23	.00	.00	.00	.23	.00	.00	.00	.00	.00
18	.00	.00	e.09	.00	.00	.00	.20	.00	.00	.00	.00	.00
19	.00	.00	e.00	.00	.00	.00	.20	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	e.10	e.17	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	e.02	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	e.06	.00	.00	.00	e.14	.00	.00	.00	.00	.00
26	.00	.00	.25	.00	.00	.00	.24	.00	.00	.00	.00	.00
27	.00	.00	.22	.00	.00	e.09	.47	.00	.00	.00	.00	.00
28	.00	.00	e.06	.00	.00	.32	.47	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.32	.43	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.32	.46	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	2.4	---	.00	---	.00	.00	---
TOTAL	0.00	0.31	3.92	0.05	0.00	3.55	14.72	3.59	0.51	0.00	0.00	0.00
MEAN	.000	.010	.13	.002	.000	.11	.49	.12	.017	.000	.000	.000
MAX	.00	.19	.76	.03	.00	2.4	1.6	.50	.22	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.6	7.8	.1	.00	7.0	29	7.1	1.0	.00	.00	.00

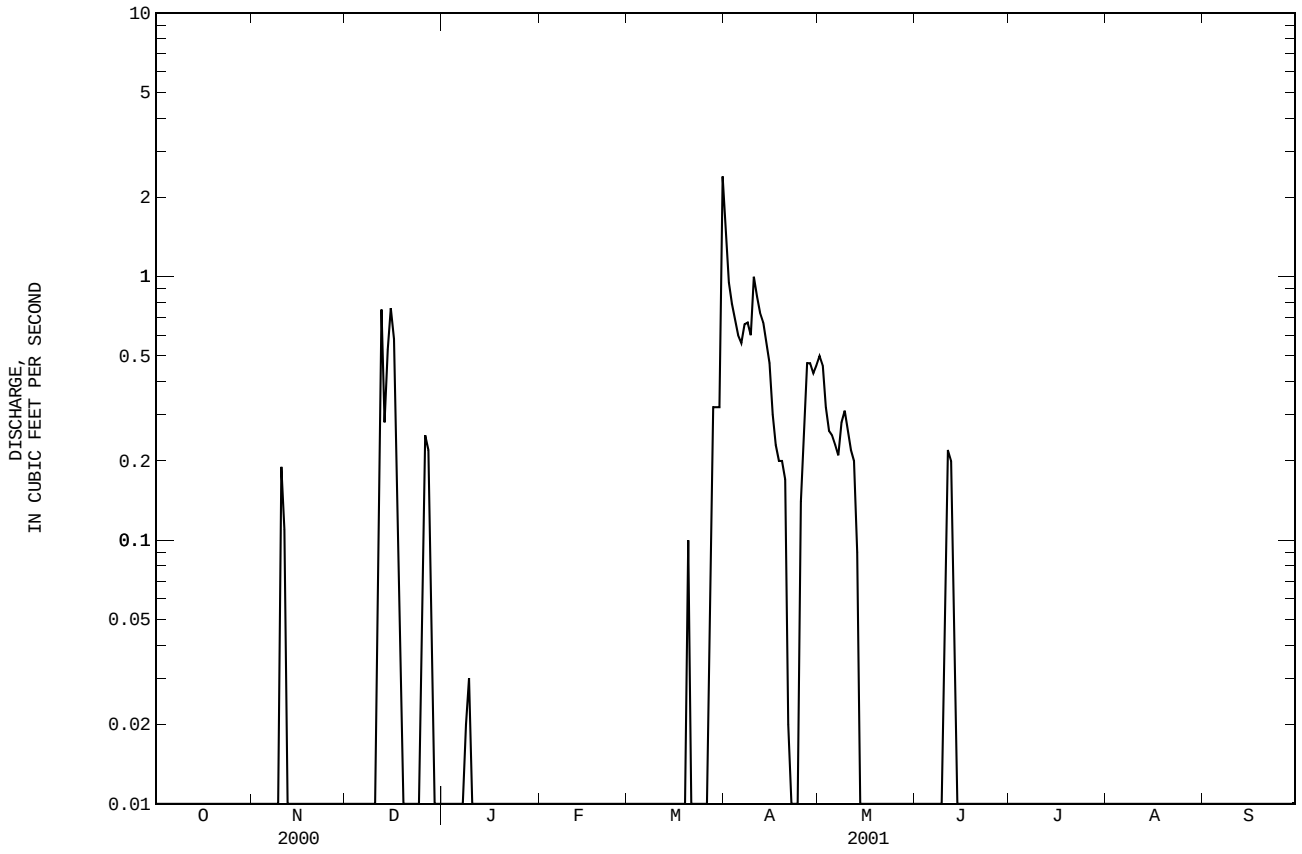
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2001, BY WATER YEAR (WY)

MEAN	.69	1.88	2.78	4.05	3.11	2.96	2.49	1.38	.58	.46	.34	.35
MAX	3.66	20.6	15.0	22.7	16.3	11.5	15.7	5.33	1.72	1.31	1.44	2.19
(WY)	1983	1997	1965	1982	1976	1962	1963	1965	1978	1986	1983	1974
MIN	.000	.000	.038	.002	.000	.11	.13	.085	.000	.000	.000	.000
(WY)	1976	1995	1995	2001	2001	2001	1993	2000	2000	2000	1995	1961

16211600 MAKAHA STREAM NEAR MAKAHA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1959 - 2001	
ANNUAL TOTAL	150.17		26.65			
ANNUAL MEAN	.41		.073		1.75	
HIGHEST ANNUAL MEAN					4.58	1997
LOWEST ANNUAL MEAN					.073	2001
HIGHEST DAILY MEAN	22	Apr 2	2.4	Mar 31	283	Feb 7 1976
LOWEST DAILY MEAN	.00	Feb 25	.00	Oct 1	.00	Sep 25 1960
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 25	.00	Oct 1	.00	Aug 28 1961
ANNUAL RUNOFF (AC-FT)	298		53		1270	
10 PERCENT EXCEEDS	.67		.25		3.3	
50 PERCENT EXCEEDS	.00		.00		.51	
90 PERCENT EXCEEDS	.00		.00		.01	

e Estimated



16212800 KIPAPA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°28'13", long 157°57'40", Hydrologic Unit 20060000, on left bank 1,700 ft downstream from forest-reserve boundary, 4.9 mi southeast of Wahiawa Post Office, and 6.3 mi northeast of Waipahu.

DRAINAGE AREA.--4.29 mi^2.

PERIOD OF RECORD.--January 1957 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 690 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Vaughn Kunishige. Records fair except for estimated period which is poor. At times, a small amount of water is diverted from the gage pool for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--44 years (water years 1958-2001), 10.6 ft^3/s (7,660 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,370 ft^3/s, March 21, 1991, gage height, 12.67 ft, from rating curve extended above 5,680 ft^3/s on basis of the shape of the rating; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	unknown	*2,290	*9.26	Feb 12	unknown	1130	7.33

Minimum discharge, 0.04 ft^3/s, Jan. 23, 24, 27, 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2.3	e11	e1.4	e.53	.18	e1.2	e58	10	.97	1.1	8.1	4.1
2	e1.3	e13	e1.1	e.55	e.20	e1.2	e6.0	7.1	1.1	.79	3.9	1.6
3	e1.0	e10	e1.1	e.52	e.20	e1.3	e3.3	5.3	1.1	.58	29	1.1
4	e.80	e9.0	e1.2	e.49	e.20	e1.3	e2.0	9.0	19	.48	23	1.0
5	e.80	e12	e1.2	e.46	e.20	e1.4	e1.7	10	62	e.41	4.4	1.0
6	e.70	e6.2	e1.0	e.43	e.20	e1.4	e26	12	16	e.33	4.4	.99
7	e.70	e9.2	e.94	e.40	e.20	e1.5	e10	4.3	6.4	.27	2.2	.77
8	e.74	e5.5	e.88	e.37	e.20	e1.6	e6.2	3.5	3.8	.25	1.5	.58
9	e.70	e6.8	e.83	e.34	e.22	e1.7	e7.0	3.2	2.1	e.26	1.3	.52
10	e.74	e9.5	e.79	.34	e.24	e1.3	e37	2.9	1.6	.29	1.3	1.1
11	e.70	e5.2	e.75	1.6	e.26	e1.0	e18	3.7	1.4	.47	1.4	.61
12	e.66	e15	e.70	.91	e46	e.95	e19	3.8	1.5	.49	1.2	.47
13	e.62	e20	e.75	7.0	e36	e.90	e11	2.1	1.9	.37	1.1	.39
14	e.58	e15	e.75	5.7	e50	e.85	e5.5	1.8	1.5	9.7	1.1	.34
15	e.52	e7.0	e.70	.99	e19	e.80	e3.8	1.7	11	2.5	.91	.32
16	e.54	e6.6	e.63	.46	e6.0	e.90	e5.0	2.0	2.7	2.8	9.4	13
17	e.52	e4.1	e.57	.32	e2.2	e14	e6.2	3.3	6.7	1.7	11	3.6
18	e.54	e4.3	e.52	.22	e1.4	e10	e12	13	3.8	1.5	14	1.3
19	e.52	e4.4	e.48	.15	e1.1	e6.5	e10	8.0	e1.4	1.2	4.3	.90
20	e.50	e4.2	e.45	.11	e.98	e3.3	e65	2.5	e1.1	.84	1.9	.55
21	e.50	e2.6	e4.3	.12	e.90	e1.4	e42	1.7	e.77	1.0	4.2	.59
22	e.48	e12	e4.8	.12	e.90	e1.1	e10	1.5	e1.7	1.8	12	1.1
23	e.52	e3.5	e1.7	.07	e1.0	e1.0	e8.2	4.8	2.1	1.0	19	.77
24	e.60	e2.2	e1.0	.09	e1.0	e30	e6.5	2.1	.95	.52	3.1	.48
25	e.74	e1.7	e.87	.27	e1.1	e58	e100	1.5	5.8	.35	22	.37
26	e.80	e12	e.81	.19	e2.5	e4.0	e14	3.2	4.1	6.3	4.7	.43
27	1.9	e6.5	e.75	.06	e1.5	e1.7	e10	1.6	1.2	2.2	17	4.2
28	e5.0	e4.8	e.70	.08	e1.2	e1.2	13	1.2	8.0	.78	2.9	1.7
29	e145	e2.5	e.65	.14	---	e1.1	49	2.4	2.1	.49	1.7	1.1
30	e20	e1.7	e.61	.31	---	e1.1	15	1.8	1.0	15	5.2	.61
31	e16	---	e.57	.25	---	e41	---	1.4	---	14	2.2	---
TOTAL	207.02	227.5	33.50	23.59	175.08	194.70	580.4	132.4	174.79	69.77	219.41	45.59
MEAN	6.68	7.58	1.08	.76	6.25	6.28	19.3	4.27	5.83	2.25	7.08	1.52
MAX	145	20	4.8	7.0	50	58	100	13	62	15	29	13
MIN	.48	1.7	.45	.06	.18	.80	1.7	1.2	.77	.25	.91	.32
AC-FT	411	451	66	47	347	386	1150	263	347	138	435	90

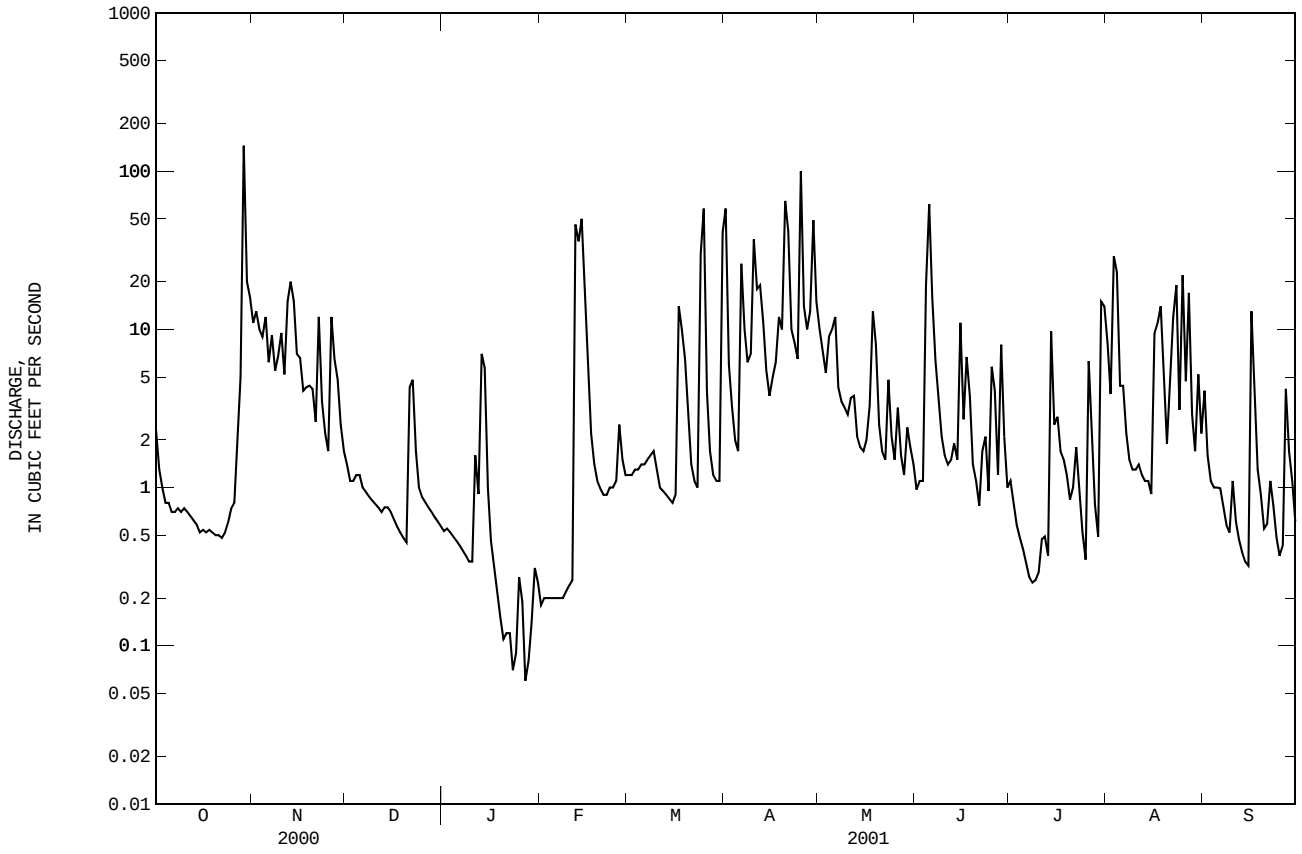
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2001, BY WATER YEAR (WY)

MEAN	9.67	14.7	12.5	11.1	9.70	15.5	14.9	8.76	5.69	9.76	8.12	5.91
MAX	49.6	61.8	42.2	32.1	54.4	98.4	60.9	34.0	21.9	28.1	37.5	23.6
(WY)	1982	1966	1988	1989	1969	1991	1963	1965	1978	1989	1958	1994
MIN	.84	.23	.83	.17	.19	.021	.33	.39	.16	.47	.30	.49
(WY)	1958	1963	1990	1977	1978	1983	1966	1992	1959	1968	1971	1998

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1957 - 2001	
ANNUAL TOTAL	2337.53		2083.75			
ANNUAL MEAN	6.39		5.71		10.6	
HIGHEST ANNUAL MEAN					25.2	1982
LOWEST ANNUAL MEAN					3.85	1998
HIGHEST DAILY MEAN	146	Jan 19	145	Oct 29	852	Apr 15 1963
LOWEST DAILY MEAN	.00	Jun 6	.06	Jan 27	.00	Jun 18 1959
ANNUAL SEVEN-DAY MINIMUM	.22	May 31	.13	Jan 18	.00	Jun 18 1959
ANNUAL RUNOFF (AC-FT)	4640		4130		7660	
10 PERCENT EXCEEDS	14		13		24	
50 PERCENT EXCEEDS	1.7		1.4		2.8	
90 PERCENT EXCEEDS	.48		.36		.36	

e Estimated



16213000 WAIKELE STREAM AT WAIPAHU

LOCATION.--Lat 21°23'11", long 158°00'49", Hydrologic Unit 20060000, on left bank 300 ft upstream from bridge on Highway 90, and 0.3 mi southwest of former sugar refinery at Waipahu.

DRAINAGE AREA.--45.7 mi^2.

PERIOD OF RECORD.--June to October 1951, December 1951 to October 1959, July 1960 to current year.

REVISED RECORDS.--WSP 1639: 1955(M). WSP 1937: Drainage area. WSP 2137: 1965.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.37 ft above mean sea level (by stadia survey). Prior to July 1, 1960, at site 300 ft downstream at datum 1.30 ft higher.

REMARKS.--Records computed by Vaughn Kunishige. Records poor.

AVERAGE DISCHARGE.--48 years (water years 1953-59, 1961-2001), 39.9 ft^3/s (28,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft^3/s, November 28, 1954, gage height, 14.82 ft, site and datum then in use, from rating curve extended above 730 ft^3/s on basis of slope-area measurement of peak flow; no flow for part of February 25, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0451	2,140	5.64	Mar 25	0119	*2,510	*6.01

Minimum discharge, 6.3 ft^3/s, Sept. 21, 22, 25, 26, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	31	20	16	13	14	72	32	14	14	26	16
2	19	32	19	16	13	13	24	30	14	15	21	17
3	18	41	19	16	12	14	20	30	14	15	18	14
4	17	30	18	16	12	14	17	35	21	14	70	13
5	16	40	18	16	12	14	17	30	116	13	25	13
6	16	24	17	15	12	17	47	46	76	13	18	12
7	16	26	17	15	12	16	38	26	31	13	18	12
8	17	25	16	15	11	14	23	22	23	12	15	13
9	16	25	30	15	41	15	23	21	18	12	14	12
10	15	30	21	15	19	17	59	18	17	12	11	12
11	15	23	19	14	24	15	41	16	16	13	9.0	12
12	e15	35	19	14	76	14	31	18	14	12	11	11
13	e15	60	21	15	274	14	28	18	14	13	13	12
14	e15	57	17	22	153	14	25	16	15	13	12	11
15	16	34	17	17	85	15	23	14	17	18	13	12
16	15	30	18	16	35	16	22	14	20	15	13	21
17	14	28	18	15	23	26	21	16	17	16	22	23
18	13	36	18	15	20	40	33	21	19	15	21	14
19	13	34	17	15	19	27	33	35	16	14	32	13
20	12	25	19	16	18	28	73	23	15	9.7	17	11
21	12	24	47	16	21	20	98	17	15	8.4	14	11
22	11	30	37	16	17	16	35	16	15	12	17	11
23	10	25	22	16	17	15	32	15	18	11	40	10
24	9.3	22	19	15	17	22	32	17	16	12	21	11
25	9.1	21	18	15	16	289	80	15	14	12	26	10
26	9.2	33	17	15	16	33	43	14	22	12	29	11
27	14	32	16	15	18	21	29	16	17	14	26	10
28	11	25	16	15	16	17	49	14	16	13	24	13
29	418	25	16	15	---	15	67	18	20	12	15	13
30	78	21	16	14	---	15	55	15	17	20	13	12
31	40	---	16	15	---	15	---	14	---	27	16	---
TOTAL	936.6	924	618	481	1022	835	1190	652	677	425.1	640.0	386
MEAN	30.2	30.8	19.9	15.5	36.5	26.9	39.7	21.0	22.6	13.7	20.6	12.9
MAX	418	60	47	22	274	289	98	46	116	27	70	23
MIN	9.1	21	16	14	11	13	17	14	14	8.4	9.0	10
AC-FT	1860	1830	1230	954	2030	1660	2360	1290	1340	843	1270	766

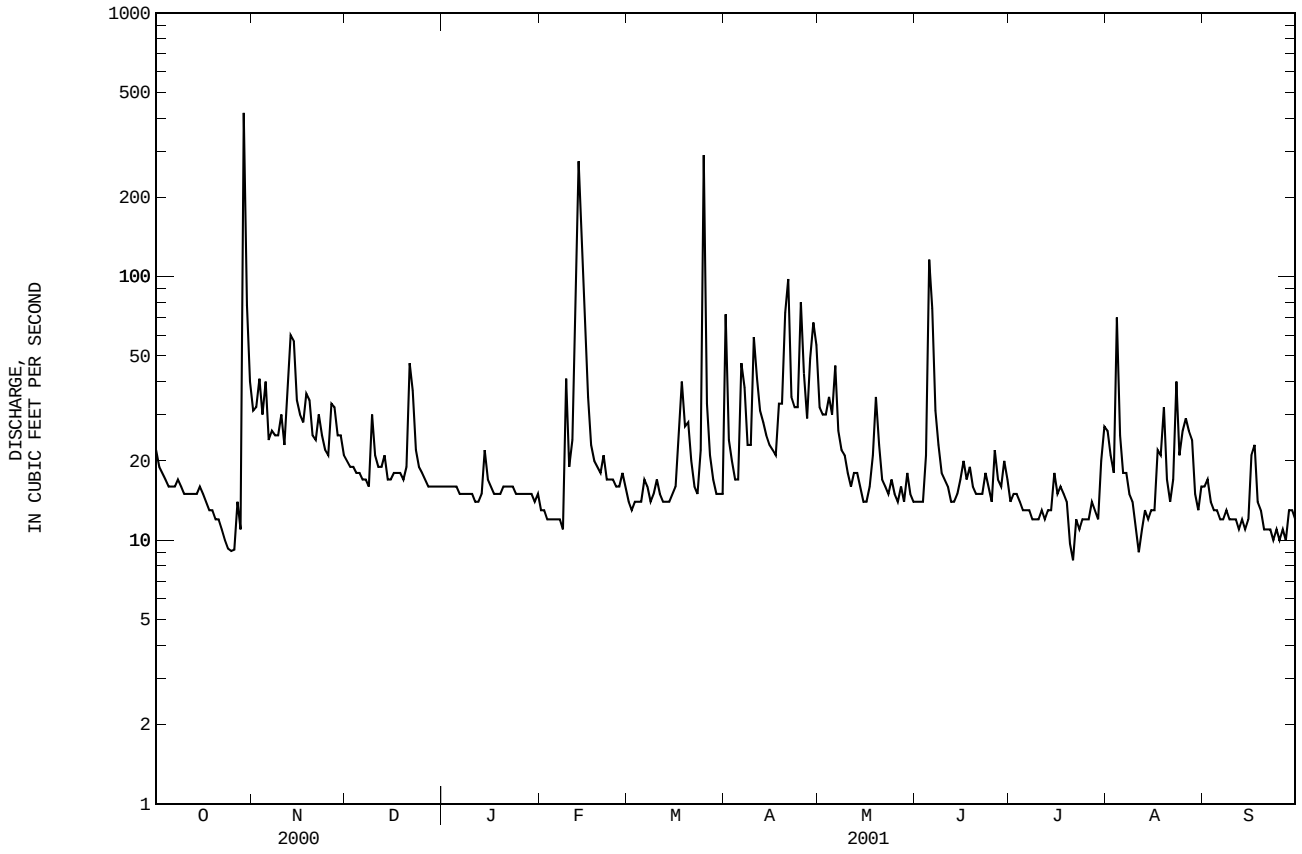
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2001, BY WATER YEAR (WY)

MEAN	32.4	49.4	49.3	59.0	53.0	52.7	49.1	32.0	24.0	29.2	25.9	22.4
MAX	97.8	198	146	222	179	195	235	99.3	51.5	76.8	90.0	68.1
(WY)	1992	1966	1966	1969	1955	1991	1963	1965	1980	1989	1958	1994
MIN	7.22	12.2	13.3	14.7	7.72	6.13	18.4	14.9	10.6	9.08	7.50	6.28
(WY)	1978	1954	1954	1986	1978	1978	1961	1954	1981	1985	1984	1975

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1953 - 2001	
ANNUAL TOTAL	9846.6		8786.7			
ANNUAL MEAN	26.9		24.1		39.9	
HIGHEST ANNUAL MEAN					77.3	1969
LOWEST ANNUAL MEAN					18.5	1954
HIGHEST DAILY MEAN	418	Oct 29	418	Oct 29	2590	Mar 21 1991
LOWEST DAILY MEAN	9.1	Oct 25	8.4	Jul 21	.61	Feb 25 1978
ANNUAL SEVEN-DAY MINIMUM	10	Oct 20	10	Oct 20	2.5	Feb 24 1978
ANNUAL RUNOFF (AC-FT)	19530		17430		28880	
10 PERCENT EXCEEDS	35		35		62	
50 PERCENT EXCEEDS	19		16		24	
90 PERCENT EXCEEDS	15		12		12	

e Estimated



16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-95, January 1999 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1973 to September 1981, January 1999 to current year.
WATER TEMPERATURE: April 1973 to September 1981, January 1999 to current year.
SUSPENDED-SEDIMENT DISCHARGE: July 1972 to August 1993.

INSTRUMENTATION.--Water-quality monitor April 1973 to September 1981, January 1999 to current year. Automatic water-quality (point) sampler March 1999 to current year.

REMARKS.-- City and County of Honolulu began pumping water from gage pool between Jan. and Mar. 2000 to irrigate soccer fields. Water-quality samples were collected monthly from March 1999 through February 2001. An additional monthly sample was collected on May 9, 2001. Monthly samples were collected at the control near the centroid of flow using the open-bottle sampling method.

Missing daily water temperature and specific conductance record from October 12-14 due to battery failure.

EXTREMES FOR THE PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum recorded (water years 1974, 1976-81, 2001), 796 microsiemens per centimeter, Dec. 1, 1980; minimum (water years 1974, 1976-80, 2001), 30 microsiemens per centimeter, Apr. 19, 1974.
WATER TEMPERATURE: Maximum recorded (water years 1973-74, 1976-81, 2001), 30.0°C, May 6, 1973; minimum (water years 1974, 1976-81, 2001), 16.0°C, Mar. 16, 1976.
SEDIMENT CONCENTRATION: Maximum daily mean, 3,420 mg/L, Feb. 7, 1976; minimum daily mean, 1 mg/L, Mar. 16, 20-22, 1989, July 10, 1990.
SEDIMENT DISCHARGE: Maximum daily, 32,200 tons, Apr. 19, 1974; minimum daily, less than 0.01 ton, Aug. 29, 30, 1992.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 550 microsiemens/cm, July 12, 13, Sept. 25, 26; minimum, 56 microsiemens/cm, Oct. 29.
WATER TEMPERATURE: Maximum, 26.5°C, July 30; minimum, 19.5°C, Feb. 9, 15.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT													
11...	1200	15	9.4	110	7.3	486	23.0	12.4	12.6	2.37	58.2	58	71
NOV													
08...	1011	26	8.2	94	7.3	332	22.0	9.76	8.20	1.98	38.6	43	53
DEC													
06...	1310	18	8.0	91	7.3	489	21.5	13.2	12.4	2.49	59.7	52	64
JAN													
10...	1130	21	7.4	84	7.5	507	21.5	14.8	13.2	2.70	62.8	61	75
FEB													
14...	1220	215	8.5	93	7.2	89	20.0	2.78	1.97	1.09	9.7	8	10
MAY													
09...	1000	20	7.4	84	7.2	412	22.0	11.6	10.3	2.13	47.7	49	60

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
OCT													
11...	91.6	E.1	56.1	19.7	<.041	E.07	<.08	1.56	E.003	.172	.161	.190	297
NOV													
08...	61.5	E.1	36.9	12.5	<.041	E.06	.10	1.01	<.006	.113	.104	.135	205
DEC													
06...	92.3	.2	55.3	18.9	<.041	<.10	E.04	1.62	<.006	.179	.168	.184	302
JAN													
10...	102	E.1	60.2	20.0	<.041	E.07	E.08	1.73	E.003	.192	.174	.195	323
FEB													
14...	15.3	<.2	7.8	3.6	<.041	E.08	.43	.237	<.006	.017	E.013	.131	57
MAY													
09...	78.2	E.1	43.1	15.9	<.041	E.09	.13	1.17	E.004	.134	.123	.146	256

E Estimated

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	CARBON, INORG + ORGANIC PARTIC. TOTAL (MG/L AS C) (00694)	CARBON, INOR-GANIC, PARTIC. TOTAL (MG/L AS C) (00688)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)
OCT													
11...	.52	.2	3	.2	<.1	--	--	--	--	--	--	--	--
NOV													
08...	1.1	.3	10	.4	<.1	--	--	--	--	--	--	--	--
DEC													
06...	.22	.2	5	.2	<.1	3	<.05	.2	6.5	<.06	102	<.04	1.2
JAN													
10...	.16	.2	5	.2	<.1	2	<.05	E.1	6.7	<.06	110	<.04	E.7
FEB													
14...	2.6	2.6	73	3.5	.9	25	E.04	<.2	1.6	<.06	36	<.04	E.4
MAY													
09...	1.2	.2	11	.2	<.1	5	E.03	E.1	5.8	<.06	82	<.04	E.7

DATE	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	THAL-LIUM, DIS-SOLVED (UG/L AS TL) (01057)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)
OCT													
11...	--	--	10	--	--	27.3	--	--	--	--	--	--	--
NOV													
08...	--	--	30	--	--	34.7	--	--	--	--	--	--	--
DEC													
06...	.19	.4	M	E.04	.8	33.5	.3	.81	1.4	<1.0	99.2	<.04	31.8
JAN													
10...	.16	.4	M	E.05	.8	30.9	E.2	.69	.9	<1.0	102	<.04	38.9
FEB													
14...	.09	1.3	60	<.08	E.2	8.9	<.2	.42	<.3	<1.0	19.3	<.04	2.4
MAY													
09...	.19	.5	30	<.08	1.1	37.4	E.1	.37	.7	<1.0	84.0	.07	23.9

DATE	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<1	E.01	E.002	<.002	<.004	<.002	<.005	E.006	<.050	<.010	<.002	<.041	<.020
JAN													
10...	<1	<.02	E.002	<.002	<.004	<.002	<.005	E.006	<.050	<.010	<.002	<.041	<.020
FEB													
14...	<1	<.02	<.011	<.002	<.004	<.007	<.005	<.007	<.050	<.010	<.002	<.041	<.020
MAY													
09...	<1	<.02	<.011	<.002	<.004	<.002	<.005	E.004	<.050	<.010	<.002	<.041	<.020

DATE	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.005	<.006	<.018	<.003	E.002	<.005	<.005	<.021	<.002	<.009	<.005	<.003	<.004
JAN													
10...	<.005	<.006	<.018	<.003	E.003	<.005	<.005	<.021	<.002	<.009	<.005	<.003	<.004
FEB													
14...	<.005	<.006	<.018	<.003	<.006	E.004	<.005	<.021	<.002	<.009	<.005	<.003	<.004
MAY													
09...	<.005	<.006	<.018	<.003	E.002	<.005	<.005	<.021	<.002	<.009	<.005	<.003	<.004

E Estimated

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	P,P' DDE DISSOLV (UG/L) (34653)	PARA-THION, DIS-SOLVED (UG/L) (39542)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.035	<.027	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	<.015
JAN													
10...	<.035	<.027	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	<.015
FEB													
14...	<.035	E.006	<.013	.012	<.002	<.007	<.003	<.007	<.025	<.002	<.010	<.011	<.015
MAY													
09...	<.035	<.027	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	<.015

DATE	PROPA-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TER-BUTHYL-AZINE, WATER, DISS, REC (UG/L) (04022)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	CARBON DI-SULFIDE WATER WHOLE TOTAL (UG/L) (77041)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L) (34506)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009	<.07	<.03
JAN													
10...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009	<.07	<.03
FEB													
14...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009	<.07	<.03
MAY													
09...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009	<.07	<.03

DATE	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L) (34511)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L) (34496)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L) (34501)	1,1-DI CHLORO-PRO-PENE, WAT, WH TOTAL (UG/L) (77168)	123-TRI CHLORO-PROPANE WATER WHOLE TOTAL (UG/L) (77443)	1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L) (77651)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L) (32103)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L) (34541)	TRANS-1,2-DI-CHLORO-ETHENE TOTAL (UG/L) (34546)	2,2-DI CHLORO-PRO-PANE WAT, WH TOTAL (UG/L) (77170)	2BUTENE TRANS-1 4-DI-CHLORO UNFLTRD RECOVER (UG/L) (73547)	2-HEXA-NONE WATER WHOLE TOTAL (UG/L) (77103)	ACETONE WATER WHOLE TOTAL (UG/L) (81552)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.06	<.04	<.04	<.03	E.1	<.04	<.1	<.03	<.03	<.05	<.7	<.7	<7
JAN													
10...	<.06	<.04	<.04	<.03	.2	<.04	<.1	E.03	<.03	<.05	<.7	<.7	<7
FEB													
14...	<.06	<.04	<.04	<.03	<.2	<.04	<.1	<.03	<.03	<.05	<.7	<.7	<7
MAY													
09...	<.06	<.04	<.04	<.03	E.1	<.04	<.1	E.03	<.03	<.05	<.7	<.7	<7

DATE	ACRYLO-NITRILE TOTAL (UG/L) (34215)	1,2,3-TRI-CHLORO BENZENE WAT, WH REC (UG/L) (77613)	BENZENE 123-TRI METHYL-WATER UNFLTRD RECOVER (UG/L) (77221)	BENZENE 1,2,4-TRI-CHLORO-WAT UNF REC (UG/L) (34551)	BENZENE 124-TRI METHYL UNFILT RECOVER (UG/L) (77222)	BENZENE 135-TRI METHYL WATER UNFLTRD REC (UG/L) (77226)	BENZENE 1,3-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34571)	ISO-PROPYL-BENZENE WATER WHOLE REC (UG/L) (77223)	BENZENE N-BUTYL WATER UNFLTRD REC (UG/L) (77342)	BENZENE N-PROPY WATER UNFLTRD REC (UG/L) (77224)	BENZENE O-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34536)	BENZENE SEC BUTYL-WATER UNFLTRD REC (UG/L) (77350)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<1	<.3	<.1	<.2	<.06	<.04	<.03	<.05	<.03	<.2	<.04	<.03	<.03
JAN													
10...	<1	<.3	<.1	<.2	<.06	<.04	<.03	<.05	<.03	<.2	<.04	<.03	<.03
FEB													
14...	<1	<.3	<.1	<.2	<.06	<.04	<.03	<.05	<.03	<.2	<.04	<.03	<.03
MAY													
09...	<1	<.3	<.1	<.2	<.06	<.04	<.03	<.05	<.03	<.2	<.04	<.03	<.03

E Estimated

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	BENZENE TERT-BUTYL-WATER UNFLTRD REC (UG/L) (77353)	BENZENE TOTAL (UG/L) (34030)	BROMO-BENZENE WATER, WHOLE, TOTAL (UG/L) (81555)	BROMO-ETHENE WATER UNFLTRD RECOVER (UG/L) (50002)	BROMO-FORM TOTAL (UG/L) (32104)	CARBON TETRA-CHLO-RIDE TOTAL (UG/L) (32102)	CHLORO-BENZENE TOTAL (UG/L) (34301)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L) (32105)	CHLORO-ETHANE TOTAL (UG/L) (34311)	CHLORO-FORM TOTAL (UG/L) (32106)	CIS-1,2-DI-CHLORO-ETHENE WATER TOTAL (UG/L) (77093)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34704)	DIBROMO CHLORO-PROPANE WATER WHOLE TOT.REC (UG/L) (82625)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.06	<.04	<.04	<.1	<.06	<.06	<.03	<.2	<.1	E.01	<.04	<.09	<.2
JAN													
10...	<.06	<.04	<.04	<.1	<.06	<.06	<.03	<.2	<.1	<.02	<.04	<.09	<.2
FEB													
14...	<.06	<.04	<.04	<.1	<.06	<.06	<.03	<.2	<.1	<.02	<.04	<.09	<.2
MAY													
09...	<.06	<.04	<.04	<.1	<.06	<.06	<.03	<.2	<.1	<.02	<.04	<.09	<.2

DATE	DI-BROMO-METHANE WATER WHOLE RECOVER (UG/L) (30217)	BROMO-DI-CHLORO-METHANE TOTAL (UG/L) (32101)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L) (34668)	DI-ISO-PROPYL-ETHER, WATER, UNFLTRD RECOVER (UG/L) (81577)	ETHANE, 1112-TETRA-CHLORO-WAT UNF REC (UG/L) (77562)	ETHANE, 1,1,2,2 TETRA-CHLORO-WAT UNF REC (UG/L) (34516)	ETHANE HEXA-CHLORO-WATER UNFLTRD RECOVER (UG/L) (34396)	ETHER ETHYL WATER UNFLTRD RECOVER (UG/L) (81576)	ETHER TERT-BUTYL ETHYL UNFLTRD RECOVER (UG/L) (50004)	ETHER TERT-PENTYL METHYL UNFLTRD RECOVER (UG/L) (50005)	ETHYL-BENZENE TOTAL (UG/L) (34371)	FREON-113 WATER UNFLTRD REC (UG/L) (77652)	FURAN, TETRA-HYDRO-WATER UNFLTRD RECOVER (UG/L) (81607)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.05	<.05	<.3	<.1	<.03	<.09	<.2	<.2	<.05	<.1	<.03	<.06	<2
JAN													
10...	<.05	<.05	<.3	<.1	<.03	<.09	<.2	<.2	<.05	<.1	<.03	<.06	<2
FEB													
14...	<.05	<.05	<.3	<.1	<.03	<.09	<.2	<.2	<.05	<.1	<.03	<.06	<2
MAY													
09...	<.05	<.05	<.3	<.1	<.03	<.09	<.2	<.2	<.05	<.1	<.03	<.06	<2

DATE	HEXA-CHLORO-BUT-ADIENE TOTAL (UG/L) (39702)	ISO-DURENE WATER UNFLTRD RECOVER (UG/L) (50000)	METHAC-RYLATE ETHYL-WATER UNFLTRD RECOVER (UG/L) (73570)	METHAC-RYLATE METHYL WATER UNFLTRD RECOVER (UG/L) (81597)	METH-ACRYLO-NITRILE WATER UNFLTRD RECOVER (UG/L) (81593)	METHANE BROMO CHLORO-WAT UNFLTRD REC (UG/L) (77297)	METHYL ACRY-LATE WATER UNFLTRD RECOVER (UG/L) (49991)	METHYL IODIDE WATER UNFLTRD RECOVER (UG/L) (77424)	METHYL TERT-BUTYL ETHER WAT UNF REC (UG/L) (78032)	METHYL-BROMIDE TOTAL (UG/L) (34413)	METHYL-CHLO-RIDE TOTAL (UG/L) (34418)	METHYL ENE CHLO-RIDE TOTAL (UG/L) (34423)	METHYL-ETHYL-KETONE WATER WHOLE TOTAL (UG/L) (81595)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.1	<.2	<.2	<.3	<.6	<.04	<1	<.1	<.2	<.3	<.2	<.2	<2
JAN													
10...	<.1	<.2	<.2	<.3	<.6	<.04	<1	<.1	<.2	<.3	<.2	<.2	<2
FEB													
14...	<.1	<.2	<.2	<.3	<.6	<.04	<1	<.1	<.2	<.3	<.2	<.2	<2
MAY													
09...	<.1	<.2	<.2	<.3	<.6	<.04	<1	<.1	<.2	<.3	<.2	<.2	<2

DATE	METHYL ISO-BUTYL KETONE WAT.WH. TOTAL (UG/L) (78133)	META/ PARA-XYLENE WATER UNFLTRD REC (UG/L) (85795)	NAPHTH-ALENE TOTAL (UG/L) (34696)	O-CHLORO-TOLUENE WATER WHOLE TOTAL (UG/L) (77275)	O-XYLENE WATER WHOLE TOTAL (UG/L) (77135)	P-ISO-PROPYL-TOLUENE WATER WHOLE REC (UG/L) (77356)	1234-TETRA METHYL BENZENE UNFLTRD REC (UG/L) (49999)	1,3-DI-CHLORO-PROPANE WAT. WH TOTAL (UG/L) (77173)	PROPENE 3-CHLORO-WATER UNFLTRD RECOVER (UG/L) (78109)	STYRENE TOTAL (UG/L) (77128)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L) (34475)	TOLUENE O-ETHYL WATER UNFLTRD RECOVER (UG/L) (77220)	TOLUENE P-CHLOR WATER UNFLTRD REC (UG/L) (77277)
OCT													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
06...	<.4	<.06	<.2	<.03	<.04	<.07	<.2	<.1	<.1	<.04	<.1	<.06	<.06
JAN													
10...	<.4	<.06	<.2	<.03	<.04	<.07	<.2	<.1	<.1	<.04	<.1	<.06	<.06
FEB													
14...	<.4	<.06	<.2	<.03	<.04	<.07	<.2	<.1	<.1	<.04	<.1	<.06	<.06
MAY													
09...	<.4	<.06	<.2	<.03	<.04	<.07	<.2	<.1	<.1	<.04	<.1	<.06	<.06

E Estimated

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TOLUENE TOTAL (UG/L) (34010)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34699)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L) (39180)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L) (34488)	VINYL CHLO-RIDE TOTAL (UG/L) (39175)
OCT					
11...	--	--	--	--	--
NOV					
08...	--	--	--	--	--
DEC					
06...	E.03	<.09	E.01	<.09	<.1
JAN					
10...	E.02	<.09	E.01	<.09	<.1
FEB					
14...	E.01	<.09	<.04	<.09	<.1
MAY					
09...	E.06	<.09	<.04	<.09	<.1

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	403	328	375	306	188	257	456	437	449	505	496	499
2	436	403	422	316	229	281	469	456	463	506	493	501
3	442	411	427	299	148	243	475	468	471	512	480	504
4	448	422	436	360	209	314	479	475	477	513	478	504
5	471	448	463	280	191	225	484	478	481	514	477	504
6	482	471	477	361	280	332	488	483	486	513	503	509
7	489	475	481	361	311	339	493	487	489	507	494	505
8	492	431	474	380	321	349	495	490	492	513	503	509
9	488	446	472	395	336	376	494	253	356	515	508	511
10	496	488	493	336	300	311	418	348	395	518	514	516
11	494	470	484	400	332	367	458	418	440	516	512	514
12	---	---	---	407	220	320	481	361	466	517	514	515
13	---	---	---	263	169	198	449	357	406	517	484	504
14	---	---	---	236	162	200	479	449	465	512	306	396
15	502	479	495	316	236	280	486	479	483	476	399	446
16	505	489	502	319	243	289	480	443	465	501	476	489
17	509	484	499	353	273	317	469	444	456	511	501	506
18	513	502	508	370	224	301	475	467	470	515	510	513
19	515	510	513	339	246	292	496	475	487	517	512	515
20	516	476	506	369	335	349	501	345	489	516	511	514
21	502	480	492	409	369	390	369	163	283	518	513	516
22	505	499	503	422	276	344	341	165	261	519	512	516
23	505	476	502	401	313	363	423	341	387	515	512	513
24	510	502	506	428	401	415	461	423	444	517	511	515
25	509	505	507	424	402	415	481	458	471	514	506	509
26	509	485	496	430	212	363	492	474	487	507	505	506
27	500	278	387	338	237	294	499	489	495	516	507	511
28	477	343	426	382	338	362	501	485	497	513	510	511
29	451	56	146	386	348	366	508	491	499	514	509	512
30	187	72	147	437	386	419	511	486	506	511	509	510
31	247	154	205	---	---	---	511	501	508	517	511	513
MONTH	516	56	441	437	148	322	511	163	452	519	306	503

E Estimated

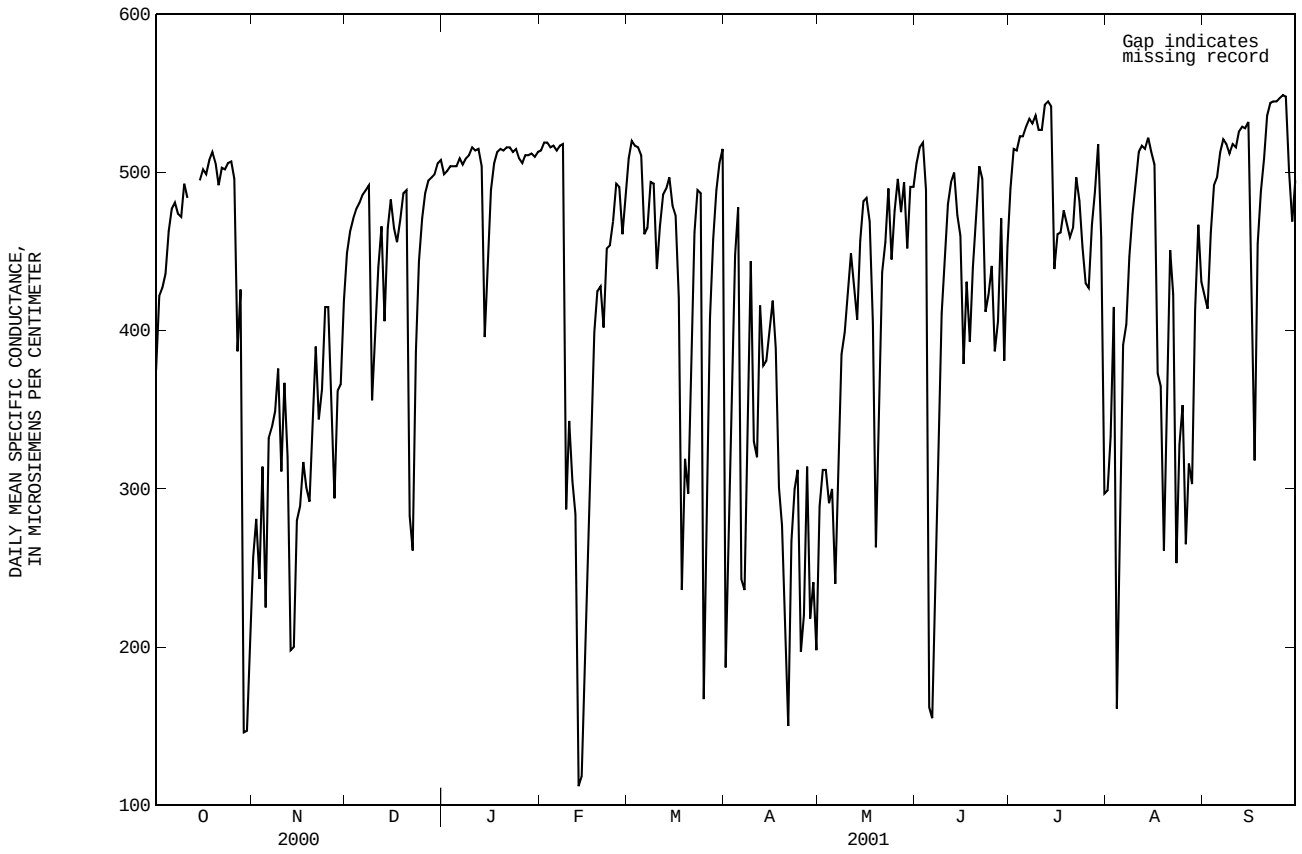
16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	516	513	514	519	486	509	516	101	187	306	259	289
2	524	514	519	522	518	520	374	260	329	329	296	312
3	523	515	519	520	504	517	419	374	400	344	268	312
4	518	514	516	517	513	516	470	419	448	336	225	291
5	519	514	517	516	506	511	487	470	478	331	249	300
6	517	513	514	513	395	461	487	184	243	333	185	240
7	520	514	517	484	439	465	308	190	236	369	276	327
8	519	517	518	500	483	494	419	308	355	403	369	385
9	521	121	287	498	467	493	508	414	444	417	366	399
10	408	248	343	467	392	439	532	187	330	443	391	424
11	393	251	305	480	435	466	410	223	320	453	443	449
12	390	67	284	491	457	486	461	376	416	462	396	429
13	176	58	112	502	468	490	403	360	378	438	384	407
14	181	92	118	507	460	497	408	363	381	471	438	457
15	215	138	175	499	457	479	425	370	401	488	471	482
16	320	207	277	493	451	473	438	351	419	496	459	484
17	378	320	345	486	157	421	416	350	389	480	456	469
18	415	378	399	291	157	236	418	238	301	464	251	405
19	439	404	425	365	229	319	317	252	277	306	215	263
20	438	411	428	355	245	297	284	108	222	407	289	349
21	448	363	402	429	355	387	218	98	150	457	407	437
22	469	428	452	482	429	462	309	218	267	478	438	456
23	468	444	454	512	469	489	333	250	300	497	478	490
24	479	457	469	520	170	487	357	252	312	499	408	445
25	502	479	493	240	76	167	315	114	197	485	455	476
26	505	464	491	370	230	307	288	141	220	507	485	496
27	495	445	461	438	370	408	337	240	314	512	436	475
28	501	454	482	475	438	458	276	172	218	509	471	494
29	---	---	---	500	475	489	324	115	241	516	270	452
30	---	---	---	511	500	506	259	129	198	516	439	491
31	---	---	---	517	507	515	---	---	---	503	474	491
MONTH	524	58	405	522	76	444	532	98	312	516	185	409

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	511	499	506	507	470	490	370	235	299	464	355	422
2	523	509	516	519	507	515	395	291	333	459	397	414
3	532	499	519	522	509	514	450	287	415	484	438	462
4	527	224	489	528	518	523	287	127	161	500	481	492
5	273	72	162	529	506	523	357	227	300	520	486	497
6	241	89	155	536	523	529	413	357	391	523	491	513
7	333	238	275	538	531	534	421	382	404	529	516	521
8	388	322	351	536	527	531	467	421	447	524	511	518
9	433	388	411	538	531	536	491	458	474	525	451	512
10	468	432	444	531	524	527	509	481	495	525	510	518
11	488	468	480	536	522	527	516	509	513	523	503	516
12	499	488	494	550	536	543	519	515	517	531	522	526
13	510	481	500	550	540	545	519	510	515	531	526	529
14	481	449	473	544	533	542	526	518	522	531	499	528
15	499	319	460	542	384	439	523	507	513	535	526	532
16	440	324	379	473	436	461	510	501	505	532	207	440
17	456	404	431	487	402	462	504	285	373	413	204	318
18	441	344	393	492	459	476	437	251	365	480	413	455
19	463	412	440	487	445	468	331	216	261	500	476	488
20	498	458	471	477	380	459	426	331	380	526	500	509
21	509	498	504	501	404	465	468	426	451	541	526	536
22	519	423	496	513	479	497	478	351	423	546	541	544
23	454	377	412	494	467	482	427	171	253	547	544	545
24	439	403	423	472	423	453	389	253	328	547	539	545
25	511	344	441	442	403	430	420	186	353	550	540	547
26	495	335	387	540	359	427	333	193	265	550	547	549
27	454	363	406	534	415	467	398	178	316	549	540	548
28	498	448	471	508	462	488	373	239	303	549	433	501
29	454	315	381	526	508	518	444	373	413	487	449	469
30	470	435	453	532	264	459	484	444	467	517	479	495
31	---	---	---	369	226	297	489	387	431	---	---	---
MONTH	532	72	424	550	226	488	526	127	393	550	204	500
YEAR	550	56	425									

16213000 WAIKELE STREAM AT WAIPAHU--Continued



16213000 WAIKELE STREAM AT WAIPAHU--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

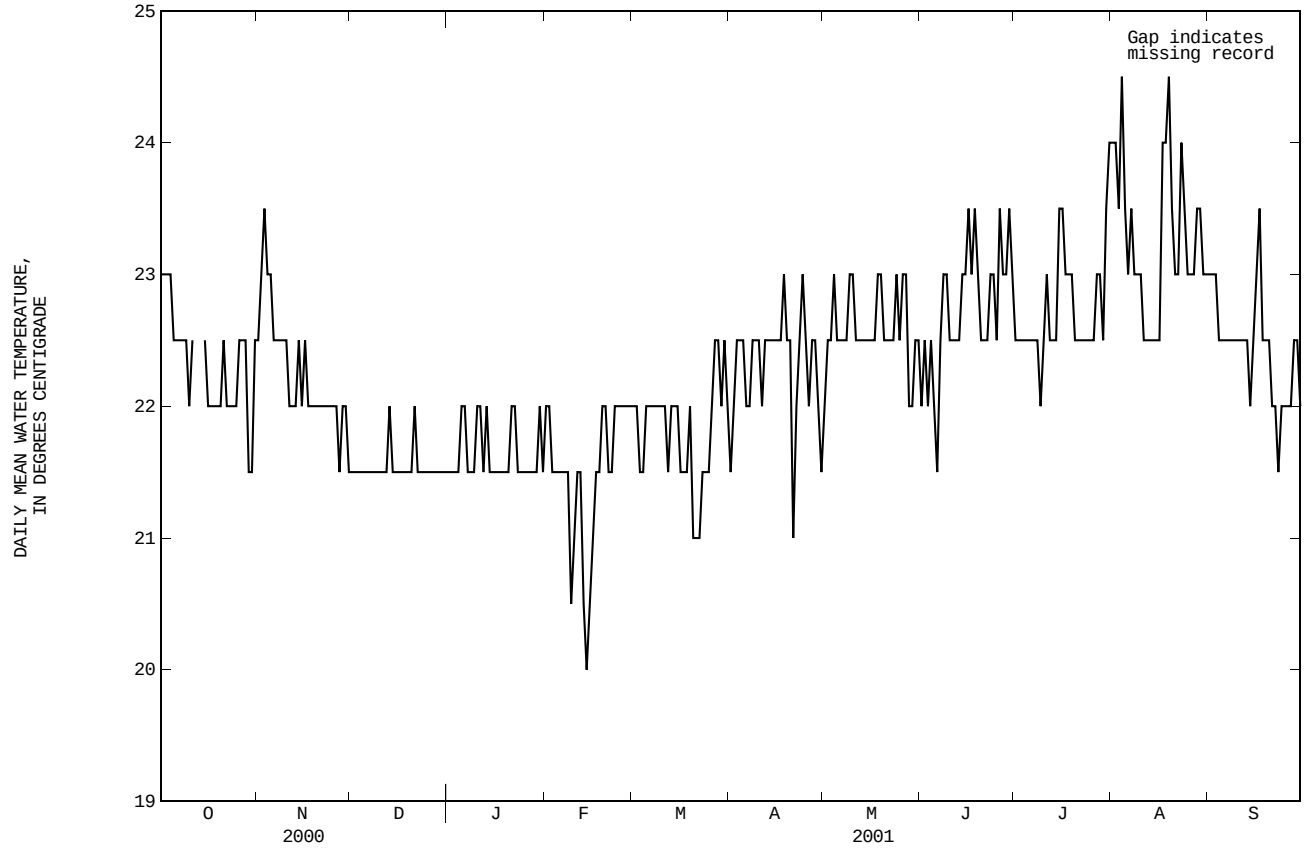
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	24.5	22.5	23.0	23.0	22.5	22.5	22.5	21.0	21.5	22.0	21.0	21.5
2	24.0	22.5	23.0	23.5	22.5	23.0	22.5	21.0	21.5	22.5	21.0	21.5
3	24.5	22.0	23.0	24.5	23.0	23.5	22.5	21.0	21.5	22.0	21.0	21.5
4	24.0	22.0	23.0	24.0	22.5	23.0	22.5	21.0	21.5	22.5	21.5	21.5
5	24.0	22.0	22.5	24.0	22.5	23.0	22.5	21.0	21.5	23.0	21.0	22.0
6	24.0	21.5	22.5	23.5	22.0	22.5	22.5	21.0	21.5	22.5	21.0	22.0
7	23.5	21.5	22.5	23.5	22.0	22.5	22.5	21.0	21.5	22.5	21.0	21.5
8	23.5	21.5	22.5	23.5	22.0	22.5	22.5	21.0	21.5	22.5	21.0	21.5
9	23.0	22.0	22.5	23.0	21.5	22.5	22.0	21.0	21.5	22.5	21.0	21.5
10	23.0	21.5	22.0	23.0	22.0	22.5	22.5	21.0	21.5	22.5	21.0	22.0
11	23.5	21.5	22.5	23.0	21.5	22.0	22.5	21.0	21.5	22.5	21.0	22.0
12	---	---	---	22.5	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
13	---	---	---	23.0	21.5	22.0	22.5	21.5	22.0	22.5	21.5	22.0
14	---	---	---	23.0	21.5	22.5	22.5	21.0	21.5	22.5	21.0	21.5
15	23.5	21.5	22.5	23.0	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
16	23.5	21.5	22.0	23.0	21.5	22.5	22.5	21.0	21.5	22.5	21.0	21.5
17	23.5	21.5	22.0	23.0	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
18	22.5	21.5	22.0	22.5	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
19	23.0	21.5	22.0	22.5	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
20	23.0	21.5	22.0	22.5	21.5	22.0	22.5	21.0	21.5	23.0	21.0	21.5
21	23.5	21.5	22.5	22.5	21.0	22.0	23.0	21.5	22.0	23.0	21.0	22.0
22	23.5	21.5	22.0	22.5	21.5	22.0	22.0	20.5	21.5	23.0	21.0	22.0
23	23.5	21.5	22.0	23.0	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
24	23.5	21.5	22.0	22.5	21.5	22.0	22.0	21.0	21.5	22.5	21.0	21.5
25	23.0	21.5	22.0	23.0	21.5	22.0	22.0	21.0	21.5	22.5	21.0	21.5
26	23.5	21.5	22.5	23.0	21.5	22.0	22.0	21.0	21.5	22.5	21.0	21.5
27	24.0	21.5	22.5	22.0	21.0	21.5	22.5	21.0	21.5	22.5	21.0	21.5
28	23.5	21.5	22.5	23.0	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
29	24.0	21.0	21.5	22.5	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
30	22.5	20.5	21.5	23.0	21.0	21.5	22.0	21.0	21.5	23.0	21.0	22.0
31	23.0	21.5	22.5	---	---	---	22.5	21.0	21.5	23.0	21.0	21.5
MONTH	24.5	20.5	22.3	24.5	21.0	22.2	23.0	20.5	21.5	23.0	21.0	21.6

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	23.0	21.0	22.0	23.5	21.5	22.0	22.5	20.5	21.5	23.5	21.0	22.0
2	23.0	21.0	22.0	23.0	21.0	22.0	23.0	21.5	22.0	24.0	22.0	22.5
3	22.5	21.0	21.5	22.5	21.0	21.5	23.5	21.5	22.5	24.0	22.0	22.5
4	22.5	21.0	21.5	22.5	21.0	21.5	24.0	21.5	22.5	24.0	21.5	23.0
5	22.5	21.0	21.5	23.0	21.0	22.0	24.0	21.5	22.5	23.5	22.0	22.5
6	22.0	21.0	21.5	23.0	21.0	22.0	22.5	21.5	22.0	24.0	21.5	22.5
7	22.5	20.5	21.5	23.0	21.0	22.0	23.0	20.5	22.0	24.0	21.5	22.5
8	22.0	21.0	21.5	23.0	21.0	22.0	23.5	21.5	22.5	24.0	22.0	22.5
9	21.5	19.5	20.5	23.5	21.0	22.0	24.0	21.5	22.5	24.5	22.0	23.0
10	22.0	20.5	21.0	23.5	21.5	22.0	23.0	21.5	22.5	24.0	22.0	23.0
11	22.0	21.0	21.5	23.0	21.0	22.0	23.5	20.5	22.0	24.0	21.5	22.5
12	22.5	20.0	21.5	22.5	21.0	21.5	24.0	21.5	22.5	24.0	21.5	22.5
13	21.0	19.5	20.5	23.5	21.0	22.0	24.0	22.0	22.5	24.5	21.5	22.5
14	20.5	19.5	20.0	23.5	21.0	22.0	24.0	22.0	22.5	24.0	21.5	22.5
15	21.5	19.5	20.5	23.0	21.0	22.0	24.0	21.5	22.5	24.0	21.5	22.5
16	22.0	20.0	21.0	22.5	21.0	21.5	24.0	21.5	22.5	24.0	21.5	22.5
17	22.0	20.5	21.5	22.0	21.0	21.5	23.5	21.5	22.5	24.0	22.0	22.5
18	23.0	21.0	21.5	22.5	20.5	21.5	24.0	22.0	23.0	24.0	22.0	23.0
19	23.0	21.0	22.0	23.0	21.0	22.0	23.5	21.5	22.5	24.5	22.0	23.0
20	23.0	21.0	22.0	22.0	20.0	21.0	23.5	21.0	22.5	24.0	22.0	22.5
21	22.5	21.0	21.5	22.5	20.0	21.0	22.5	20.0	21.0	24.0	21.5	22.5
22	23.0	21.0	21.5	22.0	20.5	21.0	23.0	20.5	22.0	24.0	22.0	22.5
23	23.5	21.0	22.0	22.0	20.5	21.5	23.5	21.5	22.5	24.0	21.5	22.5
24	23.5	21.0	22.0	22.5	21.0	21.5	24.5	22.0	23.0	24.5	21.5	23.0
25	22.5	21.5	22.0	22.5	20.5	21.5	23.0	21.5	22.5	24.0	22.0	22.5
26	23.0	21.5	22.0	23.5	21.0	22.0	23.0	20.5	22.0	24.5	22.0	23.0
27	23.5	21.0	22.0	23.5	21.5	22.5	23.0	21.5	22.5	24.5	21.5	23.0
28	23.5	21.0	22.0	24.0	21.5	22.5	23.5	21.5	22.5	22.5	21.5	22.0
29	---	---	---	23.5	21.5	22.0	22.5	20.5	22.0	23.5	21.5	22.0
30	---	---	---	24.0	21.5	22.5	22.5	20.5	21.5	23.5	21.5	22.5
31	---	---	---	23.0	21.5	22.0	---	---	---	24.0	21.5	22.5
MONTH	23.5	19.5	21.5	24.0	20.0	21.8	24.5	20.0	22.3	24.5	21.0	22.6

16213000 WAIKELE STREAM AT WAIPAHU--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	22.5	21.5	22.0	23.5	22.0	22.5	25.0	23.0	24.0	24.5	22.0	23.0
2	24.0	21.5	22.5	23.5	22.0	22.5	25.5	23.0	24.0	24.5	22.5	23.0
3	23.5	21.0	22.0	24.0	22.0	22.5	24.5	22.5	23.5	24.0	22.0	23.0
4	24.5	21.5	22.5	24.0	21.5	22.5	25.0	23.5	24.5	24.0	21.5	22.5
5	23.5	21.0	22.0	24.0	21.5	22.5	24.0	22.5	23.5	24.0	21.5	22.5
6	23.0	20.5	21.5	24.5	21.5	22.5	24.0	22.5	23.0	24.0	21.5	22.5
7	23.5	21.5	22.5	24.0	21.5	22.5	24.5	22.5	23.5	23.5	21.5	22.5
8	24.5	22.0	23.0	23.5	21.5	22.5	23.5	22.0	23.0	23.5	21.5	22.5
9	23.5	22.0	23.0	23.0	21.5	22.0	24.5	22.0	23.0	24.0	21.5	22.5
10	23.5	22.0	22.5	24.0	21.5	22.5	23.5	22.0	23.0	24.0	21.5	22.5
11	24.0	22.0	22.5	24.5	21.5	23.0	24.0	22.0	22.5	24.0	21.5	22.5
12	24.0	21.5	22.5	24.0	21.5	22.5	23.5	21.5	22.5	23.5	21.5	22.5
13	24.0	21.5	22.5	24.0	21.5	22.5	23.5	21.5	22.5	23.5	21.5	22.5
14	24.5	22.0	23.0	24.0	21.5	22.5	24.0	21.5	22.5	23.0	21.5	22.0
15	24.5	22.0	23.0	25.0	21.5	23.5	24.0	21.5	22.5	23.5	21.5	22.5
16	24.5	23.0	23.5	24.5	22.5	23.5	23.5	22.0	22.5	24.5	21.5	23.0
17	24.5	22.5	23.0	24.5	22.0	23.0	26.0	22.0	24.0	24.0	22.5	23.5
18	25.0	22.0	23.5	24.0	22.0	23.0	25.0	23.0	24.0	23.0	22.0	22.5
19	24.5	22.0	23.0	24.5	22.0	23.0	25.5	23.5	24.5	23.5	21.5	22.5
20	24.0	22.0	22.5	24.0	22.0	22.5	24.0	23.0	23.5	23.5	21.5	22.5
21	24.0	21.5	22.5	24.0	22.0	22.5	23.5	22.0	23.0	23.5	21.5	22.0
22	24.0	21.5	22.5	24.0	21.5	22.5	25.0	22.0	23.0	23.5	21.0	22.0
23	24.5	22.0	23.0	24.0	21.5	22.5	25.5	22.5	24.0	22.0	21.5	21.5
24	24.0	22.0	23.0	24.0	21.5	22.5	24.5	23.0	23.5	23.0	21.0	22.0
25	24.0	21.5	22.5	24.0	21.5	22.5	25.0	22.0	23.0	23.0	21.0	22.0
26	25.0	22.0	23.5	24.0	21.5	22.5	24.0	22.5	23.0	22.5	21.5	22.0
27	24.5	22.5	23.0	25.0	21.5	23.0	24.5	22.0	23.0	22.5	21.0	22.0
28	24.5	22.0	23.0	24.5	22.0	23.0	24.5	23.0	23.5	24.0	21.5	22.5
29	24.5	22.5	23.5	24.0	21.5	22.5	24.5	22.5	23.5	23.5	22.0	22.5
30	24.0	22.5	23.0	26.5	22.0	23.5	24.0	22.0	23.0	23.5	21.5	22.0
31	---	---	---	25.5	23.0	24.0	24.5	22.0	23.0	---	---	---
MONTH	25.0	20.5	22.7	26.5	21.5	22.7	26.0	21.5	23.3	24.5	21.0	22.4
YEAR	26.5	19.5	22.3									



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16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Hydrologic Unit 20060000, on left bank 100 ft upstream from lower bridge on Highway 90, 0.6 mi northwest of Pearl City, and 2.0 mi northeast of Waipahu.

DRAINAGE AREA.--26.4 mi^2.

PERIOD OF RECORD.--June 1952 to current year.

REVISED RECORDS.--WSP 1569: Drainage area, WDR HI-90-1: 1982-89 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.81 ft above mean sea level (State of Hawaii benchmark).

REMARKS.--Records computed by S.T.M. Young. Records poor. Occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--49 years (water years 1953-2001), 32.9 ft^3/s (23,850 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,900 ft^3/s, October 28, 1981, gage height, 22.46 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurements at gage heights 17.1 ft and 20.56 ft; minimum, 1.1 ft^3/s on several days in 1984, 1985, 1999, and 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0415	*2,430	*10.54	No other peak greater than base discharge.			

Minimum discharge, 1.1 ft^3/s, Sept. 14, 15, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	17	2.0	1.2	1.7	1.7	94	26	3.6	1.5	2.0	e3.0
2	2.3	20	1.7	1.2	1.7	1.6	9.5	19	2.8	1.4	3.2	e3.2
3	1.9	15	1.6	1.2	1.6	1.6	4.8	12	2.5	1.4	29	e2.8
4	1.7	14	1.7	1.2	1.6	1.5	2.7	14	2.7	1.4	67	e2.5
5	1.7	18	1.7	1.2	1.6	1.6	2.3	14	150	1.5	6.1	e2.5
6	1.6	9.9	1.5	1.2	1.7	1.5	37	e25	57	1.5	2.5	e2.0
7	1.6	15	1.5	1.2	1.7	1.5	14	e8.8	14	1.5	1.7	e2.0
8	1.7	9.1	1.5	1.2	1.7	1.5	8.5	e5.8	7.6	1.5	1.5	e2.0
9	1.6	11	1.5	1.3	2.0	1.5	9.0	4.0	4.7	1.5	1.4	e1.7
10	1.7	14	1.5	1.3	2.3	1.2	51	3.2	3.7	1.5	1.4	e1.7
11	1.7	7.9	1.4	1.2	2.3	.89	24	2.6	3.5	1.6	1.4	e1.7
12	1.7	25	1.4	1.2	74	.92	26	2.4	3.5	1.6	1.3	e1.4
13	1.7	30	1.4	1.9	59	.92	15	2.3	3.5	1.5	1.3	e1.7
14	1.7	27	1.4	1.4	83	.92	7.3	2.2	4.9	1.5	1.4	1.1
15	1.6	e11	1.4	1.3	33	.92	4.9	2.1	5.4	1.5	1.4	1.1
16	1.7	e8.0	1.4	1.4	10	.98	6.7	2.1	6.5	1.5	1.4	21
17	1.6	e7.2	1.3	1.4	3.9	18	8.9	2.0	12	1.6	18	5.5
18	1.7	7.6	1.3	1.4	2.4	16	18	4.2	11	1.5	17	1.5
19	1.7	7.8	1.3	1.4	1.9	11	15	24	e4.5	1.4	10	1.2
20	1.6	7.7	1.3	1.4	1.6	5.3	114	5.2	e3.3	1.4	3.7	1.2
21	1.6	4.1	5.2	1.4	1.5	1.7	74	2.9	e3.0	1.4	2.2	1.3
22	1.5	20	5.4	1.4	1.5	1.2	17	2.5	e3.0	1.4	4.3	1.3
23	1.6	6.2	2.0	1.4	1.7	1.1	13	2.4	e4.1	1.4	36	1.3
24	1.9	3.8	1.4	1.5	1.8	39	11	3.8	e3.2	1.4	4.8	1.3
25	1.7	2.9	1.3	1.6	1.8	99	159	2.6	e2.9	1.4	25	1.3
26	1.8	19	1.2	1.5	3.8	6.0	27	2.3	e4.3	1.3	8.8	1.3
27	1.7	9.5	1.2	1.6	2.3	2.4	20	2.4	e3.6	1.3	17	1.3
28	1.7	8.2	1.2	1.6	1.7	1.7	27	2.4	e1.7	1.3	6.3	1.3
29	352	4.0	1.2	1.7	---	1.6	166	3.5	3.4	1.3	e2.8	1.4
30	41	2.7	1.2	1.6	---	1.5	49	2.4	1.8	1.3	e2.1	1.3
31	32	---	1.2	1.6	---	53	---	13	---	1.3	e3.0	---
TOTAL	474.5	362.6	52.3	43.1	304.8	279.25	1035.6	221.1	337.7	44.6	285.0	73.9
MEAN	15.3	12.1	1.69	1.39	10.9	9.01	34.5	7.13	11.3	1.44	9.19	2.46
MAX	352	30	5.4	1.9	83	99	166	26	150	1.6	67	21
MIN	1.5	2.7	1.2	1.2	1.5	.89	2.3	2.0	1.7	1.3	1.3	1.1
AC-FT	941	719	104	85	605	554	2050	439	670	88	565	147

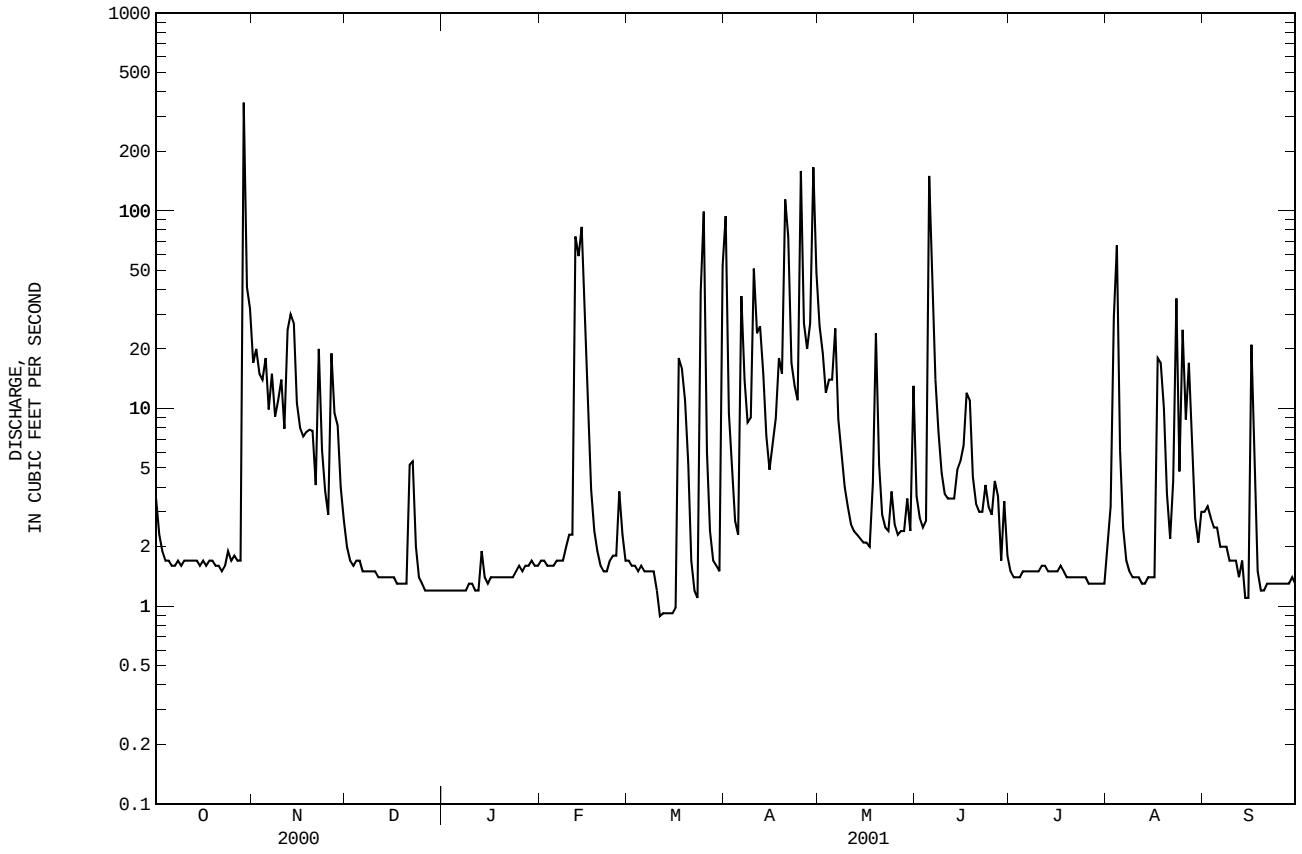
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	28.1	52.7	43.8	44.0	36.4	50.7	40.4	22.5	15.1	26.1	20.9	14.0
MAX	131	295	351	199	208	336	241	131	72.9	149	128	104
(WY)	1967	1997	1988	1969	1955	1980	1974	1965	1987	1970	1982	1992
MIN	1.55	2.54	1.69	1.39	1.66	1.43	1.75	1.44	1.43	1.40	1.28	1.28
(WY)	1985	1990	2001	2001	1986	2000	1992	2000	1984	1984	1984	1984

16216000 WAIAWA STREAM NEAR PEARL CITY--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	4587.6		3514.45			
ANNUAL MEAN	12.5		9.63		32.9	
HIGHEST ANNUAL MEAN					80.8	1982
LOWEST ANNUAL MEAN					7.56	1984
HIGHEST DAILY MEAN	797	Aug 20	352	Oct 29	5150	Mar 24 1994
LOWEST DAILY MEAN	1.1	Mar 28	.89	Mar 11	.89	Mar 11 2001
ANNUAL SEVEN-DAY MINIMUM	1.2	Mar 24	.96	Mar 10	.96	Mar 10 2001
ANNUAL RUNOFF (AC-FT)	9100		6970		23850	
10 PERCENT EXCEEDS	19		20		46	
50 PERCENT EXCEEDS	2.0		1.9		6.2	
90 PERCENT EXCEEDS	1.4		1.3		2.0	

e Estimated



16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23'46", long 157°53'37", Hydrologic Unit 20060000, on left bank 2.7 mi upstream from confluence with South Halawa Stream, and 2.7 mi northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 mi^2.

PERIOD OF RECORD.--August 1929 to June 1933, July 1953 to current year. Monthly discharge only May, June 1931, published in WSP 1319.

REVISED RECORDS.--WSP 1319: Drainage area. WSP 1719: 1954-55(P), 1956, 1957(P), 1958-59.

GAGE.--Water-stage recorder. Elevation of gage is 320 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Vaughn Kunishige. Records fair. Recording rain gage located at station.

AVERAGE DISCHARGE.--51 years (water years 1930-32, 1954-2001), 5.17 ft^3/s (3,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft^3/s, February 28, 1932, gage height, 13.36 ft, from rating curve extended above 420 ft^3/s; maximum gage height, 13.46 ft, May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 430 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0245	*631	*8.98	No other peak greater than base discharge.			

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

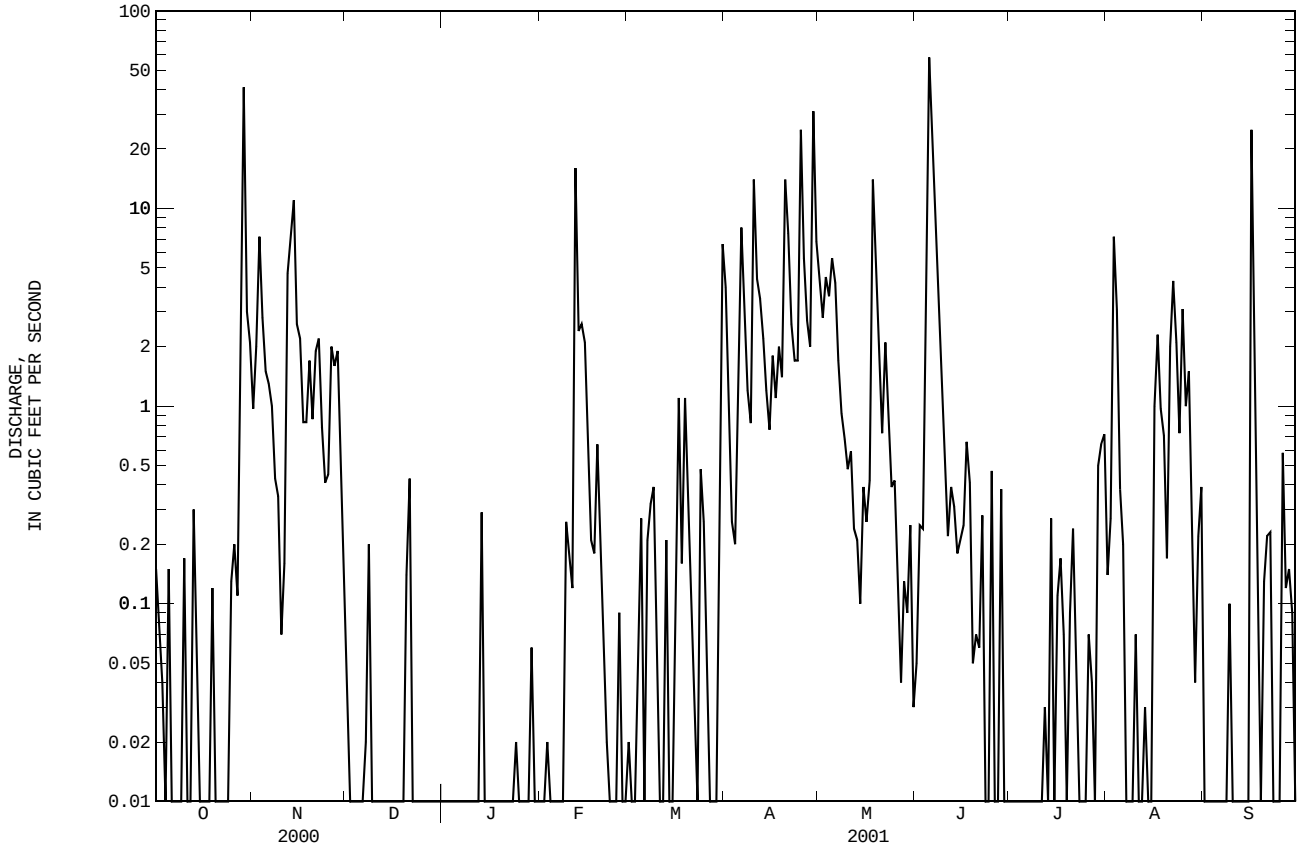
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.15	.97	.06	.00	.00	.02	4.0	4.3	.05	.00	.14	.01
2	.07	2.0	.00	.00	.00	.00	.93	2.8	.25	.00	.27	.00
3	.04	7.2	.00	.00	.02	.00	.26	4.5	.24	.00	7.2	.00
4	.01	2.8	.00	.00	.00	.04	.20	3.6	6.8	.00	3.1	.00
5	.15	1.5	.00	.00	.00	.27	1.7	5.6	58	.00	.38	.00
6	.01	1.3	.00	.00	.00	.01	8.0	4.2	19	.00	.20	.00
7	.00	1.0	.02	.00	.00	.21	2.9	1.7	4.9	.00	.00	.00
8	.00	.43	.20	.00	.00	.32	1.2	.92	2.2	.00	.00	.00
9	.01	.35	.00	.00	.26	.39	.82	.68	1.1	.00	.01	.10
10	.17	.07	.00	.01	.18	.07	14	.48	.47	.00	.07	.00
11	.01	.16	.00	.00	.12	.00	4.4	.59	.22	.00	.00	.00
12	.00	4.7	.00	.00	16	.00	3.5	.24	.39	.03	.00	.00
13	.30	7.0	.00	.29	2.4	.21	2.2	.21	.31	.00	.03	.00
14	.04	11	.00	.00	2.6	.00	1.2	.10	.18	.27	.00	.00
15	.00	2.6	.00	.00	2.1	.00	.76	.39	.21	.00	.00	.00
16	.01	2.2	.00	.00	.66	.15	1.8	.26	.25	.11	1.0	25
17	.00	.83	.00	.00	.21	1.1	1.1	.42	.66	.17	2.3	2.2
18	.00	.83	.00	.00	.18	.16	2.0	14	.41	.07	.97	.17
19	.12	1.7	.00	.00	.64	1.1	1.4	5.6	.05	.00	.71	.00
20	.00	.86	.14	.00	.18	.25	14	1.6	.07	.09	.17	.13
21	.00	1.9	.43	.00	.07	.08	7.5	.73	.06	.24	2.0	.22
22	.00	2.2	.00	.00	.02	.03	2.6	2.1	.28	.03	4.3	.23
23	.00	.78	.00	.00	.00	.00	1.7	.96	.01	.00	2.1	.00
24	.00	.41	.00	.02	.00	.48	1.7	.39	.00	.00	.73	.00
25	.13	.45	.00	.00	.00	.26	25	.42	.47	.00	3.1	.00
26	.20	2.0	.00	.00	.09	.03	5.6	.16	.00	.07	1.0	.58
27	.11	1.6	.00	.00	.00	.00	2.7	.04	.00	.04	1.5	.12
28	.47	1.9	.00	.00	.00	.00	2.0	.13	.38	.00	.28	.15
29	41	.60	.00	.06	---	.00	31	.09	.00	.50	.04	.09
30	3.0	.22	.00	.00	---	.54	6.8	.25	.00	.64	.22	.00
31	2.1	---	.00	.00	---	6.6	---	.03	---	.72	.39	---
TOTAL	48.10	61.56	0.85	0.38	25.73	12.32	152.97	57.49	96.96	2.98	32.21	29.00
MEAN	1.55	2.05	.027	.012	.92	.40	5.10	1.85	3.23	.096	1.04	.97
MAX	41	11	.43	.29	16	6.6	31	14	58	.72	7.2	25
MIN	.00	.07	.00	.00	.00	.00	.20	.03	.00	.00	.00	.00
AC-FT	95	122	1.7	.8	51	24	303	114	192	5.9	64	58

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2001, BY WATER YEAR (WY)

MEAN	3.36	7.65	7.48	6.49	7.42	7.75	6.98	4.51	1.84	3.54	3.55	2.10
MAX	16.3	50.6	35.0	26.0	76.3	37.8	33.2	30.1	7.86	23.0	21.6	17.1
(WY)	1959	1966	1930	1988	1932	1968	1932	1965	1932	1954	1982	1931
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1933	1954	1990	1977	1931	1931	1931	1931	1931	1953	1962	1953

16226000 NORTH HALAWA STREAM NEAR AIEA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1929 - 2001	
ANNUAL TOTAL	903.68		520.55			
ANNUAL MEAN	2.47		1.43		5.17	
HIGHEST ANNUAL MEAN					15.7	1932
LOWEST ANNUAL MEAN					1.41	1984
HIGHEST DAILY MEAN	137	Jan 20	58	Jun 5	956	Nov 18 1930
LOWEST DAILY MEAN	.00	Jan 2	.00	Oct 7	.00	Sep 14 1929
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 9	.00	Dec 9	.00	Sep 14 1929
ANNUAL RUNOFF (AC-FT)	1790		1030		3750	
10 PERCENT EXCEEDS	3.0		2.8		11	
50 PERCENT EXCEEDS	.07		.12		.36	
90 PERCENT EXCEEDS	.00		.00		.00	



212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA

LOCATION.--Lat 21°23'53", long 157°53'30", Hydrologic Unit 2006000, on manhole 6.1 mi west of Kaneohe Elementary School, 1.65 mi northeast of Halawa Prison, and 1.05 mi east of Keaiwa Heiau.

PERIOD OF RECORD.--September 1998 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 336.22 ft from Hawaii State Department of Transportation levels.

REMARKS.--Records computed by Heather Jeppesen. Records fair except for discharges greater than 15 ft^3/s and estimated days which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37 ft^3/s, October 29, 2000, gage height, 4.63 ft, no flow at times during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 30 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0220	*37	*4.63	Sep 16	0816	34	4.42
Nov 20	0030	35	4.44				

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.19	.00	.08	e.00	e.05	.00	.41	.05	.00	.14	.00
2	.00	.58	.00	.02	e.00	.04	.14	.00	.25	.00	.19	.00
3	.01	.34	.00	.01	e.03	.07	.00	.43	.22	.00	.79	.01
4	.08	.28	.01	.00	e.00	.16	.06	.13	.93	.00	.02	.01
5	.11	.02	.00	.00	e.00	.25	.61	.54	1.5	.00	.10	.00
6	.00	.47	.00	.00	e.00	.00	.64	.00	.12	.00	.10	.00
7	.00	.01	.15	.00	e.00	.32	.05	.00	.03	.00	.00	.00
8	.05	.19	.47	.00	e.00	.28	.15	.01	.01	.00	.00	.03
9	.14	.30	.00	.28	e.16	.39	.28	.10	.00	.04	.12	.16
10	.17	.01	.00	.05	.47	.00	.99	.07	.00	.02	.08	.00
11	.04	.23	.04	.08	.16	.00	e.27	.28	.01	.06	.05	.00
12	.05	.98	.05	.04	.82	.00	e.48	.00	.17	.10	.05	.00
13	.45	.75	.09	.55	.58	.32	.11	.01	.11	.08	.07	.02
14	.00	.53	.10	.00	.63	.04	.16	.00	.12	.21	.00	.01
15	.00	.14	.04	.02	.41	.04	.14	.26	.14	.06	.13	.00
16	.14	.32	.07	.00	.00	.30	.21	.14	.21	.13	.72	1.8
17	.00	.03	.01	.00	.00	.70	.32	.31	.15	.18	.18	.01
18	.07	.40	.00	.00	.08	.00	.50	.92	.00	.11	.37	.00
19	.24	.38	.00	.00	.46	.50	.02	.00	.03	.06	.12	.00
20	.00	.23	.45	.02	.05	.00	1.3	.00	.02	.16	.04	.12
21	.00	.60	.61	.00	.04	.00	.02	.01	.10	.21	.49	.17
22	.04	.00	.02	.01	.00	.00	.19	.24	.15	.03	.36	.08
23	.02	.11	.00	.00	.00	.00	.21	.03	.03	.00	.01	.00
24	.07	.10	.00	e.06	.00	.56	.29	.01	.03	.02	.17	.00
25	.23	.41	.00	e.00	.00	.14	1.0	.21	.38	.06	.37	.00
26	.32	.41	.00	e.00	.12	.00	.04	.00	.00	.14	.00	.47
27	.05	.39	.00	e.00	.00	.00	.23	.00	.00	.06	.13	.06
28	.59	.00	.00	e.00	.04	.00	.31	.15	.34	.00	.00	.12
29	2.0	.03	.06	e.03	---	.00	1.0	.03	.00	.46	.00	.14
30	.12	.00	.01	e.01	---	.67	.05	.23	.01	.42	.14	.00
31	.40	---	.00	e.00	---	.80	---	.00	---	.39	.24	---
TOTAL	5.39	8.43	2.18	1.26	4.05	5.63	9.77	4.52	5.11	3.00	5.18	3.21
MEAN	.17	.28	.070	.041	.14	.18	.33	.15	.17	.097	.17	.11
MAX	2.0	.98	.61	.55	.82	.80	1.3	.92	1.5	.46	.79	1.8
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	11	17	4.3	2.5	8.0	11	19	9.0	10	6.0	10	6.4

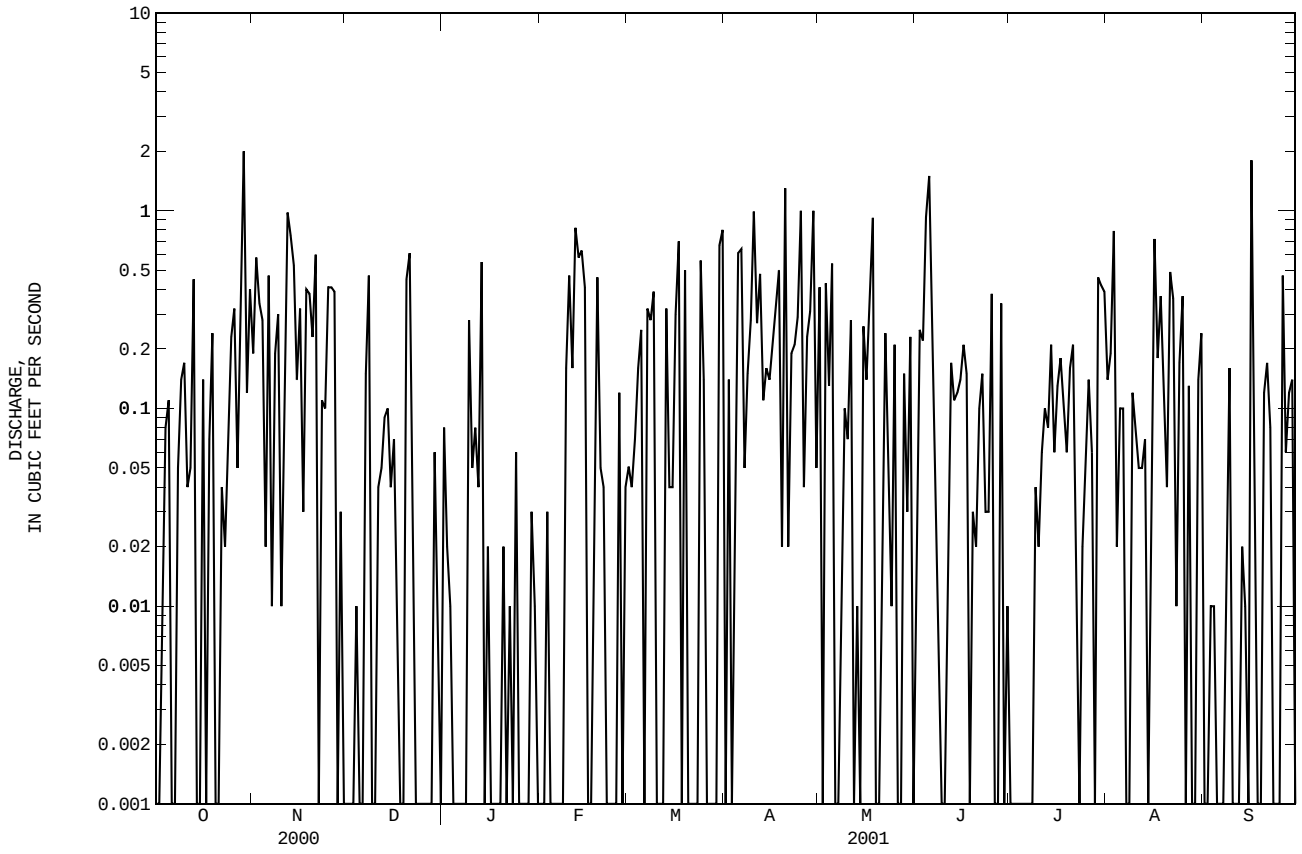
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2001, BY WATER YEAR (WY)

MEAN	.14	.26	.24	.26	.12	.20	.29	.10	.14	.17	.16	.12
MAX	.17	.37	.35	.42	.19	.28	.33	.15	.17	.22	.20	.17
(WY)	2001	1999	2000	2000	1999	1999	2001	2001	2001	2000	2000	2000
MIN	.088	.13	.070	.041	.035	.14	.23	.056	.10	.097	.12	.095
(WY)	1999	2000	2001	2001	2000	2000	2000	2000	2000	2001	1999	1999

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1998 - 2001	
ANNUAL TOTAL	63.92		57.73			
ANNUAL MEAN	.17		.16		.18	
HIGHEST ANNUAL MEAN					.21	1999
LOWEST ANNUAL MEAN					.16	2001
HIGHEST DAILY MEAN	3.2	Jan 20	2.0	Oct 29	3.2	Jan 20 2000
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Sep 23 1998
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 9	.00	Jul 1	.00	Feb 24 1999
ANNUAL RUNOFF (AC-FT)	127		115		133	
10 PERCENT EXCEEDS	.45		.47		.50	
50 PERCENT EXCEEDS	.05		.05		.06	
90 PERCENT EXCEEDS	.00		.00		.00	

e Estimated



Periods of no flow are plotted as 0.001 ft^3/s

HAWAII, ISLAND OF OAHU
212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA--Continued
WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1998 to current year.

INSTRUMENTATION.--Automatic water-quality (point) sampler since September 1998.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	SAMPLE TYPE	GAGE HEIGHT (FEET) (00065)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SAM-PLING METHOD, CODES (82398)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUN													
05...	1815	9	1.50	1.7	70	6.9	7.6	65	66	22.9	<10	40	<.040
SEP													
16...	1600	9	1.22	.01	70	7.8	7.7	195	--	--	<10	132	<.040
16...	0745	H	--	--	50	8.0	7.4	50	--	--	47	22	E.032

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L) (00556)	HYDRO-CARBONS PET.WAT FREON CHR.IR. RECOV. (MG/L) (45501)
JUN												
05...	.16	<.050	E.005	<.060	<.060	14	.10	7.0	2	34	<1	<2
SEP												
16...	.12	.582	<.006	.080	.093	<10	E.02	4.6	<1	8	1	<2
16...	.86	.053	<.006	<.060	.188	21	.30	136	12	142	--	--

Sample type
9 Regular
H Composite
E Estimated

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16226200 NORTH HALAWA STREAM NEAR HONOLULU

LOCATION.--Lat 21°23'04", long 157°54'22", Hydrologic Unit 20060000, on right bank, 0.5 mi north of Halawa quarry, 1.7 mi east of Aiea High School, and 1.9 mi east of Aiea.

DRAINAGE AREA.--4.01 mi^2.

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 160 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Vaughn Kunishige. Records fair.

AVERAGE DISCHARGE.--18 years (water years 1984-2001), 4.87 ft^3/s (3,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,780 ft^3/s, December 18, 1990, gage height, 12.02 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0300	*643	*10.11	No other peak greater than base discharge.			

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

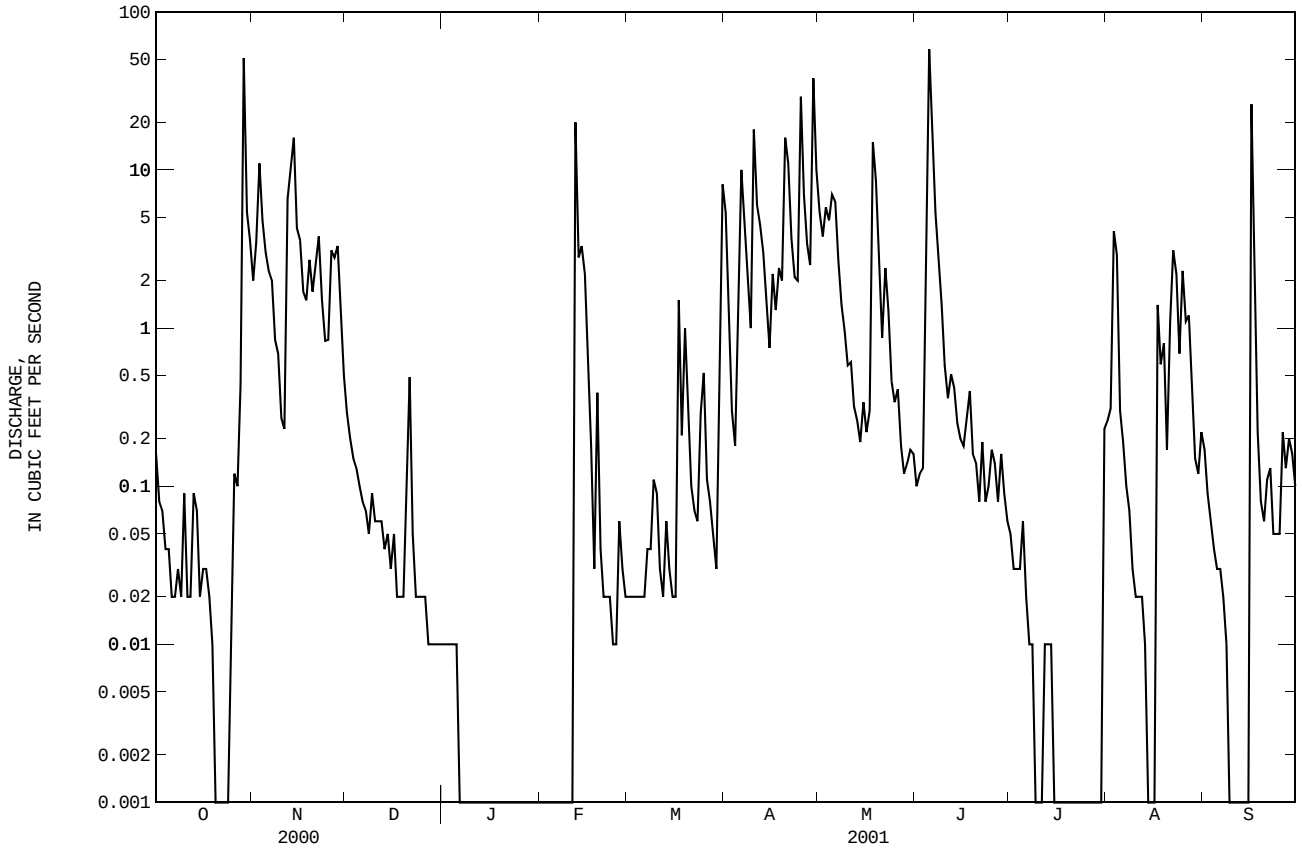
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.16	2.0	.29	.01	.00	.02	5.4	5.4	.10	.05	.26	.17
2	.08	3.5	.20	.01	.00	.02	1.1	3.8	.12	.03	.31	.09
3	.07	11	.15	.01	.00	.02	.30	5.8	.13	.03	4.1	.06
4	.04	4.8	.13	.01	.00	.02	.18	4.8	8.5	.03	2.9	.04
5	.04	3.0	.10	.01	.00	.02	1.5	7.0	58	.06	.30	.03
6	.02	2.3	.08	.00	.00	.02	10	6.3	18	.02	.19	.03
7	.02	2.0	.07	.00	.00	.04	3.9	2.7	5.4	.01	.10	.02
8	.03	.84	.05	.00	.00	.04	1.9	1.4	2.7	.01	.07	.01
9	.02	.69	.09	.00	.00	.11	1.0	.95	1.4	.00	.03	.00
10	.09	.27	.06	.00	.00	.09	18	.58	.58	.00	.02	.00
11	.02	.23	.06	.00	.00	.03	6.0	.61	.36	.00	.02	.00
12	.02	6.6	.06	.00	20	.02	4.5	.32	.51	.01	.02	.00
13	.09	10	.04	.00	2.8	.06	3.0	.26	.42	.01	.01	.00
14	.07	16	.05	.00	3.3	.03	1.6	.19	.25	.01	.00	.00
15	.02	4.3	.03	.00	2.2	.02	.75	.34	.20	.00	.00	.00
16	.03	3.6	.05	.00	.48	.02	2.2	.22	.18	.00	.00	26
17	.03	1.7	.02	.00	.18	1.5	1.3	.30	.26	.00	1.4	2.1
18	.02	1.5	.02	.00	.03	.21	2.4	15	.40	.00	.59	.22
19	.01	2.7	.02	.00	.39	1.0	2.0	8.6	.16	.00	.80	.08
20	.00	1.7	.12	.00	.04	.27	16	2.4	.14	.00	.17	.06
21	.00	2.5	.49	.00	.02	.10	11	.87	.08	.00	1.1	.11
22	.00	3.8	.05	.00	.02	.07	3.7	2.4	.19	.00	3.1	.13
23	.00	1.5	.02	.00	.02	.06	2.1	1.3	.08	.00	2.2	.05
24	.00	.83	.02	.00	.01	.29	2.0	.46	.10	.00	.69	.05
25	.01	.84	.02	.00	.01	.52	29	.34	.17	.00	2.3	.05
26	.12	3.1	.02	.00	.06	.11	7.0	.41	.14	.00	1.1	.22
27	.10	2.8	.01	.00	.03	.08	3.4	.18	.08	.00	1.2	.13
28	.44	3.3	.01	.00	.02	.05	2.5	.12	.16	.00	.37	.20
29	51	1.2	.01	.00	---	.03	38	.14	.09	.00	.15	.16
30	5.4	.50	.01	.00	---	.48	10	.17	.06	.00	.12	.10
31	3.6	---	.01	.00	---	8.1	---	.16	---	.23	.22	---
TOTAL	61.55	99.10	2.36	0.05	29.61	13.45	191.73	73.52	98.96	0.50	23.84	30.11
MEAN	1.99	3.30	.076	.002	1.06	.43	6.39	2.37	3.30	.016	.77	1.00
MAX	51	16	.49	.01	20	8.1	38	15	58	.23	4.1	26
MIN	.00	.23	.01	.00	.00	.02	.18	.12	.06	.00	.00	.00
AC-FT	122	197	4.7	.1	59	27	380	146	196	1.0	47	60

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2001, BY WATER YEAR (WY)

MEAN	3.46	7.44	7.84	6.71	3.76	7.28	6.46	2.59	2.00	3.92	2.74	2.73
MAX	9.71	29.1	40.6	29.6	17.4	31.0	35.3	15.5	7.84	15.0	10.0	12.6
(WY)	1992	1997	1988	1988	1989	1991	1989	1988	1987	1989	1991	1992
MIN	.000	.059	.008	.001	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1985	1990	1990	1986	1983	1983	1983	1992	1984	1984	1984	1984

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1983 - 2001	
ANNUAL TOTAL	1052.88		624.78			
ANNUAL MEAN	2.88		1.71		4.87	
HIGHEST ANNUAL MEAN					10.1	1988
LOWEST ANNUAL MEAN					1.43	1984
HIGHEST DAILY MEAN	165	Jan 20	58	Jun 5	476	Mar 24 1994
LOWEST DAILY MEAN	.00	Mar 8	.00	Oct 20	.00	Feb 1 1983
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 10	.00	Jan 6	.00	Feb 1 1983
ANNUAL RUNOFF (AC-FT)	2090		1240		3530	
10 PERCENT EXCEEDS	4.0		3.8		9.9	
50 PERCENT EXCEEDS	.06		.09		.41	
90 PERCENT EXCEEDS	.00		.00		.00	



Periods of no flow are plotted as 0.001 ft^3/s

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1983 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1983 to September 30, 1999 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Sediment concentrations: maximum daily mean 5,360 mg/L (estimated), November 14, 1996; 0 mg/L on many days in 1983-86, 1988, 1990, 1992-95, 1997-99. Sediment discharge: maximum daily 5,310 tons, March 24, 1994; 0.0 tons on many days in 1983-86, 1990, 1992-95, 1997-99.

INSTRUMENTATION.--Automatic water-quality (point) sampler since September 1998.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	SAMPLE TYPE	GAGE HEIGHT (FEET) (00065)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SAM-PLING METHOD, CODES (82398)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUN													
05...	1900	9	7.71	80	70	6.9	7.6	90	94	--	49	76	<.040
SEP													
16...	0930	H	--	--	50	7.5	7.2	68	--	--	522	46	<.040
16...	1600	9	6.92	22	10	7.1	7.3	99	99	23.6	10	72	<.040

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L) (00556)	HYDRO-CARBONS PET.WAT FREON CHR.IR. RECOV. (MG/L) (45501)
JUN												
05...	.47	<.050	E.003	<.060	.085	25	E.03	4.3	<1	9	<1	<2
SEP												
16...	2.2	.104	<.006	<.060	.582	110	.35	64.0	11	128	--	--
16...	.33	.105	<.006	<.060	E.046	13	E.02	3.8	<1	4	<1	<2

E Estimated

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16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'00", long 157°50'49", Hydrologic Unit 20060000, on right bank 1.9 mi upstream from Kamanaiki Stream, and 4.1 mi north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi^2.

PERIOD OF RECORD.--September 1913 to April 1914, July 1914 to current year. Monthly discharge only for some periods, published in WSP 1319.
CHEMICAL ANALYSES: Water years 1972, 1974-93, 1996, quarterly.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1719: 1921-22(M), 1923-24, 1925-26(M), 1927-28, 1929-32(M), 1935, 1937, 1938-39(M), 1943(M), 1948-52(P), 1955-56, 1957-58(M), 1959.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 464.40 ft above mean sea level (by stadia survey). Prior to October 12, 1923, at datum 2.00 ft lower.

REMARKS.--Records computed by H.A. Jeppesen. Records fair.

AVERAGE DISCHARGE.--87 years (water years 1915-2001), 6.36 ft^3/s (4,610 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft^3/s, November 18, 1930, gage height, 13.81 ft, from rating curve extended above 280 ft^3/s on basis of indirect measurements at gage heights 8.9 ft, 10.96 ft, and 11.27 ft; minimum, 0.09 ft^3/s, October 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 3	0015	*705	*7.34	No other peak greater than base discharge.			

Minimum discharge, 0.31 ft^3/s, Sept. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	e4.5	e2.9	1.3	.88	1.1	1.3	5.8	1.3	1.2	.84	1.0
2	2.8	e7	2.7	1.5	.88	1.0	1.3	4.1	2.5	1.2	.84	.86
3	2.5	e75	2.6	1.3	1.0	.98	1.0	4.7	2.1	1.1	2.5	.75
4	2.3	e9.8	2.5	1.3	.80	.95	1.1	3.6	9.1	1.2	1.7	.66
5	2.5	e6.4	2.4	1.2	.74	1.7	5.1	8.5	52	1.2	.96	.67
6	2.5	e5.6	2.2	1.2	.85	1.1	6.4	3.8	7.4	1.1	1.0	.61
7	2.1	e4.6	2.4	1.2	.81	1.1	2.5	3.1	3.9	.93	.76	.54
8	2.1	e4.2	4.6	1.2	.85	1.3	2.0	2.7	3.0	1.1	.62	.52
9	2.1	e7.8	3.4	1.5	1.1	2.4	1.6	2.5	2.4	1.1	.68	.80
10	2.0	e4.4	2.5	1.4	1.1	1.7	6.8	2.0	2.4	.95	.69	.50
11	2.0	e3.4	2.3	1.5	1.0	1.1	2.3	2.0	2.8	.92	.60	.54
12	1.8	e7.2	2.1	1.3	20	1.1	1.9	1.8	3.1	.91	.60	.52
13	1.6	e6.4	2.2	4.3	6.2	2.0	1.6	1.7	2.8	.90	.61	.79
14	1.6	e5.7	2.3	1.4	2.2	1.3	1.7	1.6	2.4	1.2	.59	.84
15	1.5	e4.4	2.3	1.0	3.0	1.1	1.9	1.8	2.2	1.1	.54	.79
16	1.6	e9.8	2.1	.85	1.4	1.8	2.0	1.8	2.2	1.2	2.6	37
17	1.4	e4.3	2.0	.80	1.0	28	2.0	2.0	2.1	1.1	1.9	2.7
18	1.3	e4	1.9	.69	.88	4.0	3.0	3.4	2.1	.91	1.7	1.5
19	1.4	e5.5	1.9	.61	2.2	10	1.9	2.7	1.8	.89	1.3	1.2
20	1.3	e2.9	2.0	.62	.98	2.6	9.3	1.8	1.6	1.1	.95	.90
21	1.2	e6.1	4.8	.76	.85	1.8	4.2	1.7	1.4	1.4	2.9	1.0
22	1.3	e4.4	1.5	.84	.79	1.5	2.9	4.2	1.4	1.1	2.8	.95
23	1.3	e2.7	1.2	.86	.75	1.4	2.6	2.2	1.5	.89	2.3	.82
24	1.2	e2.2	1.1	.89	.76	1.4	3.4	1.7	1.6	.76	1.4	.80
25	1.4	e2.4	1.2	.92	.74	1.6	12	1.8	1.6	.64	1.4	.85
26	1.3	e3.7	1.2	.88	.74	1.2	3.6	2.0	1.4	.63	1.1	1.6
27	1.4	e2.4	1.3	.83	.90	1.3	2.8	1.5	1.3	.60	1.6	.86
28	5.7	e2.3	1.2	.77	1.1	1.2	2.5	1.5	1.5	.59	1.0	.95
29	26	e1.8	1.4	.98	---	1.4	25	1.7	1.2	.74	.90	.81
30	4.0	e1.6	1.3	1.1	---	1.4	5.7	1.5	1.2	1.1	1.0	.92
31	6.2	---	1.3	.93	---	1.3	---	1.5	---	1.2	.97	---
TOTAL	90.6	212.5	66.8	35.93	54.50	81.83	121.4	82.7	123.3	30.96	39.35	63.25
MEAN	2.92	7.08	2.15	1.16	1.95	2.64	4.05	2.67	4.11	1.00	1.27	2.11
MAX	26	75	4.8	4.3	20	28	25	8.5	52	1.4	2.9	37
MIN	1.2	1.6	1.1	.61	.74	.95	1.0	1.5	1.2	.59	.54	.50
AC-FT	180	421	132	71	108	162	241	164	245	61	78	125

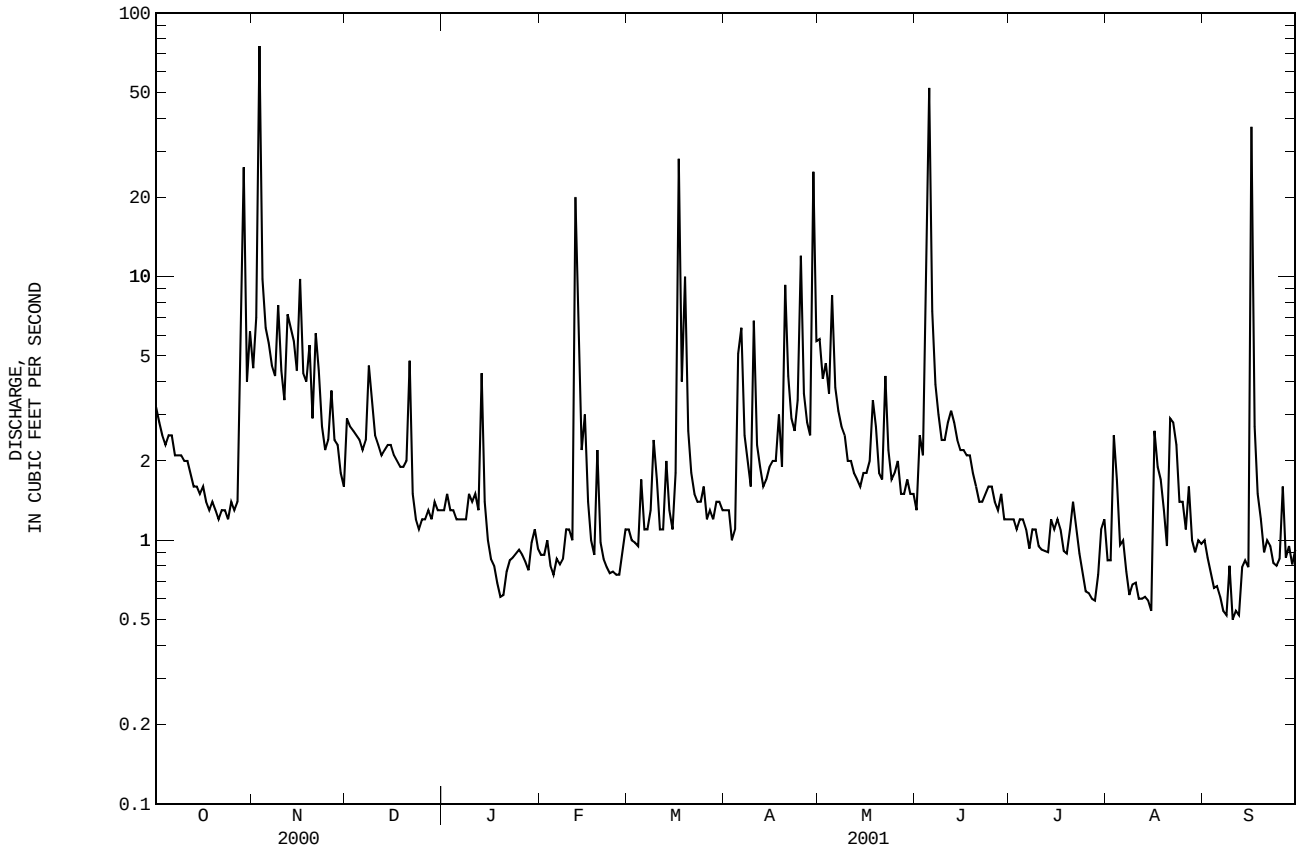
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2001, BY WATER YEAR (WY)

MEAN	4.53	7.26	8.30	8.93	7.03	8.37	8.26	6.32	3.68	4.47	4.98	4.46
MAX	18.9	35.0	35.0	65.7	48.6	40.6	36.0	37.5	12.9	16.6	26.7	31.3
(WY)	1937	1928	1930	1923	1932	1951	1989	1927	1934	1954	1958	1914
MIN	.29	.46	.74	.50	.34	.74	.63	.27	.32	.60	.43	.30
(WY)	1985	1954	1977	1977	1978	1926	1926	1926	1966	1984	1984	1984

16229000 KALIHI STREAM NEAR HONOLULU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1914 - 2001	
ANNUAL TOTAL	1339.12		1003.12			
ANNUAL MEAN	3.66		2.75		6.36	
HIGHEST ANNUAL MEAN					13.5	1923
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	106	Jan 20	75	Nov 3	951	Jan 19 1923
LOWEST DAILY MEAN	.58	May 29	.50	Sep 10	.11	Jul 29 1966
ANNUAL SEVEN-DAY MINIMUM	.67	May 29	.58	Sep 6	.15	May 15 1926
ANNUAL RUNOFF (AC-FT)	2660		1990		4610	
10 PERCENT EXCEEDS	6.1		4.5		11	
50 PERCENT EXCEEDS	1.8		1.5		2.8	
90 PERCENT EXCEEDS	.84		.79		.95	

e Estimated



16229300 KALIHI STREAM AT KALIHI

LOCATION.--Lat 21°20'29", long 157°52'36", Hydrologic Unit 20060000, on right bank at Kalihi, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu Post Office.

DRAINAGE AREA.--5.18 mi^2.

PERIOD OF RECORD.--Water year 1962 (annual maximum), July 1962 to current year.
CHEMICAL ANALYSES: Water years 1970-74, 1975-93, quarterly.
SUSPENDED-SEDIMENT DISCHARGE: Water years 1969-74, 1975-93, quarterly.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1719: 1921-22(M), 1923-24, 1925-26(M), 1927-28, 1929-32(M), 1935, 1937, 1938-39(M), 1943(M), 1948-52(P), 1955-56, 1957-58(M), 1959.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 70 ft above mean sea level (from topographic map). August 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft downstream at different datum.

REMARKS.--Records computed by Heather Jeppesen. Records fair.

AVERAGE DISCHARGE.--39 years (water years 1963-2001), 9.84 ft^3/s (7,130 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s, April 19, 1974, gage height, 9.98 ft from rating curve extended above 180 ft^3/s on basis of slope-area measurement at gage height 9.98 ft; minimum, 0 ft^3/s, October 13-14, 1999.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 14, 1960, reached a stage of 8.0 ft from floodmarks, present site and datum, discharge, 6,350 ft^3/s, from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 980 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 3	0330	1,020	4.06	Jun 5	1530	*1,080	*4.18

Minimum discharge, 0.90 ft^3/s, Aug. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	6.5	3.7	2.0	1.8	1.4	2.1	9.1	e2.0	e1.7	1.9	1.6
2	3.3	11	2.7	2.4	2.0	1.5	2.9	7.1	e3.7	e1.7	2.3	1.1
3	3.0	115	3.1	1.9	1.8	1.5	3.2	7.6	e3.1	e1.6	3.6	1.1
4	2.8	15	3.1	1.9	1.7	1.2	2.7	6.1	e13	e1.7	3.7	1.1
5	3.2	10	2.2	1.8	1.4	2.1	4.8	13	e70	e1.7	1.7	1.0
6	2.6	9.0	2.6	1.8	2.5	1.4	12	6.1	14	e1.6	2.3	1.0
7	2.6	7.4	3.3	1.8	1.1	1.6	4.6	4.8	6.2	e1.5	1.5	.88
8	2.5	6.9	4.6	1.7	1.1	2.8	5.8	4.1	4.7	e1.6	1.3	.91
9	2.6	13	5.2	2.2	1.8	5.3	4.1	4.7	4.0	e1.7	1.5	1.4
10	2.4	7.6	3.1	3.0	1.8	3.6	23	3.4	3.3	e1.8	1.6	.89
11	2.3	6.1	2.9	3.2	2.1	1.8	6.6	3.7	3.0	e1.5	1.5	.88
12	3.1	13	3.1	2.8	26	1.8	7.6	e2.7	3.1	e1.5	1.6	.86
13	2.6	11	3.4	6.2	12	2.9	5.2	e2.6	3.1	e1.6	1.1	.99
14	2.2	10	3.8	2.9	9.4	1.8	4.9	e2.4	2.3	e2.0	.90	.86
15	1.8	8.0	3.9	2.1	12	1.3	4.7	e2.7	2.4	e1.9	.99	.89
16	2.3	17	3.5	1.9	3.0	2.2	4.6	e2.7	2.7	e2.0	3.7	60
17	2.0	8.3	3.3	1.9	1.9	34	4.4	e2.8	2.8	e1.8	3.4	5.0
18	2.0	8.4	3.4	1.7	1.5	6.3	6.6	e4.7	e2.6	e1.5	2.9	2.3
19	2.4	10	3.6	2.0	3.8	13	5.5	e3.7	e2.5	e1.5	2.6	1.7
20	2.4	6.3	4.0	2.1	1.7	4.8	15	e2.4	e2.3	e1.8	1.5	1.6
21	2.5	12	10	2.1	1.4	3.2	8.9	e2.4	e2.0	e2.2	6.0	2.2
22	2.5	8.9	3.1	1.9	1.4	2.5	5.9	e5.9	e2.0	e1.7	3.5	1.6
23	2.8	6.2	2.7	2.4	1.6	2.3	4.9	e3.1	e2.1	e1.6	3.6	1.3
24	2.4	5.4	2.5	3.1	1.2	2.4	5.7	e2.4	e2.2	e1.5	2.4	1.2
25	3.5	5.7	2.4	2.0	.94	2.8	20	e2.6	e2.2	e1.4	2.2	1.2
26	4.6	8.0	2.3	1.6	1.8	1.9	7.8	e2.8	e2.0	e1.3	1.6	3.1
27	3.2	6.1	2.3	2.6	1.0	1.8	6.0	e2.1	e1.8	e1.2	2.0	1.7
28	11	5.9	2.1	2.2	1.3	2.0	5.5	e2.1	e2.0	e1.2	1.5	1.9
29	40	4.8	2.1	2.8	---	2.1	35	e2.4	e1.7	e1.5	1.4	1.6
30	5.5	4.1	1.9	2.8	---	2.7	10	e2.1	e1.7	e1.8	1.6	1.8
31	7.1	---	1.9	1.9	---	2.1	---	e2.1	---	2.6	1.6	---
TOTAL	136.9	366.6	101.8	72.7	101.04	118.1	240.0	126.4	170.5	51.7	68.99	103.66
MEAN	4.42	12.2	3.28	2.35	3.61	3.81	8.00	4.08	5.68	1.67	2.23	3.46
MAX	40	115	10	6.2	26	34	35	13	70	2.6	6.0	60
MIN	1.8	4.1	1.9	1.6	.94	1.2	2.1	2.1	1.7	1.2	.90	.86
AC-FT	272	727	202	144	200	234	476	251	338	103	137	206

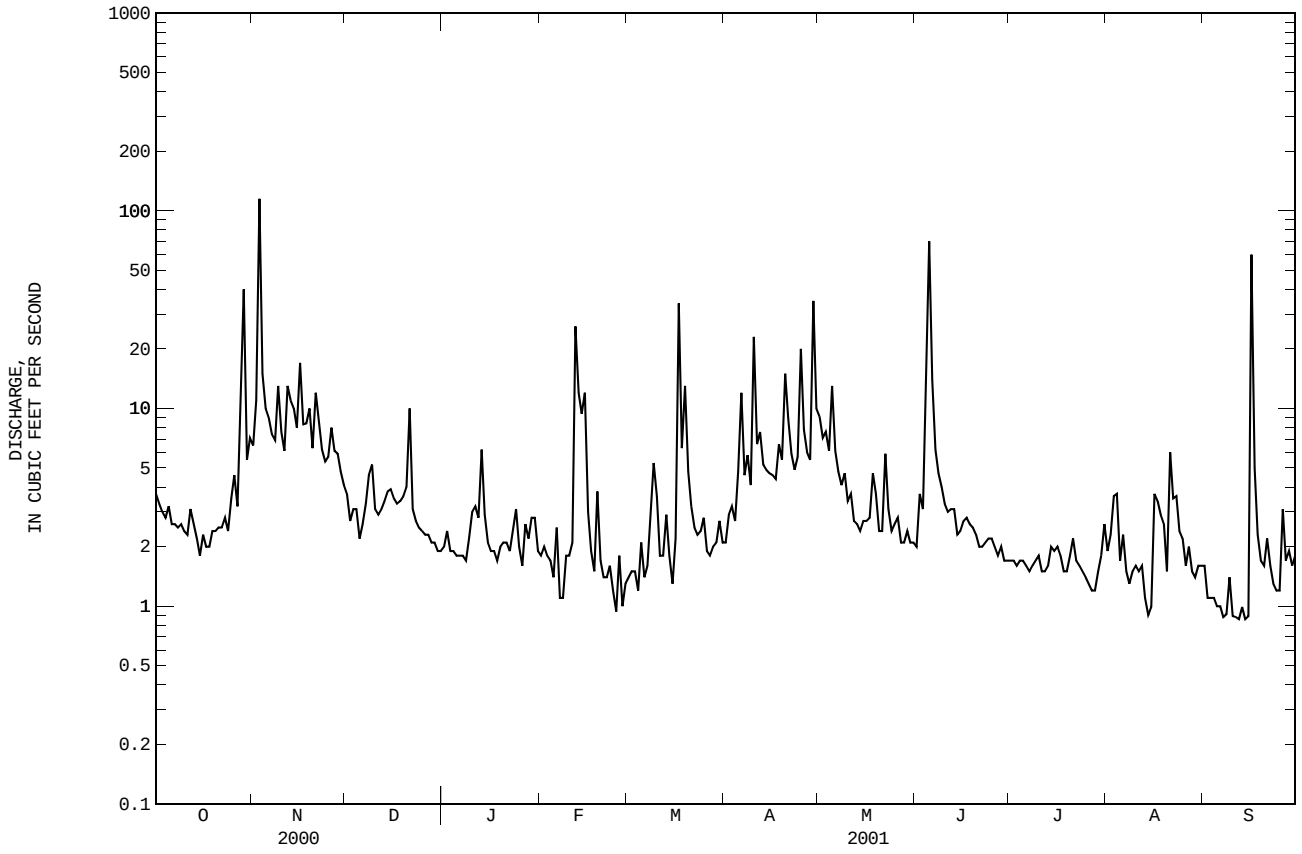
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2001, BY WATER YEAR (WY)

MEAN	6.57	13.5	14.4	13.2	10.5	14.9	13.1	8.98	5.24	7.52	5.85	4.62
MAX	22.2	49.2	56.6	45.8	60.3	73.2	57.6	40.9	19.5	29.3	35.7	20.4
(WY)	1964	1966	1988	1982	1969	1968	1989	1965	1980	1970	1982	1992
MIN	.95	2.15	1.15	.82	.78	1.15	1.65	1.49	.87	1.17	.83	.64
(WY)	1985	1981	1977	1977	1978	1983	1992	1966	1966	1984	1984	1984

16229300 KALIHI STREAM AT KALIHI--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1962 - 2001	
ANNUAL TOTAL	2207.46		1658.39			
ANNUAL MEAN	6.03		4.54		9.84	
HIGHEST ANNUAL MEAN					21.3	1982
LOWEST ANNUAL MEAN					3.13	1984
HIGHEST DAILY MEAN	248	Jan 20	115	Nov 3	781	Feb 1 1969
LOWEST DAILY MEAN	.86	Jun 30	.86	Sep 12	.05	Oct 14 1999
ANNUAL SEVEN-DAY MINIMUM	1.0	Jun 24	.97	Sep 9	.36	Oct 14 1984
ANNUAL RUNOFF (AC-FT)	4380		3290		7130	
10 PERCENT EXCEEDS	9.4		8.3		17	
50 PERCENT EXCEEDS	2.8		2.4		3.7	
90 PERCENT EXCEEDS	1.2		1.4		1.3	

e Estimated



16240500 WAIAKEAKUA STREAM AT HONOLULU

LOCATION.--Lat 21°19'52", long 157°48'08", Hydrologic Unit 20060000, on right bank 5 ft downstream from bridge on Waaloa Way, 500 ft upstream from confluence with Waihi Stream, and 4.2 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 mi^2.

