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Water Resources Data
Iowa
Water Year 1998

Volume 1. Surface Water—Mississippi River Basin

By J.E. May, J.G. Gorman, R.D. Goodrich, V.E. Miller, M.J. Turco, and S.M. Linhart

Water-Data Report IA-98-1

Prepared in cooperation with the Iowa Department of Natural Resources (Geological Survey Bureau), Iowa Department of Transportation, and with Federal agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

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District Chief, Water Resources Division
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P.O. Box 1230
Iowa City, Iowa 52244

1999

PREFACE

This volume of the annual hydrologic data report of Iowa 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 and, the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by local, State, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines.

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for Iowa for the 1998 water year consists of records of stage, discharge, and water quality of streams; stage, and/or contents of lakes and reservoirs; ground water levels and water quality of ground-water wells. This report volume contains discharge records for 90 gaging stations; stage or contents for 6 lakes and reservoirs and 3 streams; water quality for 1 stream-gaging station; sediment records for 10 stream-gaging stations; and precipitation record for 10 precipitation stations. Also included are data for 61 crest-stage partial record stations. Additional water data were collected at various sites, but are not part of the systematic data collection program and are published as miscellaneous discharge and miscellaneous water-quality analyses.

14. SUBJECT TERMS

*Iowa, *Hydrological data, *Surface water, *Water quality, Flow rates, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediment, Water temperatures, Sampling sites, Water levels, Water analyses, Data collection.

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{Letter after station name designates types of data: (d) discharge, (c) chemical, (p) precipitation, (s) sediment, (t) temperature, (e) elevations, gage heights, or contents}

	Station Number	Page

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

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in Iowa have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

[(d), discharge station; (e), elevation (stage only) station; *, currently operated as crest-stage partial-record station]

Station name	Station number	Drainage area (mi^2)	Period of record
Upper Iowa River at Decorah, Ia. (d)	05387500	511	1952-83
Upper Iowa River near Decorah, Ia. (d)	05388000	568	1913-14; 1919-27, 1933-51
Paint Creek at Waterville, Ia. (d)	05388500	42.8	1952-73
Yellow River at Ion, Ia. (d)	05389000	221	1934-51
Mississippi River at Clayton, Ia. (d)	05411500	79,200	1930-36
Turkey River at Spillville, Ia. (d)	05411600	177	1957-73; 1978-91
Big Springs near Elkader, Ia. (d)	05411950	103	1938; 1982-83; 1988-95
Turkey River at Elkader, Ia. (d)	05412000	891	1932-42
Silver Creek near Luana, Ia (d)	05412060	4.39	1986-98
Unnamed Creek near Luana, Ia. (d)	05412070	1.15	1986-92
Little Maquoketa River near Durango, Ia. (d)	05414500*	130	1934-82
Maquoketa River near Manchester, Ia. (d)	05417000	305	1933-73
Maquoketa River near Delhi, Ia. (d)	05417500	347	1933-40
Bear Creek near Monmouth, Ia. (d)	05417700	61.3	1957-76
Maquoketa River above North Fork Maquoketa River near Maquoketa, Ia. (d)	05418000	938	1913-14
North Fork Maquoketa River at Fulton, Ia. (d)	05418450	516	1977-91
Elk River near Almont, Ia. (d)	05420300	55.9	1995-97
Wapsipinicon River near Elma, Ia. (d)	05420560	95.2	1958-92
Wapsipinicon River at Stone City, Ia. (d)	05421500	1,324	1903-14
Crow Creek at Eldridge, Ia. (d)	05422420	2.20	1977-82
Crow Creek at Mt. Joy, Ia. (d)	05422450	6.90	1977-82
Pine Creek near Muscatine, Ia. (d)	05448150	38.9	1975-82
Eagle Lake Inlet near Britt, Ia. (e)	05448285	3.83	1975-80
Eagle Lake Outlet near Britt, Ia. (e)	05448290	11.3	1975-80
West Branch (West Fork) Iowa River near Klemme, Ia. (d)	05448500	112	1948-58
East Branch (East Fork) Iowa River near Klemme, Ia. (d)	05449000	133	1948-76; 1977-95
Iowa River near Iowa Falls, Ia. (d)	05450000	665	1911-14
Upper Pine Lake at Eldora, Ia. (e)	05450500	14.9	1936-70
Lower Pine Lake at Eldora, Ia. (e)	05451000	15.9	1936-70
Iowa River near Belle Plaine, Ia. (d)	05452500	2,455	1939-59
Lake Macbride near Solon, Ia. (e)	05453500	27.0	1937-71
Ralston Creek at Iowa City, Ia. (d)	05455000	3.01	1924-87
Cedar River at Mitchell, Ia. (d)	05457500	826	1933-42
Shell Rock River near Northwood, Ia. (d)	05459000	300	1945-86
Shell Rock River at Marble Rock, Ia. (d)	05460500	1,318	1933-53
Shell Rock River at Greene, Ia. (d)	05461000	1,357	1933-42
Shell Rock River near Clarksville, Ia. (d)	05461500	1,626	1915-27; 1932-34
Black Hawk Creek at Hudson, Ia. (d)	05463500	303	1952-95
Fourmile Creek near Lincoln, Ia. (d)	05464130	13.8	1962-67; 1969-74; 1976-80
Half Mile Creek near Gladbrook, Ia. (d)	05464133	1.33	1962-67; 1969-74; 1976-80
Fourmile Creek near Traer, Ia. (d)	05464137	19.5	1962-74; 1975-80
Prairie Creek at Fairfax, Ia. (d)	05464640	178	1966-82
Lake Keomah near Oskaloosa, Ia. (e)	05472000	3.06	1936-71
Skunk River at Coppock, Ia. (d)	05473000	2,916	1913-44
Big Creek near Mount Pleasant, Ia. (d)	05473500	106	1955-79
Des Moines River at Estherville (d)	05476500	1,372	1951-95