PERIOD OF RECORD.--May 1913 to January 1921, August 1925 to current year. Prior to July 1960, published as East Branch Manoa Stream near Honolulu.

REVISED RECORDS.--WSP 1319: 1919(M), 1930-33(M). WSP 1569: Drainage area. WSP 1937: 1949(M), 1960(M).

GAGE.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft above mean sea level (Honolulu Board of Water Supply benchmark). Prior to May 20, 1914, nonrecording gage at site 200 ft upstream at different datum. May 20, 1914 to January 16, 1921, water-stage recorder at site 30 ft upstream at different datum. August 18, 1925 to March 15, 1928, water-stage recorder at present site at datum 2.99 ft lower. March 16, 1928 to October 18, 1933, water-stage recorder at present site at datum 0.41 ft higher.

REMARKS.--Records computed by H.A.Jeppesen. Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel upstream of station. Occasional small diversions for irrigation upstream of station.

AVERAGE DISCHARGE.--83 years (water years 1914-20, 1926-2001), 4.86 ft^3/s (3,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s, January 16, 1921, gage height, 10.4 ft, from floodmarks, site and datum then in use, from rating curve extended above 58 ft^3/s; minimum, 0.6 ft^3/s, June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0230	638	3.66	Jun 5	1415	*741	*3.80
Nov 3	0015	374	3.18				

Minimum discharge, 1.3 ft^3/s, July 27-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

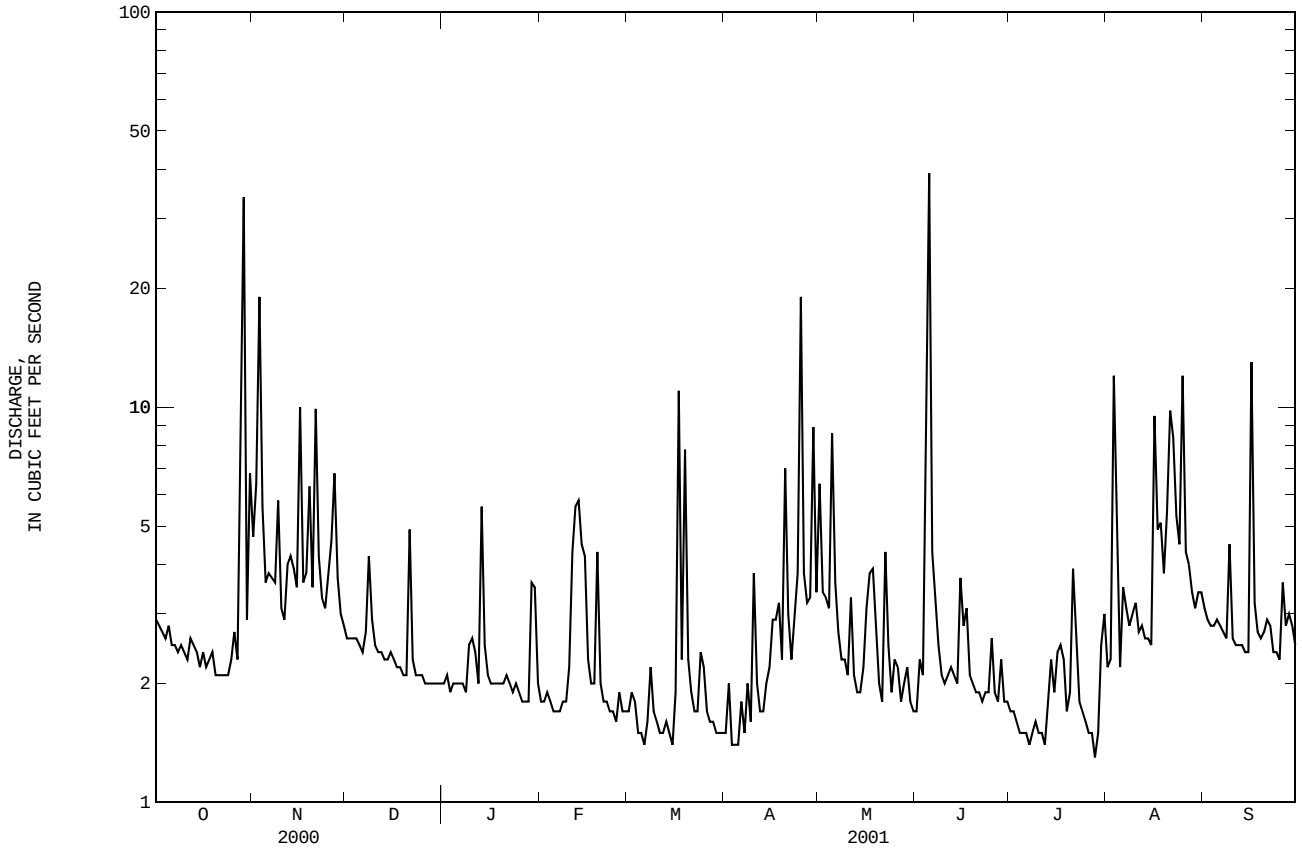
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	4.7	2.6	2.0	1.8	1.7	1.5	6.4	1.7	1.7	2.2	3.1
2	2.8	6.4	2.6	2.1	1.8	1.9	2.0	3.4	2.3	1.7	2.3	2.9
3	2.7	19	2.6	1.9	1.9	1.8	1.4	3.3	2.1	1.6	12	2.8
4	2.6	5.6	2.6	2.0	1.8	1.5	1.4	3.1	5.6	1.5	4.1	2.8
5	2.8	3.6	2.5	2.0	1.7	1.5	1.4	8.6	39	1.5	2.2	2.9
6	2.5	3.8	2.4	2.0	1.7	1.4	1.8	3.6	4.3	1.5	3.5	2.8
7	2.5	3.7	2.7	2.0	1.7	1.6	1.5	2.7	3.2	1.4	3.1	2.7
8	2.4	3.6	4.2	1.9	1.8	2.2	2.0	2.3	2.5	1.5	2.8	2.6
9	2.5	5.8	2.9	2.5	1.8	1.7	1.6	2.3	2.1	1.6	3.0	4.5
10	2.4	3.1	2.5	2.6	2.2	1.6	3.8	2.1	2.0	1.5	3.2	2.6
11	2.3	2.9	2.4	2.4	4.3	1.5	2.0	3.3	2.1	1.5	2.7	2.5
12	2.6	4.0	2.4	2.0	5.6	1.5	1.7	2.1	2.2	1.4	2.8	2.5
13	2.5	4.2	2.3	5.6	5.8	1.6	1.7	1.9	2.1	1.8	2.6	2.5
14	2.4	3.9	2.3	2.5	4.5	1.5	2.0	1.9	2.0	2.3	2.6	2.4
15	2.2	3.5	2.4	2.1	4.2	1.4	2.2	2.2	3.7	1.9	2.5	2.4
16	2.4	10	2.3	2.0	2.3	1.9	2.9	3.1	2.8	2.4	9.5	13
17	2.2	3.6	2.2	2.0	2.0	11	2.9	3.8	3.1	2.5	4.9	3.2
18	2.3	3.8	2.2	2.0	2.0	2.3	3.2	3.9	2.1	2.3	5.1	2.7
19	2.4	6.3	2.1	2.0	4.3	7.8	2.3	2.8	2.0	1.7	3.8	2.6
20	2.1	3.5	2.1	2.0	2.0	2.3	7.0	2.0	1.9	1.9	5.4	2.7
21	2.1	9.9	4.9	2.1	1.8	1.9	3.0	1.8	1.9	3.9	9.8	2.9
22	2.1	4.2	2.3	2.0	1.8	1.7	2.3	4.3	1.8	2.6	8.4	2.8
23	2.1	3.3	2.1	1.9	1.7	1.7	2.9	2.5	1.9	1.8	5.3	2.4
24	2.1	3.1	2.1	2.0	1.7	2.4	3.8	1.9	1.9	1.7	4.5	2.4
25	2.3	3.8	2.1	1.9	1.6	2.2	19	2.3	2.6	1.6	12	2.3
26	2.7	4.6	2.0	1.8	1.9	1.7	3.8	2.2	1.9	1.5	4.3	3.6
27	2.3	6.8	2.0	1.8	1.7	1.6	3.2	1.8	1.8	1.5	4.0	2.8
28	9.9	3.7	2.0	1.8	1.7	1.6	3.3	2.0	2.3	1.3	3.4	3.0
29	34	3.0	2.0	3.6	---	1.5	8.9	2.2	1.8	1.5	3.1	2.8
30	2.9	2.8	2.0	3.5	---	1.5	3.4	1.8	1.8	2.5	3.4	2.5
31	6.8	---	2.0	2.0	---	1.5	---	1.7	---	3.0	3.4	---
TOTAL	118.8	150.2	75.8	70.0	69.1	69.0	99.9	89.3	108.5	58.1	141.9	93.7
MEAN	3.83	5.01	2.45	2.26	2.47	2.23	3.33	2.88	3.62	1.87	4.58	3.12
MAX	34	19	4.9	5.6	5.8	11	19	8.6	39	3.9	12	13
MIN	2.1	2.8	2.0	1.8	1.6	1.4	1.4	1.7	1.7	1.3	2.2	2.3
AC-FT	236	298	150	139	137	137	198	177	215	115	281	186

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2001, BY WATER YEAR (WY)

MEAN	4.17	5.23	5.31	4.89	4.43	5.36	5.64	5.09	4.16	4.90	4.81	4.16
MAX	10.7	18.1	15.5	14.8	15.6	19.5	17.5	13.3	10.3	12.3	13.6	13.3
(WY)	1915	1928	1988	1988	1955	1942	1989	1988	1938	1958	1958	1914
MIN	1.18	1.17	1.42	1.28	1.03	1.14	1.16	.87	1.27	.87	1.31	1.27
(WY)	1946	1934	1920	1977	1920	1926	1926	1926	1920	1926	1984	1984

16240500 WAIAKEAKUA STREAM AT HONOLULU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1913 - 2001	
ANNUAL TOTAL	1338.0		1144.3			
ANNUAL MEAN	3.66		3.14		4.86	
HIGHEST ANNUAL MEAN					8.23	1988
LOWEST ANNUAL MEAN					1.94	1920
HIGHEST DAILY MEAN	59	Jan 19	39	Jun 5	183	Mar 24 1994
LOWEST DAILY MEAN	1.7	May 27	1.3	Jul 28	.62	Feb 26 1920
ANNUAL SEVEN-DAY MINIMUM	1.7	Aug 10	1.5	Jul 6	.75	May 23 1926
ANNUAL RUNOFF (AC-FT)	2650		2270		3520	
10 PERCENT EXCEEDS	5.6		4.5		8.0	
50 PERCENT EXCEEDS	2.4		2.3		3.5	
90 PERCENT EXCEEDS	1.8		1.6		1.8	



16242500 MANOA STREAM AT KANEWAI FIELD

LOCATION.--Lat 21°17'47", long 157°48'56", Hydrologic Unit 20060000, on left bank, 0.5 mi northeast of Kaimuki High School, 0.4 mi northwest of St. Louis High School, and 0.3 mi upstream from confluence with Palolo Stream.

DRAINAGE AREA.--5.99 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1999 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 38.0 ft. above mean sea level (by stadia survey).

REMARKS.--Records computed by Lisa Miller. Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,900 ft^3/s, June 5, 2001, gage height, 14.81 ft. Minimum discharge, 1.6 ft^3/s, July 11, 2001, gage height, 8.93 ft; minimum gage height, 8.75 ft., July 12, 2001.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0247	1,340	13.69	Feb 12	1907	461	11.54
Nov 3	0041	631	12.01	Jun 5	1429	*1,900	*14.81

Minimum discharge, 1.6 ft^3/s, July 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	15	6.7	2.7	2.8	2.7	4.1	29	3.6	3.3	6.3	5.5
2	5.7	20	6.4	3.2	2.6	4.3	5.4	12	5.1	3.2	6.1	5.0
3	5.4	68	6.0	2.5	3.9	4.4	4.6	12	3.8	3.0	34	5.0
4	5.3	21	5.9	2.5	2.5	3.0	4.7	10	16	2.9	15	5.4
5	6.1	12	5.5	2.4	2.3	3.3	4.1	28	125	2.7	7.5	6.7
6	4.9	12	4.9	2.2	2.9	3.4	8.0	10	16	2.7	10	4.6
7	4.8	11	6.3	2.1	2.4	3.8	5.4	7.8	9.7	2.9	5.8	4.4
8	4.5	17	8.4	2.0	2.6	5.6	9.3	7.0	7.3	2.8	4.7	4.2
9	5.2	23	6.8	2.5	2.6	3.9	6.4	7.6	6.0	2.5	5.1	6.8
10	8.4	9.3	4.7	3.5	3.4	3.2	18	6.5	5.4	1.9	6.1	4.5
11	4.7	8.3	4.4	2.5	13	2.6	7.3	10	5.2	2.2	4.6	4.1
12	5.9	14	4.2	2.1	40	2.5	6.1	6.1	5.5	3.0	4.6	4.0
13	6.6	18	4.3	9.0	27	2.5	6.1	5.6	6.2	4.2	4.1	3.9
14	5.1	18	4.3	3.7	26	2.7	7.6	5.4	5.2	8.5	4.0	3.8
15	4.0	12	4.4	2.6	17	2.4	8.9	7.2	8.8	3.5	3.7	3.9
16	5.5	48	3.9	2.3	7.0	3.5	8.2	7.5	6.7	4.6	18	31
17	3.7	14	3.7	e2.3	5.4	24	10	9.0	6.6	5.0	8.8	5.6
18	3.7	13	3.6	e2.3	4.7	4.9	12	7.9	5.0	5.2	11	4.0
19	3.9	26	e3.8	e2.3	9.0	14	8.1	7.3	4.5	3.4	7.2	3.4
20	3.0	12	e4.2	2.3	4.2	4.0	20	4.9	4.5	5.6	12	4.7
21	2.9	36	16	2.2	3.6	3.3	10	4.4	4.5	10	28	6.7
22	2.9	16	3.4	2.1	3.5	3.0	8.6	7.4	4.6	6.3	17	4.5
23	4.0	11	2.8	2.0	3.1	2.8	8.1	5.2	4.7	3.9	11	3.2
24	3.7	11	2.6	e2.1	2.9	7.1	11	3.9	4.6	3.6	10	3.0
25	5.8	13	2.5	e2.0	2.8	5.0	67	4.0	5.7	3.2	26	2.7
26	5.3	18	e2.5	e2.0	3.7	3.5	10	4.9	4.1	3.6	8.5	7.9
27	5.6	17	e2.5	e2.0	2.8	3.2	9.1	3.6	3.7	2.8	7.5	5.3
28	29	11	e2.5	e2.0	2.7	3.1	9.7	3.4	6.0	2.5	6.4	5.8
29	87	8.2	e2.5	e8.1	---	3.3	32	4.4	3.7	4.5	5.7	4.4
30	9.9	7.3	2.7	9.0	---	3.9	12	3.9	3.4	7.5	6.0	3.4
31	21	---	2.5	3.2	---	3.9	---	3.6	---	12	6.4	---
TOTAL	279.6	540.1	144.9	93.7	206.4	142.8	341.8	249.5	301.1	133.0	311.1	167.4
MEAN	9.02	18.0	4.67	3.02	7.37	4.61	11.4	8.05	10.0	4.29	10.0	5.58
MAX	87	68	16	9.0	40	24	67	29	125	12	34	31
MIN	2.9	7.3	2.5	2.0	2.3	2.4	4.1	3.4	3.4	1.9	3.7	2.7
AC-FT	555	1070	287	186	409	283	678	495	597	264	617	332

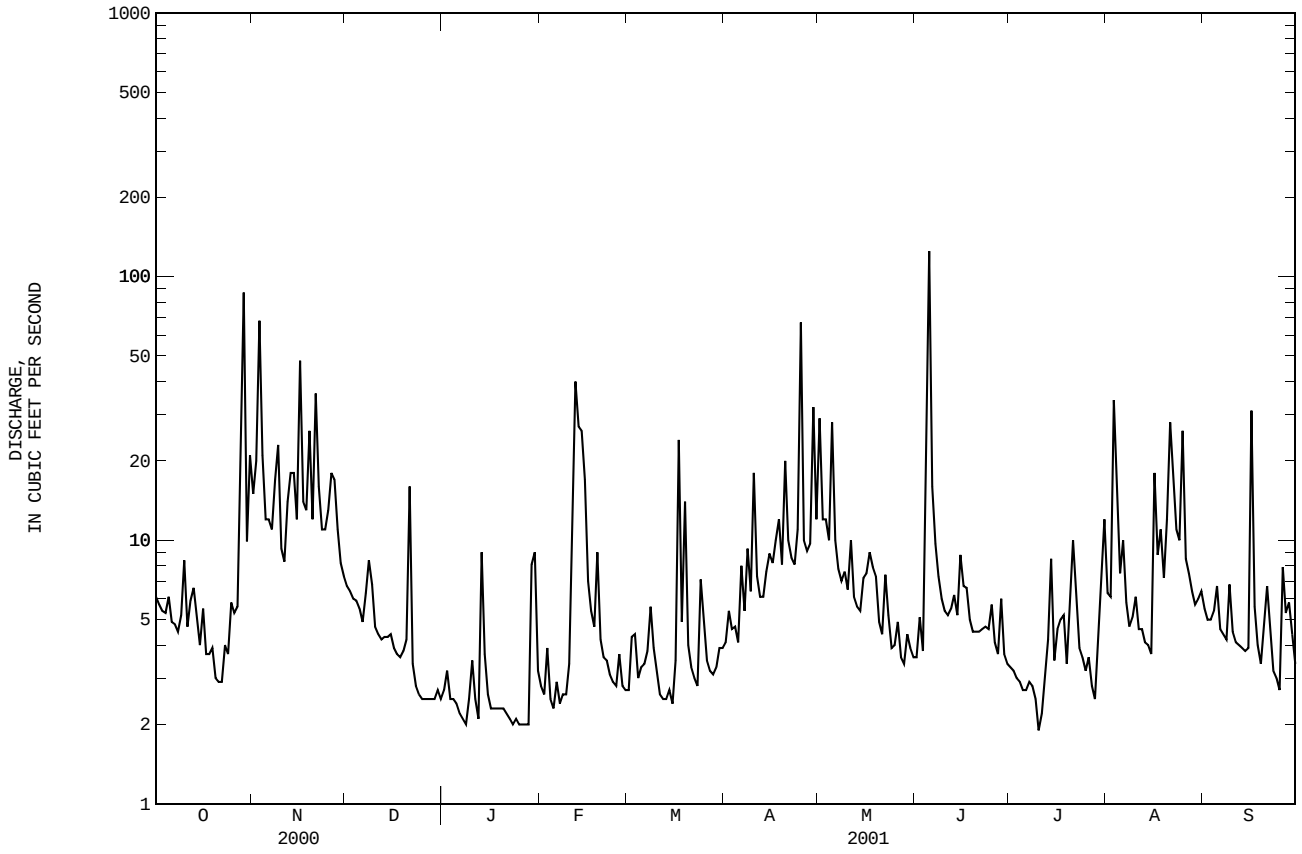
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2001, BY WATER YEAR (WY)

MEAN	7.68	13.0	12.7	14.9	8.62	10.5	14.6	6.29	6.88	9.07	9.12	7.52
MAX	9.02	18.0	20.7	26.8	13.0	22.5	16.6	8.05	10.0	13.3	10.3	13.1
(WY)	2001	2001	2000	2000	1999	1999	1999	2001	2001	1999	2000	2000
MIN	6.35	7.93	4.67	3.02	5.54	4.45	11.4	4.87	4.10	4.29	7.03	3.89
(WY)	2000	2000	2001	2001	2000	2000	2001	2000	2000	2001	1999	1999

16242500 MANOA STREAM AT KANEWAI FIELD--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1999 - 2001	
ANNUAL TOTAL	3848.8		2911.4			
ANNUAL MEAN	10.5		7.98		9.40	
HIGHEST ANNUAL MEAN					10.8	2000
LOWEST ANNUAL MEAN					7.98	2001
HIGHEST DAILY MEAN	202	Jan 19	125	Jun 5	202	Jan 19 2000
LOWEST DAILY MEAN	2.4	Jun 27	1.9	Jul 10	1.9	Jul 10 2001
ANNUAL SEVEN-DAY MINIMUM	2.5	Dec 25	2.0	Jan 22	2.0	Jan 22 2001
ANNUAL RUNOFF (AC-FT)	7630		5770		6810	
10 PERCENT EXCEEDS	18		16		19	
50 PERCENT EXCEEDS	5.7		5.0		5.8	
90 PERCENT EXCEEDS	3.2		2.5		3.0	

e Estimated



16242500 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 1999 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1999 to current year.
WATER TEMPERATURE: January 1999 to current year.

INSTRUMENTATION.--Specific conductance and water temperature monitor January 1999 to current year. Automatic water-quality (point) sampler March 1999 to current year.

REMARKS.--Water-quality samples were collected monthly from March 1999 through February 2001. Monthly samples were collected with a hand-held sampler using the equal-width-increment sampling method. Additional samples were collected during storms using an automatic (point) sampler. Storm samples were collected on November 3 and June 5 this year. All samples analyzed for VOCs were collected near the centroid of flow using a hand-held VOC sampler.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 1,190 microsiemens per centimeter, May 25, 2000; minimum, 36 microsiemens per centimeter, February 12, 2001.
WATER TEMPERATURE: Maximum, 26.5°C, June 11, 12, 27, 2000; July 31, 2000; July 3, 4, 5, 6, 9, 10, 29, 2001: minimum, 17.5°C, January 18, 2000.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 458 microsiemens/cm, July 27; minimum, 36 microsiemens/cm, Feb. 12.
WATER TEMPERATURE: Maximum, 26.6°C, July 4, 29; minimum, 18.3°C, Feb. 5, Mar. 20.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT													
18...	1100	3.8	8.0	94	8.0	197	23.5	9.77	8.26	.98	13.2	61	75
30...	1000	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
03...	0036	569	--	--	7.4	89	23.5	4.95	3.07	1.25	6.8	26	32
15...	1040	11	8.0	92	8.0	181	22.5	11.2	7.23	1.06	13.1	50	62
DEC													
13...	1145	4.1	8.0	92	7.9	186	22.5	10.4	8.46	1.13	13.4	60	73
JAN													
17...	1245	2.0	8.3	95	8.0	183	22.0	10.9	8.85	1.01	14.2	61	74
FEB													
21...	1200	3.7	8.4	95	8.0	204	21.5	11.3	8.86	1.13	14.8	63	77
JUN													
05...	1413	790	--	--	7.3	75	24.0	4.81	2.61	1.88	6.2	20	24

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
OCT													
18...	20.4	.2	18.4	5.4	<.041	.10	.19	.067	<.006	.018	E.016	.061	122
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
03...	8.8	<.2	9.0	2.5	<.041	E.10	5.4	E.046	E.004	.018	E.013	1.80	58
15...	18.2	<.2	15.7	6.6	<.041	<.10	.19	.179	E.003	.017	E.013	.040	111
DEC													
13...	16.9	<.2	18.7	5.6	<.041	E.06	.19	<.047	<.006	.006	<.018	.024	116
JAN													
17...	18.7	<.2	18.8	5.3	<.041	.12	.26	.109	E.003	.025	E.016	.062	117
FEB													
21...	20.4	<.2	18.6	7.8	<.041	E.09	.13	.156	E.005	.017	E.017	.034	123
JUN													
05...	8.1	<.2	5.9	2.9	.112	.50	12	.221	E.005	.058	.029	2.73	47

E Estimated

16242500 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	CARBON, INORG + ORGANIC PARTIC. TOTAL (MG/L AS C) (00694)	CARBON, INOR-GANIC, PARTIC. TOTAL (MG/L AS C) (00688)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)
OCT													
18...	1.3	1.0	9	1.0	<.1	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
03...	2.7	100	796	100	<.1	32	.05	.6	1.7	<.06	24	<.04	E.6
15...	1.6	1.3	11	1.3	<.1	--	--	--	--	--	--	--	--
DEC													
13...	2.7	.9	6	.9	<.1	--	--	--	--	--	--	--	--
JAN													
17...	1.2	1.3	52	1.3	<.1	--	--	--	--	--	--	--	--
FEB													
21...	1.1	.7	6	.7	<.1	--	--	--	--	--	--	--	--
JUN													
05...	4.8	27	1320	27	<.1	10	.49	1.5	2.4	<.06	22	E.03	<.8

DATE	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	THAL-LIUM, DIS-SOLVED (UG/L AS TL) (01057)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)
OCT													
18...	--	--	100	--	--	13.4	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
03...	.09	1.6	70	.11	E.2	4.8	<.2	.75	<.3	<1.0	33.1	<.04	1.5
15...	--	--	80	--	--	17.6	--	--	--	--	--	--	--
DEC													
13...	--	--	210	--	--	33.2	--	--	--	--	--	--	--
JAN													
17...	--	--	160	--	--	18.0	--	--	--	--	--	--	--
FEB													
21...	--	--	50	--	--	18.3	--	--	--	--	--	--	--
JUN													
05...	.21	2.1	60	.35	<.3	22.9	.2	.74	<.3	<1.0	35.7	<.04	3.5

DATE	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)
OCT													
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
03...	1	<.02	<.011	<.002	<.004	<.002	<.005	<.007	<.050	<.010	<.002	E.007	<.020
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
13...	--	--	<.011	<.002	<.004	<.002	<.005	<.007	<.050	<.010	<.002	E.034	<.020
JAN													
17...	--	--	<.011	<.002	<.004	<.002	<.005	<.007	<.050	<.010	<.002	<.041	<.020
FEB													
21...	--	--	<.011	<.002	<.004	<.002	<.005	E.001	<.050	<.010	<.002	<.041	<.020
JUN													
05...	1	<.02	E.006	<.002	<.004	<.002	<.005	<.007	<.050	<.010	<.002	E.027	<.020

E Estimated

16242500 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)
OCT													
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
03...	<.005	<.006	<.018	<.003	<.006	.009	.024	<.021	<.002	<.009	<.005	<.003	<.004
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
13...	<.005	<.006	<.018	<.003	<.006	<.005	.056	<.021	<.002	<.009	<.005	<.003	<.004
JAN													
17...	<.005	<.006	<.018	<.003	<.006	<.005	.032	<.021	<.002	<.009	<.005	<.003	<.004
FEB													
21...	<.005	<.006	<.018	<.003	<.006	<.005	.048	<.021	<.002	<.009	<.005	<.003	<.004
JUN													
05...	<.005	<.006	<.018	<.003	<.006	.010	.034	<.021	<.002	<.009	<.005	<.003	<.004

DATE	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	P,P' DDE DISSOLV (UG/L) (34653)	PARA-THION, DIS-SOLVED (UG/L) (39542)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)
OCT													
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
03...	<.035	E.010	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	<.015
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
13...	<.035	<.027	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	E.004
JAN													
17...	<.035	<.027	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	.006
FEB													
21...	<.035	<.027	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	E.004
JUN													
05...	<.035	.045	<.013	<.006	<.002	<.007	<.003	<.007	<.006	<.002	<.010	<.011	<.015

DATE	PROPA-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TER-BUTHYL-AZINE, WATER, DISS, REC (UG/L) (04022)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)
OCT											
18...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
NOV											
03...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009
15...	--	--	--	--	--	--	--	--	--	--	--
DEC											
13...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009
JAN											
17...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009
FEB											
21...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009
JUN											
05...	<.010	<.011	<.023	<.004	<.016	<.034	<.017	U	<.005	<.002	<.009

E Estimated

16242500 MANOA STREAM AT KANEWAI FIELD--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

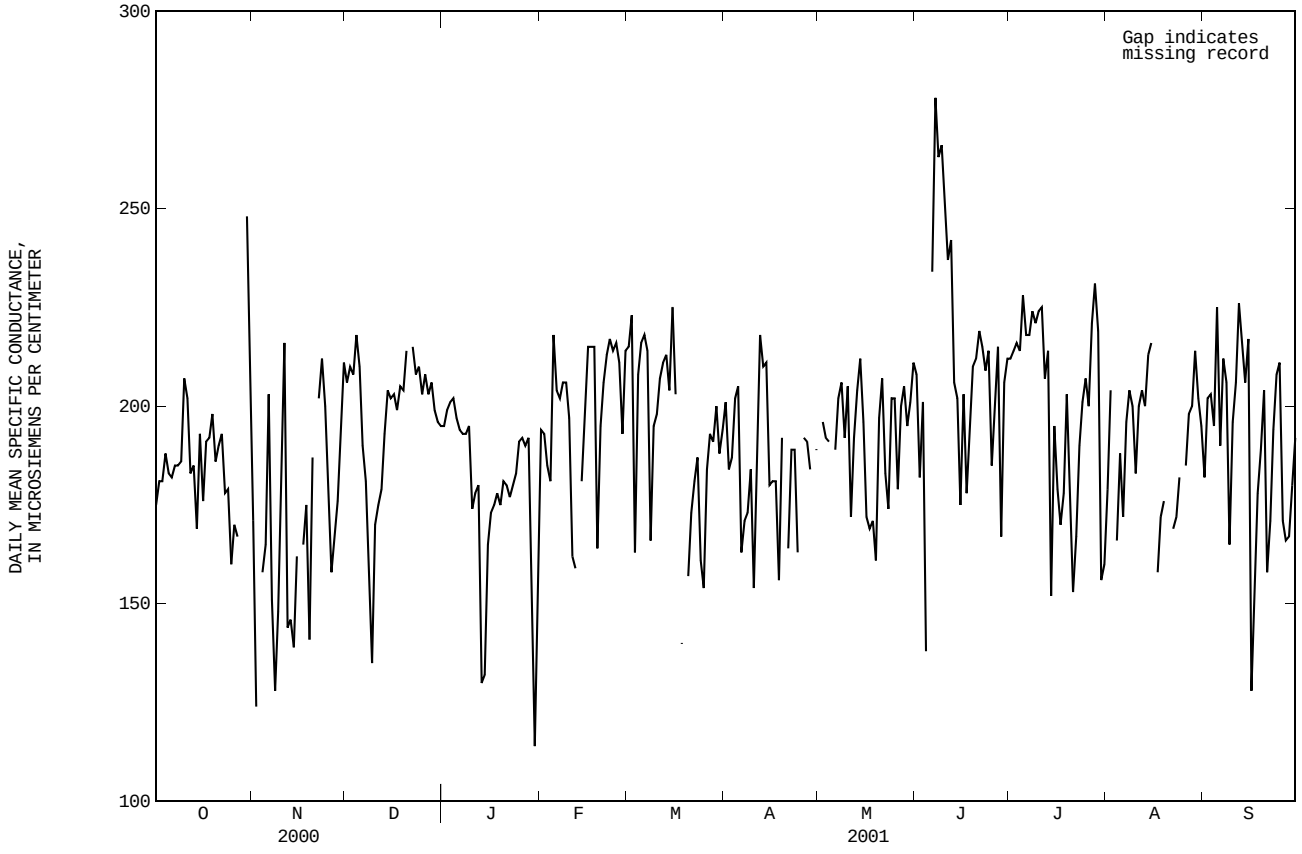
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	180	171	175	247	146	171	217	198	206	201	188	195
2	298	173	181	162	97	124	220	198	210	233	186	199
3	188	177	181	---	---	---	220	190	208	220	184	201
4	194	181	188	232	94	158	231	208	218	353	184	202
5	303	163	183	212	100	165	219	199	210	208	186	197
6	186	177	182	219	160	203	210	182	190	203	185	194
7	192	180	185	161	112	151	288	157	181	199	185	193
8	189	180	185	179	75	128	172	126	162	200	185	193
9	200	180	186	183	124	148	167	110	135	202	185	195
10	312	183	207	216	155	191	175	167	170	253	162	174
11	210	186	202	220	205	216	179	169	175	185	163	178
12	273	160	183	205	119	144	183	175	179	188	172	180
13	202	148	185	164	129	146	206	181	193	190	96	130
14	190	134	169	180	97	139	443	188	204	156	100	132
15	197	187	193	190	125	162	222	190	202	169	154	165
16	198	154	176	---	---	---	242	191	203	177	164	173
17	196	182	191	177	142	165	211	189	199	186	163	175
18	199	179	192	185	160	175	217	199	205	385	92	178
19	329	167	198	184	109	141	212	196	204	181	166	175
20	191	177	186	194	170	187	251	196	214	187	165	181
21	197	183	190	---	---	---	---	---	---	187	167	180
22	203	183	193	224	152	202	291	182	215	182	167	177
23	197	162	178	217	209	212	223	194	208	184	174	180
24	198	167	179	269	183	200	230	202	210	195	166	183
25	201	132	160	204	128	184	214	194	203	375	167	191
26	258	145	170	187	131	158	238	194	208	205	181	192
27	197	141	167	201	110	166	212	194	203	204	180	190
28	---	---	---	191	149	176	369	191	206	200	181	192
29	---	---	---	200	191	195	208	187	199	196	102	159
30	269	203	248	304	198	211	208	183	196	152	75	114
31	257	166	210	---	---	---	201	185	195	174	152	166
MONTH	329	132	187	304	75	171	443	110	197	385	75	179

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	308	172	194	228	202	215	215	186	201	---	---	---
2	213	179	193	328	154	223	204	169	184	210	158	196
3	199	159	185	195	127	163	193	171	187	227	162	192
4	220	159	181	212	195	208	213	190	202	203	173	191
5	282	197	218	226	202	216	229	189	205	---	---	---
6	216	182	204	227	208	218	191	125	163	200	176	189
7	233	187	202	232	194	214	187	132	171	250	199	202
8	337	187	206	208	131	166	199	126	173	215	203	206
9	225	194	206	271	159	195	205	159	184	210	160	192
10	213	179	197	232	182	198	204	111	154	249	197	205
11	203	101	162	217	197	207	224	174	195	209	120	172
12	233	36	159	224	197	211	230	203	218	203	167	192
13	---	---	---	221	205	213	227	196	210	207	198	204
14	235	129	181	224	195	204	231	164	211	270	206	212
15	230	154	200	319	198	225	216	135	180	219	175	196
16	220	211	215	228	161	203	214	159	181	179	163	172
17	220	208	215	---	---	---	209	141	181	220	152	169
18	219	207	215	162	105	140	194	135	156	190	153	171
19	221	117	164	---	---	---	201	176	192	190	136	161
20	210	171	195	174	131	157	---	---	---	207	190	197
21	214	197	206	180	167	173	260	115	164	213	199	207
22	305	198	213	187	171	181	206	169	189	216	148	183
23	256	201	217	326	172	187	256	170	189	189	154	174
24	226	203	214	192	103	161	187	143	163	322	189	202
25	226	204	216	181	119	154	---	---	---	206	198	202
26	225	179	211	188	177	184	262	175	192	203	169	179
27	211	165	193	201	179	193	208	178	191	202	192	200
28	230	201	214	204	177	191	203	155	184	207	201	205
29	---	---	---	286	179	200	---	---	---	235	180	195
30	---	---	---	201	118	188	208	170	189	209	193	201
31	---	---	---	208	163	194	---	---	---	260	200	211
MONTH	337	36	199	328	103	192	262	111	186	322	120	192

16242500 MANOA STREAM AT KANEWAI FIELD--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	217	197	208	218	207	212	207	137	179	202	164	182
2	221	151	182	220	209	214	336	190	204	217	196	202
3	208	182	201	225	209	216	---	---	---	207	198	203
4	205	101	138	218	209	214	184	134	166	220	183	195
5	---	---	---	383	210	228	194	184	188	315	146	225
6	265	178	234	222	211	218	204	136	172	233	148	190
7	301	252	278	222	213	218	209	178	196	228	203	212
8	272	254	263	229	216	224	208	200	204	213	200	206
9	271	263	266	225	217	221	210	187	200	210	139	165
10	264	238	253	234	216	224	203	169	183	277	169	196
11	238	236	237	245	208	225	216	187	200	213	198	206
12	266	214	242	384	112	207	211	195	204	356	203	226
13	221	190	206	227	162	214	206	194	200	286	198	216
14	254	192	202	186	114	152	374	202	213	215	199	206
15	215	148	175	200	186	195	223	205	216	388	199	217
16	214	167	203	210	157	179	---	---	---	214	40	128
17	214	161	178	195	149	170	182	146	158	255	113	150
18	211	178	195	204	156	178	187	159	172	276	165	178
19	217	204	210	321	189	203	196	154	176	200	179	189
20	219	206	212	227	145	178	---	---	---	357	178	204
21	324	207	219	203	120	153	---	---	---	189	136	158
22	225	208	215	180	159	167	193	122	169	185	161	171
23	221	202	209	195	180	190	224	138	172	198	185	194
24	218	208	214	210	195	201	193	173	182	388	195	208
25	216	171	185	211	203	207	---	---	---	392	195	211
26	207	191	201	224	183	200	196	163	185	217	129	171
27	222	207	215	458	188	221	235	192	198	231	146	166
28	216	124	167	236	226	231	207	195	200	189	150	167
29	328	184	206	231	151	219	284	204	214	188	172	180
30	218	206	212	190	119	156	258	188	202	197	183	192
31	---	---	---	190	128	160	200	168	195	---	---	---
MONTH	328	101	211	458	112	200	374	122	190	392	40	190
YEAR	458	36	191									



16242500 MANOA STREAM AT KANEWAI FIELD--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

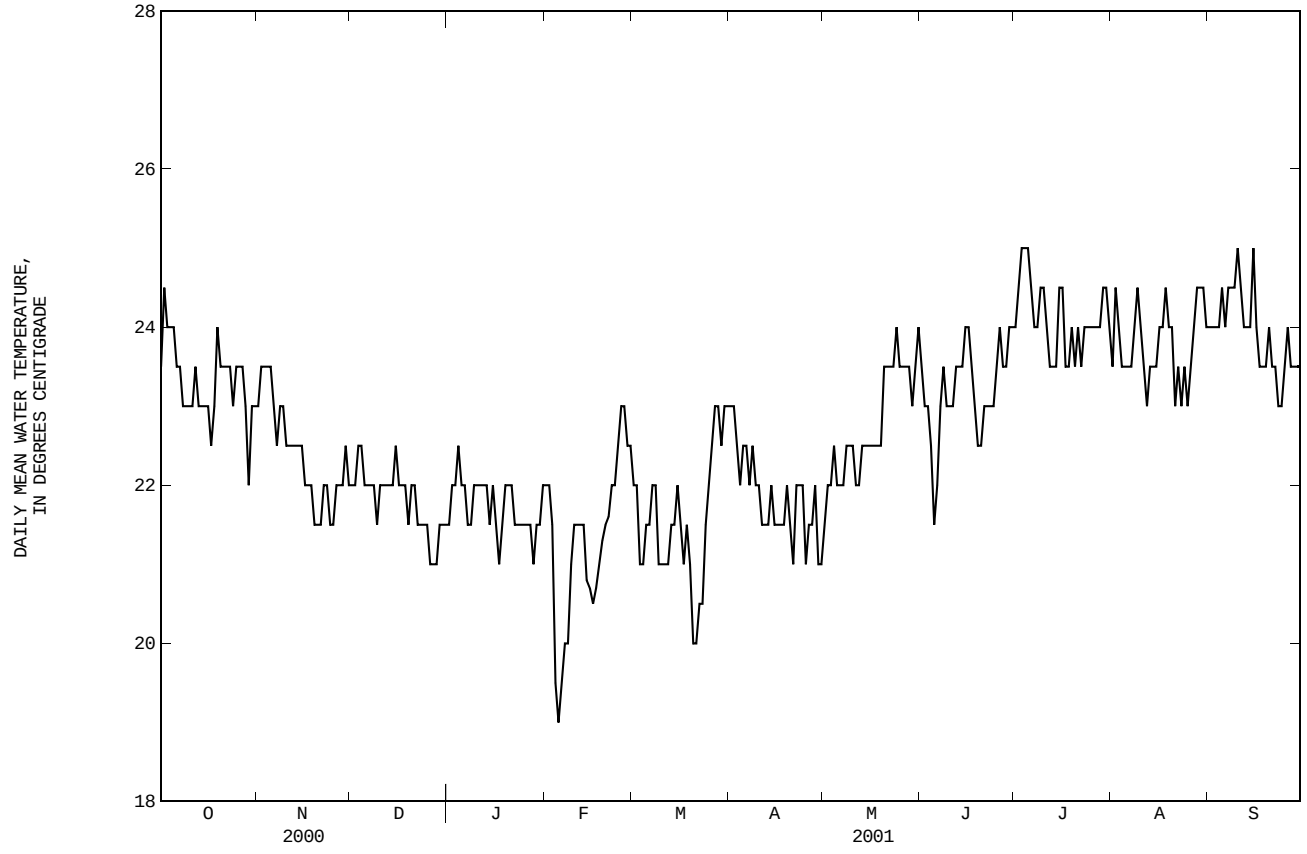
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	25.0	22.5	23.5	24.0	22.5	23.0	23.0	21.0	22.0	22.0	21.0	21.5
2	25.5	23.0	24.5	24.5	22.5	23.5	23.0	21.5	22.0	22.5	21.5	22.0
3	25.0	23.0	24.0	25.0	23.0	23.5	23.0	21.5	22.5	23.0	21.5	22.0
4	25.0	23.0	24.0	24.5	22.5	23.5	23.0	21.5	22.5	23.0	22.0	22.5
5	24.5	23.0	24.0	24.0	22.5	23.5	22.5	21.0	22.0	22.5	21.5	22.0
6	24.5	22.5	23.5	24.0	22.5	23.0	22.5	21.0	22.0	23.0	21.0	22.0
7	24.5	22.5	23.5	23.5	22.0	22.5	23.5	21.0	22.0	22.0	20.5	21.5
8	24.0	22.0	23.0	24.0	22.0	23.0	23.0	21.5	22.0	22.0	21.0	21.5
9	23.5	22.0	23.0	24.0	22.0	23.0	22.5	21.0	21.5	23.0	21.5	22.0
10	24.0	22.0	23.0	23.5	21.5	22.5	22.5	21.0	22.0	23.0	21.5	22.0
11	24.0	22.5	23.0	23.5	21.5	22.5	23.0	21.0	22.0	22.5	22.0	22.0
12	24.5	22.5	23.5	23.5	22.0	22.5	22.5	21.5	22.0	22.5	21.5	22.0
13	24.0	22.5	23.0	24.0	22.0	22.5	22.5	21.0	22.0	23.0	21.5	22.0
14	24.0	22.5	23.0	23.5	21.5	22.5	23.0	21.5	22.0	22.5	21.0	21.5
15	23.5	22.5	23.0	24.0	22.0	22.5	22.5	22.0	22.5	22.5	21.5	22.0
16	23.5	22.0	23.0	23.0	21.5	22.0	22.5	21.5	22.0	22.0	21.0	21.5
17	23.5	22.0	22.5	22.5	21.0	22.0	22.5	21.5	22.0	22.0	20.5	21.0
18	24.0	22.0	23.0	22.5	21.5	22.0	22.5	21.0	22.0	22.0	20.5	21.5
19	25.0	23.5	24.0	22.5	21.0	21.5	22.0	20.5	21.5	23.0	21.0	22.0
20	24.5	23.0	23.5	22.5	21.0	21.5	22.0	21.5	22.0	22.5	21.0	22.0
21	24.5	22.5	23.5	24.5	20.5	21.5	23.0	21.5	22.0	22.5	21.5	22.0
22	24.5	23.0	23.5	23.0	21.0	22.0	22.0	21.0	21.5	22.5	21.0	21.5
23	24.5	22.5	23.5	22.5	21.0	22.0	22.0	21.0	21.5	22.0	21.0	21.5
24	24.5	22.5	23.0	22.5	21.0	21.5	22.5	21.0	21.5	22.5	20.5	21.5
25	24.0	22.5	23.5	23.0	21.0	21.5	22.5	21.0	21.5	22.0	21.0	21.5
26	24.5	22.5	23.5	23.0	21.5	22.0	21.5	20.0	21.0	22.0	21.0	21.5
27	24.5	22.5	23.5	23.5	21.0	22.0	21.5	20.5	21.0	22.5	21.0	21.5
28	24.5	21.5	23.0	23.0	21.5	22.0	21.5	20.5	21.0	22.0	20.5	21.0
29	23.5	21.0	22.0	23.5	21.5	22.5	22.5	21.0	21.5	22.5	21.0	21.5
30	24.0	21.5	23.0	22.5	21.0	22.0	22.5	21.0	21.5	22.5	20.5	21.5
31	24.0	22.5	23.0	---	---	---	22.0	20.5	21.5	23.0	21.5	22.0
MONTH	25.5	21.0	23.3	25.0	20.5	22.4	23.5	20.0	21.8	23.0	20.5	21.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	23.0	21.5	22.0	23.0	21.5	22.0	23.5	22.0	23.0	24.0	21.0	21.5
2	23.0	21.0	22.0	23.0	21.5	22.0	23.5	22.5	23.0	24.0	21.0	22.0
3	22.0	20.0	21.5	22.0	21.0	21.0	24.0	21.5	22.5	24.0	21.0	22.0
4	20.0	18.5	19.5	21.5	20.0	21.0	23.5	21.5	22.0	24.5	21.0	22.5
5	20.0	18.5	19.0	22.0	21.0	21.5	23.5	21.0	22.5	23.0	20.5	22.0
6	21.5	18.5	19.5	23.0	20.5	21.5	23.0	22.0	22.5	24.0	20.5	22.0
7	21.5	18.5	20.0	22.5	21.0	22.0	23.0	21.0	22.0	24.0	21.0	22.0
8	21.0	20.0	20.0	22.5	21.0	22.0	23.5	22.0	22.5	23.5	21.0	22.5
9	21.5	20.5	21.0	22.5	20.0	21.0	23.5	20.5	22.0	24.0	21.0	22.5
10	22.0	21.5	21.5	22.5	20.5	21.0	23.5	20.5	22.0	23.5	21.0	22.5
11	22.5	21.0	21.5	22.5	20.0	21.0	22.5	20.0	21.5	23.5	21.0	22.0
12	24.5	20.5	21.5	22.0	20.5	21.0	23.0	20.5	21.5	23.0	20.5	22.0
13	22.0	21.0	21.5	22.5	20.5	21.5	23.0	20.5	21.5	23.5	20.5	22.5
14	22.0	19.9	20.8	22.0	20.5	21.5	23.0	20.5	22.0	23.5	21.0	22.5
15	21.6	20.0	20.7	23.0	21.0	22.0	22.5	20.5	21.5	23.5	21.5	22.5
16	21.6	19.5	20.5	22.5	20.5	21.5	22.5	20.0	21.5	24.0	21.0	22.5
17	21.5	19.8	20.7	22.0	20.5	21.0	23.0	20.5	21.5	23.5	21.5	22.5
18	21.8	20.2	21.0	23.0	20.0	21.5	23.5	20.5	21.5	24.5	21.0	22.5
19	22.2	20.2	21.3	22.0	20.0	21.0	23.5	20.5	22.0	23.5	21.0	22.5
20	22.3	20.5	21.5	21.0	18.5	20.0	24.0	20.5	21.5	24.5	22.0	23.5
21	22.4	20.8	21.6	21.0	19.0	20.0	22.0	20.5	21.0	24.5	22.0	23.5
22	22.5	21.0	22.0	22.0	19.5	20.5	23.5	20.5	22.0	25.0	22.5	23.5
23	23.0	21.0	22.0	21.0	19.5	20.5	23.5	20.5	22.0	25.0	22.0	23.5
24	23.5	21.5	22.5	23.0	20.5	21.5	23.5	20.5	22.0	25.0	22.0	24.0
25	23.5	22.5	23.0	23.5	21.0	22.0	21.5	20.0	21.0	24.5	22.5	23.5
26	24.0	22.0	23.0	24.0	21.5	22.5	23.0	20.5	21.5	25.0	22.0	23.5
27	24.0	22.0	22.5	24.0	22.0	23.0	22.5	20.5	21.5	24.5	22.0	23.5
28	23.5	22.0	22.5	24.0	22.0	23.0	23.5	20.5	22.0	24.5	22.0	23.5
29	---	---	---	23.5	22.0	22.5	22.0	20.5	21.0	24.0	22.5	23.0
30	---	---	---	25.0	21.5	23.0	22.0	20.5	21.0	24.5	22.5	23.5
31	---	---	---	24.0	22.5	23.0	---	---	---	25.0	22.5	24.0
MONTH	24.5	18.5	21.3	25.0	18.5	21.6	24.0	20.0	21.8	25.0	20.5	22.8

16242500 MANOA STREAM AT KANEWAI FIELD--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	24.5	22.5	23.5	24.5	24.0	24.0	24.5	22.5	23.5	24.5	23.0	24.0
2	24.0	22.0	23.0	25.0	24.0	24.5	26.0	23.0	24.5	24.5	22.5	24.0
3	24.5	22.0	23.0	26.5	24.0	25.0	25.5	23.0	24.0	25.0	23.0	24.0
4	24.0	21.0	22.5	26.5	24.5	25.0	24.5	22.5	23.5	25.0	23.0	24.0
5	26.0	20.5	21.5	26.5	24.0	25.0	24.5	22.5	23.5	25.5	23.0	24.5
6	23.5	21.0	22.0	26.5	23.5	24.5	24.5	22.5	23.5	25.0	23.5	24.0
7	24.0	21.5	23.0	25.0	23.5	24.0	25.0	22.5	23.5	26.0	23.5	24.5
8	25.0	22.0	23.5	25.5	23.5	24.0	24.5	23.0	24.0	25.5	24.0	24.5
9	24.0	22.0	23.0	26.5	23.5	24.5	25.0	23.5	24.5	25.0	23.5	24.5
10	24.0	22.0	23.0	26.5	24.0	24.5	24.5	23.5	24.0	26.0	24.0	25.0
11	24.0	22.0	23.0	26.0	23.5	24.0	24.0	22.5	23.5	26.0	24.0	24.5
12	24.0	22.0	23.5	26.0	22.5	23.5	23.5	22.5	23.0	25.0	23.5	24.0
13	24.5	22.0	23.5	25.5	22.5	23.5	24.5	22.5	23.5	25.5	23.0	24.0
14	24.5	22.5	23.5	24.5	22.5	23.5	24.5	22.5	23.5	24.5	23.5	24.0
15	25.0	22.0	24.0	25.5	23.5	24.5	24.5	22.5	23.5	26.0	24.0	25.0
16	25.5	22.5	24.0	25.0	23.5	24.5	25.0	23.5	24.0	25.5	23.0	24.0
17	25.0	22.5	23.5	24.5	23.0	23.5	25.0	23.0	24.0	24.5	23.0	23.5
18	24.0	22.5	23.0	24.5	22.5	23.5	25.5	23.5	24.5	24.5	23.0	23.5
19	23.5	22.0	22.5	25.5	23.0	24.0	24.5	23.0	24.0	24.5	23.0	23.5
20	24.0	21.5	22.5	25.0	23.0	23.5	25.0	23.0	24.0	25.0	23.5	24.0
21	24.5	22.0	23.0	24.5	22.5	24.0	24.5	22.0	23.0	24.5	23.0	23.5
22	24.5	22.5	23.0	24.5	22.5	23.5	25.5	22.5	23.5	24.5	22.5	23.5
23	24.0	22.0	23.0	25.0	22.5	24.0	24.0	22.5	23.0	23.5	22.5	23.0
24	24.0	22.5	23.0	25.5	23.0	24.0	25.0	22.5	23.5	24.5	22.5	23.0
25	24.5	22.0	23.5	25.5	23.0	24.0	24.5	22.0	23.0	25.0	23.0	23.5
26	25.0	23.0	24.0	25.5	23.5	24.0	25.0	22.0	23.5	25.0	23.0	24.0
27	24.5	22.5	23.5	25.5	23.0	24.0	25.0	23.0	24.0	24.5	23.0	23.5
28	24.5	22.5	23.5	26.0	23.0	24.0	25.5	23.0	24.5	24.5	23.0	23.5
29	25.5	23.0	24.0	26.5	23.5	24.5	25.5	23.5	24.5	24.5	22.5	23.5
30	25.0	23.5	24.0	25.5	23.5	24.5	25.0	23.5	24.5	24.5	22.5	23.5
31	---	---	---	25.0	23.0	24.0	25.0	23.0	24.0	---	---	---
MONTH	26.0	20.5	23.2	26.5	22.5	24.1	26.0	22.0	23.8	26.0	22.5	23.9
YEAR	26.5	18.5	22.6									



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16247100 MANOA-PALOLO DRAINAGE CANAL AT MOILIILI

LOCATION.--Lat 21°17'24", long 157°49'17", on left bank at Kaimuki High School, 0.3 mi downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of discharge into Ala Wai Canal.

DRAINAGE AREA.--10.6 mi^2.

PERIOD OF RECORD.--Annual maximum, water years 1968-99. October 1, 1999 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 5 ft above mean sea level (from topographic map). October 1, 1967 to November 29, 1972 crest-stage gage at site 1,800 feet upstream at same datum. November 29, 1972 to current year, crest-stage gage at site 160 feet upstream at same datum.

REMARKS.--Records computed by Heather Jeppesen. Records poor due to tidal backwater.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft^3/s, December 18, 1967, gage height, 12.60 feet, site then in use, from slope-area measurement of peak flow; minimum, 2.4 ft^3/s, April 5, 2001.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	0300	1,770	5.47	Jun 5	1445	*2,590	*6.41

Minimum daily discharge, 2.4 ft^3/s, Apr. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e6.9	16	7.0	3.2	6.7	4.1	3.0	31	3.9	3.5	9.1	6.4
2	e6.1	24	6.6	4.4	6.9	5.0	4.7	16	6.3	3.4	7.7	5.4
3	e6.0	73	6.2	3.4	9.2	6.2	3.2	15	4.6	3.3	41	5.1
4	e6.0	21	6.4	3.1	5.9	3.7	2.7	13	20	3.2	21	5.8
5	e6.9	12	5.9	3.3	5.1	3.9	2.4	35	175	3.0	10	9.2
6	e5.7	12	5.4	3.5	5.8	4.0	6.4	15	22	2.9	14	5.2
7	e5.6	12	6.9	3.8	4.2	4.6	3.3	9.6	12	2.8	7.6	4.8
8	6.2	21	8.6	3.4	5.3	12	8.1	7.9	8.1	2.9	6.2	4.4
9	8.0	25	8.4	4.0	5.3	5.7	5.3	8.7	6.2	2.8	6.5	8.2
10	11	12	6.4	6.3	6.0	5.2	21	7.1	5.6	2.8	8.0	4.3
11	5.5	10	5.9	4.5	22	4.1	6.3	11	5.4	3.6	6.5	3.8
12	6.4	15	5.9	3.6	63	3.7	4.7	6.3	6.1	3.6	6.0	3.8
13	8.0	19	5.4	18	39	4.0	4.5	5.6	7.4	4.6	5.6	3.7
14	5.7	19	5.2	8.4	51	4.8	6.1	5.3	6.0	11	5.2	3.4
15	4.7	13	5.8	6.3	28	4.0	8.5	7.4	11	4.1	4.6	3.4
16	6.2	50	5.5	5.5	14	5.9	7.0	8.4	7.8	5.2	22	32
17	4.5	13	5.2	5.0	10	33	9.6	11	8.7	5.8	12	6.4
18	4.6	12	5.1	4.9	9.7	8.9	13	9.1	5.6	5.8	14	4.6
19	5.8	25	5.3	5.1	15	23	7.5	10	4.8	3.6	9.0	4.0
20	4.2	12	5.9	7.2	14	7.0	20	5.9	4.6	6.5	13	5.4
21	4.2	37	26	5.1	13	5.0	11	5.0	4.2	12	36	8.0
22	4.1	17	6.8	4.9	14	4.4	8.2	9.0	4.5	7.5	22	4.9
23	5.3	11	5.7	3.9	7.4	4.9	7.2	6.8	4.5	4.5	15	3.5
24	5.3	12	5.7	7.8	6.0	13	11	4.8	4.0	4.0	14	3.3
25	7.3	14	5.5	6.6	5.3	9.0	84	e6.3	7.5	4.0	31	3.2
26	6.3	20	5.5	6.3	6.8	4.9	15	e7.9	4.3	4.5	11	8.8
27	6.8	18	5.1	5.8	6.9	5.1	12	4.5	3.8	4.0	9.8	6.0
28	32	12	4.2	6.0	5.6	e4.3	12	4.2	7.6	3.9	7.6	6.1
29	121	8.5	3.7	12	---	e4.8	34	5.4	4.0	5.6	6.7	4.5
30	11	7.5	3.2	16	---	3.6	16	4.9	3.6	11	7.0	3.7
31	25	---	3.1	6.7	---	3.4	---	4.1	---	17	7.4	---
TOTAL	352.3	573.0	197.5	188.0	391.1	215.2	357.7	301.2	379.1	162.4	396.5	181.3
MEAN	11.4	19.1	6.37	6.06	14.0	6.94	11.9	9.72	12.6	5.24	12.8	6.04
MAX	121	73	26	18	63	33	84	35	175	17	41	32
MIN	4.1	7.5	3.1	3.1	4.2	3.4	2.4	4.1	3.6	2.8	4.6	3.2
AC-FT	699	1140	392	373	776	427	709	597	752	322	786	360

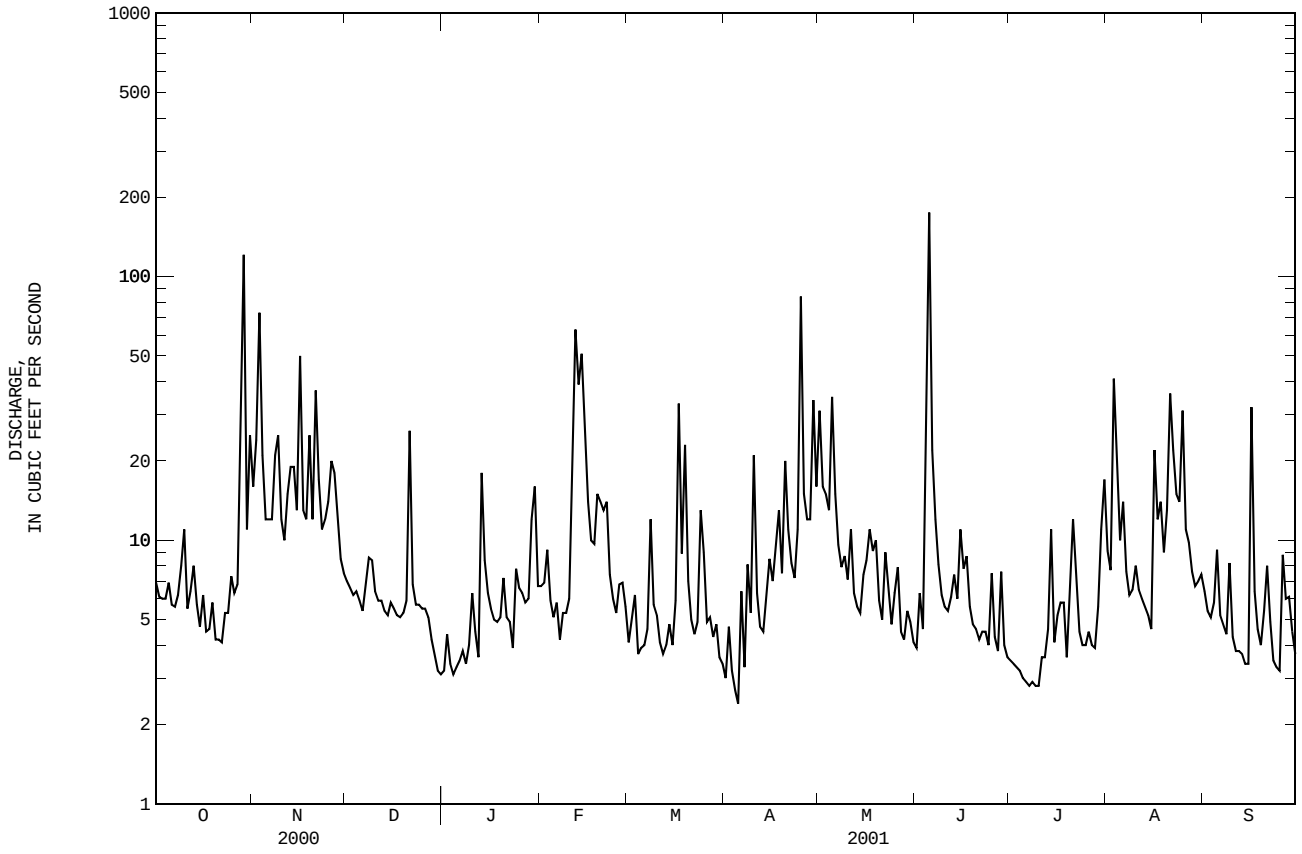
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2001, BY WATER YEAR (WY)

MEAN	9.41	14.1	16.6	20.7	9.96	6.05	16.4	7.24	8.94	12.7	13.0	11.5
MAX	11.4	19.1	26.8	35.3	14.0	6.94	21.0	9.72	12.6	17.5	13.1	16.9
(WY)	2001	2001	2000	2000	2001	2001	2000	2001	2001	1999	2000	2000
MIN	7.46	9.03	6.37	6.06	6.08	5.16	11.9	4.75	5.24	5.24	12.8	6.04
(WY)	2000	2000	2001	2001	2000	2000	2001	2000	2000	2001	2001	2001

16247100 MANOA-PALOLO DRAINAGE CANAL AT MOILIILI--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1999 - 2001	
ANNUAL TOTAL	4882.1		3695.3			
ANNUAL MEAN	13.3		10.1		12.0	
HIGHEST ANNUAL MEAN					13.9	2000
LOWEST ANNUAL MEAN					10.1	2001
HIGHEST DAILY MEAN	290	Jan 19	175	Jun 5	290	Jan 19 2000
LOWEST DAILY MEAN	3.1	Mar 17	2.4	Apr 5	2.4	Apr 5 2001
ANNUAL SEVEN-DAY MINIMUM	3.3	Mar 11	2.9	Jul 4	2.9	Jul 4 2001
ANNUAL RUNOFF (AC-FT)	9680		7330		8710	
10 PERCENT EXCEEDS	24		19		21	
50 PERCENT EXCEEDS	6.8		6.2		6.8	
90 PERCENT EXCEEDS	3.9		3.7		3.9	

e Estimated



16249500 MAUNAWILI DITCH AT AINONI SPRING

LOCATION.--Lat 21°21'08", long 157°46'03", on left bank about 1,000 ft below Siphon 8, 3.2 mi east of Waimanalo Elementary School, and 3.8 mi northeast of Manoa Elementary School.

PERIOD OF RECORD.--June 1991 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 440 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Heather Jeppesen. Records good. At times flow is diverted above gage by Waimanalo Irrigation System, State Department of Agriculture.

AVERAGE DISCHARGE.--10 years (water years 1992-2001) 1.10 ft^3/s (795 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2.9 ft^3/s, May 20, 1997; minimum daily, no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1.7 ft^3/s, Nov. 3; minimum daily discharge, 0.08 ft^3/s, on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

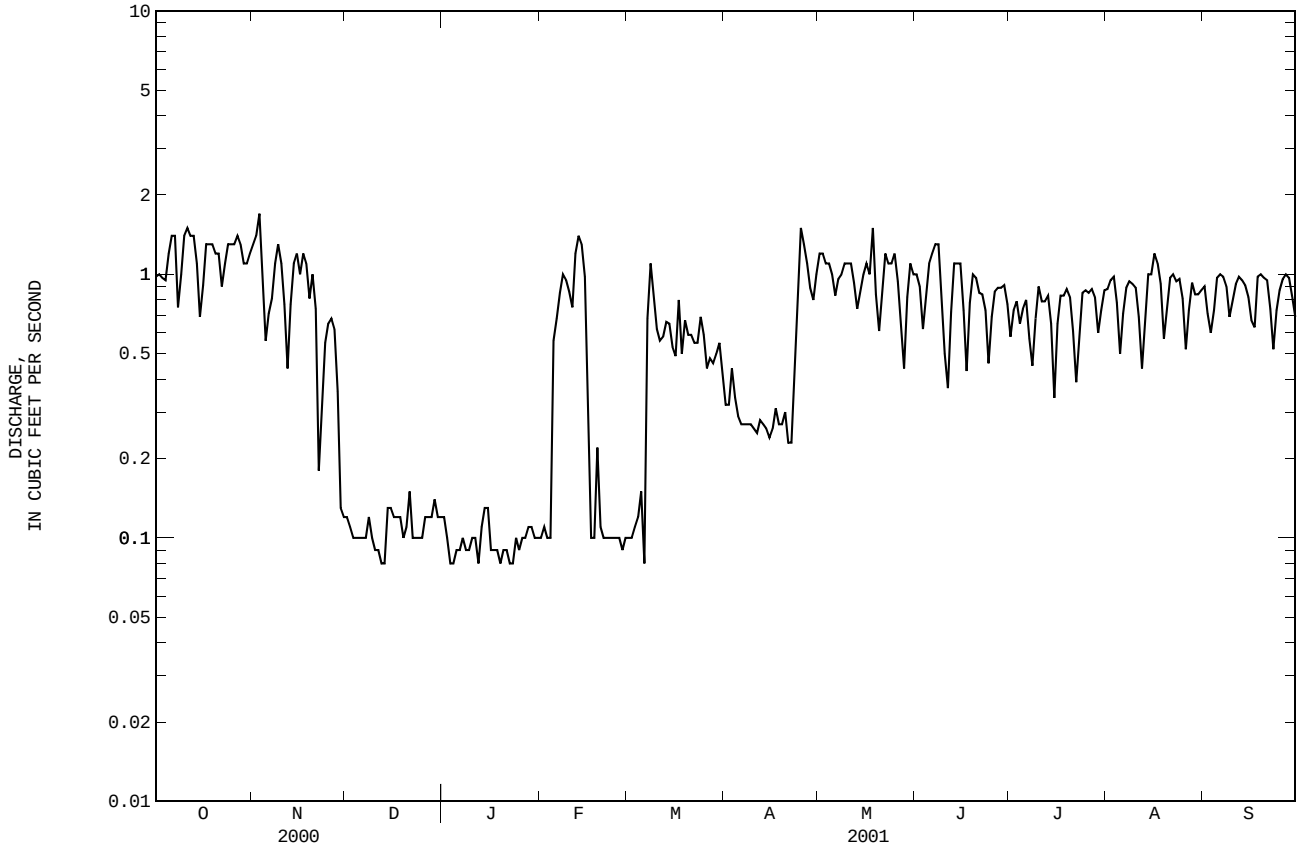
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.98	1.3	.12	.12	.10	.10	.32	1.2	1.0	.58	.88	.90
2	1.0	1.4	.11	.10	.11	.10	.32	1.2	.90	.73	.95	.71
3	.97	1.7	.10	.08	.10	.11	.44	1.1	.62	.79	.98	.60
4	.95	1.0	.10	.08	.10	.12	.34	1.1	.80	.65	.78	.73
5	1.2	.56	.10	.09	.56	.15	.29	1.0	1.1	.74	.50	.97
6	1.4	.71	.10	.09	.68	.08	.27	.83	1.2	.80	.71	1.0
7	1.4	.81	.10	.10	.85	.68	.27	.96	1.3	.57	.89	.98
8	.75	1.1	.12	.09	1.0	1.1	.27	1.0	1.3	.45	.94	.90
9	1.0	1.3	.10	.09	.95	.84	.27	1.1	.85	.68	.92	.69
10	1.4	1.1	.09	.10	.86	.62	.26	1.1	.50	.90	.89	.80
11	1.5	.77	.09	.10	.75	.56	.25	1.1	.37	.79	.69	.92
12	1.4	.44	.08	.08	1.2	.58	.28	.93	.72	.79	.44	.98
13	1.4	.77	.08	.11	1.4	.66	.27	.74	1.1	.83	.69	.95
14	1.1	1.1	.13	.13	1.3	.65	.26	.85	1.1	.65	1.0	.91
15	.69	1.2	.13	.13	.98	.53	.24	1.0	1.1	.34	1.0	.82
16	.91	1.0	.12	.09	.34	.49	.26	1.1	.73	.65	1.2	.67
17	1.3	1.2	.12	.09	.10	.80	.31	1.0	.43	.83	1.1	.63
18	1.3	1.1	.12	.09	.10	.50	.27	1.5	.78	.83	.92	.98
19	1.3	.81	.10	.08	.22	.67	.27	.84	1.0	.88	.57	1.0
20	1.2	1.0	.11	.09	.11	.59	.30	.61	.97	.82	.75	.97
21	1.2	.74	.15	.09	.10	.59	.23	.83	.85	.61	.97	.95
22	.90	.18	.10	.08	.10	.55	.23	1.2	.84	.39	1.0	.74
23	1.1	.29	.10	.08	.10	.55	.45	1.1	.73	.58	.94	.52
24	1.3	.55	.10	.10	.10	.69	.85	1.1	.46	.85	.96	.73
25	1.3	.65	.10	.09	.10	.59	1.5	1.2	.69	.87	.81	.87
26	1.3	.68	.12	.10	.10	.44	1.3	.94	.86	.85	.52	.96
27	1.4	.62	.12	.10	.09	.48	1.1	.62	.89	.88	.73	1.0
28	1.3	.36	.12	.11	.10	.46	.89	.44	.89	.82	.93	.97
29	1.1	.13	.14	.11	---	.50	.80	.82	.91	.60	.84	.82
30	1.1	.12	.12	.10	---	.55	1.0	1.1	.77	.73	.84	.69
31	1.2	---	.12	.10	---	.42	---	1.0	---	.87	.87	---
TOTAL	36.35	24.69	3.41	2.99	12.60	15.75	14.11	30.61	25.76	22.35	26.21	25.36
MEAN	1.17	.82	.11	.096	.45	.51	.47	.99	.86	.72	.85	.85
MAX	1.5	1.7	.15	.13	1.4	1.1	1.5	1.5	1.3	.90	1.2	1.0
MIN	.69	.12	.08	.08	.09	.08	.23	.44	.37	.34	.44	.52
AC-FT	72	49	6.8	5.9	25	31	28	61	51	44	52	50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2001, BY WATER YEAR (WY)

MEAN	1.19	1.19	.95	.81	.89	1.04	1.03	1.31	1.23	1.19	1.26	1.23
MAX	2.01	1.84	1.86	1.89	1.60	1.76	1.63	1.64	1.80	1.76	1.76	1.90
(WY)	1992	1992	1992	1992	1995	1992	1992	1994	1994	1991	1991	1992
MIN	.81	.70	.11	.096	.24	.34	.47	.99	.86	.72	.85	.78
(WY)	1997	1997	2001	2001	1999	1996	2001	2001	2001	2001	2001	1997

16249500 MAUNAWILI DITCH AT AINONI SPRING--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1991 - 2001	
ANNUAL TOTAL	381.78		240.19			
ANNUAL MEAN	1.04		.66		1.10	
HIGHEST ANNUAL MEAN					1.75	1992
LOWEST ANNUAL MEAN					.66	2001
HIGHEST DAILY MEAN	2.8	Jan 19	1.7	Nov 3	2.9	May 20 1997
LOWEST DAILY MEAN	.08	Dec 12	.08	Dec 12	.00	Jan 1 1993
ANNUAL SEVEN-DAY MINIMUM	.09	Dec 7	.09	Jan 17	.00	Jan 12 1999
ANNUAL RUNOFF (AC-FT)	757		476		795	
10 PERCENT EXCEEDS	1.5		1.2		1.8	
50 PERCENT EXCEEDS	1.1		.73		1.1	
90 PERCENT EXCEEDS	.42		.10		.43	



16250000 MAUNAWILI DITCH NEAR WAIMANALO

LOCATION.--Lat 21°20'45", long 157°45'10", Hydrologic Unit 20060000, on left bank 80 ft downstream from Aniani Nui Ridge tunnel, and 3.5 mi west of Waimanalo Post Office.

PERIOD OF RECORD.--March 1954 to September 1968, October 1993 to current year.

GAGE.--Water-stage recorder with concrete Columbus type control. Altitude of gage is 390 ft above mean sea level (from topographic map). Prior to July 12, 1993, water stage recorder at same site with different datum.

REMARKS.--Records computed by H.A. Jeppesen. Records good. Ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--22 years (water years 1955-68, 1994-2001), 2.10 ft^3/s (1,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 11 ft^3/s, March 5, 1958; minimum, no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2.2 ft^3/s, Nov. 2; minimum daily discharge, 0.25 ft^3/s, Dec. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

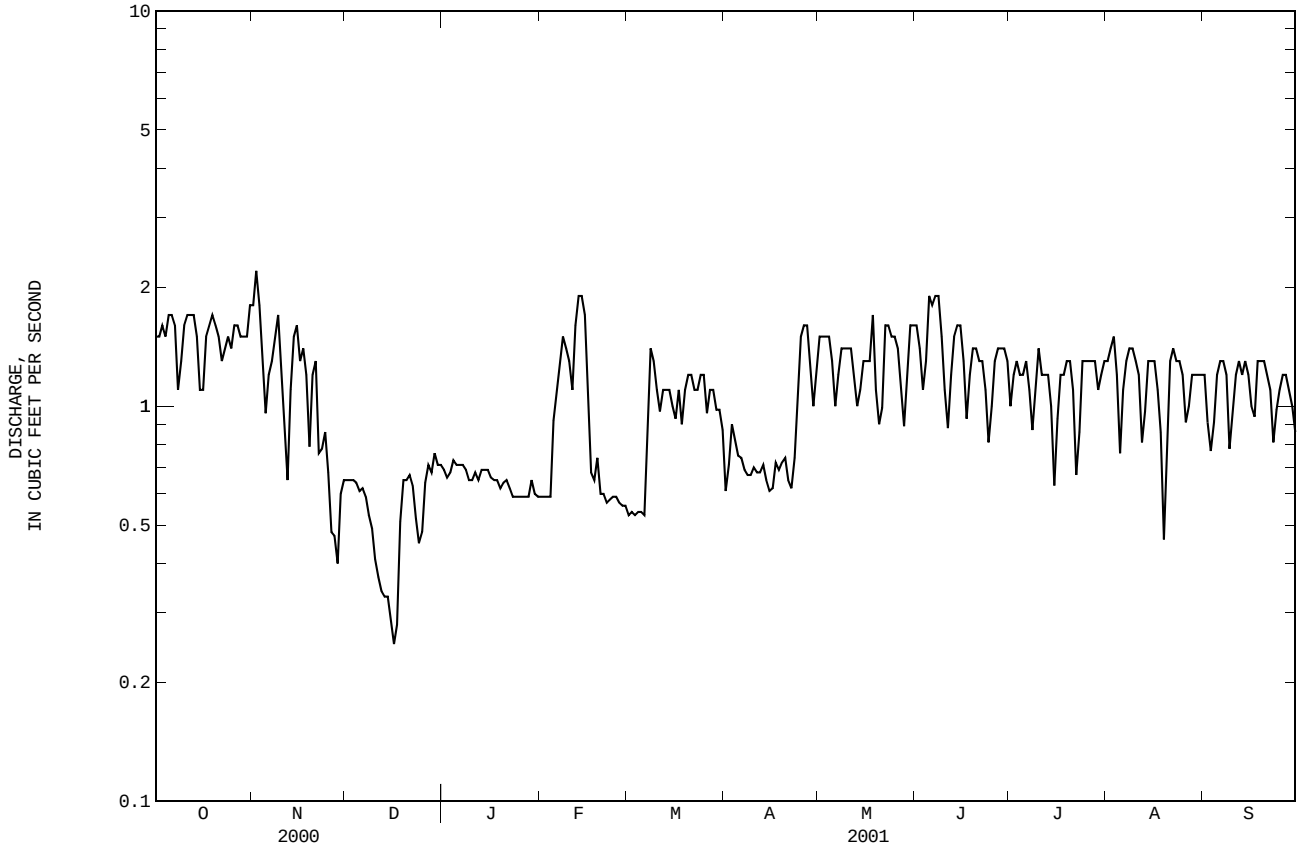
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.8	.65	.69	.59	.53	.61	1.5	1.6	1.0	1.3	1.2
2	1.5	2.2	.65	.66	.59	.54	.71	1.5	1.4	1.2	1.4	.91
3	1.6	1.8	.65	.68	.59	.53	.90	1.5	1.1	1.3	1.5	.77
4	1.5	1.3	.64	.73	.59	.54	.82	1.5	1.3	1.2	1.2	.91
5	1.7	.96	.61	.71	.92	.54	.75	1.3	1.9	1.2	.76	1.2
6	1.7	1.2	.62	.71	1.1	.53	.74	1.0	1.8	1.3	1.1	1.3
7	1.6	1.3	.59	.71	1.3	.93	.69	1.2	1.9	1.1	1.3	1.3
8	1.1	1.5	.53	.69	1.5	1.4	.67	1.4	1.9	.87	1.4	1.2
9	1.3	1.7	.49	.65	1.4	1.3	.67	1.4	1.5	1.1	1.4	.78
10	1.6	1.3	.41	.65	1.3	1.1	.70	1.4	1.1	1.4	1.3	.95
11	1.7	.94	.37	.68	1.1	.97	.68	1.4	.88	1.2	1.2	1.2
12	1.7	.65	.34	.65	1.6	1.1	.68	1.2	1.2	1.2	.81	1.3
13	1.7	1.1	.33	.69	1.9	1.1	.71	1.0	1.5	1.2	.97	1.2
14	1.5	1.5	.33	.69	1.9	1.1	.65	1.1	1.6	1.0	1.3	1.3
15	1.1	1.6	.29	.69	1.7	1.0	.61	1.3	1.6	.63	1.3	1.2
16	1.1	1.3	.25	.66	1.0	.93	.62	1.3	1.3	.93	1.3	1.0
17	1.5	1.4	.28	.65	.68	1.1	.72	1.3	.93	1.2	1.1	.94
18	1.6	1.2	.51	.65	.65	.90	.69	1.7	1.2	1.2	.86	1.3
19	1.7	.79	.65	.62	.74	1.1	.72	1.1	1.4	1.3	.46	1.3
20	1.6	1.2	.65	.64	.60	1.2	.74	.90	1.4	1.3	.85	1.3
21	1.5	1.3	.67	.65	.60	1.2	.65	.99	1.3	1.1	1.3	1.2
22	1.3	.76	.63	.62	.57	1.1	.62	1.6	1.3	.67	1.4	1.1
23	1.4	.78	.52	.59	.58	1.1	.74	1.6	1.1	.86	1.3	.81
24	1.5	.86	.45	.59	.59	1.2	1.0	1.5	.81	1.3	1.3	.98
25	1.4	.68	.48	.59	.59	1.2	1.5	1.5	1.0	1.3	1.2	1.1
26	1.6	.48	.64	.59	.57	.96	1.6	1.4	1.3	1.3	.91	1.2
27	1.6	.47	.71	.59	.56	1.1	1.6	1.1	1.4	1.3	1.0	1.2
28	1.5	.40	.68	.59	.56	1.1	1.3	.89	1.4	1.3	1.2	1.1
29	1.5	.60	.76	.65	---	.98	1.0	1.2	1.4	1.1	1.2	1.0
30	1.5	.65	.71	.60	---	.98	1.2	1.6	1.3	1.2	1.2	.86
31	1.8	---	.71	.59	---	.87	---	1.6	---	1.3	1.2	---
TOTAL	46.9	33.72	16.80	20.15	26.37	30.23	25.29	40.98	40.82	35.56	36.02	33.11
MEAN	1.51	1.12	.54	.65	.94	.98	.84	1.32	1.36	1.15	1.16	1.10
MAX	1.8	2.2	.76	.73	1.9	1.4	1.6	1.7	1.9	1.4	1.5	1.3
MIN	1.1	.40	.25	.59	.56	.53	.61	.89	.81	.63	.46	.77
AC-FT	93	67	33	40	52	60	50	81	81	71	71	66

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2001, BY WATER YEAR (WY)

MEAN	2.48	2.16	1.49	1.45	1.36	1.61	2.15	2.69	2.72	2.53	2.51	2.48
MAX	4.36	3.87	3.24	3.22	2.67	3.89	4.07	4.90	4.52	4.02	4.74	4.61
(WY)	1955	1955	1961	1955	1957	1956	1966	1955	1955	1955	1954	1954
MIN	1.00	.85	.026	.000	.000	.097	.39	1.19	1.14	.92	1.16	.61
(WY)	1998	1998	1968	1968	1968	1968	1963	1965	1997	1997	2001	1968

16250000 MAUNAWILI DITCH NEAR WAIMANALO--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1954 - 2001	
ANNUAL TOTAL	478.66		385.95			
ANNUAL MEAN	1.31		1.06		2.10	
HIGHEST ANNUAL MEAN					3.43	1955
LOWEST ANNUAL MEAN					1.06	1997
HIGHEST DAILY MEAN	2.7	Jan 19	2.2	Nov 2	11	Mar 5 1958
LOWEST DAILY MEAN	.25	Dec 16	.25	Dec 16	.00	Dec 27 1955
ANNUAL SEVEN-DAY MINIMUM	.31	Dec 11	.31	Dec 11	.00	Dec 27 1955
ANNUAL RUNOFF (AC-FT)	949		766		1520	
10 PERCENT EXCEEDS	1.8		1.6		3.9	
50 PERCENT EXCEEDS	1.3		1.1		2.0	
90 PERCENT EXCEEDS	.69		.59		.60	



16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Hydrologic Unit 20060000, on left bank 650 ft upstream from mouth, 2.7 mi southwest of Kailua, and 4.3 mi southeast of Kaneohe Courthouse.

DRAINAGE AREA.--2.04 mi^2.

PERIOD OF RECORD.--November 1912 to June 1916, January 1958 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 80 ft above mean sea level (from topographic map). Prior to January 1, 1958, nonrecording gage at sites about 200 ft upstream at different datums.

REMARKS.--Records computed by H.A. Jeppesen. Records good. Maunawili ditch diverts water 1.5 mi upstream of station for irrigation in vicinity of Waimanalo. Records do not include flow of Maunawili ditch (stations 16249500 and 16250000).

AVERAGE DISCHARGE.--45 years (water years 1914-15, 1959-2001), 4.90 ft^3/s (3,550 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft^3/s, February 4, 1965, gage height, 12.41 ft, from rating curve extended above 470 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.43 ft^3/s, September 8-12, 14, 16-20, 22, 23, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 390 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jun 5	1515	*108	*3.28				

Minimum discharge, 0.65 ft^3/s, Sept. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

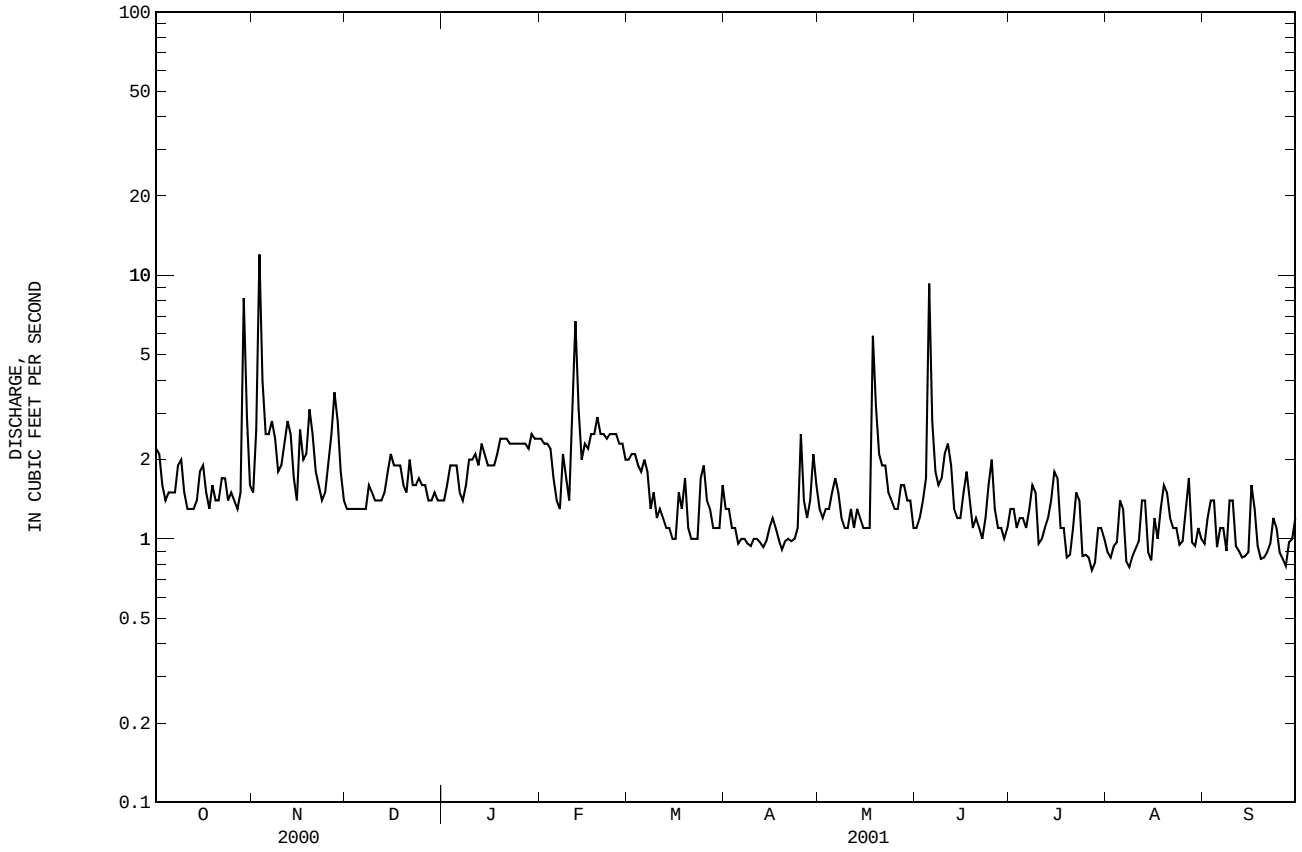
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	1.5	1.3	1.4	2.4	2.0	1.3	1.3	1.1	1.3	.89	.96
2	2.1	2.6	1.3	1.6	2.3	2.1	1.3	1.2	1.2	1.3	.85	1.2
3	1.6	12	1.3	1.9	2.3	2.1	1.1	1.3	1.4	1.1	.94	1.4
4	1.4	4.0	1.3	1.9	2.2	1.9	1.1	1.3	1.7	1.2	.97	1.4
5	1.5	2.5	1.3	1.9	1.7	1.8	.96	1.5	9.3	1.2	1.4	.93
6	1.5	2.5	1.3	1.5	1.4	2.0	1.0	1.7	2.8	1.1	1.3	1.1
7	1.5	2.8	1.3	1.4	1.3	1.8	1.0	1.5	1.8	1.3	.82	1.1
8	1.9	2.4	1.6	1.6	2.1	1.3	.96	1.2	1.6	1.6	.78	.90
9	2.0	1.8	1.5	2.0	1.7	1.5	.94	1.1	1.7	1.5	.86	1.4
10	1.5	1.9	1.4	2.0	1.4	1.2	1.0	1.1	2.1	.96	.92	1.4
11	1.3	2.3	1.4	2.1	2.7	1.3	1.0	1.3	2.3	1.0	.98	.94
12	1.3	2.8	1.4	1.9	6.7	1.2	.97	1.1	1.9	1.1	1.4	.90
13	1.3	2.5	1.5	2.3	3.1	1.1	.93	1.3	1.3	1.2	1.4	.85
14	1.4	1.7	1.8	2.1	2.0	1.1	.98	1.2	1.2	1.4	.89	.86
15	1.8	1.4	2.1	1.9	2.3	1.0	1.1	1.1	1.2	1.8	.83	.89
16	1.9	2.6	1.9	1.9	2.2	1.0	1.2	1.1	1.5	1.7	1.2	1.6
17	1.5	2.0	1.9	1.9	2.5	1.5	1.1	1.1	1.8	1.1	1.0	1.3
18	1.3	2.1	1.9	2.1	2.5	1.3	.99	5.9	1.4	1.1	1.3	.94
19	1.6	3.1	1.6	2.4	2.9	1.7	.91	3.2	1.1	.85	1.6	.84
20	1.4	2.5	1.5	2.4	2.5	1.1	.98	2.1	1.2	.87	1.5	.85
21	1.4	1.8	2.0	2.4	2.5	1.0	1.0	1.9	1.1	1.1	1.2	.89
22	1.7	1.6	1.6	2.3	2.4	1.0	.98	1.9	1.0	1.5	1.1	.96
23	1.7	1.4	1.6	2.3	2.5	1.0	1.0	1.5	1.2	1.4	1.1	1.2
24	1.4	1.5	1.7	2.3	2.5	1.7	1.1	1.4	1.6	.86	.95	1.1
25	1.5	1.9	1.6	2.3	2.5	1.9	2.5	1.3	2.0	.87	.98	.89
26	1.4	2.5	1.6	2.3	2.3	1.4	1.4	1.3	1.3	.85	1.3	.84
27	1.3	3.6	1.4	2.3	2.3	1.3	1.2	1.6	1.1	.76	1.7	.79
28	1.5	2.8	1.4	2.2	2.0	1.1	1.4	1.6	1.1	.81	.97	.97
29	8.2	1.8	1.5	2.5	---	1.1	2.1	1.4	1.0	1.1	.94	1.0
30	2.9	1.4	1.4	2.4	---	1.1	1.6	1.4	1.1	1.1	1.1	1.2
31	1.6	---	1.4	2.4	---	1.6	---	1.1	---	1.0	1.0	---
TOTAL	56.6	77.3	47.8	63.9	67.2	44.2	35.10	49.0	52.1	36.03	34.17	31.60
MEAN	1.83	2.58	1.54	2.06	2.40	1.43	1.17	1.58	1.74	1.16	1.10	1.05
MAX	8.2	12	2.1	2.5	6.7	2.1	2.5	5.9	9.3	1.8	1.7	1.6
MIN	1.3	1.4	1.3	1.4	1.3	1.0	.91	1.1	1.0	.76	.78	.79
AC-FT	112	153	95	127	133	88	70	97	103	71	68	63

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2001, BY WATER YEAR (WY)

MEAN	2.93	5.46	6.72	8.14	6.74	7.31	6.39	5.15	3.24	2.66	2.51	2.43
MAX	8.43	38.2	34.8	39.2	27.2	24.3	31.4	17.2	11.3	6.66	8.52	15.1
(WY)	1966	1966	1988	1916	1979	1958	1963	1981	1982	1982	1982	1914
MIN	1.06	.99	1.22	1.24	1.11	1.25	1.17	1.40	1.15	1.16	1.10	1.00
(WY)	1976	1963	1978	1973	1978	1978	2001	1973	1973	2001	2001	1975

16254000 MAKAWAO STREAM NEAR KAILUA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1913 - 2001	
ANNUAL TOTAL	814.84		595.00			
ANNUAL MEAN	2.23		1.63		4.90	
HIGHEST ANNUAL MEAN					11.1	1982
LOWEST ANNUAL MEAN					1.31	1973
HIGHEST DAILY MEAN	22	Jan 20	12	Nov 3	518	Dec 31 1987
LOWEST DAILY MEAN	.95	Aug 11	.76	Jul 27	.50	Sep 8 1964
ANNUAL SEVEN-DAY MINIMUM	1.0	Aug 10	.91	Jul 24	.67	Sep 8 1964
ANNUAL RUNOFF (AC-FT)	1620		1180		3550	
10 PERCENT EXCEEDS	3.2		2.4		8.5	
50 PERCENT EXCEEDS	1.7		1.4		2.8	
90 PERCENT EXCEEDS	1.3		.96		1.4	



16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'47", long 157°48'23", Hydrologic Unit 20060000, on left bank 300 ft downstream from Luluku Stream, 1.0 mi southwest of Castle High School, and 1.9 mi northwest of the intersection of State Highways 61 and 83.

DRAINAGE AREA.--3.81 mi^2.

PERIOD OF RECORD.--November 1976 to current year.

REVISED RECORDS.--WDR HI-92-1: 1991(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 116.39 ft above mean sea level (levels by Corps of Engineers).

REMARKS.--Records computed by Ben Shimizu. Records good. Flow regulated by a flood-control dam upstream.

AVERAGE DISCHARGE.--24 years (water years 1977-2001), 10.2 ft^3/s (7,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,760 ft^3/s, January 25, 1996, gage height, 5.72 ft, from rating curve extended above 200 ft^3/s; minimum, 0.22 ft^3/s , September 25-26, 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 360 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 3	0430	*147	*2.66				

Minimum discharge, 0.37 ft^3/s, Oct. 12, result of maintenance work on dam upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

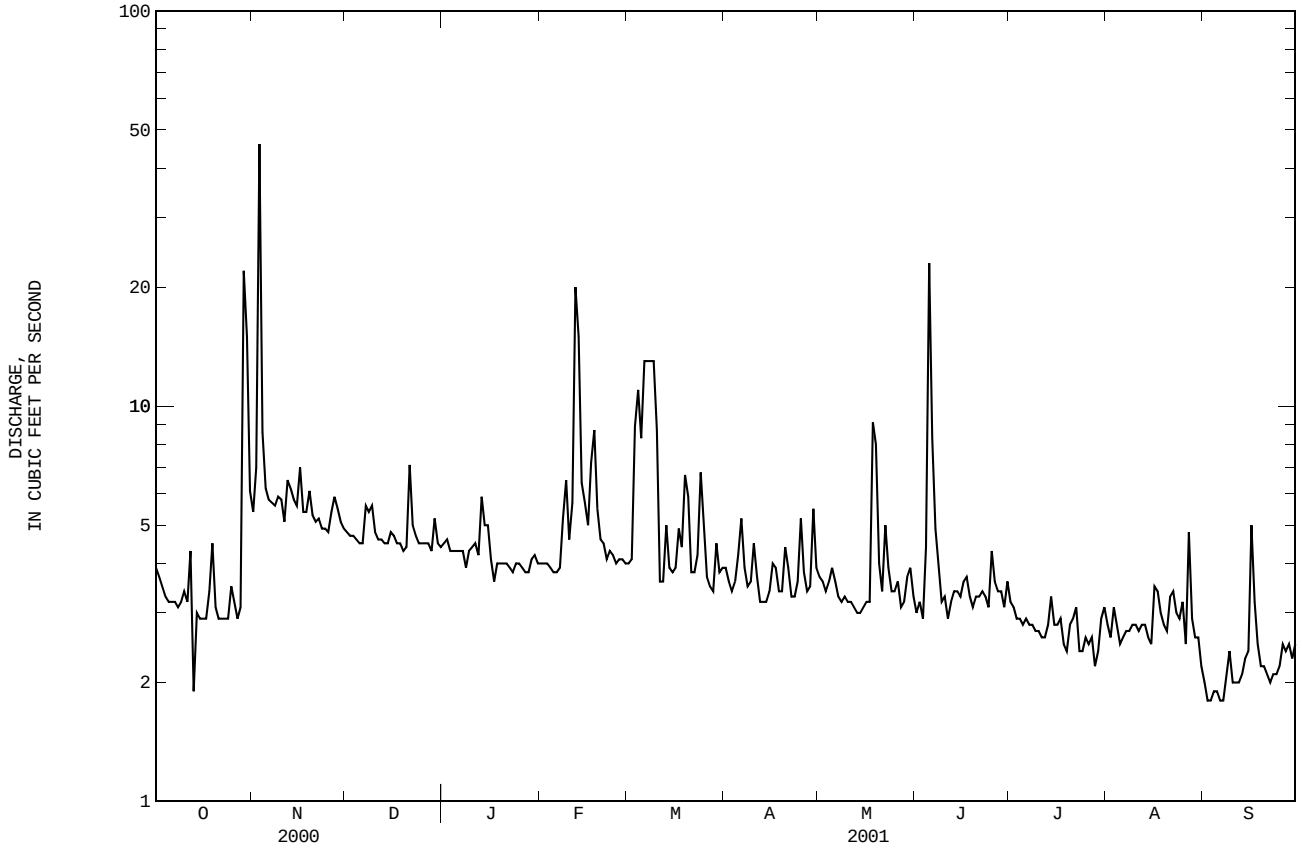
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	5.4	4.8	4.5	4.0	4.0	3.9	3.7	3.0	3.2	2.8	2.0
2	3.7	7.0	4.7	4.6	4.0	4.1	3.6	3.6	3.2	3.1	2.6	1.8
3	3.5	46	4.7	4.3	4.0	8.9	3.4	3.4	2.9	2.9	3.1	1.8
4	3.3	8.6	4.6	4.3	3.9	11	3.6	3.6	4.4	2.9	2.8	1.9
5	3.2	6.2	4.5	4.3	3.8	8.3	4.2	3.9	23	2.8	2.5	1.9
6	3.2	5.8	4.5	4.3	3.8	13	5.2	3.6	8.3	2.9	2.6	1.8
7	3.2	5.7	5.6	4.3	3.9	13	3.9	3.3	4.9	2.8	2.7	1.8
8	3.1	5.6	5.4	3.9	5.2	13	3.5	3.2	3.9	2.8	2.7	2.1
9	3.2	5.9	5.6	4.3	6.5	13	3.6	3.3	3.2	2.7	2.8	2.4
10	3.4	5.8	4.8	4.4	4.6	8.7	4.5	3.2	3.3	2.7	2.8	2.0
11	3.2	5.1	4.6	4.5	5.7	3.6	3.7	3.2	2.9	2.6	2.7	2.0
12	4.3	6.5	4.6	4.2	20	3.6	3.2	3.1	3.2	2.6	2.8	2.0
13	1.9	6.2	4.5	5.9	15	5.0	3.2	3.0	3.4	2.8	2.8	2.1
14	3.0	5.8	4.5	5.0	6.4	3.9	3.2	3.0	3.4	3.3	2.6	2.3
15	2.9	5.6	4.8	5.0	5.7	3.8	3.4	3.1	3.3	2.8	2.5	2.4
16	2.9	7.0	4.7	4.1	5.0	3.9	4.0	3.2	3.6	2.8	3.5	5.0
17	2.9	5.4	4.5	3.6	7.2	4.9	3.9	3.2	3.7	2.9	3.4	3.2
18	3.4	5.4	4.5	4.0	8.7	4.4	3.4	9.1	3.3	2.5	3.0	2.5
19	4.5	6.1	4.3	4.0	5.5	6.7	3.4	8.0	3.1	2.4	2.8	2.2
20	3.1	5.3	4.4	4.0	4.6	5.9	4.4	4.0	3.3	2.8	2.7	2.2
21	2.9	5.1	7.1	4.0	4.5	3.8	3.9	3.4	3.3	2.9	3.3	2.1
22	2.9	5.2	5.0	3.9	4.1	3.8	3.3	5.0	3.4	3.1	3.4	2.0
23	2.9	4.9	4.7	3.8	4.3	4.2	3.3	3.9	3.3	2.4	3.0	2.1
24	2.9	4.9	4.5	4.0	4.2	6.8	3.6	3.4	3.1	2.4	2.9	2.1
25	3.5	4.8	4.5	4.0	4.0	5.0	5.2	3.4	4.3	2.6	3.2	2.2
26	3.2	5.4	4.5	3.9	4.1	3.7	3.8	3.6	3.6	2.5	2.5	2.5
27	2.9	5.9	4.5	3.8	4.1	3.5	3.4	3.1	3.4	2.6	4.8	2.4
28	3.1	5.5	4.3	3.8	4.0	3.4	3.5	3.2	3.4	2.2	2.9	2.5
29	22	5.1	5.2	4.1	---	4.5	5.5	3.7	3.1	2.4	2.6	2.3
30	15	4.9	4.5	4.2	---	3.8	3.9	3.9	3.6	2.9	2.6	2.5
31	6.1	---	4.4	4.0	---	3.9	---	3.3	---	3.1	2.2	---
TOTAL	133.2	212.1	147.8	131.0	160.8	189.1	114.6	117.6	127.8	85.4	89.6	68.1
MEAN	4.30	7.07	4.77	4.23	5.74	6.10	3.82	3.79	4.26	2.75	2.89	2.27
MAX	22	46	7.1	5.9	20	13	5.5	9.1	23	3.3	4.8	5.0
MIN	1.9	4.8	4.3	3.6	3.8	3.4	3.2	3.0	2.9	2.2	2.2	1.8
AC-FT	264	421	293	260	319	375	227	233	253	169	178	135

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 2001, BY WATER YEAR (WY)

MEAN	7.72	10.8	11.8	14.6	11.8	12.8	11.8	10.1	8.44	7.53	7.05	6.94
MAX	16.8	29.6	37.2	53.4	35.9	34.3	49.1	23.0	25.7	19.9	24.0	16.9
(WY)	1983	1987	1988	1988	1979	1982	1989	1981	1982	1982	1982	1982
MIN	2.91	3.29	4.56	4.05	3.83	4.03	3.82	3.44	2.65	2.75	2.89	2.27
(WY)	1985	2000	1978	1977	1978	1978	2001	2000	2000	2001	2001	2001

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1977 - 2001	
ANNUAL TOTAL	1808.0		1577.1			
ANNUAL MEAN	4.94		4.32		10.2	
HIGHEST ANNUAL MEAN					22.0	1982
LOWEST ANNUAL MEAN					4.32	2001
HIGHEST DAILY MEAN	65	Jan 20	46	Nov 3	723	Jan 1 1988
LOWEST DAILY MEAN	1.9	Sep 26	1.8	Sep 2	.29	Oct 10 1984
ANNUAL SEVEN-DAY MINIMUM	2.3	Jun 14	1.9	Sep 1	.30	Oct 10 1984
ANNUAL RUNOFF (AC-FT)	3590		3130		7420	
10 PERCENT EXCEEDS	6.2		5.8		16	
50 PERCENT EXCEEDS	4.2		3.7		7.0	
90 PERCENT EXCEEDS	2.8		2.5		3.9	



16275000 HAIKU STREAM NEAR HEEIA

LOCATION.--Lat 21°24'45", long 157°49'35", Hydrologic Unit 20060000, on left bank, 1.7 mi west of Kaneohe Post Office, and 1.8 mi southwest of Heeia.

DRAINAGE AREA.--0.97 mi^2.

PERIOD OF RECORD.--January 1914 to October 1919, July 1939 to September 1977, October 1982 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 935: 1940. WSP 1319: 1916-19(M). WSP 1569: Drainage area. WSP 1719: 1942-43, 1946(M), 1947, 1949, 1951, 1954(M), 1955, 1957-59. WSP 1937: 1940-45(M), 1947(M), 1948-50(P), 1951, 1952(P), 1953(M), 1955-57(P), 1958-59, 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by City and County of Honolulu). Prior to April 28, 1914, nonrecording gage and April 28, 1914 to October 25, 1919, water-stage recorder, at same site at different datums.

REMARKS.--Records computed by Ben Shimizu. Records poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

AVERAGE DISCHARGE (since diversion from tunnel began).--53 years (water years 1944-77, 1983-2001), 2.19 ft^3/s, (1,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,740 ft^3/s, May 2, 1965, gage height, 7.94 ft, from rating curve extended above 57 ft^3/s on basis of slope-area measurements at gage heights 3.87 ft, 3.88 ft, and 7.94 ft; minimum, 0.20 ft^3/s, July 20, 1957, September 17, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 12	1815	*231	*2.81				

Minimum discharge, 1.0 ft^3/s, on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

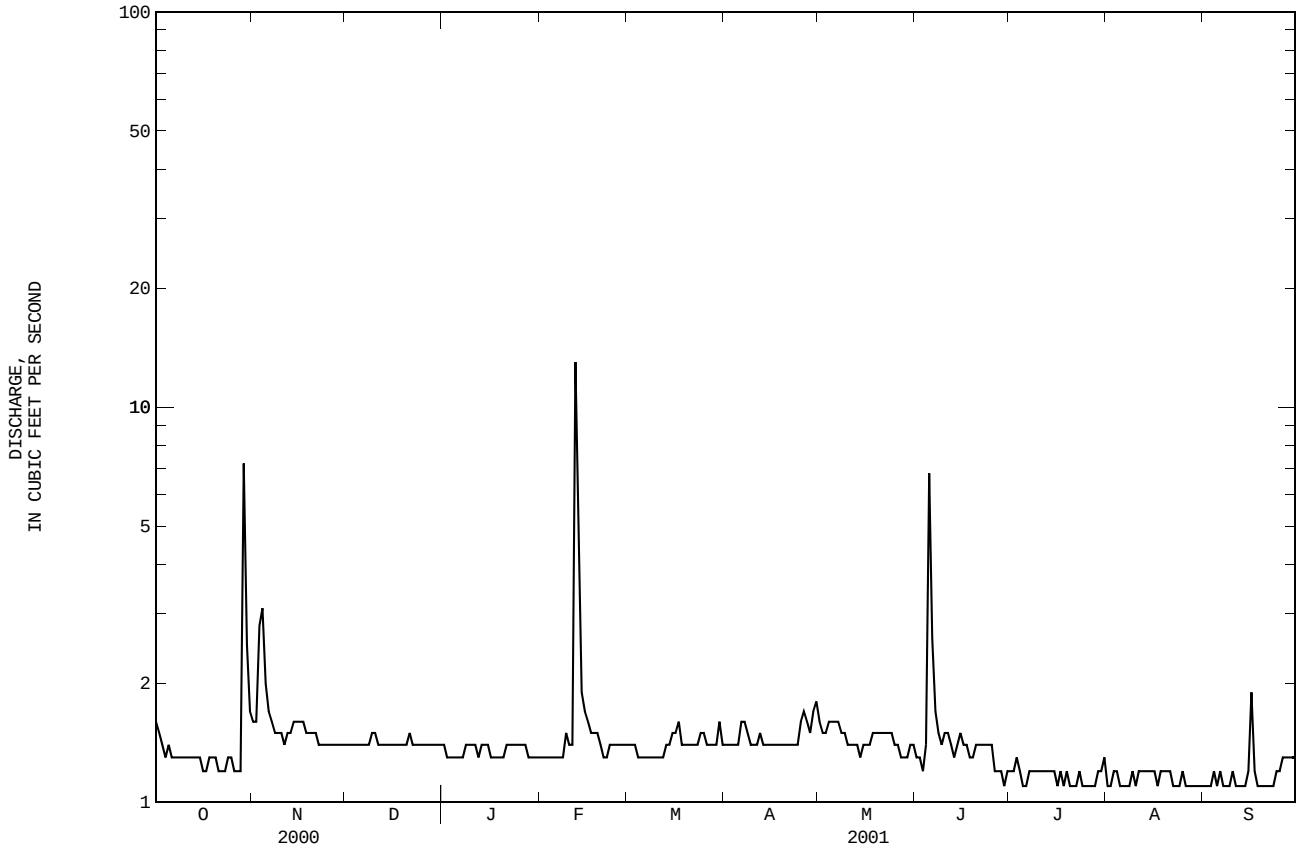
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.6	1.4	1.4	1.3	1.4	1.4	1.6	1.3	1.2	1.1	1.1
2	1.5	1.6	1.4	1.3	1.3	1.4	1.4	1.5	1.3	1.2	1.1	1.1
3	1.4	2.8	1.4	1.3	1.3	1.4	1.4	1.5	1.2	1.3	1.2	1.1
4	1.3	3.1	1.4	1.3	1.3	1.3	1.4	1.6	1.4	1.2	1.2	1.2
5	1.4	2.0	1.4	1.3	1.3	1.3	1.4	1.6	6.8	1.1	1.1	1.1
6	1.3	1.7	1.4	1.3	1.3	1.3	1.6	1.6	2.6	1.1	1.1	1.2
7	1.3	1.6	1.4	1.3	1.3	1.3	1.6	1.6	1.7	1.2	1.1	1.1
8	1.3	1.5	1.4	1.4	1.3	1.3	1.5	1.5	1.5	1.2	1.1	1.1
9	1.3	1.5	1.5	1.4	1.5	1.3	1.4	1.5	1.4	1.2	1.2	1.1
10	1.3	1.5	1.5	1.4	1.4	1.3	1.4	1.4	1.5	1.2	1.1	1.2
11	1.3	1.4	1.4	1.4	1.4	1.3	1.4	1.4	1.5	1.2	1.2	1.1
12	1.3	1.5	1.4	1.3	13	1.3	1.5	1.4	1.4	1.2	1.2	1.1
13	1.3	1.5	1.4	1.4	3.6	1.4	1.4	1.4	1.3	1.2	1.2	1.1
14	1.3	1.6	1.4	1.4	1.9	1.4	1.4	1.3	1.4	1.2	1.2	1.1
15	1.3	1.6	1.4	1.4	1.7	1.5	1.4	1.4	1.5	1.2	1.2	1.2
16	1.2	1.6	1.4	1.3	1.6	1.5	1.4	1.4	1.4	1.1	1.2	1.9
17	1.2	1.6	1.4	1.3	1.5	1.6	1.4	1.4	1.4	1.2	1.1	1.2
18	1.3	1.5	1.4	1.3	1.5	1.4	1.4	1.5	1.3	1.1	1.2	1.1
19	1.3	1.5	1.4	1.3	1.5	1.4	1.4	1.5	1.3	1.2	1.2	1.1
20	1.3	1.5	1.4	1.3	1.4	1.4	1.4	1.5	1.4	1.1	1.2	1.1
21	1.2	1.5	1.5	1.4	1.3	1.4	1.4	1.5	1.4	1.1	1.2	1.1
22	1.2	1.4	1.4	1.4	1.3	1.4	1.4	1.5	1.4	1.1	1.1	1.1
23	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.4	1.2	1.1	1.1
24	1.3	1.4	1.4	1.4	1.4	1.5	1.4	1.5	1.4	1.1	1.1	1.2
25	1.3	1.4	1.4	1.4	1.4	1.5	1.6	1.4	1.4	1.1	1.2	1.2
26	1.2	1.4	1.4	1.4	1.4	1.4	1.7	1.4	1.2	1.1	1.1	1.3
27	1.2	1.4	1.4	1.4	1.4	1.4	1.6	1.3	1.2	1.1	1.1	1.3
28	1.2	1.4	1.4	1.3	1.4	1.4	1.5	1.3	1.2	1.1	1.1	1.3
29	7.2	1.4	1.4	1.3	---	1.4	1.7	1.3	1.1	1.2	1.1	1.3
30	2.5	1.4	1.4	1.3	---	1.6	1.8	1.4	1.2	1.2	1.1	1.3
31	1.7	---	1.4	1.3	---	1.4	---	1.4	---	1.3	1.1	---
TOTAL	47.7	48.3	43.7	41.8	53.4	43.3	44.1	45.1	47.5	36.2	35.5	35.5
MEAN	1.54	1.61	1.41	1.35	1.91	1.40	1.47	1.45	1.58	1.17	1.15	1.18
MAX	7.2	3.1	1.5	1.4	13	1.6	1.8	1.6	6.8	1.3	1.2	1.9
MIN	1.2	1.4	1.4	1.3	1.3	1.3	1.4	1.3	1.1	1.1	1.1	1.1
AC-FT	95	96	87	83	106	86	87	89	94	72	70	70

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 2001, BY WATER YEAR (WY)

MEAN	1.91	2.73	2.64	2.62	2.46	3.18	2.49	2.29	1.40	1.55	1.57	1.45
MAX	11.6	15.7	9.72	9.68	10.7	16.5	13.0	27.3	2.34	3.25	4.24	3.62
(WY)	1959	1966	1988	1949	1955	1958	1989	1965	1989	1989	1967	1992
MIN	.32	.33	.64	.94	.86	.60	.50	.51	.38	.41	.56	.36
(WY)	1946	1946	1960	1977	1963	1946	1946	1961	1946	1945	1961	1945

16275000 HAIKU STREAM NEAR HEEIA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1944 - 2001	
ANNUAL TOTAL	582.6		522.1			
ANNUAL MEAN	1.59		1.43		2.19	
HIGHEST ANNUAL MEAN					4.82	1965
LOWEST ANNUAL MEAN					.67	1946
HIGHEST DAILY MEAN	14	Jan 19	13	Feb 12	620	May 2 1965
LOWEST DAILY MEAN	1.2	Jun 29	1.1	Jun 29	.29	Jul 13 1945
ANNUAL SEVEN-DAY MINIMUM	1.2	Aug 6	1.1	Aug 26	.29	Oct 19 1945
ANNUAL RUNOFF (AC-FT)	1160		1040		1590	
10 PERCENT EXCEEDS	1.7		1.6		2.6	
50 PERCENT EXCEEDS	1.4		1.4		1.5	
90 PERCENT EXCEEDS	1.3		1.1		.93	



16283200 KAHALUU STREAM NEAR AHUIMANU

LOCATION.--Lat 21°26'32", long 157°50'47", Hydrologic Unit 20060000, on left bank, 1.1 mi west of Valley of the Temples Memorial Park, 1.3 mi south of Kahaluu School, and 2.7 mi northwest of Heeia Elementary School.

DRAINAGE AREA.--0.84 mi^2, revised, exclusion of drainage area from right bank tributary downstream of gage.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records good except for discharges greater than 30 ft^3/s which are poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. At times, farmers upstream of gage pump and/or divert small amounts of water from the stream.

AVERAGE DISCHARGE.--18 years (water years 1984-2001), 3.10 ft^3/s (2,250 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 728 ft^3/s, September 18, 1994, gage height, 6.05 ft; minimum, 0.51 ft^3/s on October 23, 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	1615	*104	*2.92				

Minimum discharge, 0.51 ft^3/s, Oct. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

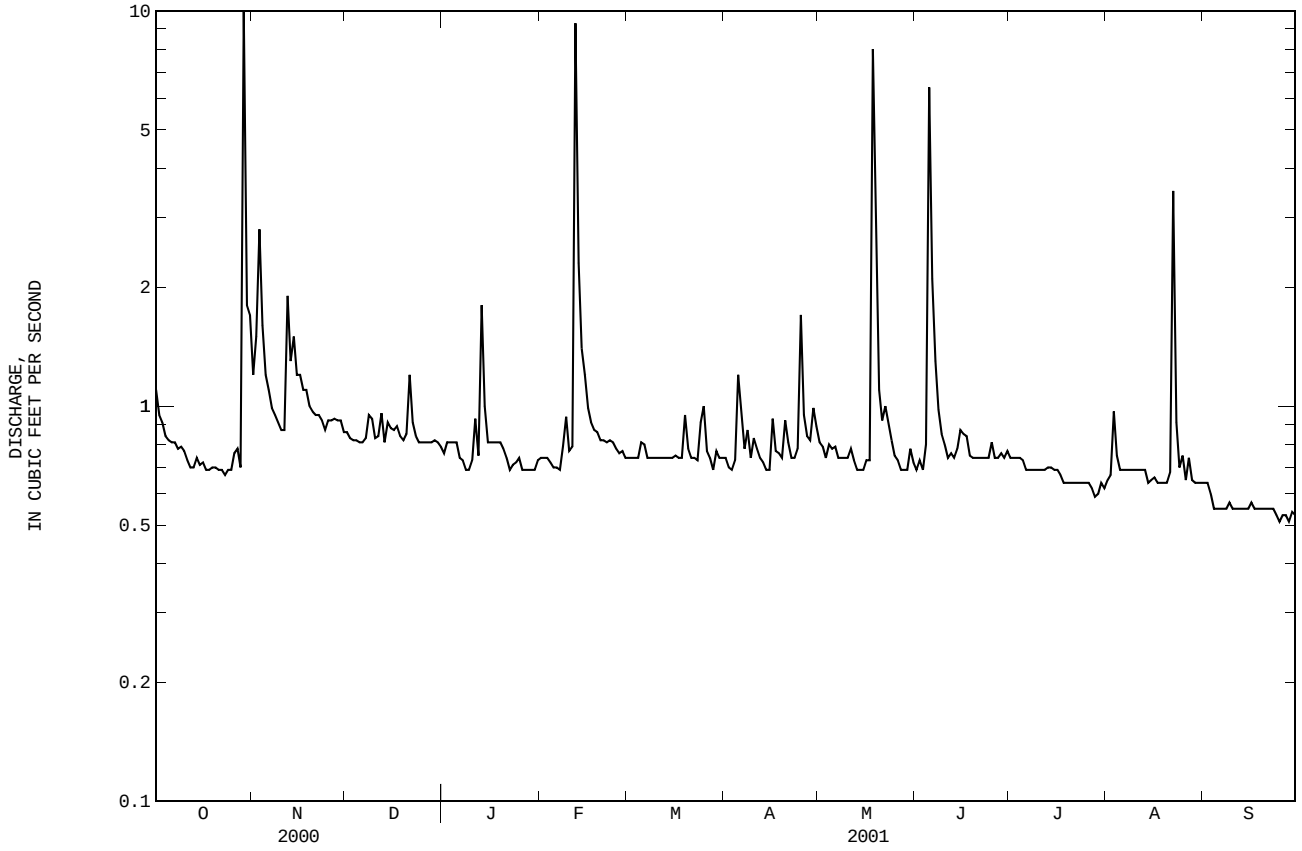
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.2	.86	.76	.74	.74	.74	.81	.69	.74	.65	.64
2	.95	1.5	.83	.81	.74	.74	.70	.79	.73	.74	.67	.64
3	.91	2.8	.82	.81	.74	.74	.69	.74	.69	.74	.97	.60
4	.84	1.6	.82	.81	.72	.74	.73	.80	.80	.74	.75	.55
5	.82	1.2	.81	.81	.70	.81	1.2	.78	6.4	.73	.69	.55
6	.81	1.1	.81	.74	.70	.80	.96	.79	2.1	.69	.69	.55
7	.81	.99	.83	.73	.69	.74	.78	.74	1.3	.69	.69	.55
8	.78	.95	.95	.69	.79	.74	.87	.74	.98	.69	.69	.55
9	.79	.91	.93	.69	.94	.74	.74	.74	.85	.69	.69	.57
10	.77	.87	.83	.73	.77	.74	.83	.74	.80	.69	.69	.55
11	.73	.87	.84	.93	.79	.74	.78	.78	.74	.69	.69	.55
12	.70	1.9	.96	.75	9.3	.74	.74	.73	.76	.69	.69	.55
13	.70	1.3	.81	1.8	2.3	.74	.72	.69	.74	.70	.69	.55
14	.74	1.5	.91	1.0	1.4	.74	.69	.69	.78	.70	.64	.55
15	.71	1.2	.88	.81	1.2	.74	.69	.69	.87	.69	.65	.55
16	.72	1.2	.87	.81	.99	.75	.93	.73	.85	.69	.66	.57
17	.69	1.1	.89	.81	.91	.74	.77	.73	.84	.67	.64	.55
18	.69	1.1	.84	.81	.87	.74	.76	8.0	.75	.64	.64	.55
19	.70	1.0	.82	.81	.86	.95	.74	2.6	.74	.64	.64	.55
20	.70	.97	.85	.78	.82	.78	.92	1.1	.74	.64	.64	.55
21	.69	.95	1.2	.74	.82	.74	.81	.92	.74	.64	.68	.55
22	.69	.95	.91	.69	.81	.74	.74	1.0	.74	.64	3.5	.55
23	.67	.92	.84	.71	.82	.73	.74	.91	.74	.64	.91	.55
24	.69	.87	.81	.72	.81	.91	.78	.82	.74	.64	.70	.53
25	.69	.92	.81	.74	.78	1.0	1.7	.75	.81	.64	.75	.51
26	.76	.92	.81	.69	.76	.77	.95	.73	.74	.64	.65	.53
27	.78	.93	.81	.69	.77	.74	.84	.69	.74	.62	.74	.53
28	.70	.92	.81	.69	.74	.69	.82	.69	.76	.59	.65	.51
29	10	.92	.82	.69	---	.77	.99	.69	.74	.60	.64	.54
30	1.8	.86	.81	.69	---	.74	.89	.78	.77	.64	.64	.53
31	1.7	---	.79	.73	---	.74	---	.72	---	.62	.64	---
TOTAL	34.83	34.42	26.58	24.67	33.28	23.76	25.24	33.11	30.67	20.80	24.26	16.60
MEAN	1.12	1.15	.86	.80	1.19	.77	.84	1.07	1.02	.67	.78	.55
MAX	10	2.8	1.2	1.8	9.3	1.0	1.7	8.0	6.4	.74	3.5	.64
MIN	.67	.86	.79	.69	.69	.69	.69	.69	.69	.59	.64	.51
AC-FT	69	68	53	49	66	47	50	66	61	41	48	33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2001, BY WATER YEAR (WY)

MEAN	2.91	3.57	3.46	3.50	3.39	3.79	3.29	2.88	2.52	2.73	2.49	2.72
MAX	6.69	10.6	9.56	8.65	7.55	11.8	10.6	5.52	4.78	5.89	5.78	5.81
(WY)	1992	1991	1988	1988	1989	1991	1989	1988	1991	1989	1991	1992
MIN	.66	1.15	.86	.80	1.03	.77	.84	.85	.73	.67	.67	.55
(WY)	1985	2001	2001	2001	1986	2001	2001	1984	1984	2001	1984	2001

16283200 KAHALUU STREAM NEAR AHUIMANU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1984 - 2001	
ANNUAL TOTAL	416.14		328.22			
ANNUAL MEAN	1.14		.90		3.10	
HIGHEST ANNUAL MEAN					5.97	1991
LOWEST ANNUAL MEAN					.90	2001
HIGHEST DAILY MEAN	15	Jan 19	10	Oct 29	97	Mar 19 1991
LOWEST DAILY MEAN	.60	Jul 13	.51	Sep 25	.51	Sep 25 2001
ANNUAL SEVEN-DAY MINIMUM	.65	Aug 13	.53	Sep 24	.53	Sep 24 2001
ANNUAL RUNOFF (AC-FT)	825		651		2250	
10 PERCENT EXCEEDS	1.5		.99		4.8	
50 PERCENT EXCEEDS	.89		.74		2.6	
90 PERCENT EXCEEDS	.69		.64		.85	



16284200 WAIHEE STREAM NEAR KAHALUU

LOCATION.--Lat 21°27'04", long 157°51'36", Hydrologic Unit 20060000, on right bank, 0.2 mi downstream from forest-reserve boundary, 1.0 mi south of Kahaluu School, and 1.6 mi west of Ahuimanu sewage treatment plant.

DRAINAGE AREA.--0.97 mi^2.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 170 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records good. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

AVERAGE DISCHARGE.--27 years (water years 1975-2001), 6.03 ft^3/s (4,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft^3/s, March 21, 1991, gage height, 7.93 ft, from rating curve extended above 100 ft^3/s on basis of slope area measurement at gage height 7.93 ft; minimum, 1.1 ft^3/s, April 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 12	1830	*88	*3.93				

Minimum discharge, 3.5 ft^3/s, July 18-19, 21-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

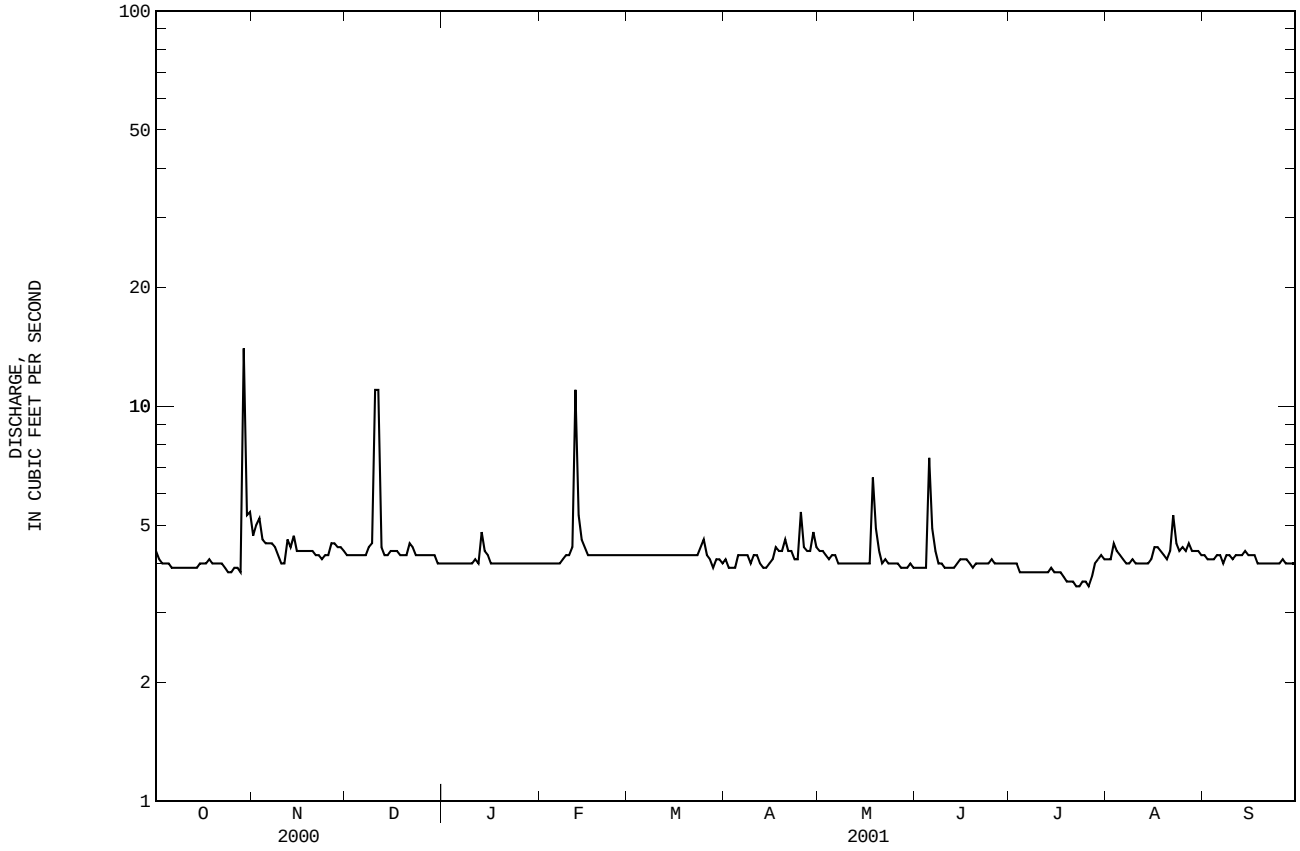
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	4.7	4.2	4.0	4.0	4.2	4.1	4.3	3.9	4.0	4.1	4.2
2	4.1	5.0	4.2	4.0	4.0	4.2	3.9	4.3	3.9	4.0	4.1	4.1
3	4.0	5.2	4.2	4.0	4.0	4.2	3.9	4.2	3.9	4.0	4.5	4.1
4	4.0	4.6	4.2	4.0	4.0	4.2	3.9	4.1	3.9	3.8	4.3	4.1
5	4.0	4.5	4.2	4.0	4.0	4.2	4.2	4.2	7.4	3.8	4.2	4.2
6	3.9	4.5	4.2	4.0	4.0	4.2	4.2	4.2	4.9	3.8	4.1	4.2
7	3.9	4.5	4.2	4.0	4.0	4.2	4.2	4.0	4.3	3.8	4.0	4.0
8	3.9	4.4	4.4	4.0	4.1	4.2	4.2	4.0	4.0	3.8	4.0	4.2
9	3.9	4.2	4.5	4.0	4.2	4.2	4.0	4.0	4.0	3.8	4.1	4.2
10	3.9	4.0	11	4.0	4.2	4.2	4.2	4.0	3.9	3.8	4.0	4.1
11	3.9	4.0	11	4.1	4.4	4.2	4.2	4.0	3.9	3.8	4.0	4.2
12	3.9	4.6	4.4	4.0	11	4.2	4.0	4.0	3.9	3.8	4.0	4.2
13	3.9	4.4	4.2	4.8	5.3	4.2	3.9	4.0	3.9	3.8	4.0	4.2
14	3.9	4.7	4.2	4.3	4.6	4.2	3.9	4.0	4.0	3.9	4.0	4.3
15	4.0	4.3	4.3	4.2	4.4	4.2	4.0	4.0	4.1	3.8	4.1	4.2
16	4.0	4.3	4.3	4.0	4.2	4.2	4.1	4.0	4.1	3.8	4.4	4.2
17	4.0	4.3	4.3	4.0	4.2	4.2	4.4	4.0	4.1	3.8	4.4	4.2
18	4.1	4.3	4.2	4.0	4.2	4.2	4.3	6.6	4.0	3.7	4.3	4.0
19	4.0	4.3	4.2	4.0	4.2	4.2	4.3	4.9	3.9	3.6	4.2	4.0
20	4.0	4.3	4.2	4.0	4.2	4.2	4.6	4.3	4.0	3.6	4.1	4.0
21	4.0	4.2	4.5	4.0	4.2	4.2	4.3	4.0	4.0	3.6	4.3	4.0
22	4.0	4.2	4.4	4.0	4.2	4.2	4.3	4.1	4.0	3.5	5.3	4.0
23	3.9	4.1	4.2	4.0	4.2	4.2	4.1	4.0	4.0	3.5	4.5	4.0
24	3.8	4.2	4.2	4.0	4.2	4.4	4.1	4.0	4.0	3.6	4.3	4.0
25	3.8	4.2	4.2	4.0	4.2	4.6	5.4	4.0	4.1	3.6	4.4	4.0
26	3.9	4.5	4.2	4.0	4.2	4.2	4.4	4.0	4.0	3.5	4.3	4.1
27	3.9	4.5	4.2	4.0	4.2	4.1	4.3	3.9	4.0	3.7	4.5	4.0
28	3.8	4.4	4.2	4.0	4.2	3.9	4.3	3.9	4.0	4.0	4.3	4.0
29	14	4.4	4.2	4.0	---	4.1	4.8	3.9	4.0	4.1	4.3	4.0
30	5.3	4.3	4.0	4.0	---	4.1	4.4	4.0	4.0	4.2	4.3	4.0
31	5.4	---	4.0	4.0	---	4.0	---	3.9	---	4.1	4.2	---
TOTAL	135.4	132.1	144.9	125.4	124.8	130.0	126.9	128.8	124.1	117.6	131.6	123.0
MEAN	4.37	4.40	4.67	4.05	4.46	4.19	4.23	4.15	4.14	3.79	4.25	4.10
MAX	14	5.2	11	4.8	11	4.6	5.4	6.6	7.4	4.2	5.3	4.3
MIN	3.8	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9	3.5	4.0	4.0
AC-FT	269	262	287	249	248	258	252	255	246	233	261	244

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2001, BY WATER YEAR (WY)

MEAN	5.64	6.45	6.37	6.65	6.35	7.07	6.12	5.72	5.50	5.60	5.49	5.46
MAX	9.81	14.3	15.5	12.1	13.2	17.7	15.1	8.46	8.88	9.95	10.6	9.43
(WY)	1983	1991	1988	1988	1979	1991	1989	1981	1982	1989	1982	1982
MIN	2.70	3.97	3.60	3.71	3.05	2.85	2.72	3.18	3.36	2.40	2.61	2.74
(WY)	1976	2000	1976	1977	1977	1977	1977	1977	1976	1977	1976	1976

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1975 - 2001	
ANNUAL TOTAL	1592.4		1544.6			
ANNUAL MEAN	4.35		4.23		6.03	
HIGHEST ANNUAL MEAN					9.36	1982
LOWEST ANNUAL MEAN					3.32	1977
HIGHEST DAILY MEAN	21	Jan 19	14	Oct 29	149	Mar 19 1991
LOWEST DAILY MEAN	3.5	Aug 4	3.5	Jul 22	1.3	Apr 15 1977
ANNUAL SEVEN-DAY MINIMUM	3.6	Aug 2	3.6	Jul 20	1.4	Apr 12 1977
ANNUAL RUNOFF (AC-FT)	3160		3060		4370	
10 PERCENT EXCEEDS	4.6		4.4		7.4	
50 PERCENT EXCEEDS	4.0		4.1		5.4	
90 PERCENT EXCEEDS	3.8		3.9		3.8	



16284200 WAIHEE STREAM NEAR KAHALUU

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975-86, March 1999 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June 1999 to current year.
WATER TEMPERATURE: June 1999 to current year.

INSTRUMENTATION.--Specific conductance and water temperature monitor from June 1999 to current year. Automatic water-quality (point) sampler from January 1999 to current year.

REMARKS.--Water-quality samples were collected monthly from March 1999 through February 2001. Monthly samples were collected with a hand-held sampler using the equal-width-increment sampling method. Additional samples were collected during storm events using an automatic (point) sampler located on the right bank of the stream at the gage.

Daily water temperature and specific conductance values from December 13-19 are missing due to battery failure. Daily specific conductance values on July 13, July 15-August 2, August 4-15, August 17-September 30 are missing due to instrument malfunction. Specific conductance extremes for current water year were not reported because more than 20 percent of the record was missing.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 228 microsiemens per centimeter, September 21 1999; minimum, 55 microsiemens per centimeter, December 10, 11, 1999.
WATER TEMPERATURE: Maximum, 22.5°C, September 27, 2000; minimum, 18.0°C, January 19, 20, 2000.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 180 microsiemens per centimeter, April 22, 1980; minimum, 100 microsiemens per centimeter, August 9, 1977.
WATER TEMPERATURE: Maximum, 24.0°C, August 9, 1977; minimum, 19.0°C, January 24, March 6, 1980.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 192 microsiemens/cm, Nov. 21; minimum, 51 microsiemens/cm, Oct. 29.
WATER TEMPERATURE: Maximum, 21.4°C, Oct. 29; minimum, 18.8°C, Mar. 21.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT													
16...	1150	4.0	9.0	101	7.9	142	20.5	8.35	5.16	.97	11.9	46	56
29...	0211	52	--	--	7.6	116	21.0	6.86	4.21	1.95	9.7	34	41
NOV													
13...	1040	4.5	8.9	99	7.8	145	20.5	8.71	5.34	1.00	10.3	44	53
DEC													
11...	1250	4.2	9.0	100	7.0	144	20.0	8.59	5.27	.90	11.8	46	57
JAN													
08...	1320	4.0	8.6	95	7.8	151	20.0	8.39	5.10	.81	11.9	41	50
FEB													
12...	1140	4.0	8.5	94	7.8	148	20.0	8.81	5.32	.97	12.4	44	54
12...	1516	57	--	--	7.5	103	20.5	5.88	3.14	1.66	7.7	27	33
12...	1744	15	--	--	--	--	--	--	--	--	--	--	--

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
OCT													
16...	14.2	<.2	29.1	2.4	<.041	<.10	.13	.111	<.006	.028	.029	.038	106
29...	12.6	<.2	21.5	2.5	<.041	E.10	2.5	<.047	E.004	.043	.031	.753	89
NOV													
13...	14.3	E.1	28.6	2.4	<.041	E.06	.09	.106	<.006	.038	.026	.035	102
DEC													
11...	14.2	<.2	29.5	2.4	<.041	<.10	<.08	.133	<.006	.034	<.018	.035	103
JAN													
08...	14.8	<.2	28.8	2.5	<.041	<.10	<.08	.132	<.006	.035	.030	.036	107
FEB													
12...	14.0	<.2	29.7	2.5	<.041	<.10	<.08	.131	<.006	.035	.034	.037	105
12...	9.8	<.2	15.6	2.8	<.041	E.06	5.0	.108	<.006	.031	.019	1.23	74
12...	--	--	--	--	--	--	--	--	--	--	--	--	--

E Estimated

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	CARBON, INORG + ORGANIC PARTIC. TOTAL (MG/L AS C) (00694)	CARBON, INOR-GANIC, PARTIC. TOTAL (MG/L AS C) (00688)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
OCT							
16...	.28	.1	<.5	.1	<.1	<10	<3.2
29...	2.6	64	456	64	.1	20	<3.2
NOV							
13...	.51	.3	2	.3	<.1	M	<3.2
DEC							
11...	.33	.3	2	.3	<.1	<10	E2.0
JAN							
08...	.19	.1	5	.1	<.1	<10	<3.2
FEB							
12...	.29	.2	1	.2	<.1	<10	<3.2
12...	2.8	130	1170	130	<.1	80	<3.2
12...	3.2	2.9	--	2.9	<.1	--	--

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	153	151	152	147	146	147	147	147	147	152	150	151
2	151	150	151	147	143	145	151	147	147	152	151	152
3	151	149	150	149	139	146	150	147	148	153	152	153
4	150	148	149	149	146	148	148	147	147	154	152	153
5	149	147	148	150	148	149	148	147	147	154	153	153
6	148	147	148	153	147	149	148	147	147	155	153	154
7	148	146	147	152	148	149	148	146	147	155	154	154
8	148	146	147	151	148	149	148	144	147	155	151	153
9	147	145	146	151	149	150	148	147	148	152	150	151
10	148	145	146	150	148	149	149	148	148	152	151	151
11	146	145	146	150	147	149	148	145	148	151	148	151
12	145	143	144	148	141	146	149	143	148	151	150	151
13	147	143	145	150	147	148	---	---	---	152	131	148
14	147	143	144	188	144	147	---	---	---	153	152	153
15	146	142	143	149	147	147	---	---	---	153	152	152
16	144	142	143	147	144	146	---	---	---	153	152	153
17	145	142	143	148	145	146	---	---	---	153	152	153
18	148	140	144	185	144	146	---	---	---	154	153	153
19	145	142	143	148	145	146	---	---	---	153	150	152
20	146	142	143	148	145	147	155	149	150	153	151	152
21	145	142	143	192	139	147	151	146	149	152	151	152
22	146	142	144	146	145	146	151	150	151	152	151	152
23	146	142	145	146	145	146	152	150	151	153	151	152
24	149	142	144	146	145	146	155	152	152	152	149	151
25	156	142	144	146	146	146	152	151	152	151	150	151
26	147	142	144	147	145	146	153	151	152	152	151	151
27	148	144	146	147	145	147	153	152	152	152	150	151
28	145	141	143	147	146	147	152	151	151	152	150	151
29	143	51	121	147	146	147	152	149	150	151	150	151
30	149	143	146	147	147	147	151	148	149	151	150	151
31	147	133	143	---	---	---	151	150	151	151	150	151
MONTH	156	51	145	192	139	147	155	143	149	155	131	152

E Estimated

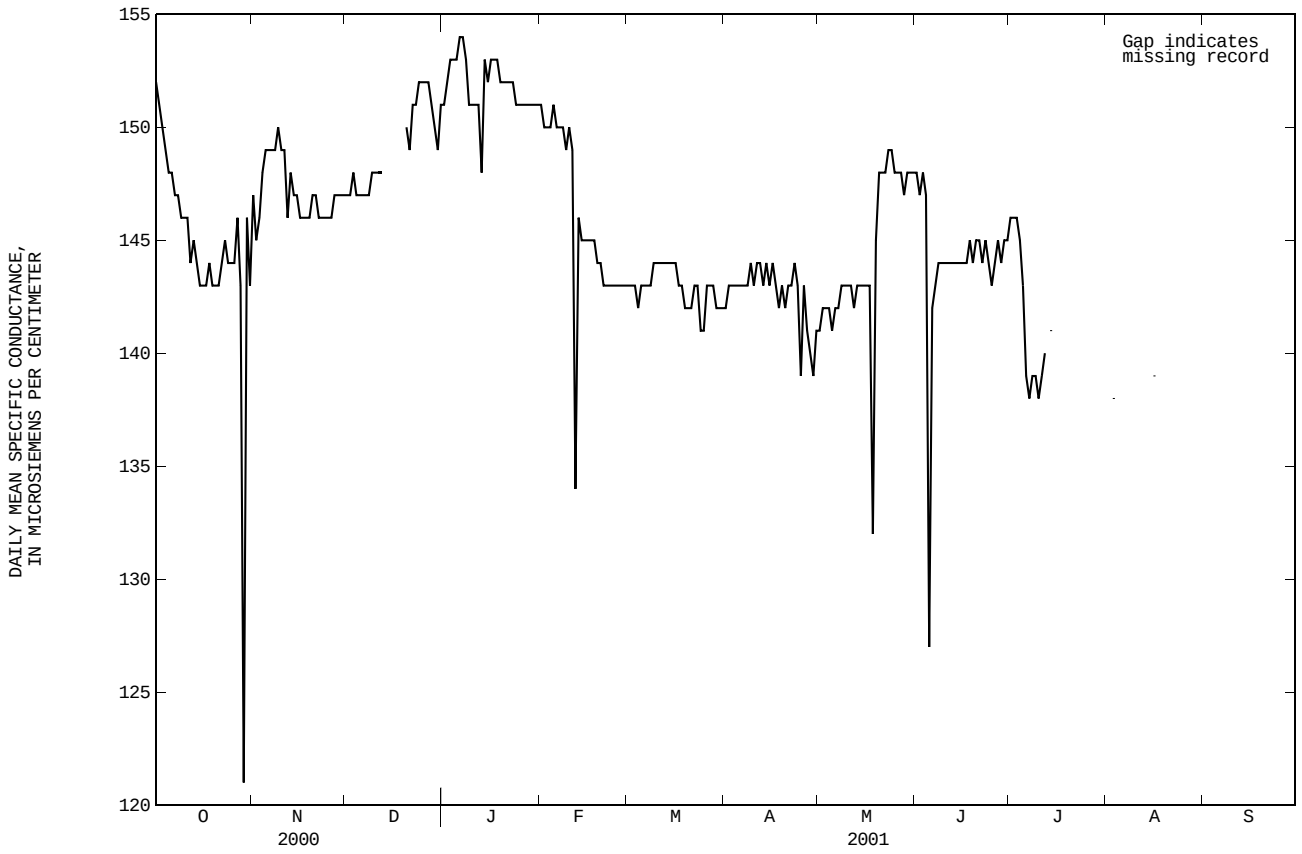
16284200 WAIHEE STREAM NEAR KAHALUU--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	151	150	151	143	142	143	143	140	142	142	140	141
2	150	149	150	143	142	143	143	142	143	143	141	142
3	151	149	150	143	142	143	143	142	143	142	141	142
4	151	150	150	143	141	142	143	142	143	143	141	142
5	151	149	151	145	139	143	143	139	143	143	138	141
6	150	149	150	143	141	143	144	142	143	143	141	142
7	150	149	150	143	141	143	144	143	143	143	141	142
8	150	143	150	144	142	143	144	141	143	144	142	143
9	151	141	149	144	143	144	144	143	144	144	143	143
10	151	149	150	144	143	144	144	141	143	144	142	143
11	151	146	149	144	143	144	147	143	144	143	140	143
12	151	65	134	144	143	144	145	143	144	143	141	142
13	147	141	146	144	143	144	145	143	143	143	142	143
14	146	145	145	144	143	144	145	143	144	143	142	143
15	146	144	145	144	143	144	146	141	143	144	142	143
16	146	144	145	144	141	144	148	143	144	144	142	143
17	145	144	145	144	141	143	147	140	143	144	142	143
18	145	144	145	143	142	143	143	140	142	143	91	132
19	145	143	144	143	142	142	144	142	143	148	121	145
20	144	142	144	143	142	142	144	138	142	149	146	148
21	144	142	143	143	141	142	144	142	143	149	147	148
22	143	142	143	143	142	143	144	142	143	149	146	148
23	143	142	143	143	141	143	145	143	144	150	148	149
24	143	142	143	143	125	141	144	142	143	150	148	149
25	143	142	143	144	125	141	144	130	139	149	147	148
26	143	142	143	144	142	143	144	140	143	149	146	148
27	143	142	143	144	142	143	143	139	141	150	147	148
28	143	142	143	143	142	143	141	139	140	148	146	147
29	---	---	---	144	139	142	141	131	139	148	147	148
30	---	---	---	143	141	142	148	140	141	148	146	148
31	---	---	---	144	138	142	---	---	---	149	147	148
MONTH	151	65	146	145	125	143	148	130	143	150	91	144

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	149	146	148	146	145	146	---	---	---	---	---	---
2	149	145	147	146	145	146	---	---	---	---	---	---
3	149	147	148	146	145	146	140	134	138	---	---	---
4	149	143	147	154	144	145	---	---	---	---	---	---
5	145	99	127	147	138	143	---	---	---	---	---	---
6	144	136	142	148	137	139	---	---	---	---	---	---
7	144	142	143	139	137	138	---	---	---	---	---	---
8	144	143	144	140	138	139	---	---	---	---	---	---
9	144	142	144	140	138	139	---	---	---	---	---	---
10	144	143	144	139	138	138	---	---	---	---	---	---
11	144	143	144	140	139	139	---	---	---	---	---	---
12	145	143	144	140	139	140	---	---	---	---	---	---
13	145	143	144	---	---	---	---	---	---	---	---	---
14	145	139	144	142	138	141	---	---	---	---	---	---
15	145	141	144	---	---	---	---	---	---	---	---	---
16	145	142	144	---	---	---	140	137	139	---	---	---
17	145	140	144	---	---	---	---	---	---	---	---	---
18	146	144	145	---	---	---	---	---	---	---	---	---
19	145	144	144	---	---	---	---	---	---	---	---	---
20	145	144	145	---	---	---	---	---	---	---	---	---
21	145	143	145	---	---	---	---	---	---	---	---	---
22	145	143	144	---	---	---	---	---	---	---	---	---
23	145	144	145	---	---	---	---	---	---	---	---	---
24	145	143	144	---	---	---	---	---	---	---	---	---
25	145	139	143	---	---	---	---	---	---	---	---	---
26	145	143	144	---	---	---	---	---	---	---	---	---
27	146	144	145	---	---	---	---	---	---	---	---	---
28	146	142	144	---	---	---	---	---	---	---	---	---
29	146	144	145	---	---	---	---	---	---	---	---	---
30	146	143	145	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	149	99	144	154	137	141	140	134	138	---	---	---
YEAR	192	51	146									

16284200 WAIHEE STREAM NEAR KAHALUU--Continued



TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

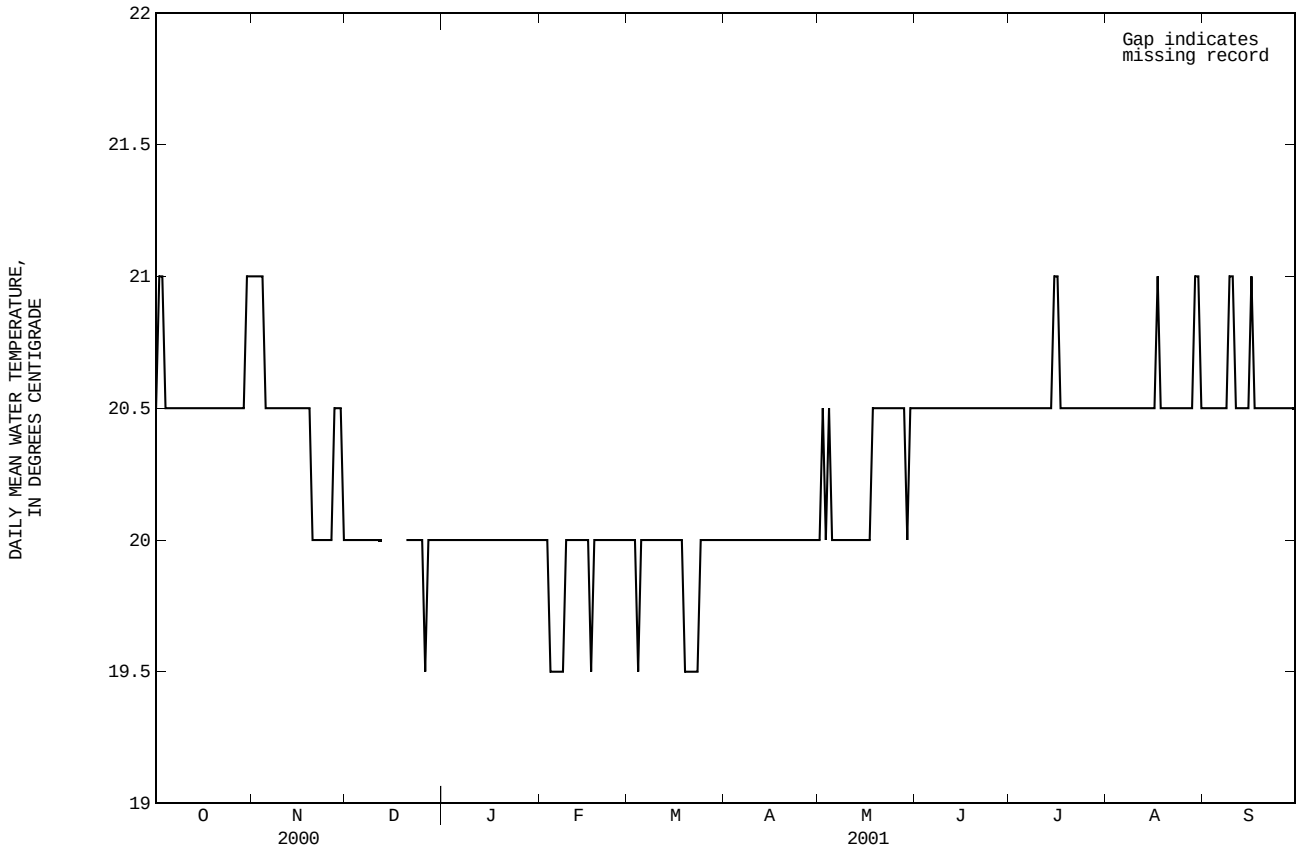
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	21.0	20.5	20.5	21.0	20.5	21.0	20.0	20.0	20.0	20.0	20.0	20.0
2	21.0	20.5	21.0	21.0	20.5	21.0	20.5	20.0	20.0	20.0	20.0	20.0
3	21.0	20.5	21.0	21.0	21.0	21.0	20.5	20.0	20.0	20.5	20.0	20.0
4	21.0	20.5	20.5	21.0	20.5	21.0	20.5	20.0	20.0	20.5	20.0	20.0
5	21.0	20.5	20.5	21.0	20.5	20.5	20.0	20.0	20.0	20.0	20.0	20.0
6	21.0	20.5	20.5	20.5	20.5	20.5	20.0	19.5	20.0	20.0	19.5	20.0
7	20.5	20.5	20.5	21.0	20.5	20.5	20.0	20.0	20.0	20.0	19.5	20.0
8	21.0	20.5	20.5	20.5	20.5	20.5	20.5	20.0	20.0	20.0	20.0	20.0
9	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.0	20.0	20.5	20.0	20.0
10	21.0	20.5	20.5	20.5	20.5	20.5	20.5	20.0	20.0	20.5	20.0	20.0
11	20.5	20.5	20.5	20.5	20.0	20.5	20.0	19.5	20.0	20.5	20.0	20.0
12	21.0	20.5	20.5	20.5	20.5	20.5	20.5	20.0	20.0	20.0	20.0	20.0
13	21.0	20.5	20.5	21.0	20.5	20.5	---	---	---	20.5	20.0	20.0
14	21.0	20.5	20.5	20.5	20.5	20.5	---	---	---	20.5	20.0	20.0
15	21.0	20.5	20.5	20.5	20.5	20.5	---	---	---	20.0	20.0	20.0
16	20.5	20.5	20.5	20.5	20.5	20.5	---	---	---	20.0	20.0	20.0
17	20.5	20.0	20.5	20.5	20.0	20.5	---	---	---	20.0	19.5	20.0
18	20.5	20.5	20.5	20.5	20.0	20.5	---	---	---	20.0	19.5	20.0
19	21.0	20.5	20.5	20.5	20.0	20.5	---	---	---	20.0	19.5	20.0
20	21.0	20.5	20.5	20.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
21	20.5	20.5	20.5	20.0	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0
22	20.5	20.5	20.5	20.5	20.0	20.0	20.5	20.0	20.0	20.0	20.0	20.0
23	21.0	20.5	20.5	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0
24	20.5	20.5	20.5	20.5	20.0	20.0	20.0	19.5	20.0	20.0	19.5	20.0
25	20.5	20.5	20.5	20.5	20.0	20.0	20.0	19.5	20.0	20.5	20.0	20.0
26	20.5	20.5	20.5	20.5	20.0	20.0	20.0	19.5	19.5	20.0	20.0	20.0
27	20.5	20.5	20.5	20.5	20.0	20.5	20.0	19.5	20.0	20.0	20.0	20.0
28	20.5	20.5	20.5	20.5	20.0	20.5	20.0	19.5	20.0	20.0	20.0	20.0
29	21.5	20.5	20.5	20.5	20.0	20.5	20.5	20.0	20.0	20.0	20.0	20.0
30	21.0	20.5	21.0	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0
31	21.0	20.5	21.0	---	---	---	20.0	19.5	20.0	20.5	20.0	20.0
MONTH	21.5	20.0	20.6	21.0	20.0	20.4	20.5	19.5	20.0	20.5	19.5	20.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	20.5	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0
2	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
3	20.0	19.5	20.0	20.0	19.5	20.0	20.5	20.0	20.0	20.5	20.0	20.0
4	19.5	19.5	19.5	20.0	19.5	19.5	20.5	20.0	20.0	21.0	20.0	20.5
5	19.5	19.0	19.5	20.0	19.5	20.0	20.0	20.0	20.0	20.5	20.0	20.0
6	19.5	19.0	19.5	20.0	19.5	20.0	20.0	20.0	20.0	20.5	20.0	20.0
7	20.0	19.0	19.5	20.0	19.5	20.0	20.5	19.5	20.0	20.5	20.0	20.0
8	20.0	19.5	19.5	20.0	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.0
9	20.0	19.5	20.0	20.0	19.5	20.0	20.5	20.0	20.0	20.5	20.0	20.0
10	20.0	20.0	20.0	20.5	19.5	20.0	20.0	20.0	20.0	21.0	20.0	20.0
11	20.0	20.0	20.0	20.5	19.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0
12	20.5	20.0	20.0	20.0	19.5	20.0	20.0	20.0	20.0	20.5	19.5	20.0
13	20.5	20.0	20.0	20.0	19.5	20.0	20.0	20.0	20.0	20.5	20.0	20.0
14	20.0	20.0	20.0	20.0	19.5	20.0	20.5	20.0	20.0	20.0	20.0	20.0
15	20.0	19.5	20.0	20.0	20.0	20.0	20.5	19.5	20.0	20.5	20.0	20.0
16	20.0	19.5	20.0	20.0	19.5	20.0	20.5	19.5	20.0	20.5	20.0	20.0
17	20.0	19.5	19.5	20.5	20.0	20.0	20.0	19.5	20.0	21.0	20.0	20.0
18	20.0	19.5	20.0	20.5	19.5	20.0	20.0	19.5	20.0	20.5	20.0	20.5
19	20.0	20.0	20.0	20.0	19.5	19.5	20.0	20.0	20.0	20.5	20.0	20.5
20	20.0	20.0	20.0	20.0	19.0	19.5	20.0	20.0	20.0	21.0	20.0	20.5
21	20.5	19.5	20.0	20.0	19.0	19.5	20.0	20.0	20.0	21.0	20.0	20.5
22	20.5	19.5	20.0	19.5	19.0	19.5	20.5	20.0	20.0	21.0	20.0	20.5
23	20.0	19.5	20.0	19.5	19.0	19.5	21.0	20.0	20.0	21.0	20.0	20.5
24	20.5	20.0	20.0	20.0	19.5	20.0	20.5	20.0	20.0	21.0	20.0	20.5
25	20.5	20.0	20.0	20.5	20.0	20.0	20.5	19.5	20.0	20.5	20.0	20.5
26	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
27	20.5	20.0	20.0	20.5	20.0	20.0	20.0	20.0	20.0	21.0	20.0	20.5
28	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.5
29	---	---	---	20.5	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.0
30	---	---	---	20.5	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.5
31	---	---	---	20.5	20.0	20.0	---	---	---	21.0	20.0	20.5
MONTH	20.5	19.0	19.9	20.5	19.0	19.9	21.0	19.5	20.0	21.0	19.5	20.2

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.5	20.0	20.5	20.5	20.5	20.5	21.5	20.5	20.5	21.0	20.5	20.5
2	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.0	20.5
3	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
4	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
5	20.5	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
6	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
7	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
8	21.0	20.0	20.5	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5
9	20.5	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.5	20.5	21.0
10	21.0	20.0	20.5	20.5	20.5	20.5	21.0	20.5	20.5	21.5	20.5	21.0
11	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
12	20.5	20.0	20.5	21.0	20.5	20.5	20.5	20.5	20.5	21.0	20.5	20.5
13	20.5	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
14	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.0	20.5
15	21.0	20.0	20.5	21.5	20.5	21.0	20.5	20.0	20.5	21.0	20.5	20.5
16	20.5	20.5	20.5	21.0	20.5	21.0	21.0	20.5	20.5	21.0	20.5	21.0
17	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	21.0	21.0	20.5	20.5
18	21.0	20.0	20.5	21.5	20.5	20.5	21.0	20.5	20.5	20.5	20.5	20.5
19	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	20.5	20.5	20.5
20	20.5	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
21	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
22	21.0	20.0	20.5	21.5	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
23	20.5	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5	20.5	20.5	20.5
24	20.5	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	20.5	20.0	20.5
25	20.5	20.5	20.5	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.0	20.5
26	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.0	20.5	20.5	20.5	20.5
27	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
28	21.0	20.5	20.5	21.0	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5
29	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	21.0	21.0	20.5	20.5
30	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	21.0	21.0	20.5	20.5
31	---	---	---	21.0	20.5	20.5	21.0	20.5	20.5	---	---	---
MONTH	21.0	20.0	20.5	21.5	20.0	20.5	21.5	20.0	20.5	21.5	20.0	20.5
YEAR	21.5	19.0	20.3									



16286000 WAIAHOLE TUNNEL WASTEWAY AT INTAKE 31, NEAR WAIAHOLE

LOCATION.--Lat 21°28'30", long 157°53'15", Hydrologic Unit 20060000, on left bank 150 ft downstream from wasteway gates at Waiahole tunnel intake No. 31 and 2.2 miles west of Waiahole School.

PERIOD OF RECORD.--January 1951 to May 1969 (discontinued), November 2000 to current year. Record from 1969-2000 were kept by Waiahole Irrigation Company (now the Agribusiness Development Corporation, State of Hawaii).

GAGE.--Water-stage recorder and Parshall Flume. Elevation of gage is 742.7 ft above mean sea level (levels from Waiahole Water Co.).

REMARKS.--Records computed by Ben Shimizu. Records good. Station measures releases from Waiahole tunnel to Waiahole Stream.

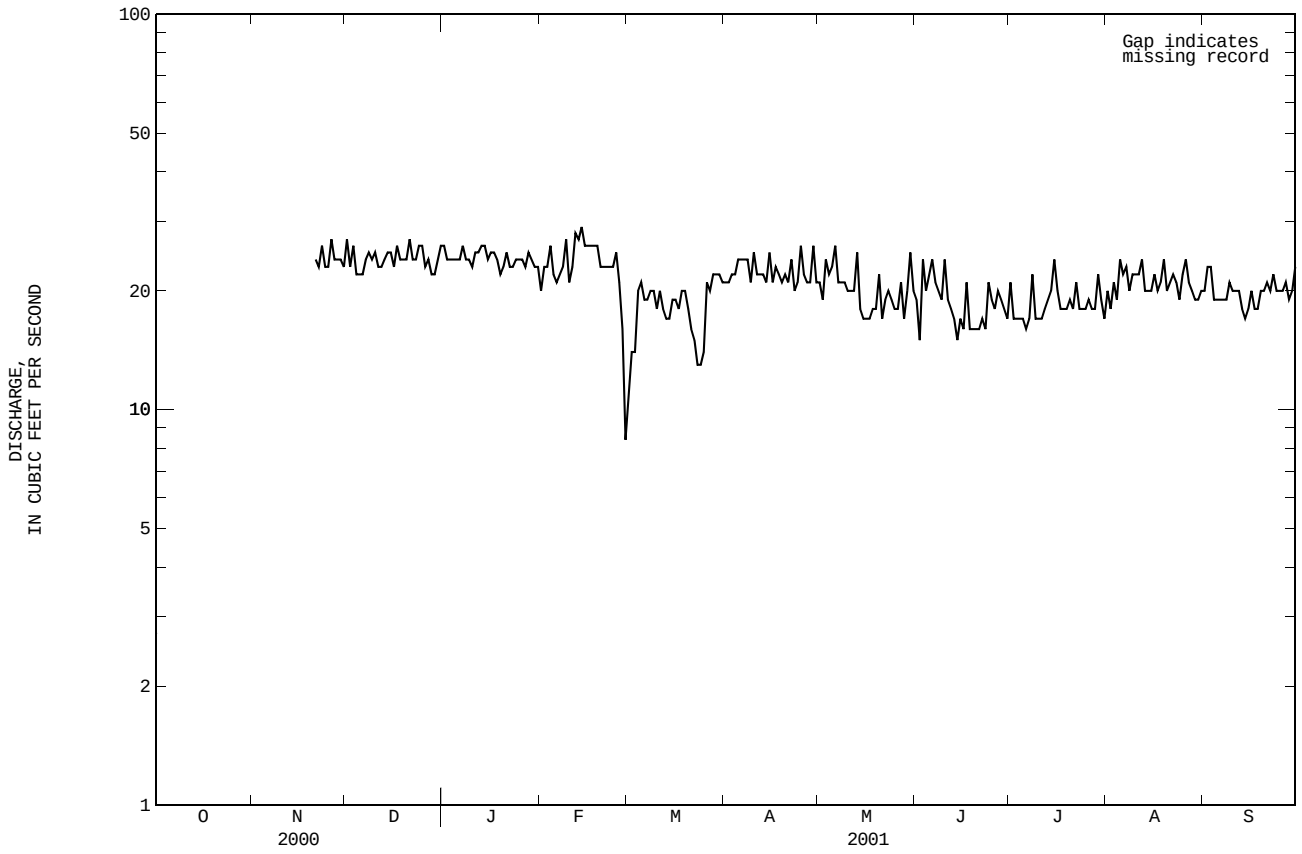
EXTREMES FOR CURRENT YEAR.--Maximum daily discharge; 29 ft^3/s, February 14, 2001; minimum daily, 8.4 ft^3/s on February 28, 2001.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	27	26	20	11	21	21	e19	21	20	20
2	---	---	23	24	23	14	21	19	e15	17	18	23
3	---	---	26	24	23	14	22	24	e24	17	21	23
4	---	---	22	24	26	20	22	22	e20	17	19	19
5	---	---	22	24	22	21	24	23	e22	17	24	19
6	---	---	22	24	21	19	24	26	24	16	22	19
7	---	---	24	26	22	19	24	21	21	17	23	19
8	---	---	25	24	23	20	24	21	20	22	20	19
9	---	---	24	24	27	20	21	21	19	17	22	21
10	---	---	25	23	21	18	25	20	24	17	22	20
11	---	---	23	25	23	20	22	20	19	17	22	20
12	---	---	23	25	28	18	22	20	18	18	24	20
13	---	---	24	26	27	17	22	25	17	19	20	18
14	---	---	25	26	29	17	21	18	15	20	20	17
15	---	---	25	24	26	19	25	17	17	24	20	18
16	---	---	23	25	26	19	21	17	16	20	22	20
17	---	---	26	25	26	18	23	17	21	18	20	18
18	---	---	24	24	26	20	22	18	16	18	21	18
19	---	---	24	22	26	20	21	18	16	18	24	20
20	---	---	24	23	23	18	22	22	16	19	20	20
21	---	24	27	25	23	16	21	17	16	18	21	21
22	---	23	24	23	23	15	24	19	17	21	22	20
23	---	26	24	23	23	13	20	20	16	18	21	22
24	---	23	26	24	23	13	21	19	21	18	19	20
25	---	23	26	24	25	14	26	18	19	18	22	20
26	---	27	23	24	21	21	22	18	18	19	24	20
27	---	24	24	23	16	20	21	21	20	18	21	21
28	---	24	22	25	8.4	22	21	17	19	18	20	19
29	---	24	22	24	---	22	26	20	18	22	19	20
30	---	23	24	23	---	22	21	25	17	19	19	23
31	---	---	26	23	---	21	---	20	---	17	20	---
TOTAL	---	241	749	749	650.4	561	672	624	560	575	652	597
MEAN	---	24.1	24.2	24.2	23.2	18.1	22.4	20.1	18.7	18.5	21.0	19.9
MAX	---	27	27	26	29	22	26	26	24	24	24	23
MIN	---	23	22	22	8.4	11	20	17	15	16	18	17
AC-FT	---	478	1490	1490	1290	1110	1330	1240	1110	1140	1290	1180

e Estimated

16286000 WAIAHOLE TUNNEL WASTEWAY AT INTAKE 31, NEAR WAIAHOLE--Continued



16287000 WAIAHOLE TUNNEL AT NORTH PORTAL, NEAR WAIAHOLE

LOCATION.--Lat 21°28'15", long 157°53'30", Hydrologic Unit 20060000, on right bank in Waiahole tunnel directly below crest of Koolau Ridge and 2.6 miles southwest of Waiahole School.

PERIOD OF RECORD.--January 1951 to May 1969, October 2000 to current year. Records from 1969-2000 were kept by Waiahole Irrigation Company (now the Agribusiness Development Corporation, State of Hawaii).

GAGE.--Water-stage recorder and Parshall Flume. Elevation of gage is 752.5 ft above mean sea level (levels from Waiahole Water Co.).

REMARKS.--Records computed by Ben Shimizu. Oct. 1-11 computed by use of graphic recorder provided by Waiahole Water System. Records good. Station measures releases from Waiahole tunnel to Waiahole Stream.

ETREMES FOR PERIOD OF RECORD.--Maximum daily discharge; 125 ft^3/s, July 28, 1954; minimum daily, 1.8 ft^3/s on May 13, 2001, June 10, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge; 19 ft^3/s, Feb. 28; minimum daily discharge, 1.8 ft^3/s on May 13, June 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

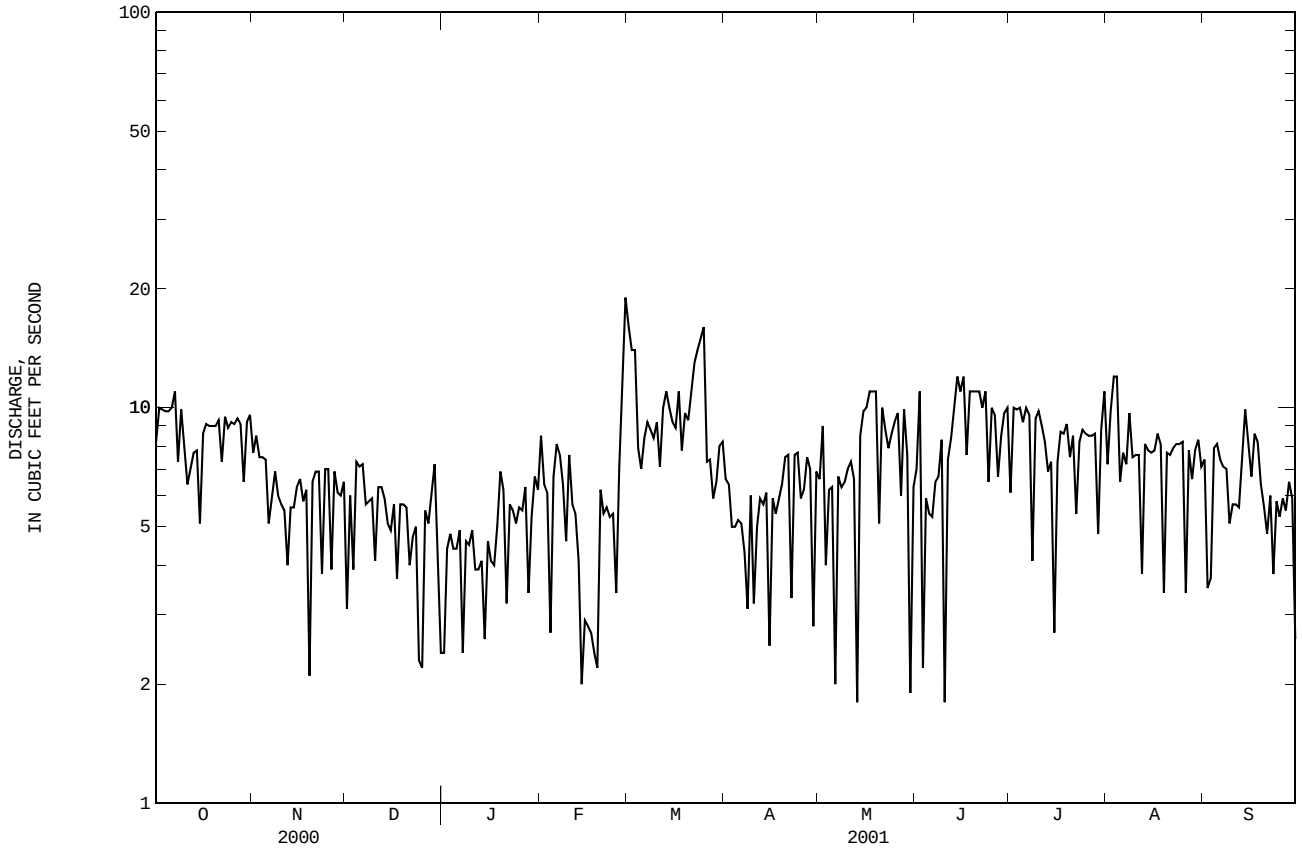
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	7.7	3.1	2.4	8.5	16	6.6	6.6	7.0	6.1	7.2	7.4
2	10	8.5	6.0	4.4	6.4	14	6.4	9.0	11	10	9.8	3.5
3	9.9	7.5	3.9	4.8	6.1	14	5.0	4.0	2.2	9.9	12	3.7
4	9.8	7.5	7.3	4.4	2.7	7.9	5.0	6.2	5.9	10	12	7.9
5	9.8	7.4	7.1	4.4	6.7	7.0	5.2	6.3	5.4	9.2	6.5	8.1
6	10	5.1	7.2	4.9	8.1	8.4	5.1	2.0	5.3	10	7.7	7.4
7	11	5.9	5.7	2.4	7.6	9.2	4.3	6.7	6.5	9.6	7.2	7.1
8	7.3	6.9	5.8	4.6	6.4	8.8	3.1	6.3	6.7	4.1	9.7	7.0
9	9.9	6.0	5.9	4.5	4.6	8.4	6.0	6.5	8.3	9.4	7.5	5.1
10	8.1	5.7	4.1	4.9	7.6	9.2	3.2	7.0	1.8	9.8	7.6	5.7
11	6.4	5.5	6.3	3.9	5.7	7.1	5.0	7.3	7.4	9.0	7.6	5.7
12	7.0	4.0	6.3	3.9	5.4	10	5.9	6.6	8.4	8.2	3.8	5.6
13	7.7	5.6	5.9	4.1	4.1	11	5.7	1.8	10	6.9	8.1	7.6
14	7.8	5.6	5.1	2.6	2.0	10	6.1	8.5	12	7.3	7.8	9.9
15	5.1	6.3	4.9	4.6	2.9	9.2	2.5	9.8	11	2.7	7.7	8.2
16	8.6	6.6	5.7	4.1	2.8	8.9	5.9	10	12	7.3	7.8	6.7
17	9.1	5.8	3.7	4.0	2.7	11	5.4	11	7.6	8.7	8.6	8.6
18	9.0	6.2	5.7	5.0	2.4	7.8	5.9	11	11	8.6	8.1	8.2
19	9.0	2.1	5.7	6.9	2.2	9.7	6.4	11	11	9.1	3.4	6.4
20	9.0	6.5	5.6	6.2	6.2	9.3	7.5	5.1	11	7.5	7.7	5.6
21	9.3	6.9	4.0	3.2	5.4	11	7.6	10	11	8.5	7.6	4.8
22	7.3	6.9	4.7	5.7	5.6	13	3.3	8.8	10	5.4	7.9	6.0
23	9.5	3.8	5.0	5.5	5.3	14	7.6	7.9	11	8.2	8.1	3.8
24	8.9	7.0	2.3	5.1	5.4	15	7.7	8.6	6.5	8.8	8.1	5.8
25	9.2	7.0	2.2	5.6	3.4	16	5.9	9.2	10	8.6	8.2	5.3
26	9.1	3.9	5.5	5.5	7.1	7.3	6.2	9.7	9.6	8.5	3.4	5.9
27	9.4	6.9	5.1	6.3	11	7.4	7.5	6.0	6.7	8.5	7.8	5.5
28	9.1	6.1	6.1	3.4	19	5.9	7.0	9.9	8.5	8.6	6.6	6.5
29	6.5	6.0	7.2	5.3	---	6.5	2.8	7.6	9.7	4.8	7.8	5.9
30	9.2	6.5	4.6	6.7	---	8.0	6.9	1.9	10	8.8	8.3	2.6
31	9.6	---	2.4	6.2	---	8.2	---	6.3	---	11	7.1	---
TOTAL	269.8	183.4	160.1	145.5	163.3	309.2	168.7	228.6	254.5	253.1	238.7	187.5
MEAN	8.70	6.11	5.16	4.69	5.83	9.97	5.62	7.37	8.48	8.16	7.70	6.25
MAX	11	8.5	7.3	6.9	19	16	7.7	11	12	11	12	9.9
MIN	5.1	2.1	2.2	2.4	2.0	5.9	2.5	1.8	1.8	2.7	3.4	2.6
AC-FT	535	364	318	289	324	613	335	453	505	502	473	372

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2001, BY WATER YEAR (WY)

MEAN	8.70	6.11	5.16	4.69	5.83	9.97	5.62	7.37	8.48	8.16	7.70	6.25
MAX	8.70	6.11	5.16	4.69	5.83	9.97	5.62	7.37	8.48	8.16	7.70	6.25
(WY)	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001
MIN	8.70	6.11	5.16	4.69	5.83	9.97	5.62	7.37	8.48	8.16	7.70	6.25
(WY)	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001

16287000 WAIAHOLE TUNNEL AT NORTH PORTAL, NEAR WAIAHOLE--Continued

SUMMARY STATISTICS	FOR 2001 WATER YEAR	
ANNUAL TOTAL	2562.4	
ANNUAL MEAN	7.02	
HIGHEST DAILY MEAN	19	Feb 28
LOWEST DAILY MEAN	1.8	May 13
ANNUAL SEVEN-DAY MINIMUM	2.7	Feb 13
ANNUAL RUNOFF (AC-FT)	5080	
10 PERCENT EXCEEDS	10	
50 PERCENT EXCEEDS	6.9	
90 PERCENT EXCEEDS	3.8	



16287200 WAIAHOLE TUNNEL AT ADIT 8, NEAR WAIPAHU

LOCATION.--Lat 21°27'00", long 157°57'30", Hydrologic Unit 20060000, on left bank at adit 8, 2,700 ft downstream from Ewa Forest Reserve, and 5.2 miles northeast of Waipahu Post Office.

PERIOD OF RECORD.--August 1956 to May 1969, November 2000 to current year. Records from 1969-2000 were kept by Waiahole Irrigation Company (now the Agribusiness Development Corporation, State of Hawaii).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 709.0 ft. above mean sea level (levels from Waiahole Water Co).

REMARKS.--Records computed by Stacie T.M. Young. Records good, except for estimated daily discharges which are fair. Records represent entire flow of Waiahole water-development tunnel; water is used for irrigation of diversified agriculture.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge; 151 ft^3/s, Oct. 23, 1958; minimum daily discharge, 8.7 ft^3/s, June 10, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge; 24 ft^3/s, Feb. 28; minimum daily discharge, 8.7 ft^3/s, June 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	11	9.9	15	23	14	13	e15	12	14	14
2	---	---	13	12	14	20	14	15	e17	16	15	11
3	---	---	11	12	13	20	12	12	e9.0	16	17	10
4	---	---	14	12	10	15	12	13	e13	16	18	14
5	---	---	14	12	13	14	12	13	e12	15	14	14
6	---	---	14	12	14	15	12	9.3	12	16	14	14
7	---	---	13	9.8	15	16	11	13	13	16	14	14
8	---	---	13	12	13	16	10	13	13	10	16	13
9	---	---	13	11	12	15	13	13	14	15	14	12
10	---	---	12	12	14	15	10	13	8.7	15	14	12
11	---	---	13	11	13	14	12	14	13	15	14	12
12	---	---	13	11	12	16	13	13	14	15	11	12
13	---	---	13	11	11	17	13	8.9	16	13	14	14
14	---	---	e12	9.9	9.7	17	13	14	18	14	14	16
15	---	---	12	11	10	16	9.8	16	17	9.5	14	15
16	---	---	13	11	10	15	13	16	17	13	14	13
17	---	---	11	11	10	17	12	17	14	15	15	15
18	---	---	13	12	9.8	15	13	17	17	15	15	15
19	---	---	13	13	9.7	16	13	16	17	15	10	13
20	---	---	13	13	13	16	14	12	17	14	14	12
21	---	---	11	10	13	17	14	16	17	15	14	11
22	---	---	12	12	13	19	10	15	16	12	14	13
23	---	11	12	13	12	20	14	14	17	15	14	10
24	---	14	10	12	12	21	14	14	13	15	14	12
25	---	14	9.8	12	11	22	13	15	16	15	15	12
26	---	11	12	12	13	15	13	15	16	15	10	12
27	---	14	12	13	16	14	14	12	13	15	13	12
28	---	13	13	11	24	13	13	e15	14	15	12	13
29	---	13	14	12	---	13	10	e14	16	11	13	13
30	---	14	12	13	---	14	14	e9.0	16	15	14	9.3
31	---	---	10	13	---	14	---	e14	---	16	13	---
TOTAL	---	104	381.8	361.6	355.2	510	374.8	424.2	440.7	444.5	431	382.3
MEAN	---	13.0	12.3	11.7	12.7	16.5	12.5	13.7	14.7	14.3	13.9	12.7
MAX	---	14	14	13	24	23	14	17	18	16	18	16
MIN	---	11	9.8	9.8	9.7	13	9.8	8.9	8.7	9.5	10	9.3
AC-FT	---	206	757	717	705	1010	743	841	874	882	855	758

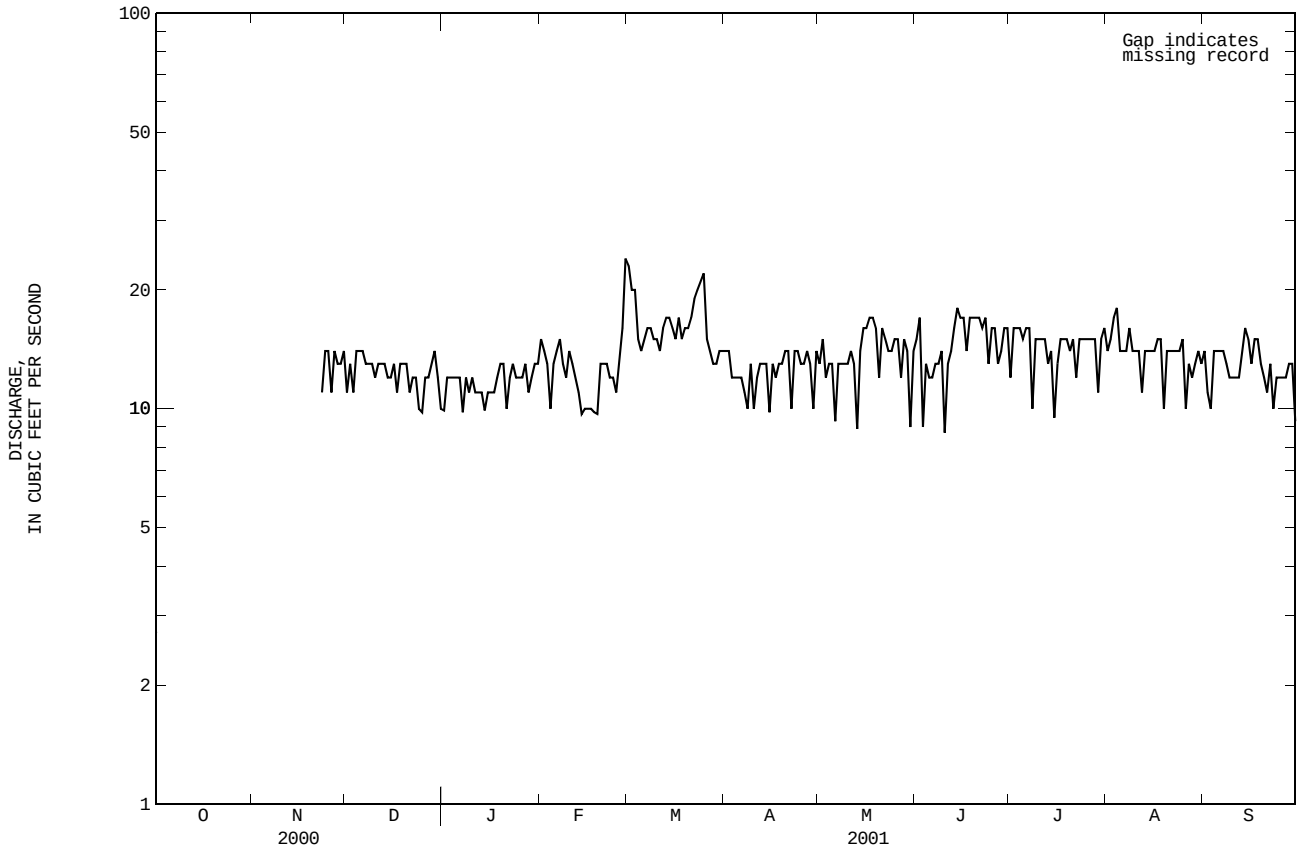
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 2001, BY WATER YEAR (WY)

MEAN	51.5	48.0	39.4	41.0	38.3	47.4	50.2	51.7	48.8	51.1	50.8	49.2
MAX	69.8	63.2	63.3	58.2	65.8	63.8	68.0	73.7	61.6	66.2	66.1	62.1
(WY)	1959	1965	1965	1959	1965	1965	1969	1969	1965	1965	1967	1958
MIN	35.7	34.2	12.3	11.7	12.7	16.5	12.5	13.7	14.7	14.3	13.9	12.7
(WY)	1967	1967	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001

16287200 WAIAHOLE TUNNEL AT ADIT 8, NEAR WAIPAHU--Continued

SUMMARY STATISTICS	FOR 2001 WATER YEAR		WATER YEARS 1956 - 2001	
ANNUAL MEAN			49.6	
HIGHEST ANNUAL MEAN			61.8	1965
LOWEST ANNUAL MEAN			45.0	1958
HIGHEST DAILY MEAN	24	Feb 28	151	Oct 23 1958
LOWEST DAILY MEAN	8.7	Jun 10	8.7	Jun 10 2001
ANNUAL SEVEN-DAY MINIMUM	10	Feb 13	10	Feb 13 2001
ANNUAL RUNOFF (AC-FT)			35960	
10 PERCENT EXCEEDS	16		63	
50 PERCENT EXCEEDS	13		49	
90 PERCENT EXCEEDS	10		20	

e Estimated



16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, on right bank, 0.3 mi downstream from Waikeekee Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi^2.

PERIOD OF RECORD.--December 1959 to current year.

REVISED RECORDS.--WSP 1937: Drainage area, WDR HI-94-1: 1993 (M).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 75 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Heather Jeppesen. Records good except for period of estimated record which is poor. Waiahole tunnel diverts water from tributaries and tunnels upstream of station. Elevation of the Waiahole tunnel is 800 ft (from topographic map).

AVERAGE DISCHARGE.--41 years (water years 1961-2001), 8.47 ft^3/s (6,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s, February 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft^3/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft^3/s, October 27, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	1400	1,420	6.14	Jun 5	0545	1,120	5.64
Feb 9	0045	*1,450	*6.18				

Minimum discharge, 1.6 ft^3/s, Sept. 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	8.8	2.4	2.1	1.8	2.4	2.2	3.5	2.3	4.2	2.9	e2.7
2	6.5	14	2.3	2.1	1.7	2.3	2.1	3.1	2.7	3.2	2.6	e2.6
3	4.6	11	2.3	2.0	1.8	2.3	1.9	3.0	2.3	2.9	5.7	e2.6
4	4.0	8.0	2.3	2.0	1.8	2.2	1.9	4.3	6.6	2.7	5.0	e2.5
5	3.7	6.6	2.3	2.0	1.8	2.8	4.5	7.3	56	2.6	2.7	e2.5
6	3.5	5.1	2.3	2.0	1.8	2.3	4.9	6.6	11	2.5	2.5	e2.4
7	3.2	4.8	2.3	1.9	1.7	2.2	3.2	4.1	6.6	2.5	e2.8	e2.3
8	3.1	4.0	3.2	1.9	1.8	2.2	2.5	3.5	5.0	2.4	e2.8	e2.3
9	3.0	4.0	3.4	2.0	37	2.3	2.4	3.3	4.4	2.4	e2.5	e2.3
10	3.2	3.6	2.3	2.0	1.9	2.1	3.3	3.1	3.9	2.3	e2.6	e2.2
11	3.1	3.2	2.4	2.2	3.4	2.1	3.2	3.0	3.7	2.5	e2.5	e2.2
12	2.9	5.3	3.4	1.9	40	2.1	2.9	2.8	3.5	2.4	e2.4	e2.1
13	2.8	6.9	2.4	3.3	16	2.1	2.6	2.7	3.3	2.4	e2.3	e2.1
14	2.7	4.3	2.6	2.7	12	2.0	2.3	2.7	3.4	3.2	e2.3	e2.0
15	2.5	4.0	3.2	2.0	5.9	2.0	2.3	2.7	6.9	2.7	e2.4	e1.9
16	2.7	4.0	2.9	1.9	4.4	2.1	2.4	2.8	3.9	3.2	e5.4	e1.9
17	2.5	3.6	2.6	1.9	3.8	2.3	4.0	2.9	4.4	2.9	e4.2	e1.9
18	2.6	3.8	2.5	1.9	3.5	2.3	3.0	8.6	3.6	2.7	e3.4	e1.8
19	3.0	3.6	2.4	1.8	3.3	3.5	3.0	5.2	3.2	2.5	e3.1	1.7
20	2.4	3.2	3.5	1.9	3.0	2.3	4.4	3.3	3.2	2.4	e2.9	1.7
21	2.3	3.4	6.5	1.8	2.9	2.0	3.8	2.8	3.0	2.4	e3.4	1.7
22	2.3	3.2	3.2	1.8	2.8	2.0	3.1	2.7	3.1	2.3	e5.5	1.8
23	2.2	3.0	2.6	1.8	2.9	2.0	3.4	3.9	2.9	2.3	e3.4	1.8
24	2.2	3.2	2.4	1.9	2.8	2.7	5.1	2.8	2.9	2.3	e3.1	1.7
25	2.2	3.0	2.4	1.8	2.6	5.6	15	2.6	5.2	2.3	e6.2	1.7
26	2.2	3.2	2.3	1.8	2.5	2.4	5.6	2.9	3.4	2.9	e4.2	1.9
27	2.1	3.6	2.2	1.8	2.4	2.2	4.6	2.5	2.8	2.5	e3.7	2.1
28	2.1	3.2	2.1	1.8	2.4	2.1	4.1	2.3	3.1	2.3	e3.2	1.9
29	114	2.8	3.4	1.9	---	3.3	4.9	2.5	2.8	2.2	e2.9	1.8
30	25	2.4	2.3	1.8	---	3.2	4.0	2.4	6.3	2.4	e2.8	1.8
31	8.4	---	2.1	1.8	---	2.3	---	2.3	---	2.9	e2.7	---
TOTAL	233.3	142.8	84.5	61.5	169.7	75.7	112.6	108.2	175.4	81.4	104.1	61.9
MEAN	7.53	4.76	2.73	1.98	6.06	2.44	3.75	3.49	5.85	2.63	3.36	2.06
MAX	114	14	6.5	3.3	40	5.6	15	8.6	56	4.2	6.2	2.7
MIN	2.1	2.4	2.1	1.8	1.7	2.0	1.9	2.3	2.3	2.2	2.3	1.7
AC-FT	463	283	168	122	337	150	223	215	348	161	206	123

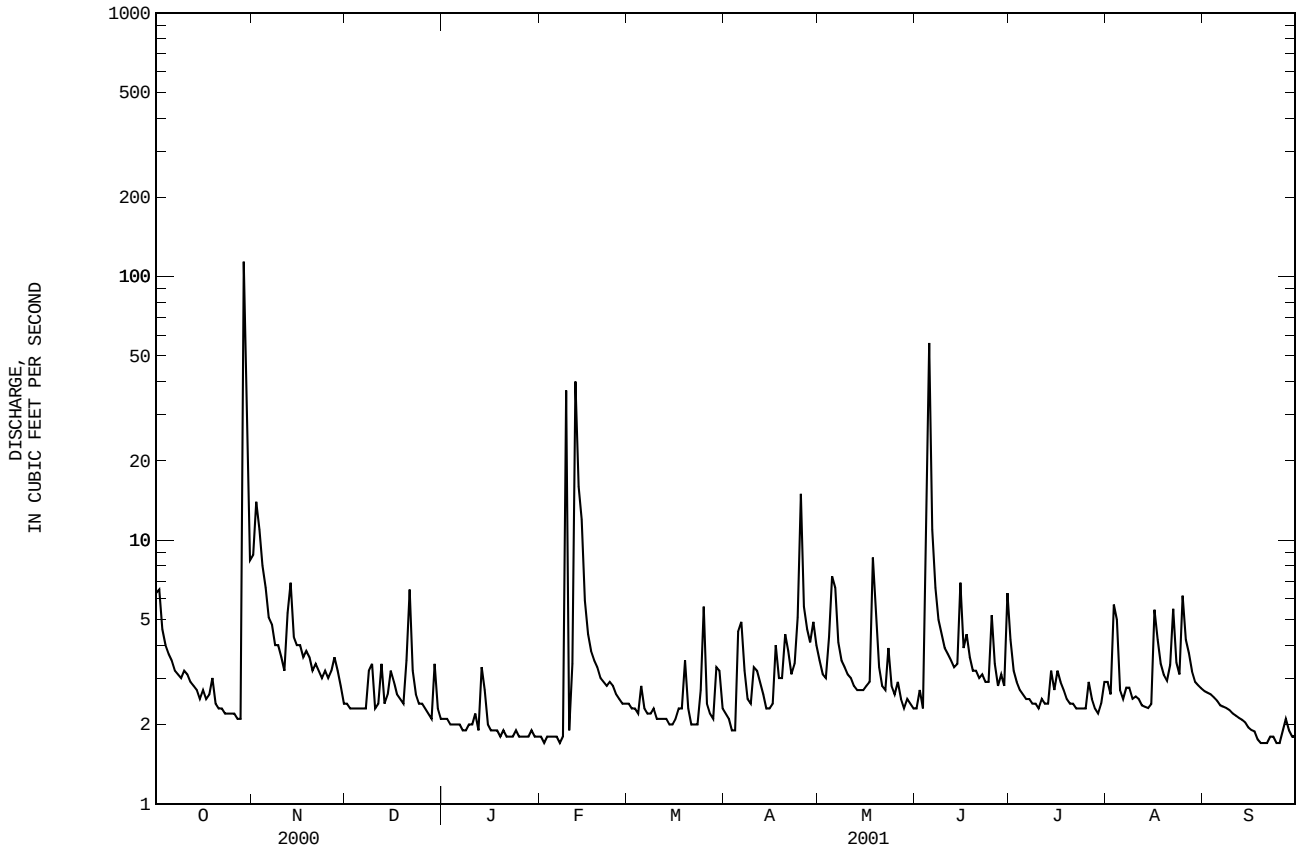
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2001, BY WATER YEAR (WY)

MEAN	6.54	11.2	9.29	11.3	11.5	12.2	10.1	8.19	5.31	6.15	5.22	5.13
MAX	31.0	55.7	44.1	45.6	65.5	53.1	49.3	29.3	16.2	30.2	25.0	22.1
(WY)	1992	1966	1988	1988	1994	1982	1963	1965	1977	1987	1967	1986
MIN	1.55	2.13	2.23	1.67	1.77	2.03	2.65	1.98	1.83	1.76	1.57	1.38
(WY)	1985	1963	1978	1977	1978	1978	1998	2000	1984	1984	1984	1984

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1960 - 2001	
ANNUAL TOTAL	1616.6		1411.1			
ANNUAL MEAN	4.42		3.87		8.47	
HIGHEST ANNUAL MEAN					16.7	1982
LOWEST ANNUAL MEAN					3.33	1984
HIGHEST DAILY MEAN	114	Oct 29	114	Oct 29	868	Feb 4 1965
LOWEST DAILY MEAN	1.5	Aug 16	1.7	Feb 2	1.1	Oct 17 1975
ANNUAL SEVEN-DAY MINIMUM	1.6	Aug 10	1.7	Sep 19	1.3	Sep 19 1984
ANNUAL RUNOFF (AC-FT)	3210		2800		6140	
10 PERCENT EXCEEDS	6.7		5.1		13	
50 PERCENT EXCEEDS	2.5		2.7		4.1	
90 PERCENT EXCEEDS	1.8		1.9		2.1	

e Estimated



16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank 600 ft upstream from Kawa Stream, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi^2.

PERIOD OF RECORD.--December 1958 to current year.

REVISED RECORDS.--WSP 1937: 1959-60.

GAGE.--Water-stage recorder and concrete-masonry control. Elevation of gage is 30 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records good. Waiahole tunnel diverts water from tributaries and tunnels upstream of station. Elevation of the Waiahole tunnel is 800 ft (from topographic map). Recording rain gage located 150 ft from the streamgage at an elevation of 95 ft.

AVERAGE DISCHARGE.--42 years (water years 1960-2001), 36.1 ft^3/s (26,150 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,250 ft^3/s, March 20, 1991, gage height, 8.60 ft, from rating curve extended above 530 ft^3/s on basis of computation of peak flow over submerged weir; minimum, 9.9 ft^3/s, June 5, 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 9	0115	*4,620	*7.51	No other peak greater than base discharge.			

Minimum discharge, 13 ft^3/s, Jan. 22-29, Feb. 2-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

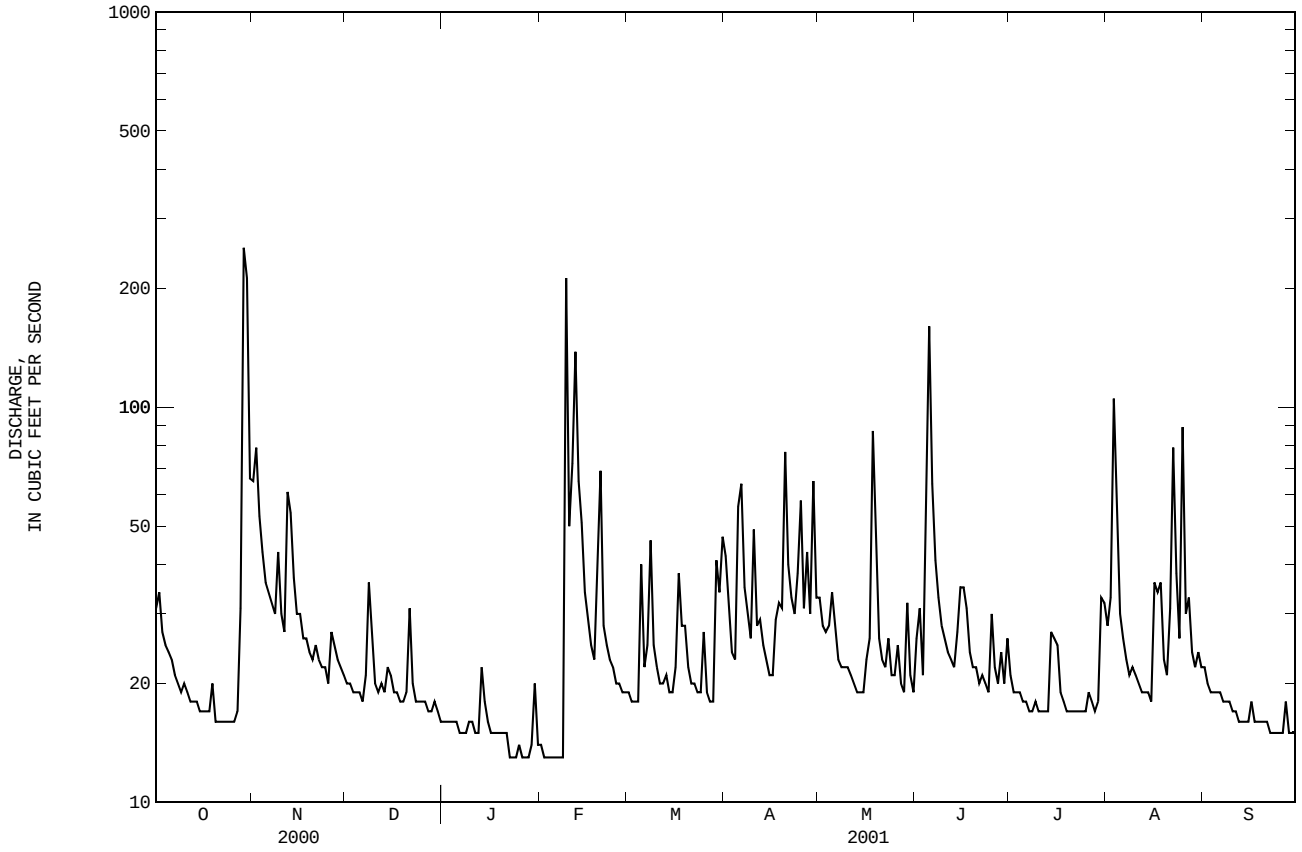
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	65	20	16	14	19	42	33	26	21	28	22
2	34	79	20	16	13	18	31	28	31	19	33	20
3	27	53	19	16	13	18	24	27	21	19	105	19
4	25	43	19	16	13	18	23	28	53	19	48	19
5	24	36	19	16	13	40	56	34	160	18	30	19
6	23	34	18	15	13	22	64	28	64	18	26	19
7	21	32	21	15	13	25	35	23	41	17	23	18
8	20	30	36	15	13	46	30	22	33	17	21	18
9	19	43	27	16	212	25	26	22	28	18	22	18
10	20	30	20	16	50	22	49	22	26	17	21	17
11	19	27	19	15	72	20	28	21	24	17	20	17
12	18	61	20	15	138	20	29	20	23	17	19	16
13	18	54	19	22	65	21	25	19	22	17	19	16
14	18	37	22	18	51	19	23	19	27	27	19	16
15	17	30	21	16	34	19	21	19	35	26	18	16
16	17	30	19	15	29	22	21	23	35	25	36	18
17	17	26	19	15	25	38	29	26	31	19	34	16
18	17	26	18	15	23	28	32	87	24	18	36	16
19	20	24	18	15	41	28	31	54	22	17	23	16
20	16	23	19	15	69	22	77	26	22	17	21	16
21	16	25	31	15	28	20	40	23	20	17	31	16
22	16	23	20	13	25	20	33	22	21	17	79	15
23	16	22	18	13	23	19	30	26	20	17	38	15
24	16	22	18	13	22	19	38	21	19	17	26	15
25	16	20	18	14	20	27	58	21	30	17	89	15
26	16	27	18	13	20	19	31	25	22	19	30	15
27	17	25	17	13	19	18	43	20	20	18	33	18
28	31	23	17	13	19	18	30	19	24	17	24	15
29	253	22	18	14	---	41	65	32	20	18	22	15
30	212	21	17	20	---	34	33	21	26	33	24	15
31	66	---	16	14	---	47	---	19	---	32	22	---
TOTAL	1096	1013	621	473	1090	772	1097	830	970	605	1020	506
MEAN	35.4	33.8	20.0	15.3	38.9	24.9	36.6	26.8	32.3	19.5	32.9	16.9
MAX	253	79	36	22	212	47	77	87	160	33	105	22
MIN	16	20	16	13	13	18	21	19	19	17	18	15
AC-FT	2170	2010	1230	938	2160	1530	2180	1650	1920	1200	2020	1000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2001, BY WATER YEAR (WY)

MEAN	32.2	44.3	37.6	36.9	36.0	43.1	44.7	37.5	27.0	32.0	30.2	29.4
MAX	55.1	170	101	94.9	141	176	137	102	56.5	90.5	73.7	84.7
(WY)	1992	1991	1988	1988	1969	1982	1963	1965	1978	1987	1978	1994
MIN	12.6	14.5	14.5	12.9	13.2	14.5	19.3	13.3	13.8	15.0	13.6	13.3
(WY)	1985	1963	1978	1977	1978	2000	1992	2000	2000	1984	1984	1975

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1959 - 2001	
ANNUAL TOTAL	9992		10093			
ANNUAL MEAN	27.3		27.7		36.1	
HIGHEST ANNUAL MEAN					67.2	1982
LOWEST ANNUAL MEAN					20.1	1984
HIGHEST DAILY MEAN	376	Jan 19	253	Oct 29	1750	Apr 15 1963
LOWEST DAILY MEAN	10	Jun 5	13	Jan 22	10	Jun 5 2000
ANNUAL SEVEN-DAY MINIMUM	11	May 31	13	Feb 2	11	May 31 2000
ANNUAL RUNOFF (AC-FT)	19820		20020		26150	
10 PERCENT EXCEEDS	43		41		57	
50 PERCENT EXCEEDS	19		21		23	
90 PERCENT EXCEEDS	13		16		15	



16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", Hydrologic Unit 20060000, on right bank 800 ft downstream from intake, 1.5 mi west of Kahana, and 1.7 mi southwest of Punaluu.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1719: 1954-55, WDR HI-91-1: 1990 (Maximum and minimum daily discharges).

GAGE.--Water-stage recorder. Elevation of gage is 200 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Heather Jeppesen. Records good except for June 6 to September 30, which are fair. Ditch diverts water from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--48 years (water years 1954-2001), 8.29 ft^3/s (6,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s, October 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 16 ft^3/s, on several days; minimum daily discharge, 3.9 ft^3/s, Jun. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

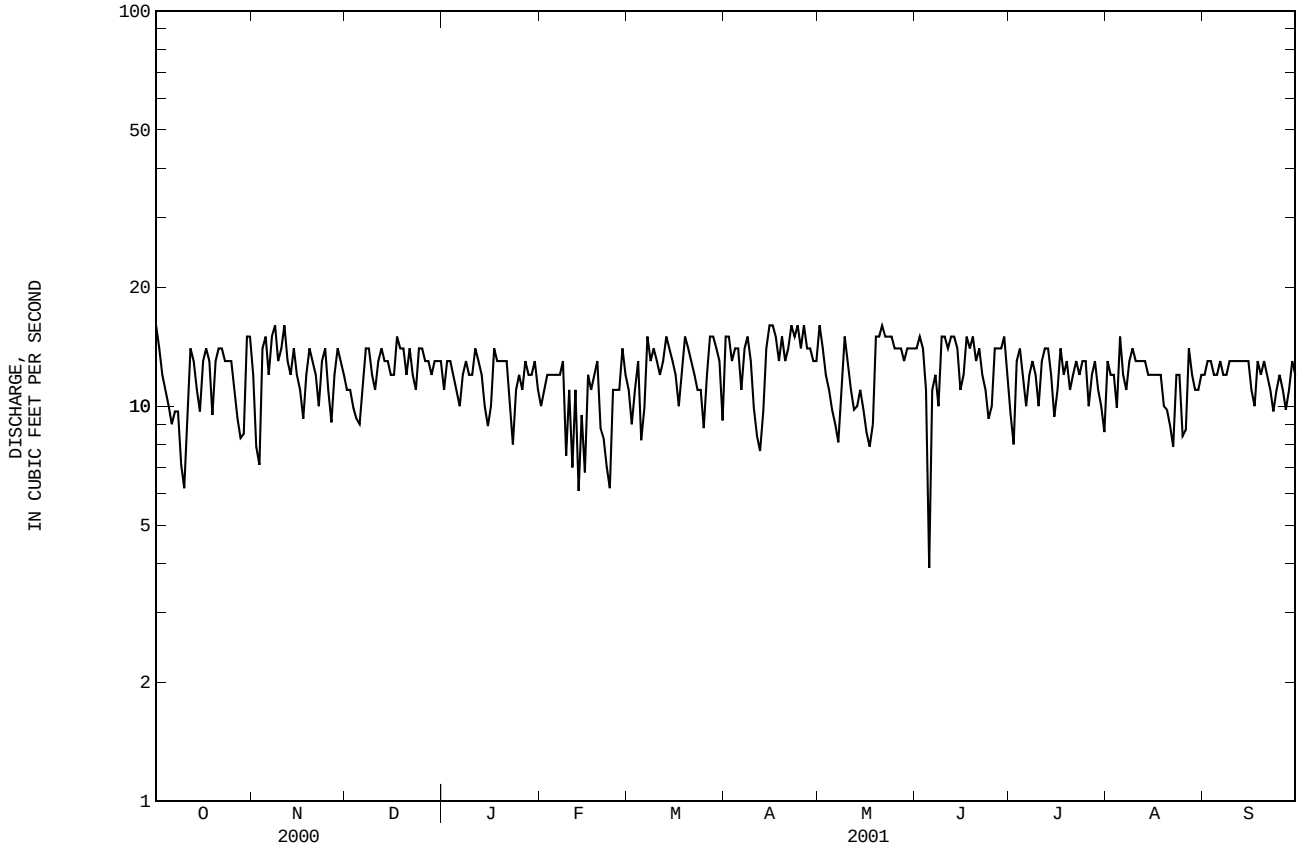
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	12	11	11	10	11	15	16	14	9.6	13	12
2	14	7.9	11	13	11	9.0	15	14	15	8.0	12	13
3	12	7.1	9.9	13	12	11	13	12	14	13	12	13
4	11	14	9.3	12	12	13	14	11	11	14	9.9	12
5	10	15	9.0	11	12	8.2	14	9.8	3.9	12	15	12
6	9.0	12	11	10	12	9.9	11	9.0	11	10	12	13
7	9.7	15	14	12	12	15	14	8.1	12	12	11	12
8	9.7	16	14	13	13	13	15	11	10	13	13	12
9	7.1	13	12	12	7.5	14	13	15	15	12	14	13
10	6.2	14	11	12	11	13	9.9	13	15	10	13	13
11	9.8	16	13	14	7.0	12	8.4	11	14	13	13	13
12	14	13	14	13	11	13	7.7	9.8	15	14	13	13
13	13	12	13	12	6.1	15	9.7	10	15	14	13	13
14	11	14	13	10	9.5	14	14	11	14	12	12	13
15	9.7	12	12	8.9	6.8	13	16	9.8	11	9.4	12	13
16	13	11	12	10	12	12	16	8.6	12	11	12	11
17	14	9.3	15	14	11	10	15	7.9	15	14	12	10
18	13	12	14	13	12	12	13	9.0	14	12	12	13
19	9.5	14	14	13	13	15	15	15	15	13	10	12
20	13	13	12	13	8.8	14	13	15	13	11	9.8	13
21	14	12	14	13	8.3	13	14	16	14	12	8.9	12
22	14	10	12	10	7.0	12	16	15	12	13	7.9	11
23	13	13	11	8.0	6.2	11	15	15	11	12	12	9.7
24	13	14	14	11	11	11	16	15	9.3	13	12	11
25	13	11	14	12	11	8.8	14	14	10	13	8.4	12
26	11	9.1	13	11	11	12	16	14	14	10	8.7	11
27	9.3	12	13	13	14	15	14	14	14	12	14	9.8
28	8.3	14	12	12	12	15	14	13	14	13	12	11
29	8.5	13	13	12	---	14	13	14	15	11	11	13
30	15	12	13	13	---	13	13	14	12	10	11	12
31	15	---	13	11	---	9.2	---	14	---	8.6	12	---
TOTAL	358.8	372.4	386.2	365.9	290.2	381.1	406.7	384.0	384.2	364.6	361.6	361.5
MEAN	11.6	12.4	12.5	11.8	10.4	12.3	13.6	12.4	12.8	11.8	11.7	12.1
MAX	16	16	15	14	14	15	16	16	15	14	15	13
MIN	6.2	7.1	9.0	8.0	6.1	8.2	7.7	7.9	3.9	8.0	7.9	9.7
AC-FT	712	739	766	726	576	756	807	762	762	723	717	717

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2001, BY WATER YEAR (WY)

MEAN	9.16	7.67	6.28	6.19	6.20	7.01	8.49	8.79	9.63	10.0	10.2	10.1
MAX	26.4	15.3	16.0	17.6	21.7	16.1	19.0	21.2	22.6	22.0	23.9	21.3
(WY)	1965	1988	1988	1960	1964	1964	1961	1964	1963	1963	1958	1958
MIN	.002	.000	.001	.003	.011	.046	.015	.027	.020	.003	.002	.001
(WY)	1981	1981	1981	1981	1981	1979	1979	1981	1979	1980	1974	1980

16302000 PUNALUU DITCH NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1953 - 2001	
ANNUAL TOTAL	4175.5		4417.2			
ANNUAL MEAN	11.4		12.1		8.29	
HIGHEST ANNUAL MEAN					15.2	1964
LOWEST ANNUAL MEAN					.23	1981
HIGHEST DAILY MEAN	17	Jan 22	16	Oct 1	54	Oct 31 1964
LOWEST DAILY MEAN	2.1	Jan 20	3.9	Jun 5	.00	Dec 7 1963
ANNUAL SEVEN-DAY MINIMUM	5.1	May 2	8.4	Feb 9	.00	Jan 5 1969
ANNUAL RUNOFF (AC-FT)	8280		8760		6010	
10 PERCENT EXCEEDS	14		15		17	
50 PERCENT EXCEEDS	12		12		7.5	
90 PERCENT EXCEEDS	7.5		9.2		.28	



16303000 PUNALUU STREAM NEAR PUNALUU

LOCATION.--Lat 21°33'33", long 157°54'06", Hydrologic Unit 20060000, on left bank at Punaluu ditch diversion dam, 1.4 mi west of Kahana, and 1.8 mi southwest of Punaluu.

DRAINAGE AREA.--2.78 mi^2.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WRD Hawaii 1974: 1971-72(P), 1973(M). WDR HI-78-1: 1954(M), 1955-70(P).

GAGE.--Gage destroyed by flood of March 20-21, 1991 but was restored and water-stage recorder installed on March 29, 1993. Masonry control and elevation of gage is 212 ft above mean sea level (from topographic map). Prior to March 29, 1993, datum 2.00 ft higher.

REMARKS.--Records computed by Heather Jeppesen. Records good below 50 ft^3/s and poor above that. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--48 years (water years 1954-2001), 16.4 ft^3/s (11,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft^3/s, March 20, 1991, gage height, 10.02 ft, from rating curve extended above 170 ft^3/s on basis of slope-area measurements at gage heights 7.77 ft and 9.60 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 30	0330	1,010	5.49	Feb 9	0100	*2,920	*7.88

Minimum discharge, 0.23 ft^3/s, Jan. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

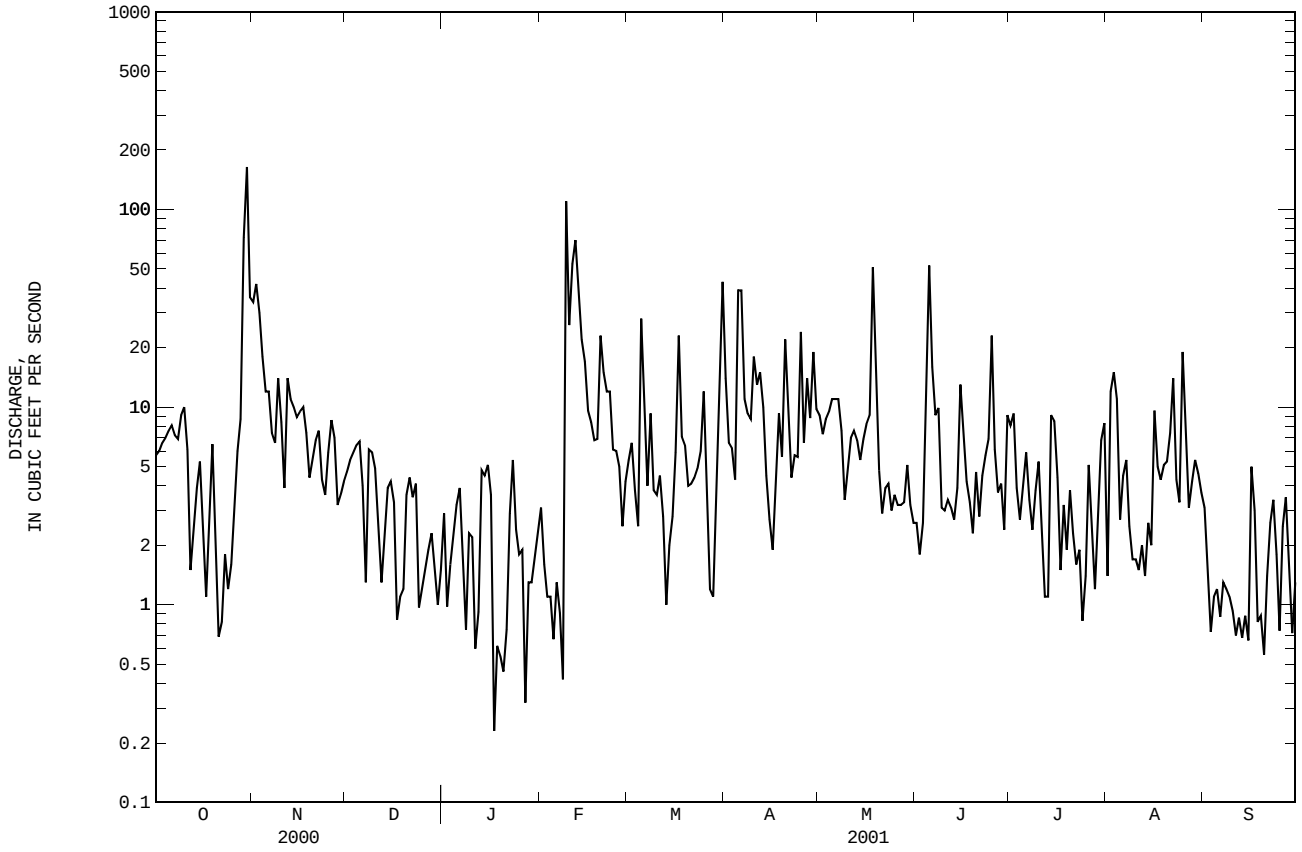
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	34	4.7	2.9	3.1	5.4	14	9.1	2.6	8.1	1.4	3.1
2	6.0	42	5.4	.98	1.6	6.6	6.6	7.3	1.8	9.3	12	1.4
3	6.6	30	5.9	1.6	1.1	3.8	6.2	8.7	2.6	3.9	15	.73
4	7.0	18	6.4	2.2	1.1	2.5	4.3	9.5	9.2	2.7	11	1.1
5	7.6	12	6.7	3.2	.67	28	39	11	52	4.0	2.7	1.2
6	8.1	12	4.0	3.9	1.3	8.6	39	11	16	5.9	4.5	.87
7	7.2	7.4	1.3	2.0	.91	4.0	11	11	9.1	3.4	5.4	1.3
8	6.9	6.6	6.1	.75	.42	9.3	9.3	7.6	9.9	2.4	2.5	1.2
9	9.1	14	5.9	2.3	110	3.8	8.7	3.4	3.1	3.8	1.7	1.1
10	10	8.4	4.9	2.2	26	3.6	18	4.8	3.0	5.3	1.7	.93
11	6.1	3.9	2.6	.60	53	4.5	13	7.0	3.4	2.4	1.5	.70
12	1.5	14	1.3	.92	70	2.8	15	7.6	3.1	1.1	2.0	.86
13	2.5	11	2.3	4.8	37	1.0	10	6.8	2.7	1.1	1.4	.68
14	3.9	10	3.9	4.5	22	2.0	4.5	5.4	3.9	9.1	2.6	.88
15	5.3	8.9	4.2	5.1	17	2.8	2.7	6.9	13	8.5	2.0	.66
16	2.7	9.5	3.3	3.6	9.6	5.9	1.9	8.2	7.7	4.4	9.6	5.0
17	1.1	10	.84	.23	8.4	23	4.6	9.1	4.2	1.5	5.0	3.0
18	2.6	7.4	1.1	.62	6.8	7.1	9.3	51	3.3	3.2	4.3	.82
19	6.5	4.4	1.2	.55	6.9	6.4	5.6	15	2.3	1.9	5.1	.88
20	2.2	5.4	3.6	.46	23	4.0	22	4.8	4.7	3.8	5.3	.56
21	.69	6.8	4.4	.75	15	4.1	8.7	2.9	2.8	2.3	7.4	1.4
22	.82	7.6	3.5	2.9	12	4.4	4.4	3.9	4.5	1.6	14	2.6
23	1.8	4.3	4.1	5.4	12	4.9	5.7	4.1	5.7	1.9	4.3	3.4
24	1.2	3.6	.97	2.4	6.1	6.0	5.6	3.0	6.9	.83	3.3	1.8
25	1.6	5.9	1.2	1.8	6.0	12	24	3.6	23	1.4	19	.74
26	3.2	8.6	1.5	1.9	5.0	4.5	6.6	3.2	6.1	5.1	7.7	2.5
27	6.0	7.0	1.9	.32	2.5	1.2	14	3.2	3.7	2.4	3.1	3.5
28	8.7	3.2	2.3	1.3	4.2	1.1	8.8	3.3	4.1	1.2	4.2	1.5
29	72	3.6	1.5	1.3	---	3.3	19	5.1	2.4	2.8	5.4	.72
30	164	4.2	1.0	1.7	---	11	9.8	3.2	9.1	6.8	4.6	1.3
31	36	---	1.5	2.3	---	43	---	2.6	---	8.3	3.7	---
TOTAL	404.61	323.7	99.51	65.48	462.70	230.6	351.3	243.3	225.9	120.43	173.4	46.43
MEAN	13.1	10.8	3.21	2.11	16.5	7.44	11.7	7.85	7.53	3.88	5.59	1.55
MAX	164	42	6.7	5.4	110	43	39	51	52	9.3	19	5.0
MIN	.69	3.2	.84	.23	.42	1.0	1.9	2.6	1.8	.83	1.4	.56
AC-FT	803	642	197	130	918	457	697	483	448	239	344	92

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2001, BY WATER YEAR (WY)

MEAN	13.4	19.8	20.0	20.3	20.6	21.0	21.0	16.4	11.0	11.7	11.0	10.0
MAX	38.7	74.7	64.5	40.9	76.3	73.1	84.6	64.9	35.4	39.0	36.9	30.0
(WY)	1959	1991	1965	1988	1969	1982	1963	1965	1982	1974	1982	1994
MIN	.28	4.58	.23	2.11	.58	3.19	2.37	1.00	.000	.000	.31	.49
(WY)	1958	1960	1960	2001	1964	1993	1954	1961	1953	1953	1961	1961

16303000 PUNALUU STREAM NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1953 - 2001	
ANNUAL TOTAL	2538.79		2747.36			
ANNUAL MEAN	6.94		7.53		16.4	
HIGHEST ANNUAL MEAN					35.4	1982
LOWEST ANNUAL MEAN					7.17	2000
HIGHEST DAILY MEAN	164	Oct 30	164	Oct 30	1010	Apr 15 1963
LOWEST DAILY MEAN	.04	May 21	.23	Jan 17	.00	Jun 1 1953
ANNUAL SEVEN-DAY MINIMUM	.69	May 15	.83	Sep 9	.00	Jun 1 1953
ANNUAL RUNOFF (AC-FT)	5040		5450		11890	
10 PERCENT EXCEEDS	14		14		29	
50 PERCENT EXCEEDS	3.7		4.2		11	
90 PERCENT EXCEEDS	.89		1.1		2.2	



16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35'22", long 157°54'38", Hydrologic Unit 20060000, on right bank, 0.8 mi downstream from Sacred Falls, 1.6 mi west of Punaluu Beach Park, and 1.7 mi south of cemetery in Hauula.

DRAINAGE AREA.--1.11 mi^2.

PERIOD OF RECORD.--May 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 110 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records good except for discharges greater than 80 ft^3/s which are poor. No diversion upstream of station.

AVERAGE DISCHARGE.--34 years (water years 1968-2001), 4.26 ft^3/s (3,080 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s, January 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft^3/s on basis of slope-area measurement at gage height 10.84 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 30	0145	*511	*8.40	No other peak greater than base discharge.			

Minimum discharge, 0.04 ft^3/s, Feb. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

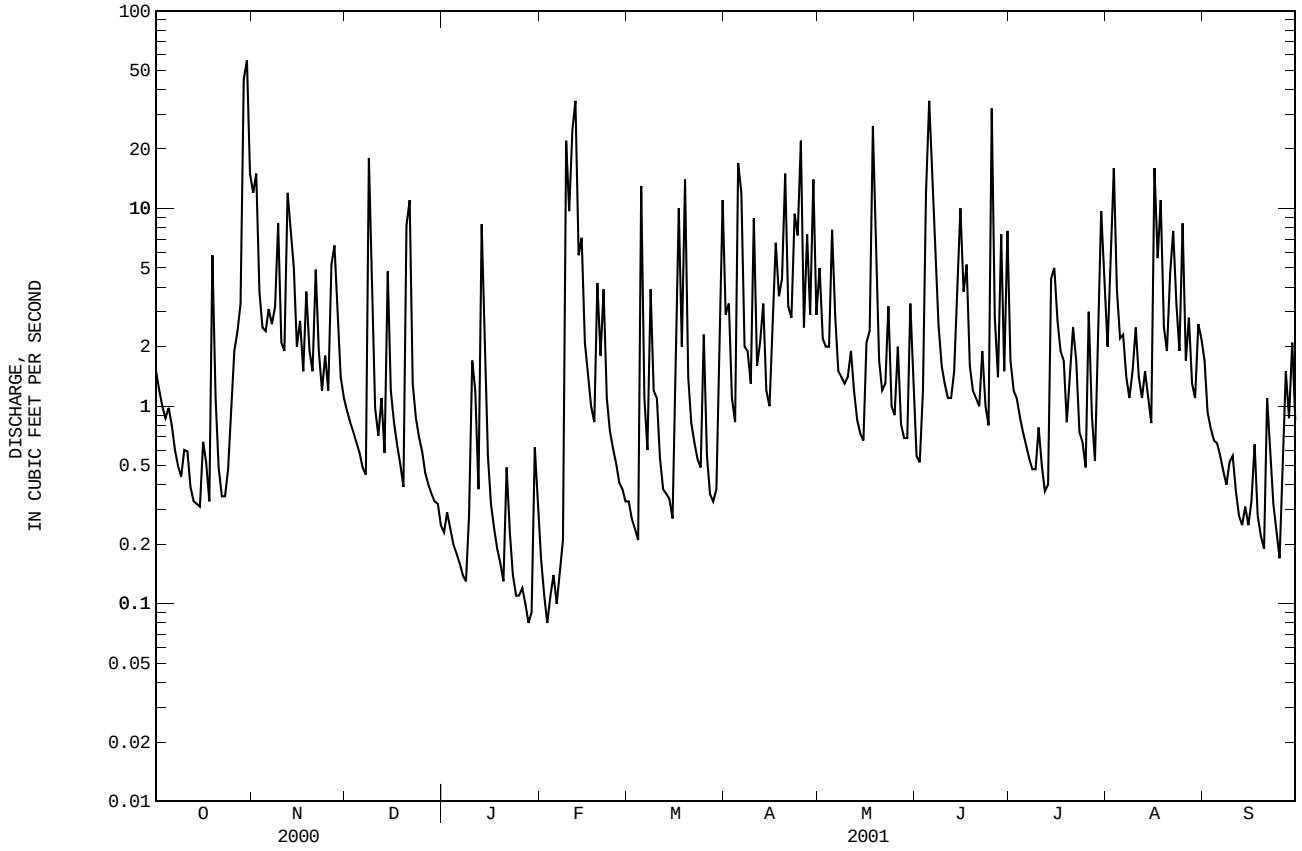
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	12	.95	.23	.17	.33	2.9	5.0	.56	1.7	2.0	1.7
2	1.2	15	.83	.29	.11	.27	3.3	2.2	.52	1.2	6.7	.93
3	1.0	3.8	.74	.24	.08	.24	1.1	2.0	1.2	1.1	16	.77
4	.87	2.5	.66	.20	.11	.21	.83	2.0	12	.88	3.9	.67
5	.98	2.4	.58	.18	.14	13	17	7.8	35	.74	2.2	.65
6	.80	3.1	.49	.16	.10	1.1	12	2.8	12	.63	2.3	.56
7	.60	2.6	.45	.14	.15	.60	2.0	1.5	4.9	.54	1.4	.47
8	.50	3.2	18	.13	.21	3.9	1.9	1.4	2.6	.48	1.1	.40
9	.44	8.4	3.2	.28	22	1.2	1.3	1.3	1.6	.48	1.5	.52
10	.60	2.1	.98	1.7	9.7	1.1	8.9	1.4	1.3	.78	2.5	.56
11	.59	1.9	.71	1.2	25	.55	1.6	1.9	1.1	.50	1.4	.37
12	.39	12	1.1	.38	35	.38	2.1	1.2	1.1	.37	1.1	.28
13	.33	7.5	.58	8.3	5.8	.36	3.3	.85	1.5	.40	1.5	.25
14	.32	5.0	4.8	1.6	7.1	.34	1.2	.73	3.5	4.4	1.1	.31
15	.31	2.0	1.2	.56	2.1	.27	1.0	.67	10	5.0	.82	.25
16	.66	2.7	.83	.32	1.4	2.3	2.3	2.1	3.8	2.7	16	.33
17	.52	1.5	.64	.24	1.0	10	6.7	2.4	5.2	1.9	5.6	.64
18	.33	3.8	.51	.19	.83	2.0	3.6	26	1.6	1.7	11	.28
19	5.8	1.9	.39	.16	4.2	14	4.4	5.8	1.2	.83	2.5	.22
20	1.1	1.5	8.2	.13	1.8	1.4	15	1.7	1.1	1.5	1.9	.19
21	.49	4.9	11	.49	3.9	.82	3.2	1.2	1.0	2.5	4.7	1.1
22	.35	1.9	1.3	.23	1.1	.65	2.8	1.3	1.9	1.7	7.7	.63
23	.35	1.2	.87	.14	.75	.54	9.4	3.2	1.0	.74	3.3	.32
24	.48	1.8	.70	.11	.61	.49	7.3	1.0	.80	.66	1.9	.23
25	.91	1.2	.59	.11	.51	2.3	22	.90	32	.49	8.4	.17
26	1.9	5.2	.46	.12	.41	.56	2.5	2.0	2.8	3.0	1.7	.60
27	2.4	6.5	.40	.10	.38	.36	7.4	.81	1.4	.89	2.8	1.5
28	3.3	2.7	.36	.08	.33	.33	2.9	.69	7.4	.53	1.3	.87
29	45	1.4	.33	.09	---	.38	14	.69	1.5	2.4	1.1	2.1
30	56	1.1	.32	.62	---	1.6	2.9	3.3	7.7	9.7	2.6	.85
31	15	---	.25	.34	---	11	---	1.4	---	4.3	2.2	---
TOTAL	145.02	122.8	62.42	19.06	124.99	72.58	166.83	87.24	159.28	54.74	120.22	18.72
MEAN	4.68	4.09	2.01	.61	4.46	2.34	5.56	2.81	5.31	1.77	3.88	.62
MAX	56	15	18	8.3	35	14	22	26	35	9.7	16	2.1
MIN	.31	1.1	.25	.08	.08	.21	.83	.67	.52	.37	.82	.17
AC-FT	288	244	124	38	248	144	331	173	316	109	238	37

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2001, BY WATER YEAR (WY)

MEAN	3.32	5.82	4.92	5.13	4.39	5.33	5.74	3.61	2.83	4.00	3.23	2.97
MAX	7.68	19.0	17.7	17.9	19.7	32.2	19.3	7.93	7.72	11.7	8.37	9.34
(WY)	1992	1991	1988	1988	1979	1982	1989	1988	1987	1982	1991	1994
MIN	.27	1.66	.48	.26	.37	.14	.87	.52	.61	.21	.53	.22
(WY)	1985	1981	1977	1986	2000	1983	1979	2000	1981	1971	1984	1975

16304200 KALUANUI STREAM NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1967 - 2001	
ANNUAL TOTAL	1195.15		1153.90			
ANNUAL MEAN	3.27		3.16		4.26	
HIGHEST ANNUAL MEAN					9.94	1982
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	62	Mar 31	56	Oct 30	230	Feb 1 1969
LOWEST DAILY MEAN	.00	Mar 12	.08	Jan 28	.00	Jul 24 1971
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 12	.11	Jan 23	.00	Sep 14 1975
ANNUAL RUNOFF (AC-FT)	2370		2290		3080	
10 PERCENT EXCEEDS	8.1		8.2		9.4	
50 PERCENT EXCEEDS	1.0		1.2		1.4	
90 PERCENT EXCEEDS	.13		.26		.26	



16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on left bank 75 ft upstream from Pupukea Military Road, and 3.5 mi southeast of Maunawai.

DRAINAGE AREA.--3.13 mi^2.

PERIOD OF RECORD.--June 1963 to September 2001 (discontinued). Occasional low-flow measurements, water years 1961 and 1963.

GAGE.--Water-stage recorder and combination pipe culvert and paved road control. Elevation of gage is 590 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Stacie Young. Records fair for discharges up to 30 ft^3/s and poor for discharges greater than 30 ft^3/s and for estimated daily discharges. No diversion upstream of station. Recording rain gage located at station.

AVERAGE DISCHARGE.--38 years (water years 1964-2001), 9.83 ft^3/s (7,120 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,810 ft^3/s November 20, 1990, gage height, 11.34 ft, from rating curve extended above 42 ft^3/s on basis of slope-area measurements at gage heights 10.06 ft, and 11.34 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 950 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 29	1600	*696	*6.63				

Minimum discharge, 0.45 ft^3/s, Jan. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	4.2	1.8	.75	.45	1.5	e23	e3.1	2.7	2.3	12	2.3
2	1.5	4.8	1.7	1.2	.37	1.5	2.4	e5.6	2.9	1.9	3.9	1.9
3	1.4	2.9	1.7	1.1	.34	1.5	2.3	4.7	3.1	1.7	50	1.6
4	1.3	2.1	1.6	.84	.31	1.3	1.6	5.7	e11	1.6	15	1.5
5	1.3	2.0	1.6	.74	.29	9.3	5.3	4.9	e28	1.5	3.8	1.5
6	1.6	2.0	1.5	.68	.29	2.7	4.6	5.7	12	1.5	2.9	1.4
7	1.3	2.5	1.5	.63	.31	1.8	2.3	3.8	4.9	1.4	2.4	1.4
8	1.3	2.0	1.9	.61	e.66	2.0	2.0	3.5	2.8	1.4	1.9	1.4
9	1.2	14	7.0	.66	e18	2.6	2.9	3.5	2.3	1.4	1.9	1.4
10	1.2	4.5	2.0	.99	e7.3	2.8	e17	3.2	2.0	1.4	2.3	1.5
11	1.1	2.3	1.7	1.4	e17	2.0	9.1	4.8	1.9	1.5	2.6	1.4
12	1.1	5.6	1.7	.92	e35	1.5	12	4.8	1.9	1.4	2.1	1.3
13	1.1	12	1.5	2.7	e16	1.3	8.9	3.1	2.1	1.5	2.0	1.3
14	1.1	12	1.6	5.0	e16	1.3	5.3	2.8	2.4	10	2.2	1.3
15	1.0	3.4	1.8	1.5	e5.2	1.2	4.8	2.7	4.2	2.7	1.6	1.4
16	1.1	14	1.5	.90	2.8	1.3	5.6	3.0	3.1	2.1	21	1.3
17	1.1	3.7	1.4	.70	2.3	e2.5	4.7	4.3	3.3	2.2	6.3	1.3
18	1.1	2.8	1.2	.61	2.0	e8.5	e3.0	11	3.7	2.2	9.5	1.3
19	2.4	2.8	1.1	.56	2.2	e6.0	e6.1	11	2.0	2.1	4.9	1.3
20	2.2	2.3	5.6	.55	2.3	e6.4	e9.6	4.0	1.5	1.7	2.8	1.2
21	1.5	4.7	18	.61	e3.1	1.6	e13	3.1	1.5	1.7	3.7	1.4
22	1.3	7.0	3.5	.63	e2.7	1.3	e4.9	3.0	2.2	1.7	3.6	1.5
23	1.2	2.4	1.6	.53	1.9	1.2	e3.6	3.0	2.0	1.6	5.2	1.4
24	1.2	2.2	1.3	.48	1.8	1.1	e6.9	3.1	1.7	1.3	3.3	1.3
25	1.2	2.2	1.1	.52	1.6	1.3	e18	2.8	43	1.4	5.6	1.1
26	2.2	4.8	.99	.55	1.5	1.6	e9.2	3.1	4.5	2.5	4.0	1.5
27	5.2	3.1	.94	.49	1.5	1.2	e6.4	3.5	2.4	2.7	2.3	5.6
28	2.6	3.9	.89	.52	1.5	.98	e7.3	2.8	9.5	1.5	2.1	3.4
29	114	2.3	.85	.59	---	.94	e19	2.8	2.9	1.4	1.9	2.3
30	23	2.0	.84	e.85	---	1.1	e15	2.8	2.7	16	1.9	2.2
31	6.4	---	.78	.81	---	e2.2	---	2.8	---	9.8	2.2	---
TOTAL	186.8	136.5	72.19	29.62	144.72	73.52	235.8	128.0	170.2	85.1	186.9	50.7
MEAN	6.03	4.55	2.33	.96	5.17	2.37	7.86	4.13	5.67	2.75	6.03	1.69
MAX	114	14	18	5.0	35	9.3	23	11	43	16	50	5.6
MIN	1.0	2.0	.78	.48	.29	.94	1.6	2.7	1.5	1.3	1.6	1.1
AC-FT	371	271	143	59	287	146	468	254	338	169	371	101

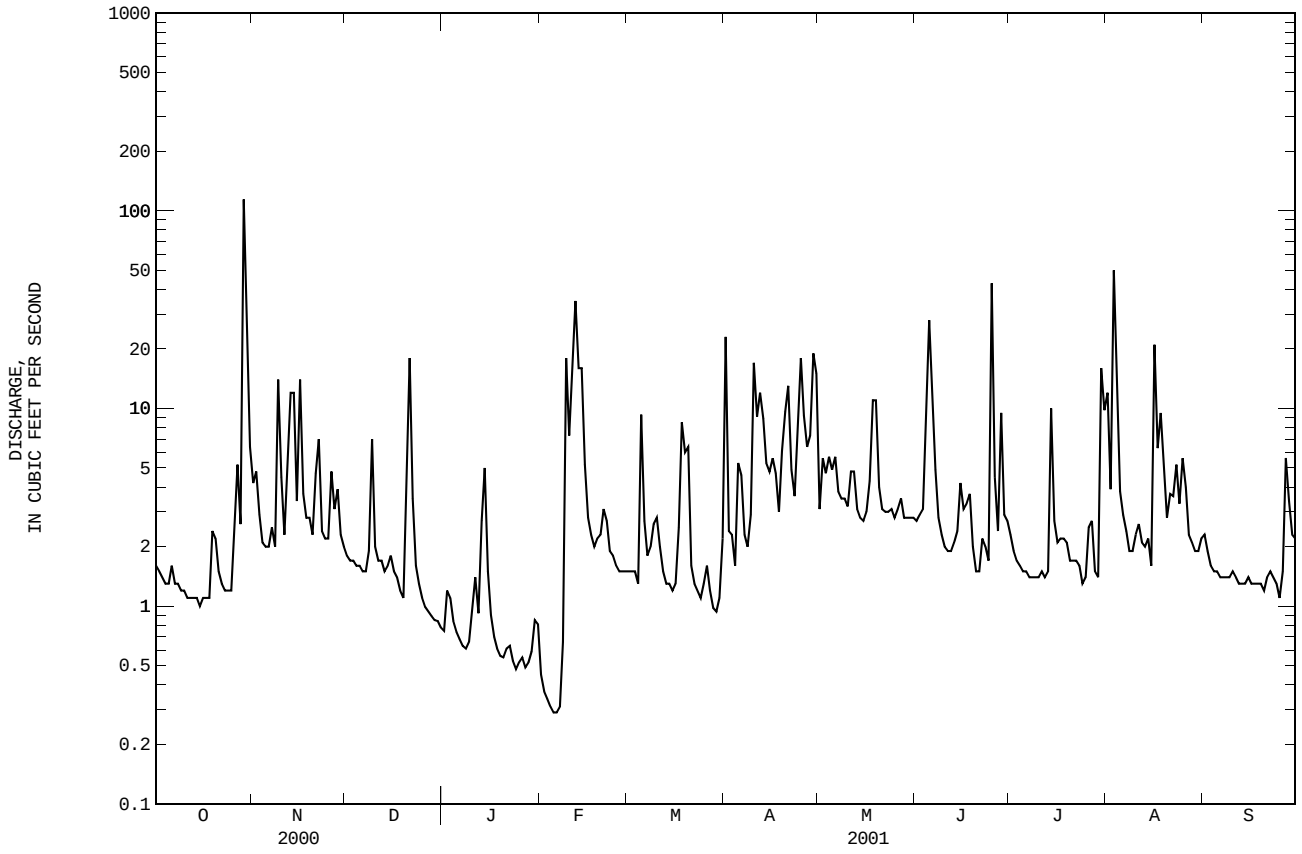
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2001, BY WATER YEAR (WY)

MEAN	6.48	15.1	12.4	14.3	11.7	14.7	13.7	7.83	5.01	7.74	5.33	3.90
MAX	16.3	68.6	44.8	75.8	64.2	77.3	53.6	30.5	20.1	20.2	19.7	10.8
(WY)	1966	1966	1965	1988	1969	1968	1989	1965	1978	1982	1982	1994
MIN	.000	2.27	.91	.45	.073	1.07	.79	.95	.91	.76	.57	.000
(WY)	1985	1990	1977	1986	1978	1983	1992	1966	2000	1971	1984	1984

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1963 - 2001	
ANNUAL TOTAL	1860.67		1500.05			
ANNUAL MEAN	5.08		4.11		9.83	
HIGHEST ANNUAL MEAN					22.1	1982
LOWEST ANNUAL MEAN					4.09	1984
HIGHEST DAILY MEAN	148	Apr 2	114	Oct 29	620	Nov 20 1990
LOWEST DAILY MEAN	.35	Jun 16	.29	Feb 5	.00	Aug 27 1971
ANNUAL SEVEN-DAY MINIMUM	.48	Jun 11	.34	Feb 1	.00	Oct 15 1971
ANNUAL RUNOFF (AC-FT)	3690		2980		7120	
10 PERCENT EXCEEDS	7.4		9.2		19	
50 PERCENT EXCEEDS	2.2		2.1		3.2	
90 PERCENT EXCEEDS	.84		.93		.67	

e Estimated



16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank, 0.5 mi upstream from Kamehameha Highway, 4.9 mi northeast of Waialua School, and 7.3 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi^2, revised, including that of Elehaha Stream which is mostly diverted into Kamananui Stream since June 14, 1975.

PERIOD OF RECORD.--February 1958 to current year.

REVISED RECORDS.--WSP 1937: 1958-60. WRD Hawaii 1974: 1971(P), 1972-73(M). WDR HI-81-1: Drainage area.

GAGE.--Gage destroyed by flood of November 20, 1990 was restored and water-stage recorder installed on February 25, 1993. Control rebuilt about 75 ft downstream of gage. Elevation of gage is 20 ft above mean sea level (from topographic map). Prior to May 18, 1966, datum 2.00 ft higher.

REMARKS.--Records computed by Stacy Young. Records fair. Small diversion upstream of station.

AVERAGE DISCHARGE.--27 years (water years 1975-2001), 18.6 ft^3/s (13,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft^3/s, November 20, 1990, gage height, 15.84 ft, from rating curve extended above 150 ft^3/s on basis of slope-area measurements at gage heights 5.68 ft, 11.46 ft, and 15.84 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	1700	*1,350	*6.12	No other peak greater than base discharge.			

Minimum discharge, no flow Oct. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.9	8.5	2.2	.77	.40	1.2	66	9.2	1.3	e2.4	e26	2.4
2	e1.4	9.4	1.9	1.8	.21	.95	9.2	8.2	.98	e1.9	e8.0	2.6
3	e1.1	6.1	1.2	1.8	.14	1.0	7.1	6.4	1.3	e1.6	e145	1.6
4	.80	2.7	1.1	1.7	.12	.92	5.0	6.9	22	e1.5	e32	1.1
5	.61	2.0	1.2	1.2	.09	6.4	5.2	7.2	89	e1.4	e7.0	.95
6	.69	1.5	1.1	.86	.07	10	17	6.6	31	e1.3	e4.0	.87
7	1.2	1.7	.88	.65	.06	4.1	7.2	5.1	14	e1.2	e2.8	.87
8	.81	1.9	.86	.45	.05	2.7	5.0	4.0	5.0	e1.2	e1.9	.82
9	.65	14	9.7	.32	48	3.9	5.5	3.6	3.0	e1.2	e1.9	.75
10	.56	11	4.4	.45	12	4.2	41	3.5	2.2	e1.2	e2.5	.37
11	.45	3.2	2.1	1.3	42	4.3	17	3.4	1.9	e1.3	e3.0	.36
12	.31	3.8	1.4	1.6	127	2.7	9.2	6.6	1.7	e1.2	e2.1	.30
13	.25	20	1.3	1.6	39	2.2	11	3.7	1.9	e1.3	e2.0	.19
14	.24	23	1.0	13	40	1.7	6.3	3.1	2.1	e19	e2.3	.12
15	.20	8.0	1.3	4.4	19	1.3	3.8	2.7	2.8	e3.2	e1.4	.10
16	.12	18	1.1	2.5	7.5	.97	2.9	2.7	5.2	e2.2	30	.26
17	.08	10	.76	1.6	4.2	2.4	3.1	3.7	3.6	e2.3	15	.17
18	.07	4.8	.69	.90	3.1	15	3.1	10	e4.0	e2.3	15	.15
19	1.0	3.9	.50	.56	2.5	8.8	9.1	19	e2.1	e2.1	13	.15
20	4.9	3.0	4.4	.29	2.9	10	18	6.6	e1.4	e1.6	5.0	.11
21	2.4	2.6	28	.19	3.3	4.9	29	3.7	e1.4	e1.6	3.9	.06
22	1.1	13	11	.18	7.8	3.3	6.7	2.8	e2.3	e1.5	7.2	.16
23	.49	4.5	4.2	.15	3.5	2.4	4.2	2.3	e2.0	e1.4	12	.26
24	.32	2.5	2.9	.14	2.6	1.6	11	2.2	e1.6	e1.1	6.8	.23
25	.25	2.2	2.2	.18	1.8	1.5	46	2.1	e136	e1.3	5.4	.12
26	.79	6.3	1.8	.14	1.6	1.8	17	1.9	e9.0	e2.8	10	.08
27	12	8.5	1.6	.14	1.4	3.5	9.8	2.1	e3.0	e3.1	3.9	3.8
28	7.0	7.9	1.3	.12	1.3	2.5	12	2.0	e17	e1.3	3.0	3.5
29	206	4.9	1.1	.13	---	1.6	49	1.5	e3.4	e1.2	2.4	2.6
30	67	3.2	.89	.13	---	.28	34	1.4	e3.0	e45	1.9	1.1
31	12	---	.86	.17	---	2.0	---	1.4	---	e18	2.1	---
TOTAL	326.69	212.1	94.94	39.42	371.64	110.12	470.4	145.6	375.18	129.7	378.5	26.15
MEAN	10.5	7.07	3.06	1.27	13.3	3.55	15.7	4.70	12.5	4.18	12.2	.87
MAX	206	23	28	13	127	15	66	19	136	45	145	3.8
MIN	.07	1.5	.50	.12	.05	.28	2.9	1.4	.98	1.1	1.4	.06
AC-FT	648	421	188	78	737	218	933	289	744	257	751	52

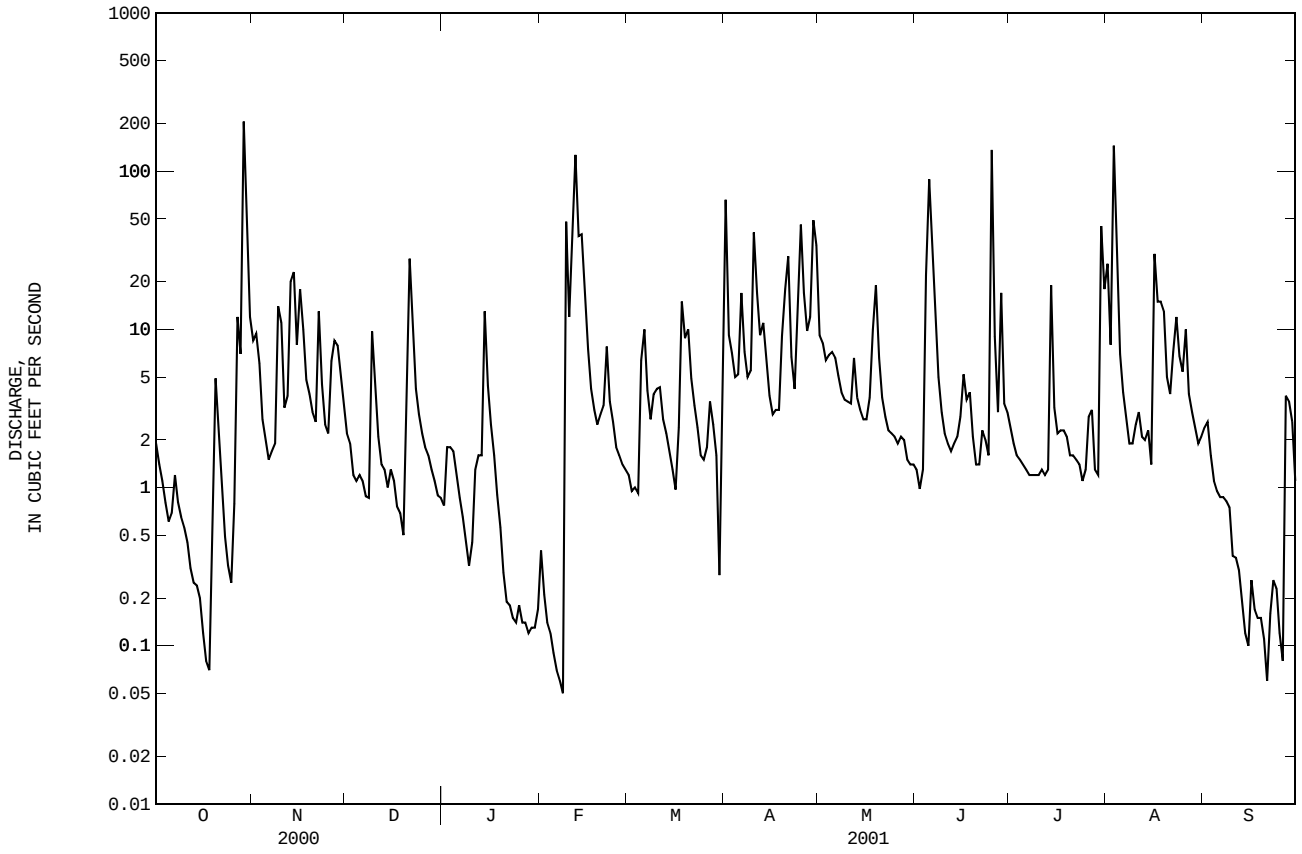
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2001, BY WATER YEAR (WY)

MEAN	11.5	31.1	21.3	30.1	20.3	31.4	25.7	14.0	9.12	12.9	9.69	6.45
MAX	54.1	168	107	143	96.9	155	168	58.3	52.9	52.7	46.2	19.9
(WY)	1992	1991	1988	1988	1979	1982	1989	1988	1978	1989	1995	1994
MIN	.006	2.60	.67	.094	.022	.85	.64	.95	.65	.98	.58	.006
(WY)	1985	1990	1977	1986	1978	1998	1992	1984	2000	1984	1984	1984

16330000 KAMANANUI STREAM AT MAUNAWAI--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1975 - 2001	
ANNUAL TOTAL	2806.11		2680.44			
ANNUAL MEAN	7.67		7.34		18.6	
HIGHEST ANNUAL MEAN					50.3	1982
LOWEST ANNUAL MEAN					4.81	1984
HIGHEST DAILY MEAN	306	Apr 2	206	Oct 29	1940	Jan 1 1988
LOWEST DAILY MEAN	.03	Mar 15	.05	Feb 8	.00	Sep 15 1975
ANNUAL SEVEN-DAY MINIMUM	.03	Mar 14	.11	Feb 2	.00	Sep 15 1975
ANNUAL RUNOFF (AC-FT)	5570		5320		13490	
10 PERCENT EXCEEDS	12		15		30	
50 PERCENT EXCEEDS	2.0		2.3		3.9	
90 PERCENT EXCEEDS	.08		.25		.27	

e Estimated



16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 20060000, on left bank, 4.3 mi northeast of Leilehua High School in Wahiawa, and 8.1 mi east of Waialua School.

DRAINAGE AREA.--2.98 mi^2.

PERIOD OF RECORD.--August 1959 to current year.

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,120 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records poor. No diversion upstream of station.

AVERAGE DISCHARGE.--42 years (water years 1960-2001), 13.4 ft^3/s (9,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft^3/s, July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft^3/s on basis of slope-area measurements at gage heights 6.74 ft and 10.12 ft; maximum gage height, 13.20 ft, November 20, 1990; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 9	0245	*1,420	*7.50	No other peak greater than base discharge.			

Minimum discharge, 0.25 ft^3/s, Jan. 23, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	15	2.8	.81	1.5	1.3	35	20	3.4	9.5	14	7.7
2	3.3	17	2.4	.79	.77	1.1	5.0	11	2.0	4.2	14	7.2
3	2.7	9.2	2.1	.79	.51	1.0	4.9	7.1	2.2	3.1	20	4.1
4	2.3	7.6	1.9	.78	.43	.92	2.5	8.1	23	2.8	35	3.3
5	2.2	12	1.7	.67	.58	18	25	6.9	95	2.5	11	3.0
6	2.6	9.2	1.6	.57	.74	9.9	55	16	33	2.2	7.4	2.6
7	2.2	12	1.5	.51	.52	3.3	15	5.7	15	2.0	7.6	2.3
8	1.8	5.8	4.8	.45	.38	e4.0	7.5	4.7	14	1.8	5.4	2.0
9	1.7	14	24	.43	96	e9.2	9.0	4.5	8.0	1.6	4.3	1.7
10	1.7	13	4.3	.45	33	e4.7	40	4.5	5.8	1.5	4.1	1.5
11	1.7	5.0	2.2	2.2	52	e3.5	11	4.8	4.2	1.5	6.3	1.4
12	1.7	23	1.8	2.1	38	e1.8	10	5.8	3.7	1.6	6.0	1.3
13	1.4	30	2.1	8.1	35	e1.4	16	4.0	3.7	1.7	5.1	1.1
14	1.2	21	2.3	12	40	e1.1	7.3	3.3	7.8	7.2	4.6	.98
15	1.1	8.1	4.7	3.1	14	e.96	4.8	3.0	32	12	4.3	.86
16	1.0	8.1	2.4	1.4	7.4	e.86	7.7	2.9	11	8.4	32	2.7
17	1.9	6.3	1.8	.86	4.3	e36	12	6.1	13	5.3	23	4.7
18	1.8	8.4	1.6	.61	3.1	e17	18	20	11	5.1	19	2.7
19	1.3	8.8	1.5	.48	22	e25	20	38	4.9	5.2	18	1.4
20	4.6	5.4	17	.41	14	e9.7	40	5.7	3.8	4.1	10	1.1
21	2.4	6.5	30	.35	12	e3.6	27	3.4	3.7	6.2	10	.95
22	1.4	20	9.5	.31	9.2	e2.2	8.7	2.7	4.6	10	12	2.3
23	1.0	4.9	3.5	.27	4.0	e1.6	9.1	3.3	9.1	6.3	20	2.4
24	.82	4.1	2.2	.40	3.1	e1.4	26	4.9	4.0	3.6	11	1.6
25	.94	5.3	1.7	.44	2.5	e7.5	89	2.6	25	3.0	9.8	.95
26	3.0	14	1.4	.35	2.1	e4.9	13	3.3	29	2.5	15	.84
27	8.0	7.9	1.2	.35	1.7	e2.0	19	4.0	6.9	6.7	6.8	5.5
28	5.6	14	1.1	.37	1.5	e1.4	18	2.1	5.4	4.1	6.2	4.3
29	150	5.1	1.0	.37	---	1.1	48	1.9	10	2.8	5.4	3.2
30	59	3.5	1.0	.83	---	1.1	17	3.1	6.4	13	4.7	5.5
31	31	---	.94	3.5	---	7.3	---	6.7	---	24	5.3	---
TOTAL	305.46	324.2	138.04	45.05	400.33	184.84	620.5	220.1	400.6	165.5	357.3	81.18
MEAN	9.85	10.8	4.45	1.45	14.3	5.96	20.7	7.10	13.4	5.34	11.5	2.71
MAX	150	30	30	12	96	36	89	38	95	24	35	7.7
MIN	.82	3.5	.94	.27	.38	.86	2.5	1.9	2.0	1.5	4.1	.84
AC-FT	606	643	274	89	794	367	1230	437	795	328	709	161

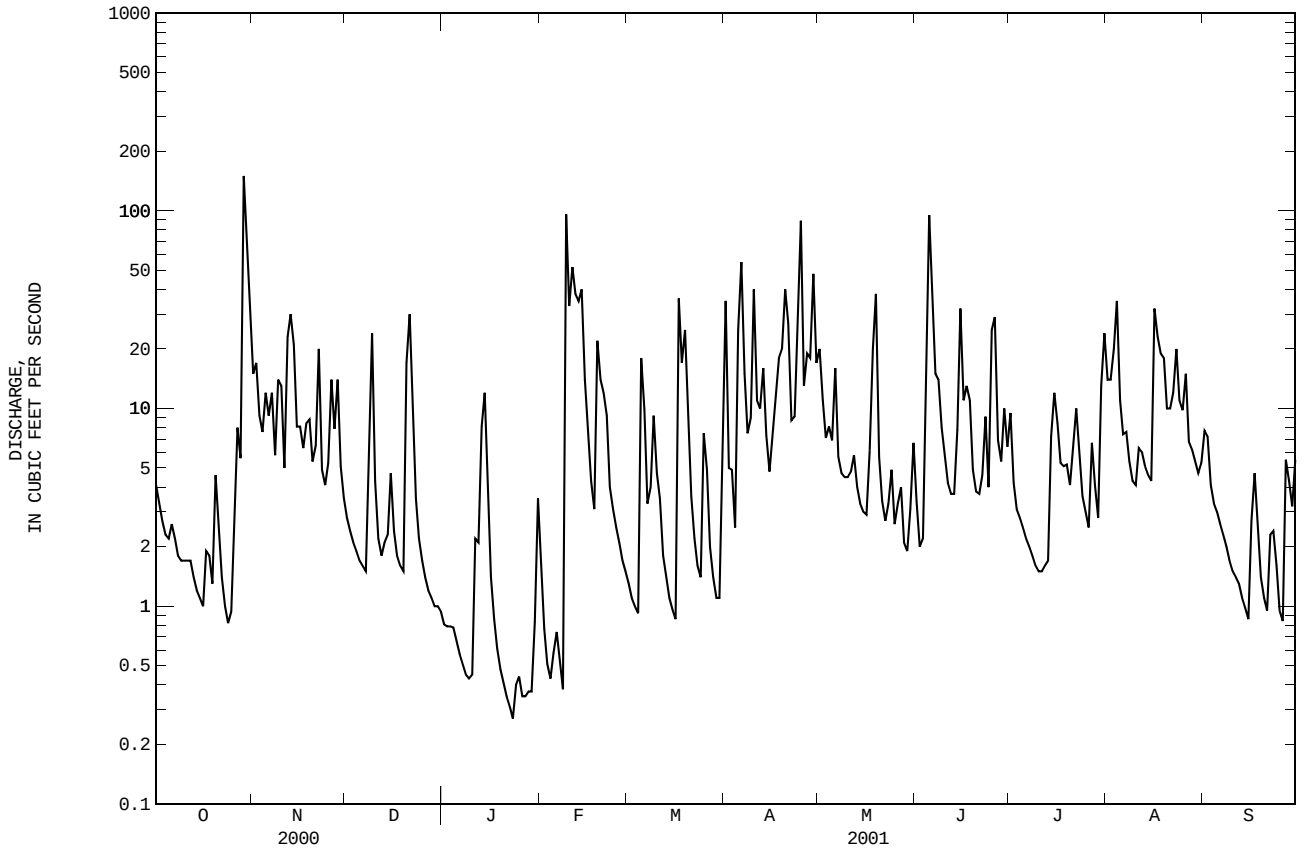
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2001, BY WATER YEAR (WY)

MEAN	10.8	18.3	15.6	15.8	13.3	19.7	20.6	11.7	7.60	11.7	8.58	7.53
MAX	30.7	71.9	52.6	54.1	66.9	90.0	75.7	43.7	24.9	29.3	31.0	24.9
(WY)	1982	1991	1988	1988	1969	1982	1989	1965	1978	1989	1982	1994
MIN	.057	2.90	1.29	.37	.32	.35	1.57	1.37	1.59	.95	1.51	.52
(WY)	1985	1963	1977	1977	1978	1983	1966	2000	2000	1971	1984	1975

16345000 OPAEULA STREAM NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1959 - 2001	
ANNUAL TOTAL	3397.35		3243.10			
ANNUAL MEAN	9.28		8.89		13.4	
HIGHEST ANNUAL MEAN					29.7	1982
LOWEST ANNUAL MEAN					7.12	1998
HIGHEST DAILY MEAN	186	Apr 2	150	Oct 29	825	Feb 1 1969
LOWEST DAILY MEAN	.10	Mar 18	.27	Jan 23	.00	Jan 24 1977
ANNUAL SEVEN-DAY MINIMUM	.12	Mar 15	.35	Jan 21	.00	Oct 24 1984
ANNUAL RUNOFF (AC-FT)	6740		6430		9740	
10 PERCENT EXCEEDS	22		21		28	
50 PERCENT EXCEEDS	3.2		4.3		4.6	
90 PERCENT EXCEEDS	.46		.93		.93	

e Estimated



Surface-Water Station Records for Molokai

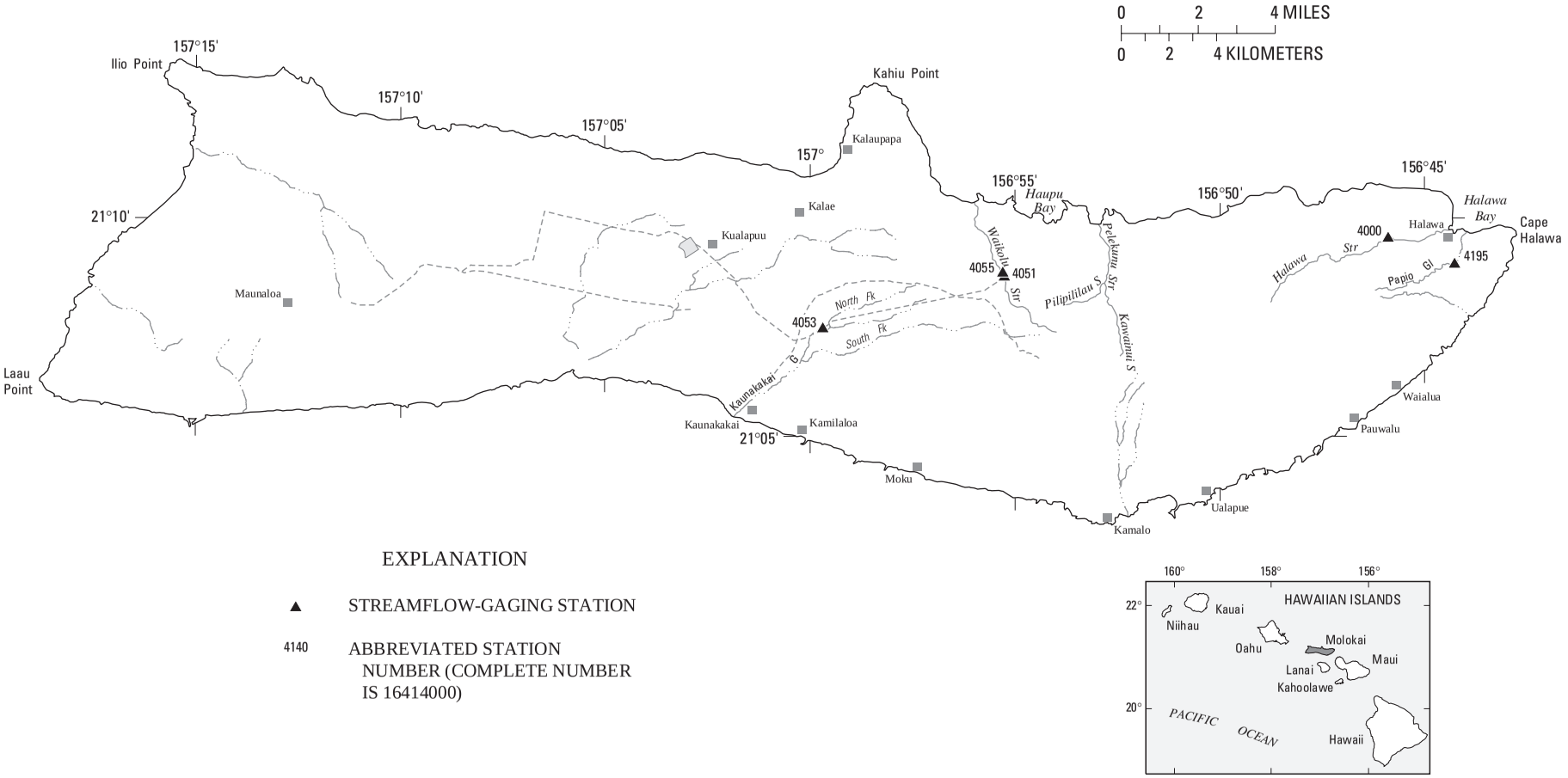


Figure 7. Locations of streamflow-gaging stations on Molokai.

16400000 HALAWA STREAM NEAR HALAWA

LOCATION.--Lat 21°09'31", long 156°45'53", Hydrologic Unit 20050000, on right bank 600 ft downstream from Hipuapua Stream, and 1.5 mi west of Halawa.

DRAINAGE AREA.--4.62 mi^2.

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS.--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft above mean sea level (from topographic map). Prior to June 25, 1923, at site 350 ft upstream of gage at different datum. June 25, 1923 to July 18, 1932, and November 17, 1937 to February 3, 1965, at present site at datum 2.00 ft higher.

REMARKS.--Records computed by Roy Taogoshi. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--77 years (water years 1918-31, 1939-2001), 29.5 ft^3/s (21,390 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s, February 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft^3/s, about November 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 29	1600	*9,000	*14.70	Nov 3	1015	3,180	10.10
Nov 2	1000	1,980	8.55				

Minimum discharge, 2.9 ft^3/s, Feb. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

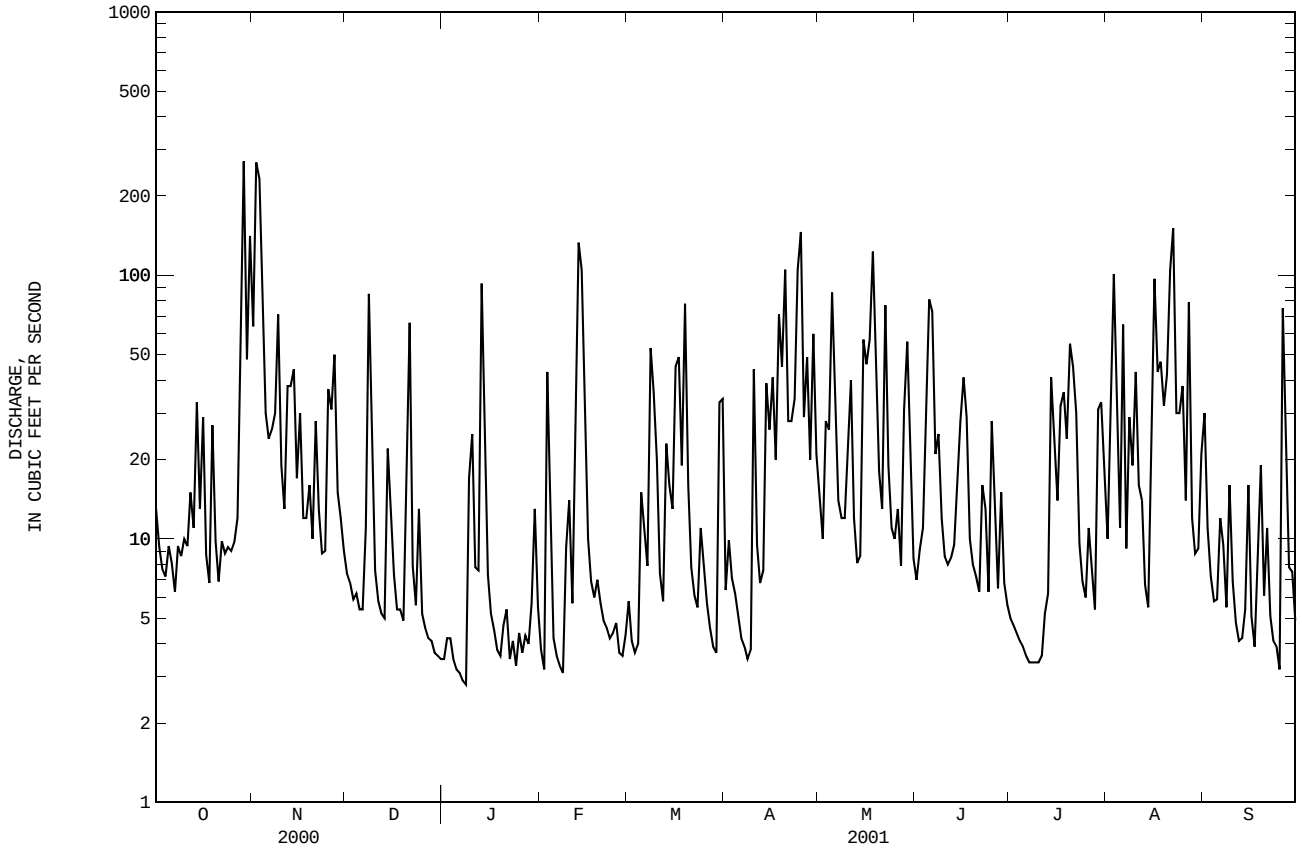
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	64	7.4	3.5	3.8	5.8	6.4	15	7.0	5.0	10	30
2	9.3	268	6.8	4.2	3.2	4.1	9.9	10	9.1	4.7	27	11
3	7.7	232	5.9	4.2	43	3.7	7.1	28	11	4.4	101	7.2
4	7.2	63	6.2	3.5	11	4.0	6.2	26	23	4.1	34	5.8
5	9.4	30	5.4	3.2	4.2	15	5.1	86	81	3.9	11	5.9
6	8.1	24	5.4	3.1	3.6	11	4.2	31	73	3.6	65	12
7	6.3	26	11	2.9	3.3	7.9	3.9	14	21	3.4	9.2	9.5
8	9.4	30	85	2.8	3.1	53	3.5	12	25	3.4	29	5.5
9	8.6	71	18	17	9.3	36	3.8	12	12	3.4	19	16
10	10	19	7.6	25	14	20	44	21	8.6	3.4	43	6.9
11	9.4	13	5.8	7.8	5.7	7.4	9.5	40	8.0	3.6	16	4.8
12	15	38	5.2	7.6	28	5.8	6.8	12	8.5	5.2	14	4.1
13	11	38	5.0	93	133	23	7.6	8.1	9.5	6.2	6.7	4.2
14	33	44	22	25	105	16	39	8.6	16	41	5.5	5.4
15	13	17	12	7.3	24	13	26	57	28	26	14	16
16	29	30	7.3	5.2	10	45	41	46	41	14	97	5.1
17	8.7	12	5.4	4.5	6.9	49	20	57	29	32	43	3.9
18	6.8	12	5.4	3.8	6.0	19	71	123	10	36	47	9.9
19	27	16	4.9	3.6	7.0	78	45	38	8.0	24	32	19
20	9.8	10	18	4.7	5.7	16	105	18	7.2	55	42	6.1
21	6.9	28	66	5.4	4.9	7.8	28	13	6.3	45	105	11
22	9.8	13	7.9	3.5	4.6	6.1	28	77	16	30	151	5.1
23	8.8	8.8	5.6	4.1	4.2	5.5	34	19	13	9.6	30	4.1
24	9.3	9.0	13	3.3	4.4	11	105	11	6.3	6.9	30	3.9
25	9.0	37	5.2	4.4	4.8	8.1	146	10	28	6.0	38	3.2
26	9.7	31	4.6	3.7	3.7	5.7	29	13	13	11	14	75
27	12	50	4.2	4.3	3.6	4.6	49	7.9	6.5	7.5	79	24
28	63	15	4.1	4.0	4.3	3.9	20	31	15	5.4	12	7.8
29	271	12	3.7	5.7	---	3.7	60	56	6.8	31	8.8	7.5
30	48	9.0	3.6	13	---	33	21	17	5.6	33	9.2	4.9
31	141	---	3.5	5.5	---	34	---	8.4	---	17	21	---
TOTAL	840.2	1269.8	371.1	288.8	464.3	556.1	985.0	926.0	552.4	484.7	1163.4	334.8
MEAN	27.1	42.3	12.0	9.32	16.6	17.9	32.8	29.9	18.4	15.6	37.5	11.2
MAX	271	268	85	93	133	78	146	123	81	55	151	75
MIN	6.3	8.8	3.5	2.8	3.1	3.7	3.5	7.9	5.6	3.4	5.5	3.2
AC-FT	1670	2520	736	573	921	1100	1950	1840	1100	961	2310	664

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 2001, BY WATER YEAR (WY)

MEAN	26.3	36.4	36.0	33.4	29.0	36.9	39.8	26.8	18.9	25.6	24.9	20.6
MAX	100	97.8	84.7	118	114	134	157	85.2	59.2	58.2	69.8	58.2
(WY)	1942	1951	1947	1921	1932	1942	1989	1963	1961	1954	1938	1992
MIN	2.04	5.80	8.56	5.31	2.98	5.48	11.7	4.26	4.93	6.00	1.19	2.85
(WY)	1918	1920	1977	1977	1978	1970	1990	1920	1966	1917	1971	1975

16400000 HALAWA STREAM NEAR HALAWA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1917 - 2001	
ANNUAL TOTAL	9100.0		8236.6			
ANNUAL MEAN	24.9		22.6		29.5	
HIGHEST ANNUAL MEAN					47.4	1965
LOWEST ANNUAL MEAN					17.4	1975
HIGHEST DAILY MEAN	434	Aug 20	271	Oct 29	1240	Feb 4 1965
LOWEST DAILY MEAN	3.2	Mar 21	2.8	Jan 8	.86	Sep 1 1971
ANNUAL SEVEN-DAY MINIMUM	3.4	Mar 16	3.4	Jan 2	.90	Aug 26 1971
ANNUAL RUNOFF (AC-FT)	18050		16340		21390	
10 PERCENT EXCEEDS	51		51		65	
50 PERCENT EXCEEDS	9.8		10		13	
90 PERCENT EXCEEDS	4.4		3.9		4.8	



16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft downstream from the east portal, 5.3 mi southeast of Kalaupapa, and 7.5 mi northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 989 ft above mean sea level, from tunnel plans.

REMARKS.--Records computed by Matt Wong. Records good. Tunnel diverts water from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--35 years (water years 1967-2001), 4.82 ft^3/s (3,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, March 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 27 ft^3/s, February 14; minimum daily discharge, 0.67 ft^3/s, February 23, 27, and March 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

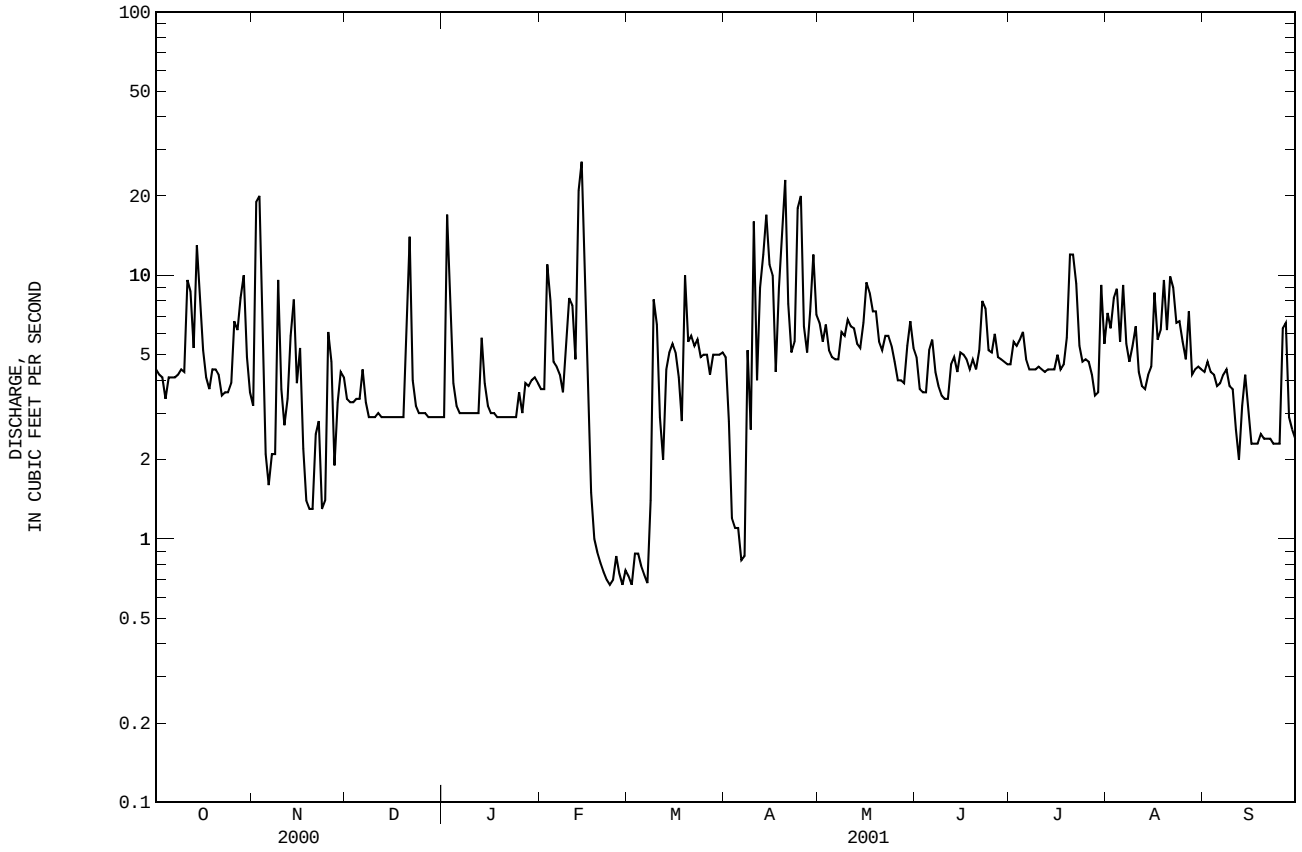
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	3.2	3.4	2.9	3.7	.72	4.9	6.6	4.9	4.6	7.2	4.3
2	4.2	19	3.3	17	3.7	.67	2.8	5.6	3.7	5.6	6.3	4.7
3	4.1	20	3.3	8.0	11	.88	1.2	6.5	3.6	5.4	8.2	4.3
4	3.4	5.0	3.4	3.9	8.0	.88	1.1	5.2	3.6	5.7	8.9	4.2
5	4.1	2.1	3.4	3.2	4.7	.79	1.1	4.9	5.2	6.1	5.6	3.8
6	4.1	1.6	4.4	3.0	4.5	.73	.83	4.8	5.7	4.8	9.2	3.9
7	4.1	2.1	3.3	3.0	4.2	.68	.86	4.8	4.3	4.4	5.5	4.2
8	4.2	2.1	2.9	3.0	3.6	1.4	5.2	6.1	3.8	4.4	4.7	4.4
9	4.4	9.6	2.9	3.0	5.7	8.1	2.6	5.9	3.5	4.4	5.4	3.8
10	4.3	3.7	2.9	3.0	8.2	6.5	16	6.8	3.4	4.5	6.4	3.7
11	9.6	2.7	3.0	3.0	7.7	2.9	4.0	6.4	3.4	4.4	4.3	2.6
12	8.7	3.4	2.9	3.0	4.8	2.0	9.0	6.3	4.6	4.3	3.8	2.0
13	5.3	5.9	2.9	5.8	21	4.4	12	5.5	4.9	4.4	3.7	3.2
14	13	8.1	2.9	3.9	27	5.1	17	5.3	4.3	4.4	4.2	4.2
15	8.4	3.9	2.9	3.2	11	5.5	11	6.6	5.1	4.4	4.5	3.0
16	5.2	5.3	2.9	3.0	3.7	5.1	10	9.4	5.0	5.0	8.6	2.3
17	4.1	2.2	2.9	3.0	1.5	4.1	4.3	8.6	4.8	4.4	5.7	2.3
18	3.7	1.4	2.9	2.9	1.0	2.8	9.0	7.3	4.4	4.6	6.2	2.3
19	4.4	1.3	2.9	2.9	.89	10	14	7.3	4.8	5.8	9.6	2.5
20	4.4	1.3	5.3	2.9	.81	5.6	23	5.6	4.4	12	6.2	2.4
21	4.2	2.5	14	2.9	.75	5.9	7.8	5.2	5.2	12	9.9	2.4
22	3.5	2.8	4.0	2.9	.70	5.4	5.1	5.9	8.0	9.3	9.0	2.4
23	3.6	1.3	3.2	2.9	.67	5.7	5.6	5.9	7.5	5.4	6.6	2.3
24	3.6	1.4	3.0	2.9	.70	4.9	18	5.4	5.2	4.7	6.7	2.3
25	3.9	6.1	3.0	3.6	.86	5.0	20	4.7	5.1	4.8	5.6	2.3
26	6.7	4.7	3.0	3.0	.74	5.0	6.4	4.0	6.0	4.7	4.8	6.3
27	6.2	1.9	2.9	3.9	.67	4.2	5.1	4.0	4.9	4.2	7.3	6.6
28	8.2	3.3	2.9	3.8	.76	5.0	7.3	3.9	4.8	3.5	4.2	2.9
29	10	4.3	2.9	4.0	---	5.0	12	5.4	4.7	3.6	4.4	2.6
30	4.9	4.1	2.9	4.1	---	5.0	7.1	6.7	4.6	9.2	4.5	2.4
31	3.6	---	2.9	3.9	---	5.1	---	5.3	---	5.5	4.4	---
TOTAL	166.5	136.3	109.4	121.5	142.55	125.05	244.29	181.9	143.4	170.5	191.6	100.6
MEAN	5.37	4.54	3.53	3.92	5.09	4.03	8.14	5.87	4.78	5.50	6.18	3.35
MAX	13	20	14	17	27	10	23	9.4	8.0	12	9.9	6.6
MIN	3.4	1.3	2.9	2.9	.67	.67	.83	3.9	3.4	3.5	3.7	2.0
AC-FT	330	270	217	241	283	248	485	361	284	338	380	200

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2001, BY WATER YEAR (WY)

MEAN	4.10	5.74	5.64	5.17	4.92	5.64	5.78	4.61	4.25	4.57	3.92	3.40
MAX	8.05	10.2	10.8	12.5	12.5	13.8	12.8	12.3	9.49	9.89	7.22	5.81
(WY)	1996	1988	1997	1987	1990	1986	1986	1987	1998	1986	1985	1994
MIN	1.80	1.86	.41	.086	.010	.009	.001	.037	.016	.055	.004	.24
(WY)	1972	1992	1968	1968	1968	1968	1967	1967	1974	1974	1974	1974

16405100 MOLOKAI TUNNEL AT EAST PORTAL--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1966 - 2001	
ANNUAL TOTAL	2059.8		1833.59			
ANNUAL MEAN	5.63		5.02		4.82	
HIGHEST ANNUAL MEAN					8.19	1987
LOWEST ANNUAL MEAN					1.31	1974
HIGHEST DAILY MEAN	28	Apr 1	27	Feb 14	41	Mar 19 1986
LOWEST DAILY MEAN	1.3	Nov 19	.67	Feb 23	.00	Mar 30 1967
ANNUAL SEVEN-DAY MINIMUM	1.7	Nov 18	.73	Feb 21	.00	Mar 30 1967
ANNUAL RUNOFF (AC-FT)	4090		3640		3500	
10 PERCENT EXCEEDS	9.6		8.6		9.9	
50 PERCENT EXCEEDS	4.6		4.4		3.7	
90 PERCENT EXCEEDS	2.9		2.1		1.1	



16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft upstream from the west portal, 2.5 mi northeast of Kaunakakai, and 4.7 mi south of Kalaupapa.

PERIOD OF RECORD.--July 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft above mean sea level, from tunnel plans.

REMARKS.--Records computed by Matt Wong. Records good. Tunnel diverts water from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--36 years (water years 1966-2001), 7.35 ft^3/s (5,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s, April 8, 9, 1986, January 2, 26, 1988, and March 3, 1989; minimum daily, 1.8 ft^3/s, October 15, 1967, August 27, 1992.

EXTREMES FOR CURRENT YEAR.--Maximun daily discharge, 32 ft^3/s, February 14; minimum daily discharge, 2.7 ft^3/s, March 2, and 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

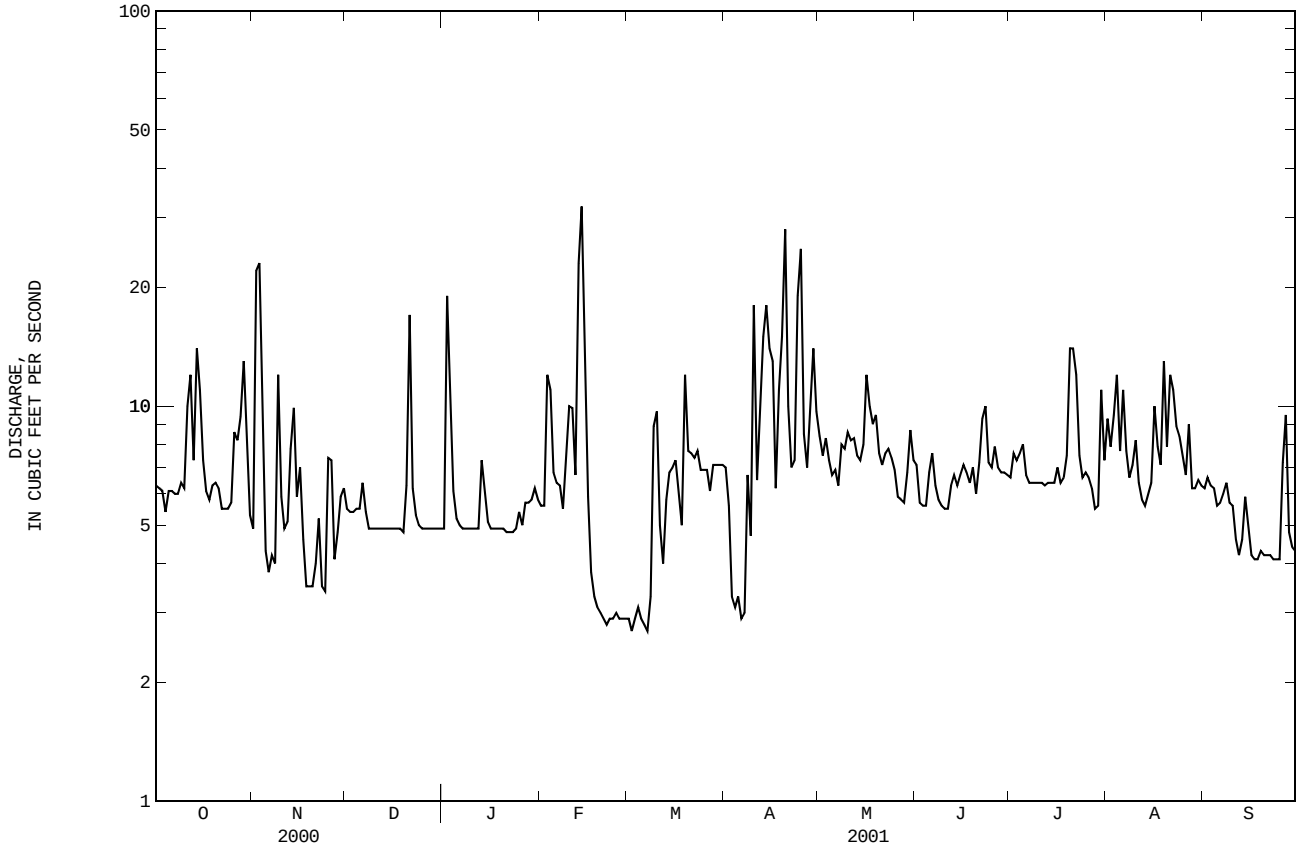
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	4.9	5.5	4.9	5.6	2.9	7.0	8.4	7.1	6.6	9.3	6.2
2	6.2	22	5.4	19	5.6	2.7	5.6	7.5	5.7	7.6	7.9	6.6
3	6.1	23	5.4	10	12	2.9	3.3	8.3	5.6	7.3	9.5	6.3
4	5.4	7.8	5.5	6.1	11	3.1	3.1	7.3	5.6	7.6	12	6.2
5	6.1	4.3	5.5	5.2	6.8	2.9	3.3	6.7	6.8	8.0	7.7	5.6
6	6.1	3.8	6.4	5.0	6.4	2.8	2.9	6.9	7.6	6.7	11	5.7
7	6.0	4.2	5.4	4.9	6.3	2.7	3.0	6.3	6.3	6.4	7.7	6.0
8	6.0	4.0	4.9	4.9	5.5	3.3	6.7	8.0	5.8	6.4	6.6	6.4
9	6.4	12	4.9	4.9	7.4	8.9	4.7	7.8	5.6	6.4	7.1	5.7
10	6.2	5.9	4.9	4.9	10	9.7	18	8.6	5.5	6.4	8.2	5.6
11	10	4.9	4.9	4.9	9.9	5.0	6.5	8.2	5.5	6.4	6.4	4.6
12	12	5.1	4.9	4.9	6.7	4.0	10	8.3	6.3	6.3	5.8	4.2
13	7.3	7.8	4.9	7.3	23	5.8	15	7.5	6.7	6.4	5.6	4.6
14	14	9.9	4.9	6.1	32	6.8	18	7.3	6.3	6.4	6.0	5.9
15	11	5.9	4.9	5.1	14	7.0	14	8.0	6.7	6.4	6.4	4.9
16	7.3	7.0	4.9	4.9	5.9	7.3	13	12	7.1	7.0	10	4.2
17	6.1	4.6	4.9	4.9	3.8	6.1	6.2	10	6.8	6.4	7.9	4.1
18	5.8	3.5	4.9	4.9	3.3	5.0	11	9.0	6.4	6.6	7.1	4.1
19	6.3	3.5	4.8	4.9	3.1	12	15	9.5	7.0	7.5	13	4.3
20	6.4	3.5	6.3	4.9	3.0	7.7	28	7.6	6.0	14	7.9	4.2
21	6.2	4.0	17	4.8	2.9	7.6	10	7.1	7.2	14	12	4.2
22	5.5	5.2	6.2	4.8	2.8	7.4	7.0	7.6	9.3	12	11	4.2
23	5.5	3.5	5.3	4.8	2.9	7.7	7.3	7.8	10	7.5	8.9	4.1
24	5.5	3.4	5.0	4.9	2.9	6.9	19	7.4	7.2	6.6	8.4	4.1
25	5.7	7.4	4.9	5.4	3.0	6.9	25	6.9	7.0	6.8	7.5	4.1
26	8.6	7.3	4.9	5.0	2.9	6.9	8.5	5.9	7.9	6.6	6.7	7.2
27	8.2	4.1	4.9	5.7	2.9	6.1	7.0	5.8	7.0	6.2	9.0	9.5
28	9.4	4.8	4.9	5.7	2.9	7.1	9.3	5.7	6.8	5.5	6.2	4.8
29	13	5.9	4.9	5.8	---	7.1	14	6.8	6.8	5.6	6.2	4.4
30	8.0	6.2	4.9	6.2	---	7.1	9.7	8.7	6.7	11	6.5	4.3
31	5.3	---	4.9	5.8	---	7.1	---	7.3	---	7.3	6.3	---
TOTAL	227.9	199.4	171.9	181.5	204.5	186.5	311.1	240.2	202.3	231.9	251.8	156.3
MEAN	7.35	6.65	5.55	5.85	7.30	6.02	10.4	7.75	6.74	7.48	8.12	5.21
MAX	14	23	17	19	32	12	28	12	10	14	13	9.5
MIN	5.3	3.4	4.8	4.8	2.8	2.7	2.9	5.7	5.5	5.5	5.6	4.1
AC-FT	452	396	341	360	406	370	617	476	401	460	499	310

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	6.54	8.20	7.99	7.49	7.39	8.17	8.38	7.22	6.89	7.23	6.45	5.96
MAX	10.6	14.0	13.8	14.4	15.9	15.5	15.6	15.8	12.8	13.2	10.2	9.21
(WY)	1996	1999	1991	1988	1990	1986	1986	1987	1998	1986	1985	1987
MIN	2.60	2.60	2.83	2.61	2.25	2.55	2.61	2.69	2.32	2.30	2.21	2.33
(WY)	1966	1966	1966	1966	1974	1967	1974	1974	1974	1974	1974	1974

16405300 MOLOKAI TUNNEL AT WEST PORTAL--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	2855.0		2565.3			
ANNUAL MEAN	7.80		7.03		7.35	
HIGHEST ANNUAL MEAN					11.4	1987
LOWEST ANNUAL MEAN					3.46	1974
HIGHEST DAILY MEAN	33	Apr 1	32	Feb 14	39	Apr 8 1986
LOWEST DAILY MEAN	3.4	Nov 24	2.7	Mar 2	1.8	Oct 15 1967
ANNUAL SEVEN-DAY MINIMUM	3.8	Nov 18	2.9	Mar 1	1.9	May 3 1976
ANNUAL RUNOFF (AC-FT)	5660		5090		5330	
10 PERCENT EXCEEDS	12		10		12	
50 PERCENT EXCEEDS	6.6		6.3		6.2	
90 PERCENT EXCEEDS	4.9		4.1		3.1	



16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2.

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above mean sea level (from topographic map). Prior to July 1, 1962, at site 200 ft upstream of gage at datum 6.14 ft higher.

REMARKS.--Records computed by Roy Taogoshi. Records fair. Since November 16, 1960, low flow water diverted 400 ft upstream into Molokai tunnel (16405100, 16405300). Hawaii Departmant of Agriculture diverts flow into transmountain tunnel for irrigation in west central Molokai.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--40 years (water years 1961, 1963-2001), 5.80 ft^3/s (4,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s, January 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft^3/s on basis of slope-area measurements at gage heights 5.24 ft and 6.64 ft; no flow at times since 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of October 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft^3/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 14	0445	*184	*2.66				

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

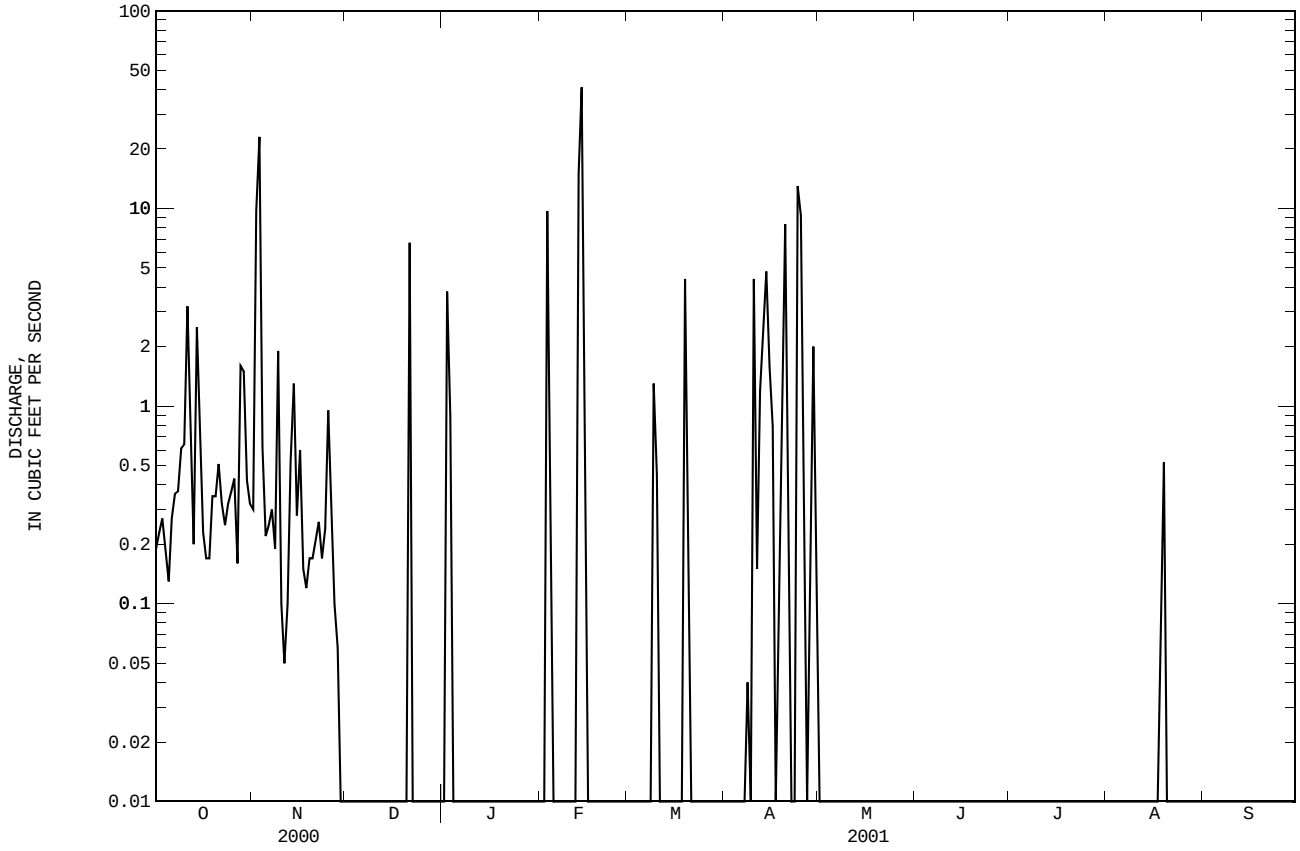
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.19	.30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.23	9.7	.00	3.8	.00	.00	.00	.00	.00	.00	.00	.00
3	.27	23	.00	.89	9.7	.00	.00	.00	.00	.00	.00	.00
4	.19	.62	.00	.00	.29	.00	.00	.00	.00	.00	.00	.00
5	.13	.22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.27	.25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.36	.30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.37	.19	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00
9	.61	1.9	.00	.00	.00	1.3	.00	.00	.00	.00	.00	.00
10	.64	.10	.00	.00	.00	.45	4.4	.00	.00	.00	.00	.00
11	3.2	.05	.00	.00	.00	.00	.15	.00	.00	.00	.00	.00
12	1.1	.10	.00	.00	.00	.00	1.2	.00	.00	.00	.00	.00
13	.20	.53	.00	.00	15	.00	2.2	.00	.00	.00	.00	.00
14	2.5	1.3	.00	.00	41	.00	4.8	.00	.00	.00	.00	.00
15	.83	.28	.00	.00	1.6	.00	1.6	.00	.00	.00	.00	.00
16	.23	.60	.00	.00	.01	.00	.79	.00	.00	.00	.00	.00
17	.17	.15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.17	.12	.00	.00	.00	.00	.71	.00	.00	.00	.09	.00
19	.35	.17	.00	.00	.00	4.4	2.9	.00	.00	.00	.52	.00
20	.35	.17	.00	.00	.00	.12	8.3	.00	.00	.00	.00	.00
21	.51	.21	6.7	.00	.00	.00	.21	.00	.00	.00	.00	.00
22	.32	.26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.25	.17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.32	.24	.00	.00	.00	.00	13	.00	.00	.00	.00	.00
25	.37	.95	.00	.00	.00	.00	9.2	.00	.00	.00	.00	.00
26	.43	.38	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00
27	.16	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	1.6	.06	.00	.00	.00	.00	.13	.00	.00	.00	.00	.00
29	1.5	.00	.00	.00	---	.00	2.0	.00	.00	.00	.00	.00
30	.42	.00	.00	.00	---	.00	.19	.00	.00	.00	.00	.00
31	.32	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	18.56	42.42	6.70	4.69	67.60	6.27	52.19	0.00	0.00	0.00	0.61	0.00
MEAN	.60	1.41	.22	.15	2.41	.20	1.74	.000	.000	.000	.020	.000
MAX	3.2	23	6.7	3.8	41	4.4	13	.00	.00	.00	.52	.00
MIN	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	37	84	13	9.3	134	12	104	.00	.00	.00	1.2	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2001, BY WATER YEAR (WY)

MEAN	3.03	8.33	8.92	10.5	8.43	8.54	9.30	4.43	2.31	2.73	2.00	1.37
MAX	16.7	30.5	31.0	40.5	30.6	22.6	64.8	23.6	10.5	11.0	7.52	6.81
(WY)	1966	1971	1966	1982	1979	1968	1989	1987	1961	1964	1961	1963
MIN	.000	.000	.22	.15	.000	.20	.71	.000	.000	.000	.010	.000
(WY)	1985	2000	2001	2001	2000	2001	1996	2001	1985	2001	1996	1996

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1961 - 2001	
ANNUAL TOTAL	730.84		199.04			
ANNUAL MEAN	2.00		.55		5.80	
HIGHEST ANNUAL MEAN					11.8	1965
LOWEST ANNUAL MEAN					.55	2001
HIGHEST DAILY MEAN	155	Apr 1	41	Feb 14	847	Apr 8 1989
LOWEST DAILY MEAN	.00	Jan 1	.00	Nov 29	.00	Sep 12 1984
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Nov 29	.00	Sep 12 1984
ANNUAL RUNOFF (AC-FT)	1450		395		4200	
10 PERCENT EXCEEDS	1.7		.56		10	
50 PERCENT EXCEEDS	.10		.00		1.3	
90 PERCENT EXCEEDS	.00		.00		.00	



16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft downstream from concrete bridge on Highway 45, and 0.8 mi south of Halawa.

DRAINAGE AREA.--0.94 mi^2.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Phillip Teeters. Records fair except for estimated daily discharges which are poor. Diversion upstream of station for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--38 years (water years 1964-2001), 0.79 ft^3/s (575 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s, April 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft^3/s on basis of slope-area measurements at gage heights 4.60 ft, 7.15 ft, and 11.25 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 210 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 3	1045	*256	*4.32	No other peak greater than base discharge.			

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	e3.5	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	e16	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	e.27	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	e.04	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	e.00	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	e2.8	e.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	e.02	e.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	e.03	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	2.85	19.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.092	.66	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	2.8	16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	5.7	39	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

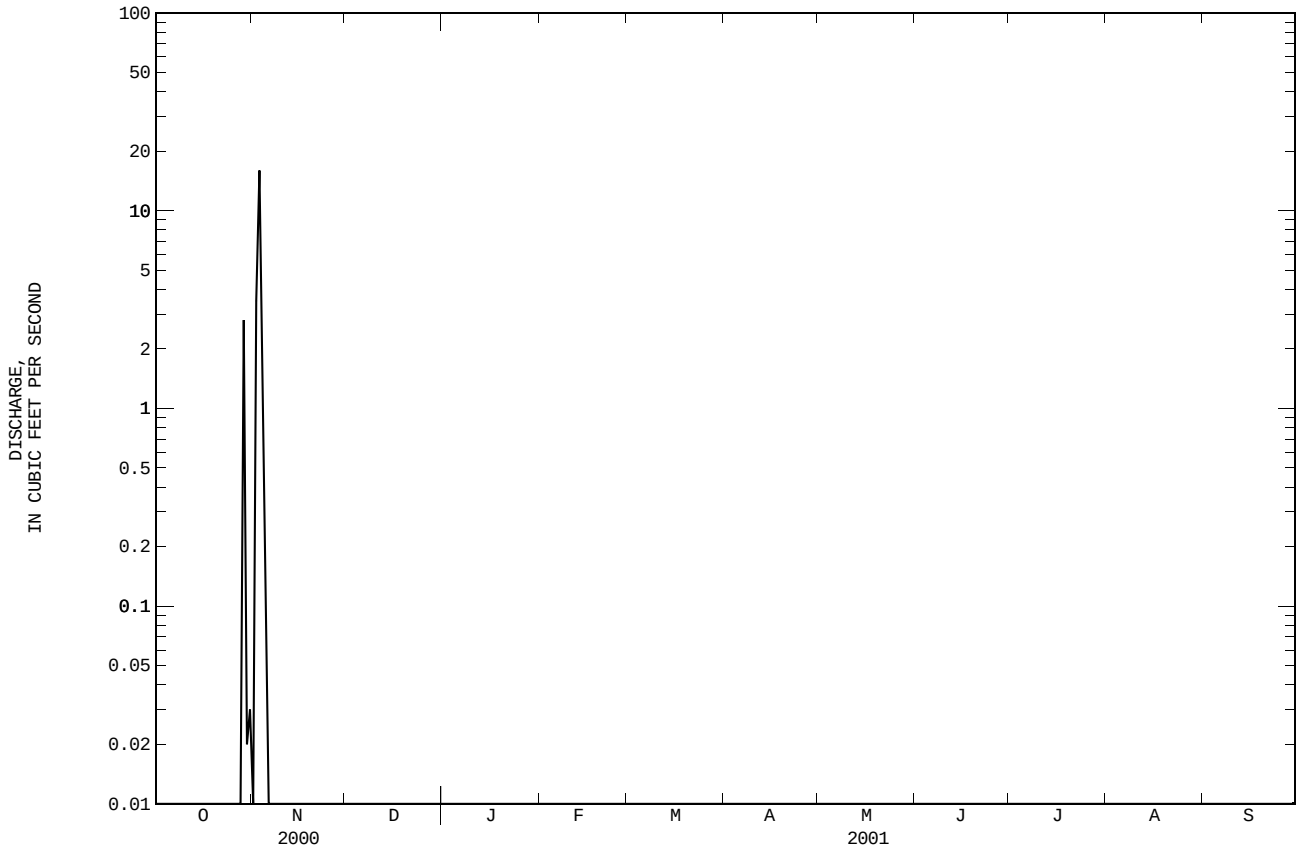
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2001, BY WATER YEAR (WY)

MEAN	.48	1.13	1.03	1.22	1.11	1.32	1.32	.64	.31	.42	.29	.28
MAX	2.63	7.56	6.12	4.84	5.88	6.42	10.3	3.99	1.43	1.56	1.21	2.24
(WY)	1986	1971	1965	1988	1965	1968	1989	1987	1982	1993	1980	1992
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1972	1972	1972	1977	1973	2001	2001	1975	1964	1972	1964	1964

16419500 PAPIO GULCH AT HALAWA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1963 - 2001	
ANNUAL TOTAL	74.86		22.66			
ANNUAL MEAN	.20		.062		.79	
HIGHEST ANNUAL MEAN					2.32	1989
LOWEST ANNUAL MEAN					.062	2001
HIGHEST DAILY MEAN	26	Aug 20	16	Nov 3	164	Apr 13 1965
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Jul 5 1963
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1	.00	Aug 3 1963
ANNUAL RUNOFF (AC-FT)	148		45		575	
10 PERCENT EXCEEDS	.00		.00		1.4	
50 PERCENT EXCEEDS	.00		.00		.20	
90 PERCENT EXCEEDS	.00		.00		.00	

e Estimated



Surface-Water Station Records for Maui

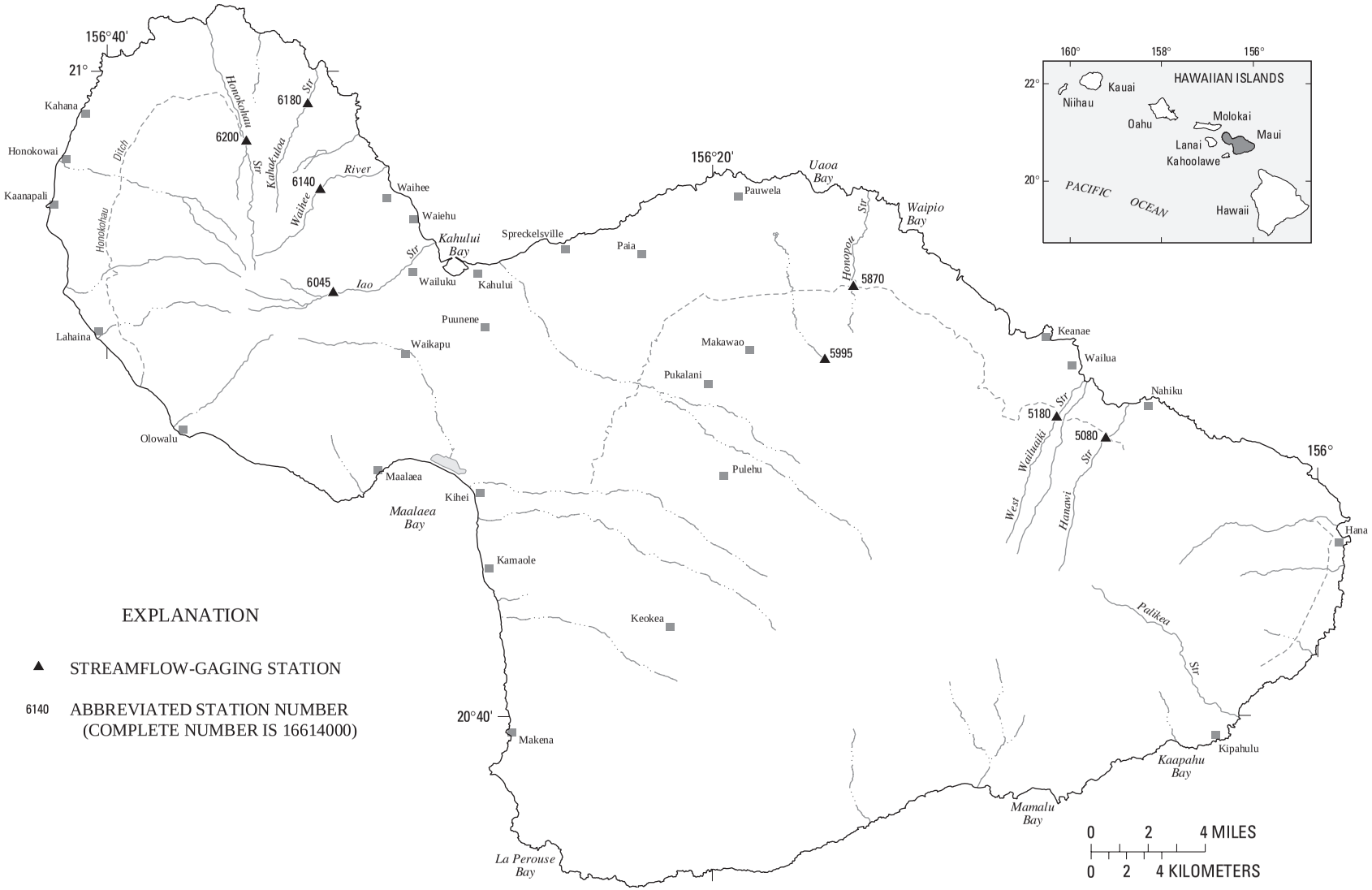


Figure 8. Locations of streamflow-gaging stations on Maui.

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft upstream from Koolau Ditch intake and trail, 1.9 mi southwest of Nahiku, and 4.5 mi southeast of Keanae.

DRAINAGE AREA.--3.49 mi^2.

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS.--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to November 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

REMARKS.--Records computed by Phiilip Teeters. Records good except discharges above 1,300 ft^3/s which are fair. No diversion upstream of station.

AVERAGE DISCHARGE.--79 years (water years 1923-2001), 23.8 ft^3/s (17,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s, January 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft^3/s by physical model of station site; minimum, 0.90 ft^3/s, October 28 to November 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 26	2130	*1,980	*6.99	No other peak greater than base discharge.			

Minimum discharge, 2.0 ft^3/s, Mar. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

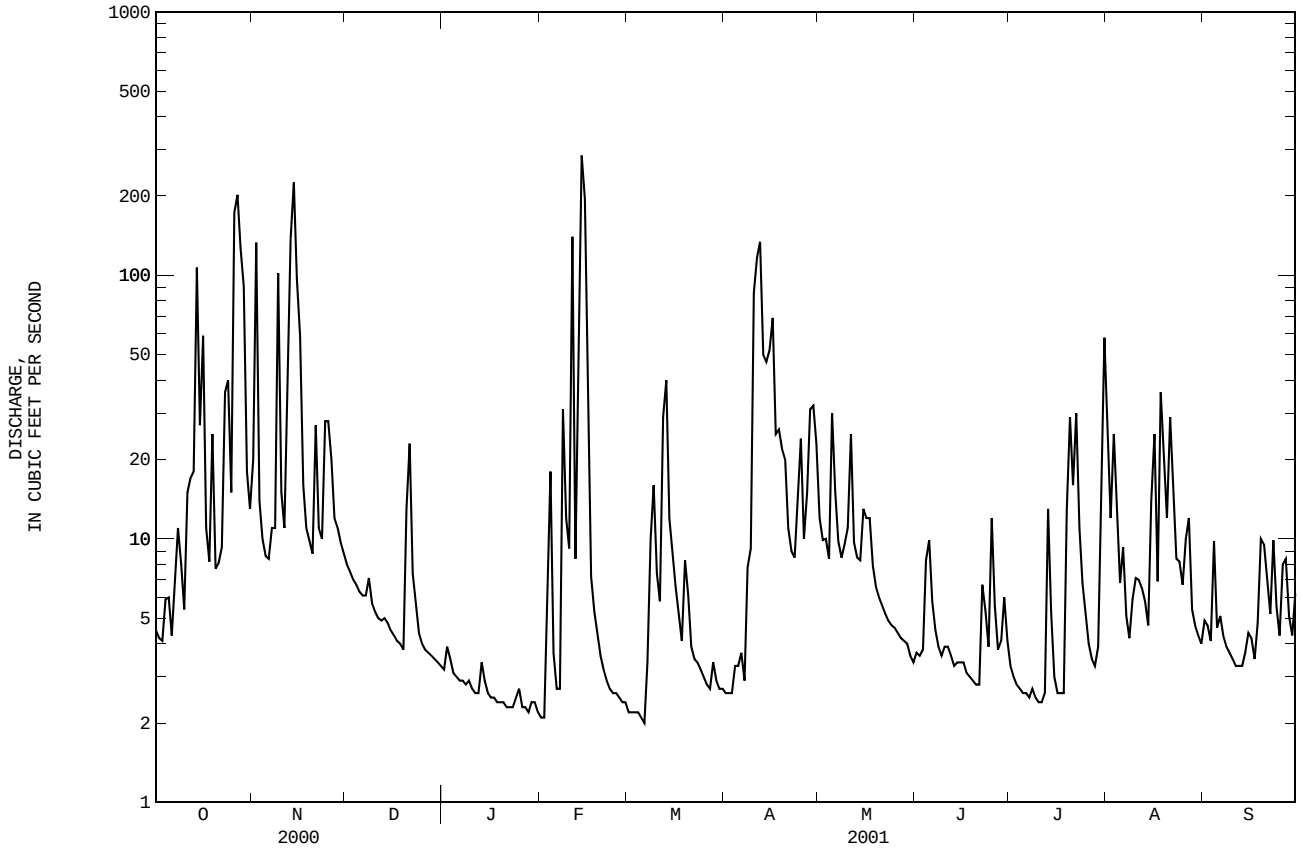
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	20	8.0	3.2	2.1	2.2	2.6	12	3.7	3.3	28	4.9
2	4.2	133	7.5	3.9	2.1	2.2	2.6	9.9	3.6	3.0	12	4.7
3	4.1	14	7.0	3.5	5.6	2.2	2.6	10	3.8	2.8	25	4.1
4	5.9	10	6.7	3.1	18	2.2	3.3	8.4	8.3	2.7	13	9.8
5	6.0	8.6	6.3	3.0	3.7	2.1	3.3	30	9.9	2.6	6.8	4.6
6	4.3	8.4	6.1	2.9	2.7	2.0	3.7	15	5.8	2.6	9.3	5.1
7	6.7	11	6.1	2.9	2.7	3.4	2.9	9.8	4.5	2.5	5.1	4.3
8	11	11	7.1	2.8	31	10	7.8	8.5	3.9	2.7	4.2	3.9
9	8.0	102	5.7	2.9	12	16	9.2	9.6	3.6	2.5	5.9	3.7
10	5.4	15	5.3	2.7	9.2	7.4	86	11	3.9	2.4	7.1	3.5
11	15	11	5.0	2.6	140	5.8	117	25	3.9	2.4	7.0	3.3
12	17	39	4.9	2.6	8.4	29	134	9.7	3.6	2.6	6.5	3.3
13	18	138	5.0	3.4	46	40	50	8.5	3.3	13	5.8	3.3
14	107	225	4.8	2.9	285	12	47	8.3	3.4	5.3	4.7	3.7
15	27	97	4.5	2.6	195	8.8	52	13	3.4	3.0	14	4.4
16	59	59	4.3	2.5	35	6.6	69	12	3.4	2.6	25	4.2
17	11	16	4.1	2.5	7.2	5.2	25	12	3.1	2.6	6.9	3.5
18	8.2	11	4.0	2.4	5.3	4.1	26	7.9	3.0	2.6	36	4.8
19	25	9.8	3.8	2.4	4.4	8.3	22	6.6	2.9	13	19	10
20	7.7	8.8	13	2.4	3.6	6.1	20	6.0	2.8	29	12	9.5
21	8.1	27	23	2.3	3.2	3.9	11	5.6	2.8	16	29	7.0
22	9.3	11	7.4	2.3	2.9	3.5	9.0	5.2	6.7	30	15	5.2
23	36	10	5.6	2.3	2.7	3.4	8.5	4.9	5.3	11	8.4	9.9
24	40	28	4.4	2.5	2.6	3.2	15	4.7	3.9	6.8	8.2	5.5
25	15	28	4.0	2.7	2.6	3.0	24	4.6	12	5.1	6.7	4.3
26	173	20	3.8	2.3	2.5	2.8	10	4.4	5.6	4.0	10	8.0
27	202	12	3.7	2.3	2.4	2.7	15	4.2	3.8	3.5	12	8.4
28	127	11	3.6	2.2	2.4	3.4	31	4.1	4.1	3.3	5.4	5.1
29	91	9.7	3.5	2.4	---	2.9	32	4.0	6.0	3.9	4.7	4.3
30	18	8.8	3.4	2.4	---	2.7	23	3.6	4.1	9.7	4.3	6.2
31	13	---	3.3	2.2	---	2.7	---	3.4	---	58	4.0	---
TOTAL	1087.4	1113.1	184.9	83.1	840.3	209.8	864.5	281.9	138.1	254.5	361.0	162.5
MEAN	35.1	37.1	5.96	2.68	30.0	6.77	28.8	9.09	4.60	8.21	11.6	5.42
MAX	202	225	23	3.9	285	40	134	30	12	58	36	10
MIN	4.1	8.4	3.3	2.2	2.1	2.0	2.6	3.4	2.8	2.4	4.0	3.3
AC-FT	2160	2210	367	165	1670	416	1710	559	274	505	716	322

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2001, BY WATER YEAR (WY)

MEAN	15.1	29.8	32.2	30.2	30.6	40.6	36.3	20.0	11.2	16.0	16.9	11.6
MAX	101	110	129	123	182	235	161	68.2	61.2	62.0	66.2	52.3
(WY)	1942	1991	1947	1979	1969	1980	1989	1987	1997	1997	1957	1914
MIN	1.15	2.99	2.71	1.87	2.25	2.10	2.75	2.82	2.16	2.42	2.40	1.88
(WY)	1985	1990	1981	1977	1983	1983	1992	1945	1981	1926	1973	1974

16508000 HANAWI STREAM NEAR NAHIKU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1914 - 2001	
ANNUAL TOTAL	6884.8		5581.1			
ANNUAL MEAN	18.8		15.3		23.8	
HIGHEST ANNUAL MEAN					52.6	1969
LOWEST ANNUAL MEAN					7.59	1926
HIGHEST DAILY MEAN	467	Apr 1	285	Feb 14	1610	Jan 25 1948
LOWEST DAILY MEAN	2.0	Mar 17	2.0	Mar 6	.90	Oct 31 1984
ANNUAL SEVEN-DAY MINIMUM	2.0	Mar 15	2.2	Feb 28	.96	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	13660		11070		17270	
10 PERCENT EXCEEDS	40		29		51	
50 PERCENT EXCEEDS	5.7		5.6		7.1	
90 PERCENT EXCEEDS	2.4		2.6		2.8	



16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft upstream from Koolau Ditch crossing and trail bridge, and 2.8 mi south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi^2.

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M), 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft above mean sea level (by vertical angles). Prior to October 3, 1974, at present site at datum 0.50 ft higher.

REMARKS.--Records computed by Phillip Teeters. Records fair. No diversion upstream of station. Water is diverted by Koolau Ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--81 years (water years 1915, 1917, 1923-2001), 34.7 ft^3/s (25,130 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, January 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s by logarithmic plotting; minimum, 0.5 ft^3/s, July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 26	2145	*3,920	*9.76	Nov 14	0445	2,300	8.15

Minimum discharge, 1.7 ft^3/s, Feb. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	29	7.8	2.6	1.8	3.7	3.4	15	4.0	3.5	40	11
2	5.0	167	7.1	3.1	1.7	3.5	3.5	12	3.9	3.1	19	8.2
3	4.7	32	6.6	3.0	15	4.6	3.5	12	4.4	2.8	32	8.8
4	9.0	22	6.2	2.5	45	4.5	5.0	9.7	13	2.5	22	22
5	8.1	15	5.8	2.4	6.4	3.7	3.6	40	13	2.4	13	8.8
6	6.1	12	5.6	2.3	3.4	3.4	3.3	20	6.1	2.3	17	8.9
7	18	16	5.8	2.2	4.5	6.6	2.9	11	4.7	2.3	10	7.2
8	25	15	7.5	2.2	7.4	17	5.6	9.4	3.9	3.0	8.9	6.2
9	20	139	5.1	2.2	4.8	30	7.8	9.9	3.5	2.3	13	6.0
10	11	24	4.5	2.2	3.6	15	54	10	4.0	2.3	13	5.6
11	37	17	4.2	2.1	83	10	82	34	3.7	2.3	13	5.0
12	31	37	4.1	2.1	10	34	100	11	3.1	5.1	11	5.1
13	28	157	4.9	4.1	61	54	39	9.7	2.8	20	10	5.7
14	138	280	4.1	2.4	392	23	50	9.2	2.9	6.2	8.8	6.6
15	40	100	3.7	2.1	278	13	72	14	2.9	3.7	21	10
16	65	62	3.5	2.0	53	11	89	12	3.1	2.9	32	5.4
17	20	39	3.3	2.0	15	8.7	39	12	2.5	2.9	14	5.4
18	16	19	3.1	1.9	9.8	7.5	33	12	2.4	3.4	45	12
19	25	14	3.0	1.9	7.7	18	24	10	2.3	17	33	16
20	13	11	14	1.9	6.4	12	20	7.7	2.3	34	22	14
21	14	29	27	1.8	5.6	7.7	14	7.1	2.4	20	e33	11
22	14	13	7.7	1.9	5.0	6.8	13	6.6	12	53	e21	8.6
23	43	12	5.8	2.0	4.5	7.2	12	5.7	6.3	19	e17	15
24	49	27	4.4	2.0	4.1	7.6	18	5.2	6.0	12	e14	8.6
25	22	31	3.9	2.3	3.8	5.9	30	5.0	11	8.9	e12	7.2
26	248	22	3.5	1.8	3.5	5.3	e11	4.5	e6.0	7.0	26	14
27	180	14	3.3	1.8	3.4	4.7	20	4.2	e4.1	6.1	22	14
28	230	11	3.1	1.9	4.3	6.1	32	3.9	e4.5	5.7	12	9.0
29	46	9.6	3.1	2.0	---	4.2	30	3.9	7.4	8.1	10	7.5
30	e20	8.5	2.9	1.9	---	3.7	24	3.7	4.4	14	8.8	9.1
31	e18	---	2.7	1.8	---	3.9	---	3.4	---	60	8.2	---
TOTAL	1409.3	1384.1	177.3	68.4	1043.7	346.3	844.6	333.8	152.6	337.8	581.7	281.9
MEAN	45.5	46.1	5.72	2.21	37.3	11.2	28.2	10.8	5.09	10.9	18.8	9.40
MAX	248	280	27	4.1	392	54	100	40	13	60	45	22
MIN	4.7	8.5	2.7	1.8	1.7	3.4	2.9	3.4	2.3	2.3	8.2	5.0
AC-FT	2800	2750	352	136	2070	687	1680	662	303	670	1150	559

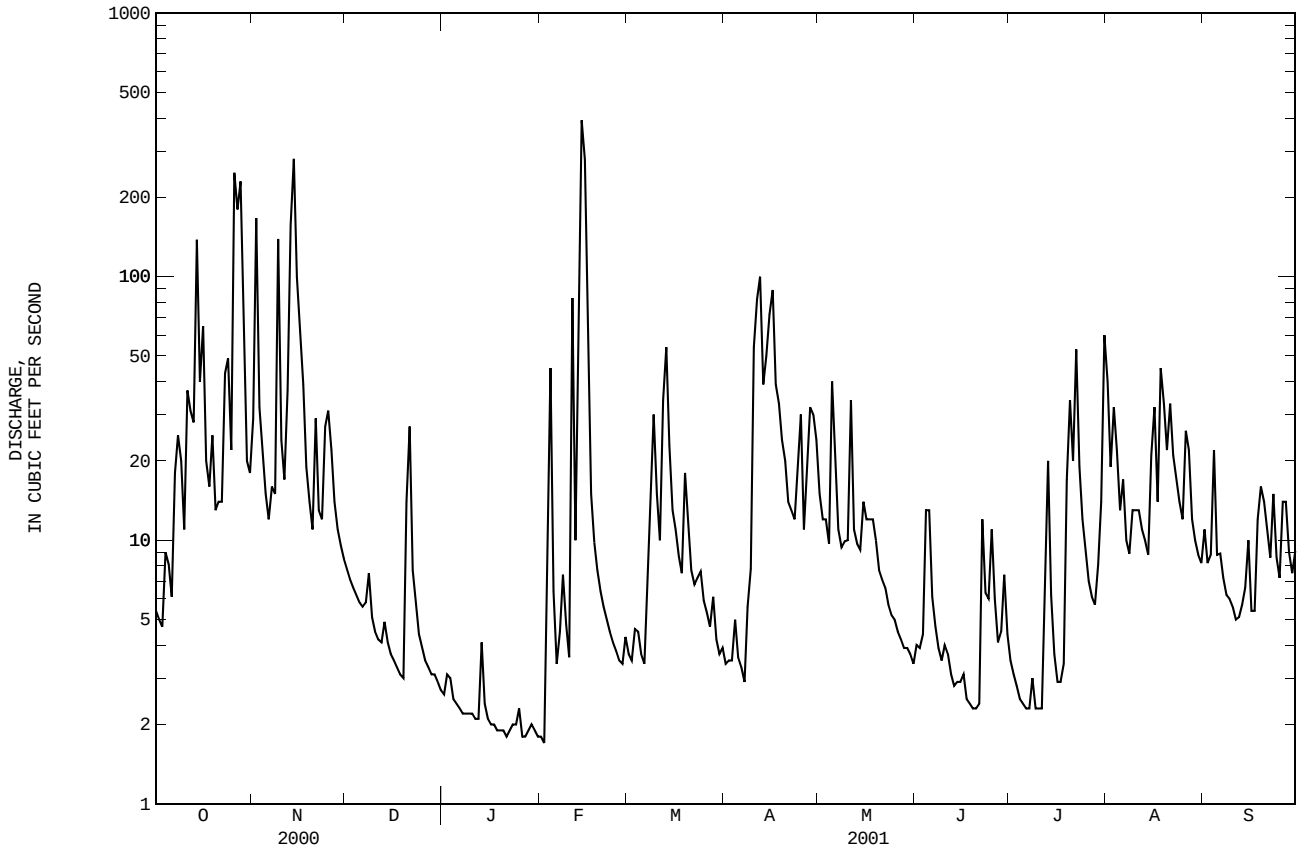
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2001, BY WATER YEAR (WY)

MEAN	23.8	45.7	48.0	41.5	45.6	55.4	54.2	29.1	16.7	24.9	25.8	18.1
MAX	133	198	200	192	222	303	221	88.4	67.7	99.4	111	101
(WY)	1942	1922	1937	1979	1932	1942	1989	1914	1997	1914	1914	1914
MIN	.88	4.06	2.82	2.01	2.65	2.04	4.17	3.86	2.37	1.72	2.85	1.68
(WY)	1985	1992	1981	1977	1995	1926	1992	1945	1981	1922	1973	1974

16518000 WEST WAILUAIKI STREAM NEAR KEANAE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1914 - 2001	
ANNUAL TOTAL	9179.2		6961.5			
ANNUAL MEAN	25.1		19.1		34.7	
HIGHEST ANNUAL MEAN					67.3	1980
LOWEST ANNUAL MEAN					14.5	1981
HIGHEST DAILY MEAN	736	Apr 1	392	Feb 14	2260	Jan 26 1948
LOWEST DAILY MEAN	1.5	Mar 17	1.7	Feb 2	.62	Jul 23 1922
ANNUAL SEVEN-DAY MINIMUM	1.8	Mar 12	1.8	Jan 27	.71	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	18210		13810		25130	
10 PERCENT EXCEEDS	54		38		76	
50 PERCENT EXCEEDS	8.0		8.2		10	
90 PERCENT EXCEEDS	2.4		2.4		3.3	

e Estimated



16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Hydrologic Unit 20020000, on left bank 75 ft upstream from Wailoa Ditch intake, 2.2 mi southwest of Huelo, and 2.5 mi west of Kailua.

DRAINAGE AREA.--0.64 mi^2.

PERIOD OF RECORD.--December 1910 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorders and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records computed by Phillip Teeters. Records good except for discharges above 100 ft^3/s, which are fair. No diversion upstream of station.

AVERAGE DISCHARGE.--90 years (water years 1912-2001), 4.80 ft^3/s (3,470 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s, November 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of physical model of station site; minimum, 0.02 ft^3/s, several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 270 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 8	1630	*290	*3.11	No other peak greater than base discharge.			

Minimum discharge, 0.35 ft^3/s, Jan. 20-22, 25-29, 31- Feb. 3, July 9-12, 16-18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

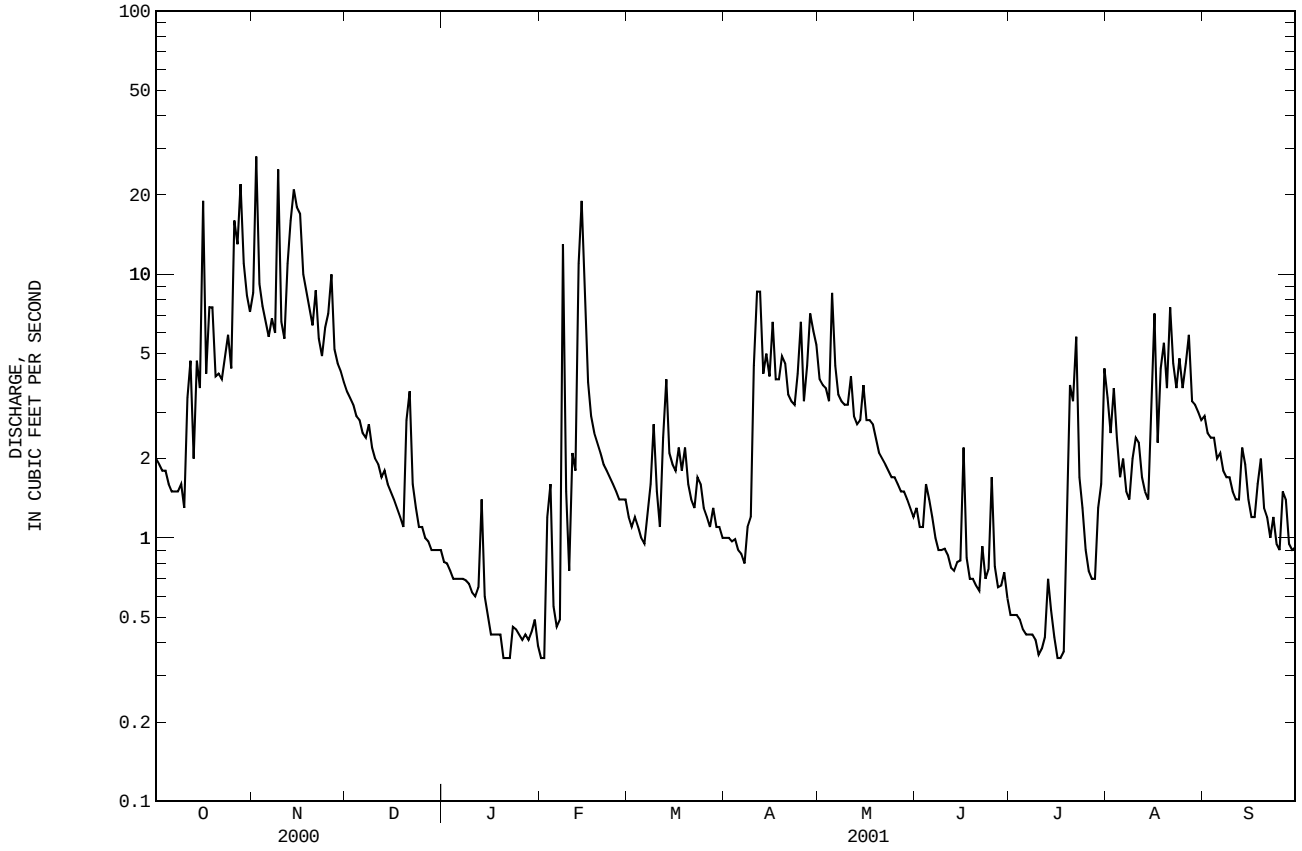
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	8.5	3.6	.81	.35	1.2	1.0	4.0	1.3	.51	3.4	2.9
2	1.9	28	3.4	.80	.35	1.1	1.0	3.8	1.1	.51	2.5	2.5
3	1.8	9.2	3.2	.75	1.2	1.2	.97	3.7	1.1	.51	3.7	2.4
4	1.8	7.6	2.9	.70	1.6	1.1	.99	3.3	1.6	.49	2.4	2.4
5	1.6	6.6	2.8	.70	.55	1.0	.90	8.5	1.4	.45	1.7	2.0
6	1.5	5.8	2.5	.70	.46	.95	.87	4.5	1.2	.43	2.0	2.1
7	1.5	6.8	2.4	.70	.49	1.2	.80	3.5	1.0	.43	1.5	1.8
8	1.5	6.0	2.7	.69	13	1.6	1.1	3.3	.90	.43	1.4	1.7
9	1.6	25	2.2	.67	1.5	2.7	1.2	3.2	.90	.41	2.0	1.7
10	1.3	6.6	2.0	.62	.75	1.5	4.5	3.2	.91	.36	2.4	1.5
11	3.4	5.7	1.9	.60	2.1	1.1	8.6	4.1	.86	.38	2.3	1.4
12	4.7	11	1.7	.65	1.8	2.4	8.6	2.9	.77	.42	1.7	1.4
13	2.0	16	1.8	1.4	11	4.0	4.2	2.7	.75	.70	1.5	2.2
14	4.7	21	1.6	.60	19	2.1	5.0	2.8	.81	.53	1.4	1.9
15	3.7	18	1.5	.51	8.3	1.9	4.1	3.8	.82	.42	2.9	1.4
16	19	17	1.4	.43	3.9	1.8	6.6	2.8	2.2	.35	7.1	1.2
17	4.2	10	1.3	.43	2.9	2.2	4.0	2.8	.84	.35	2.3	1.2
18	7.5	8.7	1.2	.43	2.5	1.8	4.0	2.7	.70	.37	4.4	1.6
19	7.5	7.4	1.1	.43	2.3	2.2	4.9	2.4	.70	1.6	5.5	2.0
20	4.1	6.4	2.8	.35	2.1	1.6	4.6	2.1	.66	3.8	3.7	1.3
21	4.2	8.7	3.6	.35	1.9	1.4	3.5	2.0	.63	3.3	7.5	1.2
22	4.0	5.7	1.6	.35	1.8	1.3	3.3	1.9	.93	5.8	4.6	1.0
23	4.9	4.9	1.3	.46	1.7	1.7	3.2	1.8	.70	1.7	3.7	1.2
24	5.9	6.3	1.1	.45	1.6	1.6	4.2	1.7	.76	1.3	4.8	.95
25	4.4	7.1	1.1	.43	1.5	1.3	6.6	1.7	1.7	.90	3.7	.90
26	16	10	1.0	.41	1.4	1.2	3.3	1.6	.78	.75	4.6	1.5
27	13	5.2	.97	.43	1.4	1.1	4.5	1.5	.65	.70	5.9	1.4
28	22	4.6	.90	.41	1.4	1.3	7.1	1.5	.66	.70	3.3	.95
29	11	4.3	.90	.44	---	1.1	6.1	1.4	.74	1.3	3.2	.90
30	8.3	3.9	.90	.49	---	1.1	5.4	1.3	.59	1.6	3.0	.92
31	7.2	---	.90	.39	---	1.0	---	1.2	---	4.4	2.8	---
TOTAL	178.2	292.0	58.27	17.58	88.85	48.75	115.13	87.7	28.66	35.90	102.9	47.52
MEAN	5.75	9.73	1.88	.57	3.17	1.57	3.84	2.83	.96	1.16	3.32	1.58
MAX	22	28	3.6	1.4	19	4.0	8.6	8.5	2.2	5.8	7.5	2.9
MIN	1.3	3.9	.90	.35	.35	.95	.80	1.2	.59	.35	1.4	.90
AC-FT	353	579	116	35	176	97	228	174	57	71	204	94

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2001, BY WATER YEAR (WY)

MEAN	2.74	5.48	6.10	5.51	5.18	7.13	7.54	5.01	2.76	3.56	3.96	2.60
MAX	15.9	21.4	20.0	20.9	24.5	33.0	43.4	24.3	9.97	14.6	18.1	14.6
(WY)	1942	1991	1947	1921	1969	1942	1989	1916	1914	1997	1982	1992
MIN	.15	.25	1.04	.57	.62	.79	.58	.84	.38	.41	.40	.25
(WY)	1985	1963	1981	2001	1983	1992	1992	1933	2000	1981	1973	1984

16587000 HONOPOU STREAM NEAR HUELO--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1912 - 2001	
ANNUAL TOTAL	1500.78		1101.46			
ANNUAL MEAN	4.10		3.02		4.80	
HIGHEST ANNUAL MEAN					9.88	1914
LOWEST ANNUAL MEAN					1.73	1981
HIGHEST DAILY MEAN	45	Jan 16	28	Nov 2	305	Apr 7 1989
LOWEST DAILY MEAN	.22	Jun 28	.35	Jan 20	.11	Oct 27 1984
ANNUAL SEVEN-DAY MINIMUM	.25	Jun 24	.40	Jan 16	.11	Oct 26 1984
ANNUAL RUNOFF (AC-FT)	2980		2180		3470	
10 PERCENT EXCEEDS	9.4		6.7		9.9	
50 PERCENT EXCEEDS	2.0		1.7		2.4	
90 PERCENT EXCEEDS	.43		.51		.73	



16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailiili, and 2.7 mi east of Makawao.

PERIOD OF RECORD.--May 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Phillip Teeters. Records good. Tunnel diverts water from Opana Gulch for agricultural and domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--36 years (water years 1966-2001), 3.18 ft^3/s (2,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s, March 31, 1982, April 12, 1986, March 23, 1994; minimum daily discharge, 0.11 ft^3/s, November 5-10, 1973, October 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 12 ft^3/s, Feb. 14-15; minimum daily discharge, 0.21 ft^3/s, Jul. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

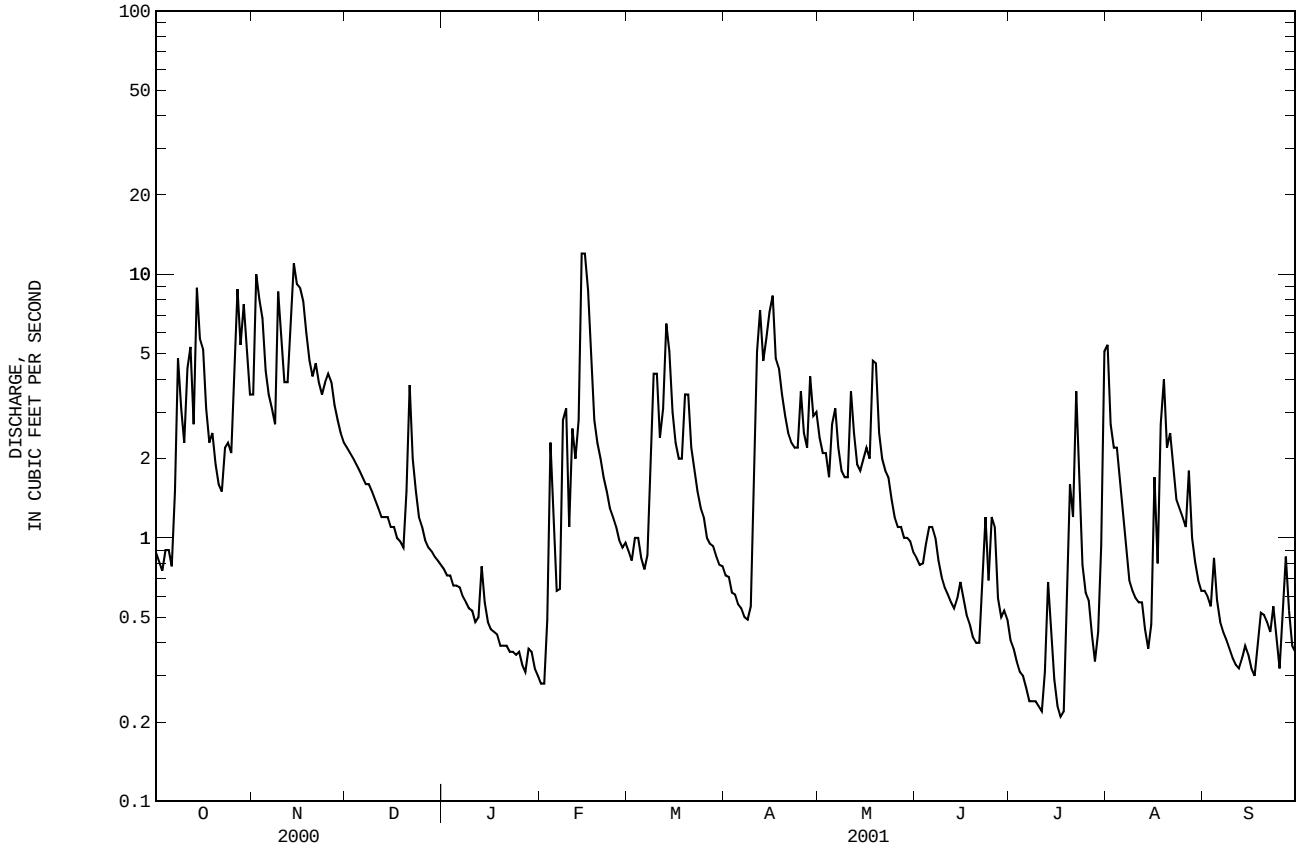
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.88	3.5	2.2	.76	.28	.89	.72	2.4	.84	.41	5.4	.63
2	.81	10	2.1	.72	.28	.82	.71	2.1	.79	.38	2.7	.60
3	.75	8.0	2.0	.72	.49	1.0	.62	2.1	.80	.34	2.2	.55
4	.90	6.8	1.9	.66	2.3	1.0	.61	1.7	.95	.31	2.2	.84
5	.90	4.3	1.8	.66	1.1	.84	.56	2.7	1.1	.30	1.6	.58
6	.78	3.5	1.7	.65	.63	.76	.54	3.1	1.1	.27	1.2	.48
7	1.5	3.1	1.6	.60	.64	.86	.50	2.2	1.0	.24	.90	.44
8	4.8	2.7	1.6	.57	2.8	1.9	.49	1.8	.82	.24	.69	.41
9	3.1	8.6	1.5	.54	3.1	4.2	.55	1.7	.71	.24	.63	.38
10	2.3	6.0	1.4	.53	1.1	4.2	2.2	1.7	.65	.23	.59	.35
11	4.4	3.9	1.3	.48	2.6	2.4	5.1	3.6	.61	.22	.57	.33
12	5.3	3.9	1.2	.50	2.0	3.1	7.3	2.5	.57	.31	.57	.32
13	2.7	6.9	1.2	.78	2.8	6.5	4.7	1.9	.54	.68	.45	.35
14	8.9	11	1.2	.57	12	5.1	5.7	1.8	.59	.46	.38	.39
15	5.7	9.2	1.1	.48	12	3.0	7.2	2.0	.68	.29	.47	.36
16	5.2	8.9	1.1	.45	8.7	2.3	8.3	2.2	.59	.23	1.7	.32
17	3.1	7.9	1.0	.44	4.6	2.0	4.8	2.0	.51	.21	.80	.30
18	2.3	6.0	.97	.43	2.8	2.0	4.4	4.7	.47	.22	2.7	.40
19	2.5	4.7	.92	.39	2.3	3.5	3.5	4.6	.42	.54	4.0	.52
20	1.9	4.1	1.5	.39	2.0	3.5	2.9	2.5	.40	1.6	2.2	.51
21	1.6	4.6	3.8	.39	1.7	2.2	2.5	2.0	.40	1.2	2.5	.48
22	1.5	3.9	2.0	.37	1.5	1.8	2.3	1.8	.68	3.6	1.9	.44
23	2.2	3.5	1.5	.37	1.3	1.5	2.2	1.7	1.2	1.5	1.4	.55
24	2.3	3.9	1.2	.36	1.2	1.3	2.2	1.4	.69	.79	1.3	.41
25	2.1	4.2	1.1	.37	1.1	1.2	3.6	1.2	1.2	.62	1.2	.32
26	3.8	3.9	.98	.33	.98	1.0	2.5	1.1	1.1	.58	1.1	.50
27	8.8	3.2	.92	.31	.92	.95	2.2	1.1	.59	.43	1.8	.85
28	5.4	2.8	.89	.38	.96	.93	4.1	1.0	.50	.34	1.0	.53
29	7.7	2.5	.85	.37	---	.85	2.9	1.0	.53	.44	.81	.39
30	5.2	2.3	.82	.32	---	.79	3.0	.97	.49	.93	.69	.37
31	3.5	---	.79	.30	---	.78	---	.88	---	5.1	.63	---
TOTAL	102.82	157.8	44.14	15.19	74.18	63.17	88.90	63.45	21.52	23.25	46.28	13.90
MEAN	3.32	5.26	1.42	.49	2.65	2.04	2.96	2.05	.72	.75	1.49	.46
MAX	8.9	11	3.8	.78	12	6.5	8.3	4.7	1.2	5.1	5.4	.85
MIN	.75	2.3	.79	.30	.28	.76	.49	.88	.40	.21	.38	.30
AC-FT	204	313	88	30	147	125	176	126	43	46	92	28

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	1.85	3.34	3.95	3.66	3.66	4.63	5.13	3.48	2.17	2.59	2.15	1.54
MAX	5.40	7.97	9.19	7.55	9.04	11.1	9.35	7.42	6.38	8.17	4.98	5.69
(WY)	1984	1968	1971	1989	1969	1982	1968	1987	1997	1997	1969	1992
MIN	.14	.25	.65	.22	.36	.51	.27	1.28	.50	.40	.19	.15
(WY)	1985	1992	1977	1977	1978	1983	1992	1992	1999	1981	1974	1984

16599500 OPANA TUNNEL AT KAILIILI--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	961.44		714.60			
ANNUAL MEAN	2.63		1.96		3.18	
HIGHEST ANNUAL MEAN					5.34	1969
LOWEST ANNUAL MEAN					1.45	1981
HIGHEST DAILY MEAN	13	Apr 1	12	Feb 14	18	Mar 31 1982
LOWEST DAILY MEAN	.24	Aug 8	.21	Jul 17	.11	Nov 5 1973
ANNUAL SEVEN-DAY MINIMUM	.29	Jun 24	.25	Jul 5	.11	Nov 4 1973
ANNUAL RUNOFF (AC-FT)	1910		1420		2300	
10 PERCENT EXCEEDS	6.6		4.6		7.8	
50 PERCENT EXCEEDS	1.7		1.1		2.2	
90 PERCENT EXCEEDS	.42		.38		.39	



16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", Hydrologic Unit 20020000, on left bank of Maniania and Waikapu Ditch intake, 0.3 mi upstream from Kepaniwai Park, 0.5 mi downstream from Iao Valley State Park, and 2.3 mi west of Wailuku Post Office.

DRAINAGE AREA.--5.98 mi^2.

PERIOD OF RECORD.--May 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 780 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records fair. No appreciable diversion upstream of station.

AVERAGE DISCHARGE.--18 years (water years 1984-2001), 64.2 ft^3/s (46,540 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,260 ft^3/s, January 28, 1988, gage height, 9.0 ft, from rating curve extended above 181 ft^3/s on basis of slope-area measurements at gage heights 6.48 ft and 9.0 ft; minimum, 11 ft^3/s for several days in October and November 1984, May 1996, several days in October and November 1996.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft^3/s, December 3, 1950, from rating curve based on model study of site 2.3 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 28	2015	*1,280	*427	No other peak greater than base discharge.			

Minimum discharge, 15 ft^3/s, Feb. 7, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	53	28	17	18	17	19	48	31	27	57	65
2	19	e225	26	84	17	16	19	43	28	25	70	38
3	18	e260	26	47	e73	32	18	41	33	24	159	42
4	42	146	25	26	43	22	18	31	119	e23	93	40
5	24	81	24	23	19	19	18	103	e150	e20	52	48
6	18	59	24	22	17	18	18	65	102	21	83	42
7	18	75	27	21	16	36	18	47	76	21	40	31
8	20	64	42	19	32	62	20	43	56	22	35	29
9	22	85	25	28	18	38	19	46	44	25	90	e38
10	17	56	24	21	17	29	41	47	49	22	102	e23
11	56	41	22	18	16	24	25	61	45	21	59	25
12	55	93	21	18	68	37	33	35	37	48	46	26
13	24	164	23	55	e166	86	27	32	68	65	38	25
14	e110	228	22	22	e178	42	65	46	89	37	34	28
15	37	142	23	19	100	35	49	113	58	30	89	91
16	e160	103	21	18	51	55	93	101	76	24	e190	35
17	44	54	20	18	32	84	96	122	e45	35	96	24
18	32	47	21	18	34	53	99	67	e32	27	163	27
19	32	44	22	17	32	70	85	e45	e32	77	85	41
20	24	36	e55	18	24	39	93	e35	35	96	113	46
21	26	e126	e93	17	22	30	48	e33	33	103	159	37
22	39	46	25	17	20	26	45	41	44	154	162	30
23	64	38	22	17	20	e20	44	30	34	62	95	44
24	83	72	20	17	19	e18	121	28	50	45	115	29
25	41	71	20	18	18	e17	e210	36	e125	35	71	27
26	57	63	19	18	18	21	68	29	44	29	70	116
27	125	40	18	19	18	22	100	29	40	26	92	55
28	e180	36	18	19	34	26	96	33	41	24	47	39
29	121	32	18	20	---	21	83	32	37	57	39	32
30	61	29	18	20	---	19	50	e24	31	67	38	34
31	58	---	18	18	---	19	---	e20	---	108	41	---
TOTAL	1648	2609	810	729	1140	1053	1738	1506	1684	1400	2623	1207
MEAN	53.2	87.0	26.1	23.5	40.7	34.0	57.9	48.6	56.1	45.2	84.6	40.2
MAX	180	260	93	84	178	86	210	122	150	154	190	116
MIN	17	29	18	17	16	16	18	20	28	20	34	23
AC-FT	3270	5170	1610	1450	2260	2090	3450	2990	3340	2780	5200	2390

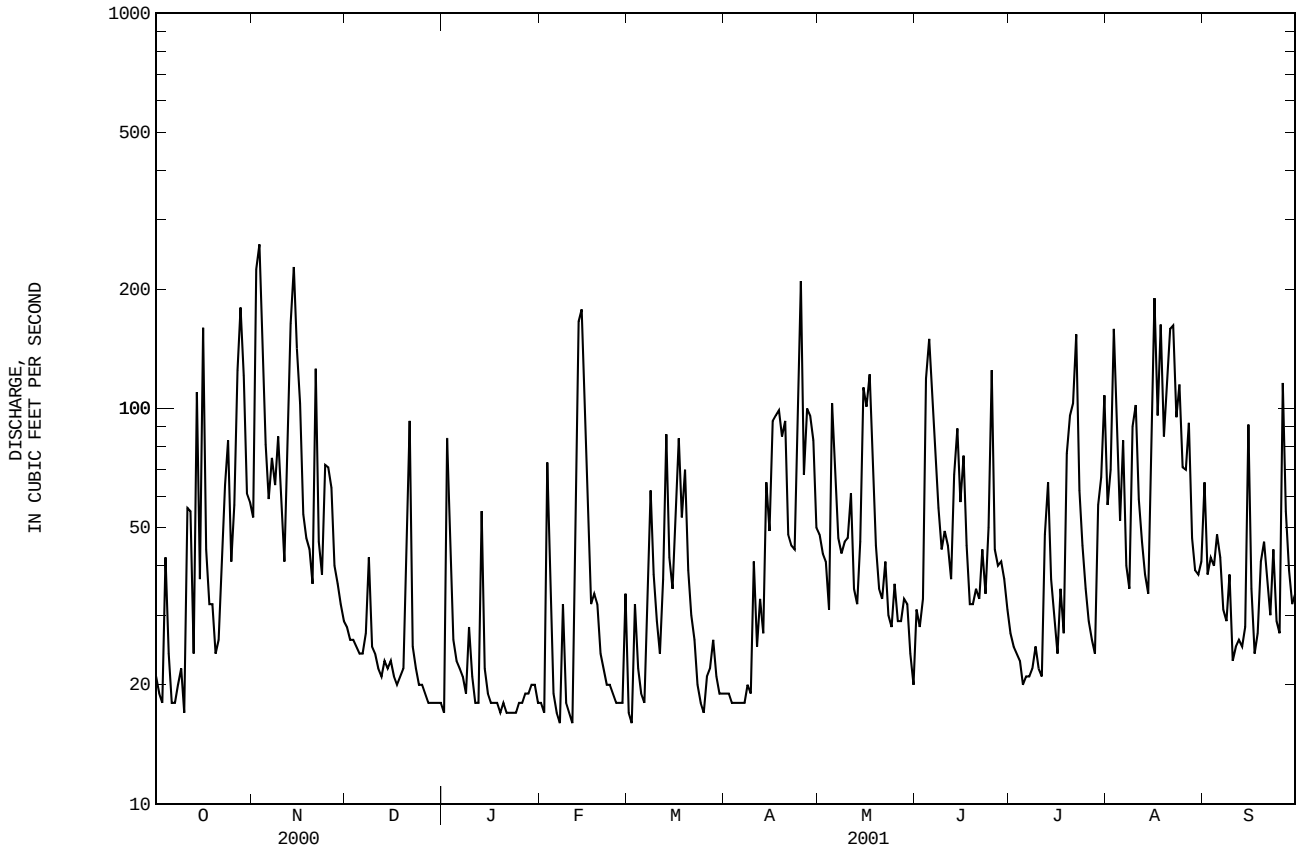
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2001, BY WATER YEAR (WY)

MEAN	51.3	69.7	63.1	67.7	55.8	76.2	83.2	62.3	58.3	69.0	61.5	48.4
MAX	103	132	103	149	108	176	230	136	110	137	97.0	133
(WY)	1984	1998	1997	1988	1994	1994	1989	1987	1998	1994	1993	1992
MIN	11.9	20.5	18.3	23.5	24.0	23.6	20.8	23.4	24.4	25.2	26.0	15.8
(WY)	1985	1985	1985	2001	2000	1998	1992	1999	1985	1984	1984	1984

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1983 - 2001	
ANNUAL TOTAL	18590		18147			
ANNUAL MEAN	50.8		49.7		64.2	
HIGHEST ANNUAL MEAN					93.4	1994
LOWEST ANNUAL MEAN					41.4	1985
HIGHEST DAILY MEAN	400	Jan 20	260	Nov 3	913	Apr 10 1986
LOWEST DAILY MEAN	16	Jun 7	16	Feb 7	11	Oct 7 1984
ANNUAL SEVEN-DAY MINIMUM	17	Mar 13	17	Jan 18	11	Oct 16 1984
ANNUAL RUNOFF (AC-FT)	36870		35990		46540	
10 PERCENT EXCEEDS	108		101		131	
50 PERCENT EXCEEDS	29		35		40	
90 PERCENT EXCEEDS	18		18		20	

e Estimated



16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--Lat 20°56'21", long 156°32'59", Hydrologic Unit 20020000, on right bank at dam 8 ft upstream from the abandoned Waihee canal intake, 2.6 mi southwest from Waihee Point, and 4.4 mi northwest from Wailuku Post Office.

DRAINAGE AREA.--4.20 mi^2.

PERIOD OF RECORD.--November 1910 to December 1913, November 1983 to current year. Low-flow records not equivalent prior to December 31, 1913, due to Waihee canal diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records fair. No diversion upstream of station.

AVERAGE DISCHARGE.--17 years (water years 1985-2001), 78.0 ft^3/s (56,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,660 ft^3/s, January 28, 1988, gage height, 8.95 ft, from rating curve extended above 280 ft^3/s on basis of slope-area measurements at gage heights 6.70 ft and 8.95 ft; minimum, 14 ft^3/s, July 13, 1995.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 28	1945	*5,110	*6.96	Feb 8	1730	2,840	5.53

Minimum discharge, 31 ft^3/s, July 9-12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

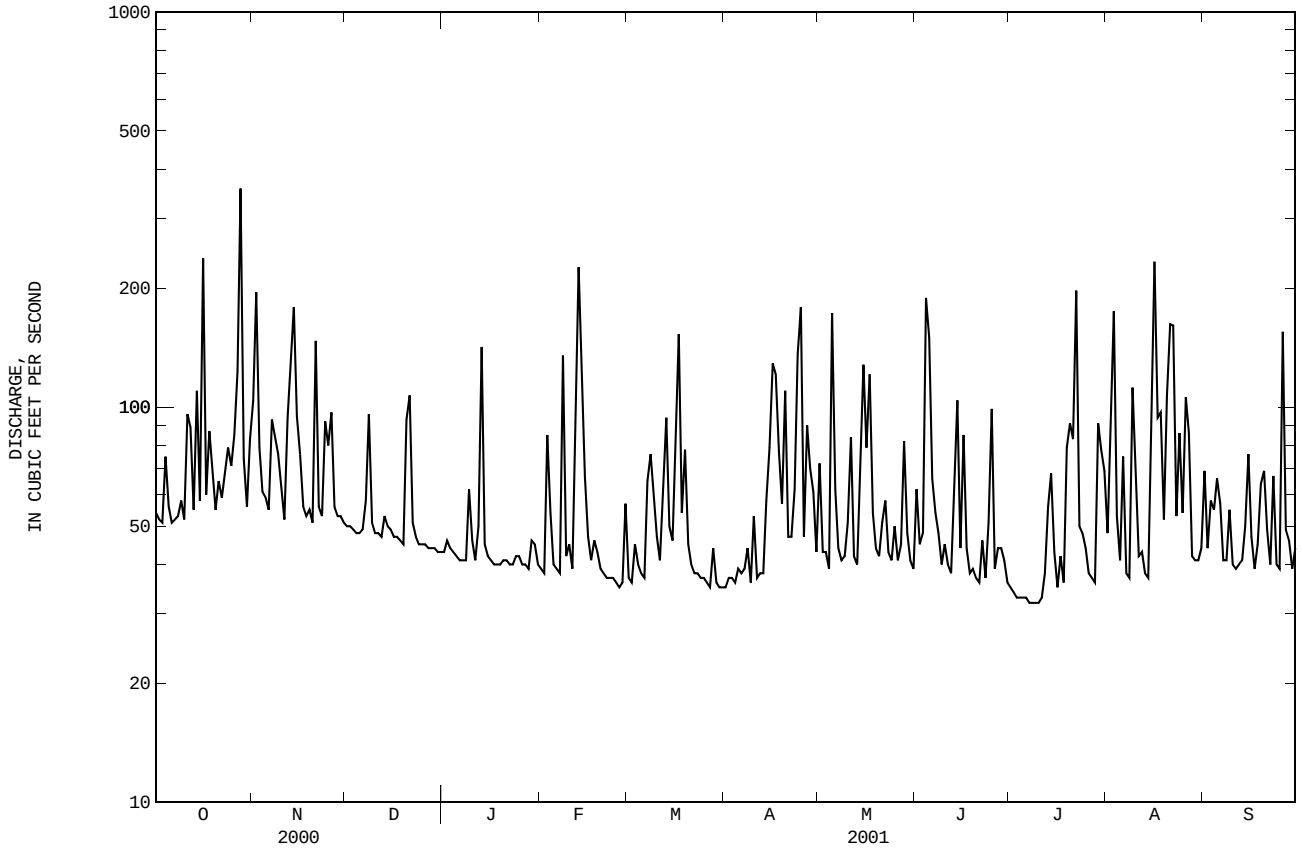
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	104	50	43	39	37	35	72	62	35	48	69
2	52	195	50	46	38	36	37	43	45	34	76	44
3	51	79	49	44	85	45	37	43	48	33	175	58
4	75	61	48	43	54	40	36	39	189	33	53	55
5	56	59	48	42	40	38	39	173	150	33	41	66
6	51	55	49	41	39	37	38	62	66	33	75	57
7	52	93	58	41	38	65	39	44	54	32	38	41
8	53	84	96	41	135	76	44	41	48	32	37	41
9	58	76	51	62	42	60	36	42	40	32	112	55
10	52	62	48	46	45	47	53	51	45	32	73	40
11	96	52	48	41	39	41	37	84	40	33	42	39
12	89	94	47	50	120	64	38	42	38	38	43	40
13	55	128	53	142	226	94	38	40	57	56	38	41
14	110	179	50	45	132	50	58	67	104	68	37	50
15	58	95	49	42	67	46	79	128	44	43	125	76
16	238	76	47	41	47	72	129	79	85	35	233	47
17	60	56	47	40	41	153	121	121	44	42	94	39
18	87	53	46	40	46	54	77	54	38	36	97	45
19	71	55	45	40	43	78	57	44	39	79	52	64
20	55	51	93	41	39	45	110	42	37	91	107	69
21	65	147	107	41	38	40	47	51	36	83	162	49
22	59	56	51	40	37	38	47	58	46	197	161	40
23	68	53	47	40	37	38	62	43	37	50	53	67
24	79	92	45	42	37	37	136	41	51	48	86	40
25	71	80	45	42	36	37	179	50	99	44	54	39
26	85	97	45	40	35	36	47	41	39	38	106	155
27	123	56	44	40	36	35	90	45	44	37	86	49
28	357	53	44	39	57	44	70	82	44	36	42	46
29	74	53	44	46	---	36	61	48	41	91	41	39
30	56	51	43	45	---	35	43	41	36	78	41	44
31	83	---	43	40	---	35	---	39	---	69	44	---
TOTAL	2593	2445	1630	1426	1668	1589	1920	1850	1746	1621	2472	1604
MEAN	83.6	81.5	52.6	46.0	59.6	51.3	64.0	59.7	58.2	52.3	79.7	53.5
MAX	357	195	107	142	226	153	179	173	189	197	233	155
MIN	51	51	43	39	35	35	35	39	36	32	37	39
AC-FT	5140	4850	3230	2830	3310	3150	3810	3670	3460	3220	4900	3180

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2001, BY WATER YEAR (WY)

MEAN	68.4	82.3	71.9	75.5	66.7	87.0	90.7	76.1	71.7	85.3	76.3	71.0
MAX	91.7	150	109	186	106	179	276	143	118	136	99.6	160
(WY)	1986	1991	1988	1988	1988	1994	1989	1987	1987	1994	1991	1992
MIN	27.4	36.8	31.3	29.4	42.2	43.7	36.6	41.5	43.4	52.3	46.1	32.9
(WY)	1985	1985	1985	1985	1993	1992	1992	1996	1984	2001	1984	1984

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1984 - 2001	
ANNUAL TOTAL	25666		22564			
ANNUAL MEAN	70.1		61.8		78.0	
HIGHEST ANNUAL MEAN					106	1994
LOWEST ANNUAL MEAN					57.5	1985
HIGHEST DAILY MEAN	453	Sep 27	357	Oct 28	1160	Jan 28 1988
LOWEST DAILY MEAN	33	Jun 12	32	Jul 7	22	Jan 18 1985
ANNUAL SEVEN-DAY MINIMUM	39	Mar 12	32	Jul 4	23	Jan 18 1985
ANNUAL RUNOFF (AC-FT)	50910		44760		56490	
10 PERCENT EXCEEDS	106		104		130	
50 PERCENT EXCEEDS	51		48		54	
90 PERCENT EXCEEDS	42		37		38	



16618000 KAHAKULOA STREAM NEAR HONOKOHAU
(Hydrologic Benchmark Network Station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi downstream from Kapuna Stream, 1.3 mi south of Kahakuloa, 2.0 mi west of Puu Makawana, and 4.3 mi southeast of Honokohau.

DRAINAGE AREA.--3.47 mi^2.

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records good. No diversion upstream of station.

AVERAGE DISCHARGE.--52 years (water years 1940-42, 1948-70, 1976-2001), 17.7 ft^3/s (12,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft^3/s, January 28, 1988, gage height, 9.93 ft from floodmarks, from rating curve extended above 510 ft^3/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 9.93 ft; minimum, 2.7 ft^3/s, January 22, 28, 29, February 10, 12, 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 8	1715	*1,590	*7.49	No other peak greater than base discharge.			

Minimum discharge, 2.2 ft^3/s, Mar. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	29	6.6	4.6	4.1	5.2	4.4	6.2	5.3	5.0	8.6	16
2	6.5	89	6.3	4.6	4.0	4.3	4.3	6.6	4.9	4.7	9.8	8.5
3	6.1	19	5.9	4.5	22	4.7	4.3	5.4	4.6	4.5	49	7.6
4	7.0	12	5.8	4.4	14	5.0	4.4	5.0	63	4.4	12	13
5	9.3	10	5.6	4.3	5.8	5.2	4.4	100	34	4.2	8.4	6.4
6	5.9	9.2	5.8	4.2	6.0	9.1	5.2	21	10	4.1	12	13
7	5.6	15	7.9	4.2	5.3	6.0	4.5	7.9	9.9	4.0	6.4	7.4
8	5.6	9.6	31	4.1	102	14	4.2	6.1	7.6	4.0	5.5	5.8
9	5.9	13	9.2	4.4	13	11	4.2	5.3	6.8	3.9	25	8.2
10	5.7	14	5.9	6.4	6.2	9.5	5.4	6.6	8.0	3.9	13	5.9
11	24	8.2	5.6	4.5	6.0	6.3	4.9	21	6.7	3.9	6.6	5.3
12	27	18	5.4	4.2	6.0	5.7	4.5	6.3	5.8	4.0	8.2	5.1
13	10	34	7.0	53	56	27	4.5	5.3	5.4	4.8	5.8	6.0
14	24	42	6.6	7.8	47	12	7.0	11	13	6.9	4.9	14
15	8.9	20	5.7	5.4	18	6.6	12	e44	9.9	12	21	6.3
16	87	20	5.4	5.0	7.9	7.8	44	e25	22	4.9	75	6.6
17	14	9.4	5.1	4.7	6.2	36	31	34	10	6.0	17	5.3
18	33	8.0	5.1	4.5	5.9	18	35	23	6.2	5.6	26	5.7
19	23	9.8	4.9	4.4	5.7	41	7.0	10	6.0	9.3	10	18
20	8.8	7.3	20	4.5	5.2	12	7.6	6.5	5.3	23	26	12
21	9.1	43	33	4.5	5.0	6.9	6.7	8.1	4.9	17	77	14
22	8.5	11	7.6	4.4	4.7	6.0	5.6	21	5.8	79	57	6.5
23	7.7	7.9	6.5	4.4	4.6	6.1	5.2	7.3	5.7	10	13	16
24	20	23	5.6	4.2	4.5	5.5	33	5.6	5.6	12	18	7.1
25	14	17	5.3	4.1	4.4	5.3	63	6.7	26	7.2	14	5.6
26	17	33	5.1	4.2	4.3	5.0	8.8	6.3	7.0	6.8	30	49
27	33	11	5.0	4.1	4.3	4.7	24	5.2	5.5	5.3	40	14
28	99	9.1	4.9	4.1	9.5	5.6	9.7	9.5	9.9	5.2	9.0	7.5
29	40	7.7	4.8	4.3	---	5.2	6.6	9.8	6.8	9.3	7.3	6.1
30	13	7.1	4.8	4.8	---	4.7	6.1	6.3	5.7	11	6.8	6.0
31	11	---	4.7	4.4	---	4.4	---	5.0	---	20	6.7	---
TOTAL	597.2	566.3	248.1	191.2	387.6	305.8	371.5	447.0	327.3	305.9	629.0	307.9
MEAN	19.3	18.9	8.00	6.17	13.8	9.86	12.4	14.4	10.9	9.87	20.3	10.3
MAX	99	89	33	53	102	41	63	100	63	79	77	49
MIN	5.6	7.1	4.7	4.1	4.0	4.3	4.2	5.0	4.6	3.9	4.9	5.1
AC-FT	1180	1120	492	379	769	607	737	887	649	607	1250	611

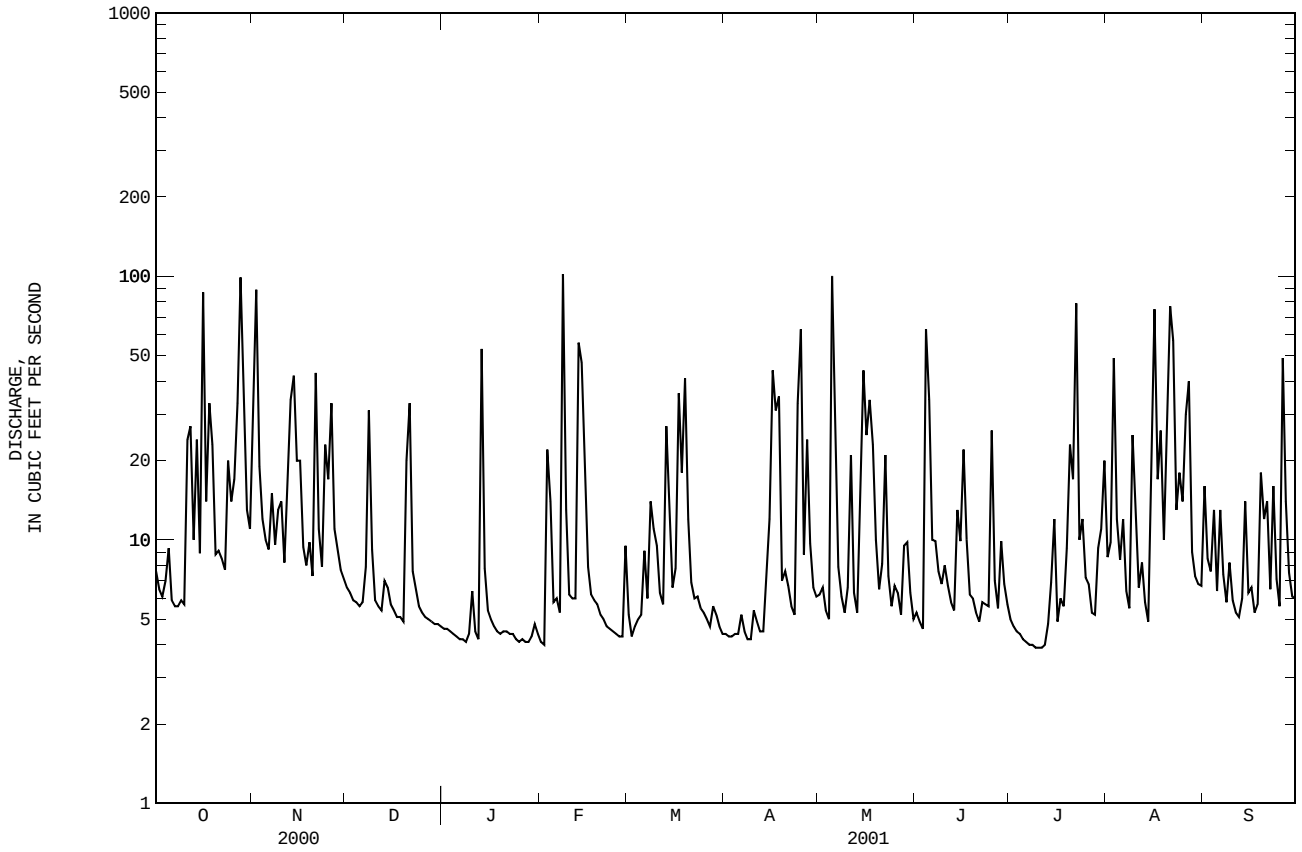
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2001, BY WATER YEAR (WY)

MEAN	15.2	20.5	18.6	18.1	17.3	24.3	23.7	16.9	12.1	16.0	16.5	12.0
MAX	49.6	51.2	37.5	71.2	50.2	133	121	54.5	28.1	34.4	37.2	40.4
(WY)	1942	1979	1955	1988	1969	1942	1989	1987	1987	1989	1957	1992
MIN	3.20	4.41	4.88	4.82	5.09	5.78	7.02	5.21	4.99	6.32	6.09	4.18
(WY)	1985	1963	1985	1977	1978	1961	1992	1975	1962	1975	1976	1984

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued
(Hydrologic Benchmark Network Station)

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1939 - 2001	
ANNUAL TOTAL	5675.9		4684.8			
ANNUAL MEAN	15.5		12.8		17.7	
HIGHEST ANNUAL MEAN					30.8	1942
LOWEST ANNUAL MEAN					11.0	1981
HIGHEST DAILY MEAN	195	Apr 1	102	Feb 8	696	Mar 10 1942
LOWEST DAILY MEAN	3.6	Mar 13	3.9	Jul 9	2.7	Jan 28 1985
ANNUAL SEVEN-DAY MINIMUM	3.7	Mar 12	4.0	Jul 6	2.8	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	11260		9290		12790	
10 PERCENT EXCEEDS	33		29		35	
50 PERCENT EXCEEDS	6.6		6.7		8.8	
90 PERCENT EXCEEDS	4.3		4.4		5.2	

e Estimated



16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'45", long 156°35'22", Hydrologic Unit 20020000, on left bank 1,250 ft upstream from intake of Honokohau Ditch, and 4.1 mi southeast of Honokohau.

DRAINAGE AREA.--4.11 mi^2.

PERIOD OF RECORD.--September, November, and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to November 1988, October 1990 to current year. Record since October 1990 equivalent to earlier records.

REVISED RECORDS.--WSP 1937: Drainage area. WDR HI-79-1: 1927-48(M), 1949-78(P). WDR HI-00-1: 1991-99 (P).

GAGE.--Water-stage recorders. Elevation of gage is 870 ft above mean sea level (from topographic map). Prior to March 7, 1913, nonrecording gage at site just below Honokohau Ditch intake at different datum. Prior to October 1, 1990, at site 250 ft downstream of gage at datum 26.67 ft lower.

REMARKS.--Records computed by Matt Wong. Records good. No diversion upstream of station. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau Ditch.

AVERAGE DISCHARGE.--83 years (water years 1914-19, 1923-88, 1991-2001), 39.0 ft^3/s (28,280 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,260 ft^3/s, January 28, 1988 (gage-height, 8.38 ft for datum and site then in use) from rating curve extended above 3,200 ft^3/s, on basis of slope-area measurement at gage height 8.38 ft; minimum, 8.4 ft^3/s, May 1, 1945, January 5, 1946.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 28	1930	*2,680	*4.65	Feb 8	1630	2,020	4.39

Minimum discharge, 13 ft^3/s, Feb. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

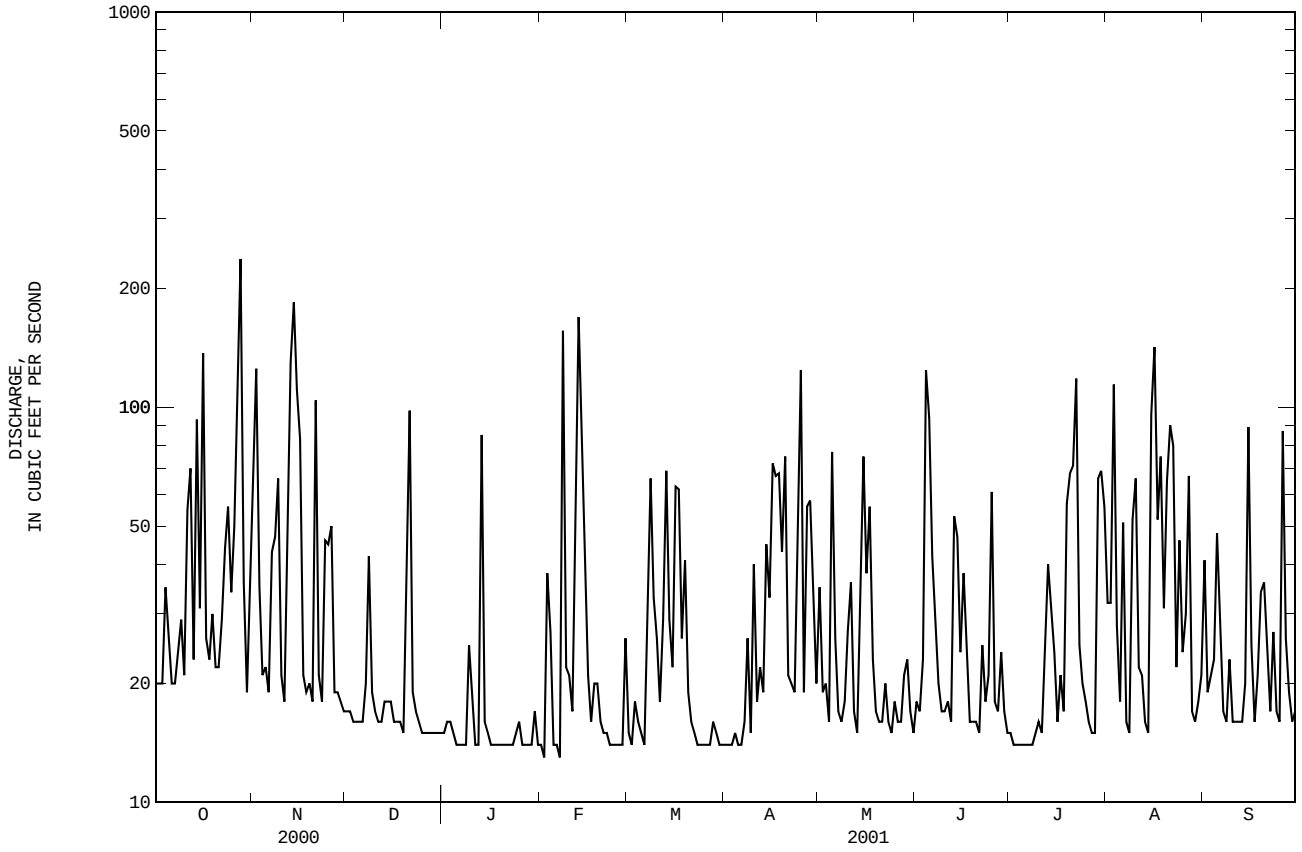
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	72	17	15	14	15	14	35	18	15	32	41
2	20	125	17	16	13	14	14	19	17	14	32	19
3	20	35	16	16	38	18	14	20	23	14	114	21
4	35	21	16	15	27	16	15	16	124	14	28	23
5	27	22	16	14	14	15	14	77	94	14	18	48
6	20	19	16	14	14	14	14	26	42	14	51	25
7	20	43	20	14	13	35	16	17	30	14	16	17
8	24	47	42	14	156	66	26	16	20	14	15	16
9	29	66	19	25	22	33	15	18	17	15	52	23
10	21	21	17	19	21	26	40	27	17	16	66	16
11	55	18	16	14	17	18	18	36	18	15	22	16
12	70	68	16	14	69	29	22	17	16	24	21	16
13	23	130	18	85	169	69	19	15	53	40	16	16
14	93	184	18	16	105	29	45	26	47	31	15	20
15	31	111	18	15	48	22	33	75	24	24	96	89
16	137	83	16	14	21	63	72	38	38	16	142	25
17	26	21	16	14	16	62	67	56	23	21	52	16
18	23	19	16	14	20	26	68	23	16	17	75	21
19	30	20	15	14	20	41	43	17	16	57	31	34
20	22	18	48	14	16	19	75	16	16	68	65	36
21	22	104	98	14	15	16	21	16	15	71	90	24
22	29	21	19	14	15	15	20	20	25	118	80	17
23	44	18	17	14	14	14	19	16	18	25	22	27
24	56	46	16	15	14	14	68	15	21	20	46	17
25	34	45	15	16	14	14	124	18	61	18	24	16
26	50	50	15	14	14	14	19	16	18	16	30	87
27	125	19	15	14	14	14	56	16	17	15	67	26
28	237	19	15	14	26	16	58	21	24	15	17	19
29	36	18	15	14	---	15	38	23	17	66	16	16
30	19	17	15	17	---	14	20	17	15	69	18	17
31	32	---	15	14	---	14	---	15	---	56	21	---
TOTAL	1430	1500	648	536	959	790	1087	783	900	946	1390	804
MEAN	46.1	50.0	20.9	17.3	34.2	25.5	36.2	25.3	30.0	30.5	44.8	26.8
MAX	237	184	98	85	169	69	124	77	124	118	142	89
MIN	19	17	15	14	13	14	14	15	15	14	15	16
AC-FT	2840	2980	1290	1060	1900	1570	2160	1550	1790	1880	2760	1590

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2001, BY WATER YEAR (WY)

MEAN	31.6	41.2	40.7	35.9	36.8	43.8	48.4	40.6	34.3	39.9	41.1	30.6
MAX	94.8	110	97.5	98.6	132	144	120	130	81.1	116	103	122
(WY)	1915	1915	1955	1916	1932	1942	1980	1916	1916	1914	1914	1914
MIN	10.8	11.8	13.0	12.3	13.5	13.4	12.9	12.2	14.2	16.2	14.5	12.1
(WY)	1985	1963	1936	1944	1963	1926	1992	1945	1962	1926	1971	1984

16620000 HONOKOHAU STREAM NEAR HONOKOHAU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1913 - 2001	
ANNUAL TOTAL	13666		11773			
ANNUAL MEAN	37.3		32.3		39.0	
HIGHEST ANNUAL MEAN					68.3	1914
LOWEST ANNUAL MEAN					24.1	1926
HIGHEST DAILY MEAN	354	Apr 1	237	Oct 28	781	Apr 7 1938
LOWEST DAILY MEAN	13	Jan 1	13	Feb 2	8.0	Aug 10 1920
ANNUAL SEVEN-DAY MINIMUM	13	Jun 3	14	Jan 16	8.5	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	27110		23350		28280	
10 PERCENT EXCEEDS	76		69		78	
50 PERCENT EXCEEDS	20		19		24	
90 PERCENT EXCEEDS	14		14		13	



Surface-Water Station Records for Hawaii

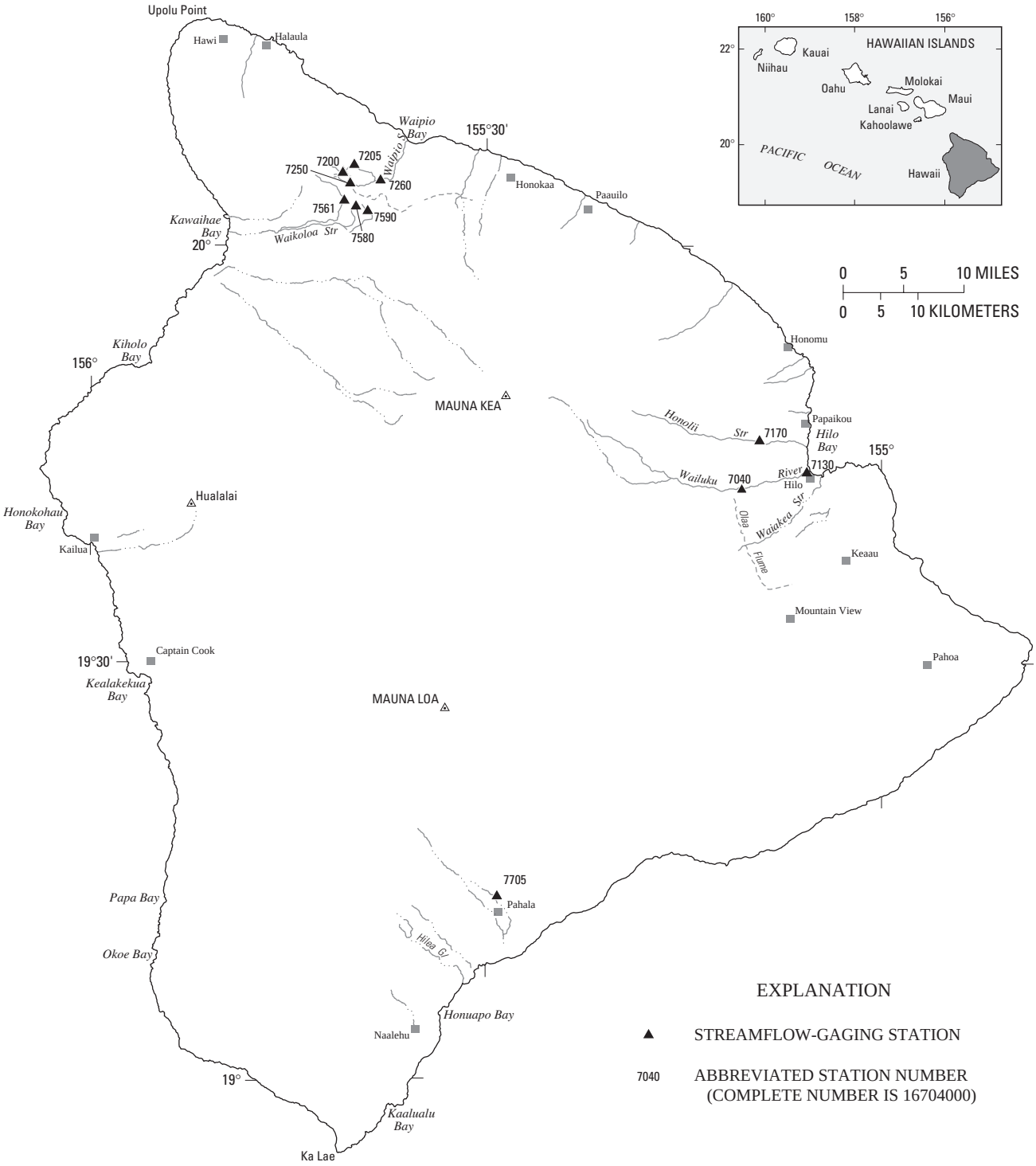


Figure 9. Locations of streamflow-gaging stations on Hawaii.

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right bank 0.2 mi downstream from Hookelekele Stream, 0.9 mi west of Piihonua, and 4.1 mi west of Hilo Post Office. Prior to November 16, 1977, at site directly across river, on left bank.

DRAINAGE AREA.--230 mi^2, of which a portion probably is noncontributing.

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

REVISED RECORDS.--WSP 865: 1929-36(M). WSP 965: 1941. WDR HI-80-1: 1929-79(P). WDR HI-81-1: 1940(M). WDR HI-96-1: 1978-82, 1985-90, 1980-90 (P).

GAGE.--Water-stage recorder. Elevation of gage is 1,090 ft above mean sea level (from topographic map). Prior to November 16, 1977, at site directly across river, on left bank at same datum.

REMARKS.--Records computed by Dale Nishimoto. Records good except for estimated daily discharges which are poor. Kapehu ditch diverted water from Kapehu Stream into Wailuku River upstream 1938-63. Department of Water Supply diverted about 6 ft^3/s of water upstream of gage until 1967. Hydroelectric plant diverts variable amounts of water up to 160 ft^3/s about 1 mi upstream of gage and discharges it about 500 ft below gage (from 1993).

AVERAGE DISCHARGE.--70 years (water years 1929-39, 1942-47, 1949-2001), 279 ft^3/s (201,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft^3/s, August 11, 1940, gage height, 28.6 ft, from floodmarks, from rating curve extended above 13,000 ft^3/s based on slope-area measurement at gage height 26.16 ft; minimum, 0.15 ft^3/s, January 20, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 2	0100	*40,700	*22.89	No other peak greater than base discharge.			

Minimum discharge, 7.1 ft^3/s, Feb. 7, 8.

REVISIONS.--The maximum annual discharges for water years 1992, 1993, and 1995 to 1999 have been revised as shown in the following table. These figures supercede those published in Water Data Reports 1998-99.

Water year	Date	Discharge (ft^3/s)	Gage height (ft)	Water year	Date	Discharge (ft^3/s)	Gage height (ft)
1992	Sep. 03, 1992	8,640	13.79	1997	Jul. 30, 1997	16,300	16.96
1993	Nov. 29, 1992	13,400	15.91	1998	Sep. 21, 1998	6,750	12.72
1995	Nov. 16, 1994	15,800	16.81	1999	Feb. 02, 1999	8,410	13.67
1996	Feb. 25, 1996	16,500	17.03				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	99	e3000	96	29	11	52	48	266	29	15	116	33
2	82	e8000	74	27	9.6	47	49	191	33	14	60	31
3	70	e1000	67	25	9.2	43	49	152	36	15	103	32
4	64	e300	64	24	9.0	41	52	124	30	14	106	40
5	61	e250	64	22	8.0	39	50	121	31	13	83	35
6	55	e200	53	20	7.6	36	78	116	30	12	66	38
7	82	e150	50	19	7.3	35	181	104	27	13	58	36
8	111	e100	60	18	18	139	599	91	31	18	49	30
9	91	e700	50	16	150	56	281	94	30	17	62	27
10	81	221	47	16	142	88	1850	101	28	17	58	25
11	330	179	46	15	2860	77	3560	165	40	17	126	23
12	584	150	64	15	1330	108	1830	110	35	24	72	22
13	343	132	65	14	1230	436	1070	103	32	26	60	23
14	1040	720	63	15	4030	247	613	111	37	24	52	23
15	647	1070	60	15	4280	279	383	122	39	21	47	35
16	593	2370	52	15	1600	164	372	105	26	18	47	32
17	318	854	48	14	625	127	285	96	24	20	41	25
18	232	366	45	13	377	103	274	81	24	22	46	25
19	949	255	42	12	247	89	229	72	24	53	94	38
20	293	204	42	11	202	78	299	65	22	37	58	38
21	387	180	54	10	164	72	571	59	21	41	63	39
22	944	159	47	11	134	62	286	54	20	54	107	39
23	996	141	41	12	111	59	284	49	19	105	87	80
24	436	130	38	11	94	54	192	45	18	117	68	73
25	e200	120	36	20	82	51	169	43	25	63	56	50
26	e900	157	34	18	72	46	145	46	26	51	65	44
27	e750	127	33	18	67	41	255	38	31	44	73	47
28	e250	118	31	22	63	60	322	36	24	40	48	42
29	e150	108	30	19	---	60	239	36	21	41	42	38
30	e120	103	32	15	---	56	652	33	20	37	38	42
31	e200	---	31	12	---	51	---	31	---	95	35	---
TOTAL	11458	21564	1559	523	17939.7	2896	15267	2860	833	1098	2086	1105
MEAN	370	719	50.3	16.9	641	93.4	509	92.3	27.8	35.4	67.3	36.8
MAX	1040	8000	96	29	4280	436	3560	266	40	117	126	80
MIN	55	100	30	10	7.3	35	48	31	18	12	35	22
AC-FT	22730	42770	3090	1040	35580	5740	30280	5670	1650	2180	4140	2190

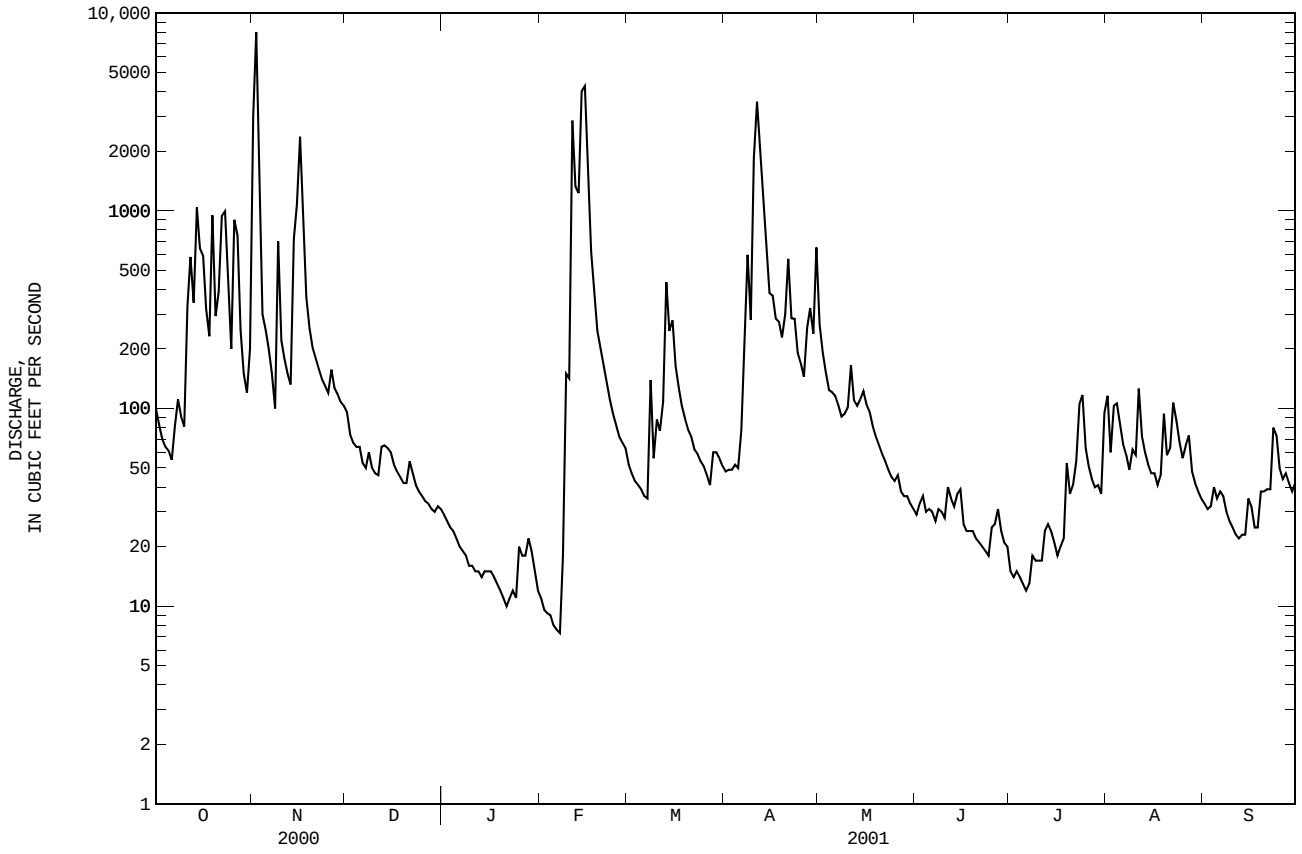
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 2001, BY WATER YEAR (WY)

MEAN	171	384	355	287	305	405	383	220	129	215	286	166
MAX	765	2238	1368	2061	2050	2026	2262	1246	715	1140	1989	992
(WY)	1942	1991	1971	1975	1969	1991	1986	1964	1941	1989	1930	1930
MIN	2.96	19.1	7.15	1.10	.51	.26	7.83	6.23	5.48	2.79	12.8	10.2
(WY)	1985	1934	1934	1981	1983	1983	1992	1992	1981	1981	1971	1974

16704000 WAILUKU RIVER AT PIIHONUA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1928 - 2001	
ANNUAL TOTAL	79016.1		79188.7			
ANNUAL MEAN	216		217		279	
HIGHEST ANNUAL MEAN					588	1991
LOWEST ANNUAL MEAN					103	1981
HIGHEST DAILY MEAN	8000	Nov 2	8000	Nov 2	22200	Jan 8 1975
LOWEST DAILY MEAN	7.0	Mar 16	7.3	Feb 7	.22	Mar 20 1983
ANNUAL SEVEN-DAY MINIMUM	8.1	Mar 11	8.8	Feb 1	.23	Mar 17 1983
ANNUAL RUNOFF (AC-FT)	156700		157100		201800	
10 PERCENT EXCEEDS	521		379		593	
50 PERCENT EXCEEDS	64		55		79	
90 PERCENT EXCEEDS	13		18		12	

e Estimated



16717000 HONOLII STREAM NEAR PAPAIKOU

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi downstream from Pohakupaa Stream, 4.1 mi west of Papaikou, and 4.8 mi northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi^2.

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to current year.

REVISED RECORDS.--WDR HI-95-1: 1967-90 (P) 1988-90 (m), 1988-90.

GAGE.--Water-stage recorder. Elevation of gage is 1,540 ft above mean sea level (from topographic map). Prior to August 27, 1911, nonrecording gage and August 27, 1911 to March 24, 1913, water-stage recorder, at site 0.5 mi upstream at different datum.

REMARKS.--Records computed by Dale Nishimoto. Records good. No diversion upstream. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft^3/s upstream for fluming cane and domestic use.

AVERAGE DISCHARGE.--35 years (water years 1912, 1968-2001), 130 ft^3/s (94,350 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s, May 23, 1978, gage height, 20.00 ft, from floodmarks and from rating curve extended above 4,610 ft^3/s on basis of slope-area measurement at gage height 20.00 ft; minimum, 0.8 ft^3/s, January 31, 1912. Minimum discharge since February 1967 (period of no diversions), 1.0 ft^3/s, February 22-28, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 2	0100	*14,300	*17.38	Feb 11	1300	4,870	11.98

Minimum discharge, 7.3 ft^3/s, Feb. 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

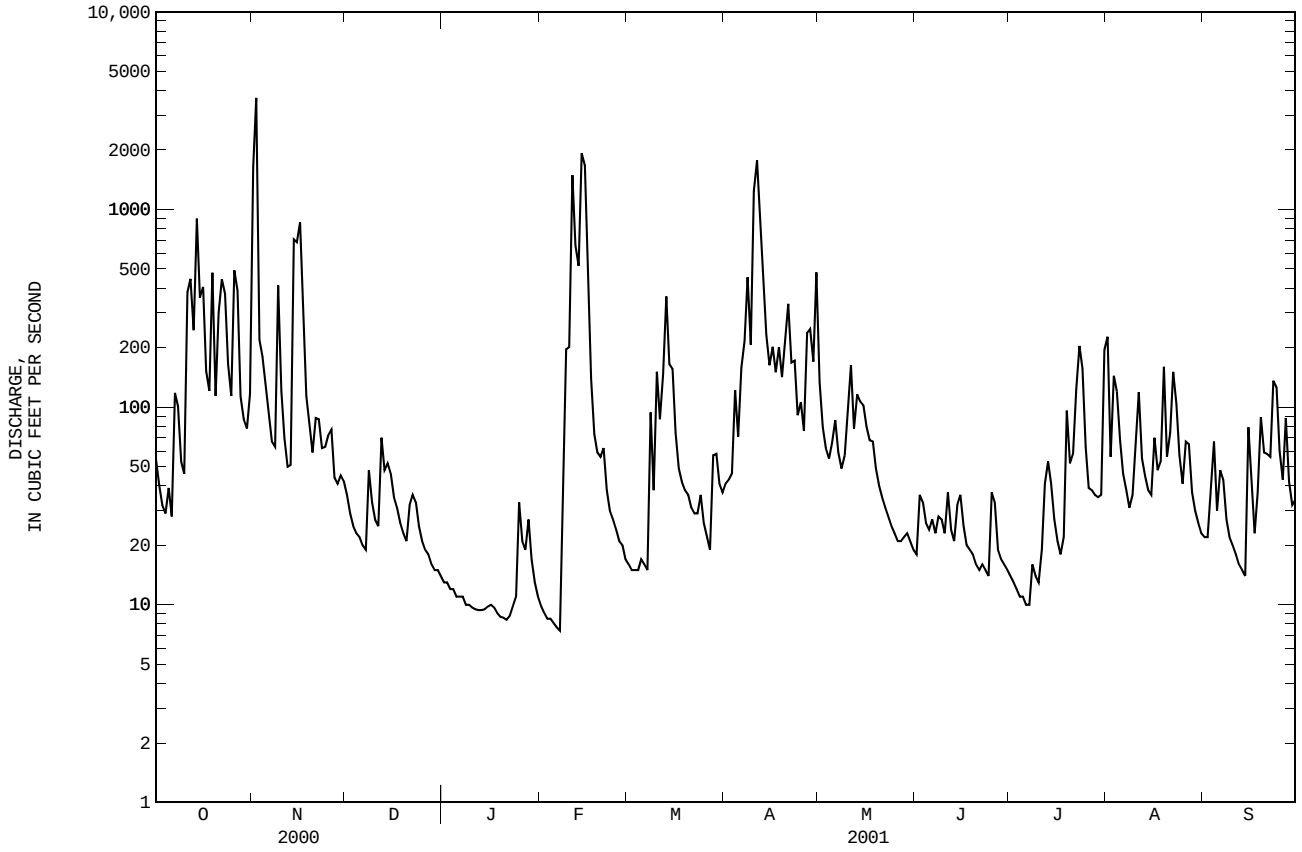
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	1640	36	13	9.9	16	41	134	18	14	227	22
2	40	3670	29	13	9.1	15	43	79	36	13	56	22
3	32	219	25	12	8.5	15	46	62	33	12	144	36
4	29	180	23	12	8.5	15	122	55	26	11	120	67
5	39	130	22	11	8.1	17	71	66	24	11	68	30
6	28	94	20	11	7.7	16	158	86	27	10	46	48
7	118	67	19	11	7.4	15	216	59	23	10	38	43
8	101	63	48	10	52	94	454	49	28	16	31	27
9	53	413	33	10	196	38	207	57	27	14	36	22
10	46	121	27	9.7	201	151	1240	95	23	13	62	20
11	382	70	25	9.5	1490	87	1770	163	37	19	119	18
12	446	50	70	9.4	657	147	783	78	24	41	55	16
13	245	51	48	9.4	518	363	403	116	21	53	45	15
14	898	705	52	9.5	1920	165	232	107	32	41	38	14
15	358	683	46	9.8	1670	156	163	102	36	27	36	79
16	405	861	35	10	508	74	202	80	25	21	70	46
17	152	330	31	9.7	139	49	150	68	20	18	48	23
18	121	114	26	9.1	73	42	201	67	19	22	53	37
19	478	80	23	8.7	59	38	142	49	18	96	160	89
20	114	59	21	8.6	56	36	217	40	16	52	56	59
21	301	88	32	8.4	62	31	333	35	15	58	74	58
22	444	87	36	8.8	38	29	168	31	16	123	151	56
23	375	62	33	9.8	30	29	172	28	15	204	104	136
24	165	63	25	11	27	36	91	25	14	157	57	126
25	114	72	21	33	24	26	106	23	37	63	41	60
26	492	77	19	21	21	22	76	21	33	39	67	43
27	389	44	18	19	20	19	237	21	19	38	65	88
28	113	41	16	27	17	57	248	22	17	36	37	42
29	87	45	15	17	---	58	170	23	16	35	30	32
30	78	42	15	13	---	41	480	21	15	36	26	34
31	117	---	14	11	---	37	---	19	---	195	23	---
TOTAL	6814	10221	903	385.4	7837.2	1934	8942	1881	710	1498	2183	1408
MEAN	220	341	29.1	12.4	280	62.4	298	60.7	23.7	48.3	70.4	46.9
MAX	898	3670	70	33	1920	363	1770	163	37	204	227	136
MIN	28	41	14	8.4	7.4	15	41	19	14	10	23	14
AC-FT	13520	20270	1790	764	15550	3840	17740	3730	1410	2970	4330	2790

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2001, BY WATER YEAR (WY)

MEAN	79.0	194	161	128	121	208	191	93.5	73.4	118	117	80.2
MAX	222	783	625	648	752	1349	772	319	349	384	420	276
(WY)	1991	1995	1971	1975	1969	1980	1986	1989	1997	1989	1982	1994
MIN	9.70	18.7	10.5	5.64	4.80	6.71	12.5	11.4	8.61	9.66	13.9	8.81
(WY)	1985	1986	1984	1981	1980	1983	1992	1992	1981	1981	1973	1979

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1968 - 2001	
ANNUAL TOTAL	44983.7		44716.6			
ANNUAL MEAN	123		123		130	
HIGHEST ANNUAL MEAN					220	1991
LOWEST ANNUAL MEAN					53.1	1981
HIGHEST DAILY MEAN	3670	Nov 2	3670	Nov 2	6410	Dec 10 1999
LOWEST DAILY MEAN	6.8	Mar 16	7.4	Feb 7	1.0	Feb 23 1980
ANNUAL SEVEN-DAY MINIMUM	7.0	Mar 12	8.5	Feb 1	1.0	Feb 22 1980
ANNUAL RUNOFF (AC-FT)	89230		88700		94350	
10 PERCENT EXCEEDS	340		229		266	
50 PERCENT EXCEEDS	38		41		41	
90 PERCENT EXCEEDS	11		13		11	



16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 ft upstream from Upper Hamakua ditch intake, and 4.5 mi north of Kamuela.

DRAINAGE AREA.--1.58 mi^2.

PERIOD OF RECORD.--January 1964 to current year.

REVISED RECORDS.--WDR HI-95-1: 1965-90 (m), 1970-71, 1979, 1984, 1990.

GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft above mean sea level (from topographic map).

REMARKS.--Record computed by Gary Sanchez. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--37 years (water years 1965-2001), 15.0 ft^3/s (10,870 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft^3/s, November 18, 1979, gage height, 10.03 ft, from rating curve extended above 53 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft; minimum, 0.01 ft^3/s, January 23-28, February 20-21, 1977, December 16-19, February 23, 24, 1980 (revised).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 2	1300	446	5.03	Feb. 14	0715	*479	*5.16

Minimum discharge, 0.14 ft^3/s, Jan. 11, 12, 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

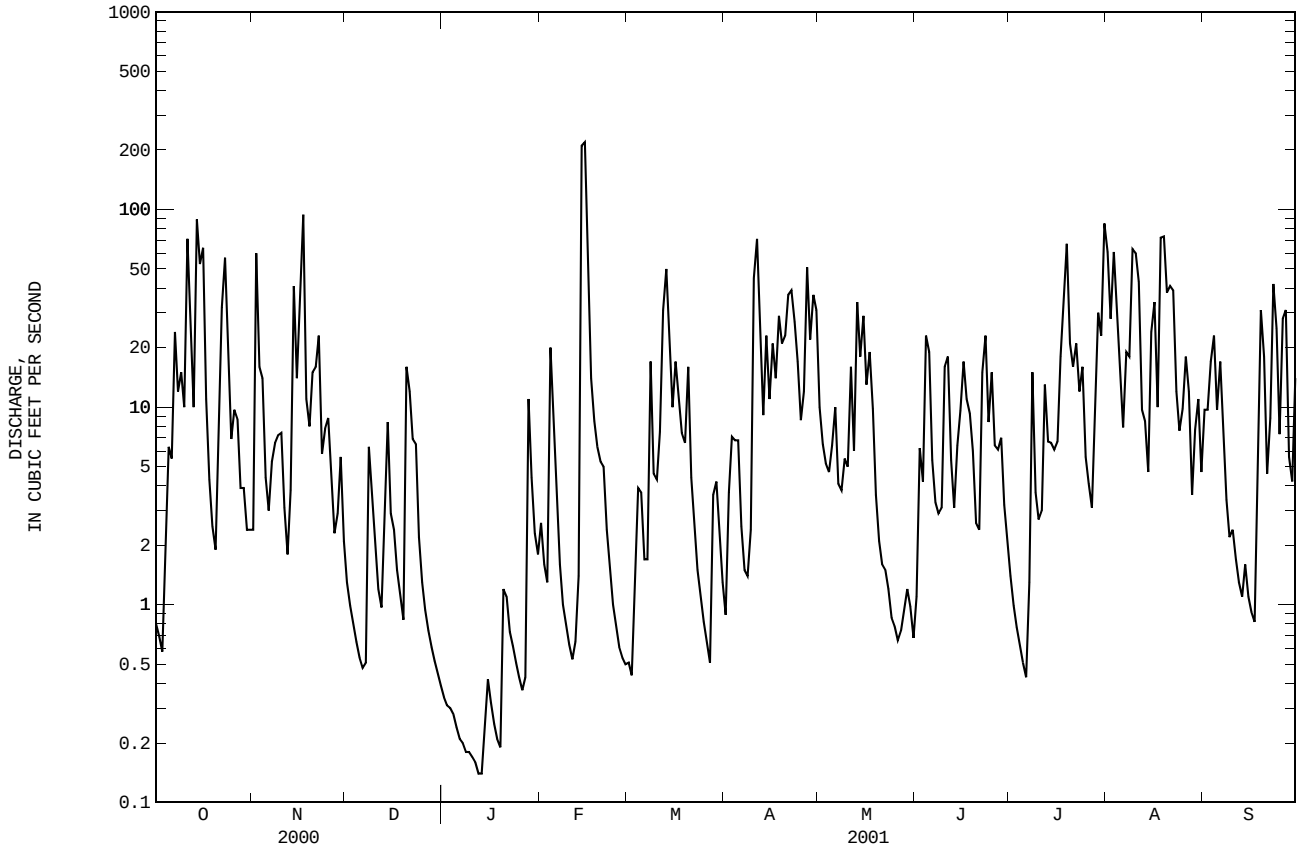
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	2.4	1.3	.34	2.6	.51	.89	10	1.1	1.4	61	9.7
2	.69	60	.99	.31	1.6	.44	3.7	6.5	6.2	.99	28	9.7
3	.58	16	.80	.30	1.3	1.6	7.1	5.2	4.2	.77	61	17
4	1.8	14	.65	.28	20	3.9	6.8	4.7	23	.62	28	23
5	6.3	4.4	.54	.24	7.1	3.7	6.8	6.4	19	.51	15	9.7
6	5.5	3.0	.48	.21	3.1	1.7	2.5	10	5.4	.43	7.9	17
7	24	5.3	.51	.20	1.6	1.7	1.5	4.1	3.3	1.3	19	8.8
8	12	6.6	6.3	.18	1.0	17	1.4	3.8	2.9	15	18	3.4
9	15	7.2	3.7	.18	.78	4.6	2.4	5.5	3.1	3.7	63	2.2
10	10	7.4	2.1	.17	.63	4.3	45	5.0	16	2.7	60	2.4
11	71	3.1	1.2	.16	.53	7.5	71	16	18	3.0	43	1.7
12	22	1.8	.97	.14	.65	31	30	6.0	5.4	13	9.7	1.3
13	10	3.8	3.1	.14	1.4	50	9.1	34	3.1	6.7	8.5	1.1
14	89	41	8.4	.25	210	24	23	18	6.4	6.6	4.7	1.6
15	53	14	2.9	.42	219	10	11	29	9.6	6.1	24	1.1
16	64	32	2.4	.32	81	17	21	13	17	6.7	34	.92
17	11	94	1.5	.25	14	11	14	19	11	18	10	.82
18	4.3	11	1.1	.21	8.5	7.4	29	9.8	9.3	33	72	2.6
19	2.5	8.0	.84	.19	6.3	6.6	21	3.6	6.0	67	73	31
20	1.9	15	16	1.2	5.3	16	23	2.1	2.6	21	38	18
21	7.5	16	12	1.1	5.0	4.4	37	1.6	2.4	16	41	4.6
22	32	23	6.9	.73	2.4	2.4	39	1.5	15	21	39	8.8
23	57	5.8	6.5	.62	1.5	1.5	27	1.2	23	12	12	42
24	21	7.8	2.2	.51	1.0	1.1	17	.86	8.4	16	7.6	25
25	6.9	8.8	1.3	.43	.78	.82	8.6	.78	15	5.6	9.8	7.3
26	9.7	4.0	.94	.37	.61	.64	12	.66	6.4	4.1	18	28
27	8.7	2.3	.74	.43	.54	.51	51	.74	6.1	3.1	12	31
28	3.9	2.9	.61	11	.50	3.6	22	.93	7.0	11	3.6	5.6
29	3.9	5.6	.52	4.4	---	4.2	37	1.2	3.2	30	7.7	4.2
30	2.4	2.1	.45	2.3	---	2.5	31	.98	2.1	23	11	14
31	2.4	---	.39	1.8	---	1.3	---	.68	---	85	4.7	---
TOTAL	560.77	428.3	88.33	29.38	598.72	242.92	611.79	222.83	261.2	435.32	844.2	333.54
MEAN	18.1	14.3	2.85	.95	21.4	7.84	20.4	7.19	8.71	14.0	27.2	11.1
MAX	89	94	16	11	219	50	71	34	23	85	73	42
MIN	.58	1.8	.39	.14	.50	.44	.89	.66	1.1	.43	3.6	.82
AC-FT	1110	850	175	58	1190	482	1210	442	518	863	1670	662

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2001, BY WATER YEAR (WY)

MEAN	9.41	16.9	15.1	14.9	12.3	20.6	22.9	12.3	13.9	18.5	15.3	8.58
MAX	27.3	55.8	41.4	62.5	40.6	98.0	67.5	36.0	37.7	37.0	31.8	27.5
(WY)	1984	1980	1971	1979	1969	1980	1986	1998	1998	1982	1982	1992
MIN	.17	1.77	.51	.34	.51	3.33	1.71	1.07	3.18	4.56	2.70	.27
(WY)	1985	1990	1981	1981	1995	1983	1992	1999	1985	1981	1971	1965

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1964 - 2001	
ANNUAL TOTAL	4564.41		4657.30			
ANNUAL MEAN	12.5		12.8		15.0	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	140	Jan 16	219	Feb 15	612	Nov 18 1979
LOWEST DAILY MEAN	.20	Feb 21	.14	Jan 12	.01	Jan 23 1977
ANNUAL SEVEN-DAY MINIMUM	.22	Feb 19	.17	Jan 7	.01	Jan 22 1977
ANNUAL RUNOFF (AC-FT)	9050		9240		10870	
10 PERCENT EXCEEDS	33		31		41	
50 PERCENT EXCEEDS	4.8		5.5		4.6	
90 PERCENT EXCEEDS	.68		.54		.51	



16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 mi north of Kamuela.

PERIOD OF RECORD.--January 1964 to November 1979, October 1980 to current year.

REVISED RECORDS.--WDR HI-95-1: 1980-81.

GAGE.--Water-stage recorders and concrete control. Elevation of gage is 4,020 ft (from topographic map).

REMARKS.--Records computed by Gary Sanchez. Records fair except for estimated daily discharges which are poor. Ditch diverts water from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Rain gage located at station monitoring total rainfall between service dates.

AVERAGE DISCHARGE.-- 37 years (water years 1965-79; 1982-2001), 7.38 ft^3/s (5,340 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft^3/s, November 2, 1967; minimum daily discharge, no flow, July 8-9, 14-16, 1992, August 4-6, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 13 ft^3/s, for several days in October, November, February, July, and August; minimum daily discharge, 0.25 ft^3/s, Jan. 12-13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	e3.1	2.2	.58	3.4	.72	1.5	9.0	1.6	1.9	e12	7.7
2	.86	e13	1.7	.52	2.2	.64	3.8	7.2	7.4	1.4	e11	9.8
3	.70	e12	1.3	.51	1.7	2.0	7.4	6.1	6.0	1.1	e10	8.5
4	1.9	e11	1.1	.47	10	5.1	6.7	5.9	7.1	.84	13	11
5	7.1	e7.0	.92	.43	7.4	4.8	7.0	6.3	10	.67	11	9.0
6	4.3	4.9	.84	.39	3.7	2.5	3.2	8.9	6.8	.57	8.4	9.9
7	11	5.9	.89	.36	2.1	2.5	2.2	5.4	4.6	1.7	12	8.4
8	9.9	8.6	6.8	.33	1.3	9.9	2.1	5.1	4.2	9.7	10	3.6
9	8.9	7.3	5.7	.30	.98	5.7	3.0	6.5	4.6	4.5	13	2.2
10	9.6	9.0	3.4	.28	.76	5.0	8.4	6.3	9.7	3.4	13	2.5
11	13	5.1	2.0	.28	.62	7.9	11	10	9.9	3.5	12	1.9
12	12	3.0	1.7	.25	.90	10	11	7.0	6.5	9.4	9.9	1.4
13	9.9	4.2	3.4	.25	2.0	11	8.4	11	3.9	6.9	9.1	1.2
14	13	12	9.4	.39	13	11	11	10	e6.0	7.1	5.3	1.7
15	12	11	4.7	.62	13	8.9	9.3	11	e8.0	7.0	7.2	1.3
16	13	12	4.1	.46	12	9.9	11	9.8	9.6	6.8	13	1.0
17	9.7	12	2.4	.36	10	9.1	10	11	9.1	10	9.8	.85
18	5.3	9.7	1.9	.31	8.7	8.0	11	8.6	8.5	9.8	13	2.9
19	3.1	9.0	1.4	.28	7.4	5.9	10	4.5	6.8	13	13	12
20	2.4	11	7.5	2.1	6.4	9.8	10	2.8	3.3	13	12	9.9
21	4.6	11	9.5	1.8	6.3	5.4	11	2.3	3.1	12	13	5.0
22	12	11	7.2	1.0	3.3	3.1	11	2.2	6.0	12	13	8.4
23	13	7.7	7.8	.74	2.3	2.2	11	1.9	9.9	11	10	12
24	12	7.7	3.3	.56	1.6	1.7	10	1.4	6.1	11	8.7	11
25	8.0	9.3	2.1	.45	1.2	1.2	8.6	1.2	9.9	e6.0	9.7	7.5
26	7.8	6.0	1.6	.36	.91	.96	8.8	1.0	7.2	e5.0	8.6	9.9
27	8.8	3.4	1.2	.46	.78	.76	11	1.1	7.5	e4.0	9.6	11
28	5.0	4.3	.98	8.4	.74	4.4	10	1.5	7.6	e9.0	4.2	5.9
29	5.1	7.6	.84	5.3	---	6.3	8.9	1.8	4.0	e11	6.1	4.0
30	3.1	3.4	.73	2.9	---	3.9	11	1.6	2.7	e10	10	10
31	e3.1	---	.64	2.4	---	2.1	---	1.0	---	e12	5.9	---
TOTAL	231.16	242.2	99.24	33.84	124.69	162.38	249.3	169.4	197.6	215.28	316.5	191.45
MEAN	7.46	8.07	3.20	1.09	4.45	5.24	8.31	5.46	6.59	6.94	10.2	6.38
MAX	13	13	9.5	8.4	13	11	11	11	10	13	13	12
MIN	.70	3.0	.64	.25	.62	.64	1.5	1.0	1.6	.57	4.2	.85
AC-FT	459	480	197	67	247	322	494	336	392	427	628	380

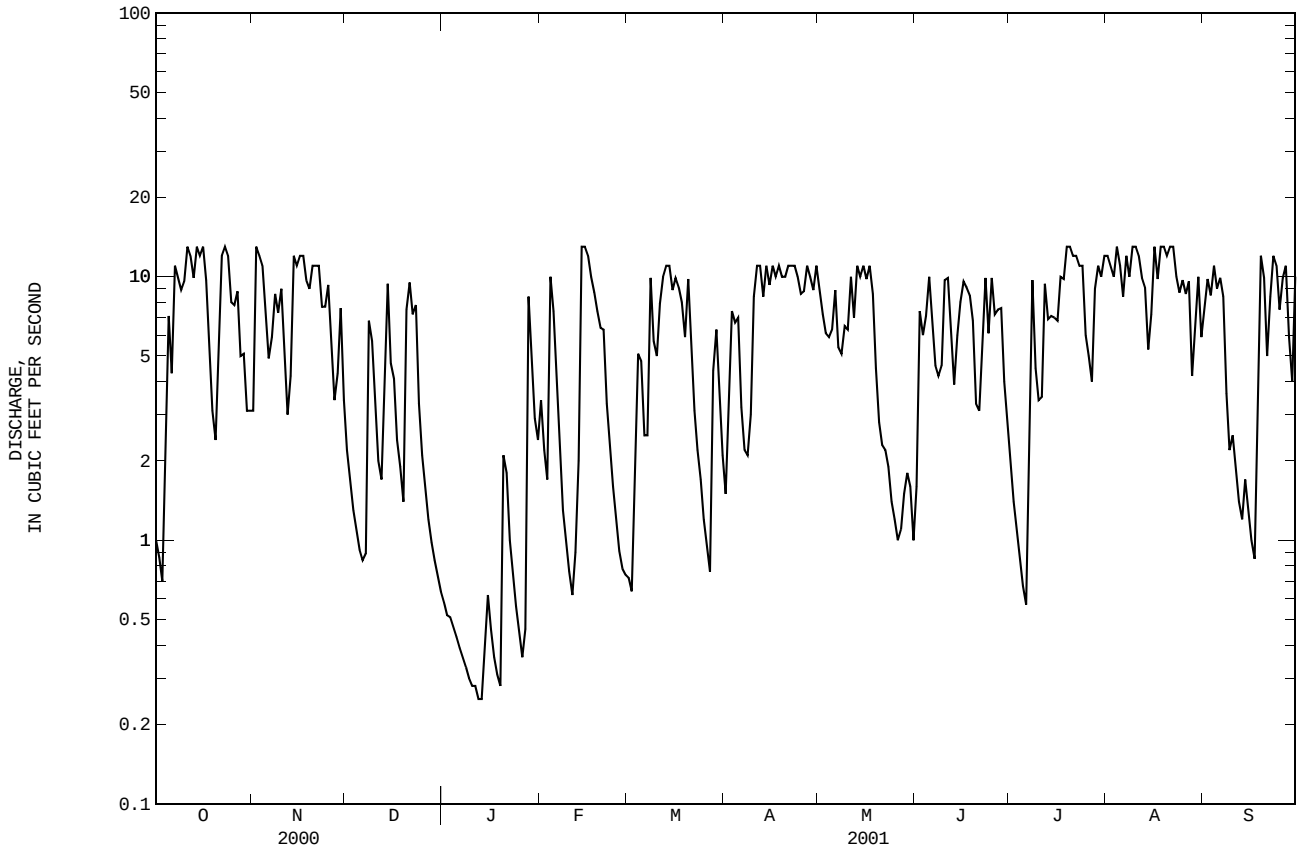
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2001, BY WATER YEAR (WY)

MEAN	5.74	7.78	6.68	5.70	5.33	7.85	9.22	7.20	8.47	10.3	8.45	5.77
MAX	14.0	21.0	17.5	11.9	17.1	16.0	22.1	16.2	16.5	20.5	18.7	13.4
(WY)	1965	1968	1971	1967	1969	1973	1970	1970	1966	1967	1966	1964
MIN	.14	1.85	.77	.53	.77	1.69	2.23	1.42	3.30	2.67	2.66	.19
(WY)	1985	1996	1981	1981	1995	1974	1992	1999	1984	1984	1973	1965

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1964 - 2001	
ANNUAL TOTAL	2289.20		2233.04			
ANNUAL MEAN	6.25		6.12		7.38	
HIGHEST ANNUAL MEAN					11.3	1970
LOWEST ANNUAL MEAN					3.78	1984
HIGHEST DAILY MEAN	13	Jan 15	13	Oct 11	49	Nov 2 1967
LOWEST DAILY MEAN	.28	Feb 20	.25	Jan 12	.00	Jul 8 1992
ANNUAL SEVEN-DAY MINIMUM	.29	Feb 18	.29	Jan 7	.04	Dec 29 1980
ANNUAL RUNOFF (AC-FT)	4540		4430		5340	
10 PERCENT EXCEEDS	12		11		16	
50 PERCENT EXCEEDS	5.8		6.1		5.3	
90 PERCENT EXCEEDS	.90		.82		.71	

e Estimated



16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155°40'25", Hydrologic Unit 20010000, on right bank 25 ft upstream from Upper Hamakua ditch intake, and 3.5 mi north of Kamuela.

DRAINAGE AREA.--0.87 mi^2.

PERIOD OF RECORD.--January 1964 to current year.

REVISED RECORDS.--WDR HI-94-1: 1964-90, 1964-90 (P).

GAGE.--Water-stage recorders. Elevation of gage is 3,900 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records fair except for estimated daily discharges which are poor. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area.

AVERAGE DISCHARGE.--37 years (water years 1965-2001), 7.90 ft^3/s (5,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,430 ft^3/s (revised), January 11, 1967, gage height 8.65 ft, from rating curve extended above 28 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 8.65 ft; maximum gage height, 12.80 ft, November 18, 1979; minimum, 0.03 ft^3/s on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 2	1300	*235	*5.07	Feb. 14	0715	231	5.04

Minimum discharge, 0.40 ft^3/s, Jan 13-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.90	e1.8	1.0	.56	1.3	e.60	.74	5.7	.99	e1.7	48	7.0
2	e.80	e40	.81	.54	.96	e.55	1.2	3.7	2.9	e1.5	25	7.0
3	e.70	e14	.71	.54	.95	e1.0	3.5	2.6	2.6	e1.2	46	8.8
4	e2.0	e12	.64	.54	11	e3.0	2.3	2.5	21	.96	19	15
5	e5.0	e4.0	.58	.54	3.3	e2.5	2.9	4.1	15	.90	9.9	6.3
6	e4.5	e2.5	.58	.51	1.5	e1.5	1.2	7.2	4.1	.86	4.1	12
7	e15	e4.5	.64	.50	.99	e1.5	.83	2.7	3.0	1.7	12	5.8
8	e11	e5.5	3.3	.50	.83	e12	.72	2.4	2.9	10	14	2.2
9	e14	e6.5	2.9	.47	.71	e3.5	.69	2.5	3.0	2.8	51	1.8
10	e10	e7.0	1.3	.45	.62	e3.0	20	2.9	12	2.6	46	2.1
11	e30	e2.5	.89	.43	.56	e6.0	31	12	12	2.1	28	1.8
12	e18	e1.5	.80	.43	.54	e25	15	3.9	2.9	5.1	5.1	1.5
13	e9.0	e3.0	1.1	.43	e1.0	e40	4.4	19	2.0	4.5	4.4	1.4
14	e50	e35	4.3	.54	e130	e10	8.8	12	4.5	5.7	2.6	1.6
15	e40	e11	2.3	.58	e150	e4.0	6.5	26	5.4	5.4	18	1.4
16	e45	e25	2.1	.50	e70	7.1	18	7.3	10	4.3	24	1.3
17	e10	e70	1.1	.47	e10	7.0	10	15	7.1	11	6.2	1.2
18	e4.0	e9.0	.90	.47	e7.5	6.2	17	6.7	5.5	21	47	1.5
19	e2.0	e7.0	.79	.47	e5.5	3.2	10	2.4	3.9	44	45	19
20	e1.7	e11	12	1.1	e4.5	9.1	15	1.7	2.0	13	28	11
21	e7.0	e12	7.0	1.0	e4.0	3.0	23	1.5	1.8	7.5	29	2.6
22	e25	15	3.6	.80	e2.0	1.4	24	1.6	13	14	30	4.6
23	e45	4.4	3.5	.67	e1.0	.91	18	1.4	e18	7.1	7.4	35
24	e18	3.6	1.9	.58	e.90	.76	12	1.2	e7.0	7.8	4.1	19
25	e6.0	5.1	1.0	.53	e.80	.65	5.2	1.2	e10	3.4	5.8	4.7
26	e8.0	2.8	.89	.49	e.70	.56	8.3	1.1	e5.0	2.9	12	19
27	e7.0	1.6	.79	.52	e.65	.51	35	1.0	e4.5	2.7	7.5	23
28	e3.0	1.7	.70	3.5	e.60	1.6	13	1.1	e5.5	7.8	2.4	3.4
29	e2.5	3.9	.65	1.9	---	2.7	18	1.1	e3.0	26	4.4	2.4
30	e2.0	1.7	.63	1.1	---	1.9	17	1.1	e2.0	17	5.8	6.6
31	e1.9	---	.59	.99	---	.95	---	.97	---	53	2.8	---
TOTAL	399.00	324.6	59.99	22.65	412.41	161.69	343.28	155.57	192.59	289.52	594.5	230.0
MEAN	12.9	10.8	1.94	.73	14.7	5.22	11.4	5.02	6.42	9.34	19.2	7.67
MAX	50	70	12	3.5	150	40	35	26	21	53	51	35
MIN	.70	1.5	.58	.43	.54	.51	.69	.97	.99	.86	2.4	1.2
AC-FT	791	644	119	45	818	321	681	309	382	574	1180	456

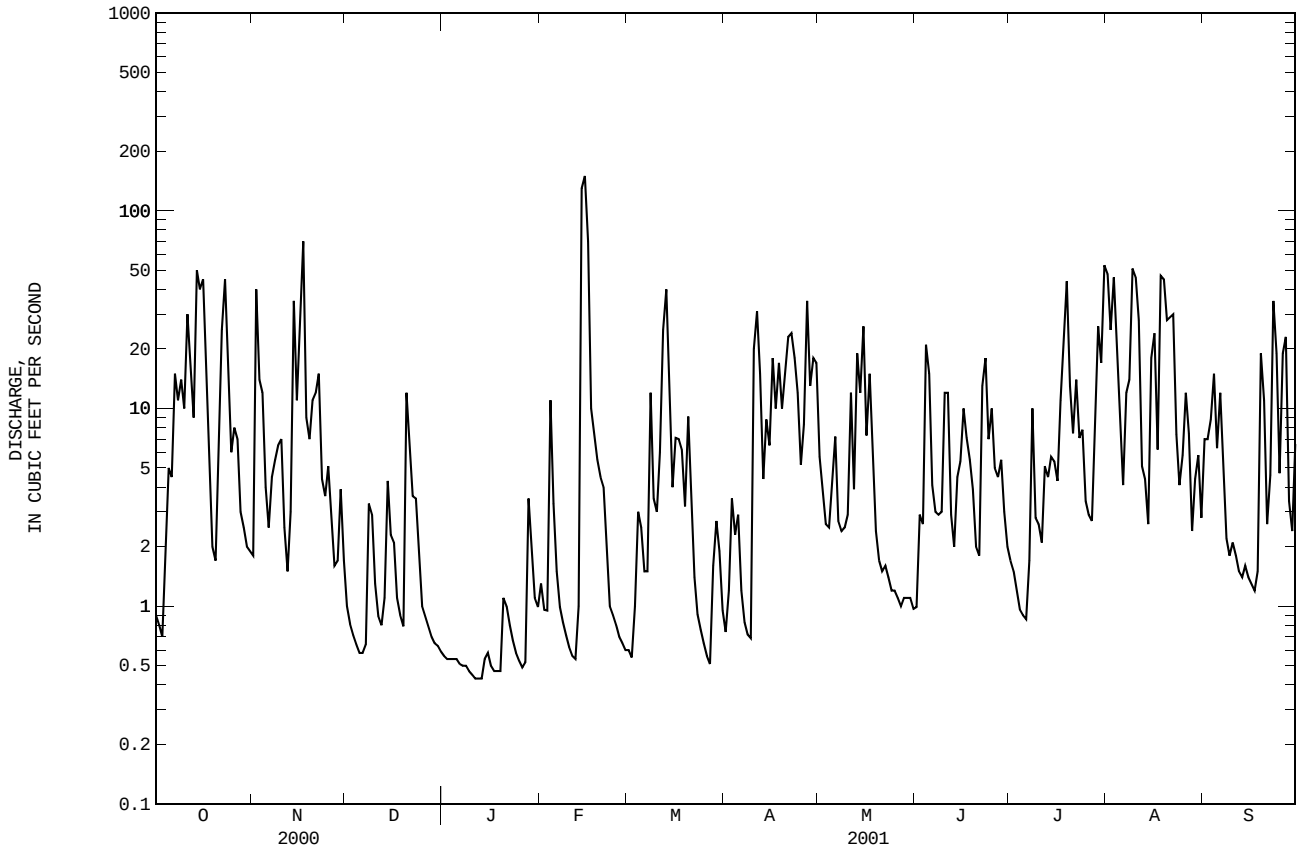
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2001, BY WATER YEAR (WY)

MEAN	5.16	8.38	7.23	7.57	6.05	10.1	11.7	6.91	7.88	10.2	8.61	5.08
MAX	14.7	26.5	16.7	26.4	18.6	37.9	31.6	20.5	22.6	18.7	19.2	17.8
(WY)	1999	1980	1971	1979	1969	1980	1986	1998	1998	1978	2001	1992
MIN	.31	1.07	.54	.46	.40	1.27	.82	.78	2.04	2.38	1.72	.087
(WY)	1985	1969	1981	1981	1993	1983	1992	1999	1985	1981	1971	1965

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1964 - 2001	
ANNUAL TOTAL	2853.42		3185.80			
ANNUAL MEAN	7.80		8.73		7.90	
HIGHEST ANNUAL MEAN					13.4	1994
LOWEST ANNUAL MEAN					3.39	1981
HIGHEST DAILY MEAN	87	Jan 16	150	Feb 15	338	Nov 18 1979
LOWEST DAILY MEAN	.58	Dec 5	.43	Jan 11	.03	May 22 1965
ANNUAL SEVEN-DAY MINIMUM	.71	Dec 1	.46	Jan 7	.04	Sep 22 1965
ANNUAL RUNOFF (AC-FT)	5660		6320		5720	
10 PERCENT EXCEEDS	20		23		20	
50 PERCENT EXCEEDS	3.1		3.4		3.2	
90 PERCENT EXCEEDS	1.0		.64		.59	

e Estimated



16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03'31", long 155°37'40", Hydrologic Unit 20010000, on left bank 500 ft upstream from diversion intake leading to Waimea Reservoir and 3.7 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1974 to September 1983, September 1992 to September 1994 (discharge measurements only). October 1994 to current year.

REVISED RECORDS.--WDR HI-94-1: 1981.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records good. Records for October 1984 to September 1990, published in WDR: HI-84-1 to HI-90-1 are unreliable and should not be used. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--16 years (water years 1975-83, 1995-2001), 9.79 ft^3/s (7,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s, April 6, 1977; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 40 ft^3/s, Feb. 15; minimum daily discharge, 0.66 ft^3/s, Jan. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

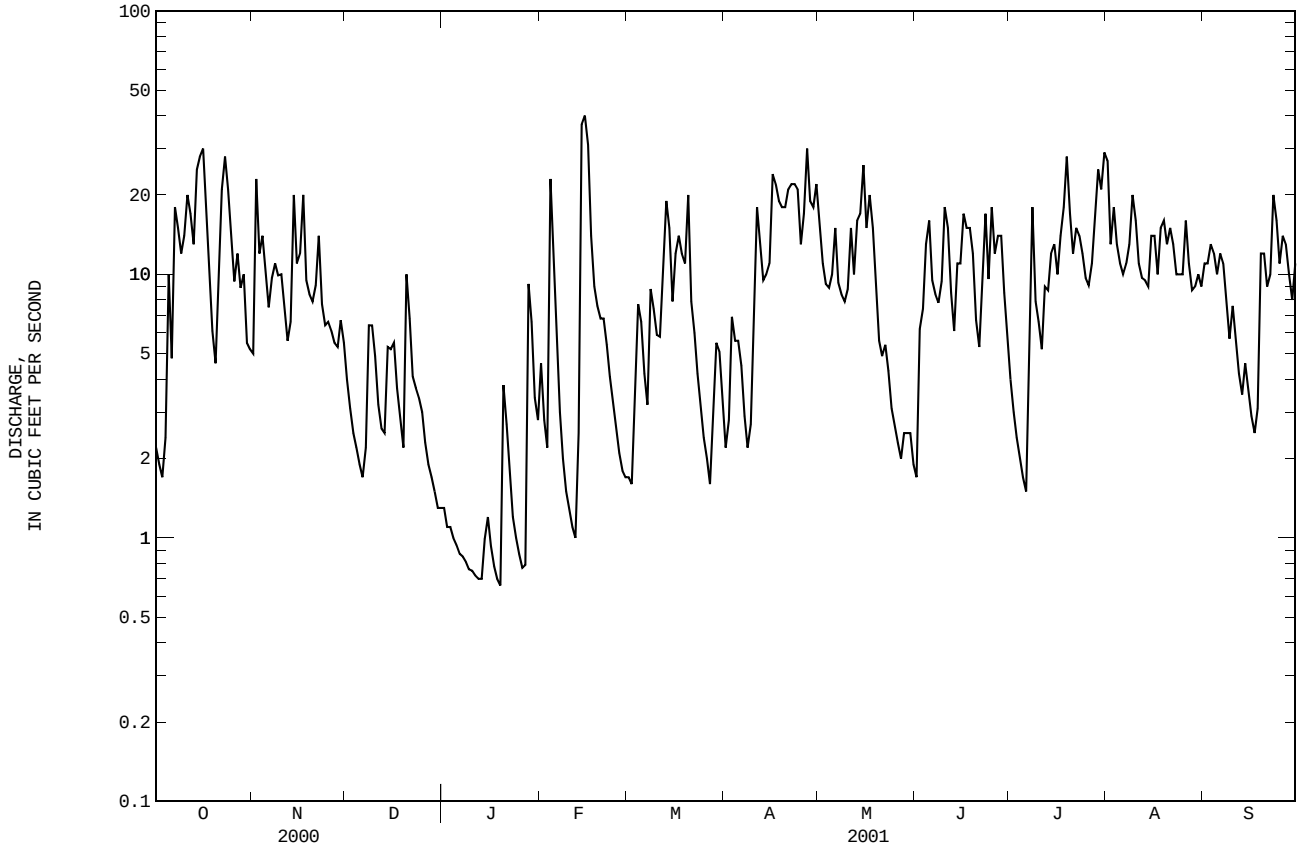
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	5.0	4.0	1.3	4.6	1.7	2.2	15	1.7	4.0	27	11
2	1.9	23	3.1	1.1	2.8	1.6	2.8	11	6.2	3.0	13	11
3	1.7	12	2.5	1.1	2.2	3.6	6.9	9.2	7.4	2.4	18	13
4	2.4	14	2.2	1.0	23	7.7	5.6	8.9	13	2.0	13	12
5	10	9.9	1.9	.94	12	6.6	5.6	10	16	1.7	11	10
6	4.8	7.5	1.7	.87	5.5	4.2	4.5	15	9.5	1.5	10	12
7	18	9.7	2.2	.85	3.0	3.2	2.9	9.3	8.4	5.8	11	11
8	15	11	6.4	.81	2.0	8.8	2.2	8.4	7.8	18	13	7.9
9	12	9.9	6.4	.76	1.5	7.4	2.7	7.9	9.4	7.9	20	5.7
10	14	10	4.9	.75	1.3	5.9	7.2	8.8	18	6.6	16	7.6
11	20	7.7	3.2	.72	1.1	5.8	18	15	15	5.2	11	5.7
12	17	5.6	2.6	.70	1.0	10	13	10	8.5	9.0	9.7	4.2
13	13	6.6	2.5	.70	2.5	19	9.5	16	6.1	8.7	9.5	3.5
14	25	20	5.3	.99	37	15	10	17	11	12	9.0	4.6
15	28	11	5.2	1.2	40	7.9	11	26	11	13	14	3.6
16	30	12	5.5	.93	31	12	24	15	17	10	14	2.9
17	19	20	3.7	.78	14	14	22	20	15	14	10	2.5
18	10	9.5	2.8	.70	9.0	12	19	15	15	18	15	3.1
19	6.1	8.4	2.2	.66	7.6	11	18	9.1	12	28	16	12
20	4.6	7.9	10	3.8	6.8	20	18	5.6	6.7	17	13	12
21	10	9.1	6.8	2.7	6.8	7.9	21	4.9	5.3	12	15	9.0
22	21	14	4.1	1.7	5.4	6.0	22	5.4	10	15	13	10
23	28	7.7	3.7	1.2	4.1	4.2	22	4.3	17	14	10	20
24	21	6.4	3.4	1.0	3.3	3.1	21	3.1	9.6	12	10	16
25	14	6.6	3.0	.87	2.6	2.4	13	2.7	18	9.7	10	11
26	9.4	6.1	2.3	.77	2.1	2.0	17	2.3	12	9.1	16	14
27	12	5.5	1.9	.79	1.8	1.6	30	2.0	14	11	11	13
28	8.9	5.3	1.7	9.2	1.7	2.8	19	2.5	14	16	8.7	10
29	10	6.7	1.5	6.6	---	5.5	18	2.5	8.5	25	9.0	8.0
30	5.5	5.5	1.3	3.4	---	5.1	22	2.5	5.8	21	10	11
31	5.2	---	1.3	2.8	---	3.2	---	1.9	---	29	9.0	---
TOTAL	399.7	293.6	109.3	51.69	235.7	221.2	410.1	286.3	328.9	361.6	394.9	277.3
MEAN	12.9	9.79	3.53	1.67	8.42	7.14	13.7	9.24	11.0	11.7	12.7	9.24
MAX	30	23	10	9.2	40	20	30	26	18	29	27	20
MIN	1.7	5.0	1.3	.66	1.0	1.6	2.2	1.9	1.7	1.5	8.7	2.5
AC-FT	793	582	217	103	468	439	813	568	652	717	783	550

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2001, BY WATER YEAR (WY)

MEAN	8.01	10.6	7.89	5.77	5.97	11.3	13.6	10.4	10.0	13.6	11.6	8.59
MAX	17.3	17.4	12.6	13.4	15.1	19.7	26.0	23.9	26.3	26.0	19.6	16.9
(WY)	1999	1977	1979	2000	1999	1982	1998	1998	1998	1978	1978	1982
MIN	1.18	2.82	.79	.31	.63	3.61	2.76	2.05	3.03	2.84	2.23	2.95
(WY)	1975	1996	1981	1981	1995	1995	1981	1999	1981	1981	1979	1981

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1975 - 2001	
ANNUAL TOTAL	3401.92		3370.29			
ANNUAL MEAN	9.29		9.23		9.79	
HIGHEST ANNUAL MEAN					15.0	1998
LOWEST ANNUAL MEAN					3.80	1981
HIGHEST DAILY MEAN	30	Oct 16	40	Feb 15	48	Apr 6 1977
LOWEST DAILY MEAN	.38	May 2	.66	Jan 19	.00	Oct 1 1974
ANNUAL SEVEN-DAY MINIMUM	1.1	Mar 15	.76	Jan 7	.00	Oct 1 1974
ANNUAL RUNOFF (AC-FT)	6750		6680		7090	
10 PERCENT EXCEEDS	19		18		23	
50 PERCENT EXCEEDS	7.7		8.5		6.8	
90 PERCENT EXCEEDS	1.6		1.7		.70	



16756100 KOHAKOHAU STREAM ABOVE DWS INTAKE, NEAR KAMUELA

LOCATION.--Lat 20°02'58", long 155°41'05", Hydrologic Unit 20010000, on right bank 200 ft upstream of Department of Water Supply dam and intake, 0.85 mi west of Puu Ohu, and 1.85 mi northwest of junction of Highways 19 and 190.

DRAINAGE AREA.--2.40 mi^2.

PERIOD OF RECORD.--June 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,470 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records fair except for estimated daily discharges which are poor. Two Parker Ranch 4-in. pipelines divert water upstream at 4,250 ft and below. Hawaii Department of Water Supply diverts water at dam 200 ft downstream for domestic use in the Kamuela and Kawaihae areas since August 20, 1973.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 967 ft^3/s, November 2, 2000, gage height, 6.11 ft from rating curve developed using flow-over-dam computations and high water marks at gage; minimum, 0.22 ft^3/s, March 15-17, 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 2	1315	*967	*6.11	Feb 14	0730	631	5.47
Nov 17	0315	401	4.88	Aug 1	1845	731	5.68

Minimum discharge, 0.30 ft^3/s, Jan. 17-20, 25-27, Feb. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.45	1.2	1.4	.39	.45	.68	.51	6.9	.49	1.1	103	6.1
2	.38	103	1.2	.40	.39	.56	.58	3.8	.67	.94	28	6.4
3	.32	38	1.1	.43	.36	.80	1.7	2.6	.74	.78	60	3.8
4	.82	25	1.0	.39	3.7	1.7	1.0	2.3	5.8	.65	25	8.4
5	3.4	5.6	.93	.36	1.7	1.3	1.0	2.2	10	.57	12	6.2
6	1.1	3.4	.86	.34	.78	.81	.67	3.6	2.8	.47	4.9	9.7
7	5.5	2.9	.84	.32	.51	.64	.48	2.3	1.9	1.8	10	6.8
8	3.9	3.8	1.7	.32	.41	2.6	.38	1.8	1.8	8.7	11	3.2
9	2.9	3.5	1.6	.31	.38	1.7	.33	1.5	2.3	2.2	56	2.4
10	3.4	4.5	1.2	.31	.35	1.0	13	1.5	7.8	1.9	57	2.2
11	34	2.8	.89	.31	.32	.87	40	6.4	8.6	1.3	35	1.9
12	16	2.1	.81	.31	.31	6.4	18	3.2	3.1	2.5	6.9	1.5
13	5.5	3.2	.80	.31	.34	42	5.0	8.8	1.7	2.3	4.4	1.4
14	60	28	1.3	.34	196	15	5.8	12	1.5	3.4	2.8	1.3
15	44	11	1.1	.37	284	6.9	5.7	22	2.0	4.3	11	1.2
16	61	18	1.3	.31	107	5.4	11	8.1	5.0	3.6	26	1.1
17	11	106	.90	.31	12	6.2	9.0	12	5.7	6.7	6.9	.95
18	3.8	8.6	.68	.30	5.5	4.9	15	7.4	5.1	21	50	.90
19	2.3	7.0	.60	.30	3.6	2.6	9.9	3.2	3.9	49	78	e6.0
20	1.7	6.0	6.8	.52	2.3	5.7	10	2.0	1.8	18	29	e5.5
21	2.3	9.8	5.0	.46	2.2	2.6	21	1.5	1.4	8.0	34	e3.0
22	12	21	2.1	.37	1.5	1.8	21	1.4	4.9	7.9	32	e3.5
23	45	6.3	1.6	.34	1.2	1.4	24	1.2	11	7.0	10	e50
24	15	3.6	1.2	.32	1.0	1.1	13	1.0	4.1	6.4	6.0	e40
25	5.8	3.9	.88	.31	.91	.91	5.7	.97	9.3	3.5	5.7	e6.0
26	3.2	2.8	.70	.30	.80	.74	7.4	.87	5.3	2.4	8.6	e15
27	3.1	2.0	.61	.30	.72	.59	35	.76	3.7	2.0	7.9	e20
28	2.1	1.8	.53	.98	.69	1.4	20	.71	5.1	4.5	3.7	e4.0
29	2.0	2.2	.47	.72	---	1.6	20	.83	2.3	16	5.0	e3.0
30	1.5	1.7	.43	.44	---	1.0	24	.74	1.5	14	5.7	e4.0
31	1.4	---	.40	.39	---	.69	---	.58	---	84	3.2	---
TOTAL	354.87	438.7	40.93	11.88	629.42	121.59	340.15	124.16	121.30	286.91	738.7	225.45
MEAN	11.4	14.6	1.32	.38	22.5	3.92	11.3	4.01	4.04	9.26	23.8	7.51
MAX	61	106	6.8	.98	284	42	40	22	11	84	103	50
MIN	.32	1.2	.40	.30	.31	.56	.33	.58	.49	.47	2.8	.90
AC-FT	704	870	81	24	1250	241	675	246	241	569	1470	447

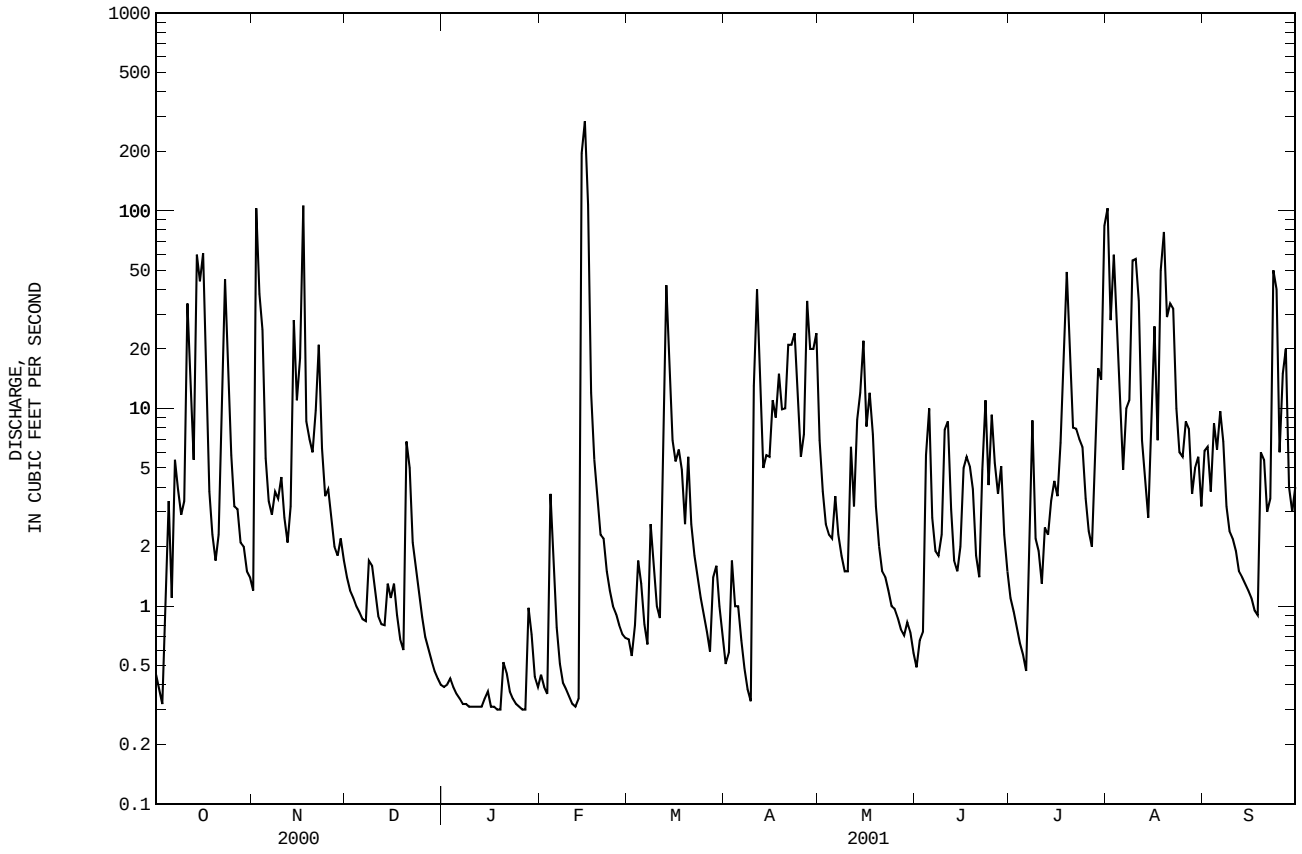
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2001, BY WATER YEAR (WY)

MEAN	13.1	18.2	9.75	12.4	15.7	20.4	9.71	2.94	2.78	11.8	18.2	10.5
MAX	24.6	21.5	16.8	25.4	24.5	54.8	11.9	4.31	4.04	21.1	23.8	21.7
(WY)	1999	2000	2000	2000	1999	1999	2000	2000	2001	1998	2001	1998
MIN	3.32	14.6	1.32	.38	.52	2.47	5.90	.50	2.01	6.85	13.5	6.23
(WY)	2000	2001	2001	2001	2000	2000	1999	1999	1999	1999	2000	1999

16756100 KOHAKOHAU STREAM ABOVE DWS INTAKE, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1998 - 2001	
ANNUAL TOTAL	3192.25		3434.06			
ANNUAL MEAN	8.72		9.41		11.5	
HIGHEST ANNUAL MEAN					15.1	1999
LOWEST ANNUAL MEAN					9.41	2001
HIGHEST DAILY MEAN	185	Jan 16	284	Feb 15	356	Mar 21 1999
LOWEST DAILY MEAN	.22	Mar 16	.30	Jan 18	.22	Mar 16 2000
ANNUAL SEVEN-DAY MINIMUM	.23	Mar 12	.31	Jan 7	.23	Mar 12 2000
ANNUAL RUNOFF (AC-FT)	6330		6810		8320	
10 PERCENT EXCEEDS	22		21		32	
50 PERCENT EXCEEDS	2.3		2.5		3.1	
90 PERCENT EXCEEDS	.31		.40		.42	

e Estimated



HAWAII, ISLAND OF HAWAII
16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

LOCATION.--Lat 20°02'48", long 155°39'58", Hydrologic Unit 20010000, on right bank 160 ft upstream from Marine Dam, 0.4 mi east of Puu Ohu, and 1.6 mi north of Kamuela.

DRAINAGE AREA.--1.18 mi^2.

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,460 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records good. Parker Ranch diverts less than 1 ft^3/s through a 6-in. pipe upstream of gage.

AVERAGE DISCHARGE.--54 years (water years 1948-2001), 9.31 ft^3/s (6,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft^3/s, November 18, 1979, gage height, 6.84 ft, from rating curve extended above 120 ft^3/s on the basis of computations of flow over dam at gage heights 5.46 ft and 5.96 ft; minimum, 0.34 ft^3/s, June 5-6, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 2	1300	268	3.58	Aug 1	1845	*420	*4.12

Minimum discharge, 1.0 ft^3/s, Jan. 25, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

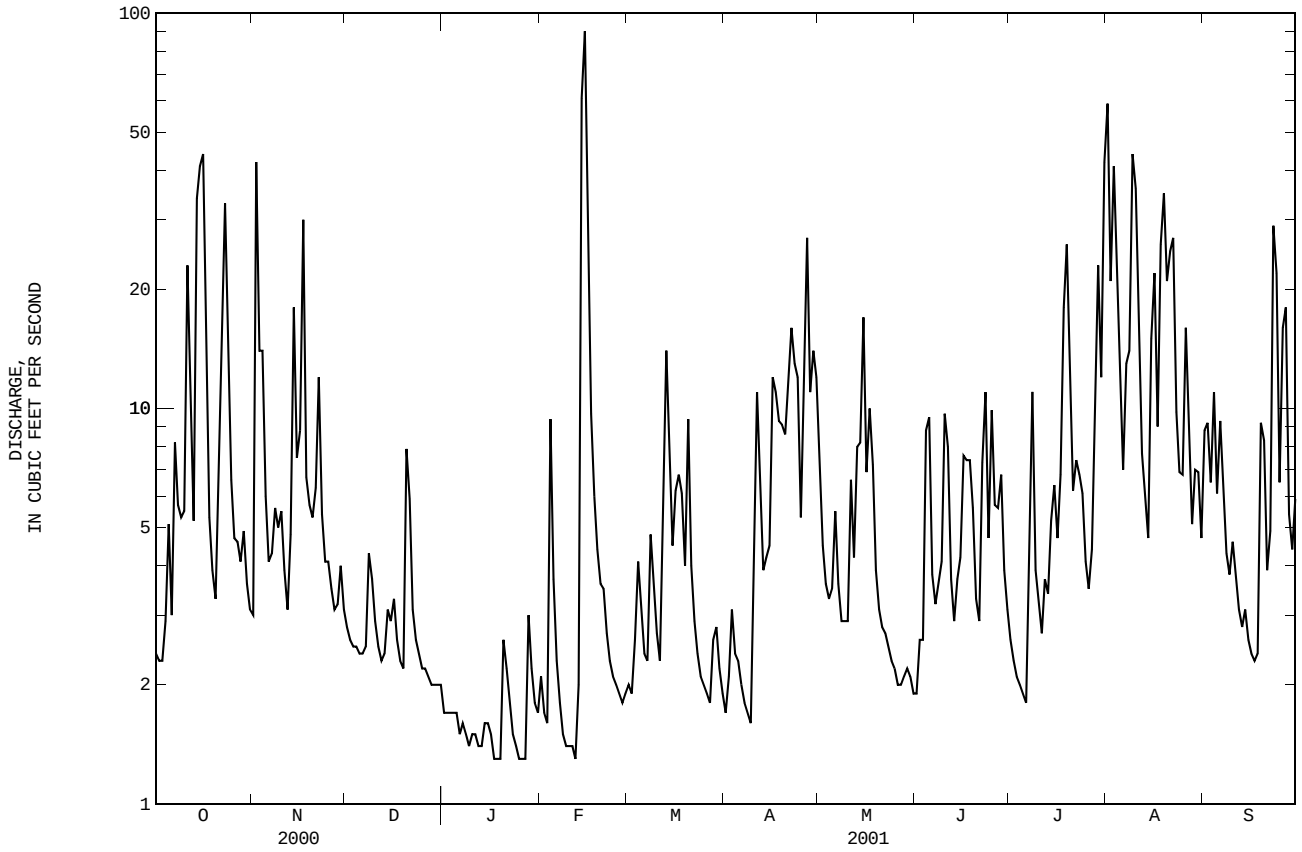
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	3.0	2.8	1.7	2.1	2.0	1.7	6.6	1.9	2.6	59	8.8
2	2.3	42	2.6	1.7	1.7	1.9	2.1	4.5	2.6	2.3	21	9.2
3	2.3	14	2.5	1.7	1.6	2.6	3.1	3.6	2.6	2.1	41	6.5
4	2.9	14	2.5	1.7	9.4	4.1	2.4	3.3	8.8	2.0	21	11
5	5.1	6.0	2.4	1.7	3.7	3.1	2.3	3.5	9.5	1.9	13	6.1
6	3.0	4.1	2.4	1.5	2.3	2.4	2.0	5.5	3.8	1.8	7.0	9.3
7	8.2	4.3	2.5	1.6	1.8	2.3	1.8	3.6	3.2	4.2	13	6.8
8	5.7	5.6	4.3	1.5	1.5	4.8	1.7	2.9	3.6	11	14	4.3
9	5.3	5.0	3.7	1.4	1.4	3.6	1.6	2.9	4.1	3.9	44	3.8
10	5.5	5.5	2.9	1.5	1.4	2.7	5.4	2.9	9.7	3.3	36	4.6
11	23	3.9	2.5	1.5	1.4	2.3	11	6.6	8.0	2.7	19	3.7
12	11	3.1	2.3	1.4	1.3	5.3	6.5	4.2	3.7	3.7	7.7	3.1
13	5.2	4.8	2.4	1.4	2.0	14	3.9	8.0	2.9	3.4	6.0	2.8
14	34	18	3.1	1.6	61	8.6	4.2	8.2	3.7	5.2	4.7	3.1
15	41	7.5	2.9	1.6	90	4.5	4.5	17	4.2	6.4	15	2.6
16	44	8.8	3.3	1.5	44	6.2	12	6.9	7.6	4.7	22	2.4
17	11	30	2.6	1.3	9.7	6.8	11	10	7.4	6.8	9.0	2.3
18	5.3	6.7	2.3	1.3	6.0	6.1	9.3	7.2	7.4	18	26	2.4
19	3.9	5.7	2.2	1.3	4.4	4.0	9.1	3.9	5.6	26	35	9.2
20	3.3	5.3	7.9	2.6	3.6	9.4	8.6	3.1	3.3	11	21	8.3
21	5.5	6.3	5.9	2.2	3.5	4.0	12	2.8	2.9	6.2	25	3.9
22	14	12	3.1	1.8	2.7	2.9	16	2.7	7.3	7.4	27	4.9
23	33	5.4	2.6	1.5	2.3	2.4	13	2.5	11	6.8	9.8	29
24	14	4.1	2.4	1.4	2.1	2.1	12	2.3	4.7	6.1	6.9	22
25	6.6	4.1	2.2	1.3	2.0	2.0	5.3	2.2	9.9	4.1	6.8	6.5
26	4.7	3.5	2.2	1.3	1.9	1.9	9.3	2.0	5.7	3.5	16	16
27	4.6	3.1	2.1	1.3	1.8	1.8	27	2.0	5.6	4.4	10	18
28	4.1	3.2	2.0	3.0	1.9	2.6	11	2.1	6.8	7.5	5.1	5.4
29	4.9	4.0	2.0	2.2	---	2.8	14	2.2	3.9	23	7.0	4.4
30	3.6	3.1	2.0	1.8	---	2.2	12	2.1	3.1	12	6.9	5.9
31	3.1	---	2.0	1.7	---	1.9	---	1.9	---	42	4.7	---
TOTAL	322.5	246.1	88.6	51.0	268.5	123.3	235.8	139.2	164.5	246.0	559.6	226.3
MEAN	10.4	8.20	2.86	1.65	9.59	3.98	7.86	4.49	5.48	7.94	18.1	7.54
MAX	44	42	7.9	3.0	90	14	27	17	11	42	59	29
MIN	2.3	3.0	2.0	1.3	1.3	1.8	1.6	1.9	1.9	1.8	4.7	2.3
AC-FT	640	488	176	101	533	245	468	276	326	488	1110	449

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 2001, BY WATER YEAR (WY)

MEAN	6.04	8.87	9.59	8.53	7.59	10.6	12.9	9.08	8.91	11.8	11.3	6.02
MAX	18.2	43.7	31.4	38.7	23.0	52.1	43.4	22.1	28.4	21.3	33.6	24.9
(WY)	1984	1980	1958	1979	1960	1980	1986	1998	1998	1950	1958	1992
MIN	.98	1.42	1.47	1.46	1.31	2.11	1.53	1.95	2.68	3.08	2.27	.91
(WY)	1997	1963	1996	1953	1954	1983	1992	1999	1962	1961	1973	1965

HAWAII, ISLAND OF HAWAII
16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1947 - 2001	
ANNUAL TOTAL	2938.2		2671.4			
ANNUAL MEAN	8.03		7.32		9.31	
HIGHEST ANNUAL MEAN					17.8	1980
LOWEST ANNUAL MEAN					4.49	1981
HIGHEST DAILY MEAN	89	Jan 16	90	Feb 15	641	Nov 18 1979
LOWEST DAILY MEAN	1.5	Mar 20	1.3	Jan 17	.37	Jun 3 1992
ANNUAL SEVEN-DAY MINIMUM	1.6	Mar 15	1.4	Jan 13	.42	May 21 1992
ANNUAL RUNOFF (AC-FT)	5830		5300		6740	
10 PERCENT EXCEEDS	19		15		21	
50 PERCENT EXCEEDS	4.1		4.0		4.3	
90 PERCENT EXCEEDS	2.1		1.8		1.8	



16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02'28", long 155°39'05", Hydrologic Unit 20010000, on left bank 800 ft downstream from small tributary, and 1.8 mi northeast of Kamuela.

DRAINAGE AREA.--0.47 mi^2.

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60. WDR HI-96-1: 1969, 1977, 1979, 1987.

GAGE.--Water-stage recorder. Concrete control since February 27, 1963. Elevation of gage is 3,117.42 ft above mean sea level (Hawaii County Department of Water Supply benchmark).

REMARKS.--Records computed by Dale Nishimoto. Records good except for discharges less than 2.0 ft^3/s, which are fair. Diversion upstream for livestock and domestic use.

AVERAGE DISCHARGE.--45 years (water years 1957-2001), 1.73 ft^3/s (1,250 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft^3/s, November 18, 1979, gage height, 4.56 ft, from rating curve extended above 11 ft^3/s on basis of slope-conveyance study; maximum gage height, 4.65 ft, October 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 78 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 2	1300	78	2.58	Aug 1	1845	*234	*3.33

Minimum discharge, 0.11 ft^3/s, Jan. 25-27, Feb. 10-13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

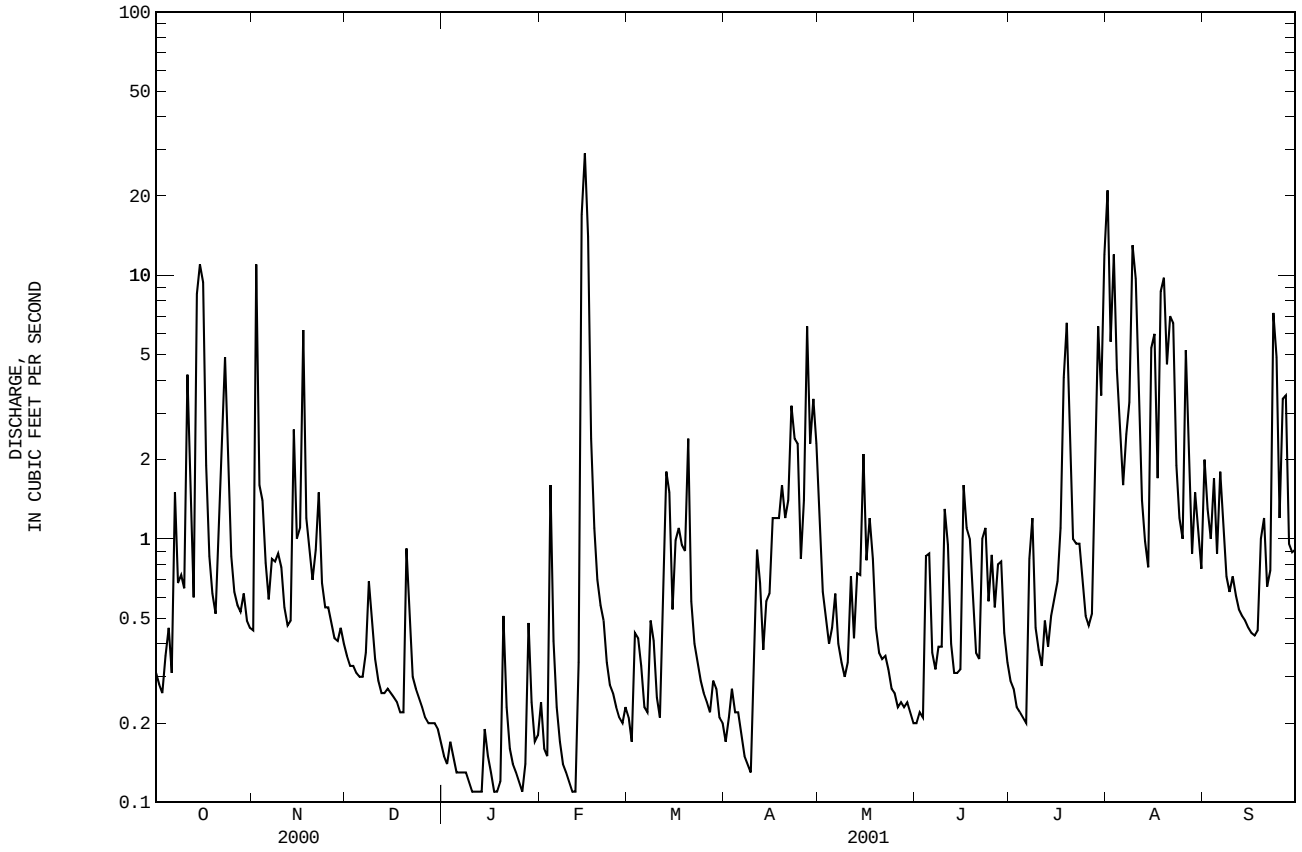
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	.45	.36	.15	.24	.21	.17	1.1	.20	.29	21	2.0
2	.28	11	.33	.14	.16	.17	.21	.63	.22	.27	5.6	1.3
3	.26	1.6	.33	.17	.15	.44	.27	.50	.21	.23	12	1.0
4	.36	1.4	.31	.15	1.6	.42	.22	.40	.86	.22	4.4	1.7
5	.46	.81	.30	.13	.41	.33	.22	.46	.88	.21	2.6	.88
6	.31	.59	.30	.13	.23	.23	.18	.62	.37	.20	1.6	1.8
7	1.5	.84	.37	.13	.17	.22	.15	.40	.32	.84	2.5	1.1
8	.68	.82	.69	.13	.14	.49	.14	.34	.39	1.2	3.3	.72
9	.73	.88	.49	.12	.13	.41	.13	.30	.39	.46	13	.63
10	.65	.78	.35	.11	.12	.25	.39	.34	1.3	.38	9.7	.72
11	4.2	.55	.29	.11	.11	.21	.91	.72	.95	.33	3.8	.61
12	1.4	.47	.26	.11	.11	.80	.68	.42	.40	.49	1.4	.54
13	.60	.49	.26	.11	.34	1.8	.38	.74	.31	.39	.98	.51
14	8.5	2.6	.27	.19	17	1.5	.58	.73	.31	.51	.78	.49
15	11	1.0	.26	.15	29	.54	.62	2.1	.32	.59	5.3	.46
16	9.4	1.1	.25	.13	14	.99	1.2	.83	1.6	.69	6.0	.44
17	1.9	6.2	.24	.11	2.4	1.1	1.2	1.2	1.1	1.1	1.7	.43
18	.86	1.2	.22	.11	1.1	.95	1.2	.84	1.0	4.1	8.7	.45
19	.62	.91	.22	.12	.70	.90	1.6	.46	.63	6.6	9.8	1.0
20	.52	.70	.92	.51	.56	2.4	1.2	.37	.37	2.0	4.6	1.2
21	.98	.91	.53	.23	.49	.58	1.4	.35	.35	1.0	7.0	.66
22	1.9	1.5	.30	.16	.34	.40	3.2	.36	1.0	.96	6.6	.76
23	4.9	.68	.27	.14	.28	.34	2.4	.32	1.1	.96	1.9	7.2
24	1.9	.55	.25	.13	.26	.29	2.3	.27	.58	.70	1.2	4.9
25	.86	.55	.23	.12	.23	.26	.84	.26	.87	.51	1.0	1.2
26	.63	.48	.21	.11	.21	.24	1.4	.23	.55	.47	5.2	3.4
27	.56	.42	.20	.14	.20	.22	6.4	.24	.80	.52	2.0	3.5
28	.53	.41	.20	.48	.23	.29	2.3	.23	.82	1.2	.88	.96
29	.62	.46	.20	.24	---	.27	3.4	.24	.44	6.4	1.5	.89
30	.49	.40	.19	.17	---	.21	2.3	.22	.34	3.5	1.1	.91
31	.46	---	.17	.18	---	.20	---	.20	---	12	.77	---
TOTAL	58.37	40.75	9.77	5.11	70.91	17.66	37.59	16.42	18.98	49.32	147.91	42.36
MEAN	1.88	1.36	.32	.16	2.53	.57	1.25	.53	.63	1.59	4.77	1.41
MAX	11	11	.92	.51	29	2.4	6.4	2.1	1.6	12	21	7.2
MIN	.26	.40	.17	.11	.11	.17	.13	.20	.20	.20	.77	.43
AC-FT	116	81	19	10	141	35	75	33	38	98	293	84

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 2001, BY WATER YEAR (WY)

MEAN	.99	1.60	1.79	1.74	1.40	2.17	2.70	1.46	1.50	2.22	2.17	.96
MAX	3.86	8.31	7.01	11.9	6.69	15.7	10.5	4.89	7.07	6.69	8.13	5.93
(WY)	1984	1980	1960	1979	1960	1980	1986	1998	1998	1958	1958	1992
MIN	.008	.000	.071	.046	.089	.10	.20	.20	.16	.15	.12	.000
(WY)	1985	1963	1996	1962	1983	1983	1981	1966	1981	1961	1965	1965

16759000 HAUANI GULCH NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1956 - 2001	
ANNUAL TOTAL	489.35		515.15			
ANNUAL MEAN	1.34		1.41		1.73	
HIGHEST ANNUAL MEAN					3.66	1998
LOWEST ANNUAL MEAN					.48	1981
HIGHEST DAILY MEAN	23	Jan 16	29	Feb 15	108	Mar 24 1980
LOWEST DAILY MEAN	.16	Mar 21	.11	Jan 10	.00	Jul 29 1961
ANNUAL SEVEN-DAY MINIMUM	.19	Mar 16	.12	Jan 7	.00	Sep 8 1961
ANNUAL RUNOFF (AC-FT)	971		1020		1250	
10 PERCENT EXCEEDS	3.2		3.3		3.9	
50 PERCENT EXCEEDS	.60		.51		.53	
90 PERCENT EXCEEDS	.28		.17		.09	



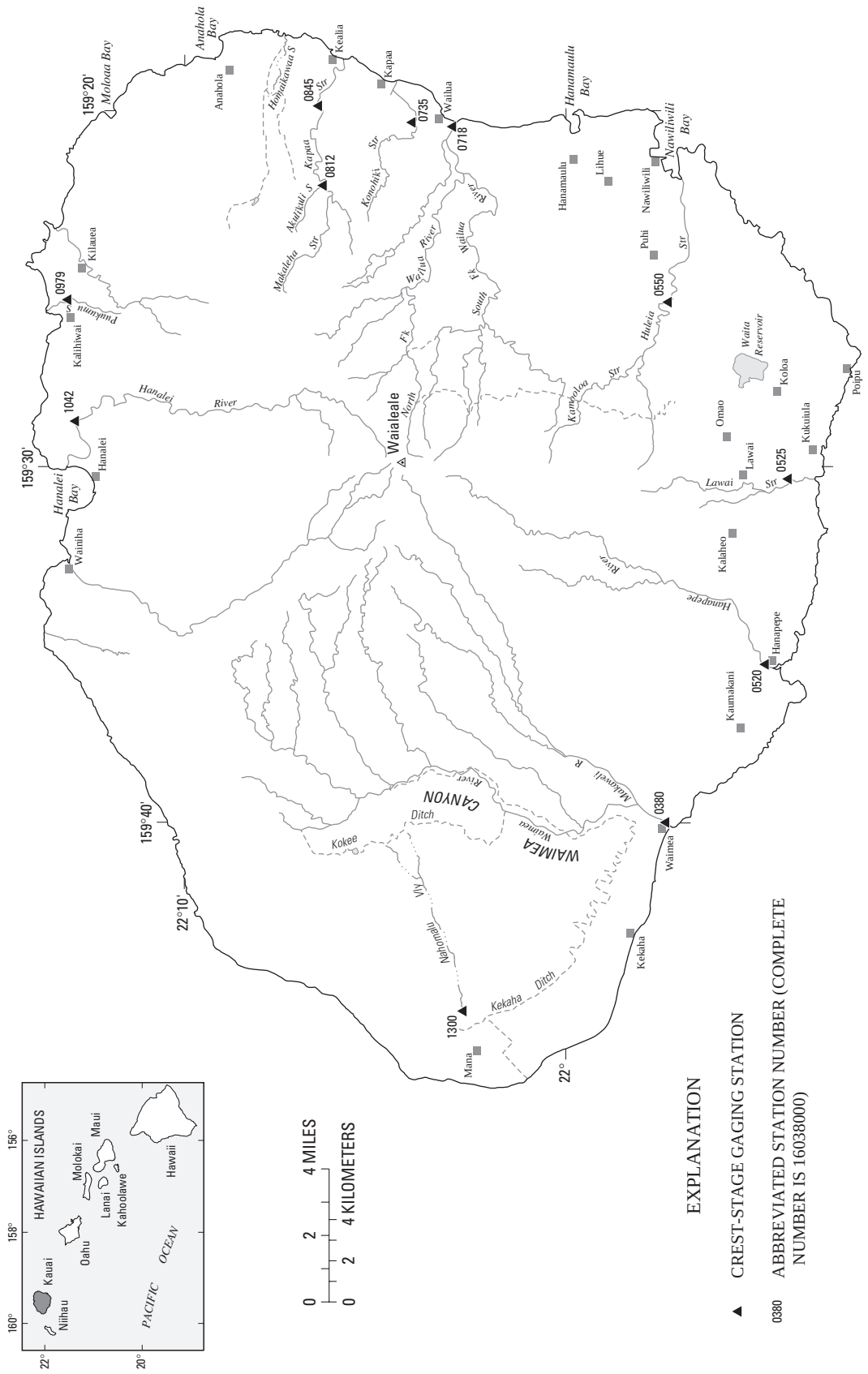


Figure 10. Locations of crest-stage gaging stations on Kauai.

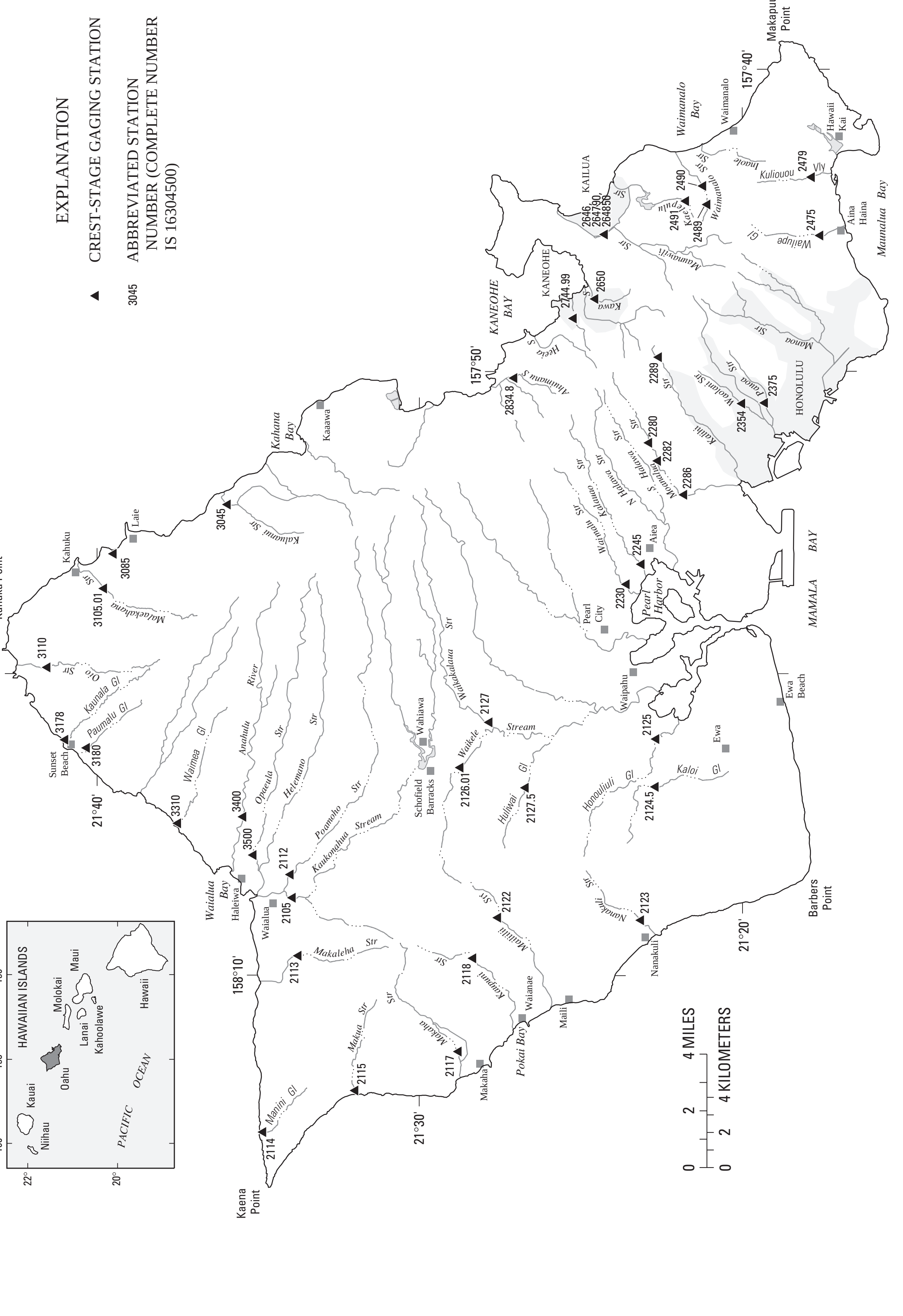


Figure 11. Locations of crest-stage gaging stations on Oahu.

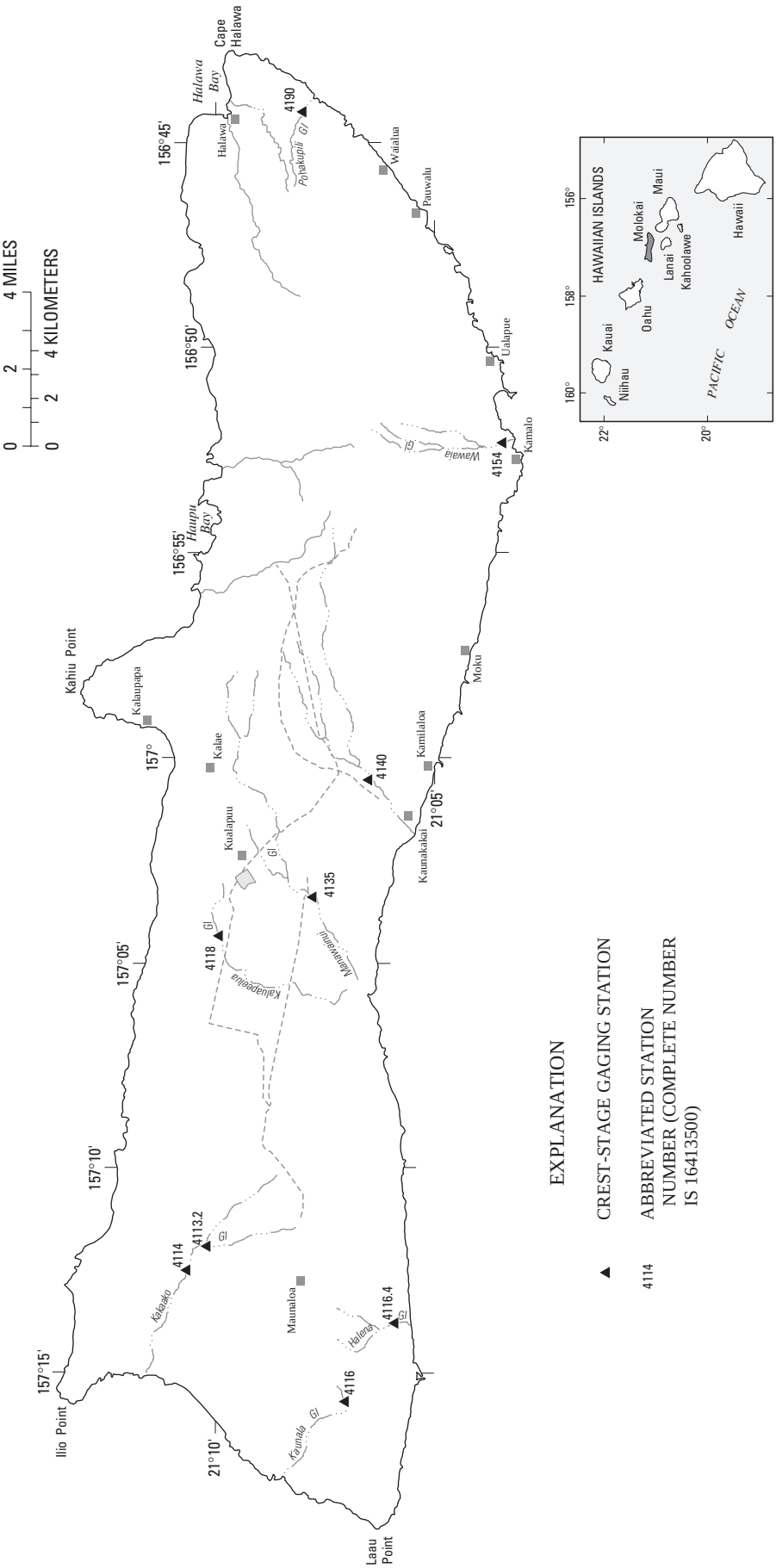


Figure 12. Locations of crest-stage gaging stations on Molokai.

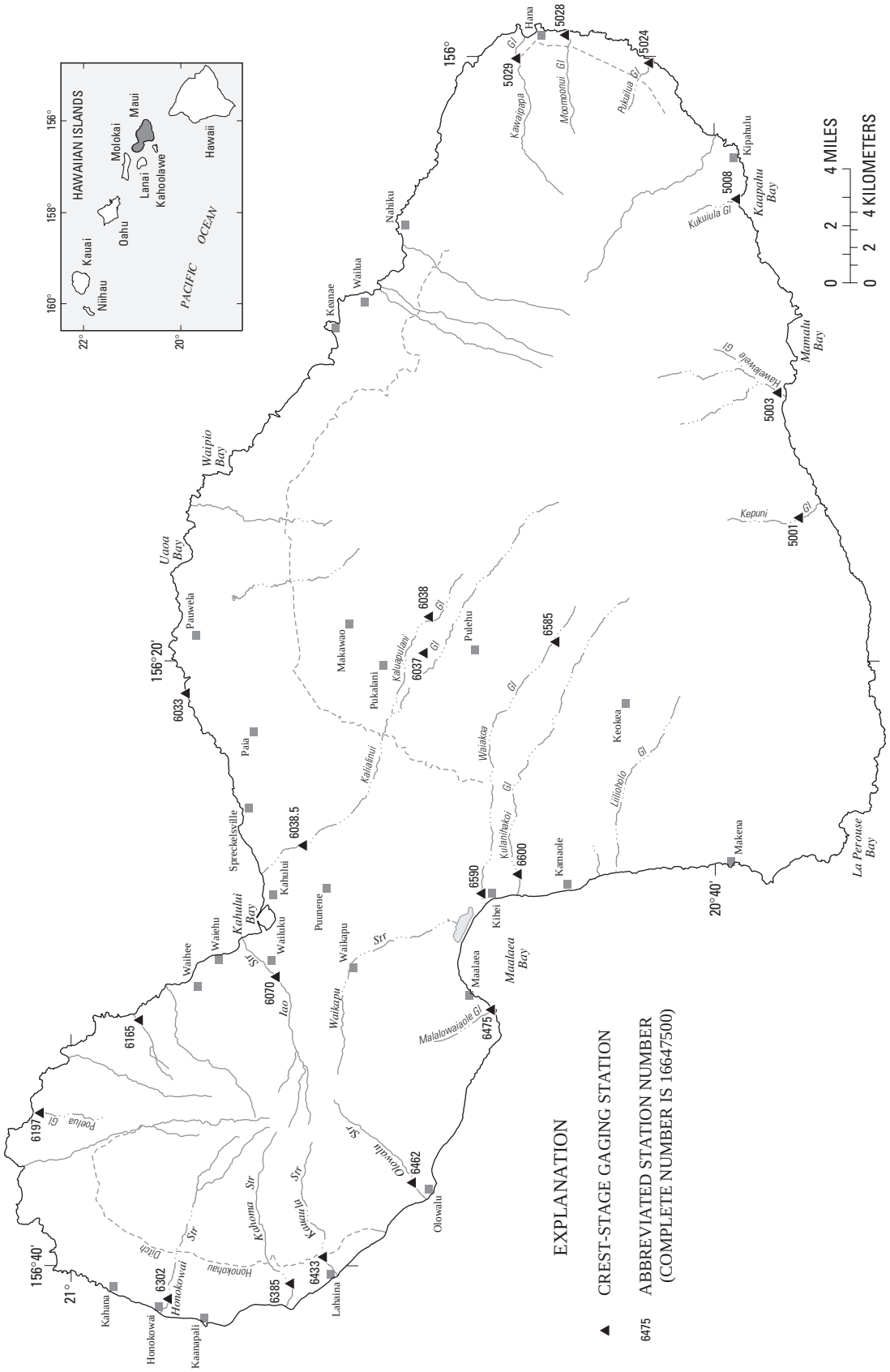


Figure 13. Locations of crest-stage gaging stations on Maui.

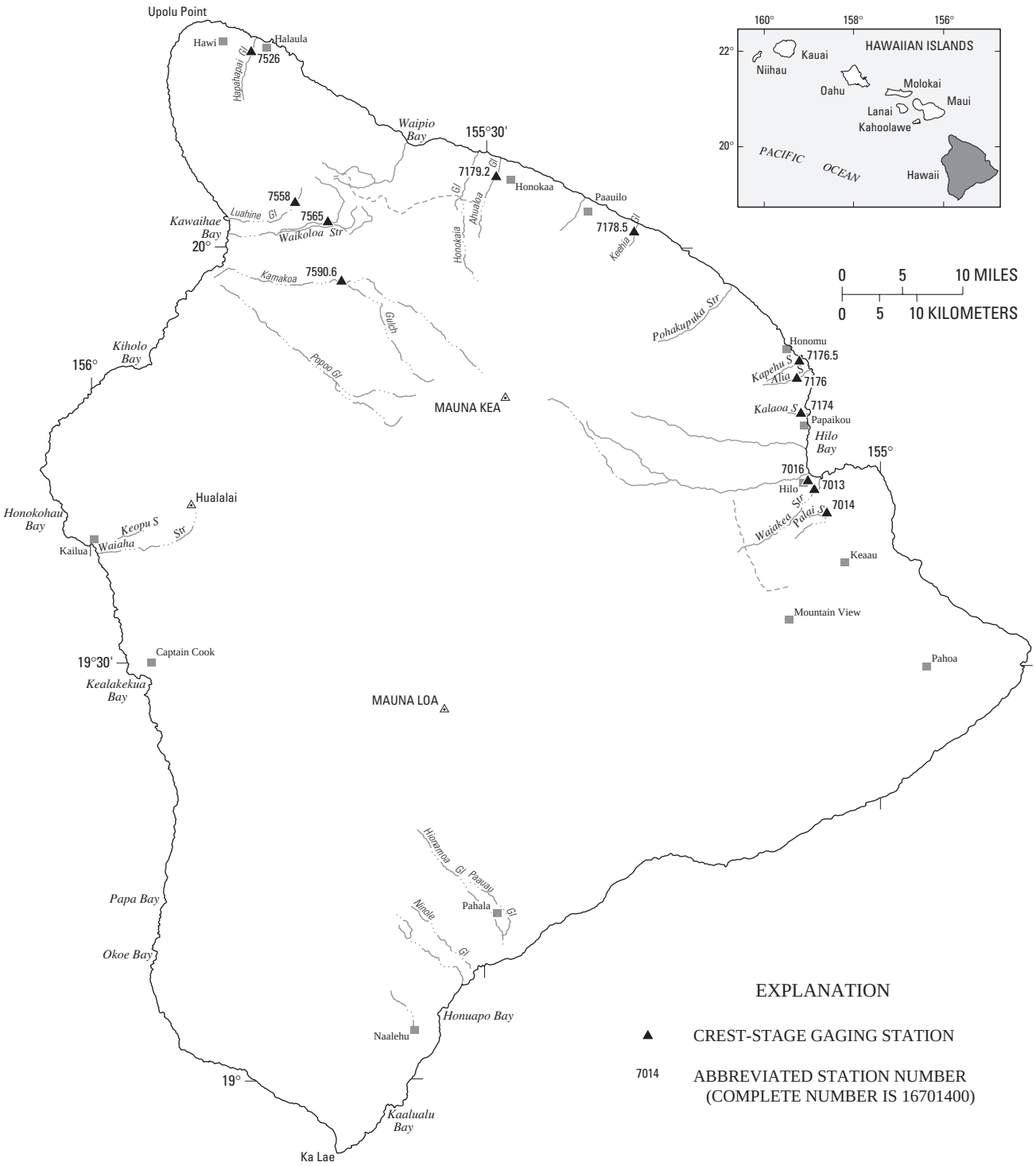


Figure 14. Locations of crest-stage gaging stations on Hawaii.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of continuous-record stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than continuous-record stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to these events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in three tables. The first is a table of annual maximum stage and discharge at crest-stage stations, the second is a table of discharge measurements at low-flow partial-record stations, and the third is a table of discharge measurements at miscellaneous sites.

Crest-Stage Partial-Record Stations

Prior to 1973, crest-stage partial-record station records for the State of Hawaii were published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain, but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Revised annual maximum discharge at crest-stage partial-record stations during water years 1988-2000

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Oahu									
16317800 Kaunala Gulch nr Sunset Beach	Lat 21°40′59″, long 158°02′12″, on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-2000	08-23-95	2.64	unknown	11-20-90	6.01	450
				01-24-96	3.40	unknown	10-19-99	r6.28	-
				11-14-96	3.90	unknown			
				01-01-98	4.29	unknown			
				unknown	5.30	unknown			
				10-19-99	6.28	unknown			
Island of Molokai									
16411400 Kakaako Gulch nr Mauna Loa	Lat 21°10′39″, long 157°12′31″, on left bank 1.0 mi downstream from Kamakahi Gulch, and 3.0 mi north of Mauna Loa School.	5.34	1963-72≠, 1973-2001	02-25-90	-	unknown	02-11-89	8.47	2,860
				1991	-	unknown			
				02-14-92	-	unknown			
				10-13-92	-	unknown			
				02-14-94	-	unknown			
				03-02-95	-	unknown			
				08-31-96	-	unknown			
				11-14-96	-	unknown			
16413500 Manawainui Gulch nr Kualapuu	Lat 21°07′42″, long 157°03′25″, at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-97¼, 2001	12-12-87	-	unknown	04-04-89	-	3,620
				01-17-90	-	unknown			
				12-24-90	-	unknown			
				01-14-92	-	unknown			
				11-21-92	-	unknown			
				03-24-94	-	unknown			
				03-01-95	-	unknown			
				03-31-96	-	unknown			
				01-04-97	-	unknown			
Island of Hawaii									
16701300 Waiakea Str at Hilo	Lat 19°42′38″, long 155°05′02″, 0.3 mi upstream from Kinoole Street bridge and 1.3 mi southeast of Hilo Post Office.	35.8	1969-75, 1979, 1994-2001r	11-20-90	deleted	deleted	11-02-00	14.85	5,760
				07-24-93	deleted	deleted			

Revised annual maximum discharge at crest-stage partial-record stations during water years 1988-2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Hawaii--Continued									
16717600 Alia Str nr Hilo	Lat 19°50′38″, long 155°06′21″, on upstream right bank wingwall of culvert on Highway 19 at Pepeekeo 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	0.58	1962-72≠, 1979, 1986, 1994-2001r	11-02-00	15.02	1,520	02-20-79	17.1	2,850
16717650 Kapehu Str nr Pepeekeo	Lat 19°51′52″, long 155°06′11″, at culvert on Highway 19, 1.0 mi southeast of Honomu, 2.2 mi north of Pepeekeo, and 9.4 mi north of Hilo.	1.09	1963-90, 1994-2001	11-02-00	14.60	1,900	02-20-79	29.93	3,320
16770000 Hionamoa Gulch at Pahala	Lat 19°11′45″, long 155°29′11″, at bridge, 0.6 mi southwest of Pahala and 4.1 mi north of Punaluu.	9.41	1963-80, 1985-86, 1994 2001	08-04-81	deleted	deleted	11-02-00	-	11,400
				12-25-81	deleted	deleted			
				09-05-83	deleted	deleted			
				09-27-84	deleted	deleted			
				03-01-85	12.10	deleted			
				04-10-86	12.90	deleted			
				11-13-86	deleted	deleted			
				12-13-87	deleted	deleted			
				07-20-89	deleted	deleted			
				01-19-90	deleted	deleted			
				11-02-00	-	11,400			
16770500 Paauau Gulch at Pahala	Lat 19°12′39″, long 155°28′48″, on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mi north of Pahala.	1.74	1962-79≠, 1980-98, 1999-2000≠, 2001	10-18-62	*4.87	*1,260	11-02-00	12.02	4,480
				03-28-63	4.40	696			
				04-15-63	4.01	408			
				05-17-63	3.74	241			
				11-14-64	*3.77	*260			
				05-03-65	3.76	254			
				11-09-65	3.84	303			
				11-14-65	4.10	*464			
				02-09-66	*a5.45	e300			
				10-09-66	3.67	186			
				11-05-66	*5.05	*1,520			
				05-15-67	4.03	391			
				11-26-67	4.19	512			
				01-27-68	*5.48	*2,360			
				02-03-68	4.15	480			
				02-28-68	3.89	304			
				04-08-68	3.88	298			
				04-17-68	3.91	316			
				04-23-68	3.66	182			
				10-03-68	5.83	3,390			
				01-05-69	*5.90	*3,600			
				08-26-70	*3.52	*131			
				01-09-71	3.75	225			
				01-27-71	*3.80	*250			
				01-30-71	3.67	186			
				11-25-71	*5.33	*2,060			
				01-24-72	3.86	286			
				10-06-72	3.71	205			
				10-15-72	*4.31	*619			
				11-20-73	3.68	191			
				12-01-73	*4.72	*1,030			
				12-22-74	3.90	310			
				01-08-75	*5.90	*3,600			
				01-30-75	4.58	880			
				11-24-75	4.67	970			
				11-27-75	3.72	210			
				01-05-76	*5.75	*3,150			
				02-05-76	5.27	1,940			

a Stage affected by backwater

Revised annual maximum discharge at crest-stage partial-record stations during water years 1988-2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
16770500--Continued				08-12-77	*4.69	*990			
				11-06-78	deleted	deleted			
				02-05-79	deleted	deleted			
				03-18-80	deleted	deleted			
				08-04-81	deleted	deleted			
				12-25-81	deleted	deleted			
				09-05-83	deleted	deleted			
				09-27-84	deleted	deleted			
				03-01-85	deleted	deleted			
				04-10-86	deleted	deleted			
				11-13-86	deleted	deleted			
				12-18-87	deleted	deleted			
				07-20-89	deleted	deleted			
				01-19-90	deleted	deleted			
				02-17-94	*b5.12	*350			
				11-14-94	*b3.45	*100			
				03-03-96	*b6.90	*780			
				11-13-96	*b8.59	deleted			
				1998	b<3.32	<86			

b At new gage 86 ft upstream

Annual maximum discharge at crest-stage partial-record stations during water year 2001

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Kauai									
16038000 Waimea River at Waimea	Lat 21°57′23″, long 159°39′59″, 150 ft upstream from highway bridge at Waimea and 0.2 mi upstream from mouth.	86.5	1944-2001b	04-02-01	6.30	-	02-07-49	11.40	-
16052000 Hanapepe River at Hanapepe	Lat 21°54′47″, long 159°35′33″, 400 ft upstream from bridge on Highway 50 and 0.5 mi upstream from mouth.	26.6	1950-2001b,r	02-09-01	4.67	-	04-15-63	11.30	-
16052500 Lawai Str nr Koloa	Lat 21°54′11″, long 159°30′21″, on right bank at private road bridge, 0.9 mi upstream from mouth, and 2.4 mi southwest of Koloa.	6.62	1962-63, 1964-72≠ 1973-2001	06-08-01	4.23	1120	01-31-75	11.37	5,810
16055000 Huleia Str nr Lihue	Lat 21°57′20″, long 159°25′23″, at highway bridge, 3.7 mi southwest of Lihue, and 4.5 mi upstream from mouth.	17.6	1912-15≠, 1962-67, 1968-70≠, 1971-2001	06-08-01	11.68	4,420	11-28-70	22.40	26,800
16071800 Wailua Riv nr Kapaa	Lat 22°03′00″, long 159°20′26″, at State park 600 ft upstream from highway bridge, 850 ft upstream from mouth, and 2.5 mi southwest of Kapaa.	52.6	1962-2001b	10-30-00	5.10	-	11-26-70	8.57	-
16073500 Konohiki Str nr Kapaa	Lat 22°04′01″, long 159°20′21″, at culvert on private road, 1.8 mi upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-2001r	06-08-01	5.50	<90	12-14-91	16.92	2,530
16081200 Akulikuli Str nr Kapaa	Lat 22°06′25″, long 159°22′07″, at Kahuna Road crossing, 800 ft upstream from mouth, and 3.5 mi northwest of Kapaa armory.	0.40	1964-2001r	12-12-00	<3.99	<164	12-14-91	11.40	1,550
16084500 Kapaa Str at old highway cross-ing nr Kealia	Lat 22°06′28″, long 159°19′52″, at abutment of old highway bridge, 100 ft upstream from road crossing, 1.4 mi northwest of Kealia, and 2.1 mi upstream from mouth.	14.0	1962-2001	12-12-00	8.77	1,990	12-14-91	23.11	30,300
16097900 Puukumu Str nr Kilauea	Lat 22°13′02″, long 159°25′18″, at culvert on Highway 56, 0.8 mi northwest of Kilauea School, and 0.9 mi upstream from mouth.	0.91	1964-68, 1971-2001	12-11-00	3.20	49	04-07-71	17.27	1,430
16104200 Hanalei Riv at Highway 56 bridge nr Hanalei	Lat 22°12′50″, long 159°28′43″, at highway bridge, 1.6 mi northeast of Hanalei, and 2.4 mi upstream from mouth.	21.0	1963-2001b,r	02-09-01	10.39	-	11-03-95	13.82	-
16130000 Nahomalu Valley nr Mana	Lat 22°02′41″, long 159°45′17″, on left bank 1.1 mi northeast of Mana, and 5.3 mi northwest of Kekaha School.	3.81	1962-63, 1964-71≠, 1972-2001	02-25-01	3.72	58	04-15-72	7.15	2,120

b Gage height only

≠ Operated as a continuous-record gaging station

r 16052000 peak gage height and discharge published for water years 1963-92 were revised in water-resources data report for Hawaii, water year 1993

r 16073500 peak gage height and discharge published for water year 1993 were revised in water-resources data report for Hawaii, water year 1999

r 16081200 peak gage heights and discharges published for water years 1993-98 were revised in water-resources data report for Hawaii, water year 1999

r 16104200 peak gage height published for water years 1983-92 were revised in water-resources data report for Hawaii, water year 1993

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Oahu									
16210500 Kaukonahua Str at Waialua	Lat 21°33′56″, long 158°07′26″, 0.2 mi upstream from Highway 99, 0.4 mi southeast of Waialua High School, and 1.3 mi southwest of Weed Circle.	38.7	1963, 1968-2001	2001	<19.31	unknown	04-15-63	26.4	15,600
16211200 Poamoho Str at Waialua	Lat 21°34′00″, long 158°06′40″, at culvert crossing of Kaheaka Road, 0.2 mi upstream from Highway 83, and 1.1 mi east of Waialua High School.	12.7	1967-2001	02-09-01	11.85	unknown	04-19-74	24.0	7,340
16211300 Makaleha Str nr Waialua	Lat 21°33′49″, long 158°09′21″, 1.0 mi southwest of Dillingham Ranch and 1.9 mi southwest of former sugar mill at Waialua.	4.15	1958-63, 1964-65≠, 1966-2001	2001	<7.30	unknown	11-13-65 11-14-96	7.41 9.41	3,640 -
16211400 Manini Gulch at Kaena	Lat 21°34′50″, long 158°15′12″, 180 ft upstream from Highway 99, 1.7 mi west of Camp Erdman, and 2.0 mi east of Kaena Point.	1.08	1974-2001	2001	<12.10	unknown	01-01-88	19.61	1,000
16211500 Makua Str at Makua	Lat 21°31′59″, long 158°13′49″, on bridge at Farrington Highway crossing, 0.1 mi north of Makua cemetery and 4.5 mi southeast of Kaena Point lighthouse.	4.28	1958-2001	2001	<6.16	unknown	02-07-76 11-14-96	a8.00 11.74	3,220 -
16211700 Makaha Str at Makaha	Lat 21°28′47″, long 158°12′31″, 0.9 mi upstream from Farrington Highway and 1.1 mi north of junction of Farrington Highway and Makaha Valley Road.	5.25	1966-2001	03-31-01	9.02	unknown	11-14-96	17.60	e5,000
16211800 Kaupuni Str at altitude 372 ft, nr Waianae	Lat 21°28′20″, long 158°09′26″, at abandoned diversion dam, 2.6 mi northeast of Waianae cemetery, and 2.8 mi northeast of junction of Waianae Valley Road and Farrington Highway.	3.58	1961-72≠, 1973-2001	03-31-01	<3.36	unknown	01-06-82	7.82	3,640
16212200 Mailiilii Str nr Waianae	Lat 21°27′34″, long 158°08′05″, at bridge at Lualualei Naval Reservation and 3.4 mi east of cemetery nr Waianae.	1.51	1958-2001	2001	<0.98	unknown	01-06-82	7.20	2,460
16212300 Nanakuli Str at Nanakuli	Lat 21°23′08″, long 158°08′11″, on left bank 0.7 mi southwest of Nanaikapono Elementary School, 1.8 mi north of Kahe Point Electric Plant, and 0.6 mi upstream of Farrington Highway.	3.98	1968-2001	2001	<17.46	<1	a2-7-76 10-20-85	26.20 26.28	3,320 -
16212450 Kaloi Gulch tributary nr Honouliuli	Lat 21°22′41″, long 158°03′45″, at culvert on private road, 1.8 mi west of Honouliuli, and 2.8 mi northwest of Ewa Post Office.	1.70	1968-2001	2001	<1.98	<22	11-25-75 01-08-80	7.89 7.45	- 724
16212500 Honouliuli Str nr Waipahu	Lat 21°22′40″, long 158°02′10″, at bridge on Farrington Highway and 1.8 mi west of Waipahu Post Office.	11.0	1956-2001	2001	<0.41	unknown	01-06-82	10.28	3,500

b Gage height only
≠ Operated as a continuous-record gaging station
< Actual value is known to be less than the value shown
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Oahu--Continued									
16212601 Waikele Str at Wheeler Field	Lat 21°28′44″, long 158°03′07″, at culvert 0.3 mi west of east-west runway at Wheeler Field and 1.9 mi southwest of Wahiawa Post Office.	6.35	1958, 1960-2001	03-25-01	6.52	349	01-06-82	22.50	1,850
16212700 Waikakalaua Str nr Wahiawa	Lat 21°27′50″, long 158°01′38″, 0.2 mi downstream from Kamehameha Highway and 2.4 mi south of Wahiawa Post Office.	6.93	1958-2001	10-29-00	7.05	unknown	04-15-63	16.50	4,820
16212750 Huliwai Gulch nr Kunia Camp	Lat 21°26′43″, long 158°03′47″, 200 ft upstream from Highway 75 and 1.2 mi south of Kunia Camp.	4.29	1974-2001	03-25-01	11.85	unknown	02-10-79 10-16-91	8.36 13.49	e600 -
16223000 Waimalu Str nr Aiea	Lat 21°23′48″, long 157°56′56″, 1,300 ft upstream from bridge on Moanalua Road and 1.2 mi northwest of Aiea High School.	5.97	1952-70≠, 1973-2001	10-29-00	2.28	442	01-05-68 05-14-60	6.82 9.49	8,020 -
16224500 Kalauao Str at Moanalua Road, at Aiea	Lat 21°23′07″, long 157°56′22″, on right bank at upstream side of Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	2.59	1957-82≠, 1984-91, 2000-2001	09-16-01	10.77	unknown	05-14-63	a6.63	2,580
16228000 Moanalua Str nr Honolulu	Lat 21°22′53″, long 157°52′22″, on left bank 1.8 mi northeast of Tripler Hospital and 5.0 mi north of Honolulu Post Office.	2.73	1927-78≠, 1979-2001	04-29-01	2.99	unknown	11-18-30 05-14-63	11.58 11.82	4,580 -
16228200 Moanalua Str nr Aiea	Lat 21°22′37″, long 157°53′03″, on right bank 1.1 mi northeast of Tripler Hospital and 2.9 mi east of Aiea sugar refinery.	3.34	1969-2001	09-16-01	3.67	415	03-18-80	9.97	4,860
16228600 Moanalua Str at Tripler Hospital	Lat 21°21′52″, long 157°54′05″, on right bank 0.5 mi west of Tripler Hospital and 1.6 mi northeast of Aliamanu School.	4.44	1971-2001	11-03-00	12.53	unknown	03-18-80	21.0	6,200
16228900 Kalihi Str nr Kaneohe	Lat 21°22′35″, long 157°49′32″, on right bank 800 ft downstream from Likelike Highway and 2.8 mi southwest of Castle High School in Kaneohe.	0.60	1967-71≠, 1972-2001	09-16-01	2.72	220	01-08-80	5.60	1,700
16235400 Waolani Str at Honolulu	Lat 21°20′00″, long 157°51′04″, at Wyllie Street bridge and 1.8 mi northeast of Honolulu Post Office.	1.29	1958-2001	06-05-01	1.61	unknown	05-14-63	6.14	2,500
16237500 Pauoa Str at Honolulu	Lat 21°19′18″, long 157°51′03″, at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-2001	06-05-01	0.96	unknown	05-14-63	4.65	2,200
16247500 Wailupe Gulch at Aina Haina	Lat 21°17′46″, long 157°45′29″, at Ani Street bridge and 1.0 mi upstream from Kalanianaole Highway in Aina Haina.	2.35	1958-2001	2001	<0.46	unknown	12-18-67 03-05-58	5.72 7.20	3,600 -

< Actual value is known to be less than the value shown
≠ Operated as a continuous-record gaging station
a At old gage datum
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Oahu--Continued									
16247900 Kuliouou Valley at Kuliouou	Lat 21°17′50″, long 157°43′35″, at Kuliouou, 300 ft downstream from single-lane wooden bridge, and 0.6 mi upstream from Highway 72.	1.18	1958-59, 1970-2001	02-12-01	27.80	250	12-31-87	36.55	4,700
16248950 Kahawai Str at Waimanalo	Lat 21°21′04″, long 157°43′33″, on left bank 30 ft downstream from Kalanianaole Highway bridge, 1.9 mi northwest of Waimanalo Post Office, and 0.75 mi southwest of Bellows Air Force Station radio towers.	1.18	1998-2001	2001	<7.36	unknown	01-22-99	7.70	unknown
16249000 Waimanalo Str at Waimanalo	Lat 21°21′14″, long 157°43′50″, on right bank 260 ft downstream from Highway 72 and 2.3 mi northeast of Waimanalo Post Office.	2.16	1967-70≠, 1971-2001	11/03/00	1.71	unknown	02-14-85 03-06-63 11-26-70	10.82 - 10.00	- a4,560 a4,560
16249100 Kaelepulu Str tributary at Kailua	Lat 21°21′44″, long 157°44′22″, 30 ft upstream from Kalanianaole Highway, 1.6 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	0.16	1963-2001	2001	<1.76	<34	12-31-87	7.53	467
16264600 Kawainui Marsh nr Levee Station 15+00	Lat 21°23′53″, long 157°45′07″, at Kawainui Marsh, 0.6 mi west of Kailua Elementary School and 1.1 mi southeast of Kalaheo High School. Datum of gage is at mean sea level.	11.0	02/2001-09/2001	02-15-01	2.60	-	02-15-01	2.60	-
16264790 Kawainui Marsh nr Levee Station 64+00	Lat 21°24′31″, long 157°45′33″, at Kawainui Marsh, 0.2 mi south of Kalaheo High School, and 1.2 mi northwest of Kailua Elementary School. Datum of gage is at mean sea level.	11.0	02/2001-09/2001	07-20-01	2.86	-	07-20-01	2.86	-
16264800 Kawainui Canal of Kailua	Lat 21°24′36″, long 157°45′31″, datum of gage is at mean sea level.	11.0	1957-60, 1963-64, 1967-97 2001	03-15-01	2.70	-	01-12-75	5.82	-
16264850 Kawainui Canal at Oneawa Street bridge	Lat 21°24′44″, long 157°45′25″, on Oneawa Street bridge and 0.15 mi southeast of Kalaheo High School. Datum of gage is at mean sea level.	11.0	02/2001-09/2001	07-21-01	2.24	-	07-21-01	2.24	-
16265000 Kawa Str at Kaneohe	Lat 21°24′32″, long 157°47′36″, 50 ft upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi northeast of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-2001	11-03-00	6.22	576	02-01-69	17.90	5,290
16274499 Keaahala Str at Kamehameha Highway, at Kaneohe	Lat 21°25′12″, long 157°48′15″, 35 ft upstream from bridge on Kamehameha Highway at Kaneohe.	0.62	1959-2001	02-12-01	2.53	232	05-02-65	11.50	2,750
16283480 Ahuimanu Str nr Kahaluu	Lat 21°27′04″, long 157°50′13″, at bridge on Ahuimanu Road and 0.8 mi south of Kahaluu.	2.31	1963-2001	02-12-01	5.03	389	02-01-69 11-25-70	a11.80 a14.30	7,300 7,300

< Actual value is known to be less than the value shown

≠ Operated as a continuous-record gaging station

b Gage height only

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Oahu--Continued									
16304500 Kaluanui Stream at Hauula	Lat 21°35′57″, long 157°54′24″, Kaluanui on left downstream wing-wall of stream at concrete bridge, 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls. Datum lowered 18.47 ft.	2.12	1958-2001	10-30-00	21.95	unknown	01-06-82	r25.42	4,920
16308500 Kahawainui Stream at Laie	Lat 21°39′25″, long 157°55′57″, 800 ft northeast of Zion Cemetery on upstream side of bridge at Kamehameha Highway.	4.79	1997-2001	02-12-01	3.94	-	12-10-99	5.01	-
16310501 Malaekahana Str at altitude 30 ft, nr Kahuku	Lat 21°39′47″, long 157°57′11″, at abandoned plantation railroad bridge, 1.1 mi southwest of junction of plantation road and Highway 83, and 1.2 mi south of Kahuku Hospi-tal.	4.05	1958-2001	02-09-01	12.66	692	04-15-63 02-09-01	a12.10 c12.66	4,640 -
16311000 Oio Stream nr Kahuku	Lat 21°41′32″, long 157°59′48″, on left bank of stream 0.5 mi southwest of junction of Plantation Road and Highway 83 at Kuilima bridge and 2.7 mi west of Kahuku Hospital.	2.13	1958-2001	10-29-00	c9.45	unknown	05-02-65 11-14-96	a8.13 a8.63	1,390 -
16317800 Kaunala Gulch nr Sunset Beach	Lat 21°40′59″, long 158°02′12″, on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-2001	06-05-01	3.67	unknown	11-20-90 10-19-99	6.01 r6.28	450 -
16318000 Paumalu Gulch at Sunset Beach	Lat 21°40′19″, long 158°02′28″ 0.4 mi upstream from Highway 83 at Sunset Beach and 2.2 mi north-east of Waimea.	2.59	1968-2001	unknown	<1.92	unknown	04-19-74 04-04-89	4.97 6.44	982 -
16331000 Waimea Gulch nr Kawailoa Camp	Lat 21°37′29″, long 158°04′58″, at culvert on Ashley Road, 0.1 mi upstream from Highway 83, and 1.1 mi north of Kawailoa Camp.	2.23	1968-2001	2001	<1.46	<22	03-18-80	11.2	2,030
16340000 Anahulu River nr Haleiwa	Lat 21°35′28″, long 158°04′45″, 1.7 mi southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi east of Waialua School at Haleiwa.	13.5	1958-2001	06-05-01	4.50	1,100	04-19-74	15.80	15,900
16350000 Opaeula Str nr Haleiwa	Lat 21°35′09″, long 158°06′01″, 0.6 mi upstream from Kamehameha Highway and 2.1 mi northeast of Waialua.	5.96	1956-2001	02-09-01	10.32	434	04-19-74	20.7	7,600

< Actual value is known to be less than the value shown
r Revised
≠ Operated as a continuous-record gaging station
a At old gage datum
c At new gage datum

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Molokai									
16411320 Kakaako Gulch abv Kamakahi Gulch, nr Mauna Loa	Lat 21°10′11″, long 157°11′56″, 0.1 mi upstream from Kamakahi Gulch, 1.7 mi downstream from Highway 46, and 2.5 mi northeast of Mauna Loa.	1.40	1964-2001	03-30-01	1.12	unknown	11-12-65	4.80	670
16411400 Kakaako Gulch nr Mauna Loa	Lat 21°10′39″, long 157°12′31″, on left bank 1.0 mi downstream from Kamakahi Gulch, and 3.0 mi north of Mauna Loa School.	5.34	1963-72≠, 1973-89 2001r	03-30-01	-	unknown	02-11-89	8.47	2,860
16411600 Kaunala Gulch nr Mauna Loa	Lat 21°07′01″, long 157°15′43″, at Sand Haul Road, 3.2 mi east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	0.28	1964-2001	11-02-00	2.10	unknown	12-25-84	3.87	151
16411640 Halena Gulch nr Mauna Loa	Lat 21°05′53″, long 157°13′47″, 2.7 mi southwest of Mauna Loa and 5.5 mi east of Laau Point.	2.07	1965-2001	11-02-00	2.88	394	01-11-74	8.20	2,920
16411800 Kaluapeelua Gulch at Hoolehua	Lat 21°09′55″, long 157°04′22″, 0.4 mi south of Hoolehua and 2.1 mi west of Kualapuu.	1.46	1964-2001	No flow.			12-08-73	3.30	86
16413500 Manawainui Gulch nr Kualapuu	Lat 21°07′42″, long 157°03′25″, at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-87, 2000-2001r	11-02-00	unknown	unknown	04-04-89	-	3,620
16414000 Kaunakakai Gulch at Kaunakakai	Lat 21°06′21″, long 157°00′34″, on left bank 0.6 mi upstream from Molokai Ranch pipeline crossing 1.3 mi northeast of Kaunakakai Post Office and 1.7 mi upstream from mouth.	6.57	1949-98≠¼, 1999-2001	10-29-00	3.06	25.5	10-31-61	9.30	3,060
16415400 Wawaia Gulch at Kamalo	Lat 21°03′25″, long 156°52′20″, at Highway 45, 0.3 mi upstream from mouth, and 0.5 mi northeast of Kamalo.	2.12	1964-2001	10-29-00	1.16	312	04-13-65	2.61	1,250
16419000 Pohakupili Gulch nr Halawa	Lat 21°07′59″, long 156°44′15″, at Highway 45, 0.5 mi upstream from mouth, and 1.9 mi south of Halawa.	0.48	1964-2001	10-29-00	5.80	70.4	11-04-66	8.93	989
Island of Maui									
16500100 Kepuni Gulch nr Kahikinui House	Lat 20°37′21″, long 156°15′16″, on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui House, and 8.5 mi west of Kaupo.	1.91	1963-72≠, 1973-2001	11-02-00	4.72	138	09-18-94	13.68	2,320
16500300 Hawelewele Gulch nr Kaupo	Lat 20°38′01″, long 156°11′08″, 700 ft upstream from Piilani Highway 31 and 3.9 mi west of Kaupo.	11.3	1967-2001	11-02-00	7.06	1,440	01-08-80	15.10	13,600

< Actual value is known to be less than the value shown

≠ Operated as a continuous-record gaging station

r 16411400 peak discharge published for water years 1990-97 were revised in water-resources data report for Hawaii, water year 2001

r 16413500 peak discharge published for water year 1988 and 1990-97 were revised in water-resources data report for Hawaii, water year 2001

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Maui--Continued									
16500800 Kukuiula Gulch nr Kipahulu	Lat 20°39′18″, long 156°04′44″, at Highway 31, 1.3 mi west of Kipahulu, and 3.2 mi east of Kaupo.	0.76	1963-68≠, 1969-2001	10-29-00	7.76	920	03-31-82	13.76	5,950
16502400 Pukuilua Gulch nr Hana	Lat 20°42′00″, long 156°00′14″, at Highway 31, 0.4 mi southwest of Puuiki and 4.0 mi south of Hana.	0.48	1963-2001	10-29-00	9.02	756	01-23-65	9.30	788
16502800 Moomoonui Gulch at Hana	Lat 20°44′37″, long 155°59′18″, at Highway 31 just downstream from Moomooiki Gulch and 1.0 mi south of Hana.	0.90	1963-2001	10-29-00	15.64	2,950	10-29-00	15.64	2,950
16502900 Kawaipapa Gulch at Hana	Lat 20°46′08″, long 156°00′04″, 1,000 ft upstream from Highway 36 and 0.3 mi northwest of Hana Hospital.	5.83	1965-2001	10-29-00	14.53	e22,200	10-29-00	14.53	e22,200
16603300 Unnamed gulch at Maliko Bay	Lat 20°56′26″, long 156°21′04″, at Hana Highway, 0.5 mi west of Maliko Bay and 1.3 mi north of Hamakuapoko.	0.43	1963-2001	No flow.			03-27-79	17.28	171
16603700 Kalialinui Gulch tributary nr Pukalani	Lat 20°49′02″, long 156°19′44″, at Lower Kula Road and 1.4 mi south of Pukalani.	1.17	1967-2001	11-03-00	e2.91	e59.0	01-09-80	7.35	414
16603800 Kaluapulani Gulch tributary nr Pukalani	Lat 20°48′52″, long 156°18′32″, at Haleakala Highway, 1.5 mi west of Olinda Prison Camp and 2.3 mi southeast of Pukalani.	0.45	1963-2001	11-03-00	2.78	74.2	07-23-64	9.90	306
16603850 Kalialinui Gulch nr Kahului	Lat 20°52′47″, long 156°26′06″, 600 ft upstream from Hansen Road, 0.5 mi northeast of Puunene Hospital and 2.5 mi southeast of Kahului Post Office.	17.9	1967-2001	No flow.			01-28-71	8.33	1,330
16607000 Iao Str at Wailuku	Lat 20°53′38″, long 156°30′27″, 560 ft upstream from Market Street bridge at Wailuku and 1.9 mi upstream from mouth.	8.24	1951≠, 1952-2001	10-28-00	4.06	1,930	12-03-50	6.21	7,540
16616500 Unnamed gulch at Maluhia Camp	Lat 20°57′26″, long 156°31′41″, at Kahekili Highway, 0.6 mi east of Maluhia Camp and 1.8 mi northwest of Waihee.	0.12	1964-2001	No flow.			01-12-75	7.29	e97
16619700 Poelua Gulch nr Kahakuloa	Lat 21°00′58″, long 156°34′58″, at Highway 30 (bypass), 1.3 mi southeast of Nakalele Point lighthouse and 2.2 mi northwest of Kahakuloa.	1.18	1965-2001	02-08-01	4.56	55.0	03-16-68	15.22	1,760
16630200 Honokowai Str at Honokowai	Lat 20°56′58″, long 156°41′07″, 0.5 mi southeast of Honokowai and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-2001	10-28-00	3.79	215	08-01-82	11.0	4,520

≠ Operated as a continuous-record gaging station

e Estimated

¼r 16619700 peak gage height and discharge published for water year 1999 were revised in water-resources data report for Hawaii, water year 2000

r 16630200 peak gage height and discharge published for water years 1997 were revised in water-resources data report for Hawaii, water year 2000

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Maui--Continued									
16638500 Kahoma Str at Lahaina	Lat 20°53′12″, long 156°40′36″, 0.2 mi west of Kelawea, 0.6 mi northeast of Lahaina, 0.6 mi downstream from Kanaha Str and 0.9 mi upstream from mouth.	5.22	1963-89≠ 1990-2001	10-28-00	-	unknown	07-11-65	11.03	2,490
16643300 Kauaula Str nr mouth, nr Lahaina	Lat 20°52′09″, long 156°39′43″, 0.7 mi upstream from Honoapiilani Highway (bypass) and 1.3 mi southeast of Lahaina Lighthouse.	4.12	1960,1962, 1964-2001	10-28-00	<2.88	<137	05-13-60	7.9	2,660
16646200 Olowalu Str at Olowalu	Lat 20°49′23″, long 156°37′15″, on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.	4.08	1962-72≠, 1973-2001	11-02-00	2.86	142	03-24-67	5.40	1,300
16647500 Malalowaiaole Gulch nr Maalaea	Lat 20°46′56″, long 156°31′32″, at Honoapiilani Highway, 200 ft upstream from mouth, 0.2 mi north of McGregor Point, and 1.2 mi southwest of Maalaea.	0.64	1964-2001	11-02-00	3.83	19.0	01-10-80	12.95	350
16658500 Waiakoa Gulch tributary nr Waiakoa	Lat 20°44′56″, long 156°19′22″, at Upper Kula Road, 1.0 mi southeast of Waiakoa, and 1.0 mi northeast of junction of Lower and Upper Kula Roads.	0.98	1964-2001	No flow.			01-28-71	8.23	409
16659000 Waiakoa Gulch at Kihei	Lat 20°47′14″, long 156°27′41″, 0.3 mi northeast of Kihei and 0.4 mi upstream from mouth.	10.1	1963-2001	11-03-00	5.97	37.0	01-28-71	9.66	1,560
16660000 Kulanihakoi Gulch nr Kihei	Lat 20°46′06″, long 156°27′03″, on right bank 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.	14.4	1963-70≠, 1971-2001	11-03-00	0.85	342	01-28-71	9.40	4,460
Island of Hawaii									
16701300 Waiakea Str at Hilo	Lat 19°42′38″, long 155°05′02″, 0.3 mi upstream from Kinoole Street bridge and 1.3 mi southeast of Hilo Post Office.	35.8	1969-75, 1979, 1994-2001r	11-02-00	14.85	5,760	11-02-00	14.85	5,760
16701400 Palai Str at Hilo	Lat 19°40′56″, long 155°04′04″, at Highway 11, 300 ft south of Palai Street intersection, and 3.5 mi southeast of Hilo Post Office.	5.08	1965-71, 1979-80, 1994, 2001r	11-02-00	unknown	1,580	11-02-00	unknown	1,580
16701600 Alenaio Str at Hilo	Lat 19°43′10″, long 155°05′27″, 0.65 mi south of Hilo Post Office, 0.65 mi west of Kapiolani School, and 0.1 mi upstream from Kapiolani Street bridge.	8.62	1997-2001	11-02-00	13.12	6,300	11-02-00	13.12	6,300
16717400 Kalaoa Mauka Stream near Hilo	Lat 19°48′07″, long 155°06′03″, on upstream side of Hwy 19, 1.0 mi north of Papaikou, 5.1 mi north of Hilo Post Office.	0.24	1963-67, 1973-76, 1978-79, 1985, 2001r	11-02-00	11.50	228	02-20-79	20.60	400

≠ Operated as a continuous-record gaging station

¼r 16701300 peak gage height and discharge published for water years 1976-78, 1980-90 were revised in water-resources data report for Hawaii, water year 1999; peak gage height and discharge published for water years 1991 and 1993 were revised in water-resources data report for Hawaii, water year 2001

r 16701400 peak gage height and discharge published for water years 1972-78, 1981-90 were revised in water-resources data report for Hawaii, water year 1999

¼r 16717400 peak gage height and discharge published for water years 1968-72, 1977, 1979-84, 1986-90 were revised in water-resources data report for Hawaii, water year 1999

Annual maximum discharge at crest-stage partial-record stations during water year 2001--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2001 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Hawaii--Continued									
16717600 Alia Str nr Hilo	Lat 19°50′38″, long 155°06′21″, on upstream right bank wingwall of culvert on Highway 19 at Pepeekeo 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	0.58	1962-72≠, 1979, 1986, 1994-2001r	11-02-00	15.02	1,520	02-20-79	17.1	2,850
16717650 Kapehu Str nr Pepeekeo	Lat 19°51′52″, long 155°06′11″, at culvert on Highway 19, 1.0 mi southeast of Honomu, 2.2 mi north of Pepeekeo, and 9.4 mi north of Hilo.	1.09	1963-68, 1975, 1979, 1985-86, 1994-2001r	11-02-00	14.60	1,900	02-20-79	29.93	3,320
16717850 Keehia Gulch nr Ookala	Lat 20°01′08″, long 155°18′45″, at culvert on Highway 19, 1.7 mi west of Ookala, and 4.1 mi southeast of Paauilo.	0.62	1963-91, 1993-2001	Records being reviewed.					
16717920 Ahualoa Gulch at Honokaa	Lat 20°05′12″, long 155°29′17″, at Highway 24, 1.1 mi northwest of Honokaa Hospital, and 1.5 mi upstream from mouth.	2.27	1963-90, 1995-2001	Records being reviewed.					
16752600 Hapahapai Gulch at Kapaau	Lat 20°14′00″, long 155°48′00″, at Highway 27, 300 ft east of Kapaau Post Office.	1.52	1963-90, 1995-2001	unknown	<4.63	<41	01-09-80	11.42	426
16755800 Luahine Gulch nr Waimea	Lat 20°03′11″, long 155°44′35″, on culvert 5.1 mi northwest of Waimea and 5.7 mi east of Kawaihae.	0.32	1963-90, 1994-2001	Records being reviewed.					
16756500 Keanuiomano Str nr Kamuela	Lat 20°01′48″, long 155°42′05″, on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 mi west of Kamuela.	4.3	1964-72≠, 1973-2001r	08-01-01	5.78	850	04-20-68	10.02	3,540
16759040 Paiakuli Reservoir tributary nr Waimea	Lat 20°02′16″, long 155°38′08″, at Highway 19, 2.1 mi west of Puukapu Reservoir, and 2.6 mi northeast of Waimea.	0.27	1963-70, 1994-2001r	08-01-01	3.02	114	01-11-67	5.63	340
16759060 Kamakoa Gulch nr Waimea	Lat 19°57′32″, long 155°41′02″, at bridge, 1.4 mi north of Saddle Road Junction, and 4.5 mi south of Waimea.	50.6	1963-91, 1994-2001	Records being reviewed.					
16770500 Paauau Gulch at Pahala	Lat 19°12′39″, long 155°28′48″, on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mi north of Pahala.	1.74	1962-79≠, 1994-98, 1999-2000≠, 2001r	2001	12.02	4,480	11-02-00	12.02	4,480

≠ Operated as a continuous-record gaging station

e Estimated stage as 0.3 ft above top of 9.01 ft pipe plus base cap elevation of 4.63 ft (gage datum). Caused by debris pile at entrance of culvert.

r 16717600 peak gage height and discharge published for water years 1973-78, 1980-90, 1995-97 were revised in water-resources data report for Hawaii, water year 1998

r 16717650 peak gage height and discharge published for water years 1966, 1969-74, 1976-78, 1980-84, 1987-90, 1996, 1999-2000 were revised in water-resources data report for Hawaii, water year 2001

¼r 16756500 peak gage height and discharge published for water years 1964, 1975, 1978, 1991-96 were revised in water-resources data report for Hawaii, water year 1998

r 16759040 peak gage height and discharge published for water years 1966, 1971-90, 1994-98 were revised in water-resources data report for Hawaii, water year 1999

r 16770500 peak gage height and discharge published for water years 1963, 1965-77, 1979-90, 1997-98 were revised in water-resources data report for Hawaii, water year 2001

Low-Flow Partial-Record Stations

Measurements of streamflow in the area covered by this report made at low-flow partial record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potential of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or nearly the same, site.

Discharge measurements made at low-flow partial-record stations during water year 2001

Station name and number	Location	Period of record	Date	Measurement	
				Gage height (ft)	Discharge (ft^3/s)
Island of Oahu					
16238500 Waihi Stream at Honolulu	Lat 21°19′55″, long 157°48′12″, 100 ft upstream from bridge on Waaloa Way, 700 ft upstream from confluence with Waiakeakua Stream, and 4.2 mi northeast of Honolulu Post Office.	1913-21≠, 1925-83¼≠, 1999-2000	11-02-00 04-10-01	-- --	4.54 4.42
16344000 Opaeula Stream at alt 2,620 ft	Lat 21°33′17″, long 157°55′36″, 250 ft downstream from Kawailoa Forest fence line.		01-25-01	--	0.06
16344100 Opaeula Stream Trib at alt 2,600 ft	Lat 21°33′25″, long 157°55′40″, 25 ft upstream from Kawailoa Forest fence line.		01-25-01	--	0.03
Island of Maui					
16588000 Wailoa ditch at Honopou, near Huelo	Lat 20°53′20″, long 156°15′19″, on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mi west of Lupi, and 2.2 mi southwest of Huelo.	1924-87≠, 1988-2001	12-21-00 03-09-01 05-31-01 08-28-01	4.78 5.19 2.57 4.82	209 231 79.7 206
16589000 New Hamakua ditch at Honopou, near Huelo	Lat 20°53′28″, long 156°15′22″, on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing and 2.1 mi southwest of Huelo.	1919-85≠, 1986-2001	12-18-00 03-09-01 05-31-01 08-28-01	0.84 5.39 0.87 1.15	0.82 152 1.03 3.94
16592000 Lowrie ditch at Honopou Gulch, near Huelo	Lat 20°54′57″, long 156°15′08″, on left bank 0.2 mi downstream from siphon across Honopou Stream, 1.6 mi west of Huelo, and 2.7 mi northwest of Kailua.	1911-26≠, 1931-85≠, 1986-2001	12-21-00 12-21-00 03-01-01 06-05-01	3.59 3.44 2.43 3.28 2.94	51.7 49.9 7.55 47.1 26.6
16594000 Haiku ditch at Honopou Gulch, near Kailua	Lat 20°55′07″, long 156°14′58″, on right bank on west side of Honopou Gulch, 160 ft below Hana Highway, 2.5 mi northwest of Kailua, and 5.0 mi east of Haiku.	1911≠¼, 1914≠¼, 1916-28≠¼, 1931-85≠¼, 1986-2001	12-21-00 12-21-00 03-01-01 03-09-01 06-05-01 08-28-01	1.75 1.4 0.3 1.48 0.42 0.41	44.8 28.4 1.04 31.5 2.07 1.98
205915156360001 Honokohau Stream 4.0	Lat 20°59′15″, long 156°36′00″, Honokohau Stream, upstream from Taro Gate release, at altitude 410 ft.	1995, 1997-2001	12-19-00	--	1.18
205928156360601 Honokohau Stream 5.9	Lat 20°59′28″, long 156°36′06″, Honokohau Stream, 350 ft upstream from dam, at altitude 350 ft.	1997-2001	12-19-00	--	1.85
210128156364201 Honokohau Stream 9.1	Lat 21°01′28″, long 156°36′42″, Honokohau Stream, 100 ft downstream from Highway 340 bridge, at altitude 5 ft.	1997-2000	12-19-00	--	1.13
Island of Hawaii					
194202155111501 Olaa Spring near Kaumana	Lat 19°42′02″, long 155°11′15″, at Olaa Spring near Kaumana	1999-2001	01-09-01 01-30-01 06-08-01	1.90 1.19 1.74	4.67 2.39 7.68

≠ Operated as a continuous-record gaging station

Discharge measurements made at miscellaneous sites during water year 2001

Station name and number	Location	Measured previously (water years)	Date	Discharge (ft^3/s)
	Island of Hawaii--Continued			
191209155282301 Paauau Stream below Hwy 11 at Pahalo	Lat 19°12'09", long 155°28'23", 100 ft downstream from Hwy 11 bridge at Pahala	--	11-02-00	7,180
191616155282601 Waiakaloa Gulch at Wood Valley Camp	Lat 19°16'16", long 155°28'26", 400 ft downstream from unnamed road and across from Wood Valley Camp	--	11-02-00	5,500
191822155281601 Waihaka Stream at alt 3,230 ft near Pahala	Lat 19°18'22", long 155°28'16", just upstream from old road crossing at alt 3,230 ft	--	11-02-00	7,150
191744155273001 Waihaka Stream at alt 2,740 ft near Pahala	Lat 19°17'44", long 155°27'30", just upstream from old road crossing at alt 2,740 ft	--	11-02-00	8,920
191702155271301 Waihaka Stream at alt 2,290 ft near Pahala	Lat 19°17'02", long 155°27'13", at alt 2,290 ft and upstream from Kapapala Ranch	--	11-02-00	11,600
192228155224201 Unnamed Stream abv Peter Lee Road near Wood Valley	Lat 19°22'28", long 155°22'42", unnamed stream above Peter Lee Road	--	11-02-00	530
192314155215901 Unnamed Gulch at alt 3,470 ft at Kaoiki Pali near Volcano	Lat 19°23'14", long 155°21'59", at alt 3,470 ft at Kaoiki Pali	--	11-02-00	229
192326155215101 Unnamed Gulch at alt 3,530 ft at Kaoiki Pali near Volcano	Lat 19°23'26", long 155°21'51", at alt 3,530 ft at Kaoiki Pali	--	11-02-00	54
192400155212101 Unnamed Gulch at alt 3,460 ft at Kaoiki Palli near Volcano	Lat 19°24'00", long 155°21'21", at alt 3,460 ft at Kaoiki Pali	--	11-02-00	145
192507155210401 Unnamed Gulch at alt 4,000 ft near Volcano	Lat 19°25'07", long 155°21'04", unnamed gulch at alt 4,000 ft	--	11-02-00	262
193940155073901 Waiakea Stream above Hoaka Street at Waiakea	Lat 19°39'40", long 155°07'39", 0.25 mi upstream from Hoaka Street bridge	--	11-02-00	6,420

Miscellaneous water-quality measurements during water year 2001

Station name and number	Location	Date and time	Water temperature °C	Suspended sediment (mg/L)
	Island of Oahu			
16344000 Opaeula Stream at alt 2,620 ft	Lat 21°33′17″, long 157°55′36″, 250 ft downstream from Kawailoa Forest fence line.	01-25-01 time=1225	16.5	4
16344100 Opaeula Stream Trib at alt 2,600 ft	Lat 21°33′25″, long 157°55′40″, 25 ft upstream from Kawailoa Forest fence line.	01-25-01 time=1325	17.0	1

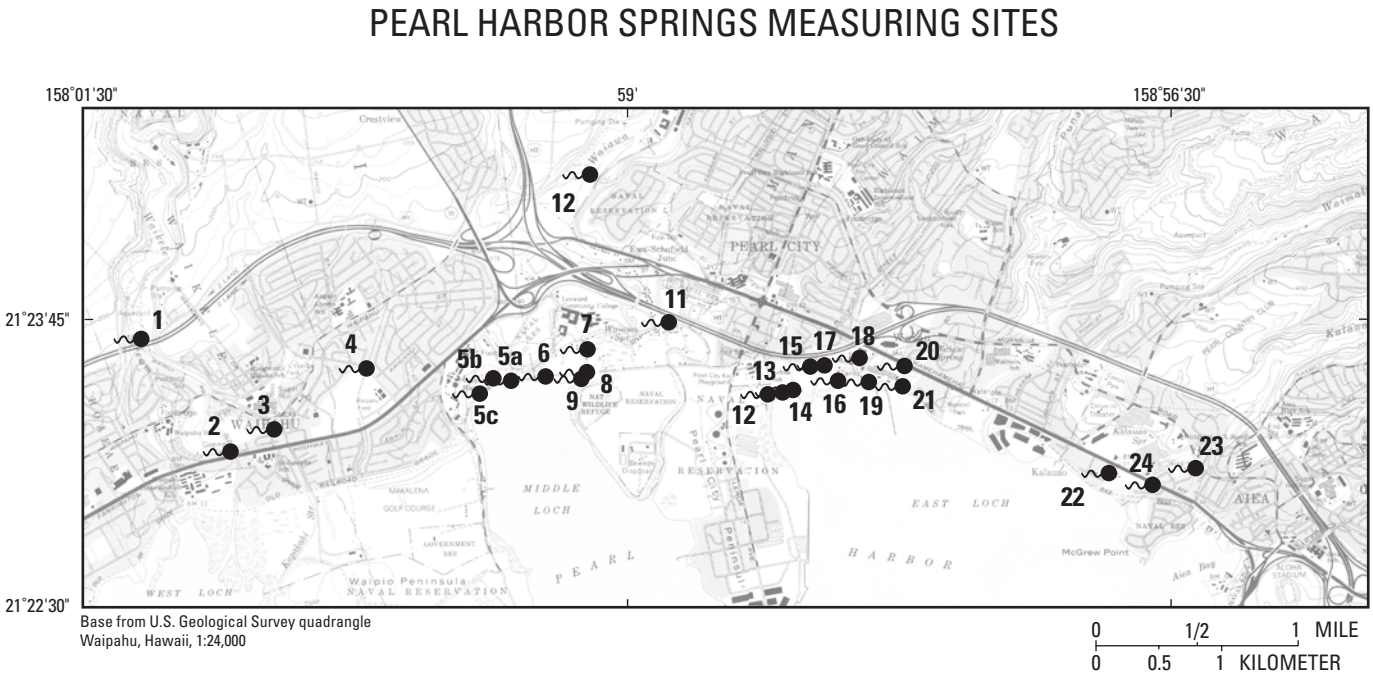


Figure 15. Map showing locations of Pearl Harbor Springs measuring sites, Oahu.

Discharge, specific-conductance, and water-temperature measurements at low-flow stations, Pearl Harbor Springs, Oahu

Map number (see figure 15)	Station number	Station name	Location	Time	Measurement		Specific conductance (µS/cm)	Water temperature (°C)
					Date	Discharge (ft^3/s)		
1	16212950	Waikele Stream below H-1 Freeway at Waipahu	Lat 21°23'39″, long 158°01'14″, below H-1 Freeway, 100 ft upstream from cane haul road, 0.7 mi northwest of Waipahu Sugar Mill, and 0.7 mi upstream from gaging station 16213000.	1119	05/07/01	10.9	82	24.0
				1025	07/18/01	2.02	125	26.0
2	16213000	Waikele Stream at Waipahu	Lat 21°23′11″, long 158°00′49″, on left bank 300 ft upstream from bridge on Highway 90, and 0.3 mi southwest of former sugar refinery at Waipahu.	0951	05/07/01	25.5	278	24.0
				0817	07/18/01	15.5	487	22.5
3	212317158003701	Kapakahi Stream above Farrington Highway	Lat 21°23′17″, long 158°00′37″, upstream from two 4-ft concrete pipe culverts in parking lot of shopping center at Hanawai Circle at Waipahu, 500 ft upstream from Farrington Highway.	1238	05/07/01	1.38	489	23.5
				1130	07/18/01	1.43	550	23.5
4	212332158001201	Waipahu Drainage Canal above Paiwa Street	Lat 21°23′32″, long 158°00′12″, 1,500 ft upstream from Farrington Highway and 0.5 mi east of Waipahu Sugar Mill, upstream from Paiwa Street bridge.	0855	05/07/01	1.82	530	22.5
				0925	07/18/01	1.40	560	24.0
5	212328157593601	Spring Outlet 2 West of Waiawa Spring	Lat 21°23′28″, long 157°59′36″, a 5×8 ft concrete box culvert 0.4 mi west of Waiawa Spring outlet and 1,200 ft east of Waipahu High School. Drains from former watercress fields (now covered) to Pearl Harbor.	1014	05/08/01	0.22	3,480	24.0
				0835	07/19/01	0.27	4,500	25.0
6	212330157592201	Spring Outlet 1 West of Waiawa Spring	Lat 21°23′30″, long 157°59′22″, a 12-in. concrete pipe culvert 1,000 ft west of Waiawa Spring outlet and 2,500 ft east of Waipahu High School. Drains from former watercress fields (now covered) to Pearl Harbor.	1018	05/08/01	0.48	4,090	24.0
				0914	07/19/01	0.45	4,430	23.0
7	16214000	Pearl Harbor Springs at Waiawa near Pearl City	Lat 21°23′36″, long 157°59′11″, near Leeward Community College, 0.7 mi west of Pearl City, and 9.8 mi northwest of Honolulu, about 350 ft upstream from the mouth.	0910	05/08/01	11.8	3,180	23.5
				0749	07/19/01	11.1	3,300	23.0
10	16215800	Waiawa Stream above Kamehameha Highway near Pearl City	Lat 21°24′23″, long 157°59′10″, 50 ft downstream from old cane haul road in Pearl City Industrial Park, 2,000 ft upstream from Kamehameha Highway, and 0.6 mi upstream from gaging station 16216000.	1245	05/08/01	4.39	148	23.5
				1005	07/18/01	Dry	--	--
11	16216100	Waiawa Stream below H-1 near Pearl City	Lat 21°23′44″, long 157°58′48″, below H-1 Freeway, 1,200 ft downstream from gaging station 16216000, and 2,000 ft east of Leeward Community College.	1252	05/08/01	8.01	349	23.5
				1112	07/18/01	3.32	713	22.0
12	212325157581801	Puukapu Site 3	Lat 21°23′25″, long 157°58′18″, at a 3-ft concrete pipe 1,000 ft west of Waimano flood channel at mouth. Drains from watercress fields to Pearl Harbor.	1010	05/08/01	1.14	1,220	21.0
				0922	07/19/01	1.27	1,200	21.0

Discharge, specific-conductance, and water-temperature measurements at low-flow stations, Pearl Harbor Springs, Oahu--Continued

Map number (see figure 15)	Station number	Station name	Location	Time	Measurement		Specific conductance (µS/cm)	Water temperature (°C)
					Date	Discharge (ft^3/s)		
13	212325157581301	Puukapu Site 2	Lat 21°23′25″, long 157°58′13″, at two 4-ft concrete culverts on concrete roadway 100 ft north of old concrete gage house and 300 ft west of Waimano flood channel at mouth.	0926	05/08/01	2.00	1,450	21.5
				0845	07/19/01	1.82	1,470	21.5
14	212326157580901	Puukapu Site 1	Lat 21°23′26″, long 157°58′09″, at two 3-ft concrete pipe culverts on right bank of Waimano flood channel at mouth. Drains from watercress fields to mouth of channel.	0848	05/08/01	0.61	2,670	20.0
				0920	07/19/01	0.50	2,610	20.5
15	16216550	Waimano Flood Channel below H-1 at Pearl City	Lat 21°23′32″, long 157°58′08″, 100 ft below Pearl Harbor bikeway, 600 ft from mouth, and 1,600 ft west of Hawaiian Electric Co. power plant at Waiau.	1028	05/08/01	0.62	385	22.0
				1005	07/18/01	0.64	344	22.5
17	212333157580101	Kaluaoopu Spring	Lat 21°23′33″, long 157°58′01″, at concrete bridge on bikeway, 700 ft west of No. 1 generator in the Hawaiian Electric Co. power plant. Measures the combined flow from the watercress fields and freeway storm drain.	0927	05/07/01	5.98	905	--
				0820	07/18/01	6.46	960	21.0
18	16219000	Hawaiian Electric Co. Tunnel at Waiau near Pearl City	Lat 21°23′33″, long 157°57′55″, concrete ditch at Hawaiian Electric Co. Waiau power plant, 20 ft downstream from tunnel portal, and 0.6 mi east of Pearl City.	1125	05/08/01	1.96	917	20.5
				1055	07/19/01	2.08	968	21.0
19	212329157575001	Makai Spring at Hawaiian Electric Co. Power Plant	Lat 21°23′29″, long 157°57′50″, south of power plant at outlet of a 30-in. concrete pipe draining overflow from power plant and seepage from Old Rice Mill Spring into Pearl Harbor.	0847	05/07/01	0.44	1,260	20.5
				0905	07/18/01	0.50	1,390	20.5
20	212331157574101	Waiau Spring below Kamehameha Highway	Lat 21°23′31″, long 157°57′41″, below Kamehameha Highway and 500 ft from outlet to Pearl Harbor. Drains from Waiau Springs.	1325	05/07/01	1.24	335	22.0
				1429	07/18/01	1.13	358	22.0
22	16224000	Pearl Harbor Spring at Kalauao near Aiea	Lat 21°23′06″, long 157°56′46″, at Kamehameha Highway bridge, drains from Sumida watercress farm, 1.1 mi west of Aiea, and 7.6 mi northwest of Honolulu.	0850	05/07/01	10.5	1,500	22.0
				0943	07/18/01	10.7	1,500	23.0
23	16224500	Kalauao Stream at Moanalua Road at Aiea	Lat 21°23′07″, long 157°56′22″, at Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	1116	05/07/01	1.00	344	24.0
				0829	07/18/01	3.31	516	21.5
24	16224550	Kalauao Stream above Kamehameha Highway at Aiea	Lat 21°23′02″, long 157°56′35″, above Kamehameha Highway and 1,300 ft from mouth, 1,000 ft downstream from gaging station 16224500, and 0.8 mi northwest of Aloha Stadium.	0951	05/07/01	1.13	425	24.0
				0736	07/18/01	3.42	561	21.5

Water-quality partial-record stations are particular sites where chemical-quality, and/or sediment data are collected systematically over a period of years for use in hydrologic analyses.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

HAWAII, ISLAND OF OAHU

16226400 NORTH HALAWA STREAM NEAR QUARANTINE STATION AT HALAWA (LAT 21°22'28" LONG 157°54'59")

16226400 -- N. Halawa Str nr Quar. Stn. at Halawa, Oahu, HI

DATE	TIME	SAMPLE TYPE	GAGE HEIGHT (FEET) (00065)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SAM-PLING METHOD, CODES (82398)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
JUN													
05...	1720	9	--	66	--	10	6.5	7.8	105	101	22.7	90	82
SEP													
16...	1500	9	4.91	--	33	10	7.4	7.2	101	102	23.0	43	76

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L) (00556)	HYDRO-CARBONS PET.WAT FREON CHR.IR. RECOV. (MG/L) (45501)
JUN													
05...	<.040	.69	<.050	E.005	<.060	.152	31	.04	6.6	1	12	<1	<2
SEP													
16...	<.040	.51	.158	<.006	<.060	.093	<10	E.03	6.2	1	11	<1	<2

16227100 HALAWA STREAM BELOW H-1 (LAT 21°23'46" LONG 157°55'57")

16227100 -- Halawa Stream below H-1, Oahu, HI

DATE	TIME	SAMPLE TYPE	GAGE HEIGHT (FEET) (00065)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SAM-PLING METHOD, CODES (82398)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUN													
05...	1605	9	1.16	83	70	8.3	7.5	119	116	24.9	92	86	<.040
SEP													
16...	1315	9	1.16	88	70	7.4	7.2	88	87	25.6	155	64	<.040

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L) (00556)	HYDRO-CARBONS PET.WAT FREON CHR.IR. RECOV. (MG/L) (45501)
JUN												
05...	.68	<.050	.006	.070	.202	20	.08	9.5	3	30	<1	<2
SEP												
16...	1.4	.179	.009	E.042	.341	40	.12	20.1	7	50	<1	<2

Sample type

9 Regular
E Estimated

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

HAWAII, ISLAND OF OAHU

212356157531801 NORTH HALAWA STREAM AT BRIDGE 8 NEAR HALAWA (LAT 21°23'56" LONG 157°53'18")

DATE	TIME	SAMPLE TYPE	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SAM-PLING METHOD, CODES (82398)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
JUN													
05...	1715	9	40	10	7.3	7.5	84	89	20.9	58	58	<.040	.78
SEP													
16...	1330	9	30	10	7.4	7.1	82	97	23.0	32	60	<.040	.51

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L) (00556)	HYDRO-CARBONS PET.WAT FREON CHR.IR. RECOV. (MG/L) (45501)
JUN											
05...	<.050	.007	<.060	.109	25	E.02	3.6	<1	9	<1	<2
SEP											
16...	.085	<.006	<.060	.090	17	E.02	4.5	<1	5	<1	<2

Sample type

9 Regular
E Estimated

Ground-Water Station Records

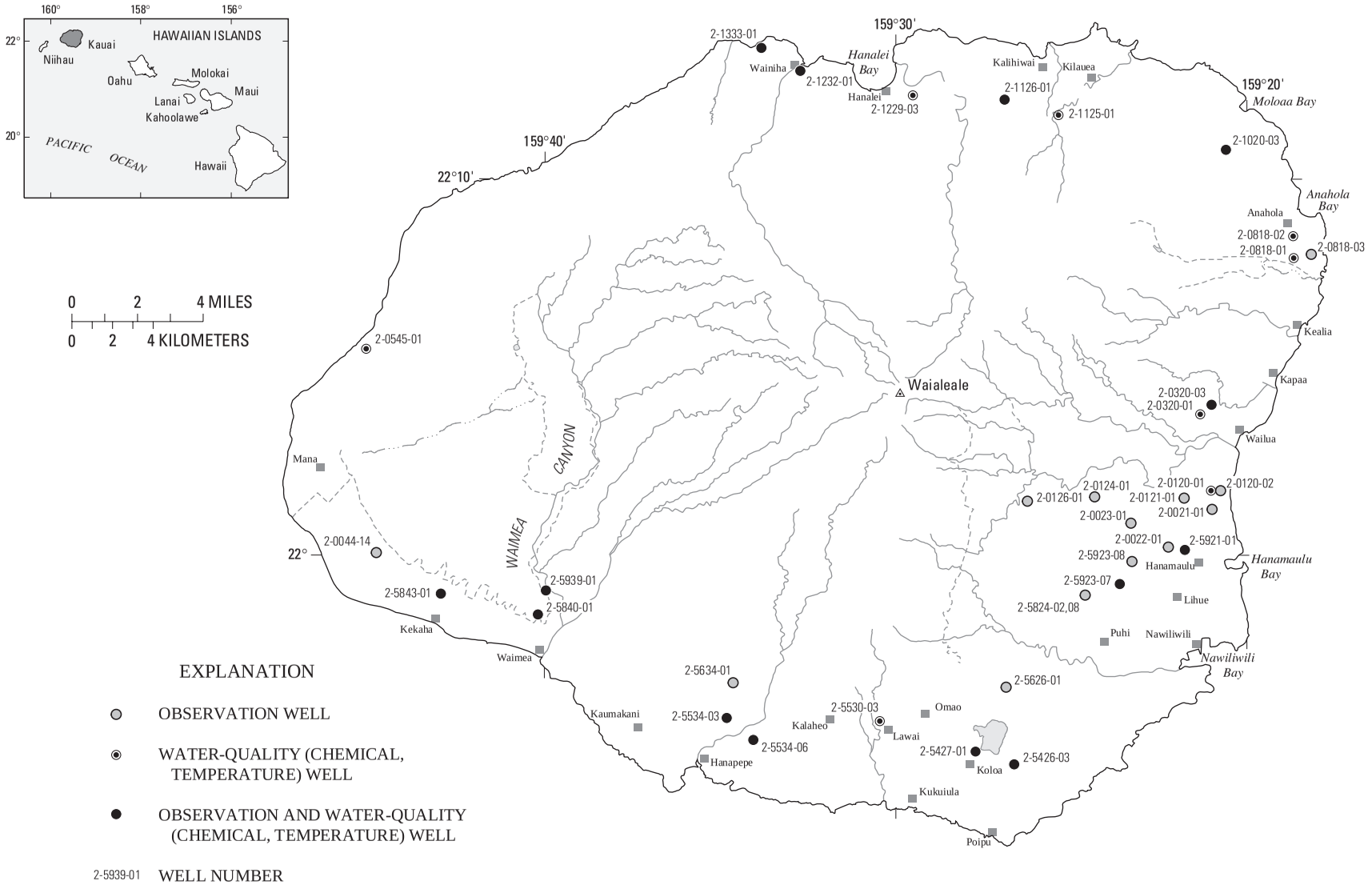


Figure 16. Locations of observation wells and ground-water quality sampling sites on Kauai.

HAWAII, ISLAND OF KAUAI

220057159210301. Local number 2-0021-01. Kalepa Ridge, Kauai.

LOCATION.--Lat 22°00'57", long 159°21'03", Hydrologic Unit 20070000, 1.0 mi southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park. Owner: State of Hawaii.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 277 ft, casing diameter 8-in., cased to 196 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point is the top of 4-in. galvanized coupling, 166.70 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1980 to June 1993. Water-level recorder, June 1993 to November 1999. Occasional measurements, November 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.86 ft above mean sea level, March 3, 1995; lowest water level measured, 9.05 ft above mean sea level, August 16, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	12.70	DEC 11	11.66	JAN 22	11.16	APR 24	10.06	MAY 22	9.71	AUG 16	9.05

WATER YEAR 2001 LOWEST 9.05 AUG 16, 2001 HIGHEST 12.70 OCT 19, 2000

220013159224001. Local number 2-0022-01, Hanamaulu W-1, Kauai.

LOCATION.--Lat 22°00'13", long 159°22'40", Hydrologic Unit 20070000, 3.2 mi north of Lihue, and 1.4 mi west of the nearest shoreline. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 700 ft; 20-in. solid casing: 0-58 ft; grouted: 0-58 ft; open hole: 58 ft to bottom.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point is the top of 4-in. stem welded to 20-in. casing, 277.67 ft above mean sea level.

PERIOD OF RECORD.--Water-level: occasional measurements, February 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 251.64 ft above mean sea level, August 2, 1999; lowest water level measured, 235.51 ft above mean sea level, September 27, 2001.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai, Department of Water.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	239.43	JAN 16	238.26	MAR 22	237.68	MAY 17	237.11	AUG 16	236.05		
NOV 28	238.93	FEB 13	238.07	APR 24	237.37	JUL 16	237.60	SEP 27	235.51		

WATER YEAR 2001 LOWEST 235.51 SEP 27, 2001 HIGHEST 239.43 OCT 18, 2000

HAWAII, ISLAND OF KAUAI--Continued

220051159231801. Local number 2-0023-01. Pukaki Reservoir monitor well, Kauai.

LOCATION.--Lat 22°00'51", long 159°23'18", Hydrologic Unit 20070000, 2.5 mi northwest of Lihue, and 2.8 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics and Waimea Canyon Basalt, Miocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,147 ft; 10-in. solid steel outer casing: 0-156 ft, 4-in. solid pvc casing: 0-20 ft, annular space grouted: 0-156 ft, open hole: 156 ft to bottom.

DATUM.--Elevation of land-surface datum is 319 ft. Measuring point is the top of 4-in. well casing, 319.88 ft above mean sea level.

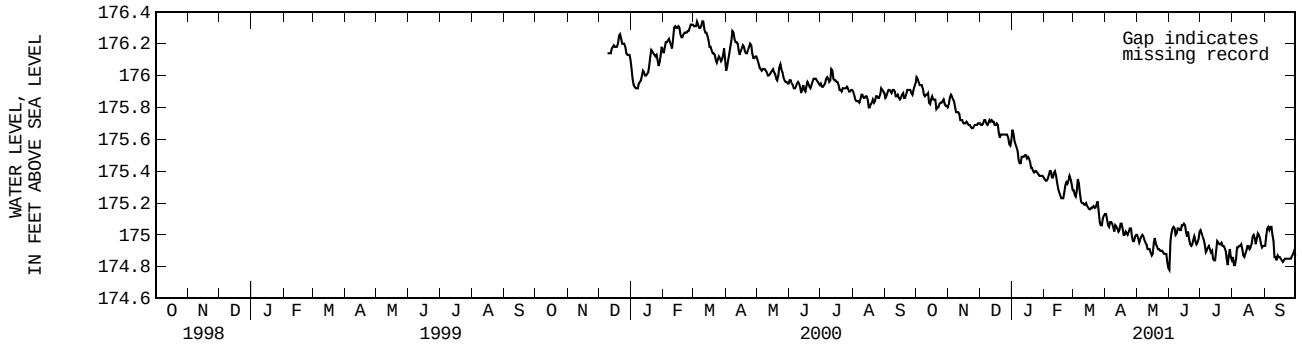
PERIOD OF RECORD.--Water-level: occasional measurements, November 1996 to December 8, 1999. Continuous water-level recorder, December 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 176.77 ft above mean sea level, August 2, 1999; lowest water level measured, 163.85 ft above mean sea level, November 14, 1996.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai, Department of Water.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	175.99	175.82	175.70	175.66	175.35	175.28	175.13	175.00	174.78	175.03	174.86	174.93
2	175.98	175.86	175.69	175.64	175.34	175.25	175.10	174.98	174.96	175.01	174.81	174.99
3	175.96	175.88	175.69	175.59	175.34	175.24	175.06	174.95	175.01	174.99	174.81	175.04
4	175.94	175.87	175.70	175.57	175.35	175.28	175.05	174.97	175.04	174.97	174.85	175.05
5	175.94	175.85	175.72	175.55	175.37	175.35	175.08	174.99	175.05	174.94	174.92	175.03
6	175.94	175.84	175.72	175.53	175.40	175.32	175.08	175.00	175.04	174.89	174.92	175.05
7	175.92	175.80	175.70	175.47	175.40	175.26	175.07	174.99	175.00	174.90	174.93	175.05
8	175.88	175.77	175.69	175.45	175.36	175.21	175.05	174.97	175.01	174.92	174.93	175.00
9	175.87	175.77	175.70	175.45	175.36	175.20	175.02	174.95	175.04	174.93	174.94	174.96
10	175.88	175.77	175.72	175.49	175.39	175.20	175.06	174.94	175.04	174.91	174.91	174.86
11	175.88	175.76	175.71	175.49	175.40	175.19	175.05	174.91	175.03	174.89	174.87	174.86
12	175.89	175.72	175.72	175.49	175.37	175.19	175.04	174.91	175.03	174.90	174.86	174.84
13	175.83	175.72	175.71	175.50	175.33	175.20	175.02	174.91	175.06	174.85	174.88	174.87
14	175.82	175.72	175.71	175.50	175.29	175.18	175.03	174.89	175.06	174.84	174.90	174.86
15	175.85	175.70	175.69	175.48	175.27	175.17	175.07	174.87	175.07	174.84	174.93	174.86
16	175.87	175.70	175.69	175.49	175.25	175.16	175.07	174.88	175.06	174.90	174.93	174.85
17	175.85	175.70	175.70	175.48	175.23	175.16	175.04	174.95	175.02	174.96	174.91	174.84
18	175.85	175.71	175.69	175.46	175.23	175.17	175.00	174.98	174.99	174.95	174.92	174.83
19	175.85	175.70	175.64	175.42	175.23	175.17	175.00	174.94	175.02	174.94	174.94	174.84
20	175.79	175.69	175.61	175.42	175.27	175.18	175.02	174.93	174.97	174.94	174.99	174.85
21	175.80	175.69	175.63	175.40	175.31	175.17	175.01	174.91	174.94	174.95	175.00	174.85
22	175.80	175.68	175.63	175.39	175.33	175.17	175.00	174.91	174.93	174.93	174.98	174.85
23	175.82	175.67	175.63	175.40	175.32	175.19	175.02	174.90	174.94	174.93	174.94	174.85
24	175.83	175.67	175.63	175.40	175.34	175.21	175.04	174.90	174.97	174.92	174.98	174.85
25	175.83	175.68	175.63	175.39	175.37	175.15	175.04	174.90	174.99	174.90	175.01	174.85
26	175.84	175.69	175.63	175.38	175.35	175.08	174.99	174.89	174.96	174.85	175.00	174.85
27	175.85	175.69	175.63	175.37	175.32	175.06	174.96	174.88	174.94	174.81	174.98	174.87
28	175.82	175.69	175.61	175.37	175.28	175.06	174.96	174.88	174.95	174.87	174.94	174.88
29	175.81	175.70	175.57	175.37	---	175.10	174.99	174.88	174.97	174.91	174.92	174.90
30	175.81	175.70	175.56	175.37	---	175.12	175.00	174.83	175.02	174.86	174.93	174.87
31	175.80	---	175.59	175.36	---	175.13	---	174.79	---	174.84	174.93	---
MEAN	175.86	175.74	175.67	175.46	175.33	175.19	175.03	174.92	175.00	174.91	174.92	174.90
MAX	175.99	175.88	175.72	175.66	175.40	175.35	175.13	175.00	175.07	175.03	175.01	175.05
MIN	175.79	175.67	175.56	175.36	175.23	175.06	174.96	174.79	174.78	174.81	174.81	174.83



HAWAII, ISLAND OF KAUAI--Continued

220019159444801. Local number 2-0044-14. Kaunalewa, Kauai.

LOCATION.--Lat 22°00'19", long 159°44'48", Hydrologic Unit 20070000,1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 245 ft, casing diameter 13-in., cased to 164 ft.

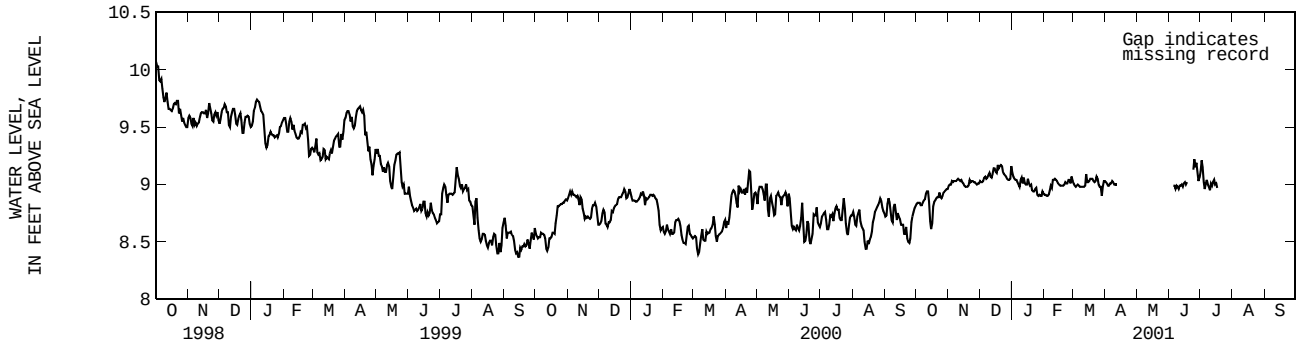
DATUM.--Elevation of land-surface datum is 8 ft. Measuring point is the top of standpipe, 11.49 ft until February 9, 1997; changed measuring point to top of recorder shelf on February 10, 1997, 11.57 ft above mean sea level. Prior to June 1979, nonrecording gage at datum 0.25 ft lower.

PERIOD OF RECORD.--Occasional measurements 1937 to 1962 (measured by Kekaha Sugar Company). Water-level recorder, June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.07 ft above mean sea level, December 20, 1937; lowest water level measured, 7.52 ft above mean sea level, August 15, 1947.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.83	8.99	9.03	9.10	8.91	9.01	9.02	---	---	9.11	---	---
2	8.84	9.00	9.02	9.07	8.91	8.99	9.01	---	---	9.21	---	---
3	8.84	9.00	9.02	9.05	8.90	8.98	8.99	---	---	9.15	---	---
4	8.84	9.03	9.03	9.04	8.90	8.99	8.99	---	---	9.02	---	---
5	8.82	9.02	9.06	9.04	8.91	9.00	9.01	---	8.99	8.96	---	---
6	8.82	9.03	9.07	9.02	8.95	8.99	9.01	---	8.99	9.01	---	---
7	8.84	9.03	9.05	9.00	8.99	8.98	9.03	---	8.96	9.04	---	---
8	8.86	9.03	9.06	8.98	8.97	8.98	9.02	---	8.99	9.00	---	---
9	8.87	9.04	9.08	9.04	9.04	8.98	9.00	---	8.98	8.98	---	---
10	8.92	9.05	9.10	9.06	9.04	8.98	9.00	---	8.96	8.95	---	---
11	8.94	9.04	9.07	9.01	9.05	8.98	9.00	---	8.99	9.01	---	---
12	8.94	9.03	9.06	9.06	9.04	8.99	---	---	8.99	8.99	---	---
13	8.85	9.04	9.09	9.01	9.03	9.09	---	---	9.00	9.02	---	---
14	8.68	9.02	9.14	9.00	9.01	9.02	---	---	8.98	9.04	---	---
15	8.61	9.01	9.14	9.00	9.00	9.02	---	---	9.01	9.00	---	---
16	8.66	8.99	9.11	9.05	8.99	9.03	---	---	9.02	9.01	---	---
17	8.81	8.98	9.10	9.01	8.99	9.05	---	---	9.00	8.97	---	---
18	8.85	8.98	9.17	8.99	8.99	9.05	---	---	9.02	---	---	---
19	8.86	8.98	9.14	9.00	8.99	9.05	---	---	---	---	---	---
20	8.88	8.99	9.16	8.95	9.00	9.03	---	---	---	---	---	---
21	8.89	9.04	9.17	8.94	9.02	9.02	---	---	---	---	---	---
22	8.89	9.02	9.16	8.94	9.01	9.03	---	---	---	---	---	---
23	8.93	9.03	9.11	8.96	9.01	9.07	---	---	---	---	---	---
24	8.89	9.03	9.09	8.97	9.04	9.05	---	---	9.13	---	---	---
25	8.88	9.02	9.08	8.91	9.04	9.00	---	---	9.22	---	---	---
26	8.90	9.02	9.07	8.90	9.01	8.98	---	---	9.15	---	---	---
27	8.93	9.01	9.05	8.91	9.07	8.98	---	---	9.19	---	---	---
28	8.94	9.00	9.04	8.90	9.03	8.90	---	---	9.11	---	---	---
29	8.95	9.01	9.04	8.90	---	8.98	---	---	9.03	---	---	---
30	8.96	9.01	9.05	8.94	---	9.03	---	---	9.06	---	---	---
31	8.96	---	9.16	8.92	---	9.03	---	---	---	---	---	---
MEAN	8.86	9.02	9.09	8.99	8.99	9.01	9.01	---	9.04	9.03	---	---
MAX	8.96	9.05	9.17	9.10	9.07	9.09	9.03	---	9.22	9.21	---	---
MIN	8.61	8.98	9.02	8.90	8.90	8.90	8.99	---	8.96	8.95	---	---



HAWAII, ISLAND OF KAUAI--Continued

220133159242001. Local number, 2-0124-01. Northeast Kilohana monitor well.

LOCATION.--Lat 22°01'33", long 159°24'20", Hydrologic unit 20070000, 3.7 mi northwest of Lihue, and 3.8 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,033 ft, 10-in. solid steel outer casing: 0-161 ft; 4-in. solid steel casing: 0-80 ft; 4-in. alternating perforated/solid steel casing: 80-1,032 ft; annular space grouted: 0-160 ft; annular space open: 160-726 ft.

DATUM.--Elevation of land-surface datum is 466 ft. Measuring point is the top of 4-in. well casing, 467.12 ft above mean sea level.

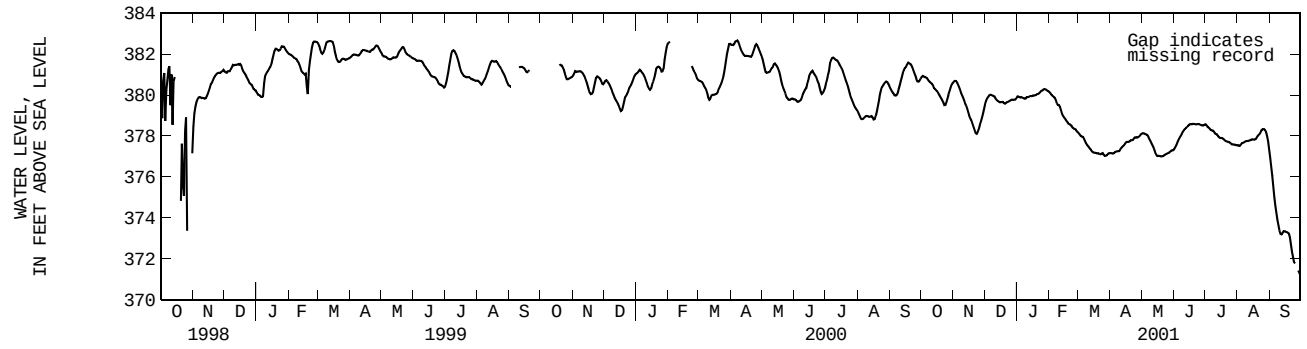
PERIOD OF RECORD.--Water level: occasional measurements, started in November 1996. Continuous water level recorder, December 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 388.31 ft above mean sea level, May 19, 1998; lowest water level measured, 368.10 ft above mean sea level, October 27, 1998.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai Department of Water. Water level affected by drilling of nearby well after August 2001.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	380.88	380.65	379.55	379.93	380.14	378.14	377.17	378.12	377.36	378.57	377.56	376.94
2	380.93	380.69	379.71	379.93	380.07	378.07	377.15	378.14	377.48	378.52	377.52	376.52
3	380.92	380.69	379.84	379.89	380.00	378.00	377.14	378.12	377.56	378.45	377.53	376.05
4	380.88	380.63	379.92	379.88	379.96	377.97	377.16	378.10	377.70	378.41	377.59	375.56
5	380.87	380.52	379.99	379.89	379.91	377.96	377.22	378.07	377.81	378.36	377.65	375.00
6	380.84	380.41	380.02	379.88	379.87	377.88	377.24	378.05	377.92	378.30	377.67	374.60
7	380.76	380.27	380.01	379.85	379.77	377.78	377.25	377.97	378.00	378.28	377.70	374.23
8	380.69	380.11	379.98	379.82	379.60	377.65	377.26	377.85	378.09	378.27	377.73	373.91
9	380.64	379.99	379.96	379.83	379.52	377.57	377.27	377.76	378.20	378.22	377.75	373.63
10	380.59	379.88	379.93	379.90	379.51	377.51	377.35	377.65	378.28	378.13	377.76	373.38
11	380.55	379.74	379.84	379.90	379.43	377.44	377.42	377.54	378.33	378.10	377.76	373.21
12	380.47	379.58	379.77	379.91	379.26	377.38	377.47	377.45	378.38	378.07	377.78	373.20
13	380.34	379.47	379.72	379.94	379.10	377.31	377.52	377.29	378.43	378.00	377.79	373.28
14	380.29	379.33	379.69	379.96	378.98	377.24	377.57	377.14	378.48	377.94	377.83	373.35
15	380.24	379.14	379.65	379.95	378.91	377.20	377.67	377.04	378.55	377.90	377.84	373.35
16	380.18	378.97	379.65	379.98	378.84	377.18	377.71	377.02	378.58	377.91	377.83	373.32
17	380.10	378.85	379.66	379.98	378.76	377.18	377.71	377.03	378.58	377.90	377.82	373.31
18	380.01	378.75	379.67	379.99	378.69	377.16	377.71	377.02	378.57	377.87	377.85	373.28
19	379.92	378.59	379.61	380.00	378.61	377.15	377.74	377.00	378.60	377.81	377.92	373.24
20	379.83	378.45	379.58	380.04	378.58	377.16	377.79	377.01	378.59	377.77	378.01	373.06
21	379.74	378.29	379.61	380.06	378.55	377.12	377.80	377.02	378.57	377.74	378.06	372.69
22	379.63	378.15	379.65	380.09	378.51	377.11	377.81	377.05	378.57	377.72	378.11	372.35
23	379.51	378.11	379.67	380.14	378.42	377.14	377.87	377.09	378.57	377.71	378.20	372.07
24	379.52	378.19	379.70	380.20	378.37	377.17	377.93	377.11	378.59	377.69	378.31	371.84
25	379.65	378.34	379.73	380.22	378.35	377.09	377.94	377.14	378.58	377.65	378.34	371.78
26	379.84	378.53	379.76	380.27	378.32	377.03	377.92	377.17	378.55	377.60	378.34	---
27	380.05	378.70	379.78	380.29	378.24	377.03	377.93	377.18	378.53	377.59	378.30	---
28	380.21	378.88	379.78	380.28	378.19	377.05	377.97	377.24	378.51	377.59	378.20	371.42
29	380.36	379.09	379.77	380.25	---	377.11	378.03	377.29	378.52	377.58	378.02	371.32
30	380.52	379.33	379.78	380.21	---	377.16	378.09	377.30	378.56	377.56	377.74	371.22
31	380.60	---	379.83	380.18	---	377.17	---	377.31	---	377.55	377.35	---
MEAN	380.31	379.34	379.77	380.02	379.09	377.39	377.59	377.43	378.30	377.96	377.87	373.47
MAX	380.93	380.69	380.02	380.29	380.14	378.14	378.09	378.14	378.60	378.57	378.34	376.94
MIN	379.51	378.11	379.55	379.82	378.19	377.03	377.14	377.00	377.36	377.55	377.35	371.22



HAWAII, ISLAND OF KAUAI--Continued

220126159261501. Local number, 2-0126-01. Northwest Kilohana monitor well, Kauai.

LOCATION.--Lat 22°01'26", long 159°26'15", Hydrologic unit 20070000, 5.3 northwest of Lihue, and 6.2 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics and Waimea Canyon Basalt, Miocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,004 ft, 10-in. solid steel outer casing: 0-198 ft; 4-in. solid pvc casing: 0-126 ft; 4.5-in. perforated pvc casing: 126 ft to bottom; annular space grouted: 0-198 ft; annular space open: 198 ft to bottom.

DATUM.--Elevation of land-surface datum is 678 ft. Measuring point is the top of 4-in. well casing, 679.06 ft above mean sea level.

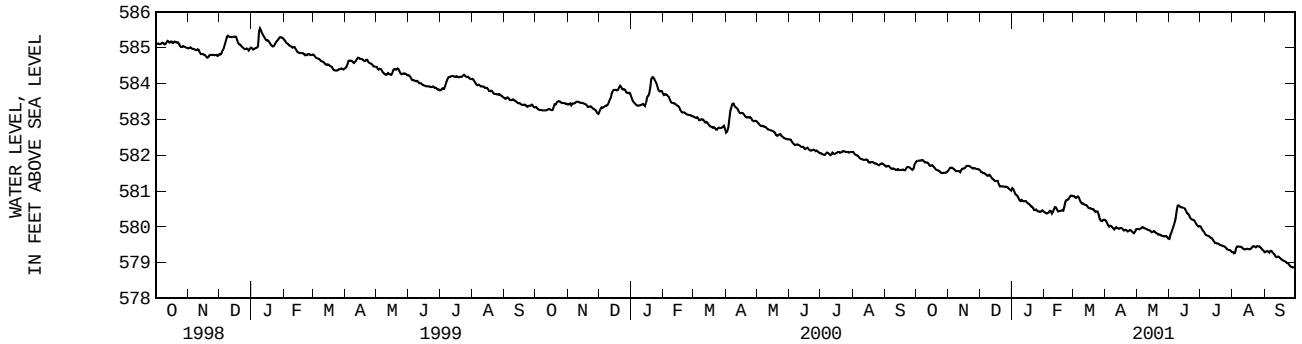
PERIOD OF RECORD.-- Water level: occasional measurements started in November 1996. Continuous water-level recorder, December 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 589.96 ft above mean sea level, December 23, 1996; lowest water level measured, 578.82 ft above mean sea level, September 30, 2001.

REMARKS.--Well part of network of observation wells in cooperation with the County of Kauai Department of Water.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	581.83	581.59	581.58	581.08	580.41	580.86	580.17	579.94	579.66	580.01	579.30	579.29
2	581.84	581.64	581.53	581.05	580.39	580.84	580.12	579.94	579.78	579.96	579.26	579.31
3	581.85	581.65	581.52	580.98	580.37	580.81	580.05	579.93	579.84	579.90	579.27	579.32
4	581.85	581.65	581.50	580.91	580.38	580.82	580.01	579.94	579.93	579.87	579.40	579.31
5	581.85	581.63	581.50	580.89	580.40	580.85	580.03	579.96	580.01	579.82	579.45	579.28
6	581.86	581.61	581.48	580.86	580.45	580.82	580.02	579.99	580.11	579.77	579.45	579.33
7	581.86	581.58	581.45	580.80	580.44	580.74	579.99	579.98	580.23	579.76	579.45	579.33
8	581.83	581.55	581.43	580.74	580.37	580.68	579.96	579.96	580.45	579.75	579.44	579.29
9	581.80	581.56	581.43	580.72	580.41	580.65	579.93	579.95	580.59	579.74	579.44	579.26
10	581.80	581.56	581.45	580.75	580.49	580.65	579.97	579.94	580.60	579.71	579.42	579.23
11	581.80	581.55	581.42	580.72	580.55	580.63	579.99	579.92	580.57	579.69	579.39	579.17
12	581.78	581.52	581.37	580.71	580.54	580.61	579.97	579.91	580.55	579.68	579.37	579.15
13	581.73	581.59	581.34	580.72	580.48	580.61	579.95	579.90	580.55	579.63	579.37	579.17
14	581.70	581.62	581.32	580.72	580.43	580.58	579.95	579.88	580.53	579.59	579.38	579.17
15	581.71	581.63	581.28	580.68	580.44	580.53	579.97	579.85	580.52	579.55	579.39	579.14
16	581.72	581.63	581.27	580.66	580.44	580.52	579.97	579.86	580.51	579.54	579.38	579.11
17	581.69	581.66	581.28	580.64	580.45	580.52	579.94	579.88	580.45	579.54	579.37	579.09
18	581.66	581.70	581.28	580.61	580.46	580.50	579.90	579.87	580.38	579.53	579.38	579.06
19	581.62	581.70	581.19	580.57	580.45	580.49	579.90	579.83	580.37	579.51	579.41	579.05
20	581.59	581.70	581.13	580.56	580.57	580.49	579.92	579.82	580.32	579.49	579.45	579.04
21	581.58	581.69	581.13	580.52	580.70	580.44	579.90	579.79	580.26	579.48	579.46	579.02
22	581.57	581.67	581.13	580.47	580.75	580.42	579.87	579.79	580.22	579.47	579.45	578.99
23	581.56	581.65	581.13	580.47	580.75	580.43	579.89	579.78	580.20	579.46	579.43	578.98
24	581.52	581.63	581.12	580.48	580.77	580.43	579.91	579.76	580.19	579.45	579.46	578.95
25	581.50	581.63	581.12	580.44	580.82	580.35	579.90	579.75	580.18	579.43	579.46	578.90
26	581.50	581.64	581.12	580.43	580.87	580.22	579.87	579.74	580.12	579.39	579.46	578.89
27	581.51	581.62	581.11	580.42	580.87	580.18	579.84	579.73	580.07	579.36	579.44	578.87
28	581.51	581.61	581.09	580.43	580.86	580.16	579.82	579.74	580.03	579.35	579.41	578.87
29	581.51	581.61	581.06	580.43	---	580.18	579.86	579.74	580.01	579.35	579.37	578.87
30	581.53	581.60	581.03	580.46	---	580.20	579.93	579.71	580.02	579.33	579.35	578.86
31	581.55	---	581.01	580.43	---	580.19	---	579.67	---	579.30	579.31	---
MEAN	581.68	581.62	581.28	580.66	580.55	580.53	579.95	579.85	580.24	579.59	579.40	579.11
MAX	581.86	581.70	581.58	581.08	580.87	580.86	580.17	579.99	580.60	580.01	579.46	579.33
MIN	581.50	581.52	581.01	580.42	580.37	580.16	579.82	579.67	579.66	579.30	579.26	578.86



HAWAII, ISLAND OF KAUAI--Continued

220354159205602. Local number, 2-0320-03. Nonou W-B, Kauai.

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 302 ft; 14-in. casing diameter, cased to 168 ft.

DATUM.--Elevation of land-surface datum is 156 ft. Measuring point is the top of 1-in. hole on pump base on southeast side after removing elbow and nipple, 156.94 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, August 1976 to current year. Water quality: occasional measurements, 1972, 1976 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level, November 19, 1982; lowest water level measured, 8.76 ft below mean sea level, August 2, 2001.

REMARKS.--Water is used for public supply. Water level affected by pumping and by nearby well.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	-3.03	DEC 20	-5.37	MAR 01	-7.02	APR 05	-7.33	JUN 07	-7.35	AUG 02	-9.05

220825159185301. Local number 2-0818-03. Anahola C, Kauai.

LOCATION.--Lat 22°08'25", long 159°18'50", Hydrologic Unit 20070000, 1.3 mi southwest of Kahala Point, and 0.2 mi south of Anahola School. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 466 ft, 12-in. casing diameter, cased to 290 ft.

DATUM.--Elevation of land-surface datum is 267 ft. Measuring point is the top of west side of 4 $\frac{1}{2}$-in. pipe at 268.99 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, October 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.64 ft above mean sea level, October 8, 1997; lowest water level measured, 7.34 ft above mean sea level, April 8, 1998, lowest water level measured with nearby pump on, 6.79 ft above mean sea level, February 15, 2000.

REMARKS.--Water for future public supply. Water level affected by pumping of nearby wells.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	10.69	DEC 20	9.08	MAR 01	10.58	APR 05	9.95	JUN 07	10.29	AUG 02	10.27

HAWAII, ISLAND OF KAUAI--Continued

221038159203801. Local number, 2-1020-03. Moloaa, Kauai.

LOCATION.--Lat 22°10'38", long 159°20'38", Hydrologic Unit 20070000, 2.6 mi south of Kulikoa Point, and 2.6 mi northwest of Kuaehu Point. Owner: Amfac Properties Development Corp.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 700 ft.

DATUM.--Elevation of land-surface datum is 358 ft. Measuring point is the top of temporary metal girder over well opening, elevation 358.52 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to 1991, 1997.

REVISED RECORDS.--WRD HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.56 ft above mean sea level, March 30, 1990; lowest water level measured, 66.17 ft above mean sea level, November 6, 1973, lowest water level measured with pump on, 42.69 ft above mean sea level, October 4, 1973.

REMARKS.--Pump is in the process of being replaced. Well unused at this time.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	88.09	DEC 06	89.22	JAN 23	91.28	APR 04	92.17	JUN 06	91.17	AUG 02	89.96

221150159264501. Local number, 2-1126-01. Princeville W-1, Kauai.

LOCATION.--Lat 22°11'50", long 159°26'45", Hydrologic Unit 20070000, 1.2 mi south of Princeville Airport terminal, and 4.0 mi east southeast of Puupoa Point. Owner: Princeville Hanalei.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 763 ft; 14-in. casing diameter, cased to 435 ft.

DATUM.--Elevation of land-surface datum is 349 ft. Measuring point is the top of 3/4-in. pipe, in 1-in. hole on southside of pump base, after removing airline connection, 349.88 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1977 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.36 ft above mean sea level, June 3, 1974; lowest water level measured, 4.12 ft below mean sea level, November 17, 1992, lowest water level measured with pump on, 10.30 ft below mean sea level, June 2, 1983.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by pumping and by nearby well.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	4.50	DEC 07	5.81	JAN 24	5.51	APR 04	6.08	JUN 06	6.04	AUG 08	5.50

HAWAII, ISLAND OF KAUAI--Continued

221247159324801. Local number, 2-1232-01. Wainiha, Kauai.

LOCATION.--Lat 22°12'47", long 159°32'48", Hydrologic Unit 20070000, 0.9 mi southwest of Kolokoko Point, and 1.5 mi southeast of Haena Point. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 188 ft, 6-in. casing diameter, cased to 140 ft.

DATUM.--Elevation of land-surface datum is 67 ft. Measuring point was the top of 1-in. pipe 0.06 ft above flange, 66.56 ft above mean sea level. New measuring point is the top of 1-in. pipe 0.16 ft above flange, 66.68 ft above mean sea level from levels of June 16, 1999.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1975 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.48 ft above mean sea level, June 3, 1974; lowest water level measured, 4.69 ft above mean sea level, August 6, 1993, lowest water level measured with pump on, 10.04 ft below mean sea level, June 9, 1975.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	6.99	DEC 20	7.71	JAN 13	9.05	APR 05		JUN 07	7.80	AUG 02	7.03

221318159335901. Local number, 2-1333-01. Haena, Kauai.

LOCATION.--Lat 22°13'18", long 159°33'59", Hydrologic Unit 20070000, 0.6 mi south southwest of Haena Point, and 1.2 mi east southeast of Kailiu Point. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 159 ft; 8-in. casing diameter, cased to 104 ft.

DATUM.--Elevation of land-surface datum is 82 ft. Measuring point is the top of airline hole after removing plug, elevation 82.05 ft above mean sea level from levels of December 12, 1995.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to current year.

REVISED RECORDS.--WRD HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.35 ft above mean sea level, December 8, 1989; lowest water level measured, 5.49 ft below mean sea level, June 7, 2001.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	-4.27	DEC 20	-3.26	MAR 01	-3.13	APR 05	-3.67	JUN 07	-5.49	AUG 02	-.22

HAWAII, ISLAND OF KAUAI--Continued

215434159263301. Local number, 2-5426-03. Koloa, Kauai.

LOCATION.--Lat 21°54'34", long 159°26'33", Hydrologic Unit 20070000, 0.6 mi northeast of Koloa Mill, and 2.6 mi north of Makahuena Point. Owner: Grove Farm Co. Inc.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 318 ft, 12-in. casing diameter, cased to 176 ft.

DATUM.--Elevation of land-surface datum is 222 ft. Measuring point is the top of 1-in. hole on southwest side of flange, 222.30 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1997.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft above mean sea level, January 10, 1974; lowest water level measured, 15.48 ft above mean sea level, June 16, 1982, lowest water level measured with pump on, 5.05 ft above mean sea level, March 10, 1975.

REMARKS.--Water used for irrigation. Water level affected by pumping.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	25.32	DEC 08	25.32	MAR 06	25.26	APR 03	25.28	JUN 04	25.23	JUL 30	24.96

WATER YEAR 2001 LOWEST 24.96 JUL 30, 2001 HIGHEST 25.32 OCT 13, 2000 DEC 08, 2000

215454159274201. Local number, 2-5427-01. Koloa W-A, Kauai.

LOCATION.--Lat 21°54'54", long 159°27'42", Hydrologic Unit 20070000, 0.1 mi west of the southwest corner of Waita Reservoir, and 2.7 mi northeast of Kaulala Point. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 455 ft; 12-in. casing diameter, cased to 263 ft.

DATUM.--Elevation of land-surface datum is 247 ft. Measuring point is the bottom edge of the east side opening on pump base 246.77 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-94 (the minimum water level for the period of record).

REVISED RECORDS.--WDR HI-01-1: 1988-2000 (the maximum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.74 ft above mean sea level, January 9, 1975; lowest water level measured, 27.97 ft above mean sea level, October 6, 1988, lowest water level measured with pump on, 22.77 ft above mean sea level, March 3, 1983.

REMARKS.--Water used for public supply. Water level affected by pumping and by nearby well.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 19	34.74	MAR 06	34.26	APR 04	34.33	JUN 28	33.99	JUL 31	34.06

WATER YEAR 2001 LOWEST 34.74 DEC 19, 2000 HIGHEST 34.74 DEC 19, 2000

HAWAII, ISLAND OF KAUAI--Continued

215522159342601. Local number, 2-5534-03. Hanapepe Town, Kauai.

LOCATION.--Lat 21°55'22", long 159°34'26", Hydrologic Unit 20070000, 1.9 mi north from Weli Point, and 2.9 mi northeast from Puolo Point. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 109 ft; 9-in. casing diameter.

DATUM.--Elevation of land-surface datum is 79 ft. Measuring point is the top of 3/4-in. galvanized pipe on northwest side of pump base 78.78 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.91 ft above mean sea level, February 1, 1990; lowest water level measured, 12.62 ft above mean sea level, May 20, 1986, lowest water level measured with pump on, 9.19 ft above mean sea level, October 13, 1978.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	15.39	DEC 19	15.87	MAR 06	15.15	APR 04	15.11	JUN 28	15.54	JUL 31	14.04

215509159340401. Local number, 2-5534-06. Upper Eleele Reservoir, Kauai.

LOCATION.--Lat 21°55'09", long 159°34'04", Hydrologic Unit 20070000, 1.6 mi north of Weli Point and 2.4 mi northeast of Puolo Point. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 740 ft; no final casing.

DATUM.--Elevation of land surface is 385.48 ft. Measuring point is top of standpipe, 386.61 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder January 11, 2000 to present.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.62 ft above mean sea level, January 19, 2000; lowest water level measured, 11.02 ft above mean sea level, June 29, 2000.

REMARKS.--Water level affected by pumping of nearby well.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	14.33	DEC 08	14.71	APR 04	13.60	JUL 30	13.16				
16	13.02	JAN 29	13.07	JUN 28	13.67						

HAWAII, ISLAND OF KAUAI--Continued

215630159265101. Local number, 2-5626-01. Puakukui Springs, Kauai.

LOCATION.--Lat 21°56'30", long 159°26'51", Hydrologic Unit 20070000, 5.7 mi south of Lihue, and 3.8 mi northwest of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 802 ft; 12.25-in. solid steel outer casing: 0-156 ft; 4-in. solid pvc casing: 0-20 ft; annular space grouted: 0-256 ft; open hole: 256 ft to bottom.

DATUM.--Elevation of land-surface is 485 ft. Measuring point is the top of 4-in. well casing, 485.40 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 180.15 ft above mean sea level, December 14, 1998; lowest water level measured, 173.49 ft above mean sea level, November 8, 1996.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai Department of Water.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	179.36	JAN 16	179.10	MAR 22	179.02	MAY 17	178.85	AUG 16	178.51		
NOV 28	179.21	FEB 13	179.06	APR 24	178.94	JUL 06	178.55	SEP 27	178.26		

HAWAII, ISLAND OF KAUAI--Continued

215607159344301. Local number 2-5634-01. Hanapepe Ridge, Kauai.

LOCATION.--Lat 21°56'07", long 159°34'43", Hydrologic Unit 20070000, 2.7 mi north of Weli Point, and 3.3 mi northeast of Puolo Point. Owner: State of Hawaii.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 508 ft, 8-in. casing diameter, cased to 507 ft.

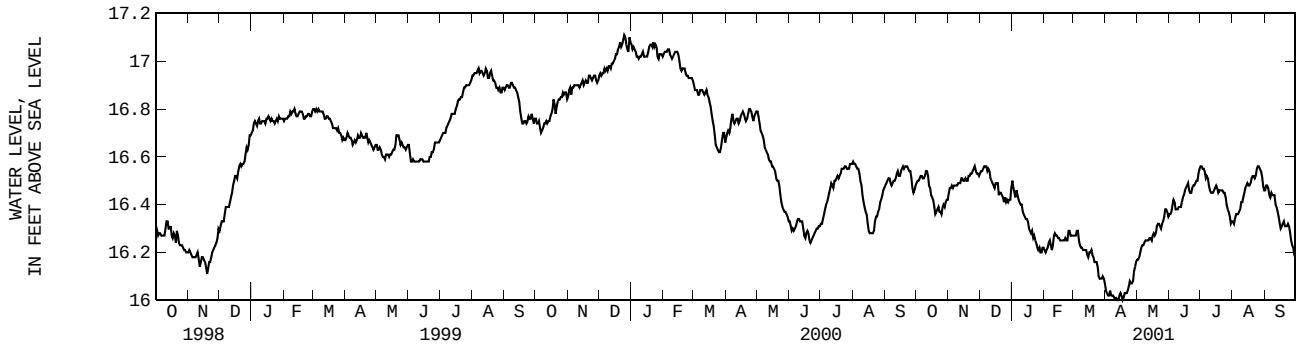
DATUM.--Elevation of land-surface datum is 439 ft. Measuring point is the top of recorder shelf 440.68 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.83 ft above mean sea level, January 15, 16, 1992; lowest water level measured, 15.87 ft above mean sea level, November 1, 1989.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.49	16.45	16.53	16.50	16.21	16.27	16.04	16.17	16.36	16.56	16.33	16.46
2	16.50	16.47	16.54	16.47	16.20	16.27	16.03	16.17	16.36	16.56	16.32	16.48
3	16.50	16.47	16.54	16.45	16.21	16.27	16.02	16.18	16.37	16.55	16.34	16.48
4	16.51	16.48	16.55	16.43	16.22	16.29	16.02	16.20	16.40	16.55	16.36	16.47
5	16.52	16.47	16.56	16.46	16.24	16.29	16.04	16.22	16.42	16.54	16.36	16.44
6	16.52	16.48	16.56	16.44	16.25	16.25	16.02	16.23	16.41	16.51	16.36	16.43
7	16.51	16.48	16.56	16.42	16.23	16.23	16.02	16.23	16.38	16.52	16.37	16.45
8	16.51	16.48	16.54	16.41	16.21	16.22	16.02	16.24	16.38	16.51	16.38	16.44
9	16.52	16.48	16.55	16.40	16.23	16.22	16.01	16.25	16.38	16.48	16.41	16.44
10	16.54	16.49	16.54	16.40	16.27	16.21	16.01	16.25	16.39	16.46	16.41	16.44
11	16.54	16.49	16.51	16.37	16.28	16.21	16.01	16.25	16.39	16.45	16.43	16.40
12	16.52	16.49	16.50	16.36	16.27	16.21	16.00	16.25	16.39	16.45	16.45	16.39
13	16.48	16.51	16.49	16.35	16.27	16.21	16.00	16.26	16.41	16.45	16.47	16.37
14	16.47	16.51	16.48	16.34	16.26	16.19	16.02	16.26	16.43	16.46	16.48	16.35
15	16.44	16.50	16.47	16.34	16.26	16.18	16.03	16.25	16.44	16.47	16.49	16.32
16	16.43	16.50	16.49	16.33	16.25	16.20	16.02	16.27	16.46	16.48	16.48	16.30
17	16.42	16.51	16.49	16.30	16.25	16.20	16.00	16.28	16.47	16.47	16.48	16.31
18	16.39	16.50	16.49	16.29	16.25	16.21	16.01	16.27	16.48	16.45	16.49	16.32
19	16.36	16.50	16.44	16.28	16.25	16.19	16.03	16.28	16.49	16.46	16.51	16.33
20	16.37	16.52	16.45	16.29	16.25	16.18	16.03	16.31	16.46	16.46	16.52	16.31
21	16.38	16.52	16.45	16.26	16.26	16.16	16.03	16.32	16.45	16.46	16.52	16.31
22	16.39	16.53	16.44	16.27	16.25	16.16	16.04	16.32	16.45	16.46	16.51	16.31
23	16.37	16.53	16.43	16.25	16.25	16.16	16.06	16.31	16.47	16.45	16.52	16.32
24	16.37	16.54	16.41	16.24	16.29	16.14	16.08	16.30	16.48	16.45	16.55	16.31
25	16.36	16.55	16.43	16.22	16.29	16.10	16.07	16.32	16.48	16.43	16.56	16.28
26	16.39	16.56	16.41	16.21	16.27	16.09	16.07	16.33	16.49	16.40	16.56	16.25
27	16.40	16.54	16.42	16.22	16.27	16.09	16.08	16.35	16.50	16.38	16.55	16.23
28	16.39	16.53	16.41	16.20	16.27	16.09	16.12	16.38	16.50	16.37	16.54	16.22
29	16.41	16.53	16.42	16.20	---	16.10	16.14	16.38	16.53	16.35	16.52	16.19
30	16.42	16.52	16.42	16.22	---	16.09	16.16	16.37	16.55	16.32	16.48	16.18
31	16.42	---	16.47	16.22	---	16.07	---	16.35	---	16.33	16.46	---
MEAN	16.45	16.50	16.48	16.33	16.25	16.19	16.04	16.28	16.44	16.46	16.46	16.35
MAX	16.54	16.56	16.56	16.50	16.29	16.29	16.16	16.38	16.55	16.56	16.56	16.48
MIN	16.36	16.45	16.41	16.20	16.20	16.07	16.00	16.17	16.36	16.32	16.32	16.18



HAWAII, ISLAND OF KAUAI--Continued

215856159243201. Local number, 2-5824-02. Kilohana D, Kauai.

LOCATION.--Lat 21°58'56", long 159°24'16", Hydrologic Unit 20070000, 2.0 mi west of Lihue, and 3.5 mi northwest of the nearest shoreline. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 250 ft, 12-in. solid casing: 0-60 ft; 12-in. perforated casing; 60-185 ft; 8-in. open hole: 185-200 ft; 6-in. open hole; 200-250 ft.

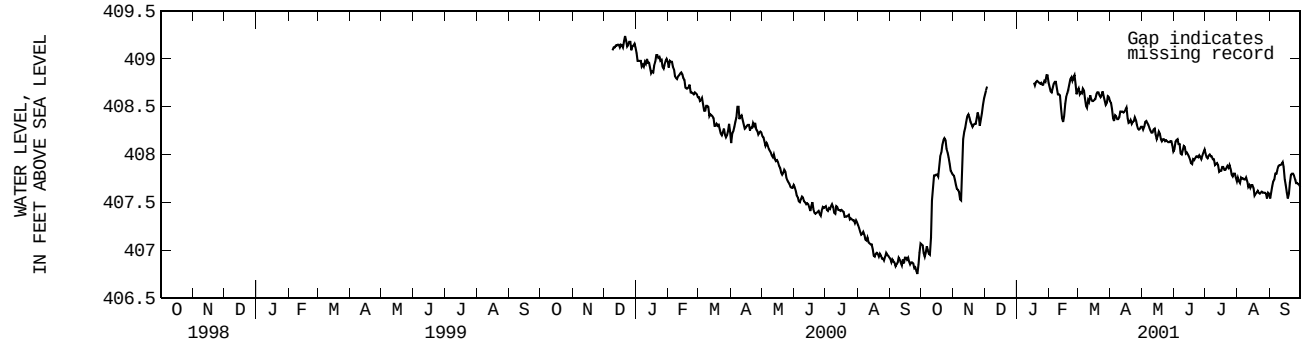
DATUM.--Elevation of land surface is 482 ft. Measuring point is top of the 12-in. well casing, 483.68 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, December 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 409.27 ft above mean sea level, December 20, 21, 1999; lowest water level measured, 406.71 ft above mean sea level, September 27, 2000.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	407.06	407.78	408.63	---	408.71	408.69	408.54	408.29	408.05	408.01	407.76	407.54
2	407.05	407.74	408.67	---	408.66	408.63	408.48	408.26	408.13	407.97	407.72	407.60
3	406.97	407.68	408.71	---	408.65	408.65	408.38	408.29	408.15	407.96	407.70	407.67
4	406.93	407.64	---	---	408.70	408.64	408.35	408.34	408.16	407.99	407.76	407.72
5	406.97	407.63	---	---	408.74	408.69	408.41	408.35	408.11	408.00	407.75	407.74
6	407.04	407.61	---	---	408.76	408.67	408.40	408.33	408.11	407.98	407.75	407.80
7	407.00	407.53	---	---	408.76	408.59	408.37	408.31	408.01	407.98	407.74	407.80
8	406.96	407.52	---	---	408.69	408.51	408.37	408.28	408.00	407.95	407.74	407.84
9	406.95	407.92	---	---	408.63	408.49	408.39	408.25	408.04	407.95	407.76	407.88
10	407.13	408.16	---	---	408.63	408.57	408.45	408.23	408.09	407.89	407.72	407.89
11	407.52	408.24	---	---	408.62	408.55	408.45	408.23	408.08	407.90	407.66	407.89
12	407.65	408.28	---	---	408.48	408.62	408.45	408.26	408.01	407.91	407.68	407.90
13	407.78	408.35	---	---	408.38	408.58	408.44	408.27	408.02	407.89	407.65	407.92
14	407.78	408.40	---	---	408.34	408.56	408.45	408.21	408.00	407.82	407.68	407.87
15	407.79	408.42	---	---	408.40	408.56	408.47	408.16	407.98	407.83	407.68	407.74
16	407.79	408.39	---	---	408.53	408.57	408.49	408.19	407.95	407.83	407.65	407.68
17	407.77	408.34	---	408.75	408.60	408.58	408.38	408.24	407.91	407.87	407.57	407.60
18	407.88	408.32	---	408.72	408.64	408.63	408.33	408.22	407.90	407.87	407.59	407.54
19	407.98	408.29	---	408.76	408.68	408.65	408.34	408.16	407.95	407.84	407.60	407.59
20	408.02	408.31	---	408.77	408.74	408.65	408.36	408.14	407.94	407.84	407.62	407.70
21	408.10	408.32	---	408.76	408.79	408.62	408.32	408.16	407.96	407.86	407.60	407.79
22	408.15	408.32	---	408.75	408.81	408.60	408.34	408.16	407.98	407.88	407.59	407.80
23	408.17	408.38	---	408.74	408.77	408.62	408.35	408.14	407.98	407.86	407.60	407.80
24	408.15	408.44	---	408.75	408.81	408.66	408.39	408.15	407.97	407.89	407.61	407.78
25	408.06	408.39	---	408.73	408.83	408.61	408.36	408.14	407.99	407.85	407.60	407.74
26	408.02	408.30	---	408.73	408.73	408.56	408.31	408.13	407.97	407.79	407.60	407.70
27	407.97	408.37	---	408.77	408.63	408.52	408.27	408.13	407.95	407.77	407.60	407.70
28	407.90	408.43	---	408.76	408.67	408.54	408.26	408.14	407.99	407.80	407.59	407.69
29	407.83	408.52	---	408.83	---	408.61	408.27	408.14	408.02	407.80	407.54	407.68
30	407.81	408.59	---	408.83	---	408.60	408.29	408.10	408.05	407.76	407.60	407.66
31	407.79	---	---	408.75	---	408.56	---	408.03	---	407.72	407.59	---
MEAN	407.61	408.15	408.67	408.76	408.66	408.60	408.38	408.21	408.02	407.88	407.65	407.74
MAX	408.17	408.59	408.71	408.83	408.83	408.69	408.54	408.35	408.16	408.01	407.76	407.92
MIN	406.93	407.52	408.63	408.72	408.34	408.49	408.26	408.03	407.90	407.72	407.54	407.54



HAWAII, ISLAND OF KAUAI--Continued

215803159401201. Local number, 2-5840-01. Waimea, Kauai.

LOCATION.--Lat 21°58'03", long 159°40'12", Hydrologic Unit 20070000, 0.7 mi north of Waimea Recreational Pier State Park, and 2.4 mi east northeast of Oomano Point. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 190 ft, 8-in. casing diameter, cased to 167 ft.

DATUM.--Elevation of land-surface datum is 168 ft. Measuring point is the top of 1-in. hole on pump base, 168.08 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1973 to current year. Water quality: occasional measurements, 1973 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.10 ft above mean sea level, January 26, 1989; lowest water level measured, 6.58 ft above mean sea level, July 19, 1990, lowest water level measured with pump on, 4.76 ft above mean sea level, December 8, 1980.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	8.57	MAR 06	8.48	JUN 28	8.61	AUG 24	8.66				
DEC 19	8.58	APR 04	8.63	JUL 31							

215857159430101. Local number, 2-5843-01. Kekaha Shaft, Kauai.

LOCATION.--Lat 21°58'57", long 159°43'01", Hydrologic Unit 20070000, 2.7 mi east northeast from Kokole Point, and 1.4 mi north northwest of Oomano Point. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 55 ft, 15-ft casing diameter, cased to 10 ft.

DATUM.--Elevation of land surface is 57 ft. Measuring point was the top of $\frac{1}{4}$-in. steel plate 57.80 ft above mean sea level. Measuring point changed April 12, 2000, to top of 1-in. pipe, 57.92 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972, 1985 to current year. Water quality: occasional measurements, 1972, 1997 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.52 ft above mean sea level, February 5, 1990; lowest water level measured, 7.82 ft above mean sea level, April 25, 1988.

REMARKS.--Well used for public supply. Water level affected by pumping.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	8.30	DEC 19	8.55	MAR 06	8.57	APR 04	8.74	JUN 28	8.74	JUL 31	8.10

HAWAII, ISLAND OF KAUAI--Continued

215958159214301. Local number 2-5921-01. Kalepa Ridge, W-10, Kauai.

LOCATION.--Lat 21°59'58", long 159°21'43", Hydrologic Unit 20070000, 1.0 mi west of Hanamaulu Beach Park, and 3.3 mi south southwest of Lydgate State Park. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 540 ft, 14-in. casing diameter, cased to 315 ft.

DATUM.--Elevation of land-surface datum is 302 ft. Measuring point is the top of 1-in. pipe, northeast side of flange after removing the plug, elevation 302.66 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, July 1980 to September 1985. Water-level recorder, October 1985 to July 1992. Occasional measurements, October 1992 to current year. Water quality: occasional measurements, 1997 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.69 ft above mean sea level, November 26, 1985; lowest water level measured, 9.16 ft above mean sea level, August 2, 2001.

REMARKS.--Water level affected by pumping.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	12.01	DEC 20	11.43	MAR 01	10.35	APR 05	10.23	JUN 07	9.41	AUG 02	9.16

215901159235201. Local number 2-5923-07. Kilohana W-I, Kauai.

LOCATION.--Lat 21°59'01", long 159°23'52", Hydrologic Unit 20070000, 4.2 mi northwest of Ninini Point and 3.4 mi west from Lihue Airport terminal. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 200 ft, 12-in. casing diameter, cased to 200 ft.

DATUM.--Elevation of land-surface datum is 364 ft. Measuring point is the top of 1-in. pump base opening, after removing copper fittings, 365.48 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1985 to current year. Water quality: occasional measurements, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 226.86 ft above mean sea level, December 8, 1989; lowest water level measured, 207.21 ft above mean sea level, August 2, 2001.

REMARKS.--Water used for public supply. Water level affected by pumping and by nearby well.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	213.62	DEC 20	213.87	MAR 01	213.52	APR 05	209.02	JUN 07	208.42	AUG 02	207.21

HAWAII, ISLAND OF KAUAI--Continued

215950159231601. Local number 2-5923-08. Hanamaulu monitor well, Kauai.

LOCATION.--Lat 21°59'50", long 159°23'16", Hydrologic Unit 20070000, 1.5 mi northwest of Lihue, and 2.8 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.---Drilled well, depth 1,002 ft, 12.75-in. solid steel outer casing: 0-124 ft; 4-in. solid pvc casing: 0-87 ft; 4-in. perforated pvc casing: 87 ft to bottom; annular space grouted: 0-124 ft; annular space gravel packed: 124 ft to bottom.

DATUM.--Elevation of land-surface datum is 272 ft. Measuring point is the top of 4-in. well casing, 273.49 ft above mean sea level.

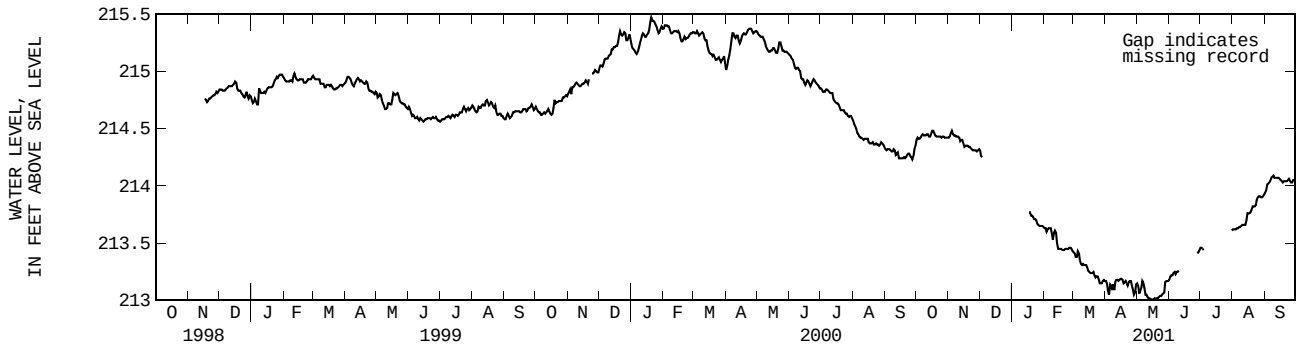
PERIOD OF RECORD.--Water-level recorder, February 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 244.14 ft above mean sea level, April 10, 1997; lowest water level measured, 204.37 ft above mean sea level, January 20, 21, 1998.

REMARKS.--Well part of network of observation wells in cooperation with the County of Kauai Department of Water.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214.40	214.42	214.31	---	213.63	213.42	213.17	213.15	213.18	213.46	213.62	213.94
2	214.42	214.43	214.26	---	213.63	213.41	213.15	213.13	213.21	213.46	213.62	213.96
3	214.41	214.46	214.25	---	213.60	213.38	213.08	213.06	213.22	213.45	213.62	214.01
4	214.41	214.48	---	---	213.62	213.38	213.05	213.08	213.22	213.44	213.62	214.02
5	214.42	214.45	---	---	213.63	213.43	213.14	213.11	213.24	---	213.63	214.03
6	214.44	214.44	---	---	213.63	213.41	213.13	213.17	213.25	---	213.63	214.04
7	214.45	214.44	---	---	213.63	213.35	213.09	213.15	213.23	---	213.64	214.07
8	214.44	214.43	---	---	213.58	213.32	213.14	213.11	213.25	---	213.64	214.08
9	214.44	214.43	---	---	213.53	213.31	213.09	213.05	213.25	---	213.65	214.09
10	214.44	214.43	---	---	213.59	213.32	213.16	213.05	213.26	---	213.66	214.07
11	214.45	214.42	---	---	213.61	213.31	213.18	213.03	---	---	213.66	214.07
12	214.45	214.39	---	---	213.59	213.31	213.18	213.02	---	---	213.66	214.07
13	214.43	214.40	---	---	213.50	213.31	213.17	213.02	---	---	213.66	214.07
14	214.43	214.40	---	---	213.45	213.29	213.18	213.01	---	---	213.70	214.07
15	214.45	214.37	---	---	213.45	213.26	213.19	213.01	---	---	213.76	214.06
16	214.48	214.34	---	---	213.45	213.25	213.19	213.01	---	---	213.76	214.05
17	214.48	214.35	---	213.77	213.45	213.24	213.18	213.01	---	---	213.76	214.04
18	214.46	214.35	---	213.77	213.44	213.24	213.15	213.02	---	---	213.77	214.03
19	214.44	214.35	---	213.74	213.44	213.24	213.16	213.01	---	---	213.79	214.04
20	214.43	214.34	---	213.74	213.44	213.25	213.17	213.02	---	---	213.82	214.04
21	214.43	214.34	---	213.73	213.45	213.22	213.15	213.02	---	---	213.82	214.04
22	214.43	214.33	---	213.71	213.45	213.20	213.13	213.03	---	---	213.82	214.04
23	214.43	214.32	---	213.71	213.45	213.21	213.16	213.04	---	---	213.83	214.05
24	214.43	214.31	---	213.70	213.45	213.21	213.17	213.04	---	---	213.88	214.06
25	214.42	214.31	---	213.67	213.46	213.19	213.17	213.05	---	---	213.90	214.04
26	214.43	214.31	---	213.66	213.46	213.15	213.13	213.06	---	---	213.91	214.03
27	214.43	214.31	---	213.65	213.45	213.15	213.09	213.07	---	---	213.91	214.03
28	214.42	214.30	---	213.65	213.43	213.15	213.05	213.16	213.41	---	213.90	214.05
29	214.42	214.31	---	213.65	---	213.17	213.07	213.17	213.42	---	213.90	214.05
30	214.42	214.32	---	213.65	---	213.18	213.14	213.17	213.44	---	213.91	214.05
31	214.42	---	---	213.64	---	213.17	---	213.17	---	213.61	213.92	---
MEAN	214.43	214.38	214.27	213.70	213.52	213.27	213.14	213.07	213.28	213.48	213.75	214.04
MAX	214.48	214.48	214.31	213.77	213.63	213.43	213.19	213.17	213.44	213.61	213.92	214.09
MIN	214.40	214.30	214.25	213.64	213.43	213.15	213.05	213.01	213.18	213.44	213.62	213.94



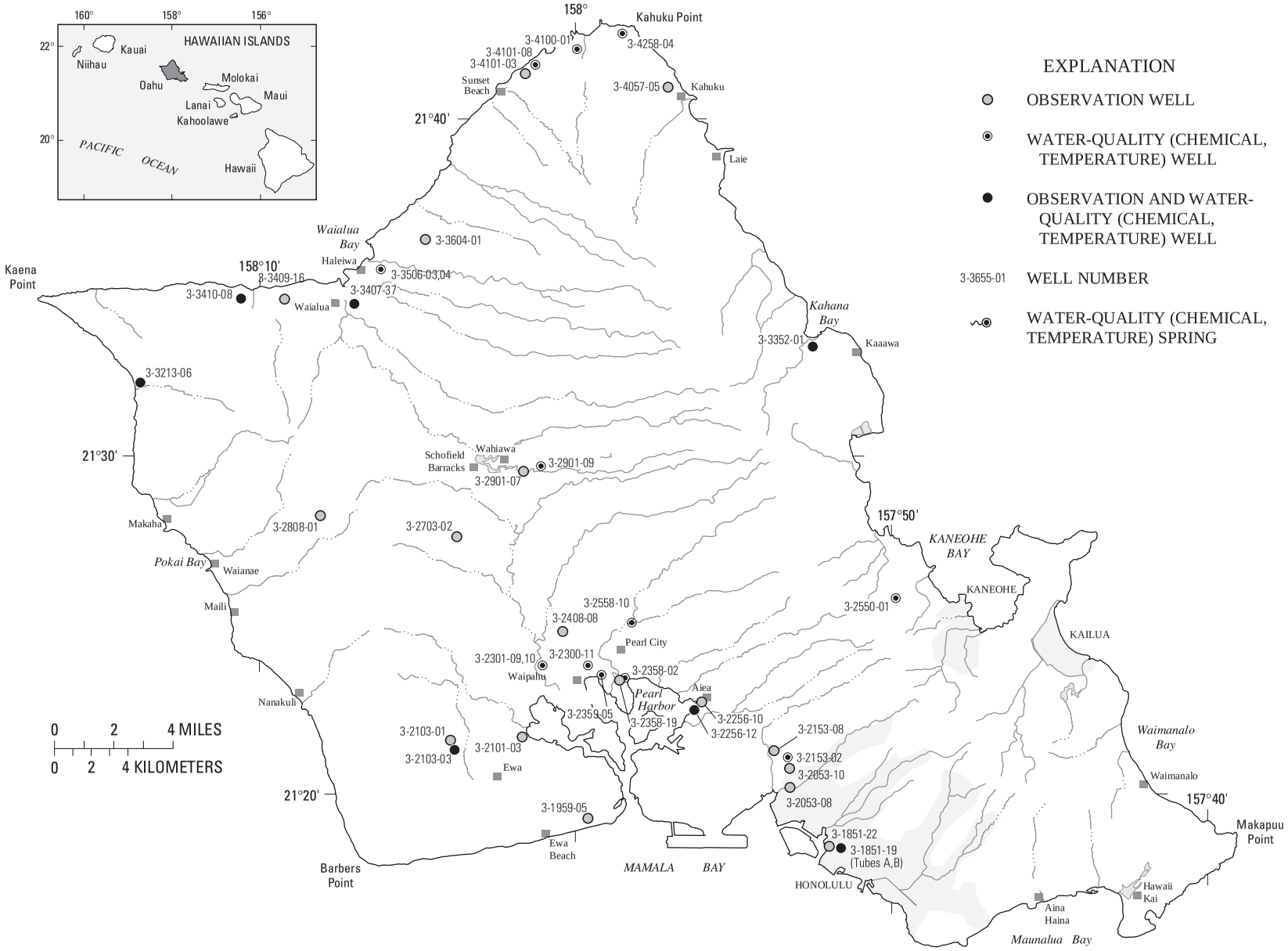


Figure 17. Locations of observation wells and ground-water quality sampling sites on Oahu.

211832157515501. Local number and name, 3-1851-19 Halekauwila Street, Pipe A, Oahu.

LOCATION.--Lat 21°18'32", long 157°51'55", Hydrologic Unit 20060000, corner of Richards and Halekauwila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, ½-in. galvanized pipe at 1,043 ft depth. Tube A is the pipe closer to Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point is chiseled square inside of wooden cover of well, elevation 5.80 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records are in files of the USGS Hawaii District office. Water level affected by high salinity of water (see water-quality section).

PERIOD OF RECORD.-- Water level: occasional measurements, April 1969, March 1973 to current year. Water quality: occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.16 ft above mean sea level, August 13, 1974; lowest measured, 4.44 ft above mean sea level, September 25, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL
AUG 09	4.49	SEP 25	4.44

211832157515502. Local number and name, 3-1851-19 Halekauwila Street, Pipe B, Oahu.

LOCATION.--Lat 21°18'32", long 157°51'55", Hydrologic Unit 20060000, corner of Richards and Halekauwila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, ½-in. galvanized pipe at 988 ft depth. Tube B is the pipe furthest from Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point is chiseled square inside of wooden cover of well, elevation 5.80 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office. Water level affected by high salinity of water (see water-quality section).

PERIOD OF RECORD.-- Water level: occasional measurements, April 1969, March 1973 to current year. Water quality: occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.16 ft above mean sea level, February 3, 1983; lowest measured, 10.75 ft above mean sea level, September 25, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	11.97	MAR 28	12.15	JUN 14	11.65	AUG 09	11.05	SEP 25	10.75

HAWAII, ISLAND OF OAHU--Continued

211828157515801. Local number and name, 3-1851-22 Ala Moana Blvd., Oahu.

LOCATION.--Lat 21°18'28", long 157°51'58", Hydrologic Unit 20060000, northeast corner of the mini-park at the intersection of Richards Street and Ala Moana Boulevard. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, 3-in. PVC pipe casing, depth 1,142 ft, bottom 60 ft slotted.

DATUM.--Elevation of land-surface datum is 7 ft. Measuring point is northeast corner of manhole cover, 7.30 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: water-level recorder, June 1983 to November 1986, occasional measurements, December 1982 to current year. Water quality: occasional measurements, 1982, 1987, 1998.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.74 ft above mean sea level, April 12, 1991; lowest measured, 14.24 ft, above mean sea level, September 25, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	14.96	MAR 28	15.35	JUN 14	14.86	AUG 09	14.30	SEP 25	14.24

HAWAII, ISLAND OF OAHU--Continued

211907157594701. Local number and name, 3-1959-05 Fort Weaver Road, Oahu.

LOCATION.--Lat 21°19'06", long 157°59'46", Hydrologic Unit 20060000, 600 ft northwest of Ewa Beach Park, and 1.2 mi southeast of Campbell High School. Owner: National Oceanic and Atmospheric Administration (NOAA).

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,110 ft, 5-in. PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land-surface datum is 5 ft. Measuring point is top of 5-in. PVC casing, 6.40 ft above mean sea level.

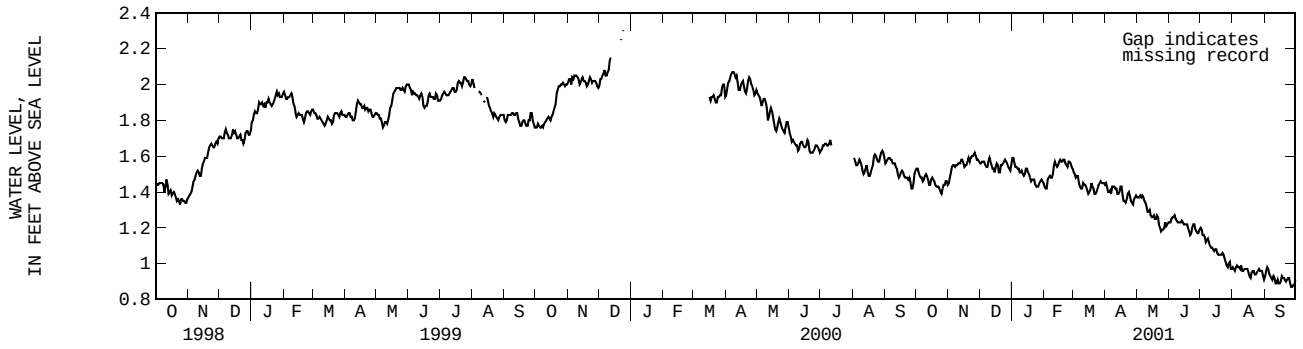
REMARKS.--Geophysical log and water-quality records are available in files of USGS Hawaii district office.

PERIOD OF RECORD.-- Water level: water-level recorder, December 1966 to January 1967, September 1968 to current year. Water quality: occasional measurements, August 1965, November 1966, and December 1968.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.38 ft above mean sea level, January 17, 1969; lowest measured, 2.81 ft below mean sea level, August 25, 1977.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.53	1.45	1.56	1.59	1.43	1.51	1.45	1.37	1.23	1.20	.98	.93
2	1.53	1.48	1.56	1.59	1.42	1.50	1.43	1.37	1.23	1.19	.97	.96
3	1.51	1.51	1.57	1.56	1.42	1.48	1.40	1.37	1.25	1.16	.96	.98
4	1.49	1.54	1.57	1.54	1.47	1.49	1.40	1.38	1.26	1.16	.98	.97
5	1.48	1.55	1.57	1.54	1.48	1.49	1.41	1.37	1.26	1.15	.99	.94
6	1.48	1.55	1.55	1.53	1.49	1.45	1.39	1.38	1.27	1.12	.98	.93
7	1.46	1.54	1.54	1.53	1.48	1.43	1.43	1.37	1.25	1.13	.98	.92
8	1.47	1.55	1.54	1.51	1.48	1.42	1.43	1.35	1.24	1.14	.97	.91
9	1.49	1.55	1.57	1.51	1.50	1.42	1.43	1.34	1.23	1.12	.99	.93
10	1.50	1.56	1.59	1.52	1.55	1.45	1.42	1.32	1.23	1.10	.96	.92
11	1.49	1.56	1.57	1.50	1.57	1.44	1.42	1.29	1.23	1.09	.96	.89
12	1.47	1.56	1.55	1.49	1.55	1.44	1.39	1.29	1.23	1.09	.97	.89
13	1.44	1.58	1.53	1.50	1.54	1.43	1.39	1.30	1.24	1.08	.97	.91
14	1.44	1.58	1.53	1.53	1.55	1.41	1.40	1.27	1.23	1.07	.97	.89
15	1.47	1.56	1.51	1.53	1.57	1.39	1.43	1.26	1.22	1.08	.97	.89
16	1.48	1.54	1.54	1.51	1.58	1.40	1.43	1.26	1.22	1.08	.95	.90
17	1.47	1.55	1.56	1.50	1.57	1.41	1.38	1.27	1.22	1.06	.93	.93
18	1.46	1.55	1.55	1.48	1.57	1.45	1.35	1.25	1.22	1.05	.92	.92
19	1.44	1.57	1.51	1.46	1.58	1.43	1.35	1.25	1.20	1.05	.95	.92
20	1.43	1.59	1.51	1.47	1.58	1.42	1.34	1.27	1.18	1.05	.96	.91
21	1.43	1.57	1.55	1.47	1.56	1.39	1.36	1.26	1.16	1.05	.96	.90
22	1.43	1.59	1.55	1.47	1.55	1.39	1.39	1.22	1.17	1.06	.94	.91
23	1.42	1.60	1.56	1.44	1.54	1.40	1.40	1.20	1.20	1.05	.94	.92
24	1.40	1.60	1.57	1.43	1.57	1.42	1.38	1.18	1.22	1.03	.95	.92
25	1.39	1.61	1.58	1.43	1.57	1.44	1.35	1.19	1.22	1.01	.96	.89
26	1.42	1.62	1.57	1.43	1.56	1.45	1.34	1.19	1.19	.99	.97	.87
27	1.44	1.60	1.56	1.45	1.54	1.46	1.33	1.20	1.18	.98	.96	.87
28	1.44	1.58	1.54	1.46	1.53	1.45	1.36	1.23	1.17	1.00	.96	.88
29	1.46	1.58	1.53	1.47	---	1.45	1.37	1.21	1.17	1.01	.96	.88
30	1.46	1.57	1.52	1.46	---	1.45	1.38	1.22	1.19	.97	.93	.91
31	1.44	---	1.55	1.45	---	1.44	---	1.23	---	.97	.91	---
MEAN	1.46	1.56	1.55	1.50	1.53	1.44	1.39	1.28	1.22	1.07	.96	.91
MAX	1.53	1.62	1.59	1.59	1.58	1.51	1.45	1.38	1.27	1.20	.99	.98
MIN	1.39	1.45	1.51	1.43	1.42	1.39	1.33	1.18	1.16	.97	.91	.87



HAWAII, ISLAND OF OAHU--Continued

212010157531501. Local number and name, 3-2053-08 Kalihi, Oahu.

LOCATION.--Lat 21°20'10", long 157°53'15", Hydrologic Unit 20060000, 0.5 mi west of Farrington High School, and 0.5 mi north of Puuhale School. Owner: Fasi Family Partners.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 607 ft, 10-in. casing diameter.

DATUM.--Elevation of land-surface datum is 10.5 ft. Measuring point is top of concrete manhole frame, elevation 10.48 ft above mean sea level.

REMARKS.--Prior to October 2001, unpublished records in files of the USGS Hawaii district office.

PERIOD OF RECORD.--Water level: occasional measurements, April 1910 to September 1931, January 1935 to December 1956, September 2000 to current year. Water quality: occasional measurements, January 1912 to October 1915, March 1924 to March 1928.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.42 ft above mean sea level, March 1911; lowest measured, 16.77 ft above mean sea level, September 25, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 07	17.59	MAR 13	17.62	JUN 14	17.21	AUG 08	16.78	SEP 25	16.77

212046157531401. Local number and name, 3-2053-10, Fort Shafter Well, Oahu.

LOCATION.--Lat 21°20'46", long 157°53'14", Hydrologic Unit 20060000, in Fort Shafter, about 1,000 ft east of Buckner Gate, and 100 ft north of Fort Shafter Elementary School. Owner: U.S. Army.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 279 ft, 12-in. casing diameter, cased to 169 ft.

DATUM.--Elevation of land-surface datum is 20 ft. Measuring point is a chiseled "1 1" on top of 8-inch casing (flange removed), at south end of pump house (Bldg. 509), 24.90 ft above mean sea level.

REMARKS.--Prior to January 2000, unpublished records are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--Occasional water quality measurements, December 1915 to November 1972. Occasional water level measurements, December 1915 to September 1931, January 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.82 ft above mean sea level, April 1917; lowest measured, 17.09 ft above mean sea level, September 04, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	17.89	DEC 01	18.20	FEB 02	17.86	APR 03	17.79	JUN 01	17.45	AUG 01	17.11
NOV 03	17.95	JAN 03	18.13	MAR 01	18.03	MAY 02	17.69	JUL 02	17.45	SEP 04	17.09

HAWAII, ISLAND OF OAHU--Continued

212154158015201. Local number and name, 3-2101-03 Honouliuli, Oahu.

LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, 0.4 mi southeast of Honouliuli, and 0.5 mi north of St. Francis West Hospital. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 355 ft, 6-in. PVC casing, cased to 165 ft. Well casing was modified in January l958 and May 1982.

DATUM.--Elevation of land-surface datum is 15.38 ft. Measuring point is top of horizontal flange below petcock, 13.31 ft above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, and 1978-81 are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--Water level: occasional measurements, April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft above mean sea level, April 1918; lowest observed, less than 11.32 ft above mean sea level (below petcock then in use), September 2, and October 19, 1977.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	16.69	DEC 20	16.70	APR 18	13.79	JUN 22	15.44	AUG 09	15.31	SEP 19	14.36

212132158035701. Local number and name, 3-2103-01 Puu Makakilo, Oahu.

LOCATION.--Lat 21°21'32", long 158°03'57", Hydrologic Unit 20060000, 1 mi east of Makakilo, and 2 mi north of Barbers Point Naval Air Station. Owner: U.S. Navy.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 206 ft, 6-in. casing diameter, cased to 17 ft.

DATUM.--Elevation of land-surface datum is 210 ft. Measuring point is top of 6-in. pipe, elevation 211.70 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii district office.

PERIOD OF RECORD.-- Water level: water-level recorder, September 1966 to December 1971. Occasional measurements, August 1942 to December 1942, January 1953 to September 1967, September 1972 to current year. Water quality: occasional measurements, 1942, 1953-68.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.81 ft above mean sea level, February 20, 1957; lowest measured, 14.14 ft above mean sea level, September 19,2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	14.66	JAN 18	14.72	APR 24	14.44	JUN 25	14.24	AUG 09	14.18	SEP 19	14.14

HAWAII, ISLAND OF OAHU--Continued

212106157533701. Local number and name, 3-2153-02 Moanalua, Oahu.

LOCATION.--Lat 21°21'06", long 157°53'37", Hydrologic Unit 20060000, in Pineapple Place near Moanalua School. Owner: Damon Estate.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 289 ft, 10-in. casing, cased to 79 ft.

DATUM.--Elevation of land-surface datum is 20 ft. Measuring point is top of 3/4-in. pipe on casing about 15 ft streamward from small pump house and elevation is 20.78 ft above mean sea level.

REMARKS.--Prior to March 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, April 1910 to March 1974, December 1977 to March 1993, and June 1999 to current year. Water quality: occasional measurements, April 1910 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.88 ft above mean sea level, April 1917; lowest measured, 16.39 ft above mean sea level, September 19, 1978.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	17.77	MAR 13	17.80	JUN 14	17.42	AUG 08	16.98	SEP 25	16.96

212117157534601. Local number and name, 3-2153-08 Tripler Army Medical Center, Oahu.

LOCATION.--Lat 21°21'17", long 157°53'46", Hydrologic Unit 20060000, 1,300 ft northwest of junction of H-1 freeway and Puuloa Road, and 0.5 mi south of Tripler Army Hospital. Owner: U.S. Army.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 306 ft, 16-in. casing diameter, cased to 57 ft.

DATUM.--Elevation of land-surface datum is 28 ft. Measuring point is top of 3/4-in. copper overflow pipe at base of pump, 33.16 ft above mean sea level.

REMARKS.--Prior to May 1998, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--Occasional measurements, April 1945 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.79 ft above mean sea level, April 21, 1969; lowest measured, 16.79 ft above mean sea level, August 1, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	17.58	DEC 01	17.89	FEB 02	17.65	APR 03	17.50	JUN 01	17.18	AUG 01	16.79
NOV 03	17.67	JAN 03	17.79	MAR 01	17.70	MAY 02	17.38	JUL 02	17.12	SEP 04	16.84

HAWAII, ISLAND OF OAHU--Continued

212238157561101. Local number and name, 3-2256-10 Aiea, U.S. Navy (187-B), Oahu.

LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 173 ft, 12-in. casing diameter, cased to 143 ft.

DATUM.--Elevation of land-surface datum is 10 ft. Measuring point is top of 10-in. stilling pipe for water-level recorder, 26.15 ft above mean sea level.

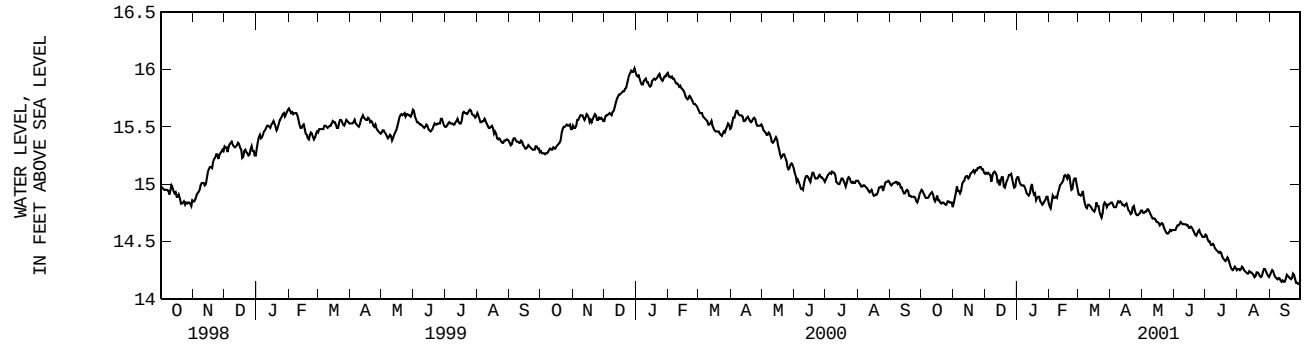
REMARKS.--Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--Water level: occasional measurements, January 1928 to February 1931, September 1934 to August 1966. Water-level recorder, September 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft above mean sea level, January 16, 1928; lowest measured, 12.97 ft above mean sea level, October 5, 1978.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.95	14.84	15.09	15.06	14.81	14.91	14.84	14.77	14.60	14.56	14.26	14.21
2	14.94	14.88	15.10	15.06	14.79	14.91	14.84	14.75	14.60	14.55	14.26	14.23
3	14.92	14.93	15.09	15.02	14.84	14.90	14.82	14.75	14.62	14.52	14.25	14.25
4	14.90	14.98	15.10	15.00	14.90	14.91	14.80	14.76	14.64	14.50	14.26	14.24
5	14.88	14.94	15.09	14.99	14.88	14.94	14.80	14.76	14.64	14.50	14.28	14.21
6	14.88	14.94	15.08	14.99	14.88	14.87	14.80	14.78	14.65	14.47	14.27	14.19
7	14.88	14.92	15.02	14.99	14.89	14.83	14.83	14.78	14.67	14.47	14.25	14.18
8	14.89	14.94	15.07	14.98	14.88	14.80	14.85	14.76	14.66	14.48	14.24	14.17
9	14.91	15.00	15.10	14.95	14.92	14.79	14.84	14.74	14.65	14.47	14.23	14.18
10	14.92	15.02	15.11	14.92	14.95	14.82	14.85	14.72	14.65	14.44	14.22	14.18
11	14.93	15.03	15.10	14.91	14.99	14.82	14.84	14.70	14.65	14.43	14.22	14.16
12	14.91	15.06	15.08	14.90	15.00	14.81	14.82	14.70	14.65	14.42	14.24	14.15
13	14.87	15.07	15.02	14.92	15.01	14.80	14.82	14.70	14.64	14.41	14.23	14.16
14	14.85	15.07	15.03	14.97	15.03	14.78	14.81	14.69	14.64	14.40	14.23	14.15
15	14.87	15.05	14.99	15.00	15.07	14.77	14.82	14.67	14.62	14.41	14.22	14.15
16	14.90	15.06	15.03	14.94	15.08	14.76	14.83	14.67	14.62	14.40	14.21	14.17
17	14.86	15.09	15.06	14.91	15.07	14.78	14.80	14.66	14.63	14.37	14.19	14.21
18	14.86	15.10	15.06	14.92	15.05	14.84	14.77	14.64	14.62	14.35	14.20	14.20
19	14.84	15.11	14.98	14.86	15.08	14.81	14.76	14.65	14.60	14.34	14.23	14.19
20	14.83	15.12	14.97	14.88	15.07	14.81	14.74	14.66	14.58	14.33	14.23	14.18
21	14.84	15.10	15.00	14.89	15.01	14.76	14.75	14.65	14.56	14.34	14.22	14.17
22	14.84	15.12	15.03	14.89	14.95	14.73	14.80	14.62	14.55	14.36	14.20	14.18
23	14.83	15.12	15.05	14.85	14.96	14.71	14.81	14.60	14.57	14.34	14.19	14.22
24	14.82	15.14	15.08	14.84	15.03	14.75	14.77	14.58	14.59	14.31	14.20	14.21
25	14.82	15.14	15.08	14.82	15.05	14.82	14.74	14.57	14.60	14.28	14.23	14.17
26	14.85	15.15	15.09	14.83	15.05	14.84	14.73	14.57	14.57	14.26	14.26	14.14
27	14.85	15.15	15.05	14.85	15.00	14.83	14.73	14.58	14.56	14.25	14.26	14.14
28	14.84	15.13	15.00	14.86	14.95	14.80	14.74	14.60	14.54	14.26	14.24	14.13
29	14.84	15.13	14.97	14.89	---	14.82	14.75	14.59	14.54	14.28	14.22	14.13
30	14.84	15.10	14.98	14.89	---	14.82	14.77	14.60	14.54	14.27	14.20	14.17
31	14.80	---	15.04	14.84	---	14.83	---	14.60	---	14.25	14.19	---
MEAN	14.87	15.05	15.05	14.92	14.97	14.82	14.80	14.67	14.61	14.39	14.23	14.18
MAX	14.95	15.15	15.11	15.06	15.08	14.94	14.85	14.78	14.67	14.56	14.28	14.25
MIN	14.80	14.84	14.97	14.82	14.79	14.71	14.73	14.57	14.54	14.25	14.19	14.13



HAWAII, ISLAND OF OAHU--Continued

212238157561102. Local number and name, 3-2256-12 Aiea, U.S. Navy (187-C), Oahu.

LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 182 ft, 12-in. casing diameter, cased to 139 ft.

DATUM.--Elevation of land-surface datum is 9 ft. Measuring point is corner of concrete base next to faucet, 13.18 ft above mean sea level.

REMARKS.--Prior to October 1996, unpublished water-level records are available in files of USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, January 1928 to December 1931, 1934, 1946-47, 1966, November 1973 to current year. Water quality: occasional measurements, January 1928 to November 1929, 1930-31, 1934, 1947, December 1966, September 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.07 ft above mean sea level, January 16, 1928; lowest measured, 13.15 ft above mean sea level, September 18, 1978.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 07	14.95	MAR 15	14.77	JUN 14	14.62

212318157583401. Local number and name, 3-2358-19 Pearl City Peninsula, Oahu.

LOCATION.--Lat 21°23'18", long 157°58'34", Hydrologic Unit 20060000, 0.3 mi southwest of Lehua Elementary School, and 0.7 mi south of Pearl City Elementary School. Owner: U.S. Navy.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 172 ft, 17-in. casing diameter, cased to 112 ft.

DATUM.--Elevation of land-surface datum is 13.30 ft. Measuring point is 1-in. square chiseled on concrete base wall, northeast corner, elevation is 13.30 ft above mean sea level.

REMARKS.--Prior to October 1995, unpublished records are available in files of USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, September 1972, November 1973 to December 1988, and March 3, 1993 to current year. Water quality: occasional measurements, 1944, 1946, 1954, 1956-58, 1972-80.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.68 ft above mean sea level, December 7, 1982; lowest measured, 12.30 ft above mean sea level, September 18, 1978.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	14.03	MAR 13	13.85	JUN 14	13.63	JUL 19	13.39	SEP 25	13.25

HAWAII, ISLAND OF OAHU--Continued

212738158034301. Local number and name, 3-2703-02 Kunia basal monitor well, Oahu.

LOCATION.--Lat 21°27'38", long 158°03'43", Hydrologic Unit 20060000, 2.9 mi southwest of Kaala School, 0.4 mi southeast of Kunia School, and 2.2 mi east of Mililani Golf Course. Owner: Del Monte Corporation.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 993.5 ft, 8-in. casing diameter, cased to 971.1 ft.

DATUM.--Elevation of land-surface datum is 849.5 ft. Measuring point is top of 3-in. PVC pipe, elevation is 852.38 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, January 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level measured, 19.30 ft above mean sea level, January 29, 2001; lowest measured, 18.33 ft above mean sea level, September 21, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 29	19.30	APR 25	19.14	JUN 28	18.88	AUG 10	18.55	SEP 21	18.33

212813158080201. Local number and name, 3-2808-01 Nanakuli, Oahu.

LOCATION.--Lat 21°28'13", long 158°08'04", Hydrologic Unit 20060000, inside Lualualei Naval Ammunition Depot, 1,000 ft west from the intersection of Kolekole Road and Radford Street, at Building 492, and 3.3 mi north from the entrance of the depot. Owner: U.S. Navy.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Depth 535 ft, cased to 179 ft, 12-in.-diameter steel casing to 179 ft, then 3-in. to 535 ft.

DATUM.--Elevation of land-surface datum is 435 ft. Measuring point is on pump 2 ft above base. Remove $^{1}/_{2}$-in. nipple, elevation 437.45 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, June 1956 to December 1957, June 1973 to December 1984, August 1988 to current year. Water quality: occasional measurements, October 1956 to December 1957, February 1972 to August 1988.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 441.81 ft above mean sea level, February 28, 1983; lowest measured, 420.78 ft above mean sea level, October 24, 1978.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	426.23	JAN 18	428.07	APR 24	428.35	JUN 27	427.25	AUG 17	425.58

HAWAII, ISLAND OF OAHU--Continued

212927158014801. Local number, 3-2901-07. Schofield Shaft, Oahu.

LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, across the main gate of Wheeler Air Force Base, and 1,200 ft south of Wahiawa bridge on Kaukonohua Stream. Owner: U.S. Army.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Dug high-level water-table well, size 8 ft x 8 ft, length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point is top of 2 inch pipe for float tape cable (cap removed), 287.16 ft above mean sea level.

REMARKS.--Maximum daily water levels are published due to the fluctuations in the water level caused by pumping.

PERIOD OF RECORD.-- Water level: water-level recorder, November 1938 to current year. Water quality: occasional measurements, 1966-72, 1975 to current year.

REVISED RECORDS.--WDR HI-99-1: Elevation of land-surface datum and measuring point. WDR HI-99-1: (m) based on non-pumping values.

EXTREMES FOR PERIOD OF RECORD (Non-pumping values).--Highest water level measured, 284.40 ft above mean sea level, May 12, 1969; lowest measured, 270.82 ft above mean sea level, May 1, 1985.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	274.05	274.21	274.29	273.70	273.94	273.70	272.84	273.29	273.08	272.79	272.59	271.89
2	273.38	274.07	273.47	274.33	273.19	273.57	273.45	273.10	272.41	272.88	271.76	271.77
3	274.17	274.08	273.66	273.61	273.29	273.64	272.80	273.08	272.20	272.10	272.47	271.76
4	273.35	274.10	274.20	273.62	273.32	273.09	272.80	273.08	272.87	272.10	272.43	271.12
5	273.91	274.08	273.66	273.65	273.33	272.97	272.83	273.10	272.90	272.73	272.27	271.13
6	273.38	274.08	274.32	273.58	273.98	273.01	272.81	273.11	272.89	272.66	272.41	271.14
7	273.38	274.15	274.16	274.21	273.72	272.85	272.81	273.08	272.86	272.04	271.79	271.15
8	274.01	274.20	274.24	273.52	273.27	272.82	272.78	272.58	272.84	272.04	271.78	271.30
9	274.04	274.14	274.30	273.58	273.29	272.95	272.75	272.59	272.84	271.99	271.73	271.34
10	274.10	274.18	273.69	273.59	273.93	272.91	273.43	272.59	272.84	272.52	271.76	271.16
11	274.11	273.61	273.62	274.17	273.98	272.95	272.78	272.56	272.15	271.88	271.72	272.09
12	273.97	274.08	273.62	273.55	273.25	272.94	272.75	272.29	272.39	271.82	271.72	271.18
13	274.07	274.14	274.31	273.61	273.23	272.94	272.75	272.53	272.42	271.85	271.70	271.22
14	274.10	274.18	274.30	273.61	273.21	272.91	272.76	272.52	272.16	271.82	271.53	271.26
15	274.13	274.15	274.27	273.55	273.21	273.48	272.83	272.55	272.13	271.81	271.49	271.24
16	273.44	274.12	274.28	273.53	273.86	272.79	272.80	272.55	272.34	271.71	271.40	271.44
17	273.40	274.14	273.64	273.52	273.23	272.91	272.75	272.55	272.07	271.97	271.41	271.28
18	273.38	274.27	273.67	273.49	273.21	272.92	272.70	272.55	272.04	272.10	272.09	271.96
19	273.36	274.18	273.61	273.47	273.19	272.92	273.32	272.53	272.07	272.13	271.19	272.03
20	273.36	274.16	273.61	273.47	273.19	272.97	272.73	272.55	272.05	271.97	271.29	271.84
21	273.38	274.16	273.64	273.30	273.19	272.88	272.69	272.90	272.05	272.08	271.19	271.81
22	273.74	274.26	274.28	273.41	273.19	272.77	272.67	272.96	272.05	272.08	271.16	272.03
23	273.86	274.11	274.30	273.41	273.03	272.88	272.69	272.96	272.79	272.34	271.15	272.02
24	273.86	274.16	274.23	273.90	273.19	272.94	272.73	272.24	272.10	272.34	271.18	272.08
25	273.89	274.21	273.64	273.39	273.13	272.85	273.07	272.91	272.83	272.29	271.19	271.29
26	273.89	274.24	273.65	273.35	272.97	272.77	273.10	272.92	272.16	272.41	271.23	271.37
27	273.91	274.20	273.65	273.32	272.95	272.80	273.07	272.91	272.14	271.61	271.71	271.55
28	273.89	274.30	273.64	273.35	273.03	272.82	273.08	272.38	272.13	271.63	271.73	271.56
29	273.87	273.66	273.61	273.38	---	272.85	273.10	272.48	272.14	271.61	271.70	271.58
30	273.87	273.66	274.22	273.35	---	272.85	273.13	272.48	272.13	272.23	271.74	271.55
31	273.89	---	273.62	273.35	---	272.87	---	272.21	---	271.81	271.65	---
MEAN	273.78	274.11	273.92	273.58	273.34	272.98	272.89	272.71	272.40	272.11	271.68	271.54
MAX	274.17	274.30	274.32	274.33	273.98	273.70	273.45	273.29	273.08	272.88	272.59	272.09
MIN	273.35	273.61	273.47	273.30	272.95	272.77	272.67	272.21	272.04	271.61	271.15	271.12

NON-PUMPING VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	274.17	DEC 14	274.30	FEB 11	273.98	JUL 2	272.88
NOV 1	274.21	DEC 16	274.28	FEB 16	273.86	AUG 1	272.59
NOV 18	274.27	DEC 23	274.30	MAR 1	273.70	SEP 11	272.09
DEC 1	274.29	JAN 2	274.33	APR 2	273.45		
DEC 6	274.32	FEB 1	273.94	MAY 1	273.31		
DEC 9	274.30	FEB 6	273.98	JUN 1	273.14		

Note: Non-pumping water levels are measured after all pumps in the pump chamber are turned off for 2 hours

HAWAII, ISLAND OF OAHU--Continued

213224158135901. Local number and name, 3-3213-06 Makua, U.S. Air Force, Oahu.

LOCATION.--Lat 21°32'24", long 158°13'59", Hydrologic Unit 20060000, along Farrington Highway, 1.2 mi north of Makua Cave, and 1 mi southeast of Yokohama Bay. Owner: U.S. Air Force.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 50 ft, cased to 21 ft with 6-in. black steel pipe.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point is top of 6-in. casing, elevation is 26.47 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, October 1972 to current year. Water quality: occasional measurements, 1965, 1967, February 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.92 ft above mean sea level, January 2, 1975; lowest measured, 6.47 ft above mean sea level, June 25, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	6.68	DEC 20	6.60	APR 16	6.50	JUN 25	6.47	AUG 09	6.55	SEP 19	6.57

213327157524401. Local number and name, 3-3352-01 Kahana Valley, Oahu.

LOCATION.--Lat 21°33'27", long 157°52'43", Hydrologic Unit 20060000, at mouth of Kahana Valley, and 700 ft southwest of Kamehameha Highway, Kahana. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 441 ft, 10-in. casing diameter, cased to 177 ft.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point is top of "T", 7.31 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, April 1935 to 1990, 1992 to current year. Water quality: occasional measurements, 1935 to 1991, 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, March 29, 1966; lowest measured, 11.76 ft above mean sea level, July 26, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	11.78	DEC 20	12.15	MAR 05	12.06	MAY 31	11.99	JUL 26	11.76

HAWAII, ISLAND OF OAHU--Continued

213430158071601. Local number and name, 3-3407-37 Kiikii exploratory well, Oahu.

LOCATION.--Lat 21°34'30", long 158°07'16", Hydrologic Unit 20060000, 2.75 miles down Haleiwa Beach Road from Weed Circle heading southwest and 0.5 mile northeast of Waialua Elementary School. Owner: Dole Food Company, Inc.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age

WELL CHARACTERISTICS.--Drilled flowing well, depth 135 ft, surface casing steel, diameter 8 5/8-in., inner casing 4½-in. PVC, cased to 115 ft.

DATUM.--Elevation of land-surface datum is 5 ft. Measuring point is top of casing, 14.68 ft above mean sea level.

LEVELS.--Date of last levels -- unknown.

REMARKS.-Prior to October 2000, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.-- Water level: occasional measurements, August 1994 to current year. Water quality: occasional measurements, October 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.60 ft above mean sea level, February 13, 1995; lowest 10.97 ft above mean sea level, June 21, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	11.36	JAN 04	11.40	JUN 21	10.97	SEP 06	11.30
26	11.33	MAY 15	11.07	AUG 21	11.21		

213438158091101. Local number and name, 3-3409-16 Mokuleia, Oahu.

LOCATION.--Lat 21°34'36", long 158°09'12", Hydrologic Unit 20060000, 1.6 mi west of Waialua High School, 2.6 mi east of Mokuleia Beach Park along Farrington Highway. Owner: J. Mendonca.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 518 ft, cased to 440 ft, diameter 10-in. to 396 ft, 8-in. to 440 ft.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point is chiseled 1-½-in. square on concrete, 3.7 ft in front of door of well shelter, elevation is 8.48 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, December 1924 to current year. Water quality: occasional measurements, 1924-84.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, January 16, 1969; lowest measured, 16.30 ft above mean sea level, June 21, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	17.03	APR 17	16.48	JUN 21	16.30	SEP 06	16.58
JAN 04	16.90	MAY 15	16.53	AUG 21	16.66		

HAWAII, ISLAND OF OAHU--Continued

213446158104901. Local number and name, 3-3410-08 Kawaihapai, Mokuleia, Oahu.

LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park. Owner: Waialua Sugar Company, Inc.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 447 ft, 1-in. casing diameter, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point is top of recorder shelf over 12-in. stilling well, 20.53 ft above mean sea level. On June 14, 2000, measuring point was changed to top of 1 1/2 inch drain pipe at bottom of 12-in. stilling well, 14.50 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: water-level recorder, January 1963 to February 1972. Occasional measurements, January 1929 to December 1962, March 1972 to current year. Water quality: occasional measurements, 1929 to 1985, 1989 to 1991, 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.98 ft above mean sea level, January 5, 1969; lowest measured, 16.08 ft above mean sea level, August 6, 1929.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	17.48	APR 17	17.23	JUN 21	17.10	SEP 06	17.24
DEC 27	17.44	MAY 15	17.22	AUG 21	17.21		

213626158044601. Local number and name, 3-3604-01 Kawailoa Deep Monitoring Well, Oahu.

LOCATION.--Lat 21°36'26", long 158°04'46", Hydrologic Unit 20060000, 2.65 miles northwest of Weed Circle and 1.0 miles north of Anahulu Gulch. Owner: Bishop Estate.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age

WELL CHARACTERISTICS.--Drilled well, depth 392 ft., surface casing diameter 6 5/8-in. inner casing 4 1/2-in., cased to 190 ft.

DATUM.--Elevation of land-surface datum is 308 ft. Measuring point is located on the top of the casing, 309.01 ft above mean sea level.

LEVELS.-- Dates of last levels -- unknown.

REMARKS.-Prior to Sept. 2000, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.-- Water level: occasional measurements, January 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.12 ft. above mean sea level, April 18, 2001; lowest 3.81 ft. above mean sea level, April 10, 1995.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	4.30	DEC 19	4.39	APR 18	5.12	JUN 21	4.10	AUG 21	3.90

HAWAII, ISLAND OF OAHU--Continued

214053157570401. Local number and name, 3-4057-05 Kahuku, Oahu.

LOCATION.--Lat 21°40'53", long 157°57'04", Hydrologic Unit 20060000, 0.4 mi northeast of Kahuku Hospital, and 500 ft north of Kahuku High School. Owner: Campbell Estate.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 397 ft, 12-in. metal casing, cased to 172 ft.

DATUM.--Elevation of land-surface datum is 9 ft. Measuring point is top of 10-in. standpipe, elevation is 16.01 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: water-level recorder, August 1958 to December 1990. Occasional measurements, March 1911 to May 1918, March 1921, January 1926 to August 1958, December 1990 to current year. Water quality: occasional measurements, 1908, 1911-16, 1924-78.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.12 ft above mean sea level, January 1916; lowest measured, 8.00 ft above mean sea level, October 5, 1962.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	11.88	DEC 13	11.97	FEB 28	11.84	JUN 29	11.81	AUG 08	11.60	SEP 20	11.74

214125158013401. Local number and name, 3-4101-03 Waialee, Oahu.

LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, 1,500 ft northeast of University of Hawaii agriculture experiment station in Waialee, and 1.9 mi northeast of Sunset Beach. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, 8-in. casing diameter, cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point is top of 4-in. pipe, 21.89 ft above mean sea level.

REMARKS.--Water-quality records for 1929-74 are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--Occasional measurements, February 1929 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft above mean sea level, November 14, 1932; lowest measured, 10.97 ft above mean sea level, July 1, 1977.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	12.54	DEC 13	12.59	FEB 28	12.54	JUN 29	12.44	AUG 08	12.38	SEP 20	12.42

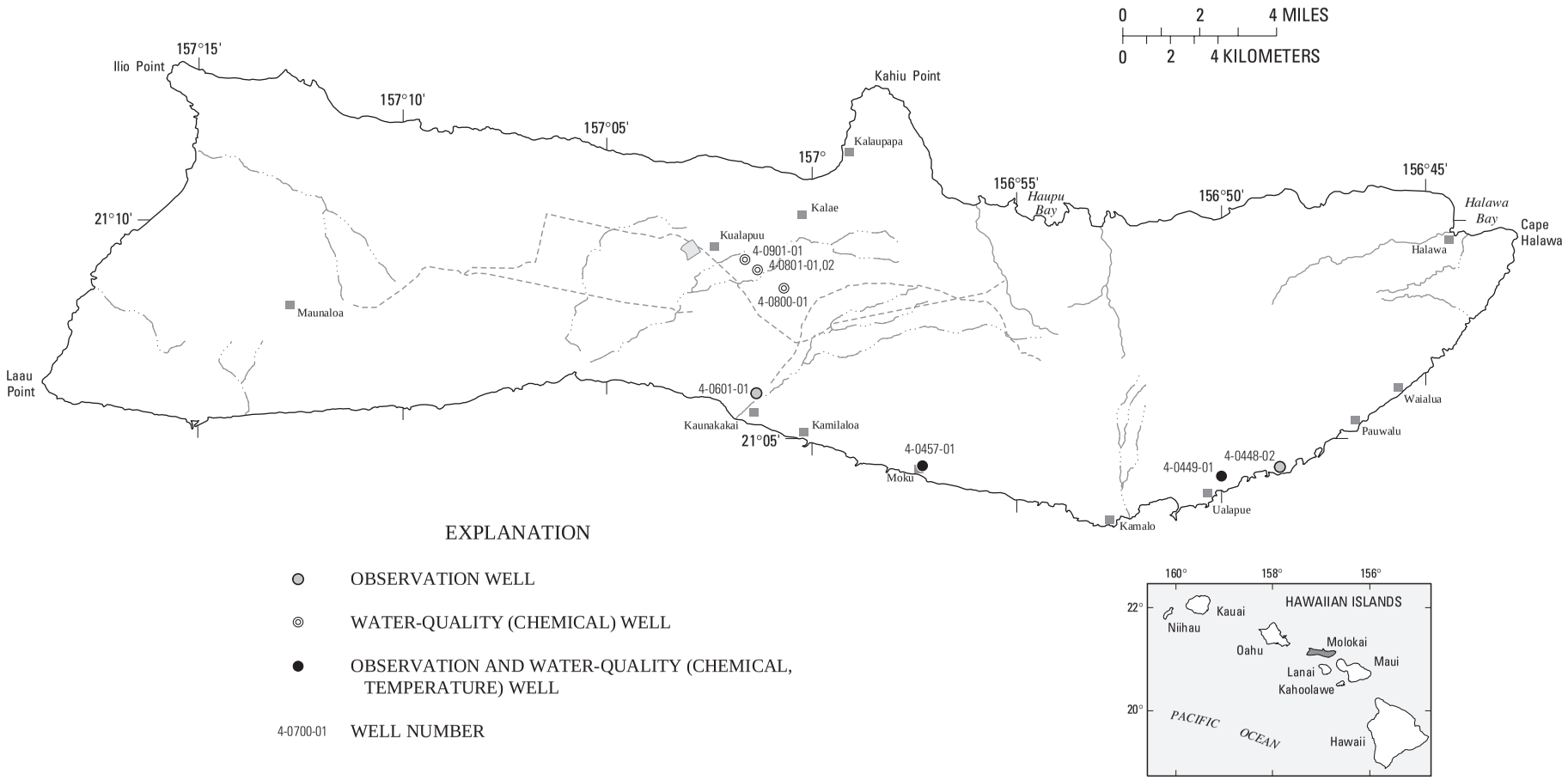


Figure 18. Locations of observation wells and ground-water quality sampling sites on Molokai.

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02. Mapulehu Shaft 2, Molokai.

LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo. Owner: P. Friel.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 ft x 6 ft, depth 21 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point is top of 2 in. x 2 in. steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

PERIOD OF RECORD.-- Water level: water-level recorder, August 1970 to January 1973. Occasional measurements, February 1973 to current year. Water quality: occasional measurements, 1970-73, 1993-2000.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, November 26, 1970; lowest measured, 3.67 ft above mean sea level, February 8, 1977.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	3.93	DEC 05	4.16	FEB 15	4.18	APR 25	3.88	JUN 20	3.85	AUG 13	4.08

WATER YEAR 2001 LOWEST 3.85 JUN 20, 2001 HIGHEST 4.18 FEB 15, 2001

210402156495801. Local number, 4-0449-01. Ualapue Shaft, Molokai.

LOCATION.--Lat 21°04'02", long 156°49'58", Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School. Owner: County of Maui.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 ft x 6 ft, depth 42 ft, lined with concrete to 42 ft; two infiltration tunnels, total length 214 ft.

DATUM.--Elevation of land-surface datum is 42 ft. Measuring point is top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply; water level affected by pumping.

PERIOD OF RECORD.-- Water level: occasional measurements, 1938-39, 1941-63, November 1972 to current year. Water quality: occasional measurements, 1948, 1952-56, 1970-91, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, January 19, 1950; lowest measured, 2.09 ft above mean sea level, September 16, 1975.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 05	3.09	FEB 15	2.84	APR 25	2.94	JUN 20	2.95	AUG 13	3.12

WATER YEAR 2001 LOWEST 2.95 JUN 20, 2001 HIGHEST 2.95 JUN 20, 2001

HAWAII, ISLAND OF MOLOKAI--Continued

210419156570501. Local number, 4-0457-01. Kawela Shaft, Molokai.

LOCATION.--Lat 21°04'19", long 156°57'05", Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku. Owner: County of Maui.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 ft x 4 ft, depth 38 ft, lined with concrete to 38 ft; two infiltration tunnels, total length 229 ft.

DATUM.--Elevation of land-surface datum is 38 ft. Measuring point is top of steel plate, 37.56 ft, above mean sea level. New M.P. August. 14, 2001.

REMARKS.--Water from this well is used for public supply. Water level measured after pump has been turned off for 30 minutes.

PERIOD OF RECORD.-- Water level: occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year. Water quality: occasional measurements, 1948, 1954-56, 1960, 1962, 1971, 1973-91, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.78 ft above mean sea level, February 5, 1991; lowest measured, 1.47 ft above mean sea level, June 24, 1955.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL
AUG 14	1.90

210605157012001. Local number, 4-0601-01. Kaunakakai, Molokai.

LOCATION.--Lat 21°06'01", long 157°01'11", Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalanianaole Colony. Owner: Molokai Ranch.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 59 ft, 12-in. casing diameter, cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point is top of 15-in. surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, May 1954 to current year. Water quality: occasional measurements, 1954-2000.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft above mean sea level, January 20, 1969; lowest measured, 1.60 ft above mean sea level, December 5, 1964.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	2.50	DEC 05	2.56	FEB 15	2.62	APR 24	2.44	JUN 20	2.47	AUG 13	2.70

WATER YEAR 2001 LOWEST 2.44 APR 24, 2001 HIGHEST 2.70 AUG 13, 2001

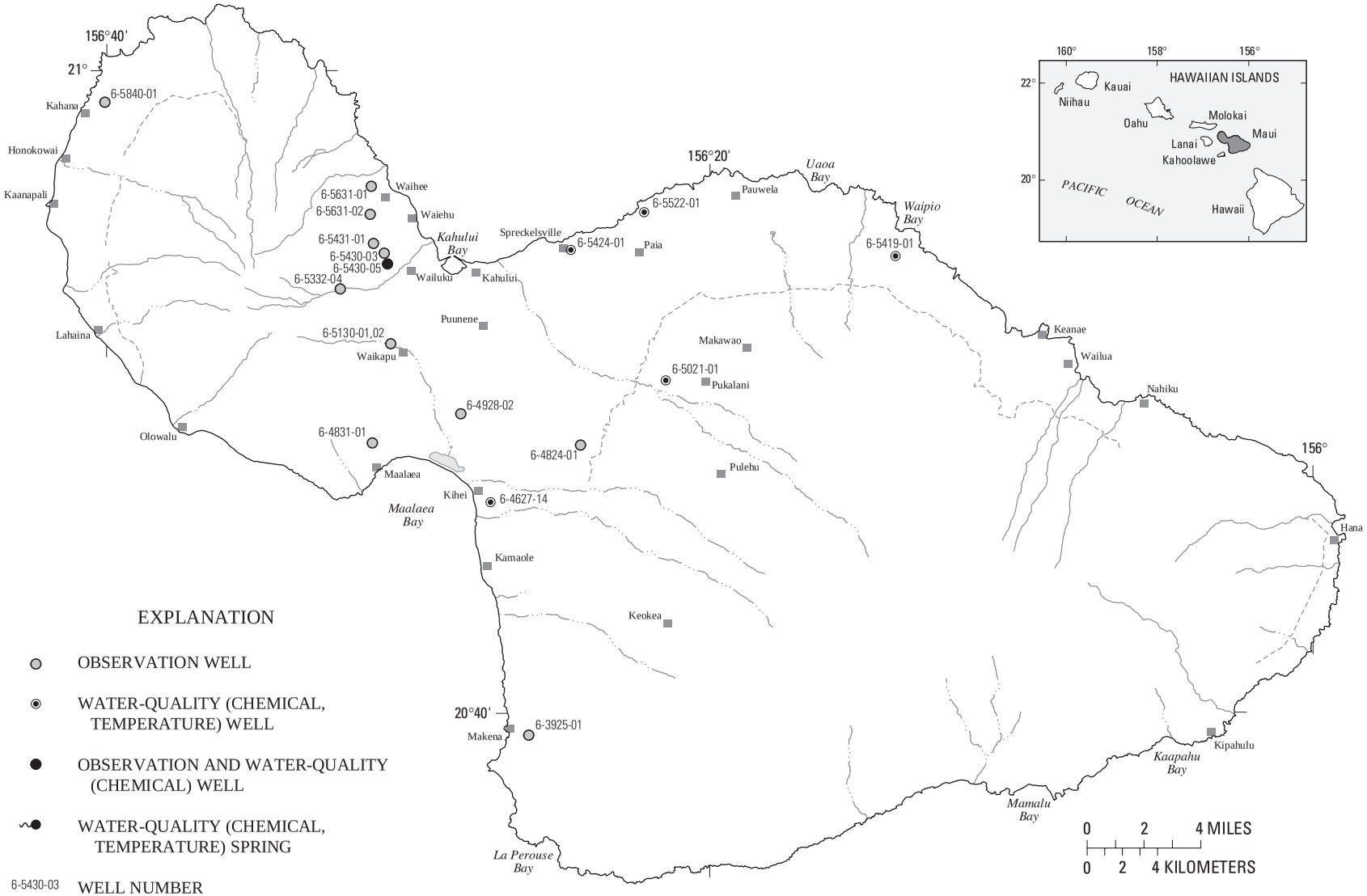


Figure 19. Locations of observation wells and ground-water quality sampling sites on Maui.

203912156255901. Local number, 6-3925-01. Makena, Maui.

LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena Roads. Owner: State of Hawaii.

AQUIFER.--Hana Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 382 ft, 8-in. casing diameter, cased to 343 ft, perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 351 ft. Measuring point is top of 2-in. pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, August 24, 1964; lowest measured, 0.60 ft below mean sea level, May 24, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	-.28	FEB 23	-.24	MAY 24	-.60	AUG 17	-.04

WATER YEAR 2001	LOWEST	-.60	MAY 24, 2001	HIGHEST	-.24	FEB 23, 2001	

204827156242201. Local number, 6-4824-01. Kihei exploratory well, Maui

LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa Gulch, and 4 mi east of Kihei. Owner: State of Hawaii.

AQUIFER.--Kula Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 646 ft, 12-in. casing diameter, cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point is top of 3-in. pipe attached to the steel casing cover, 594.74 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1971, May 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft above mean sea level, January 17, 1974; lowest measured, 3.58 ft above mean sea level, June 14, 2000.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	3.92	JAN 04	4.10	FEB 23	3.98	MAY 24	3.84	JUN 26	3.83	AUG 17	4.02

WATER YEAR 2001	LOWEST	3.83	JUN 26, 2001	HIGHEST	4.10	JAN 04, 2001	

HAWAII, ISLAND OF MAUI--Continued

204818156310301. Local number, 6-4831-01. Maalaea, Maui.

LOCATION.--Lat 20°48'18", long 156°31'03", Hydrologic Unit 20020000, on sugar plantation road 0.7 mi north of Maalaea, and 0.9 mi southwest of intersection of Honoapiilani Highway and Kihei Road. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 219 ft, 8-in. casing diameter, cased to 187 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point is top of 8-in. casing, 166.60 ft above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, January to July 1974. Occasional measurements, September 1972 to December 1973, August 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft above mean sea level, November 30, 1983; lowest measured, 4.66 ft above mean sea level, June 12, 2000.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	4.83	JAN 04	4.98	FEB 23	4.90	MAY 24	4.75	JUN 26	4.90	AUG 17	4.95

WATER YEAR 2001 LOWEST 4.75 MAY 24, 2001 HIGHEST 4.98 JAN 04, 2001

204909156281401. Local number, 6-4928-02. Puunene Airport Shaft, Maui.

LOCATION.--Lat 20°49'09", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.3 mi north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Basalt, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 ft x 9 ft vertical shaft, depth 52 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point is top of angle iron at well, 50.08 ft above mean sea level.

REMARKS.--Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, March 1972 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.09 ft above mean sea level, January 12, 1980; lowest measured, 3.05 ft above mean sea level, March 5, 6, 1977.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	3.44	JAN 04	3.53	FEB 23	3.48	MAY 24		JUN 26		AUG 28	3.65

WATER YEAR 2001 LOWEST 3.44 OCT 26, 2000 HIGHEST 3.65 AUG 28, 2001

HAWAII, ISLAND OF MAUI--Continued

205140156304501. Local number, 6-5130-01. Waikapu 1, Maui.

LOCATION.--Lat 20°51'40", long 156°30'45", Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well, depth 757 ft, 8-in. casing diameter, cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point is top of 6-in. pipe coupling, 551.33 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.90 ft above mean sea level, October 13, 1982; lowest measured, 11.21 ft above mean sea level, April 4, 2000.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	11.75	JAN 09	11.93	APR 03	11.28	JUL 03	12.57
DEC 07	12.08	MAR 08	11.49	MAY 15	11.51	AUG 21	12.73

WATER YEAR 2001 LOWEST 11.28 APR 03, 2001 HIGHEST 12.73 AUG 21, 2001

205154156303801. Local number, 6-5130-02. Waikapu 2, Maui.

LOCATION.--Lat 20°51'54", long 156°30'38", Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,020 ft, 20-in. casing diameter, cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point is top of casing, 519.33 ft above mean sea level.

REMARKS.--Water-quality records for 1974 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, August 1983 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft above mean sea level, July 15, 1987; lowest measured, 11.10 ft above mean sea level, July 3, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	11.38	JAN 09	11.43	APR 03	11.11	JUL 03	11.10
DEC 07	11.45	MAR 08	11.18	MAY 15	11.16	AUG 21	11.14

WATER YEAR 2001 LOWEST 11.10 JUL 03, 2001 HIGHEST 11.45 DEC 07, 2000

HAWAII, ISLAND OF MAUI--Continued

205305156304401. Local number, 6-5330-05. Shaft 33, well 1, Maui.

LOCATION.--Lat 20°53'05", long 156°30'44", Hydrologic Unit 20020000, 1,500 ft southwest of Wailuku Elementary School, 1,500 ft southeast of Maui DWS water tank near intersection of Wailuku Heights Road and Iao Valley Road.

AQUIFER.--Wailuku Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Three drilled wells in vault, at bottom of excavated inclined shaft. Vault floor about 32 ft above mean sea level, well nearest inclined shaft is measured. Depth 310 ft below vault floor, casing length unknown.

DATUM.--Elevation of land-surface datum is 401.51 ft. Datum of vault floor is 32.14 ft. Measuring point is the edge of steel plate, inside access hole cut through pump base casing, at cement floor level, 32.17 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, February 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.33 ft above mean sea level, April 22, 1997; lowest measured, 7.97 ft above mean sea level, July 17, and August 21, 2001.

REMARKS.--Water level affected by pumping of adjacent well in shaft, and by other nearby wells.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	8.51	JAN 09	8.87	APR 03	8.49	JUL 17	7.97
DEC 08	8.77	MAR 13	8.67	MAY 17	8.21	AUG 21	7.97

205329156305502. Local number, 6-5330-09. Mokuhau Pump 2, Maui.

LOCATION.--Lat 20°53'29", long 156°30'55", Hydrologic Unit 20020000, 05 mi northwest of Wailuku and 0.6 mi west on Mokuhau Road from Market Street. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well. Depth 600 ft, 18-in. casing diameter, length of casing 411 ft.

DATUM.--Elevation of land-surface datum is 354 ft. Measuring point is top of 1 $\frac{1}{2}$-in. plug, 353.79 ft above mean sea level.

PERIOD OF RECORD.--Chloride samples collected since 1972. Pump removed sometime in 1998 (Sept., Oct., Nov.). Occasional measurements December 1998 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.04 ft above mean sea level, March 5, 1999; lowest measured, 3.88 ft above mean sea level, August 24, 1999.

REMARKS.--Water level affected by pumping of nearby well.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	6.24	DEC 07	7.39	JAN 09	7.43	MAY 15	7.26	JUL 03	4.22	AUG 21	5.74

HAWAII, ISLAND OF MAUI--Continued

205312156321402. Local number, 6-5332-04. Kepaniwai observation well, Maui.

LOCATION.--Lat 20°53'12", long 156°32'14", Hydrologic Unit 20020000, 1.9 mi southwest of Puuohala Village, 1.9 mi west of Wailuku Elementary School, and 10 ft from well 6-5332-04. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 254 ft.

DATUM.--Elevation of land-surface datum is 713 ft. Measuring point is top of 2-in. PVC pipe.

PERIOD OF RECORD.--Occasional measurements, October 1991 to current year. Prior to October 1995, unpublished records are in the files of the U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.41 ft below land-surface datum, July 1, 1996; lowest measured, 83.20 ft below land-surface datum, July 6, 2000.

REMARKS.--Water level affected by pumping of nearby well.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	82.28	JAN 09	81.91	APR 03	82.80	JUL 03	81.58
DEC 07	81.48	MAR 08	82.37	MAY 15	81.68	AUG 21	80.35

205419156304401. Local number, 6-5430-03. TH-E Waiehu, Maui.

LOCATION.--Lat 20°54'19", long 156°30'44", Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 580 ft, 1.5-in. PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point is top of 1-in. galvanized pipe, 416.75 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984. Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, December 31, 1982; lowest measured, 9.08 ft above mean sea level, October 1, 1999.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	10.29	JAN 09	11.30	APR 03	10.47	JUL 03	9.75
DEC 07	11.10	MAR 08	10.87	MAY 15	10.08	AUG 21	9.22

WATER YEAR 2001 LOWEST 9.22 AUG 21, 2001 HIGHEST 11.30 JAN 09, 2001

HAWAII, ISLAND OF MAUI--Continued

205405156305401. Local number, 6-5430-05. Waiehu deep monitor well, Maui

LOCATION.--Lat 20°54'59", long 156°30'54", Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,400 ft, 10-in. casing diameter, cased to 400 ft.

DATUM.--Elevation of land-surface datum is 380 ft. Measuring point is top of 10-in. casing, 380.84 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, August 1983 to May 1986. Water level recorder, June 1986 to current year. Water quality: 1982, 1985 to current year.

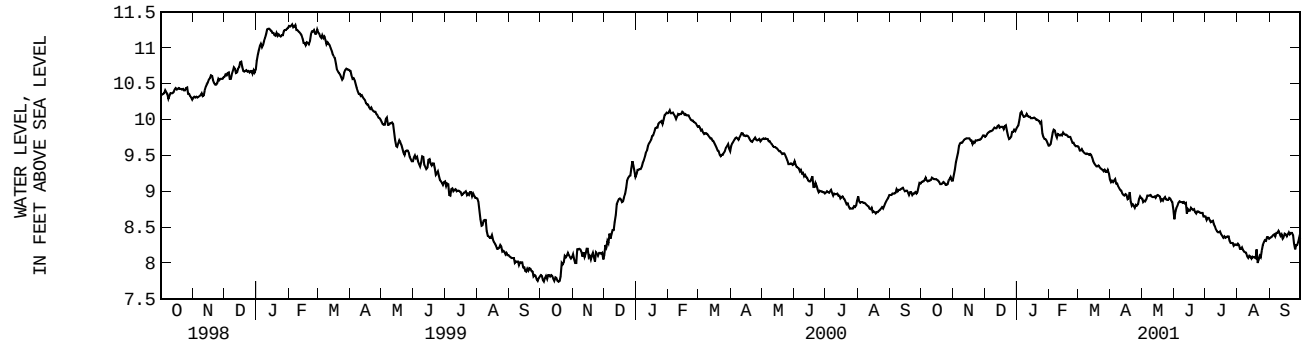
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.20 ft above mean sea level, December 14, 1989; lowest measured, 7.66 ft above mean sea level, October 18, 1999.

REMARKS.--Geophysical log and water-quality records are available in files at USGS Hawaii District Office.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.13	9.23	9.76	9.90	9.64	9.62	9.13	8.90	8.61	8.65	8.27	8.35
2	e9.14	9.30	9.77	9.92	9.66	9.57	9.15	8.85	8.72	e8.60	8.25	8.36
3	9.14	9.41	9.80	e10.00	9.73	9.57	9.13	8.87	8.77	8.63	8.20	8.37
4	9.16	9.47	9.82	10.09	9.82	9.59	e9.15	8.86	8.80	8.63	8.20	8.39
5	9.19	9.54	9.83	10.11	9.86	9.56	9.17	8.89	8.84	8.60	8.22	8.40
6	9.15	9.63	9.84	10.07	9.85	9.54	9.11	8.94	8.86	8.57	8.18	8.37
7	9.14	9.67	9.84	10.04	9.79	9.53	9.11	8.94	8.85	8.58	8.16	8.42
8	9.15	9.68	9.85	10.04	9.75	9.52	9.07	8.94	8.85	8.59	8.15	8.42
9	9.15	9.68	9.87	10.05	9.80	9.53	9.04	8.95	8.84	8.54	e8.14	8.45
10	9.16	9.70	9.89	10.08	9.79	9.52	9.02	8.93	8.85	8.51	8.09	8.42
11	9.19	9.72	9.88	10.05	9.78	9.51	9.01	8.92	8.83	8.47	8.07	8.38
12	9.18	9.73	9.88	10.04	9.79	9.52	8.97	8.92	8.84	8.44	e8.10	8.40
13	9.17	9.74	9.91	10.04	9.78	9.51	8.95	8.93	8.69	8.43	e8.09	8.34
14	9.17	9.74	9.92	10.02	9.82	9.47	8.94	8.91	8.75	8.43	e8.06	8.36
15	9.17	9.74	9.89	10.02	9.80	9.42	8.96	8.94	8.73	8.44	e8.09	8.41
16	9.16	9.74	9.90	10.02	9.79	9.39	8.95	8.95	8.73	8.40	e8.08	8.40
17	9.15	9.71	9.90	10.03	9.79	9.37	8.89	8.94	8.77	8.38	e8.08	8.37
18	9.13	9.71	9.90	10.02	9.78	9.35	8.90	8.93	8.75	8.35	e8.07	8.40
19	9.10	9.66	9.87	10.00	9.76	9.35	8.99	8.87	8.74	8.37	e8.19	8.43
20	9.10	9.69	9.91	10.00	9.76	9.36	8.86	8.89	8.75	8.35	e8.00	8.40
21	9.11	9.68	9.92	9.99	9.76	9.34	8.80	8.87	8.71	8.36	e8.04	8.42
22	9.13	9.71	9.84	9.98	9.72	9.32	8.82	8.90	8.69	8.37	e8.10	8.42
23	9.12	9.71	9.78	9.95	9.68	9.31	8.80	8.92	8.72	8.37	8.08	8.39
24	9.09	9.71	9.73	9.97	9.68	9.30	8.77	8.89	8.72	8.31	8.18	8.27
25	9.09	9.72	9.74	9.81	9.65	9.28	8.81	8.88	8.71	8.28	8.25	8.19
26	9.10	9.72	9.76	9.76	9.63	9.30	8.80	8.88	8.70	8.28	8.29	8.25
27	9.15	9.73	9.83	9.73	9.63	9.27	8.82	8.91	8.70	8.28	8.32	8.25
28	9.17	9.75	9.83	9.73	9.63	9.27	8.89	8.90	8.70	8.24	8.31	8.29
29	9.20	9.78	9.86	9.71	---	9.30	8.93	8.87	8.65	8.26	8.36	8.36
30	9.15	9.78	9.84	9.68	---	9.25	8.91	8.85	8.65	8.26	8.36	8.33
31	9.15	---	9.87	9.64	---	9.17	---	8.74	---	8.25	8.34	---
MEAN	9.14	9.66	9.85	9.95	9.75	9.42	8.96	8.90	8.75	8.43	8.17	8.37
MAX	9.20	9.78	9.92	10.11	9.86	9.62	9.17	8.95	8.86	8.65	8.36	8.45
MIN	9.09	9.23	9.73	9.64	9.63	9.17	8.77	8.74	8.61	8.24	8.00	8.19

e Estimated



HAWAII, ISLAND OF MAUI--Continued

205437156310501. Local number, 6-5431-01. TH-B Waiehu, Maui

LOCATION.--Lat 20°54'37", long 156°31'05", Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 555 ft, 1.5-in. PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

DATUM.--Elevation of land-surface datum is 493 ft. Measuring point is top of 1.5-in. PVC casing, 492.51 ft above mean sea level.

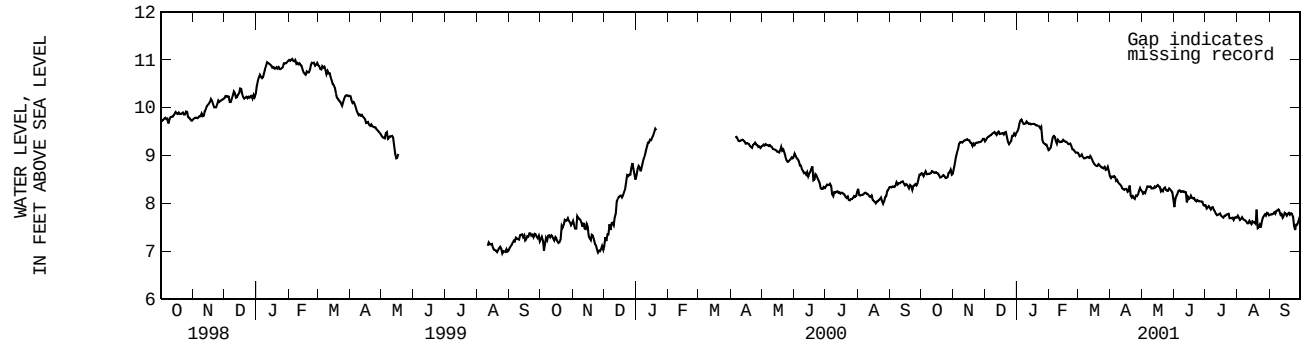
PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, January 2, 1983; lowest measured, 6.86 ft above mean sea level, November 26, 1999.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.63	8.73	9.30	9.50	9.13	9.03	8.53	8.25	7.92	7.96	7.74	7.76
2	8.62	8.83	9.33	9.55	9.16	8.98	8.56	8.20	8.10	7.89	7.70	7.77
3	8.57	8.97	9.37	9.67	9.26	8.99	8.55	8.23	8.15	7.91	7.65	7.77
4	8.62	9.05	9.39	9.73	9.38	9.02	8.57	8.21	8.20	7.94	7.67	7.78
5	8.67	9.13	9.40	9.75	9.41	8.97	8.55	8.28	8.26	7.91	7.71	7.81
6	8.61	9.24	9.42	9.70	9.39	8.94	8.47	8.35	8.27	7.87	7.67	7.78
7	8.61	9.28	e9.43	9.66	9.31	8.94	8.49	8.35	8.24	7.91	7.65	7.84
8	8.62	9.28	e9.46	9.66	9.25	8.95	8.44	8.34	8.25	7.92	7.64	7.85
9	8.62	9.27	e9.47	9.67	9.33	8.97	8.41	8.35	8.24	7.86	7.62	7.87
10	8.63	9.29	e9.49	9.71	9.30	8.96	8.39	8.31	8.25	7.83	7.58	7.84
11	8.67	9.31	e9.46	9.68	9.28	8.95	8.36	8.31	8.23	7.78	7.58	7.76
12	8.66	9.32	9.43	9.66	9.29	8.99	8.31	8.31	8.23	7.75	7.63	7.78
13	8.64	9.33	9.48	9.67	9.29	8.96	8.29	8.35	8.02	7.76	7.59	7.70
14	8.64	9.34	9.50	9.65	9.33	8.91	8.28	8.33	8.13	7.77	7.56	7.73
15	8.65	9.32	9.45	9.66	9.31	8.86	8.30	8.36	8.09	7.79	7.62	7.80
16	8.63	9.32	9.46	9.66	9.29	8.82	8.30	8.38	8.11	7.74	7.60	7.78
17	8.62	9.27	9.46	9.66	9.29	8.80	8.24	8.35	8.16	7.72	7.60	7.74
18	8.58	9.26	9.47	9.65	9.27	8.78	8.26	8.34	8.11	7.70	7.57	7.78
19	8.54	9.20	9.44	9.63	9.24	8.78	8.37	8.25	8.10	7.74	7.87	7.80
20	8.55	9.25	9.48	9.63	9.24	8.82	8.16	8.28	8.11	7.74	7.48	7.76
21	8.57	9.22	9.49	9.62	9.25	8.80	8.12	8.25	8.06	7.76	7.50	7.79
22	8.59	9.26	9.38	9.61	9.20	8.77	8.15	8.31	8.04	7.77	7.55	7.78
23	8.57	9.27	9.29	9.57	9.13	8.75	8.11	8.33	8.07	7.78	7.49	7.72
24	8.53	9.27	9.24	9.60	9.12	8.75	8.09	8.28	8.05	7.69	7.62	7.53
25	8.53	9.28	9.27	9.33	9.09	8.73	8.16	8.26	8.04	7.69	7.70	7.44
26	8.55	9.28	9.30	9.27	9.06	8.76	8.15	8.26	8.04	7.69	7.74	7.55
27	8.64	9.29	9.41	9.25	9.06	8.70	8.18	8.31	8.04	7.70	7.77	7.55
28	8.65	9.31	9.41	9.23	9.06	8.71	8.26	8.29	8.03	7.65	7.74	7.60
29	8.70	9.35	9.46	9.23	---	8.76	8.32	8.26	7.96	7.70	7.80	7.68
30	8.60	9.35	9.42	9.18	---	8.67	8.27	8.23	7.95	7.71	7.79	7.63
31	8.62	---	9.47	9.11	---	8.57	---	8.08	---	7.70	7.75	---
MEAN	8.61	9.23	9.41	9.55	9.24	8.85	8.32	8.29	8.11	7.78	7.65	7.73
MAX	8.70	9.35	9.50	9.75	9.41	9.03	8.57	8.38	8.27	7.96	7.87	7.87
MIN	8.53	8.73	9.24	9.11	9.06	8.57	8.09	8.08	7.92	7.65	7.48	7.44

e Estimated



HAWAII, ISLAND OF MAUI--Continued

205617156311101. Local number, 6-5631-01. TH-A1 Waihee, Maui.

LOCATION.--Lat 20°56'17", long 156°31'11", Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 300 ft, 1.5-in. PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point is top of 1.5-in. PVC pipe, 248.05 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.83 ft above mean sea level, December 6, 1982; lowest measured, 10.80 ft above mean sea level, August 21, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 03	11.29	JAN 09	11.65	APR 03	11.41	JUL 03	11.01
DEC 07	11.53	MAR 08	11.56	MAY 15	11.08	AUG 21	10.80

WATER YEAR 2001 LOWEST 10.80 AUG 21, 2001 HIGHEST 11.65 JAN 09, 2001

HAWAII, ISLAND OF MAUI--Continued

205651156313201. Local number, 6-5631-02. North Waihee 1, Maui.

LOCATION.--Lat 20°56'51", long 156°31'32", Hydrologic Unit 20020000, 0.9 mi northwest of Waihee School, and 0.9 mi upstream from mouth of Waihee river. Owner: Hawaiian Investments.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 387 ft, 16-in. casing diameter, cased to 290 ft, perforated from 290 to 310 ft.

DATUM.--Elevation of land-surface datum is 281 ft. Measuring point is top of 16-in. casing, 285.23 ft above mean sea level (revised November 1997).

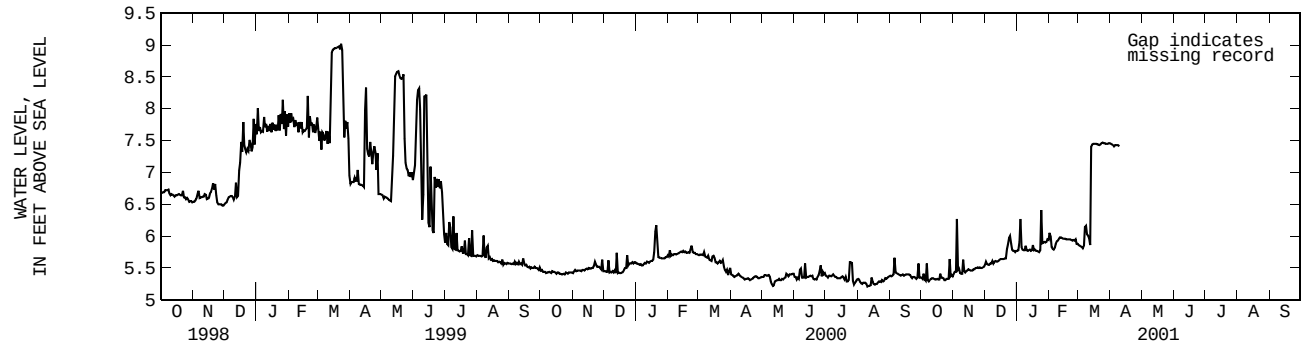
PERIOD OF RECORD.--Water-level recorder, April 1988 to January 29, 1997. Recorder removed due to installation of pump in the well. Water- level recorder reinstalled November 1997 to April 9, 2001.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.05 ft above mean sea level, October 22, November 2, 10, 11, 1989; lowest water level measured, 7.59 ft above mean sea level, November 8, 9, 1996. Lowest water level measured after pumping resumed, 5.00 ft above mean sea level, August 1, 2000.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.35	5.41	5.55	5.77	6.05	5.86	7.45	---	---	---	---	---
2	5.33	5.44	5.60	5.78	6.00	5.85	7.44	---	---	---	---	---
3	5.41	5.44	5.56	5.91	5.83	5.84	7.43	---	---	---	---	---
4	5.32	6.27	5.55	6.27	5.80	5.83	7.41	---	---	---	---	---
5	5.30	5.47	5.55	5.83	5.79	5.81	7.43	---	---	---	---	---
6	5.57	5.49	5.57	5.79	5.82	5.85	7.43	---	---	---	---	---
7	5.31	5.42	5.57	5.78	5.88	6.14	7.43	---	---	---	---	---
8	5.29	5.41	5.61	5.78	5.92	6.16	7.43	---	---	---	---	---
9	5.31	5.41	5.57	5.85	5.93	6.03	7.41	---	---	---	---	---
10	5.33	5.63	5.60	5.78	5.96	6.01	---	---	---	---	---	---
11	5.34	5.45	5.61	5.77	5.98	5.97	---	---	---	---	---	---
12	5.34	5.43	5.60	5.78	5.98	5.86	---	---	---	---	---	---
13	5.33	5.45	5.60	5.79	5.97	e7.40	---	---	---	---	---	---
14	5.32	5.46	5.61	5.77	5.96	7.44	---	---	---	---	---	---
15	5.32	5.48	5.63	5.78	5.96	7.45	---	---	---	---	---	---
16	5.33	5.47	5.64	5.86	5.96	7.45	---	---	---	---	---	---
17	5.32	5.46	5.64	5.78	5.95	7.45	---	a7.03	---	a7.02	---	---
18	5.32	5.46	5.64	5.79	5.95	7.45	---	---	---	---	---	---
19	5.41	5.46	5.64	5.77	5.95	7.44	---	---	---	---	---	---
20	5.35	5.48	5.65	5.77	5.95	7.44	---	---	---	---	---	---
21	5.35	5.48	5.65	5.76	5.95	7.43	---	---	---	---	a6.95	---
22	5.34	5.50	5.80	5.75	5.94	7.44	---	---	---	---	---	---
23	5.31	5.50	5.87	5.78	5.93	7.46	---	---	---	---	---	---
24	5.31	5.51	5.97	6.41	5.94	7.47	---	---	---	---	---	---
25	5.33	5.50	6.00	5.89	5.93	7.46	---	---	---	---	---	---
26	5.33	5.51	5.88	5.90	5.95	7.46	---	---	---	---	---	---
27	5.33	5.50	5.79	5.91	5.88	7.45	---	---	---	---	---	---
28	5.64	5.50	5.77	5.90	5.88	7.45	---	---	---	---	---	---
29	5.37	5.51	5.77	5.91	---	7.45	---	---	---	---	---	---
30	5.39	5.52	5.75	5.95	---	7.46	---	---	---	---	---	---
31	5.37	---	5.77	5.94	---	7.46	---	---	---	---	---	---
MEAN	5.35	5.50	5.68	5.85	5.93	6.86	7.43	---	---	---	---	---
MAX	5.64	6.27	6.00	6.41	6.05	7.47	7.45	---	---	---	---	---
MIN	5.29	5.41	5.55	5.75	5.79	5.81	7.41	---	---	---	---	---

a Water Level Measurement
e Estimated



HAWAII, ISLAND OF MAUI--Continued

205856156400101. Local number, 6-5840-01 Alaeloa, Maui.

LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on pineapple plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 274 ft, 8-in. casing diameter, cased to 264 ft, perforated from 264 to 274 ft. Hole was drilled to depth of 284 ft, but plugged back 10 ft with cement.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point is top of 9-in. casing, 257.33 ft. above mean sea level. New M. P. June 12, 2001.

REMARKS.--Water-quality records for 1964 and 1980 are available in files of USGS Hawaii District Office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975. Water- level recorder, August 1975 to June 1993. Occasional measurements, July 1993 to July 2001. Water level recorder July 12, 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, September 20, 1981; lowest, 2.40 ft above mean sea level May 4, 5, 1985.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	2.68	JAN 10	2.91	FEB 28	2.85	MAY 21	2.68	JUL 12	2.92	AUG 03	2.76

WATER YEAR 2001 LOWEST 2.68 OCT 25, 2000 MAY 21, 2001 HIGHEST 2.92 JUL 12, 2001

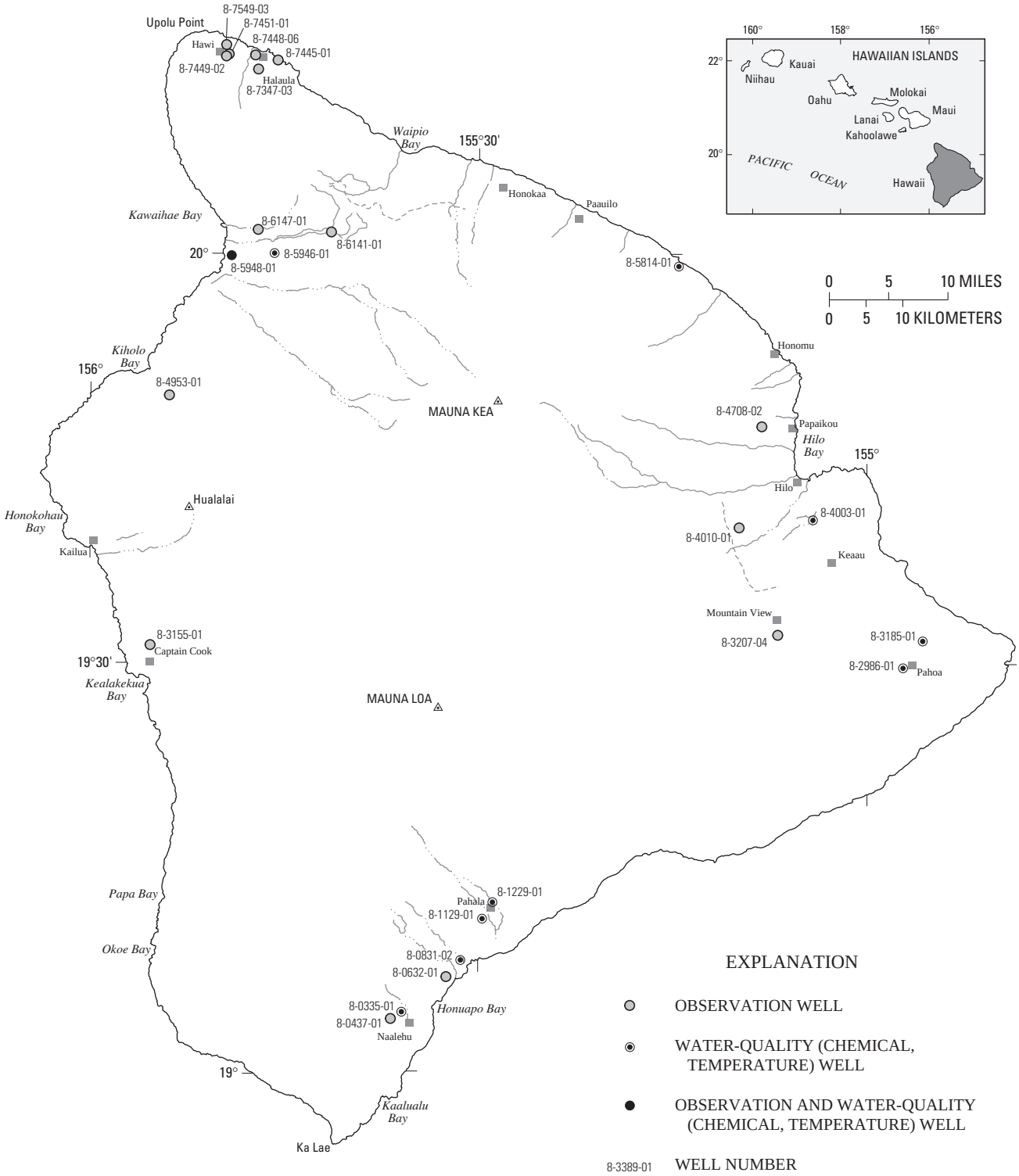


Figure 20. Locations of observation wells and ground-water quality sampling sites on Hawaii.

HAWAII, ISLAND OF HAWAII

190423155371501. Local number and name 8-0437-01 Waiohinu, Hawaii.

LOCATION.--Lat 19°04'23", long 155°37'15", Hydrologic Unit 20010000, 2,500 ft northwest of Waiohinu. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 972 ft, 4-in. casing diameter, cased to 240 ft, screened from 240 to 972 ft.

DATUM.--Elevation of land-surface datum is 1,299 ft. Measuring point is top of 4-in. casing, 1,299.83 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, September 1995, September 1997 to current year. Water quality: October 1994.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1,014.57 ft above mean sea level, September 23, 1997; lowest measured, 1,012.17 ft above mean sea level, October 25, 1999.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	1012.23	DEC 18	1014.05	FEB 23	1013.50	APR 27	1013.40	JUN 14	1013.22	AUG 20	1013.02

WATER YEAR 2001 LOWEST 1012.23 OCT 18, 2000 HIGHEST 1014.05 DEC 18, 2000

190602155325901. Local number and name 8-0632-01 Honuapo W-2, Hawaii.

LOCATION.--Lat 19°06'02", long 155°32'59", Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 140 ft, 14-in. casing diameter, cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point is “X” mark on pump base, 104.01 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, April 1972 to current year. Water quality: occasional measurements, 1972-73.

REVISED RECORDS.--WDR HI-91-1: 1984-90 (The units of the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.39 ft above mean sea level, October 19, 1978; lowest measured, 0.15 ft above mean sea level, May 26, 1998.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	1.41	DEC 18	2.22	FEB 23	1.42	APR 27	1.12	JUN 14	1.52	AUG 20	.79

WATER YEAR 2001 LOWEST .79 AUG 20, 2001 HIGHEST 2.22 DEC 18, 2000

HAWAII, ISLAND OF HAWAII--Continued

193117155550801. Local number and name 8-3155-01 Kealakekua, Hawaii.

LOCATION.--Lat 19°31'17", long 155°55'08", Hydrologic Unit 20010000, 0.3 mi east of Kealakekua Post Office and 0.6 mi north of Konawaena High School. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,510 ft, 4-in. casing diameter, cased to 1,500 ft perforated from 1,250 to 1,500 ft.

DATUM.--Elevation of land-surface datum is 1,746.80 ft. Measuring point is top of aluminum cap on 4-in. casing, 1,745.84 ft above mean sea level.

REMARKS.--Water level may be affected by pumping well 50 ft away.

PERIOD OF RECORD.--Water level: occasional measurements, April 1992 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 469.06 ft above mean sea level, December 18, 1997; lowest measured, 459.07 ft above mean sea level, August 17, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	463.24	DEC 18	462.15	FEB 27	460.92	APR 27	460.18	JUN 12	459.81	AUG 17	459.07

WATER YEAR 2001 LOWEST 459.07 AUG 17, 2001 HIGHEST 463.24 OCT 18, 2000

193251155072101. Local number and name 8-3207-04 Mt. View, Hawaii.

LOCATION.--Lat 19°32'51", long 155°07'21", Hydrologic Unit 20010000, 1.4 mi southwest of Mountain View. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,143 ft, 4-in. casing and 8-in. casing diameter, from 0 to 75 ft, cased to 660 ft slotted from 660 to 1,120 ft, solid from 1,120 to 1,143 ft. Hole caved from 1,143 to 1,155 ft; hole grouted to 95 ft.

DATUM.--Elevation of land-surface datum is 1,687 ft. Measuring point is top of casing, 1,687.84 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, March 1995, December 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1,013.58 ft above mean sea level, May 19, 1999; lowest measured, 982.87 ft above mean sea level, May 26, 1998.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	988.28	DEC 18	1004.68	FEB 22	998.41	APR 30	996.39	JUN 14	998.73	AUG 20	994.13

WATER YEAR 2001 LOWEST 988.28 OCT 18, 2000 HIGHEST 1004.68 DEC 18, 2000

HAWAII, ISLAND OF HAWAII--Continued

194035155102201. Local number and name 8-4010-01 Kaumana, Hawaii.

LOCATION.--Lat 19°40'35", long 155°10'22", Hydrologic Unit 20010000, 2 mi west of Kaumana at western end of Kaumana Estates subdivision. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,375 ft, 4-in. casing diameter, cased to 732 ft, screened from 732 to 1,375 ft.

DATUM.--Elevation of land-surface datum is 1,796 ft. Measuring point is top of 4-in. casing, 1,796.29 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, February 1995, January 1998 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 982.10 ft above mean sea level, November 8, 1999; lowest measured, 962.17 ft above mean sea level, January 21, 1999.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 09		JAN 10	973.25	JAN 30	972.14	APR 30	974.91	JUN 08	975.37	AUG 15	976.58

WATER YEAR 2001 LOWEST 972.14 JAN 30, 2001 HIGHEST 976.58 AUG 15, 2001

194731155080401. Local number and name 8-4708-02 Kaieie Mauka, Hawaii.

LOCATION.--Lat 19°47'31", long 155°08'04", Hydrologic Unit 20010000, 3.0 mi up Kaiéie Road near DWS water tank and 2.6 mi west-northwest of Papaikou Post Office. Owner: U.S. Geological Survey.

AQUIFER.--Hamakua Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,030 ft, 4-in. casing diameter, cased to 790 ft, perforated section 790 to 1,030 ft.

DATUM.--Elevation of land-surface datum is 1,134.5 ft. Measuring point is top of 4-in. casing, 1,135.08 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, June 1998 to current year. Water quality: aquifer test, November 1997, in files of Hawaii District office.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 145.96 ft above mean sea level, February 23, 2001; lowest measured, 144.76 ft above mean sea level, June 14, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	144.87	DEC 20	144.84	FEB 23	145.96	APR 26	145.46	JUN 14	144.76	AUG 15	144.95

WATER YEAR 2001 LOWEST 144.76 JUN 14, 2001 HIGHEST 145.96 FEB 23, 2001

HAWAII, ISLAND OF HAWAII--Continued

194945155534401. Local number and name 8-4953-01 Kiholo, Hawaii.

LOCATION.--Lat 19°49'45", long 155°53'44", Hydrologic Unit 20010000, 2.7 mi inland from Kiholo Bay. Owner: State of Hawaii.

AQUIFER.--Hualalai Volcanics, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 971 ft, 12-in. casing diameter, cased to 926 ft, screened from 926 to 966 ft.

DATUM.--Elevation of land-surface datum is 931.65 ft. Measuring point is top of 7 $\frac{1}{4}$ in. (O.D.) casing, 932.48 ft above mean sea level.

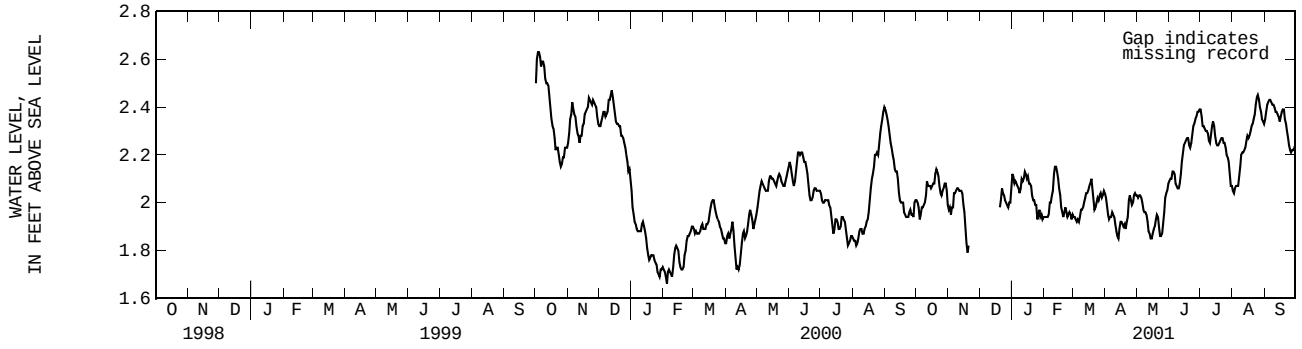
REMARKS.--State exploratory well drilling program. No record Nov 21 to Dec 19 due to battery failure.

PERIOD OF RECORD.-- Water level: occasional measurements, June 1972 to September 1999; continuous water-level measurements September 30, 1999 to current year. Water quality: 1972.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.85 ft above mean sea level, June 6, 1972 (data from Hawaii State Department of Land and Natural Resources, Circular C63, 1973); lowest measured, 1.47 ft above mean sea level, November 21, 2000.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.01	1.97	---	2.12	1.94	1.94	2.02	2.03	2.09	2.39	2.05	2.35
2	2.00	1.98	---	2.11	1.94	1.94	1.99	2.02	2.10	2.36	2.04	2.38
3	1.98	1.95	---	2.08	1.94	1.93	1.95	2.03	2.10	2.32	2.06	2.41
4	1.93	1.98	---	2.09	1.94	1.92	1.93	2.03	2.13	2.32	2.07	2.42
5	1.95	1.98	---	2.08	1.95	1.93	1.94	2.02	2.13	2.31	2.07	2.43
6	1.98	2.04	---	2.07	2.00	1.92	1.94	2.00	2.12	2.30	2.07	2.43
7	1.98	2.04	---	2.06	2.00	1.94	1.96	1.97	2.08	2.30	2.11	2.42
8	1.99	2.05	---	2.04	2.03	1.97	1.95	1.96	2.07	2.29	2.15	2.41
9	2.00	2.06	---	2.06	2.05	1.97	1.94	1.96	2.06	2.26	2.20	2.41
10	2.03	2.06	---	2.10	2.12	1.98	1.91	1.95	2.06	2.25	2.21	2.40
11	2.09	2.05	---	2.09	2.15	2.00	1.88	1.92	2.08	2.28	2.21	2.38
12	2.07	2.05	---	2.10	2.15	2.02	1.86	1.88	2.12	2.32	2.22	2.38
13	2.07	2.05	---	2.13	2.13	2.04	1.85	1.87	2.17	2.34	2.23	2.37
14	2.07	2.04	---	2.12	2.10	2.04	1.89	1.85	2.21	2.32	2.26	2.36
15	2.06	1.99	---	2.10	2.06	2.05	1.92	1.85	2.24	2.28	2.28	2.34
16	2.07	1.96	---	2.11	2.03	2.07	1.92	1.87	2.25	2.25	2.27	2.36
17	2.08	1.89	---	2.08	1.98	2.08	1.91	1.89	2.26	2.24	2.28	2.38
18	2.08	1.83	---	2.08	1.96	2.10	1.90	1.90	2.27	2.24	2.30	2.39
19	2.12	1.79	---	2.07	1.94	2.06	1.91	1.93	2.27	2.25	2.32	2.39
20	2.14	1.82	1.98	2.03	1.96	2.01	1.89	1.95	2.24	2.26	2.33	2.35
21	2.13	---	2.01	2.01	1.98	1.97	1.92	1.94	2.23	2.27	2.35	2.33
22	2.11	---	2.06	2.01	1.96	1.98	1.94	1.90	2.25	2.27	2.37	2.30
23	2.07	---	2.04	1.99	1.94	2.00	2.01	1.86	2.28	2.25	2.41	2.27
24	2.04	---	2.03	1.99	1.95	2.02	2.03	1.86	2.32	2.25	2.44	2.24
25	2.03	---	2.01	1.93	1.96	2.01	2.01	1.87	2.33	2.23	2.45	2.22
26	2.05	---	2.00	1.95	1.95	2.03	1.99	1.91	2.35	2.20	2.43	2.21
27	2.06	---	1.99	1.97	1.93	2.04	2.00	1.96	2.36	2.19	2.40	2.22
28	2.08	---	1.98	1.94	1.95	2.02	2.03	2.02	2.38	2.17	2.38	2.22
29	2.08	---	2.00	1.95	---	2.03	2.04	2.04	2.38	2.12	2.35	2.23
30	2.05	---	2.00	1.93	---	2.05	2.03	2.05	2.39	2.07	2.34	2.24
31	1.99	---	2.06	1.94	---	2.04	---	2.08	---	2.07	2.33	---
MEAN	2.04	1.98	2.01	2.04	2.00	2.00	1.95	1.95	2.21	2.26	2.26	2.34
MAX	2.14	2.06	2.06	2.13	2.15	2.10	2.04	2.08	2.39	2.39	2.45	2.43
MIN	1.93	1.79	1.98	1.93	1.93	1.92	1.85	1.85	2.06	2.07	2.04	2.21



HAWAII, ISLAND OF HAWAII--Continued

195947155485801. Local number and name 8-5948-01 Hapuna Beach Park, Hawaii.

LOCATION.--Lat 19°59'47", long 155°48'58", Hydrologic Unit 20010000, 0.7 mi east of Hapuna Beach Park, and 3.1 mi southeast of Kawaihae. Owner: State of Hawaii.

AQUIFER.--Hamakua Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 268 ft, 10-in. casing diameter, cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-surface datum is 244 ft. Measuring point is hole in pump base, 246.62 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation, water level affected by pumping.

PERIOD OF RECORD.-- Water level: occasional measurements, April 1970, March 1973 to current year. Water quality: occasional measurements, 1970, 1973 to current year.

REVISED RECORDS.--WDR HI-91-1: 1976-80 (water-level data), 1976-90 (extremes for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.83 ft above mean sea level, August 29, 1994; lowest measured, 1.38 ft above mean sea level, September 28, 1979.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	3.43	DEC 19	3.26	FEB 27	3.20	APR 27	3.13	JUN 13	3.23

WATER YEAR 2001 LOWEST 3.13 APR 27, 2001 HIGHEST 3.43 OCT 19, 2000

200143155414201. Local number and name 8-6141-01 Waiaka Tank, Hawaii.

LOCATION.--Lat 20°01'43", long 155°41'42", Hydrologic Unit 20010000, 2.6 mi west of Kamuela Post Office. Owner: U.S. Geological Survey.

AQUIFER.--Hawi Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,507 ft, 4-in. diameter steel casing, cased to 1,260 ft, 4-inch slotted casing from 1,260 to 1,507 ft.

DATUM.--Elevation of land-surface datum is 2,506.38 ft. Measuring point is paint mark at top of 4-inch casing at 2,507.00 ft above mean sea level.

REMARKS.--Drilling completed August 6, 1999.

PERIOD OF RECORD.--Water level: occasional measurements, September 1999 to present.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1,245.37 ft, November 2, 1999; lowest measured, 1,243.87 ft, August 16, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	1244.59	DEC 19	1244.57	FEB 26	1244.39	APR 26	1244.17	JUN 12	1244.03	AUG 16	1243.87

WATER YEAR 2001 LOWEST 1243.87 AUG 16, 2001 HIGHEST 1244.59 NOV 21, 2000

HAWAII, ISLAND OF HAWAII--Continued

200132155471101. Local number and name 8-6147-01 Kawaihae W-3, Hawaii.

LOCATION.--Lat 20°01'32", long 155°47'11", Hydrologic Unit 20010000, on Highway 26, 3.1 mi east of Kawaihae, and 2.8 mi northeast of Hapuna Beach Park. Owner: State of Hawaii.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,008 ft, 8-in. casing diameter, cased to 997 ft, perforated from 997 to 1,008 ft. Hole was drilled to 1,040 ft, but was finally plugged back to 1,008 ft.

DATUM.--Elevation of land-surface datum is 982 ft. Measuring point is top of pipe coupling on casing cover 983.08 ft (revised, November 18, 1986) above mean sea level.

REMARKS.--Water-quality records for 1963-64 are available in files of Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, June to July 1963, June 1973 to current year.

REVISED RECORDS.--WRD HI-91-1: 1975-90 (Station ID number).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.23 ft above mean sea level, May 1, 1987; lowest measured, 4.66 ft above mean sea level, May 3, 1994.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	5.26	DEC 19	5.09	FEB 26	5.21	APR 26	5.16	JUN 12	5.23	AUG 17	5.30

WATER YEAR 2001 LOWEST 5.09 DEC 19, 2000 HIGHEST 5.30 AUG 17, 2001

201347155470501. Local number and name 8-7347-03 Halaula Makai E, Hawaii.

LOCATION.--Lat 20°13'43", long 155°46'54", Hydrologic Unit 20010000, near intersection of Highway 270 and Kauhola Point Lighthouse Road and 40 ft north of Kohala Sugar Company Halaula well. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 405 ft, 8-in. casing diameter, cased to 80 ft, open hole 80 to 405 ft.

DATUM.--Elevation of land-surface datum is 340.5 ft. Measuring point is top of casing, 340.99 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, July 1989, July 1990 to December 1990, September 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.03 ft above mean sea level, September 10, 1990; lowest measured, 7.91 ft above mean sea level, April 26, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	8.33	DEC 20	8.11	FEB 26	7.99	APR 26	7.91	JUN 12	8.04	AUG 16	8.15

WATER YEAR 2001 LOWEST 7.91 APR 26, 2001 HIGHEST 8.33 OCT 19, 2000

HAWAII, ISLAND OF HAWAII--Continued

201406155454401. Local number and name 8-7445-01 Hapuu Bay D, Hawaii.

LOCATION.--Lat 20°14'06", long 155°45'44", Hydrologic Unit 20010000, 7.5 mi east of Hawi. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 460 ft, open hole.

DATUM.--Elevation of land-surface datum is 108.50 ft. Measuring point is top of casing and elevation is 108.76 ft.

PERIOD OF RECORD.-- Water level: April 1989, April, July, August 1990, 1991, July 1992, May 1993, June 1994, 1995, 1999 to current year. Water quality: April 1989, 1990, June 1994, 1995, September 2000, January 2001.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.55 ft above mean sea level, January 27, 1995; lowest measured, 6.41 ft above mean sea level, April 26, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 17	6.58	APR 26	6.41	JUN 12	6.54	AUG 16	6.66

WATER YEAR 2001	LOWEST	6.41	APR 26, 2001	HIGHEST	6.66	AUG 16, 2001	

HAWAII, ISLAND OF HAWAII--Continued

201429155480201. Local number and name 8-7448-06 Kohala F, Hawaii.

LOCATION.--Lat 20°14'29", long 155°48'02", Hydrologic Unit 20010000, 3.4 mi east of Hawi. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 440 ft, 8-in. casing diameter, cased to 123 ft, open hole 123 to 440 ft.

DATUM.--Elevation of land-surface datum is 411 ft. Measuring point is top of casing, 411.77 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, May 1990 to January 1991, October 1997 to current year.

REVISED RECORDS.--WRD HI-01-1: 1998-00 (Measuring point elevation corrected).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.68 ft above mean sea level, May 25, 1999; lowest measured, 6.55 ft above mean sea level, April 26, 2001.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 23	7.00	JUL 29	7.87	SEP 17	8.62
MAY 28	7.77				

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 22	8.51	MAY 25	8.68	JUL 20	7.55
MAR 19	8.57				

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	8.67	APR 11	7.26	JUL 19	7.34
JAN 31	8.05	JUN 08	7.33		

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	7.57	DEC 20	6.76	FEB 26	7.07	APR 26	6.55	JUN 12	6.90	AUG 16	6.96

WATER YEAR 2001 LOWEST 6.55 APR 26, 2001 HIGHEST 7.57 OCT 19, 2000

HAWAII, ISLAND OF HAWAII--Continued

201440155510601. Local number and name 8-7451-01 Upolu J-A, Hawaii.

LOCATION.--Lat 20°14'45", long 155°51'06", Hydrologic Unit 20010000, 3.1 mi south of Upolu Point. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 632 ft, 8-in. casing diameter, cased to 100 ft, open hole 100 to 632 ft.

DATUM.--Elevation of land-surface datum is 567 ft. Measuring point is top of casing, 567.89 ft above mean sea level.

REMARKS.--Obstruction in well. Upolu J-B monitored after Aug 16, 2001.

PERIOD OF RECORD.--Water level: occasional measurements, May 1990 to September 1995, October 1997 to current year.

REVISED RECORDS.--WRD HI-01-1: 1995, 1998-00 (Measuring point elevation corrected).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.84 ft above mean sea level, September 25, 1995; lowest measured, 4.87 ft above mean sea level, May 28, 1998.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	5.59	MAY 17	5.58	SEP 25	5.84
JAN 27	5.72	AUG 01	5.66		

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 22	5.37	MAR 20	5.07	JUL 29	5.28
FEB 05	5.27	MAY 28	4.87	SEP 17	5.36

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 1998 TO SEPTEMER 1999

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 22	5.21	MAY 25	5.41	JUL 20	5.27
MAR 19	5.26				

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	5.31	APR 11	4.91	JUL 19	4.98
JAN 31	5.05	JUN 07	5.19		

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	5.19	DEC 19	5.06	FEB 26	4.97	APR 26	4.92	JUN 12	

WATER YEAR 2001 LOWEST 4.92 APR 26, 2001 HIGHEST 5.19 OCT 19, 2000

HAWAII, ISLAND OF HAWAII--Continued

201441155510701. Local number and name 8-7451-02 Upolu J-B, Hawaii.

LOCATION.--Lat 20°14'41", long 155°51'07", Hydrologic Unit 20010000, 3.1 mi south of Upolu Point. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 632 ft, 8-in. casing diameter, open hole 560 to 632 ft.

DATUM.--Elevation of land-surface datum is 566.83 ft. Measuring point is top of casing, 567.20 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, June 1990 to July 1992, July 1993, August 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.88 ft above mean sea level, September 10, 1990; lowest measured, 4.74 ft above mean sea level, July 15, 1993.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL
AUG 16	5.08

201517155493701. Local number and name 8-7549-03 Hawi Makai I, Hawaii.

LOCATION.--Lat 20°15'13", long 155°49'27", Hydrologic Unit 20010000, 1.15 mi north-northeast of intersection of Highways 250 and 270 in Hawi and 0.9 mi southeast of Alanahihi Point. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 440 ft, 10-in. casing diameter, cased to 130 ft, open hole 130 to 440 ft.

DATUM.--Elevation of land-surface datum is 299.5 ft. Measuring point is top of casing, 300.14 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, May 1990 to September 1995, September 1999 to current year. Water quality: occasional measurements, March 1990, September 2000, January 2001.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.91 ft above mean sea level, December 10, 1991; lowest measured, 1.94 ft above mean sea level, April 11, 2000.

WATER SURFACE ELEVATION IN FEET (NGVD1929), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 17	2.36	APR 26	2.04	JUN 12	2.17	AUG 16	2.43

WATER YEAR 2001	LOWEST	2.04	APR 26, 2001	HIGHEST	2.43	AUG 16, 2001	

HAWAII, ISLAND OF KAUAI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

220136159205501 -- 2-0120-01 Kalepa Ridge W-7, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
18...	0730	854	25.5	150	24...	0800	887	25.0	160
DEC					JUN				
11...	0800	864	25.0	150	11...	0740	899	25.0	160
MAR					AUG				
08...	0750	869	24.5	150	20...	0820	893	25.0	160

220354159205602 -- 2-0320-03 Nonou W-B, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
12...	0955	405	24.5	44	05...	0910	408	24.0	50
DEC					JUN				
20...	1015	411	23.5	52	07...	0940	414	24.5	53
MAR					AUG				
01...	1040	411	24.0	51	02...	0905	420	24.0	54

220530159450401 -- 2-0545-01 Kaulaula, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
10...	1245	731	24.5	130	03...	0930	737	22.5	140
DEC					JUN				
08...	1050	730	23.5	130	04...	1450	733	23.0	130
JAN					JUL				
29...	1240	738	23.5	130	30...	1405	723	25.0	130

220827159185401 -- 2-0818-01 Anahola A, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
12...	1055	224	24.0	22	07...	1030	230	24.0	22
MAR									
01...	1140	229	24.0	22					

220826159185401 -- 2-0818-02 Anahola B, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
DEC					AUG				
20...	1115	291	23.5	23	02...	1000	279	24.0	23
APR									
05...	1020	288	23.5	24					

HAWAII, ISLAND OF KAUAI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

221141159252501 -- 2-1125-01 Kilauea W-1, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
12...	1300	179	23.5	18	05...	1300	164	24.0	21
DEC					JUN				
06...	1445	161	24.0	16	07...	1320	178	24.0	18
MAR					AUG				
01...	1430	164	24.0	17	02...	1320	163	24.0	17

221150159264501 -- 2-1126-01 Princeville W-1, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
19...	0815	194	22.0	23	04...	0815	143	22.0	19
DEC					JUN				
07...	0820	156	22.0	17	06...	0805	171	22.0	21
JAN					AUG				
24...	0805	183	22.0	21	08...	0845	159	22.5	18

221201159293401 -- 2-1229-03 Maka Ridge, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
12...	1315	352	23.5	62	05...	1225	373	24.0	69
DEC					JUN				
06...	1130	359	23.5	62	07...	1250	379	24.0	71
MAR					AUG				
01...	1410	369	24.0	66	02...	1245	390	24.0	73

221247159324801 -- 2-1232-01 Wainiha, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
12...	1250	130	23.0	20	05...	1205	129	23.0	21
DEC					JUN				
20...	1315	124	22.5	21	07...	1225	124	23.0	22
MAR					AUG				
01...	1340	121	24.0	22	02...	1145	125	23.5	22

221318159335901 -- 2-1333-01 Haena, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
12...	1215	219	22.5	25	05...	1135	228	22.1	28
DEC					JUN				
20...	1250	222	21.5	24	07...	1155	235	22.5	30
MAR					AUG				
01...	1315	226	22.0	26	02...	1115	241	22.0	31

HAWAII, ISLAND OF KAUAI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

215455159274201 -- 2-5427-02 Koloa W-B, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
13...	1100	228	23.5	27	04...	0815	231	22.5	26
DEC					JUN				
19...	0815	233	22.5	26	28...	0755	230	23.0	26

215535159302601 -- 2-5530-03 Lawai, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
13...	0810	245	23.0	28	03...	1310	243	23.5	29
DEC					JUN				
08...	1245	244	23.5	28	28...	1300	245	23.5	29
JAN					JUL				
29...	1430	245	23.5	28	30...	1515	246	23.0	28

215522159342601 -- 2-5534-03 Hanapepe Town, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
13...	1020	411	24.0	33	03...	1045	429	24.0	38
DEC					JUN				
19...	1035	409	24.0	31	28...	1135	437	24.0	36
MAR					JUL				
06...	1100	426	24.5	37	31...	1040	448	23.5	36

215803159401201 -- 2-5840-01 Waimea, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
13...	0945	765	24.0	160	04...	1000	595	24.0	110
DEC					JUN				
19...	0855	524	24.0	87	28...	1100	508	24.5	87
MAR					JUL				
06...	1020	543	24.5	91	31...	0930	573	24.0	100

215857159430101 -- 2-5843-01 Kekaha Shaft, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
13...	0910	657	24.5	100	28...	0955	570	25.0	82
APR					JUL				
04...	0920	514	24.0	67	31...	0910	638	24.5	98

HAWAII, ISLAND OF KAUAI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

215958159214301 -- 2-5921-01 Kalepa Ridge W-10, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
12...	0900	490	25.5	57	05...	0845	486	25.0	57
DEC					JUN				
20...	0915	486	24.5	55	07...	0845	489	25.5	59
MAR					AUG				
01...	0915	494	25.0	59	02...	0825	490	25.5	59

215901159235201 -- 2-5923-07 Kilohana W-I, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
12...	0820	195	23.5	21	05...	0805	198	23.5	21
DEC					JUN				
20...	0825	189	23.5	22	07...	0800	180	23.0	20
MAR					AUG				
01...	0835	192	23.0	21	02...	0750	191	23.5	22

215906159395601 -- 2-5939-01 Waimea Shaft, Kauai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
10...	1355	335	24.0	37	03...	1145	549	25.0	90
DEC					JUN				
08...	1150	365	24.0	47	28...	0910	502	24.5	71
JAN					JUL				
29...	1340	361	24.0	42	30...	1115	385	24.5	43

HAWAII, ISLAND OF OAHU

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

211832157515502 -- 3-1851-19 Halekauwila Street, Pipe B, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					AUG				
03...	1410	20000	24.5	7100	09...	0930	20800	24.0	7500
MAR					SEP				
28...	1615	20300	24.5	7400	25...	0855	21000	24.5	7600
JUN									
14...	1605	20700	24.5	7500					

212106157533701 -- 3-2153-02 Moanalua, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					AUG				
03...	0901	481	22.0	96	08...	1500	502	22.0	110
MAR					SEP				
13...	1316	501	22.0	100	25...	1217	503	22.0	110
JUN									
14...	1130	504	22.0	110					

212238157561102 -- 3-2256-12 Aiea US Navy (187-C), Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					JUN				
07...	1215	882	23.0	220	14...	1100	821	23.5	210
MAR									
15...	1130	881	23.5	230					

212343158001001 -- 3-2300-11 Waipahu Street, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					JUN				
03...	1015	553	22.0	120	15...	0940	542	22.0	120
MAR					JUL				
13...	1018	546	22.0	120	19...	1207	542	22.0	120
MAY					SEP				
07...	1049	490	22.0	120	25...	1056	539	22.0	120

212358158010901 -- 3-2301-09,10 Waikele Gulch--composite, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					JUL				
03...	1000	714	22.0	150	18...	0933	790	22.5	180
MAR					SEP				
15...	1055	685	22.5	150	26...	1100	797	23.0	180
MAY									
07...	1127	655	22.5	160					

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

212332157582201 -- 3-2358-02 Pearl City, US Navy, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					JUN				
03...	1120	1390	21.0	370	14...	1030	1440	21.5	410
MAR					19...	1020	1400	22.0	370
13...	1120	1410	20.5	390	SEP				
					25...	1000	1240	21.5	370

212343157584701 -- 3-2358-29 Taba Farm, Waiawa (204-9), Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					JUN				
03...	1037	2880	20.5	840	13...	1045	2940	20.5	850
					14...	1010	2770	20.5	830

212336157591801 -- 3-2359-05 Waiawa Road, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					JUL				
03...	1050	2610	22.0	740	19...	0932	2510	22.0	--
MAR					SEP				
13...	1034	2620	22.0	760	25...	1038	2440	22.0	740
JUN									
14...	0950	2560	22.5	740					

212422157485601 -- 3-2448-01 Hawaii State Hospital, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT									
17...	0850	201	20.5	19					

212556157500301 -- 3-2550-01 Heeia, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					MAY				
17...	1310	137	23.5	20	29...	0805	135	23.5	19
DEC					JUL				
15...	1200	137	23.5	19	26...	1440	136	24.0	20
FEB					SEP				
27...	1320	135	23.5	18	20...	1100	138	23.5	20

212506157582301 -- 3-2558-10 Waiawa Shaft, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV					JUL				
03...	0937	244	22.5	40	19...	1054	244	22.5	42
MAR					SEP				
13...	0959	243	22.5	41	25...	1113	247	24.5	42
JUN									
15...	0924	241	22.0	41					

212927158014801 -- 3-2901-07 Schofield Shaft, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
18...	0800	168	21.5	19	21...	0909	170	21.0	19
DEC					AUG				
27...	0916	172	21.5	20	21...	0936	170	21.5	20
APR					SEP				
18...	0933	165	21.0	19	06...	0827	169	21.5	20

213224158135901 -- 3-3213-06 Makua US Air Force, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
18...	1315	850	23.5	190	25...	1200	851	23.5	190
DEC					AUG				
20...	1220	860	23.5	190	09...	1010	853	23.5	190
APR					SEP				
16...	1405	852	23.5	230	19...	1215	853	23.5	190

213327157524401 -- 3-3352-01 Kahana Valley, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					MAY				
17...	0930	260	22.5	35	31...	1213	262	23.0	37
DEC					JUL				
20...	1315	260	22.5	35	26...	1400	262	23.0	38
MAR									
05...	1315	260	22.5	37					

213430158071601 -- 3-3407-37 Kiikii, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
26...	1438	488	22.5	84	21...	1324	488	22.5	85
JAN					AUG				
04...	1301	491	22.5	83	21...	1529	487	22.5	83
MAY					SEP				
15...	1715	491	22.5	85	06...	1245	487	22.5	82

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

213446158104901 -- 3-3410-08 Kawaihapai, Mokuleia, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
26...	1411	693	22.0	140	21...	1130	710	22.0	140
DEC					AUG				
27...	1115	675	22.0	140	21...	1406	706	22.5	140
APR					SEP				
17...	1053	707	22.0	140	06...	1408	751	22.0	140
MAY									
15...	1633	708	22.0	140					

213512158061601 -- 3-3506-03 TO 04 Composite--Haleiwa Batt., Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
26...	1208	416	22.5	70	21...	1004	420	22.0	70
DEC					AUG				
26...	0952	416	22.0	69	21...	1024	418	22.5	72
APR					SEP				
17...	0930	421	22.6	69	06...	0900	425	22.0	73

214157158000101 -- 3-4100-01 Turtle Bay Golf Course, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					AUG				
17...	1040	309	20.5	52	08...	0940	322	20.5	55
FEB					SEP				
28...	1005	307	20.5	51	20...	0935	328	20.5	56
JUN									
29...	1020	304	20.5	53					

214233157583501 -- 3-4258-04 Kahuku Air Field, Oahu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
17...	1010	1690	23.0	470	29...	0900	1730	23.5	490
DEC					AUG				
20...	0930	1700	22.5	470	08...	0915	1720	23.5	480
FEB					SEP				
28...	0950	1710	23.5	470	20...	0910	1740	22.5	490

HAWAII, ISLAND OF MOLOKAI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

210425156483001 -- 4-0448-02 Mapulehu Shaft 2, Molokai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT									
10...	1330	288	25.4	19					

210402156495801 -- 4-0449-01 Ualapue Shaft, Molokai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
DEC					JUN				
05...	0940	331	20.7	63	20...	1440	333	22.3	64
FEB					AUG				
15...	1155	324	20.5	60	13...	1210	350	20.7	71
APR									
25...	1120	331	20.6	64					

210419156570501 -- 4-0457-01 Kawela Shaft, Molokai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
DEC					JUN				
05...	0908	507	23.5	120	20...	1510	646	23.5	160
FEB					AUG				
15...	0905	524	23.5	120	13...	0940	608	23.6	140
APR									
25...	1200	620	23.6	150					

210605157012001 -- 4-0601-01 Kaunakakai, Molokai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT									
10...	1015	290	24.6	31					

210856157011201 -- 4-0801-01 DHHL 1, Molokai, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
20...	0810	--	--	140	20...	0750	--	--	170
JAN					AUG				
22...	0745	--	--	100	09...	1300	--	--	180
MAR					SEP				
23...	0800	--	--	150	27...	0810	--	--	180

HAWAII, ISLAND OF MOLOKAI--Continued

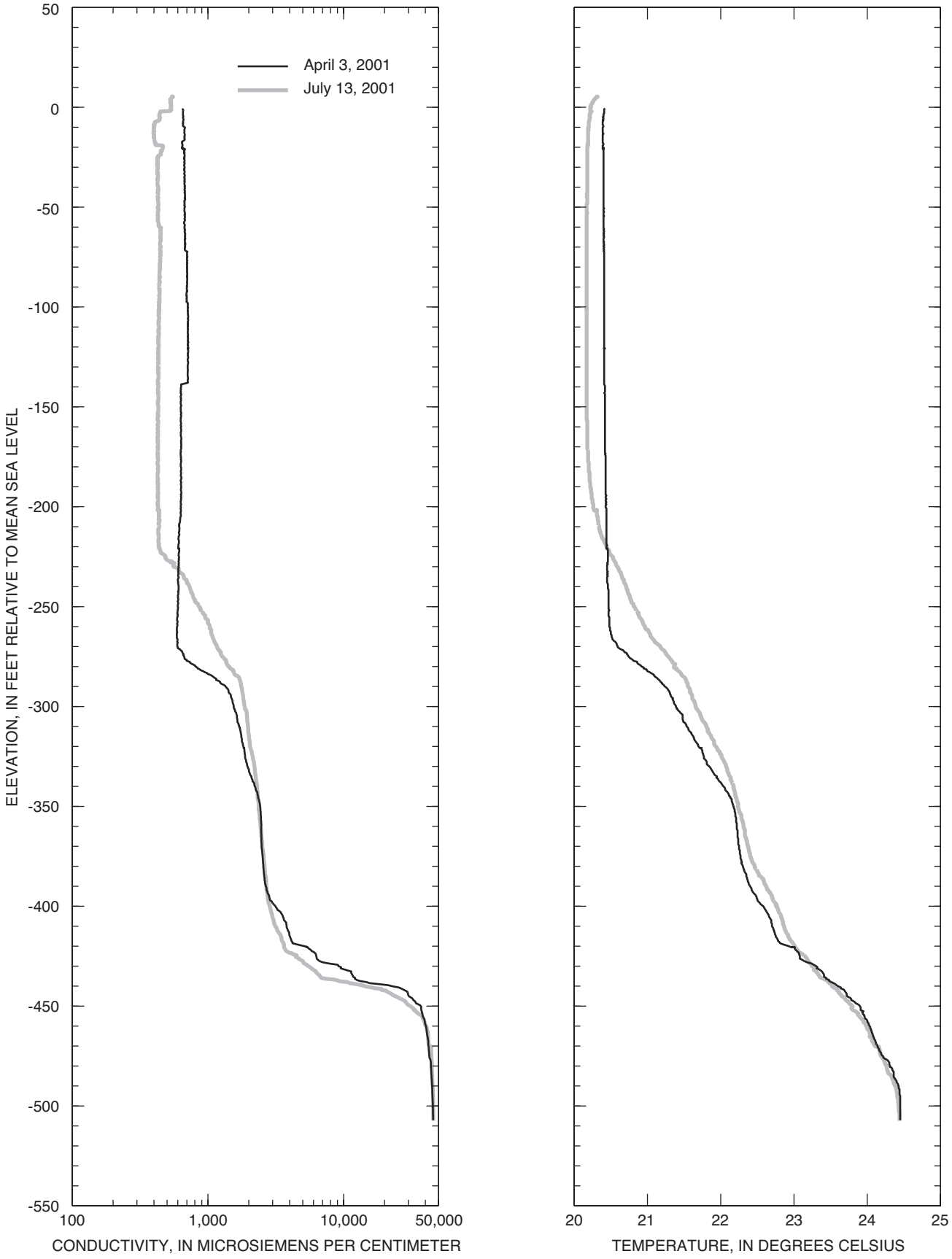
WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

210857156010701 -- 4-0801-02 DHHL 2, Molokai, HI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
20...	0800	--	--	73	20...	--	--	--	78
JAN					AUG				
22...	0750	--	--	59	09...	1240	--	--	81
MAR					SEP				
23...	0745	--	--	74	27...	0755	--	--	81

210903157013001 -- 4-0901-01 Kukui, Inc., Molokai, HI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
NOV					DEC				
05...	--	--	--	46	08...	0830	--	--	50



Water-conductivity and -temperature profiles measured in the Kualapuu deep monitor well (4-0800-01) on April 3 and July 13, 2001, Molokai, Hawaii. Data available from the USGS Hawaii District log archive.

203947156261201 -- 6-3926-03 Wailea, Maui, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT									
26...	1300	3080	19.2	1000					

204635156270101 -- 6-4627-14 Waiakea Homesteads, Maui, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					MAY				
26...	1430	1300	23.8	200	24...	1345	1300	23.7	200
FEB					AUG				
23...	1235	1300	23.5	200	17...	1500	1290	23.6	210

205014156212701 -- 6-5021-01 Pukalani, Maui, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					MAY				
24...	0445	--	--	550	23...	0500	--	--	560
FEB					AUG				
21...	0450	--	--	550	08...	0500	--	--	720

205412156193801 -- 6-5419-01 Haiku, Maui, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
FEB					JUN				
23...	0940	445	20.0	89	26...	0905	505	20.3	110
MAY					AUG				
24...	0940	517	20.4	100	17...	1045	517	20.4	110

205416156244301 -- 6-5424-01 Specklesville Shaft, Maui, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					AUG				
26...	0930	1630	23.6	350	17...	1130	1700	23.3	390

HAWAII, ISLAND OF MAUI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

205405156305401 -- 6-5430-05 Waiehu Deep Monitor Well, Maui, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
02...	0915	215	22.6	15	04...	0925	220	22.6	16
02...	0935	424	22.4	94	04...	0942	212	22.0	13
02...	0955	486	22.4	110	04...	1000	522	21.7	120
02...	1015	2900	22.6	860	04...	1023	2990	22.4	890
02...	1035	6740	22.3	2100	04...	1114	7260	22.0	2300
02...	1105	25400	22.9	9300	04...	1138	26600	22.0	9800
02...	1130	40700	22.4	16000	04...	1200	40500	22.5	15000
02...	1155	45600	22.6	17000	04...	1228	42500	22.0	17000
02...	1220	48300	23.1	18000	04...	1255	48200	22.5	18000
02...	1250	49900	23.0	19000	04...	1330	50000	22.0	18000
JAN					JUL				
03...	1105	216	22.7	13	02...	1035	225	23.9	15
03...	1120	403	22.1	87	02...	1050	216	22.2	13
03...	1135	506	21.9	120	02...	1110	565	22.2	140
03...	1200	2500	22.1	720	02...	1133	3080	22.2	930
03...	1225	6860	22.1	2100	02...	1155	7870	23.0	2500
03...	1250	25600	22.2	9400	02...	1220	27600	22.5	10000
03...	1310	40500	22.7	15000	02...	1245	42000	22.5	16000
03...	1335	45600	22.4	17000	02...	1310	46100	22.6	17000
03...	1400	48200	22.4	18000	02...	1335	48700	22.7	18000
03...	1430	50300	22.3	18000	02...	1402	50000	22.5	19000

205511156222101 -- 6-5522-01 Kuau Shaft, Maui, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
FEB					AUG				
23...	1015	1240	22.0	270	17...	1110	1280	21.9	280
JUN									
26...	0940	1320	21.9	310					

190347155354301 -- 8-0335-01 Naalehu, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
DEC					JUN				
18...	1330	96	24.5	9.0	14...	1030	96	24.0	10
APR					AUG				
27...	1445	92	24.0	10	20...	1110	168	19.5	13

190832155310801 -- 8-0831-01 NINOLE TH1

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
FEB					AUG				
23...	1015	785	18.5	200	20...	1200	821	18.5	220
JUN									
14...	1125	881	18.5	220					

190832155310901 -- 8-0831-02 Ninole, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
18...	1330	777	19.0	190	27...	1550	905	19.0	230
DEC									
18...	1215	866	19.0	220					

191114155294801 -- 8-1129-01 Pahala W-2, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
DEC					AUG				
18...	1145	94	19.0	5.0	20...	1220	88	19.0	6.0

191219155291601 -- 8-1229-01 Pahala, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
JUN									
14...	1220	94	25.5	6.0					

192924154564701 -- 8-2986-01 Pahoa, W-2A, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
20...	1345	140	29.0	8.0	25...	1445	139	24.0	8.9
DEC					JUN				
18...	0840	154	20.0	9.0	11...	1400	136	26.0	9.0
FEB					AUG				
22...	1120	160	26.0	8.0	15...	1415	125	25.0	8.0

See footnotes at end of table

HAWAII, ISLAND OF HAWAII--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

193113154555801 -- 8-3185-01 Hawaiian Shores 1 (Beaches), HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
20...	1410	136	21.5	17	25...	1420	134	21.5	17
DEC					JUN				
18...	0915	129	21.0	16	14...	1400	134	21.5	18
FEB					AUG				
22...	1050	131	22.0	16	15...	1350	126	21.5	18

194037155035301 -- 8-4003-01 Panaewa 1, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
20...	1450	80	20.5	7.0	25...	1345	87	22.0	7.0
DEC					JUN				
18...	0750	86	21.0	7.0	11...	1445	86	23.0	7.0
FEB					AUG				
22...	1000	89	21.0	8.0	15...	1445	78	20.5	7.0

195857155142301 -- 8-5814-01 Laupahoehoe 1, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
APR									
26...	0930	325	20.0	63					

195856155142401 -- 8-5814-02 Laupahoehoe 2, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
FEB					AUG				
26...	0910	321	19.5	59	16...	0850	276	20.0	54

195929155462501 -- 8-5946-01 Lalamilo, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
AUG									
17...	0900	440	26.0	82					

195912155464201 -- 8-5946-02 LALAMILO B

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT					FEB				
19...	1145	315	26.5	38	27...	0930	350	25.5	47
DEC					APR				
19...	1315	330	26.0	39	27...	1000	360	26.0	49

See footnotes at end of table

195953155464701 -- 8-5946-04 LALAMILO D

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
JUN									
13...	0950	525	26.0	97					

195947155485801 -- 8-5948-01 Hapuna Beach Park, HI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT					APR				
19...	1220	1900	26.0	510	27...	0840	1940	26.0	520
DEC					JUN				
19...	1400	1880	26.0	510	13...	0900	1910	26.0	510
FEB					AUG				
27...	1400	1680	25.0	500	17...	0830	1770	26.0	500

201428155494201 -- 8-7449-02 Hawi H, HI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT					JUN				
19...	1615	201	24.5	30	12...	1430	209	30.0	32
DEC					AUG				
20...	0845	199	22.0	29	16...	1450	198	27.0	33
APR									
26...	1200	214	24.0	30					

> Actual value is known to be greater than the value shown

< Actual value is known to be less than the value shown

a Sampled by Hawaii Department of Hawaiian Home Lands

b Sampled by Kukui, Inc.

c Sampled by Pukalani Country Club

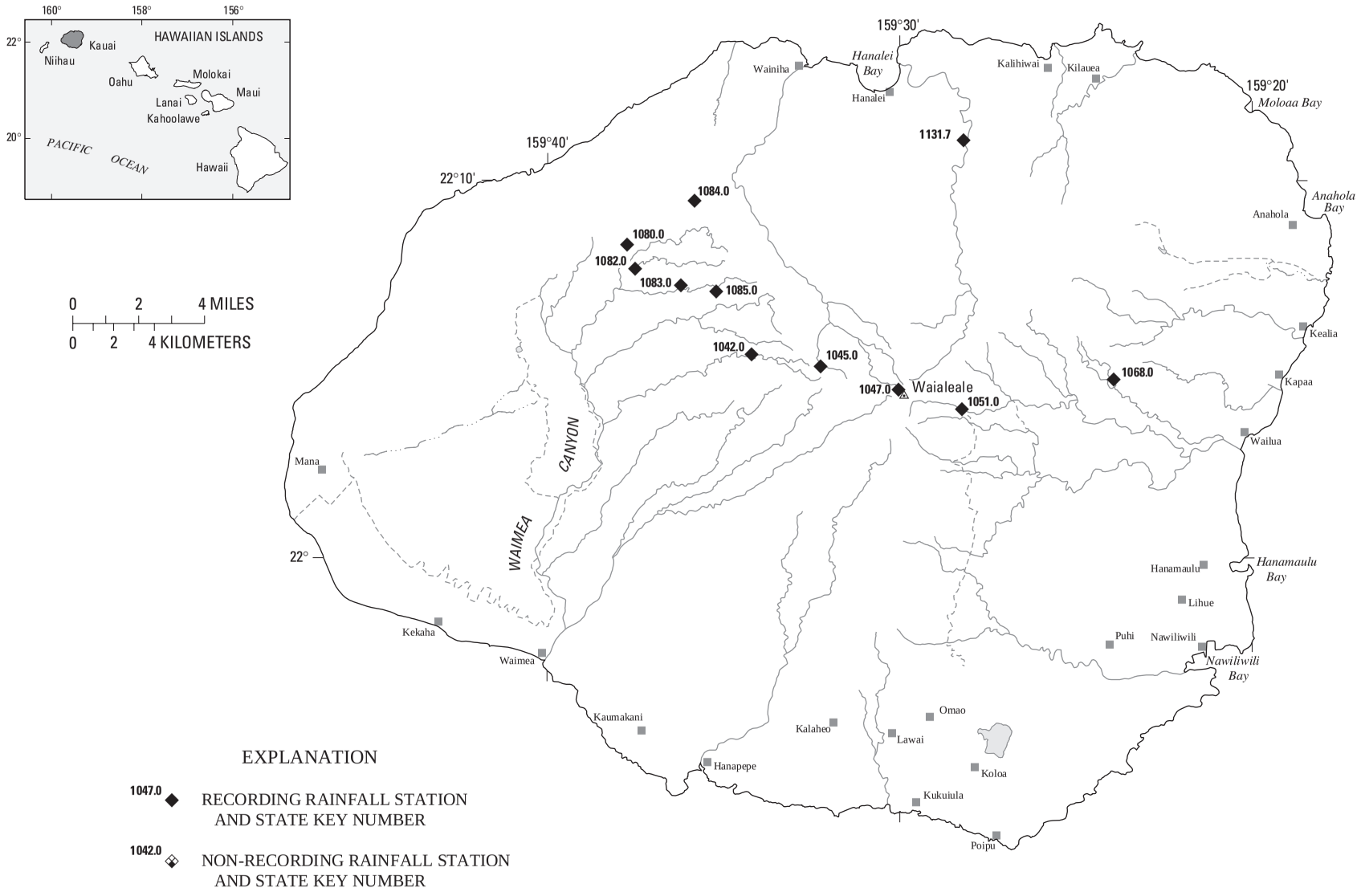


Figure 21. Locations of rainfall stations on Kauai.

HAWAII, ISLAND OF KAUAI

220523159341201. State Key Number 1042.0 Waialae rain gage near Waimea, Kauai.

LOCATION.--Lat 22°05'23", long 159°34'12", Hydrologic Unit 20070000, on ridge 6.4 mi southeast of Kokee Lodge, and 11.0 mi northeast of Waimea.

PERIOD OF RECORD.--1911 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage with a custom made reduced 1 to 2 ratio rain-gage catchment. Elevation of gage is 4,000 ft (from topographic map). On May 24, 2001 the gage was changed to an electronic data logger with a tipping bucket catchment (0.01 inch per tip).

REMARKS.--Records good. Cumulative rainfall read to nearest tenths of an inch, and to hundredths of an inch from May 24.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.13	.00	.35	.01
2	---	---	---	---	---	---	---	---	.14	.00	.31	.00
3	---	---	---	---	---	---	---	---	.09	.00	.20	.08
4	---	---	---	---	---	---	---	---	.42	.00	.06	.05
5	---	---	---	---	---	---	---	---	.01	.00	.06	.01
6	---	---	---	---	---	---	---	---	.03	.00	.06	.34
7	---	---	---	---	---	---	---	---	.04	.00	.01	.00
8	---	---	---	---	---	---	---	---	.61	.00	.00	.00
9	---	---	---	---	---	---	---	---	.00	.01	.03	.00
10	---	---	---	---	---	---	---	---	.00	.15	.08	.00
11	---	---	---	---	---	---	---	---	.00	.02	.01	.00
12	---	---	---	---	---	---	---	---	.07	.38	.17	.02
13	---	---	---	---	---	---	---	---	.25	.05	.08	.03
14	---	---	---	---	---	---	---	---	.01	.10	.03	.00
15	---	---	---	---	---	---	---	---	.23	.00	.07	.05
16	---	---	---	---	---	---	---	---	.01	.01	.07	1.27
17	---	---	---	---	---	---	---	---	.03	.00	.00	.12
18	---	---	---	---	---	---	---	---	.00	.12	.16	.01
19	---	---	---	---	---	---	---	---	.01	.18	.27	.03
20	---	---	---	---	---	---	---	---	.01	.04	.02	.02
21	---	---	---	---	---	---	---	---	.04	.05	.01	.21
22	---	---	---	---	---	---	---	---	.43	.00	.03	.23
23	---	---	---	---	---	---	---	---	.08	.01	.02	.18
24	---	---	---	---	---	---	---	---	.01	.01	.12	.00
25	---	---	---	---	---	---	---	.04	.30	.00	.01	.01
26	---	---	---	---	---	---	---	.02	.05	.02	.00	.14
27	---	---	---	---	---	---	---	.12	.01	.00	.01	.14
28	---	---	---	---	---	---	---	.34	.15	.01	.00	.00
29	---	---	---	---	---	---	---	.01	.40	.59	.02	.06
30	---	---	---	---	---	---	---	.48	.07	1.89	.00	.25
31	---	---	---	---	---	---	---	.01	---	.43	.00	---
TOTAL	---	---	---	---	---	---	---	1.02	3.63	4.07	2.26	3.26

CAL YR 2000 Total 71.5
WTR YR 2001 Total 77.0

Total accumulation Oct. 1-11, 1.4 inches based on accumulation rain can reading of 14.0 inches from Jul. 18 to Oct. 11.
Total accumulation Oct. 11 to Dec. 31, 18.5 inches based on accumulation rain can reading of 41.2 inches from Oct. 11 to Feb. 27.
Total accumulation Jan. 1 to Feb. 27, 22.7 inches based on accumulation rain can reading of 41.2 inches from Oct. 11 to Feb. 27.
Total accumulation rain can reading of 20.2 inches from Feb. 27 to May 24 (1130 hrs). May 24 (1120 to 2400 hrs) 0.01 inches of rain from tipping bucket recorder.

HAWAII, ISLAND OF KAUAI--Continued

220504159321401. State Key Number 1045.0 Waialeale Trail rain gage near Lihue, Kauai.

LOCATION.--Lat 22°05'04", long 159°32'14", Hydrologic Unit 20070000, 14.0 mi west of Kapaa Beach Park and 8.4 mi south of Hanalei Bay.

PERIOD OF RECORD.--1962 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,560 ft (from topographic map).

REMARKS.--Records good. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	.35	.00	.81	.00	.01	.22	.78	.68	.00	.74	.03
2	.01	.11	.00	.00	.00	.26	3.27	.16	.74	.00	.92	.01
3	.00	.01	.00	.00	.65	.04	.13	.28	.22	.01	1.01	.17
4	.00	.01	.61	.00	.11	.11	.19	.55	1.49	.00	.13	.07
5	.03	.33	.56	.00	1.13	.48	.05	.24	.05	.00	.50	.13
6	.00	.28	.02	.00	.45	.06	.61	.00	.39	.00	.27	1.21
7	.06	.25	.02	.00	.01	.09	.22	.00	.26	.00	.02	.01
8	.57	.03	.01	.00	2.22	.47	1.92	.24	1.11	.01	.02	.00
9	.04	1.51	.03	.00	10.17	1.18	1.25	.49	.00	.04	.11	.00
10	.51	.00	.00	.02	3.12	.24	2.67	.26	.00	.45	.17	.00
11	.02	.30	1.37	.00	1.36	.02	1.04	.11	.01	.04	.02	.00
12	.03	3.01	1.18	.00	.55	.19	4.74	.02	.26	.53	.42	.02
13	.37	.79	.35	.22	2.08	.01	2.22	.00	.86	.07	.61	.06
14	.18	.08	.11	.25	1.68	.04	.37	.02	.11	.76	.08	.02
15	.03	.08	.03	.00	.57	.06	.40	.02	.15	.02	.29	.07
16	.02	.82	.02	.00	.00	.27	.08	.06	.08	.05	.33	1.89
17	.00	.95	.02	.00	.00	.09	.36	.20	.08	.02	.04	.12
18	.04	.25	.00	.00	.10	.43	.50	.02	.00	.31	.71	.20
19	.09	.00	.26	.00	.64	.25	1.41	.79	.02	.23	.65	.12
20	.20	.00	.39	.00	.57	.01	1.41	.00	.03	.12	.10	.06
21	.07	.15	.17	.02	.16	.00	.09	.01	.20	.29	.05	.39
22	.14	.24	.29	.03	.70	.00	.99	.00	1.20	.00	.10	.38
23	.16	.04	.00	.00	.12	.00	.04	.00	.10	.02	.06	.21
24	.09	.32	.00	.57	.01	.11	.05	.04	.01	.10	.19	.00
25	.50	.38	.00	.36	3.28	.01	.11	.15	.74	.03	.03	.06
26	1.86	1.07	.00	.15	.34	.00	.72	.09	.18	.15	.01	.44
27	1.33	1.57	.03	.10	.02	.00	.72	.23	.06	.00	.01	.33
28	.36	.11	.01	.29	.00	.00	1.05	.05	.71	.07	.01	.02
29	.42	.00	.01	.48	---	.13	2.01	.00	.74	1.61	.01	.26
30	2.52	.00	.00	.32	---	.20	.29	.23	.14	3.74	.16	.27
31	.55	---	.00	.00	---	.34	---	.06	---	1.26	.04	---
TOTAL	11.00	13.04	5.49	3.62	30.04	5.10	29.13	5.10	10.62	9.93	7.81	6.55

CAL YR 2000 Total 108.87
WTR YR 2001 Total 137.43

HAWAII, ISLAND OF KAUAI--Continued

220427159300201. State Key Number 1047.0 Mount Waialeale rain gage near Lihue, Kauai.

LOCATION.--Lat 22°04'27", long 159°30'02", Hydrologic Unit 20070000, 3/4 mi north of Kawaikini summit (5,240 ft).

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 5,150 ft (from topographic map).

REMARKS.--Records good. Recorded rainfall read in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.07	2.87	.00	.85	.02	.26	.67	4.01	2.56	.00	1.28	.14
2	.06	.54	.00	.00	.00	.77	2.65	.64	5.31	.00	2.09	.05
3	.05	.03	.10	.00	.68	.14	1.22	.96	.85	.11	4.90	1.17
4	.02	.07	.47	.00	.14	.68	1.68	.99	5.74	.00	2.01	.67
5	.20	2.12	.83	.00	.65	2.46	1.74	.85	.44	.00	1.68	.85
6	.10	.71	.09	.00	.27	.53	2.51	.01	8.41	.02	1.12	2.90
7	.28	.55	.23	.00	.04	.92	1.56	.04	4.73	.14	.28	.62
8	.90	1.32	.38	.00	3.92	2.36	3.69	.66	1.85	.27	.33	.12
9	.22	2.26	.34	.34	10.69	1.87	2.10	2.35	.82	.75	1.73	.83
10	.66	.11	.01	.29	5.70	.33	3.41	1.43	.21	1.60	1.58	.08
11	.24	.94	.78	.00	1.54	.22	2.02	.35	.39	.48	.32	.02
12	.24	4.08	2.56	.02	1.04	.31	4.99	.27	.98	1.36	1.03	.08
13	.47	1.46	1.02	.94	3.21	.18	2.86	.08	2.02	.35	3.01	.12
14	.67	.18	.85	1.28	1.65	.23	.90	.37	1.81	2.54	.73	.12
15	.17	.54	.21	.02	.49	.44	.88	.12	1.66	3.76	.51	.63
16	.27	1.35	.21	.00	.17	1.23	.67	1.04	1.61	1.22	2.90	2.98
17	.05	1.61	.05	.00	.10	.62	2.20	1.08	1.09	.94	1.37	.69
18	.25	.48	.00	.05	.41	.40	2.54	.26	.01	1.84	4.86	.84
19	.92	.03	.29	.00	4.10	.28	2.91	.90	.23	.50	2.18	.29
20	.60	.11	.61	.05	2.75	.01	3.90	.38	.34	.34	.66	.40
21	.42	.55	.86	.13	---	.00	1.65	.00	.29	1.03	1.54	.88
22	1.27	.55	.68	.30	---	.00	2.04	.00	1.98	.25	4.55	.64
23	.83	.36	.04	.08	---	.00	.34	.00	.23	.28	.64	.48
24	.24	.90	.00	.86	---	.16	.30	.26	.11	.41	.49	.21
25	1.14	.73	.00	.83	---	.00	.68	.85	2.18	.32	.12	.42
26	2.16	1.31	.00	.45	---	.00	2.21	.84	.39	1.56	.01	2.01
27	1.98	3.03	.08	.29	---	.00	2.17	1.18	.21	.02	.26	.97
28	1.74	.80	.02	.77	.00	.36	1.95	.75	1.99	.56	.01	.12
29	1.17	.00	.00	2.20	---	.05	4.23	.01	1.95	3.40	.92	.97
30	6.60	.00	.00	1.71	---	.18	.95	.92	.62	3.80	.78	.64
31	3.12	---	.00	.03	---	.81	---	.22	---	2.66	.25	---
TOTAL	28.11	29.59	10.71	11.49	37.57	15.80	61.62	21.82	51.01	30.51	44.14	20.94

CAL YR 2000 Total 318.40
WTR YR 2001 Total 376.59

Catchment found plugged on Feb. 27. No record Feb. 21-27. Total for this period is 13.28 inches, based on accumulation can reading of 73.0 inches from Nov. 29 to Feb. 27.

HAWAII, ISLAND OF KAUAI--Continued

220356159281401. State Key Number 1051.0 North Wailua ditch rain gage near Lihue, Kauai.

LOCATION.--Lat 22°03'56", long 159°28'14", Hydrologic Unit 20070000, 4.0 mi west of Wailua Reservoir and 2.0 mi east southeast of Waialeale rain gage.

PERIOD OF RECORD.--1928 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service non-recording rain gage. Gage changed to electronic data logger with a tipping bucket catchment (0.01 inch per tip) on Jul 5. Elevation of gage is 1,110 ft (from topographic map).

REMARKS.--Records good. Cumulative rainfall read in nearest hundredths of an inch. Can readings are made by East Kauai Water Company until Jul. 2.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	.42	.00
2	---	---	---	---	---	---	---	---	---	---	.77	.01
3	---	---	---	---	---	---	---	---	---	---	1.44	.30
4	---	---	---	---	---	---	---	---	---	---	.41	.13
5	---	---	---	---	---	---	---	---	---	---	.39	.56
6	---	---	---	---	---	---	---	---	---	.00	.29	2.59
7	---	---	---	---	---	---	---	---	---	.00	.15	.40
8	---	---	---	---	---	---	---	---	---	.10	.03	.04
9	---	---	---	---	---	---	---	---	---	.18	.43	.21
10	---	---	---	---	---	---	---	---	---	.55	.35	.07
11	---	---	---	---	---	---	---	---	---	.16	.07	.00
12	---	---	---	---	---	---	---	---	---	.91	.25	.01
13	---	---	---	---	---	---	---	---	---	.27	1.20	.11
14	---	---	---	---	---	---	---	---	---	.73	.15	.00
15	---	---	---	---	---	---	---	---	---	.37	.26	.50
16	---	---	---	---	---	---	---	---	---	.24	.77	1.91
17	---	---	---	---	---	---	---	---	---	.11	.36	.25
18	---	---	---	---	---	---	---	---	---	.56	.60	.21
19	---	---	---	---	---	---	---	---	---	.09	.19	.08
20	---	---	---	---	---	---	---	---	---	.08	.13	.10
21	---	---	---	---	---	---	---	---	---	.27	.35	.61
22	---	---	---	---	---	---	---	---	---	.30	.44	.18
23	---	---	---	---	---	---	---	---	---	.12	.14	.14
24	---	---	---	---	---	---	---	---	---	.22	.35	.02
25	---	---	---	---	---	---	---	---	---	.21	.14	.17
26	---	---	---	---	---	---	---	---	---	.14	.01	.31
27	---	---	---	---	---	---	---	---	---	.02	.22	.13
28	---	---	---	---	---	---	---	---	---	.14	.01	.00
29	---	---	---	---	---	---	---	---	---	1.17	.15	.59
30	---	---	---	---	---	---	---	---	---	1.10	.17	.28
31	---	---	---	---	---	---	---	---	---	.43	.01	---
TOTAL	---	---	---	---	---	---	---	---	---	8.47	10.65	9.91

CAL YR 2000 132.38
WTY YR 2001 147.12

Intermittent readings taken until Jul. 5 when recording gage was installed.

Total accumulation Oct. 1-2 is 0.67 inches based on accumulation can reading of 6.68 inches from Sep. 25 to Oct. 2.
Accumulation can reading of 0.93 inches from Oct. 2 to Oct. 9.
Accumulation can reading of 1.04 inches from Oct. 9 to Oct. 16.
Accumulation can reading of 1.10 inches from Oct. 16 to Oct. 23.
Accumulation can reading of 7.28 inches from Oct. 23 to Oct. 30.
Accumulation can reading of 3.86 inches from Oct. 30 to Nov. 6.
Accumulation can reading of 4.41 inches from Nov. 6 to Nov. 13.
Accumulation can reading of 1.94 inches from Nov. 13 to Nov. 20.
Accumulation can reading of 1.90 inches from Nov. 20 to Nov. 27.
Accumulation can reading of 1.40 inches from Nov. 27 to Dec. 4.
Accumulation can reading of 4.25 inches from Dec. 4 to Dec. 12.
Accumulation can reading of 1.88 inches from Dec. 12 to Dec. 18.
Accumulation can reading of 0.97 inches from Dec. 18 to Dec. 26.

220356159281401. State Key Number 1051.0 North Wailua ditch rain gage near Lihue, Kauai--Continued.

Total accumulation Dec. 26-31 is .04 inches based on accumulation can reading of 0.40 inches from Dec. 26 to Jan. 1.
Total accumulation Jan. 1 is 0.36 inches based on accumulation can reading of 0.40 inches from Dec. 26 to Jan. 1.
Accumulation can reading of 0.25 inches from Jan. 1 to Jan. 8.
Accumulation can reading of 1.38 inches from Jan. 8 to Jan. 15.
Accumulation can reading of 0.43 inches from Jan. 15 to Jan. 22.
Accumulation can reading of 1.37 inches from Jan. 22 to Jan. 29.
Accumulation can reading of 2.73 inches from Jan. 29 to Feb. 5.
Accumulation can reading of 3.92 inches from Feb. 5 to Feb. 12.
Accumulation can reading of 3.64 inches from Feb. 12 to Feb. 20.
Accumulation can reading of 7.32 inches from Feb. 20 to Feb. 26.
Accumulation can reading of 2.27 inches from Feb. 26 to Mar. 5.
Accumulation can reading of 2.93 inches from Mar. 5 to Mar. 12.
Accumulation can reading of 1.00 inches from Mar. 12 to Mar. 19.
Accumulation can reading of 0.10 inches from Mar. 19 to Mar. 26.
Accumulation can reading of 2.95 inches from Mar. 26 to Apr. 02.
Accumulation can reading of 6.42 inches from Apr. 02 to Apr. 09.
Accumulation can reading of 6.64 inches from Apr. 09 to Apr. 16.
Accumulation can reading of 4.69 inches from Apr. 16 to Apr. 23.
Accumulation can reading of 5.52 inches from Apr. 23 to Apr. 30.
Accumulation can reading of 2.88 inches from Apr. 30 to May 7.
Accumulation can reading of 1.87 inches from May 7 to May 14.
Accumulation can reading of 3.17 inches from May 14 to May 21.
Accumulation can reading of 1.08 inches from May 21 to May 28.
Accumulation can reading of 7.50 inches from May 28 to Jun. 4.
Accumulation can reading of 7.90 inches from Jun. 4 to Jun. 11.
Accumulation can reading of 3.37 inches from Jun. 11 to Jun. 18.
Accumulation can reading of 1.12 inches from Jun. 18 to Jun. 25.
Accumulation can reading of 3.11 inches from Jun. 25 to Jul. 2.
Accumulation can reading of 0.50 inches from Jul. 2 to Jul. 5.

HAWAII, ISLAND OF KAUAI--Continued

220443159235601. State Key Number 1068.0 Left Branch Opaekea rain gage near Kapaa, Kauai.

LOCATION.--Lat 22°04'43", long 159°23'56", Hydrologic Unit 20070000, in USGS stream-gaging station 16071500 on left bank, 5.0 mi west of Kapaa Beach Park and 0.7 mi northeast of Wailua Reservoir.

PERIOD OF RECORD.--1960 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 470 ft (from topographic map).

REMARKS.--Records good. Recorded rainfall read in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.27	.00	.00	.00	.08	.04	.15	.16	.07	.09	.03
2	.02	.42	.00	.00	.00	.08	.34	.20	.64	.00	.14	.00
3	.01	.01	.00	.00	.32	.00	.09	.16	.23	.00	.51	.10
4	.00	.00	.24	.00	.00	.02	.24	.28	1.76	.00	.12	.09
5	.20	.20	.48	.00	.12	.55	.16	.22	.20	.00	.24	.34
6	.00	.01	.03	.00	.08	.07	.40	.01	.49	.00	.14	1.14
7	.01	.01	.04	.00	.00	.00	.12	.00	.38	.00	.09	.28
8	.05	.01	.03	.00	.43	.17	.14	.03	.02	.04	.00	.02
9	.03	.44	.03	.06	.90	.41	.40	.16	.06	.14	.20	.15
10	.09	.01	.04	.03	.24	.04	.24	.06	.00	.10	.29	.01
11	.03	.09	1.11	.00	.00	.05	.16	.02	.03	.08	.06	.00
12	.05	.78	.16	.01	.72	.02	.41	.00	.14	.47	.11	.01
13	.37	.20	.11	.33	.31	.05	.21	.00	.33	.10	.46	.00
14	.39	.01	.61	.83	.21	.00	.22	.03	.29	.26	.01	.00
15	.08	.06	.02	.02	.05	.00	.03	.01	.17	.08	.08	.03
16	.02	.40	.01	.00	.00	.07	.06	.15	.05	.19	.27	.01
17	.00	.50	.07	.00	.00	.02	.22	.23	.05	.08	.38	.09
18	.09	.04	.00	.01	.00	.13	.10	.73	.00	.37	.38	.04
19	.01	.00	.03	.00	.59	.09	.07	.68	.00	.03	.13	.13
20	.19	.00	.03	.03	.59	.00	.23	.01	.08	.03	.08	.23
21	.01	.20	.19	.08	.20	.00	.07	.00	.00	.07	.01	.16
22	.22	.06	.27	.00	.50	.00	.44	.01	.36	.22	.21	.12
23	.11	.09	.00	.00	.38	.00	.02	.00	.13	.14	.28	.05
24	.04	.15	.00	.11	.00	.02	.03	.01	.03	.14	.24	.00
25	.27	.17	.00	.02	1.66	.01	.07	.25	.59	.13	.01	.23
26	.12	.40	.00	.04	.29	.00	.58	.15	.03	.07	.01	.25
27	.49	.63	.08	.08	.03	.00	.12	.06	.02	.00	.00	.16
28	.07	.13	.00	.20	.01	.01	.41	.07	.69	.18	.00	.02
29	.22	.00	.00	.27	---	.00	.46	.01	.34	.56	.15	.17
30	1.44	.00	.01	.27	---	.01	.05	.00	.37	.33	.18	.14
31	.13	---	.00	.01	---	.80	---	.05	---	.13	.03	---
TOTAL	4.80	5.29	3.59	2.40	7.63	2.70	6.13	3.74	7.64	4.01	4.90	4.00

CAL YR 2000 Total 56.84
WTR YR 2001 Total 56.83

HAWAII, ISLAND OF KAUAI--Continued

220817159374401. State Key Number 1080.0 Paukahana rain gage near Waimea, Kauai.

LOCATION.--Lat 22°08'17", long 159°37'44", Hydrologic Unit 20070000, 2.0 mi east of Kokee lodge and 7.0 mi south southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage. Gage changed to electronic data logger with a tipping bucket catchment (0.01 inch per tip) on May 16. Elevation of gage is 3,700 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch. Recording rainfall in hundredths of an inch from May 16.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.01	.00	.18	.00
2	---	---	---	---	---	---	---	---	.08	.00	.14	.00
3	---	---	---	---	---	---	---	---	.03	.00	.22	.09
4	---	---	---	---	---	---	---	---	.28	.00	.08	1.05
5	---	---	---	---	---	---	---	---	.00	.00	.00	.00
6	---	---	---	---	---	---	---	---	.01	.00	.07	.05
7	---	---	---	---	---	---	---	---	.02	.00	.01	.00
8	---	---	---	---	---	---	---	---	.08	.00	.00	.00
9	---	---	---	---	---	---	---	---	.00	.01	.00	.00
10	---	---	---	---	---	---	---	---	.00	.04	.00	.00
11	---	---	---	---	---	---	---	---	.00	.00	.00	.00
12	---	---	---	---	---	---	---	---	.02	.15	.18	.02
13	---	---	---	---	---	---	---	---	.04	.04	.04	.06
14	---	---	---	---	---	---	---	---	.00	.01	.02	.00
15	---	---	---	---	---	---	---	---	.06	.02	.05	.10
16	---	---	---	---	---	---	---	---	.00	.01	.01	.58
17	---	---	---	---	---	---	---	.01	.00	.00	.00	.02
18	---	---	---	---	---	---	---	.01	.00	.20	.19	.00
19	---	---	---	---	---	---	---	.37	.00	.13	.14	.02
20	---	---	---	---	---	---	---	.08	.02	.03	.02	.06
21	---	---	---	---	---	---	---	.00	.03	.02	.02	.16
22	---	---	---	---	---	---	---	.00	.40	.00	.00	.24
23	---	---	---	---	---	---	---	.00	.03	.02	.12	.15
24	---	---	---	---	---	---	---	.00	.08	.01	.03	.00
25	---	---	---	---	---	---	---	.01	.40	.00	.00	.02
26	---	---	---	---	---	---	---	.00	.01	.01	.00	.04
27	---	---	---	---	---	---	---	.03	.00	.00	.00	.21
28	---	---	---	---	---	---	---	.27	.11	.07	.00	.01
29	---	---	---	---	---	---	---	.00	.84	.18	.00	.08
30	---	---	---	---	---	---	---	.16	.14	.23	.00	.37
31	---	---	---	---	---	---	---	.01	---	.55	.00	---
TOTAL	---	---	---	---	---	---	---	0.95	2.69	1.73	1.52	3.33

CAL YR 2000 Total 42.2
WTR YR 2001 Total 48.1

Total accumulation Oct. 1-6, 1.0 inches based on accumulation rain can reading of 4.2 inches from Aug. 3 to Oct. 6.
Total accumulation rain can reading of 8.7 inches from Oct. 6 to Dec. 6.
Total accumulation Dec. 7-31, 2.8 inches based on accumulation rain can reading of 3.7 inches from Dec. 6 to Jan. 19.
Total accumulation Jan. 1-19, 0.9 inches based on accumulation rain can reading of 3.7 inches from Dec. 6 to Jan. 19.
Total accumulation rain can reading of 21.8 inches from Jan. 19 to Apr. 12.
Total accumulation rain can reading of 2.7 inches from Apr. 12 to May 16.

HAWAII, ISLAND OF KAUAI--Continued

220739159373001. State Key Number 1082.0 Waiakoali rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'39", long 159°37'30", Hydrologic Unit 20070000, 2.4 mi east southeast of Kokee Lodge and 7.4 mi south southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage with a custom made reduced 1 to 2 ratio rain-gage catchment. Gage changed to electronic data logger with tipping bucket catchment (0.01 inch per tip) on May 16. Elevation of gage is 3,420 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch. Recording rainfall in hundredths of an inch from May 16.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.05	.00	.17	.00
2	---	---	---	---	---	---	---	---	.09	.00	.08	.00
3	---	---	---	---	---	---	---	---	.05	.00	.19	.13
4	---	---	---	---	---	---	---	---	.25	.00	.08	.81
5	---	---	---	---	---	---	---	---	.01	.00	.01	.00
6	---	---	---	---	---	---	---	---	.00	.00	.04	.06
7	---	---	---	---	---	---	---	---	.01	.00	.00	.00
8	---	---	---	---	---	---	---	---	.10	.00	.00	.00
9	---	---	---	---	---	---	---	---	.00	.02	.00	.00
10	---	---	---	---	---	---	---	---	.00	.03	.00	.00
11	---	---	---	---	---	---	---	---	.00	.01	.00	.00
12	---	---	---	---	---	---	---	---	.01	.16	.11	.02
13	---	---	---	---	---	---	---	---	.05	.05	.04	.04
14	---	---	---	---	---	---	---	---	.00	.02	.03	.00
15	---	---	---	---	---	---	---	---	.07	.05	.02	.10
16	---	---	---	---	---	---	---	---	.00	.00	.03	.51
17	---	---	---	---	---	---	---	.02	.01	.01	.00	.01
18	---	---	---	---	---	---	---	.00	.00	.13	.17	.00
19	---	---	---	---	---	---	---	.42	.00	.14	.12	.02
20	---	---	---	---	---	---	---	.16	.01	.03	.02	.03
21	---	---	---	---	---	---	---	.00	.03	.03	.02	.12
22	---	---	---	---	---	---	---	.00	.34	.00	.00	.20
23	---	---	---	---	---	---	---	.00	.05	.02	.03	.15
24	---	---	---	---	---	---	---	.00	.08	.01	.03	.00
25	---	---	---	---	---	---	---	.02	.36	.00	.00	.02
26	---	---	---	---	---	---	---	.00	.00	.00	.00	.05
27	---	---	---	---	---	---	---	.02	.01	.00	.00	.15
28	---	---	---	---	---	---	---	.23	.10	.05	.00	.02
29	---	---	---	---	---	---	---	.00	.69	.16	.01	.04
30	---	---	---	---	---	---	---	.23	.15	.27	.00	.28
31	---	---	---	---	---	---	---	.00	---	.40	.00	---
TOTAL	---	---	---	---	---	---	---	1.10	2.52	1.59	1.20	2.76

CAL YR 2000 Total 38.2
WTR YR 2001 Total 47.9

Total accumulation Oct. 1-6 is 0.6 inches based on accumulation rain can reading of 2.8 inches from Aug. 3 to Oct. 6.
Total accumulation rain can reading of 8.2 inches from Oct. 6 to Dec. 6.
Total accumulation Dec. 6-31 is 3.1 inches based on accumulation rain can reading of 4.0 inches from Dec. 6 to Jan. 19.
Total accumulation Jan. 1-19 is 0.9 inches based on accumulation rain can reading of 4.0 inches from Dec. 6 to Jan. 19.
Total accumulation rain can reading of 23.3 inches from Jan. 19 to Apr. 12.
Total accumulation rain can reading of 2.6 inches from Apr. 12 to May 16.

HAWAII, ISLAND OF KAUAI--Continued

220713159361201. State Key Number 1083.0 Mohihi crossing rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'13", long 159°36'12", Hydrologic Unit 20070000, 3.8 mi east of Kokee Lodge and 7.5 mi south of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 3,420 ft (from topographic map).

REMARKS.--Records good. Accumulated rainfall recorded in tenths of an inch and recording rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.91	.26	.00	.84	.00	.00	---	.05	.05	.00	.28	.00
2	.01	.09	.00	.00	.00	.28	---	.01	.15	.00	.14	.00
3	.00	.02	.00	.00	.50	.12	---	.04	.06	.00	.22	.11
4	.00	.00	.76	.00	.03	.06	---	.16	.37	.00	.10	.12
5	.01	.00	.73	.00	.55	.02	---	.06	.01	.00	.01	.00
6	.00	.04	.00	.00	.45	.00	---	.00	.01	.00	.09	.10
7	.00	.01	.00	.00	.01	.01	---	.00	.01	.00	.02	.00
8	.35	.00	.00	.00	.76	.02	---	.06	.18	.00	.00	.00
9	.03	.24	.00	.00	4.08	.37	---	.12	.00	.01	.01	.00
10	.16	.00	.00	.00	.83	.03	---	.11	.00	.07	.01	.00
11	.01	.00	1.11	.00	.19	.00	---	.07	.00	.01	.01	.00
12	.05	.69	.65	.00	.26	.06	---	.00	.05	.25	.15	.01
13	.36	.38	.07	.04	2.32	.01	.51	.00	.10	.06	.06	.03
14	.09	.03	.01	.05	1.42	.00	.14	.01	.00	.06	.05	.00
15	.00	.00	.00	.00	.50	.01	.21	.05	.07	.00	.05	.09
16	.01	.71	.00	.00	.00	.00	.02	.01	.00	.00	.05	.70
17	.00	.85	.00	.00	.00	.00	.06	.03	.01	.00	.00	.01
18	.00	.15	.00	.00	.00	---	.02	.00	.00	.13	.18	.02
19	.00	.00	.37	.00	.60	---	.22	.54	.00	.16	.21	.08
20	.00	.00	.53	.00	.31	---	.24	.02	.03	.06	.01	.06
21	.00	.11	.14	.00	.24	---	.01	.00	.04	.05	.02	.18
22	.03	.09	.19	.00	.94	---	.10	.00	.44	.00	.00	.28
23	.07	.01	.00	.00	.33	---	.02	.00	.05	.00	.03	.19
24	.04	.13	.00	.06	.00	---	.05	.00	.02	.00	.05	.00
25	.38	.03	.00	.09	3.96	---	.03	.03	.47	.00	.00	.02
26	.18	.12	.00	.00	.46	---	.25	.00	.01	.01	.00	.14
27	.03	.87	.00	.06	.03	---	.10	.05	.01	.00	.00	.25
28	.00	.04	.01	.08	.00	---	.20	.22	.17	.05	.00	.01
29	.33	.00	.00	.08	---	---	.43	.01	.50	.32	.00	.11
30	.27	.01	.00	.21	---	---	.02	.37	.15	.64	.00	.37
31	.01	---	.00	.00	---	---	---	.01	---	.51	.00	---
TOTAL	3.33	4.88	4.57	1.51	18.77	0.99	2.63	2.03	2.96	2.39	1.75	2.88

CAL YR 2000 Total 45.19
WTR YR 2001 Total 60.98

No daily record Mar. 18 to Apr. 12, value is based on accumulation rain can reading of 26.6 inches from Jan. 19 to Apr. 12. Total accumulation Mar. 18 to Apr. 12 is 12.29 inches.

HAWAII, ISLAND OF KAUAI--Continued

220927159355001. State Key Number 1084.0 Kilohana rain gage near Hanalei, Kauai.

LOCATION.--Lat 22°09'27", long 159°35'50", Hydrologic Unit 20070000, 4.1 mi east southeast of Kalalau Beach and 4.9 mi south southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records fair. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.28	.18	.00	.74	.00	.01	.07	.24	.17	.00	1.08	.08
2	.02	.07	.00	.01	.03	.67	6.02	.04	.71	.00	1.04	.02
3	.00	.03	.00	.00	1.10	.27	.08	.38	1.14	.00	1.59	.30
4	.00	.01	2.12	.00	.10	.12	.06	1.12	2.40	.04	.70	1.11
5	.02	.02	2.21	.00	.72	.11	.00	.24	.44	.01	.39	.01
6	.00	.01	.01	.00	.98	.01	.55	.02	.05	.00	.55	.15
7	.16	.00	.01	.00	.01	.00	.05	.00	.20	.00	.08	.02
8	.63	.00	.03	.00	.99	.13	.24	.57	.07	.01	.00	.00
9	.07	.73	.01	.00	4.27	1.69	.67	.84	.01	.01	.14	.00
10	.25	.01	.00	.01	2.82	.06	3.63	.79	.00	.15	.14	.00
11	.05	.20	4.36	.00	.23	.02	.10	.10	.00	.07	.05	.00
12	.14	2.56	3.73	.02	1.26	.19	1.37	.02	.30	1.06	1.14	.08
13	.70	.92	.10	.37	2.79	.01	1.62	.01	.27	.30	.75	.10
14	.61	.10	.02	.12	1.89	.00	.61	.07	.00	.40	.37	.05
15	.02	.11	.01	.00	1.62	.00	.45	.15	.10	.00	.69	.20
16	.03	2.11	.00	.00	.00	.00	.37	.40	.01	.14	1.33	.86
17	.00	1.20	.01	.00	.00	.02	.44	.07	.08	.08	.02	.39
18	.10	.63	.00	.00	.01	1.46	.07	.24	.01	.52	1.19	.10
19	.01	.01	.89	.00	.79	1.05	.18	.87	.06	.30	.63	.29
20	.00	.00	1.17	.00	.17	.00	.42	.01	.06	.30	.20	.19
21	.00	.27	.53	.00	.08	.00	.07	.00	.20	.19	.06	.55
22	.13	.13	.48	.00	.37	.00	.76	.00	1.68	.01	.06	.57
23	.13	.09	.00	.00	.39	.00	.20	.01	.15	.17	.82	.48
24	.26	.28	.00	.07	.01	.00	.17	.00	.36	.12	.44	.00
25	.82	.20	.00	.07	2.45	.00	.23	.06	2.62	.06	.06	.12
26	.25	.60	.00	.03	1.19	.00	2.26	.00	.06	.08	.01	.74
27	.06	3.48	.03	.14	.02	.00	.96	.06	.07	.00	.01	1.57
28	.27	.09	.01	.18	.02	.02	1.18	.19	.48	.20	.00	.07
29	.39	.00	.30	.13	---	.02	1.49	.01	5.38	1.07	.52	.33
30	.26	.00	.01	.12	---	.02	.08	.32	1.18	1.43	.02	1.00
31	.02	---	.00	.00	---	.26	---	.02	---	2.34	.08	---
TOTAL	5.68	14.04	16.04	2.01	24.31	6.14	24.40	6.85	18.26	9.06	14.16	9.38

CAL YR 2000 Total 131.87
WTR YR 2001 Total 150.33

HAWAII, ISLAND OF KAUAI--Continued

220703159351201. State Key Number 1085.0 Mohihi-Koaie divide rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'03", long 159°35'12", Hydrologic Unit 20070000, 5.0 mi east of Kokee Lodge and 7.5 mi south of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage. Gage changed to electronic data logger with tipping bucket catchment (0.01 inch per tip) on May 23. Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch. Recording rainfall in hundredths of an inch from May 23.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.10	.00	.28	.00
2	---	---	---	---	---	---	---	---	.20	.00	.23	.00
3	---	---	---	---	---	---	---	---	.12	.00	.23	.16
4	---	---	---	---	---	---	---	---	.39	.00	.09	.07
5	---	---	---	---	---	---	---	---	.02	.00	.04	.00
6	---	---	---	---	---	---	---	---	.01	.00	.11	.14
7	---	---	---	---	---	---	---	---	.03	.00	.02	.00
8	---	---	---	---	---	---	---	---	.24	.00	.00	.00
9	---	---	---	---	---	---	---	---	.00	.01	.03	.00
10	---	---	---	---	---	---	---	---	.00	.12	.04	.00
11	---	---	---	---	---	---	---	---	.00	.01	.02	.00
12	---	---	---	---	---	---	---	---	.10	.26	.19	.04
13	---	---	---	---	---	---	---	---	.17	.05	.06	.05
14	---	---	---	---	---	---	---	---	.01	.11	.05	.00
15	---	---	---	---	---	---	---	---	.15	.01	.08	.05
16	---	---	---	---	---	---	---	---	.00	.00	.06	.96
17	---	---	---	---	---	---	---	---	.03	.00	.00	.02
18	---	---	---	---	---	---	---	---	.00	.12	.23	.04
19	---	---	---	---	---	---	---	---	.01	.14	.22	.07
20	---	---	---	---	---	---	---	---	.02	.07	.02	.06
21	---	---	---	---	---	---	---	---	.05	.06	.02	.19
22	---	---	---	---	---	---	---	---	.42	.00	.01	.27
23	---	---	---	---	---	---	---	---	.06	.01	.04	.21
24	---	---	---	---	---	---	---	.00	.03	.02	.12	.00
25	---	---	---	---	---	---	---	.05	.52	.00	.01	.03
26	---	---	---	---	---	---	---	.02	.02	.02	.00	.23
27	---	---	---	---	---	---	---	.07	.02	.00	.00	.21
28	---	---	---	---	---	---	---	.19	.24	.03	.00	.03
29	---	---	---	---	---	---	---	.00	.58	.37	.00	.16
30	---	---	---	---	---	---	---	.42	.14	.87	.00	.42
31	---	---	---	---	---	---	---	.01	---	.58	.00	---
TOTAL	---	---	---	---	---	---	---	0.76	3.68	2.86	2.20	3.41

CAL YR 2000 Total 56.0
WTR YR 2001 Total 68.7

Total accumulation Oct. 1-11 is .04 inches based on accumulation rain can reading of 3.6 inches from Jul. 31 to Oct. 11.
Total accumulation Oct. 11 to Dec. 31 is 17.3 inches based on accumulation rain can reading of 38.4 inches from Oct. 11 to Feb. 27.
Total accumulation Jan. 1 to Feb. 27 is 21.1 inches based on accumulation rain can reading of 38.4 inches from Oct. 11 to Feb. 27.
Total accumulation rain can reading of 17.0 inches from Feb. 27 to May 23.

HAWAII, ISLAND OF KAUAI--Continued

221101159280801. State Key Number 1131.7 Hanalei rain gage at Hanalei, Kauai.

LOCATION.--Lat 22°11'01", long 159°28'08", Hydrologic Unit 20070000, in USGS stream-gaging station 16103000 on left bank 2.3 mi southeast of Hanalei Bridge and 5.5 mi upstream from the river mouth.

PERIOD OF RECORD.--From May 8, 2001 to September 30, 2001.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 60 ft (from topographic map).

REMARKS.--Records good. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	1.12	.01	.52	.01
2	---	---	---	---	---	---	---	---	1.27	.00	1.81	.00
3	---	---	---	---	---	---	---	---	.30	.00	.69	.29
4	---	---	---	---	---	---	---	---	1.04	.00	.34	.27
5	---	---	---	---	---	---	---	---	.10	.00	.30	.70
6	---	---	---	---	---	---	---	---	1.99	.00	.27	1.46
7	---	---	---	---	---	---	---	---	.98	.02	.26	.11
8	---	---	---	---	---	---	---	---	.11	.08	.02	.00
9	---	---	---	---	---	---	---	1.49	.08	.02	.09	.01
10	---	---	---	---	---	---	---	.25	.02	.21	.23	.01
11	---	---	---	---	---	---	---	.06	.00	.02	.11	.00
12	---	---	---	---	---	---	---	.00	.43	.71	.61	.04
13	---	---	---	---	---	---	---	.00	.54	.16	1.28	.05
14	---	---	---	---	---	---	---	.01	.21	1.04	.08	.03
15	---	---	---	---	---	---	---	.03	.12	.29	.34	.91
16	---	---	---	---	---	---	---	.42	.06	.10	1.56	1.33
17	---	---	---	---	---	---	---	.19	.01	.05	.17	.21
18	---	---	---	---	---	---	---	.02	.00	.22	.54	.09
19	---	---	---	---	---	---	---	1.14	.02	.03	.25	.11
20	---	---	---	---	---	---	---	.00	.10	.17	.29	.03
21	---	---	---	---	---	---	---	.00	.22	.34	.20	.43
22	---	---	---	---	---	---	---	.00	.47	.04	.29	.35
23	---	---	---	---	---	---	---	.00	.06	.23	.15	.42
24	---	---	---	---	---	---	---	.00	.01	.17	.55	.02
25	---	---	---	---	---	---	---	.02	1.64	.19	.01	.06
26	---	---	---	---	---	---	---	.08	.08	.52	.01	.15
27	---	---	---	---	---	---	---	.02	.02	.02	.01	.23
28	---	---	---	---	---	---	---	.03	.97	.55	.00	.07
29	---	---	---	---	---	---	---	.01	.67	.54	.04	.43
30	---	---	---	---	---	---	---	.23	.49	.98	.13	.27
31	---	---	---	---	---	---	---	.00	---	.64	.05	---
TOTAL	---	---	---	---	---	---	---	4.00	13.13	7.35	11.20	8.09

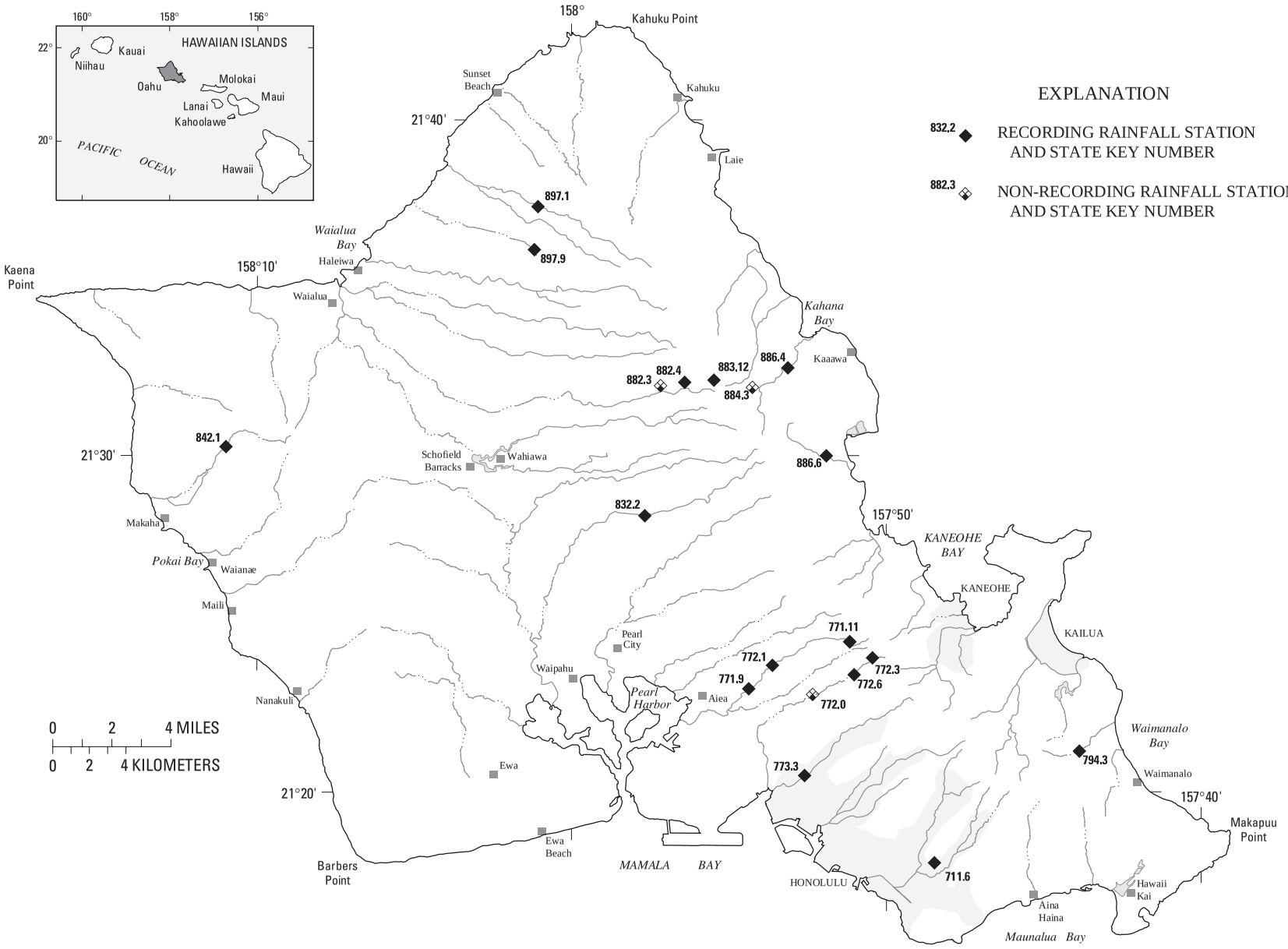


Figure 22. Locations of rainfall stations on Oahu.

HAWAII, ISLAND OF OAHU

211747157485601. State Key Number 711.6 Manoa rain gage at Kanewai Field at Honolulu, Oahu.

LOCATION.--Lat 21°17'47", long 157°48'56", Hydrologic Unit 20060000, in USGS stream-gaging station 16242500 on left bank, 0.5 mi northeast of Kaimuki High School, 0.4 mi northwest of St. Louis High School, and 0.3 mi upstream of confluence with Palolo Stream.

PERIOD OF RECORD.--Continuous-record station, May 1999 to current year.

GAGE.--Standard 8-in. National Weather Service collector and 8-in. rain can with tipping-bucket attachment. An electronic data logger records rainfall at 15-minute intervals. Elevation of gage is 22 ft above mean sea level (from topographic map).

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.01	.00	.11	.00	.00	.00	.01	---	---	---	---
2	.00	.43	.00	.00	.00	.12	.00	.00	---	---	---	---
3	.00	.03	.00	.00	.21	.03	.00	.03	---	---	---	---
4	.00	.09	.00	.00	.00	.00	.03	.03	---	---	---	---
5	.08	.00	.00	.00	.00	.01	.00	.01	---	---	---	---
6	.00	.01	.00	.00	.12	.00	.11	.00	---	---	---	---
7	.04	.03	.02	.00	.00	.04	.00	.00	---	---	---	---
8	.02	.02	.00	.00	.07	.09	.00	.03	---	---	---	---
9	.02	.11	.00	.00	.00	.05	.11	.00	---	---	---	---
10	.06	.00	.00	.00	.00	.00	.35	.01	---	---	---	---
11	.08	.00	.00	.00	.12	.00	.18	.04	---	---	---	---
12	.13	.04	.00	.00	.78	.01	.03	.00	---	---	---	---
13	.21	.25	.01	.18	.57	.04	.05	.00	---	---	---	---
14	.00	.24	.00	.00	1.02	.01	.18	.01	---	---	---	---
15	.00	.12	.04	.00	.25	.01	.13	.07	---	---	---	---
16	.02	.61	.00	.00	.00	.01	.00	.01	---	---	---	---
17	.00	.00	.00	.00	.00	.11	.12	---	---	---	---	---
18	.00	.18	.00	.00	.00	.00	.08	---	---	---	---	---
19	.02	.13	.00	.00	.00	.17	.04	---	---	---	---	---
20	.00	.02	.04	.00	.00	.00	.01	---	---	---	---	---
21	.00	.02	.29	.00	.00	.00	.00	---	---	---	---	---
22	.00	.00	.00	.00	.00	.00	.03	---	---	---	---	---
23	.09	.04	.00	.00	.00	.00	.02	---	---	---	---	---
24	.15	.01	.00	.03	.00	.60	.08	---	---	---	---	---
25	.20	.04	.00	.00	.00	.01	.14	---	---	---	---	---
26	.04	.01	.00	.01	.00	.00	.00	---	---	---	---	---
27	.00	.07	.00	.02	.00	.00	.10	---	---	---	---	---
28	.06	.00	.00	.00	.02	.00	.07	---	---	---	---	---
29	.00	.00	.03	.03	---	.00	.02	---	---	---	---	---
30	.01	.00	.00	.25	---	.43	.04	---	---	---	---	---
31	.01	---	.00	.00	---	.00	---	---	---	---	---	---
TOTAL	1.24	2.51	0.43	0.63	3.16	1.74	1.92	---	---	---	---	---

Total accumulated rainfall from May 16 (1010 hrs) to June 5 (1550 hrs) is 1.10 inches.
Missing record from June 5 to September 30.

HAWAII, ISLAND OF OAHU--Continued

212428157511201. State Key Number 771.11 North Halawa Valley rain gage at tunnel portal near Kaneohe, Oahu.

LOCATION.--Lat 21°24'28", long 157°51'12", Hydrologic Unit 20060000, on roof of Halawa portal control center, 3.2 mi west of Kaneohe Post Office and 2.4 mi southwest of Ahuimanu School.

PERIOD OF RECORD.--Continuous-record station, July 1998 to current year.

GAGE.--Standard 8-in. National Weather Service collector attached to a 7 5/16-in. rain can with float-type recorder system. Elevation of the gage is 1,100 ft above mean sea level (from topographic map).

REMARKS.--Records fair. Rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.40	.00	---	---	.00	.00	.80	.10	.00	.20	.00
2	.00	.80	.10	---	---	.20	.20	.00	.50	.00	.30	.00
3	.00	.60	---	---	.20	.10	.00	.70	.20	.00	1.30	.00
4	.10	.50	---	---	.00	.40	.10	.30	2.00	.00	.10	.00
5	.10	.10	---	---	.10	.50	1.30	1.10	3.30	.00	.20	.00
6	.00	.80	---	---	.30	.00	2.00	.00	.30	.00	.20	.00
7	.00	.00	---	---	.00	.50	.00	.00	.20	.00	.00	.00
8	.00	.20	---	---	.70	.50	.30	.00	.10	.00	.00	.00
9	.20	.30	---	---	.70	.40	.40	.20	.00	.00	.20	.40
10	.20	.00	---	---	1.00	.00	1.30	.10	.00	.10	.10	.00
11	.10	.50	---	---	.20	.00	.40	.70	.10	.10	.10	.00
12	.10	1.30	---	---	2.70	.00	.70	.00	.30	.00	.20	.00
13	.60	1.00	---	---	1.00	.60	.20	.00	.30	.20	.20	.00
14	.00	.50	---	---	.40	.10	.20	.00	.30	.40	.00	.00
15	.00	.40	---	---	.30	.00	.40	.30	.30	.10	.30	.00
16	.20	.70	---	---	.00	.50	.50	.50	.50	.30	1.60	3.90
17	.00	.00	---	---	.00	1.30	.50	.70	.30	.40	.60	.00
18	.10	.60	---	---	.10	.00	.70	1.10	.00	.20	.60	.00
19	.30	.60	---	---	.60	1.10	.10	.00	.10	.00	.10	.00
20	.00	.00	---	---	.00	.00	1.80	.00	.00	.30	.00	.20
21	.00	.90	---	---	.10	.00	.10	.10	.10	.30	1.10	.30
22	.10	.00	---	---	.00	.00	.30	.90	.20	.00	.90	.10
23	.10	.20	.00	---	.00	.00	.60	.10	.00	.00	.00	.00
24	.20	.20	---	---	.00	.80	.50	.00	.10	.20	.30	.00
25	.20	.60	---	---	.00	.20	1.80	.40	.90	.00	.60	.00
26	.40	.50	---	---	.00	.00	.00	.00	.00	.30	.00	.70
27	.00	.70	---	---	.00	.00	.40	---	.00	.10	.40	.10
28	.70	.00	---	---	.10	.00	.70	---	.50	.00	.00	.20
29	3.50	.00	---	---	---	.00	1.80	---	.00	.60	.00	.40
30	.20	.00	---	---	---	1.40	.10	---	.10	.90	.30	.00
31	.50	---	---	---	---	2.60	---	---	---	.70	.30	---
TOTAL	7.90	12.40	---	---	---	11.20	17.40	8.00	10.80	5.20	10.20	6.30

Partial daily record on December 3 from 0015 hrs to 1900 hrs was 0.10 inches.
Partial daily record on December 22 from 1015 hrs to 2400 hrs was 0.00 inches. Total accumulated rainfall from December 3 (1900 hrs) to December 22 (1000 hrs) was 3.2 inches.
Partial daily record on December 24 from 0015 hrs to 0800 hrs was 0.00 inches.
Partial daily record on February 2 from 1500 hrs to 2400 hrs was 0.00 inches. Total accumulated rainfall from December 24 (0800 hrs) to February 2 (1500 hrs) was 2.4 inches.
Partial daily record on May 31 from 1200 hrs to 2400 hrs. No rainfall data from May 27 (0015 hrs) to May 31 (1200 hrs), data logger malfunctioned.

HAWAII, ISLAND OF OAHU--Continued

212304157542201. State Key Number 771.9 North Halawa rain gage near Honolulu, Oahu.

LOCATION.--Lat 21°23'04", long 157°54'22", (Waipahu quadrangle, 1983, 1:24000) Hydrologic Unit 20060000, in USGS stream-gaging station 16226200, on right bank, 0.6 mi north of Oahu Prison, 1.0 mi south of Keaiwa Heiau, and 1.7 mi east of Aiea High School.

PERIOD OF RECORD.--Continuous-record station, May 1983 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage receiver and 7 5/16-in. rain can with float-type system attached to an electronic data logger. Elevation of gage is 160 ft above mean sea level (from topographic map).

REMARKS.--Records poor. Rainfall read in 0.1-inch increments.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0
2	.0	.6	.0	.0	.0	.0	.1	.1	.0	---	.0	.0
3	.0	.3	.0	.0	.0	.1	.0	.1	.1	---	.0	.0
4	.0	.2	.0	.0	.0	.0	.0	.2	.1	---	.1	.0
5	.0	.0	.0	.0	.0	.1	.0	.1	.9	---	---	.0
6	.0	.0	.0	.0	.1	.0	.4	.0	.0	---	---	.0
7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	---	.0
8	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	---	.0
9	.0	.1	.0	.0	.0	.3	.3	.1	.0	.0	---	.0
10	.1	.0	.0	.0	.1	.0	1.0	.0	.0	.1	---	.0
11	.0	.1	.0	.0	.3	.0	.0	.0	.0	.1	---	.0
12	.0	.3	.0	.0	.2	.0	.2	.0	.1	.0	---	.0
13	.1	.1	.0	.1	---	.0	.1	.0	.2	.0	---	.0
14	.0	.2	.0	.0	---	.0	.1	.0	.0	.0	---	.0
15	.0	.0	.0	.0	---	.1	.0	.1	.0	.0	---	.0
16	.0	.1	.0	.0	---	.0	.0	.0	.0	.0	---	1.7
17	.0	.0	.0	.0	---	1.2	.0	.0	.0	.1	.0	.0
18	.0	.1	.0	.0	---	.0	.0	.1	.0	.0	.1	.0
19	.0	.1	.0	.0	---	.1	.3	.0	.0	.1	.1	.0
20	.0	.0	.1	.0	---	.1	.3	.0	.0	.1	.0	.0
21	.0	.2	.3	.0	---	.0	.0	.0	.1	.1	.1	.2
22	.0	.0	.0	.0	---	.0	.0	.0	.1	.0	.0	.0
23	.0	.0	.0	.0	---	.0	.0	.0	.0	.0	.0	.0
24	.0	.0	.0	.2	---	.6	.0	.0	.1	.0	.0	.0
25	.1	.1	.0	.0	---	.1	.2	.0	.0	.0	.0	.0
26	.7	.2	.0	.0	---	.0	.0	.0	.0	.0	.0	.3
27	.0	.0	.0	.0	---	.0	.1	.0	.0	.0	.0	.0
28	.6	.0	.0	.0	---	.0	.1	.0	.1	.0	.0	.1
29	.1	.2	.0	.0	---	.0	.4	.1	.0	.3	.0	.1
30	.0	.0	.0	.0	---	.1	.1	.0	.0	.1	.0	.0
31	.0	---	.0	.0	---	1.5	---	.0	---	.4	.2	---
TOTAL	1.7	2.9	0.4	0.3	1.1	4.3	3.8	0.9	1.8	1.4	0.9	2.4

CAL YR 2000 TOTAL 19.3
WTR YR 2001 TOTAL 21.9

Partial daily record on February 13 from 0015 hrs to 1600 hrs was 0.1 inches.
Partial daily record on February 28 from 1430 hrs to 2400 hrs was 0 inches. Total accumulated rainfall from February 13 (1615 hrs) to February 28 (1415 hrs) was 0.3 inches.
Partial daily record on July 2 from 0015 hrs to 1800 hrs was 0 inches.
Partial daily record on July 6 from 1000 hrs to 2400 hrs was 0 inches. Total accumulated rainfall from July 2 (1815 hrs) to July 6 (0945 hrs) was 0 inches.
Partial daily record on August 5 from 0015 hrs to 0500 hrs was 0 inches.
Partial daily record on August 16 from 1500 hrs to 2400 hrs was 0 inches. Total accumulated rainfall from August 5 (0515 hrs) to August 16 (1445 hrs) was 0 inches.

HAWAII, ISLAND OF OAHU--Continued

212253157522201. State Key Number 772.0 Moanalua rain gage near Honolulu, Oahu.

LOCATION.--Lat 21°22'53", long 157°52'22", Hydrologic Unit 20060000, 1.8 mi northeast of Tripler Hospital, and 5.0 mi north of Honolulu Post Office.

PERIOD OF RECORD.--Accumulated-rainfall station, June 1926 (revised) to December 1964. Continuous-record station, December 1964 to September 2001 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector attached to a 7 5/16-in. rain can with float-type recorder system. An electronic data logger was installed on February 6, 1997 replacing the digital recorder. Housed with recording crest-gage. Elevation of the gage is 340 ft above mean sea level (from topographic map).

REMARKS.--Records good except for the period of missing record February 7 to March 2, which are poor. Rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.1	.0	.2	.0	---	.0	.5	.0	.0	.5	.0
2	.0	.6	.0	.0	.0	---	.2	.0	.1	.0	.2	.0
3	.0	.8	.0	.0	.1	.0	.0	.3	.4	.0	.6	.0
4	.0	.7	.0	.1	.0	.1	.1	.2	.7	.0	.1	.1
5	.1	.1	.0	.0	.0	.0	.5	.3	1.8	.0	.1	.1
6	.0	.4	.0	.0	.2	.1	.5	.0	.1	.0	.0	.0
7	.0	.1	.1	.0	---	.3	.4	.0	.1	.0	.0	.0
8	.1	.3	.1	.0	---	.3	.3	.0	.0	.0	.0	.0
9	.2	.4	.0	.1	---	.3	.3	.3	.0	.0	.1	.0
10	.1	.0	.0	.0	---	.0	1.8	.1	.0	.1	.0	.0
11	.1	.3	.0	.0	---	.0	.1	.1	.0	.3	.1	.0
12	.2	1.0	.0	.0	---	.0	.6	.0	.4	.3	.0	.0
13	.2	.5	.1	.4	---	.2	.1	.0	.5	.2	.0	.0
14	.0	.3	.0	.0	---	.1	.3	.0	.1	.3	.0	.0
15	.0	.3	.0	.1	---	.2	.3	.1	.3	.0	.1	.0
16	.2	.6	.0	.0	---	.4	.1	.2	.0	.1	.5	4.3
17	.0	.0	.0	.0	---	1.8	.2	.1	.0	.1	.2	.1
18	.0	.4	.0	.0	---	.0	.4	1.7	.0	.2	.4	.0
19	.1	.2	.0	.0	---	.5	.7	.0	.0	.2	.0	.0
20	.0	.1	.4	.0	---	.0	1.2	.0	.0	.3	.2	.1
21	.0	.5	1.0	.0	---	.0	.0	.0	.3	.4	.3	.2
22	.0	.0	.0	.0	---	.0	.1	.1	.5	.1	.1	.0
23	.0	.0	.0	.0	---	.0	.2	.0	.1	.0	.3	.0
24	.0	.1	.0	.5	---	.5	.2	.0	.1	.0	.2	.0
25	.6	.6	.0	.0	---	.2	.7	.1	.3	.0	.1	.0
26	.8	.4	.0	.0	---	.0	.0	.0	.0	.1	.0	.5
27	.2	.2	.0	.0	---	.0	.3	.0	.0	.1	.0	.2
28	1.3	.0	.0	.0	---	.0	.5	.0	.3	.0	.0	.2
29	1.3	.0	.0	.4	---	.0	1.9	.0	.0	.7	.0	.1
30	.1	.0	.0	.1	---	.4	.5	.1	.0	.4	.0	.1
31	.5	---	.0	.0	---	.2	---	.1	---	.6	.3	---
TOTAL	6.1	9.0	1.7	1.9	---	---	12.5	4.3	6.1	4.5	4.4	6.0

CAL YR 2000 TOTAL 67.0
WTR YR 2001 TOTAL 68.1

Estimated total rainfall from February 7 to March 2 was 5.7 inches.

HAWAII, ISLAND OF OAHU--Continued

212346157533701. State Key Number 772.1 North Halawa rain gage near Aiea, Oahu.

LOCATION.--Lat 21°23'46", long 157°53'37", Hydrologic Unit 20060000, 2.7 mi above confluence with South Halawa Stream, 2.7 mi northeast of Aiea Post Office, and 6.5 mi northwest of Honolulu.

PERIOD OF RECORD.--Continuous-record station, August 1929 to June 1933, June 1953 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--A 12-in. collector and 10-in. storage tank with float-type recorder system. Elevation of gage is 320 ft above mean sea level (from topographic map).

REMARKS.--Records fair. Rainfall recorded in 0.083-inch increments.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.17	.00	.00	.42	.00
2	.00	.67	.00	.00	.00	.00	.00	.00	.08	.00	.17	.00
3	.00	.25	.00	.00	.08	.00	.00	.50	.17	.00	.33	.00
4	.00	.25	.00	.00	.00	.00	.00	.17	.50	.00	.00	.00
5	.08	.00	.00	.00	.00	.00	.17	.25	1.33	.00	.00	.00
6	.00	.25	.00	.00	.25	.00	.33	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.17	.08	.00	.00	.00	.00	.00
8	.08	.08	.00	.00	.08	.25	.08	.08	.00	.00	.00	.00
9	.00	.25	.00	.00	.08	.42	.25	.08	.00	.00	.00	.00
10	.17	.00	.00	.00	.17	.00	1.50	.00	.00	.00	.00	.00
11	.00	.17	.00	.00	.08	.00	.00	.08	.00	.17	.00	.00
12	.00	.58	.00	.00	.58	.00	.42	.00	.08	.08	.00	.00
13	.25	.25	.00	.25	.67	.00	.08	.00	.25	.00	.00	.00
14	.00	.42	.00	.00	.42	.00	.08	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.42	.00	.00	.17	.00	.00	.00	.00
16	.00	.08	.00	.00	.00	.17	.08	.08	.00	.00	.08	1.50
17	.00	.00	.00	.00	.00	1.08	.00	.00	.00	.08	.08	.00
18	.00	.17	.00	.00	.00	.00	.17	.25	.00	.08	.17	.00
19	.00	.17	.00	.00	.25	.25	.33	.00	.00	.08	.17	.00
20	.00	.00	.17	.00	.00	.00	.58	.00	.00	.17	.08	.00
21	.00	.25	.42	.00	.00	.00	.00	.00	.08	.08	.17	.17
22	.00	.00	.00	.00	.00	.00	.00	.00	.17	.08	.08	.08
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.17	.00	.42	.08	.00	.00	.00	.17	.00
25	.25	.25	.00	.00	.00	.08	.42	.00	.17	.00	.00	.00
26	.50	.25	.00	.00	.17	.00	.00	.00	.00	.00	.00	.42
27	.17	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08
28	.75	.00	.00	.00	.00	.00	.33	.00	.25	.00	.00	.08
29	.50	.00	.00	.08	---	.00	.83	.00	.00	.33	.00	.08
30	.00	.00	.00	.00	---	.17	.08	.08	.00	.25	.00	.00
31	.08	---	.00	.00	---	.42	---	.00	---	.42	.17	---
TOTAL	2.83	4.42	0.59	0.50	3.25	3.43	5.89	1.91	3.08	1.82	2.09	2.41

CAL YR 2000 TOTAL 34.17
WTR YR 2001 TOTAL 32.22

HAWAII, ISLAND OF OAHU--Continued

212359157502601. State Key Number 772.3 Moanalua rain gage no. 1 at altitude 1,000 ft near Honolulu, Oahu.

LOCATION.--Lat 21°23'59", long 157°50'26", (Kaneohe quadrangle, 1959, 1:24000) Hydrologic Unit 20060000, 2.7 mi southwest of Kaneohe Post Office, and 4.2 mi northeast of Tripler Hospital.

PERIOD OF RECORD.--Continuous-record station, June 1968 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in. rain can with recorder. An electronic data logger was installed on February 5, 1997 replacing the digital recorder. Elevation of gage is 1,000 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for periods of estimated or missing record, which are poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.3	.0	.2	e.0	e.1	e.0	---	---	.0	.2	.0
2	.0	1.0	.0	.1	e.0	.1	e.1	---	---	.0	.4	.0
3	.0	.7	.0	.0	e.1	.0	e.0	---	---	.0	.9	.4
4	.1	.4	.0	.0	e.0	.3	e.3	---	.1	.0	.1	.1
5	.1	.1	.0	.0	e.0	.8	e1.8	---	3.5	.0	.2	.1
6	.0	.7	.0	.0	e.2	.0	e1.1	---	.3	.0	.1	.0
7	.0	.0	.2	.0	e.0	.8	e.0	---	.3	.0	.0	.0
8	.0	.5	.8	.0	e.1	.3	e.3	---	.0	.0	.0	.2
9	.2	.7	.0	.5	e1.0	.0	e.2	---	.0	.0	.3	.2
10	.1	.0	.0	.0	e.4	.0	e1.4	---	.0	.0	.1	.0
11	.1	.3	.0	.5	e.1	.0	e.2	---	.0	.5	.1	.0
12	.2	1.4	.0	.0	e4.7	.1	e.2	---	.5	.1	.3	.0
13	.2	.7	.2	1.1	e.3	.5	e.2	---	.4	.2	.1	.1
14	.0	.2	.4	.0	e1.0	.0	e.1	---	.2	.6	.0	.1
15	.0	.3	.1	.0	e.4	.1	e.8	---	.2	.1	.3	.0
16	.2	.5	.2	.0	e.0	e.6	e.0	---	.3	.2	1.5	4.7
17	.0	.1	.0	.0	e.0	e1.7	e.3	---	.3	.2	.7	.0
18	.3	.6	.0	.0	e.0	e.0	e.4	---	.0	.3	.7	.0
19	.4	.4	.0	.0	e.7	e1.0	---	---	.1	.1	.0	.1
20	.0	.0	.6	.2	e.0	.0	---	---	.0	.3	.2	.1
21	.0	.6	e1.0	e.0	e.0	.0	---	---	.1	.4	.5	.2
22	.0	.0	e.0	e.1	e.0	.1	---	---	.2	.0	.5	.0
23	.1	.1	e.1	e.0	e.0	.0	---	---	.0	.0	.0	.1
24	.1	.2	.0	e.4	e.0	.7	---	---	.2	.0	.2	.0
25	.5	.4	.0	e.0	e.0	.1	---	---	.8	.2	.4	.0
26	.2	.8	.0	e.0	e.1	e.0	---	---	.0	.0	.0	.7
27	.0	.8	.0	e.0	e.0	e.0	---	---	.0	.3	.4	.1
28	1.0	.1	.0	e.0	e.0	e.1	---	---	.3	.0	.0	.2
29	2.9	.0	.1	e.5	---	e.0	---	---	.0	.6	.0	.3
30	.5	.0	.0	e.1	---	e.7	---	---	.2	.7	.3	.0
31	.8	---	.0	e.0	---	e1.5	---	---	---	.8	.3	---
TOTAL	8.0	11.9	3.7	3.7	9.1	9.6	---	---	---	5.6	8.8	7.7

WTR YR 2001 TOTAL 100.8 inches.

Total accumulated rainfall from April 19 to June 3 was 17.3 inches.

HAWAII, ISLAND OF OAHU--Continued

212329157510501. State Key Number 772.6 Moanalua rain gage near Kaneohe, Oahu.

LOCATION.--Lat 21°23'29", long 157°51'05", (Kaneohe quadrangle, 1959, 1:24000) Hydrologic Unit 20060000, in USGS stream-gaging station 16227500, on left bank 3.3 mi northeast of Tripler Hospital, and 3.6 mi southwest of Kaneohe Post Office.

PERIOD OF RECORD.--Continuous-record station, August 1968 to September 2001 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector attached to 7 5/16-in. rain can with a digital recorder. An electronic data logger was installed on February 5, 1997 replacing the digital recorder. Elevation of gage is 660 ft above mean sea level (from topographic map).

REMARKS.--Records good except for periods of estimated record, which are fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.0	.4	.0	.2	.0	.1	.1	.7	.1	.0	.2	.0
2	e.0	.8	.0	.0	.0	.0	.2	.0	.0	.0	.3	.0
3	e.0	.8	.0	.0	.1	.0	.0	.4	.0	.0	1.2	.3
4	e.0	.4	.0	.0	.0	.4	.2	.3	.5	.0	.2	.0
5	e.0	.1	.0	.0	.0	.6	1.7	.5	3.1	.0	.2	.2
6	.0	.8	.0	.0	.3	.0	1.2	.0	.3	.0	.1	.1
7	.0	.1	.2	.0	.0	.8	.0	.0	.3	.0	.0	.0
8	.1	.5	.7	.0	.2	.4	.3	.1	.0	.0	.0	.1
9	.3	.8	.0	.0	.7	.1	.3	.3	.0	.0	.2	.2
10	.1	.0	.0	.0	.4	.0	1.9	.1	.0	.0	.2	.0
11	.2	.3	.0	.0	.1	.0	.2	.4	.0	.5	.1	.0
12	.2	1.4	.0	.0	1.1	.0	.3	.0	.6	.0	.2	.0
13	.4	.9	.0	.1	.3	.5	.1	.0	.5	.4	.1	.0
14	.0	.3	.2	.0	.4	.0	.3	.0	.2	.6	.0	.0
15	.0	.4	.1	.0	.2	.1	.7	.1	.3	.1	.3	.0
16	.4	.6	.1	.0	.0	1.0	.2	.3	.3	.2	1.3	4.7
17	.0	.0	.0	.0	.0	2.3	.4	.3	.2	.2	.6	.1
18	.3	.7	.0	.0	.0	.0	.4	1.1	.0	.2	.5	.0
19	.0	.4	.0	.0	1.0	1.0	.2	.0	.0	.2	.0	.0
20	.0	.1	.7	.0	.0	.0	2.9	.0	.1	.4	.2	.1
21	.0	.9	1.3	.0	.0	.0	.1	.0	.1	.5	.7	.2
22	.0	.0	.0	.0	.0	.0	.3	.7	.3	.1	.5	.0
23	.1	.1	.1	.0	.0	.0	.4	.0	.1	.0	.2	.0
24	.2	.1	.0	.5	.0	.7	.5	.1	.1	.0	.2	.0
25	.6	.5	.0	.0	.0	.2	1.4	.3	.7	.1	.3	.1
26	.3	1.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.9
27	.1	.5	.0	.0	.0	.0	.5	.0	.0	.3	.3	.0
28	2.8	.1	.0	.0	.0	.0	.8	.2	.6	.0	.0	.3
29	2.5	.0	.1	.5	---	.0	2.1	.1	.0	.9	.0	.3
30	.5	.0	.0	.1	---	1.2	.2	.1	.0	.8	.3	.0
31	.9	---	.0	.0	---	1.2	---	.0	---	.7	.3	---
TOTAL	10.0	13.0	3.5	1.4	4.8	10.6	17.9	6.1	8.4	6.3	8.7	7.6

CAL YR 2000 TOTAL 107.7
WTR YR 2001 TOTAL 98.3

HAWAII, ISLAND OF OAHU--Continued

212029157523601. State Key Number 773.3 Kalihi rain gage at Kalihi, Oahu.

LOCATION.--Lat 21°20'29", long 157°52'36", Hydrologic Unit 20060000, in USGS stream-gaging station 16229300 on left bank, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu Post Office.

PERIOD OF RECORD.--Continuous-record station, July 1962 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage with tipping-bucket attachment. An electronic data logger records rainfall at 15-minute intervals. Elevation of gage is 70 ft above mean sea level (from topographic map).

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.01	.00	.02	.00	.00	.00	.00	---	.00	.11	.00
2	.00	.39	.00	.01	.00	.00	.00	.00	---	.00	.00	.00
3	.00	.62	.01	.00	.02	.00	.00	.00	---	.00	.01	.00
4	.00	.04	.01	.00	.01	.00	.00	.00	---	.00	.02	.00
5	.04	.00	.00	.00	.00	.00	.00	.00	2.57	.00	.00	.02
6	.00	.01	.01	.01	.03	.00	.00	.00	.00	.00	.02	.00
7	.01	.01	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
8	.01	.02	.01	.00	.01	.02	.00	.00	.00	.00	.00	.00
9	.01	.11	.00	.01	.01	.01	.00	.00	.00	.00	.00	.00
10	.01	.00	.00	.00	.03	.00	.04	.00	.00	.02	.00	.00
11	.05	.02	.00	.00	.07	.00	.00	.00	.00	.07	.05	.00
12	.08	.07	.00	.01	.32	.00	.02	.00	.06	.11	.02	.00
13	.09	.13	.01	.01	.12	.00	.00	---	.10	.03	.00	.03
14	.00	.01	.01	.00	.18	.00	.00	---	.00	.08	.02	.00
15	.00	.03	.01	.00	.18	.00	.00	---	.01	.00	.02	.00
16	.01	.08	.00	.00	.00	.00	.00	---	.00	.00	.02	.14
17	.00	.04	.00	.00	.00	.00	.00	---	.00	.03	.00	.01
18	.01	.08	.00	.00	.01	.00	.00	---	.00	.05	.07	.00
19	.02	.04	.00	.00	.01	.00	.00	---	.00	.06	.01	.00
20	.00	.01	.03	.00	.00	.00	.00	---	.01	.06	.02	.08
21	.00	.04	.09	.01	.00	.00	.00	---	.02	.01	.06	.03
22	.00	.00	.00	.00	.00	.00	.00	---	.12	.00	.00	.04
23	.02	.00	.01	.00	.01	.00	.00	---	.04	.00	.00	.00
24	.02	.01	.00	.07	.01	.00	.00	---	.05	.00	.02	.00
25	.09	.02	.00	.01	.01	.00	.00	---	.09	.01	.00	.00
26	.22	.02	.00	.00	.04	.00	.00	---	.00	.01	.00	.07
27	.01	.01	.00	.02	.00	.00	.00	---	.00	.00	.00	.01
28	.03	.00	.00	.00	.00	.00	.00	---	.10	.00	.00	.07
29	.04	.00	.01	.04	---	.00	.00	---	.00	.20	.00	.01
30	.00	.00	.00	.00	---	.00	.00	---	.00	.20	.00	.00
31	.01	---	.00	.00	---	.00	---	---	---	.20	.04	---
TOTAL	0.78	1.82	0.21	0.22	1.07	0.04	0.06	---	---	1.14	0.51	0.51

CAL YR 2000 TOTAL 6.95
WTR YR 2001 TOTAL 9.53 (except missing record)

Missing record from May 13 to June 4.

HAWAII, ISLAND OF OAHU--Continued

212114157435001. State Key Number 794.3 Waimanalo rain gage at Waimanalo, Oahu.

LOCATION.--Lat 21°21'14", long 157°43'50", Hydrologic Unit 20060000, in USGS stream-gaging station 16249000, 260 ft downstream from Kalanianaole Highway, and 2.3 mi northwest of Waimanalo Post Office.

PERIOD OF RECORD.--Continuous-record station, January 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage collector and 7 5/16-in. diameter rain can, 4 ft tall, with a float system attached to a data logger. Elevation of gage is 20 ft above mean sea level (from topographic map).

REMARKS.--Records are good. Rainfall recorded in 0.10-inch increments.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00
2	.10	2.60	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
3	.10	.80	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.30	.50	.00	.00	.00
6	.00	.00	.00	.00	.10	.00	.30	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.10	.00	1.30	.00	.00	.00	.00	.00	.00	.00
9	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.60	.00	.00	.00	.00	.00	.00	.00
12	.00	.10	.00	.00	.30	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.60	.10	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.50	.10	.00	.00	.00	.00	.00	.00	.00
15	.00	.10	.00	.00	.10	.00	.00	.00	.00	.00	.00	.00
16	.00	.20	.00	.00	.00	.00	.10	.00	.00	.00	.00	.10
17	.00	.00	.00	.00	.00	.00	.10	.00	.00	.10	.00	.00
18	.10	.10	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00
19	.00	.20	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.10
21	.00	.00	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00
23	.00	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.10	.00	.00	.70	.00	.00	.00	.00	.10	.00
25	.00	.00	.00	.00	.00	.00	.30	.00	.30	.00	.00	.00
26	.00	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.80	.00	.00	.00	.00	.00	.00	.00	.00	.20	.00
28	.00	.00	.10	.00	.00	.00	.20	.00	.00	.00	.00	.20
29	2.20	.00	.30	.00	---	.00	.10	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.10
31	.10	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	2.80	5.10	0.70	1.10	3.00	0.90	1.30	0.40	0.80	0.10	0.40	0.50

CAL YR 2000 TOTAL 25.80
WTR YR 2001 TOTAL 17.10

HAWAII, ISLAND OF OAHU--Continued

212813157574001. State Key Number 832.2 Kipapa rain gage near Wahiawa, Oahu.

LOCATION.--Lat 21°28'13", long 157°57'40", Hydrologic Unit 20060000, on left bank of stream 1,700 ft below Forest Reserve Boundary, 4.9 mi southeast of Wahiawa Post Office, and 6.3 mi northeast of Waipahu. The rain gage is housed in the same shelter with USGS stream-gaging station 16212800.

PERIOD OF RECORD.--Continuous-record station, January 1957 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in. storage can with a float-type recorder system. Elevation of gage is 690 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for estimated periods which are poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.1	.0	.1	.0	---	.1	.1	.1	.0	---	---
2	---	.5	.0	.1	---	---	.2	.1	.3	.0	---	---
3	---	.0	.0	.0	---	---	.0	.3	.1	.0	---	---
4	---	.8	.0	.0	---	---	.2	.2	.5	.0	---	---
5	---	.1	.0	.0	---	---	1.0	.1	.7	---	---	---
6	---	.3	.0	.0	---	---	.4	.0	.0	---	---	---
7	---	.0	.0	.0	---	---	.1	.0	.0	---	---	---
8	---	.0	.2	.0	---	---	.3	.1	.0	---	---	---
9	---	.5	.0	.2	---	---	.5	.4	.0	---	---	---
10	---	.0	.0	.1	---	.0	1.1	.1	.0	---	---	---
11	---	.3	.5	.0	---	.0	.1	.1	.0	---	---	---
12	---	.7	.1	.0	---	---	.7	.0	.6	---	---	---
13	---	.3	.0	.2	---	---	.1	.0	.3	---	---	---
14	---	.1	.0	.0	---	---	.3	.0	.0	---	---	---
15	---	.1	.1	.0	---	---	.2	.4	.2	---	---	---
16	---	.2	.1	.0	---	---	.0	.2	.1	---	---	---
17	---	.1	.0	.0	---	1.1	.3	.0	.1	---	---	---
18	---	.5	.0	.0	---	.0	.2	.3	.0	---	---	---
19	---	.1	.0	.0	---	.1	1.0	.0	.0	---	---	.1
20	---	.0	.9	.0	---	.0	.7	.0	.0	---	---	.1
21	---	.3	.6	.0	---	.0	.0	.0	---	---	---	.2
22	---	.0	.1	.0	---	.0	.0	.0	---	---	---	.1
23	---	.1	.1	.0	---	.0	.0	.0	.0	---	---	.0
24	---	.2	.0	.5	---	3.4	.1	.0	.0	---	---	.0
25	.3	.5	.0	.0	---	.2	.2	.1	.3	---	---	.0
26	1.2	.3	.0	.0	---	.0	.0	.1	.1	---	---	.5
27	.2	.0	.1	.1	---	.0	.2	.0	.1	---	---	.1
28	.7	.0	.0	.0	---	.0	.2	.0	.4	---	---	.0
29	2.7	.0	.1	.2	---	.0	1.3	.3	.0	---	---	.1
30	.0	.0	.0	.0	---	.0	.3	.0	.1	---	---	.0
31	.1	---	.1	.0	---	1.3	---	.1	---	---	---	---
TOTAL	5.2	6.1	3.0	1.5	0.0	6.1	9.8	3.0	4.0	0.0	---	1.2

CAL YR 2000 TOTAL 55.3 (estimated)
WTR YR 2001 TOTAL 60.27 (estimated)

Partial daily record on October 24 from 0645 hrs to 2400 hrs was 0.2 inches. No rainfall record from September 8, 2000 (0945 hrs) to October 24 (0645 hrs), datalogger lost data. Cumulative rainfall total = 3.0 inches. Estimated total accumulated rainfall from October 1 (0001 hrs) to October 24 (0645 hrs) was 1.9 inches.
Partial daily record on February 2 from 0015 hrs to 0400 hrs was 0.0 inches.
Partial daily record on March 9 from 0900 hrs to 2400 hrs was 0.3 inches. No rainfall record from Febuary 2 (0400 hrs) to March 9 (0900 hrs), data logger lost data. Total accumulated rainfall was 7.8 inches.
Partial daily record on March 12 from 0015 hrs to 1915 hrs was 0.0 inches.
Partial daily record on March 16 from 0745 hrs to 2400 hrs was 0.0 inches. No rainfall record from March 12 (1915 hrs) to March 16 (0745 hrs), data logger lost data. Total accumulated rainfall is 0.3 inches.
Partial daily record on June 21 from 0015 hrs to 2300 hrs was 0.0 inches.
Partial daily record on June 22 from 0415 hrs to 2400 hrs was 0.4 inches. No rainfall record from June 21 (2300 hrs) to June 22 (0415 hrs), data logger malfunctioned. Total accumulated rainfall was 0.4 inches.
Partial daily record on July 5 from 0015 hrs to 0530 hrs was 0.0 inches.
Partial daily record on September 18 from 1300 hrs to 2400 hrs was 0.1 inches. No rainfall record from July 5 (0530 hrs) to September 18 (1300 hrs), data logger malfunctioned. Total accumulated rainfall was 9.37 inches.

HAWAII, ISLAND OF OAHU--Continued

213016158105901. State Key Number 842.1 Makaha rain gage near Makaha, Oahu.

LOCATION.--Lat 21°30'16", long 158°10'59", Hydrologic Unit 20060000, in USGS stream-gaging station 16211600, on right bank, 1.5 mi northeast of Kaneaki Heiau, and 3.4 mi northeast of Makaha.

PERIOD OF RECORD.--Continuous-record station, July 1959 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in., 4-ft tall rain can with a float-type system attached to an electronic data logger. Readings are taken at 15-minute intervals. Elevation of gage is 957 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for period of missing daily values, which is poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.1	---	---	.5	.0	.0	.0	.1	.0	.0	.0	.0
2	.1	---	---	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	.1	---	---	.2	.6	.1	.0	.0	.0	.0	.0	.0
4	.1	---	---	.1	.0	.0	.0	.0	.0	.0	.0	.0
5	.0	---	---	.0	.1	.0	.0	.3	.4	.0	.0	---
6	.1	---	---	.0	.2	.0	.8	.0	.0	.0	.0	---
7	.1	---	---	.0	.0	.0	.0	.0	.0	.0	.0	---
8	.0	---	---	.0	.0	.0	.0	.0	.0	.0	.0	---
9	.1	---	---	.0	1.7	.0	.0	.0	.0	.0	.0	---
10	.0	---	---	.0	.0	.0	.5	.0	.0	.0	.0	---
11	.0	---	---	.0	.0	.0	.0	.0	.0	.0	.0	---
12	.1	---	---	.0	.0	.0	.0	.0	.0	.0	.0	---
13	.0	---	---	.2	.1	.0	.0	.0	.0	.0	.0	---
14	.0	---	---	.0	.0	.0	.0	.0	.0	.0	.0	---
15	.0	---	---	.0	.2	.0	.0	.0	.0	.0	.0	---
16	.0	---	---	.0	.0	.0	.0	.0	.0	.0	.0	---
17	.0	---	---	.0	.0	.5	.0	.0	.0	.0	.0	---
18	---	---	---	.0	.0	.0	.0	.5	.0	.0	.1	---
19	---	---	.0	.0	.0	.6	.0	.0	.0	.0	.1	---
20	---	---	.6	.0	.0	.0	.2	.0	.0	.0	.0	---
21	---	---	.1	.0	.0	.0	.0	.0	.0	.0	.0	---
22	---	---	.0	.0	.0	.0	.0	.0	.0	.0	.0	---
23	---	---	.0	.0	.0	.0	.1	.0	.0	.0	.0	---
24	---	---	.0	.1	.0	.9	.2	.0	.0	.0	.0	---
25	---	---	.0	.0	.0	.0	.2	.0	.4	.0	.0	---
26	---	---	.0	.0	.2	.0	.0	.0	.0	.0	.0	---
27	---	---	.2	.0	.0	.0	.0	.0	.0	.0	.2	---
28	---	---	.0	.0	.0	.0	.1	.1	.0	.0	.0	---
29	---	---	.0	.0	---	.1	.0	.0	.0	.0	.0	---
30	---	---	.0	.0	---	1.4	.0	.8	.0	.1	.0	---
31	---	---	.0	.0	---	3.4	---	.0	---	.0	.0	---
TOTAL	0.8	---	0.9	1.1	3.1	7.0	2.1	1.8	0.8	0.1	0.4	0.0

CAL YR 2000 TOTAL 16.1
WTR YR 2001 TOTAL 21.8 (estimated)

Partial daily record on October 18 from 0015 hrs to 1115 hrs was 0 inches.
Partial daily record on December 18 from 1115 hrs to 2400 hrs. No daily rainfall record from October 18 (1130 hrs) to December 18 (1100 hrs), rain catchment sluggish. Total accumulated rainfall was 2.6 inches.
Partial daily record on September 5 from 0015 hrs to 1700 hrs was 0.1 inches.
No daily rainfall record from September 5 (1700 hrs) to October 29, 2001 (1000 hrs), data logger malfunctioned. Total accumulated rainfall was 2.8 inches. Estimated total accumulated rainfall from September 5 (1700 hrs) to September 30 (2400 hrs) was 0.4 inches.

HAWAII, ISLAND OF OAHU--Continued

213205157571001. State Key Number 882.3 Poamoho rain gage no. 3 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'05", long 157°57'10", Hydrologic Unit 20060000, on right side of Poamoho Trail, and 0.2 mi northeast from trail marker.

PERIOD OF RECORD.--Accumulated-rainfall station, July 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--A 3-in. diameter, 5-ft tall aluminum non-recording gage. Elevation of gage is 1,800 ft above mean sea level (from topographic map).

REMARKS.--Record fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
INTERMITTENT READINGS

Period	Rainfall
Aug. 01 to Oct. 06	21.8
Oct. 06 to Dec. 26	30.0
Dec. 26 to Mar. 12	18.5
Mar. 12 to May 17	37.2
May 17 to June 26	12.8
June 26 to Aug. 20	14.6
Aug. 20 to Oct. 11	16.2

HAWAII, ISLAND OF OAHU--Continued

213211157562400. State Key Number 882.4 Poamoho rain gage no. 2 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'11", long 157°56'24", Hydrologic Unit 20060000, on Poamoho trail 1.0 mi west of junction with Koolau Summit Trail, and 5.3 mi northeast of Leilehua High School in Wahiawa.

PERIOD OF RECORD.--Continuous-record station, June 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector on a 10-in. storage can with a float-type system attached to an electronic data logger. Elevation of gage is 1,960 ft above mean sea level (from topographic map).

REMARKS.--Record good for periods when logger was operational and poor when it malfunctioned. Rainfall recorded in 0.188-inch increments.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.56	.00	.00	.00	.00	.37	1.50	.38	.00	.56	.19
2	---	.56	.00	.00	.00	.19	.75	.19	.38	.00	1.12	.00
3	---	.94	.00	.00	.19	.00	.00	.75	.37	.00	1.50	.00
4	---	2.44	.00	.00	.00	.38	.00	.19	1.13	.00	.00	.00
5	---	.56	.00	.00	.19	.94	5.06	.56	2.81	.00	.37	.38
6	---	.56	.00	.00	.00	.19	1.88	.00	.75	.00	.19	.19
7	---	.38	.00	.00	.19	1.50	.38	.00	.38	.00	.00	.00
8	---	.56	.94	.00	.00	.75	1.69	.00	.00	.00	.00	.00
9	---	2.44	.00	.37	4.50	.38	.56	.38	.00	.00	.38	.19
10	---	.00	.19	.19	3.38	.19	1.31	.19	.00	.37	.38	.19
11	---	.19	.00	.19	.56	.00	.94	.19	.19	.19	.00	.00
12	---	1.69	.38	.00	.94	.00	1.88	.19	.38	.19	.38	.00
13	.00	1.31	.00	1.50	.75	.19	.38	.00	.56	.38	.00	.00
14	.00	.56	.19	.00	.75	.19	.00	.00	.56	1.50	.19	.00
15	.00	.19	.19	.00	.19	.19	.37	.19	1.31	.00	.94	.00
16	.56	.38	.56	.00	.00	1.12	.19	.56	.56	.19	1.31	3.94
17	.00	.00	.00	.00	.00	2.44	1.31	.56	.19	.37	.38	.38
18	.19	.38	.00	.00	.19	.00	1.50	2.44	.00	.19	.56	.00
19	.94	.38	.00	.00	2.44	.94	1.12	.19	.00	.00	.38	.00
20	.00	.00	.94	.37	1.31	.00	3.56	.00	.19	.56	.19	.19
21	.19	.75	1.12	.00	.38	.00	.00	.00	.19	.56	.94	.38
22	.19	.00	.00	.00	.00	.00	.19	.19	.38	.19	.94	.19
23	.19	.19	.00	.00	.00	.00	.38	.19	.00	.00	.19	.00
24	.19	.19	.00	.75	.00	.75	.56	.19	.19	.19	.19	.00
25	.56	.19	.00	.19	.00	.38	1.50	.37	2.06	.00	.75	.19
26	.94	.94	.00	.00	.19	.00	.19	.19	.00	.38	.00	.75
27	.56	.56	.00	.19	.00	.00	1.50	.00	.00	.19	.37	.38
28	3.19	.19	.00	.00	.38	.00	.19	.19	.56	.00	.00	.19
29	3.19	.00	.19	1.31	---	.19	1.50	.38	.00	1.12	.00	.37
30	.75	.00	.00	.00	---	.75	.37	.00	.19	1.69	.19	.00
31	1.88	---	.00	.19	---	3.00	---	.00	---	.75	.56	---
TOTAL	e14.46	17.09	4.70	5.25	16.53	14.66	29.63	9.78	13.71	9.01	12.96	8.10

CAL YR 2000 TOTAL 148.11 (estimated)
WTR YR 2001 TOTAL 155.88 (estimated)

No daily rainfall record from August 1, 2000 (1100 hrs) to October 6 (1015 hrs). Total accumulated rainfall was 35.14 inches.
Estimated total accumulated rainfall from October 1 (0015 hrs) to October 6 (1330 hrs) was 0.38 inches.
No daily rainfall record from October 6 (1030 hrs) to October 12 (1245 hrs). Total accumulated rainfall was 0.56 inches.

HAWAII, ISLAND OF OAHU--Continued

213215157552800. State Key Number 883.12 Poamoho rain gage no. 1 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'15", long 157°55'28", Hydrologic Unit 20060000, at junction of Poamoho and Koolau summit trails, and 6.2 mi northeast of Leilehua High School in Wahiawa.

PERIOD OF RECORD.--Continuous-record station, June 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector on a 10-in. storage can with a float-type system attached to an electronic data logger. Elevation is 2,480 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for period of estimated record, which is poor. Rainfall recorded in 0.188-inch increments.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	1.69	.00	---	---	---	.38	1.12	.37	.00	.19	.00
2	.00	.94	.00	---	---	---	.19	.00	.56	.00	1.88	.00
3	.00	.56	.00	---	---	---	.38	.56	.19	.19	1.31	.00
4	.00	1.31	.00	---	---	---	.00	.38	.94	.00	.00	.19
5	.38	.00	.00	---	---	---	4.50	.75	2.44	.00	.38	.38
6	.00	.00	.00	---	---	---	2.44	.00	.56	.00	.00	.00
7	.00	.00	.00	---	---	---	.00	.00	.38	.00	.19	.00
8	.00	1.87	.00	---	---	---	1.12	.00	.19	.00	.00	.00
9	.00	.75	1.69	---	---	---	.56	.19	.00	.19	.19	.19
10	.00	.19	.00	---	---	---	.56	.19	.00	.19	.19	.19
11	.00	.00	.00	---	---	---	.56	.19	.19	.19	.19	.00
12	.00	1.88	.00	---	---	---	.56	.00	.19	.19	.19	.00
13	.00	.94	.00	---	---	.00	.38	.00	.19	.38	.19	.00
14	.00	.19	1.50	---	---	.00	.00	.00	.94	1.50	.00	.00
15	.00	.00	.00	---	---	.00	.56	.19	.94	.19	.75	.19
16	.75	.00	.19	---	---	1.31	.00	.56	.75	.19	1.31	1.69
17	.00	.00	.00	---	---	2.81	1.13	.75	.38	.19	.38	.00
18	.00	.00	.19	---	---	.00	1.12	3.00	.00	.19	.56	.00
19	.94	.00	.00	---	---	1.31	.38	.00	.00	.19	.00	.00
20	.00	.00	.75	---	---	.00	2.62	.19	.19	.56	.38	.38
21	.00	.00	.94	---	---	.00	.00	.00	.19	.38	.94	.19
22	.19	.00	.00	---	---	.00	.38	.75	.37	.00	1.31	.00
23	.00	.00	.00	---	---	.00	.56	.19	.00	.00	.00	.00
24	.56	.00	.00	---	---	1.12	.56	.00	.00	.19	.19	.19
25	.19	.00	.00	---	---	.19	.94	.56	2.06	.19	1.12	.00
26	.38	2.81	---	---	---	.00	.38	.00	.00	.56	.00	.75
27	.37	.00	---	---	---	.00	1.12	.00	.00	.19	.38	.19
28	2.44	.00	---	---	---	.00	.00	.56	.38	.00	.00	.19
29	3.38	.56	---	---	---	.75	.94	.38	.19	.75	.00	.38
30	2.06	.00	---	---	---	1.50	.19	.19	.75	1.12	.19	.00
31	1.31	---	---	---	---	3.56	---	.00	---	.19	.56	---
TOTAL	12.95	13.69	e5.75	e6.20	e19.10	e17.80	22.51	10.70	13.34	7.91	12.97	5.10

CAL YR 2000 TOTAL 133.99
WTR YR 2001 TOTAL 148.02

Partial daily record on December 26 from 0015 hrs to 1145 hrs was 0.19 inches.
Partial daily record on March 12 from 1200 hrs to 2400 hrs was 0.00 inches. Total accumulated rainfall from December 26 (1200 hrs) to March 12 (1145 hrs) was 30.8 inches.

HAWAII, ISLAND OF OAHU--Continued

213221157541501. State Key Number 884.3 Punaluu rain gage near Punaluu, Oahu.

LOCATION.--Lat 21°32'21", long 157°54'15", Hydrologic Unit 20060000, 4.9 mi south of Hauula School, and 1.5 mi south of USGS stream-gaging station on Punaluu Ditch 16302000.

PERIOD OF RECORD.--Accumulated-rainfall station, July 1967 to October 2001 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector with standard 8-in. diameter, 24-in. tall can, and an auxiliary 3-in. diameter, 5-ft tall measuring can. Elevation of gage is 750 ft above mean sea level (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 02	1.1 (estimated)
Oct. 02 to Dec. 11	25.6
Dec. 11 to Feb. 23	18.7
Feb. 23 to May 24	25.9
May 24 to July 25	15.1
July 25 to Sep. 30	13.9 (estimated)

WTR YR 2001 TOTAL 100.3 (estimated)

Estimate based on total accumulated rainfall from July 13, 2000 to October 2 of 26.3 inches.
Estimate based on total accumulated rainfall from July 25 to October 3, 2001 of 14.7 inches.

HAWAII, ISLAND OF OAHU--Continued

213237157530701. State Key Number 886.4 Kahana rain gage at altitude 95 ft near Kahana, Oahu.

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank, 600 ft upstream from Kawa Stream, about 150 ft bankward from USGS stream-gaging station 16296500, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

PERIOD OF RECORD.--Accumulated-rainfall station, December 1958 to May 1961, February 1990 to June 1994. Continuous-record station, May 1961 to February 1990, June 1994 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--An electronic data logger with a float system using an 8-in. receiver and 7 5/16-in. diameter rain can, 4-ft tall. Readings are taken at 15-minute intervals. Elevation of gage is 95 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for days of no daily rainfall and estimated period which are poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.00	e.90	e.00	.00	.00	.00	.10	.10	.00	.00	.30	.10
2	e.00	e.30	e.00	.00	.00	.00	.10	.10	.00	.00	1.00	.00
3	e.00	e.00	e.00	.00	.00	.00	.10	.10	.10	.00	1.00	.00
4	e.00	e.00	e.00	.00	.00	.10	.00	.10	.80	.00	.00	.00
5	e.00	e.00	e.00	.00	.00	2.60	.90	.40	1.70	.00	.40	.00
6	e.00	e.00	e.00	.00	.20	.20	.40	.00	.40	.00	.10	.00
7	e.00	e.00	e.00	.00	.00	.10	.00	.00	.10	.00	.00	.00
8	e.00	e.00	e.50	.00	2.40	.20	.10	.00	.10	.00	.00	.10
9	e.00	e.40	e.00	.10	2.80	.20	.20	.00	.00	.10	.30	.20
10	e.10	e.00	e.00	.10	.70	.00	.50	.00	.00	.10	.00	.00
11	e.00	e.00	e.10	.30	1.40	.00	.10	.10	.00	.00	.10	.00
12	e.00	e.50	e.00	.00	2.70	.00	.20	.00	.10	.00	.10	.00
13	e.00	e.10	e.30	.70	.50	.00	.00	.00	.00	.10	.10	.00
14	e.00	e.20	e.00	.00	.30	.00	.00	.00	.30	.80	.00	.10
15	e.00	e.00	e.30	.00	.10	.00	.00	.00	.70	.20	.30	.00
16	e.10	e.00	e.00	.00	.00	.50	.00	.30	.30	.20	.50	.00
17	e.00	e.00	e.00	.00	.00	.60	.70	.20	.30	.10	.30	.00
18	e.70	e.00	e.00	.00	.00	.00	.40	2.10	.00	.20	.30	.00
19	e.00	e.00	e.00	.00	.10	.70	.10	.20	.00	.00	.10	.00
20	e.00	e.00	e.20	.00	.00	.00	.40	.00	.20	.20	.10	.10
21	e.00	e.10	.40	.10	.00	.00	.00	.00	.00	.10	.20	.00
22	e.00	e.00	.10	.00	.00	.00	.20	.40	.10	.10	.60	.10
23	e.00	e.00	.00	.00	.00	.10	.50	.10	.00	.10	.00	.00
24	.00	e.00	.00	.00	.20	.60	.30	.00	.00	.10	.00	.00
25	e.10	e.00	.00	.00	.00	.20	.70	.20	1.90	.00	.80	.00
26	.00	e.10	.00	.00	.00	.00	.10	.00	.00	.60	.00	.30
27	e.20	e.50	.00	.10	.00	.00	.50	.00	.00	.30	.40	.10
28	e.30	.10	.00	.00	.00	.00	.00	.20	.20	.00	.00	.10
29	1.70	e.00	.20	.20	---	.80	.60	.10	.10	.20	.00	.20
30	e3.00	e.00	.20	.00	---	.30	.10	.10	1.50	.80	.30	.00
31	e.20	---	.00	.00	---	.50	---	.00	---	.10	.40	---
TOTAL	6.40	3.20	2.30	1.60	11.40	7.70	7.30	4.80	8.90	4.40	7.70	1.40

CAL YR 2000 TOTAL 57.20 (estimated)
WTR YR 2001 TOTAL 67.10 (estimated)

HAWAII, ISLAND OF OAHU--Continued

213000157515401. State Key Number 886.6 Waikane rain gage at altitude 75 ft at Waikane, Oahu.

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, in USGS stream-gaging station 16294900, 0.3 mi downstream from Waikeekee Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

PERIOD OF RECORD.--Continuous-record station, February 1960 to October 1985, May 1994 to current year. Accumulated-rainfall station, October 1985 to May 1994. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in., 4-ft tall rain can with a float-type system attached to an electronic data logger. Readings are taken at 15-minute intervals. Elevation of gage is 75 ft above mean sea level (from topographic map).

REMARKS.--Records good except periods of missing record, which are poor. Daily record read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.5	.0	.0	.0	---	---	---	.0	.0	.2	---
2	.0	.7	.0	.0	.0	---	---	---	.2	.0	.2	---
3	.0	.3	.0	.0	.1	---	---	---	.0	.0	.2	---
4	.0	.0	.0	.0	.0	---	---	---	.2	.0	.0	---
5	.0	.0	.0	.0	.0	---	---	---	1.1	.0	.0	---
6	.0	.0	.0	.0	.1	---	---	---	.2	.0	.0	---
7	.0	.0	.0	.0	.0	---	---	---	.1	.0	---	---
8	.0	.0	.4	.0	1.7	---	---	---	.0	.0	---	---
9	.0	.0	.0	.0	.8	---	---	---	.0	.0	---	---
10	.0	.0	.0	.0	.1	---	---	---	.0	.0	---	---
11	.0	.1	.3	.5	.4	---	---	---	.0	.0	---	---
12	.0	.4	.2	.0	2.7	---	---	---	.0	.0	---	---
13	.0	.1	.0	.6	.3	---	---	---	.0	.0	---	---
14	.0	.0	.0	.0	.2	---	---	---	.2	.2	---	---
15	.0	.0	.1	.0	.0	---	---	---	.4	.0	---	---
16	.1	.0	.0	.0	.0	---	---	---	.0	.3	---	---
17	.0	.1	.0	.0	.0	---	---	---	.0	.0	---	---
18	.0	.0	.0	.0	.0	---	---	---	.0	.0	---	---
19	.2	.1	.0	.0	.0	---	---	---	.0	.0	---	.0
20	.0	.0	.2	.0	.0	---	---	---	.1	.0	---	.0
21	.0	.0	.3	.0	.0	---	---	---	.0	.0	---	.0
22	.0	.0	.0	.0	.0	---	---	---	.0	.0	---	.0
23	.0	.0	.0	.0	.1	---	---	---	.0	.0	---	.0
24	.0	.0	.0	.0	.3	---	---	---	.0	.0	---	.0
25	.0	.0	.1	.0	.0	---	---	---	.6	.0	---	.0
26	.0	.1	.0	.0	.0	---	---	---	.0	.2	---	.0
27	.0	.1	.0	.0	---	---	---	---	.0	.0	---	.0
28	.0	.0	.0	.0	---	---	---	---	.2	.0	---	.0
29	6.8	.0	.6	.0	---	---	---	---	.0	.0	---	.0
30	.2	.0	.1	.0	---	---	---	.0	.5	.0	---	.0
31	.3	---	.0	.0	---	---	---	.0	---	.0	---	---
TOTAL	7.6	2.5	2.3	1.1	---	---	---	---	3.8	0.7	---	---

CAL YR 2000 TOTAL 37.4

Partial daily record on May 29 from 0930 hrs to 2400 hrs was 0 inches. No daily rainfall record from February 27 (0930 hrs) to May 29 (0915 hrs).
Partial daily record on September 18 from 1700 hrs to 2400 hrs was 0 inches. No daily rainfall record from August 7 (1245 hrs) to September 18 (1645 hrs). Total accumulated rainfall was 2.3 inches.

HAWAII, ISLAND OF OAHU--Continued

213725158010401. State Key Number 897.1 Kamananui rain gage at Pupukea Military Road near Maunawai, Oahu.

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on left bank, at USGS stream-gaging station 16325000, 75.0 ft upstream from Pupukea Military Road, and 3.5 mi southeast of Maunawai.

PERIOD OF RECORD.--Continuous-record station, July 1963 to current year. Prior to October 1992, unpublished records are in the files of the Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 8-in. rain can attached to a tipping-bucket counter. An electronic data logger was installed on March 26, 1996 to record rainfall at 15-minute intervals. Elevation of gage is 590 ft above mean sea level (from topographic map).

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	---	---	---	---	---	---	---	---	---	---	---
2	.00	---	---	---	---	---	---	---	---	---	---	---
3	.00	---	---	---	---	---	---	---	---	---	---	---
4	.00	---	---	---	---	---	---	---	---	---	---	---
5	.30	---	---	---	---	---	---	---	---	---	---	---
6	.00	---	---	---	---	---	---	---	---	---	---	---
7	.00	---	---	---	---	---	---	---	---	---	---	---
8	.30	---	---	---	---	---	---	---	---	---	---	---
9	.00	---	---	---	---	---	---	---	---	---	---	---
10	.00	---	---	---	---	---	---	---	---	---	---	---
11	.00	---	---	---	---	---	---	---	---	---	---	---
12	.10	---	---	---	---	---	---	---	---	---	---	---
13	.10	---	---	---	---	---	---	---	---	---	---	---
14	.00	---	---	---	---	---	---	---	---	---	---	---
15	.00	---	---	---	---	---	---	---	---	---	---	---
16	.20	---	---	---	---	---	---	---	---	---	---	---
17	.00	---	---	---	---	---	---	---	---	---	---	---
18	.00	---	---	---	---	---	---	---	---	---	---	---
19	.00	---	---	---	---	---	---	---	---	---	---	---
20	.00	---	---	---	---	---	---	---	---	---	---	---
21	.10	---	---	---	---	---	---	---	---	---	---	---
22	.00	---	---	---	---	---	---	---	---	---	---	---
23	.00	---	---	---	---	---	---	---	---	---	---	---
24	.00	---	---	---	---	---	---	---	---	---	---	---
25	.20	---	---	---	---	---	---	---	---	---	---	---
26	1.20	---	---	---	---	---	---	---	---	---	---	---
27	.10	---	---	---	---	---	---	---	---	---	---	---
28	.60	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

CAL YR 2000 TOTAL 43.12
WTR YR 2001 TOTAL 52.10

Total accumulated rainfall from October 29, 2000 (0001 hrs) to December 18 (1000 hrs) was 8.4 inches.
Total accumulated rainfall from December 18 (1015 hrs) to January 30 (1045 hrs) was 3.3 inches.
Total accumulated rainfall from January 30 (1100 hrs) to May 2 (0930 hrs) was 16.6 inches.
Total accumulated rainfall from May 2 (0945 hrs) to June 12 (1230 hrs) was 5.1 inches.
Total accumulated rainfall from June 12 (1245 hrs) to August 15 (0945 hrs) was 10.3 inches.
Total accumulated rainfall from August 15 (1000 hrs) to August 23 (1000 hrs) was 2.2 inches.
Total accumulated rainfall from August 23 (1015 hrs) to October 12, 2001 (1215 hrs) was 6.2 inches.

HAWAII, ISLAND OF OAHU--Continued

213608158011101. State Key Number 897.9 Pupukea Road rain gage at altitude 1,160 ft near Haleiwa, Oahu (formerly published as Pupukea Road rain gage at altitude 1,600 ft near Haleiwa, Oahu).

LOCATION.--Lat 21°36'08", long 158°01'11", Hydrologic Unit 20060000, 4.3 mi southeast of Maunawai, 5.5 mi east of Haleiwa Beach Park, and 400 ft left of the road on the ridge.

PERIOD OF RECORD.--Continuous-record station, November 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain collector attached to 8-in. storage can with a recording float-type system. On January 23, an electronic data logger was installed to replace the recorder. Elevation of gage is 1,160 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall recorded in 0.12-inch increments.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.12	.00	.36	.00	.00	.00	.00	.00	.00	.48	.00
2	.00	.12	.00	.12	.00	.12	.12	.00	.12	.00	.24	.00
3	.00	.00	.00	.00	.12	.00	.00	.60	.24	.00	.36	.00
4	.00	.48	.00	.00	.00	.00	.00	.36	.60	.00	.00	.00
5	.12	.00	.00	.00	.12	.36	.36	.12	.72	.00	.12	.00
6	.00	.24	.00	.00	.12	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.12	.00	.00	.00	.00	.00
8	.12	.12	.12	.00	.00	.12	.24	.12	.00	.00	.00	.00
9	.00	.72	.00	.36	.96	.48	.36	.24	.00	.00	.00	.00
10	.00	.00	.00	.12	.24	.12	1.32	.12	.00	.00	.12	.00
11	.12	.24	.72	.00	.00	.00	.12	.24	.00	.12	.00	.00
12	.12	1.08	.00	.00	.12	.00	.60	.00	.36	.12	.12	.00
13	.00	.48	.00	.12	.60	.12	.48	.00	.36	.24	.00	.00
14	.00	.12	.12	.00	.72	.00	.24	.00	.00	.48	.00	.00
15	.00	.12	.00	.12	.12	.12	.36	.24	.12	.00	.12	.00
16	.12	.48	.00	.00	.00	.00	.00	.24	.00	.00	.48	.12
17	.00	.12	.00	.00	.00	.72	.12	.12	.00	.12	.12	.00
18	.00	.36	.00	.00	.12	.00	.36	.72	.00	.12	.12	.00
19	.12	.00	.00	.00	.12	.48	.72	.00	.00	.12	.24	.00
20	.00	.12	1.20	.00	.12	.00	.72	.00	.00	.24	.12	.00
21	.00	.48	.36	.00	.00	.00	.00	.00	.24	.24	.24	.12
22	.00	.00	.00	.00	.00	.00	.00	.00	.60	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.24	.00	.00	.00	.12	.00
24	.00	.24	.00	.24	.00	.00	.24	.00	.12	.00	.12	.00
25	.36	.36	.00	.00	.00	.12	.72	.00	1.20	.00	.00	.24
26	1.20	.36	.00	.00	.00	.00	.00	.00	.00	.12	.00	.84
27	.12	.24	.00	.12	.00	.00	.60	.12	.00	.12	.00	.36
28	.48	.00	.00	.12	.00	.00	.12	.00	.36	.00	.00	.12
29	2.76	.00	.00	.12	---	.00	.84	.00	.12	.60	.00	.36
30	.00	.00	.00	.00	---	.00	.24	.00	.00	.36	.00	.00
31	.00	---	.00	.00	---	1.56	---	.00	---	.48	.24	---
TOTAL	5.64	6.60	2.52	1.80	3.48	4.32	9.24	3.24	5.16	3.48	3.36	2.16

WTR YR 2001 TOTAL 51.00

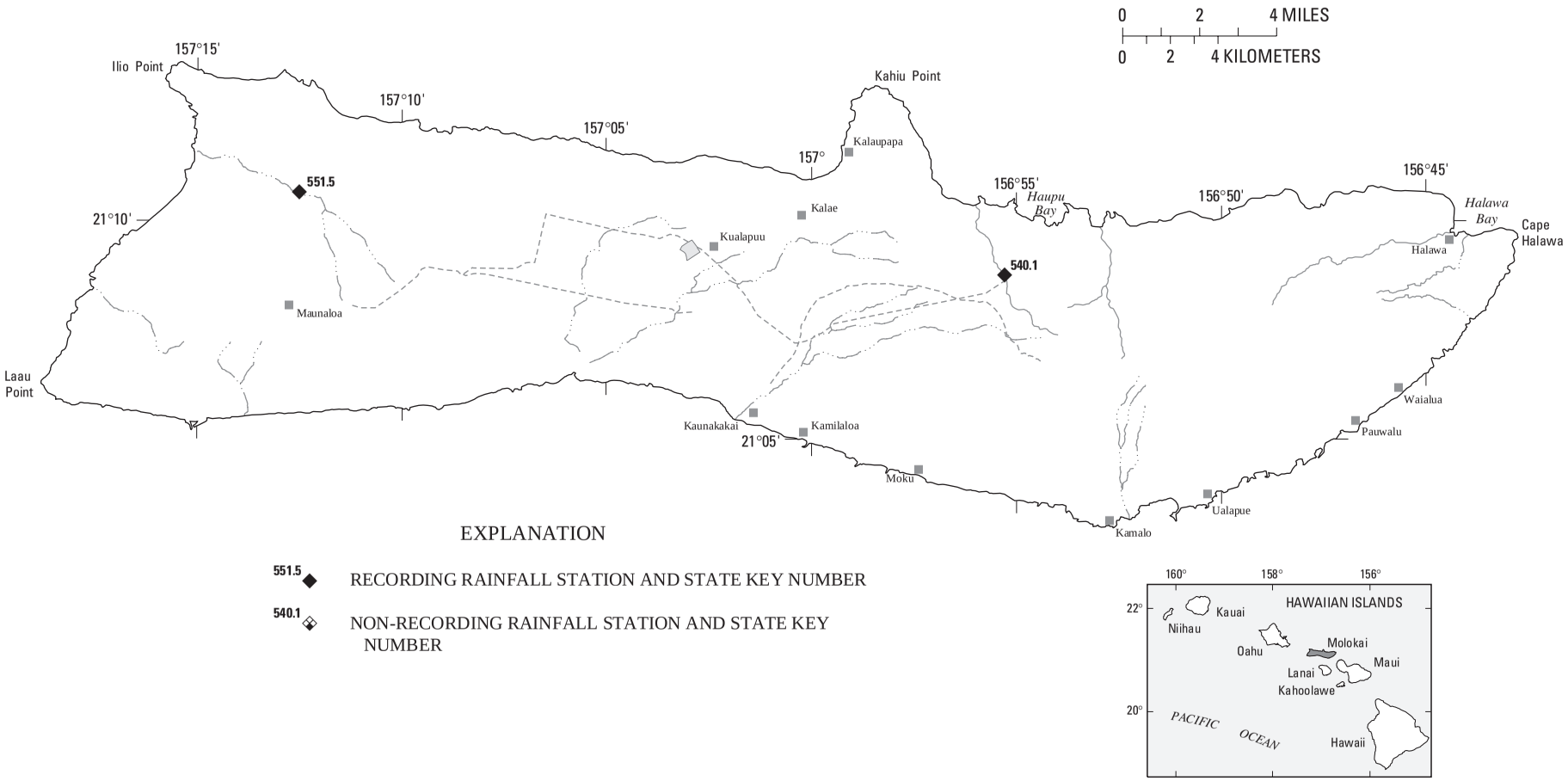


Figure 23. Locations of rainfall stations on Molokai.

HAWAII, ISLAND OF MOLOKAI

210843156551801. State Key Number 540.1 Waikolu rain gage at altitude 900 ft, near Kalaupapa, Molokai.

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank near USGS stream-gaging station 16405500, 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

PERIOD OF RECORD.--1957 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment and National Weather Service accumulation can as a backup. Elevation of gage is 900 ft (from topographic map).

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.16	.82	.00	.44	.00	.17	.02	.05	.06	.00	.21	.13
2	.00	.91	.04	1.38	.00	.07	.06	.24	.00	.00	.09	.04
3	.00	1.26	.00	.01	1.72	.52	.00	.19	.12	.00	.44	.01
4	.24	.00	.00	.00	.11	.03	.02	.15	.10	.00	.03	.00
5	.03	.00	.00	.00	.02	.00	e.00	.23	.23	.00	.04	.02
6	.04	.02	.07	.00	.08	.00	e.00	.11	.08	.00	.28	.00
7	.71	.01	.06	.00	.01	.15	e.09	.03	.01	.00	.00	.00
8	.09	.04	.07	.00	.62	.06	e.16	.08	.01	.00	.03	.09
9	.17	.53	.00	.29	.00	.65	.09	.09	.00	.00	.13	.04
10	.02	.00	.00	.00	.12	.06	.32	.01	.00	.00	.08	.01
11	1.45	.03	.00	.00	.00	.00	.02	.14	.06	.02	.05	.00
12	.01	.14	.00	.18	.45	.41	.35	.06	.01	.07	.01	.02
13	.60	.16	.04	.76	2.11	.09	.25	.01	.09	.08	.00	.20
14	1.40	.18	.00	.00	2.59	.32	1.54	.00	.08	.01	.00	.21
15	.01	.76	.04	.01	.41	.03	1.36	.87	.00	.00	.23	.00
16	.06	.32	.00	.00	.08	.15	.18	.27	.07	.02	.31	.01
17	.00	.02	.00	.00	.00	.03	.18	.07	.00	.14	.06	.08
18	.01	.19	.01	.00	.01	.01	.18	.43	.00	.31	.90	.31
19	.03	.18	.00	.00	.03	2.60	.55	.00	.24	1.02	.09	.00
20	.00	.00	3.05	.00	.00	.01	.33	.00	.25	.65	.22	.05
21	.01	.75	.81	.00	.00	.00	.01	.02	.13	.37	.38	.01
22	.03	.11	.01	.00	.00	.00	.17	.70	.68	.10	.22	.01
23	.01	.00	.00	.00	.01	.01	.88	.00	.00	.00	.07	.00
24	.28	.18	.00	.55	.24	.28	3.36	.00	.19	.00	.11	.00
25	.26	.64	.00	.00	.35	.14	.80	.26	.31	.12	.02	.14
26	.24	.01	.00	.01	.00	.00	.00	.00	.00	.02	.15	1.38
27	.01	.08	.00	.01	.12	.00	.33	.01	.04	.00	.16	.03
28	1.19	.00	.01	.00	.45	.00	.17	.07	.04	.00	.00	.13
29	.41	.00	.00	.19	---	.03	.31	.53	.01	.72	.01	.01
30	.02	.00	.00	.01	---	.54	.06	.00	.00	.09	.01	.18
31	.06	---	.00	.00	---	.15	---	.00	---	.57	.17	---
TOTAL	7.55	7.34	4.21	3.84	9.53	6.51	11.79	4.62	2.81	4.31	4.50	3.11

e Estimated

WTR YR 2001 TOTAL 70.12

HAWAII, ISLAND OF MOLOKAI--Continued

211039157123101. State Key Number 551.5 Kakaako rain gage near Mauna Loa, Molokai.

LOCATION.--Lat 21°10'39", long 157°12'31", Hydrologic Unit 20050000, at discontinued USGS stream-gaging station 16411400 on left bank, 1.0 mi downstream of Kamakahi Gulch, and 3.0 mi north of Mauna Loa school.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment and an 8-in. National Weather Service rain gage used as a backup accumulation can. Elevation of gage is 380 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.64	.52	.00	.15	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.75	.00	.35	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.46	.00	.04	.04	.00	.00	.00	.00	.00	.00	.00
4	.00	.07	.00	.02	.00	.00	.00	.00	.01	.00	.00	.00
5	.00	.00	.00	.00	.00	.02	.00	.19	.05	.00	.00	.00
6	.00	.00	.00	.00	.05	.04	.04	.00	.00	.00	.05	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.39	.00	.00	.00	.00	.00	.00	.00
9	.06	.00	.00	.06	.00	.11	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00
11	.00	.01	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00
12	.00	.01	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
13	.19	.00	.00	.31	.27	.00	.00	.00	.00	.00	.00	.00
14	.04	.00	.00	.00	.21	.00	.10	.00	.00	.00	.00	.00
15	.00	.05	.00	.00	.00	.00	.01	.00	.00	.00	.10	.02
16	.00	.01	.00	.00	.00	.00	.07	.00	.00	.00	.28	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
18	.00	.08	.00	.00	.00	.00	.01	.39	.00	.01	.01	.00
19	.00	.00	.00	.01	.00	.08	.00	.00	.00	.00	.00	.00
20	.00	.00	.13	.00	.00	.00	.05	.00	.02	.02	.01	.00
21	.00	.06	.02	.00	.00	.00	.00	.00	.00	.09	.01	.00
22	.00	.00	.00	.00	.00	.00	.00	.05	.01	.00	.00	.00
23	.00	.00	.00	.00	.00	.08	.05	.00	.00	.00	.00	.00
24	.00	.02	.00	.00	.00	.25	.05	.00	.21	.00	.00	.00
25	.05	.08	.00	.00	.00	.54	.19	.00	.16	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
27	.01	.07	.00	.00	.02	.00	.00	.00	.00	.00	.05	.02
28	.00	.00	.00	.00	.01	.00	.00	.00	.01	.00	.00	.00
29	.08	.00	.00	.00	---	.00	.00	.91	.00	.00	.00	.00
30	.00	.00	.00	.00	---	1.74	.00	.04	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.06	.02	---
TOTAL	1.07	2.19	0.15	0.96	0.99	2.88	0.57	1.58	0.49	0.21	0.53	0.09

CAL YR 2000 TOTAL 13.47
WTR YR 2001 TOTAL 11.71

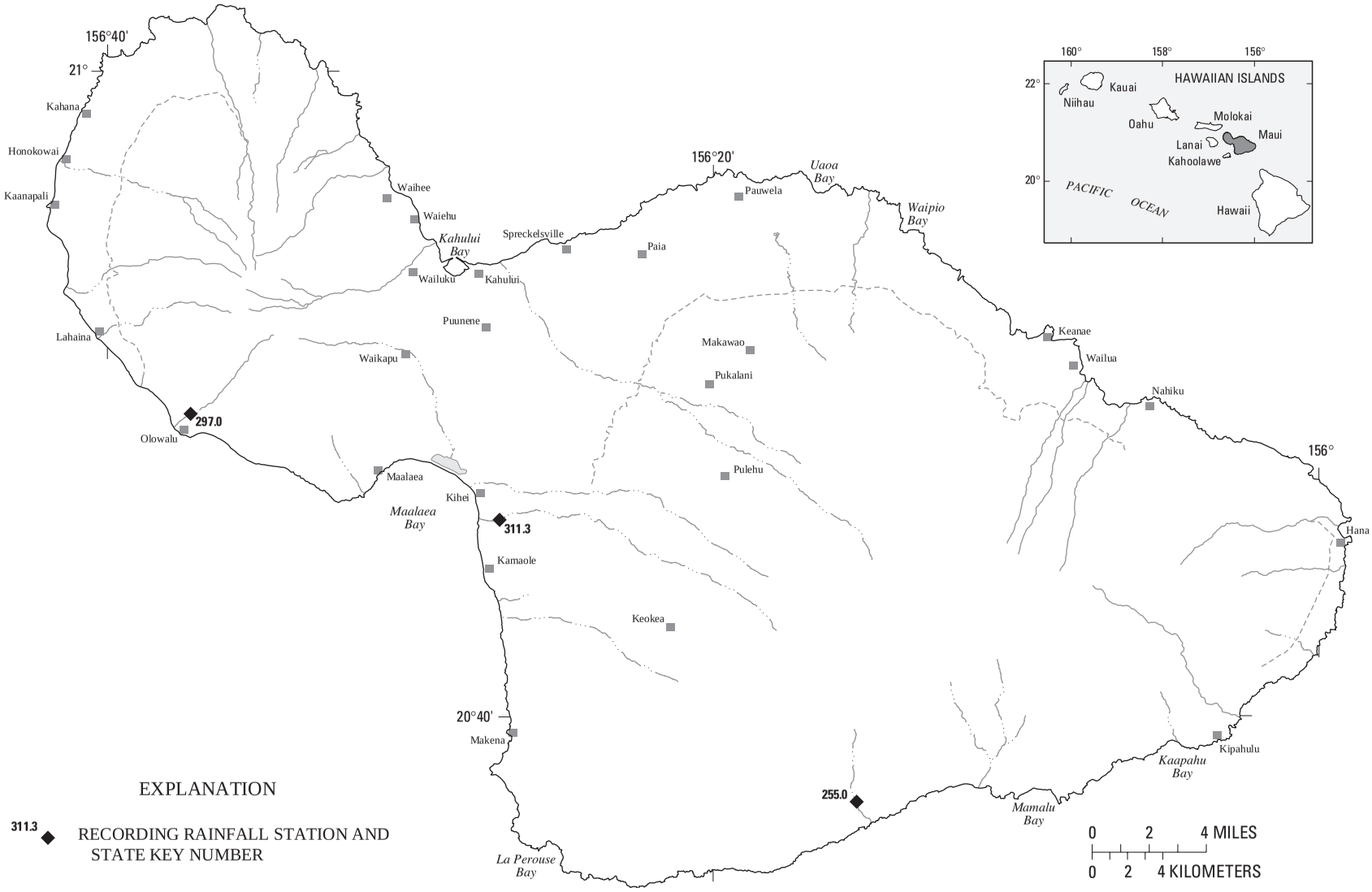


Figure 24. Locations of rainfall stations on Maui.

HAWAII, ISLAND OF MAUI

203721156151601. State Key Number 255.0 Kepuni Gulch rain gage near Kaupo, Maui.

LOCATION.--Lat 20°37'21", long 156°15'16", Hydrologic Unit 20020000, near USGS stream-gaging station 16500100 on right bank, 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui house, and 8.5 mi west of Kaupo.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment. The National Weather Service rain gage was converted to a backup accumulation can. Elevation of gage is 740 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	.88	.07	.02	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	3.06	.00	.47	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	3.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.35	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
6	.00	.00	.01	.00	.01	.00	.11	.00	.00	.00	.00	.02
7	.00	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00
8	.00	.01	.10	.00	.00	.00	.14	.00	.00	.00	.00	.00
9	.00	1.32	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.31	.00	.13	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	1.49	.00	.00	.00	.00	.00	.00	.00
12	.00	.01	.00	.00	.90	.00	.13	.00	.00	.00	.00	.00
13	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00	.00	.00
14	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.16	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
17	.00	.00	.01	.00	.00	.15	.00	.00	.00	.00	.00	.00
18	.22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.16	.00	.00	.00	.00	.25	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.16	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.01	.31	.01	.00
23	.00	.00	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.21	.02	.02	.00	.00	.00	.00	.00	.00	.00
25	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	1.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00
28	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.15	.00	.00	.03	---	.00	.01	.03	.00	.00	.00	.00
30	.01	.07	.00	.01	---	.47	.00	.00	.00	.02	.00	.00
31	.01	---	.01	.00	---	.51	---	.01	---	.00	.00	---
TOTAL	2.88	8.74	0.66	0.56	2.73	1.38	0.76	0.05	0.01	0.33	0.10	0.02

CAL YR 2000 TOTAL 20.03
WTR YR 2001 TOTAL 18.22

HAWAII, ISLAND OF MAUI--Continued

204923156371501. State Key Number 297.0 Olowalu rain gage at Olowalu, Maui.

LOCATION.--Lat 20°49'23", long 156°37'15", Hydrologic Unit 20020000, at USGS stream-gaging station 16646200 on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a tipping basket attachment. A Standard 8-in. National Weather Service accumulation can also was installed as a backup. Elevation of gage is 130 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.37	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	2.03	.00	.56	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.41	.00	.09	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.01	.00	.00	.00	.00	.39	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00
21	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00
26	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
28	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.01	2.82	0.01	0.68	0.02	0.05	0.00	0.01	0.39	0.01	0.01	0.00

e Estimated

WTR YR 2001 TOTAL 4.01

HAWAII, ISLAND OF MAUI--Continued

204606156270301. State Key Number 311.3 Kulanihakoi rain gage near Kihei, Maui.

LOCATION.--Lat 20°46'06", long 156°27'03", Hydrologic Unit 20020000, at USGS stream-gaging station 16660000 on right bank, 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment. The National Weather Service rain gage was converted to a backup accumulation can. Elevation of gage is 35 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES) WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	1.87	.00	.33	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	1.25	.00	.03	.02	.00	.00	.00	.00	.00	.00	.00
4	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00
6	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.02
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.08	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.09	.01	.00	.00	.00	.00	.00
26	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.08	3.43	0.00	0.36	0.17	0.10	0.01	0.02	0.00	0.00	0.02	0.02

CAL YR 2000 TOTAL 3.95
WTR YR 2001 TOTAL 4.21

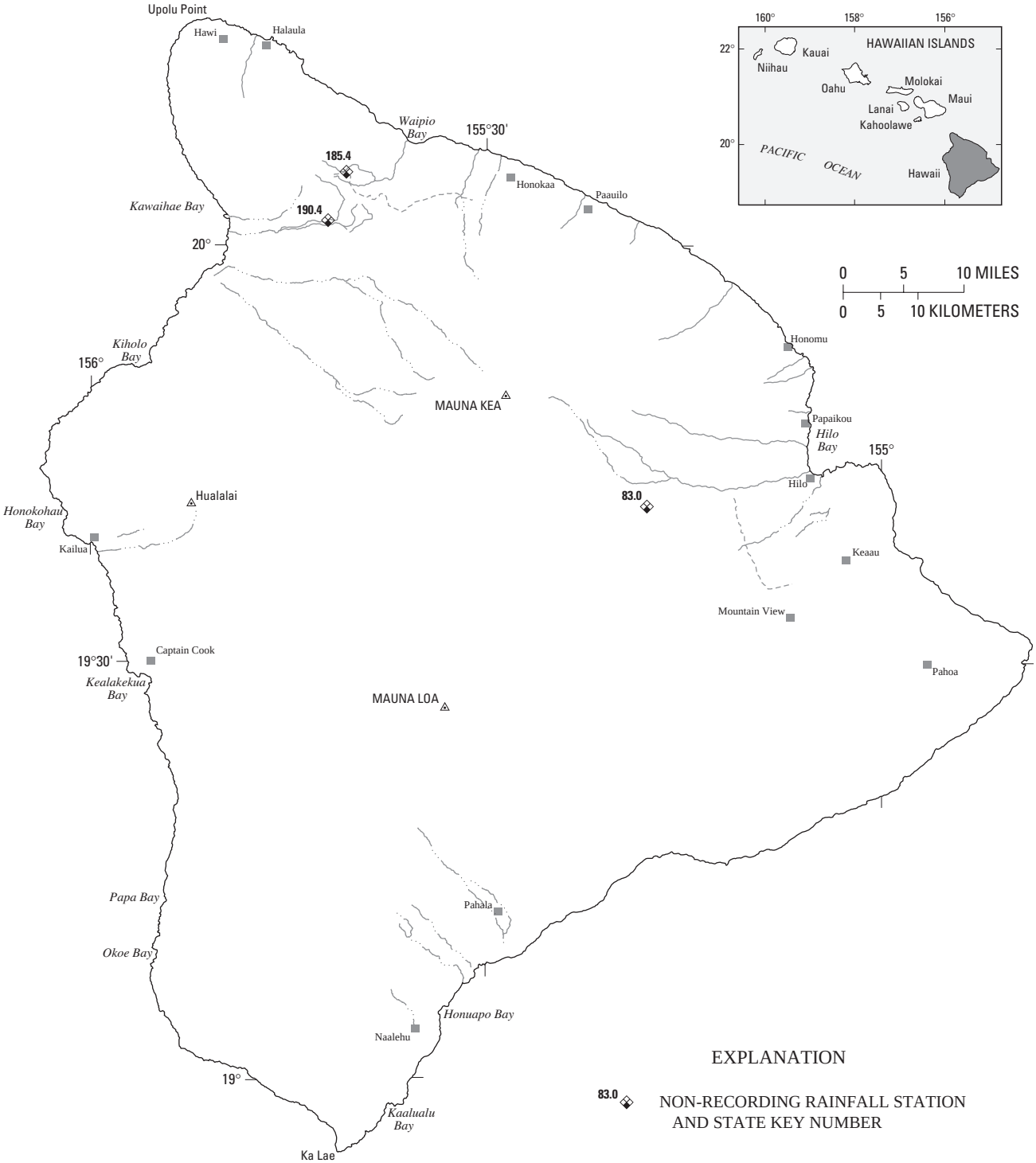


Figure 25. Locations of rainfall stations on Hawaii.

HAWAII, ISLAND OF HAWAII

194117155174801. State Key Number 83.0 Quarry rain gage at Saddle Road, Hawaii.

LOCATION.--Lat 19°41'17", long 155°17'48", Hydrologic Unit 20010000, 200 ft north of 16 mi marker on Saddle Road west of Hilo, at old quarry site.

PERIOD OF RECORD.--1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service nonrecording rain gage. Elevation of gage is 4,140 ft (from topographic map).

REMARKS.--Records poor. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
INTERMITTENT READINGS

Period	Rainfall
Aug. 31 to Oct. 03	9.4
Oct. 03 to Nov. 21	>18.6
Nov. 21 to Jan. 09	3.0
Jan. 09 to Apr. 30	>19.3
Apr. 30 to Jun. 06	5.0
Jun. 06 to Aug. 13	8.0
Aug. 13 to Oct. 09	11.3

> Actual value is known to be greater than value shown.

200515155404201. State Key Number 185.4 Upper Hamakua Ditch rain gage below Kawaiki Stream near Kamuela, Hawaii.

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, 15 ft from USGS stream-gaging station 16720500 on right bank, and 800 ft downstream of Kawaiki Stream.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service nonrecording rain gage. Elevation of gage is 4,020 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 31	21.3 a
Oct. 31 to Jan. 23	25.6
Jan. 23 to Mar. 13	32.2
Mar. 13 to May 22	40.0
May 22 to Aug. 01	35.0
Aug. 01 to Sep. 30	36.3 b

CAL YR 2000 TOTAL >172.0
WTR YR 2001 TOTAL 190.4

> Actual value is known to be greater than value shown.
a Estimated value based on accumulated reading of 23.2 inches from Sep. 14 to Oct. 31, 2000.
b Estimated value based on accumulated reading of 37.0 inches from Aug. 01 to Oct. 02, 2001.

HAWAII, ISLAND OF HAWAII--Continued

200148155420501. State Key Number 190.4 Keanuiomano rain gage near Kamuela, Hawaii.

LOCATION.--Lat 20°01'48", long 155°42'05", Hydrologic Unit 20010000, in USGS stream-gaging station 16756500 on left bank, 150 ft upstream from junction of State Highways 19 and 250, and 2.0 mi west of junction of State Highways 19 and 190.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service nonrecording rain gage housed in recording crest-stage gage 16756500. Elevation of gage is 2,410 ft (from topographic map).

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 31	0.8 a
Oct. 31 to Jan. 25	3.4
Jan. 25 to Mar. 12	3.4
Mar. 12 to May 23	0.0
May 23 to Jul. 02	0.3
Jul. 02 to Aug. 16	2.9
Aug. 16 to Sep. 30	0.1 b

CAL YR 2000 TOTAL 11.4
WTR YR 2001 TOTAL 10.9

a Estimated value based on accumulated reading of 1.6 inches from Jul. 14 to Oct. 31, 2000.
b Estimated value based on accumulated reading of 0.1 inches from Aug. 16 to Oct. 04, 2001.

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