Discontinued Surface-Water Discharge or Stage-Only Stations—continued

Station name	Station number	Drainage area (mi^2)	Period of record
East Fork Des Moines River near Burt, Ia. (d)	05478000	462	1951-74
Des Moines River near Fort Dodge, Ia. (d)	05479500	3,753	1911-13
Lizard Creek near Clare, Ia. (d)	05480000	257	1940-82
Des Moines River near Boone, Ia. (d)	05481500	5,511	1920-68
North Raccoon River near Newell, Ia. (d)	05482135	233	1982-95
Storm Lake at Storm Lake, Ia. (e)	05482140	28.3	1970-75
Big Cedar Creek near Varina, Ia. (d)	05482170	80.0	1960-91
East Fork Hardin Creek near Churdan, Ia. (d)	05483000	24.0	1953-91
Hazelbrush Creek near Maple River, Ia. (d)	05483343	9.22	1990-94
Springbrook Lake near Guthrie Center, Ia. (e)	05483460	5.18	1936-71
Raccoon River at Des Moines, Ia. (e)	05485000	3,628	1902-03
Lake Ahquabi near Indianola, Ia. (e)	05487000	4.93	1936-71
White Breast Creek near Knoxville, Ia. (d)	05488000	380	1945-62
Muchakinock Creek near Eddyville, Ia. (d)	05489190	70.2	1975-79
Lake Wapello near Drakesville, Ia. (e)	05490000	7.75	1936-71
Sugar Creek near Keokuk, Ia. (d)	05491000	105	1922-31; 1958-73
Fox River at Cantril, Ia. (d)	05494500	161	1940-51
Rock River at Rock Rapids, Ia. (d)	06483270	788	1959-74
Dry Creek at Hawarden, Ia. (d)	06484000	48.4	1948-69
West Branch Floyd River near Struble, Ia. (d)	06600300*	108	1955-95
Monona-Harrison Ditch near Blencoe, IA (d)	06602410	4,440	1939-42
Loon Creek near Orleans, Ia. (d)	06603920	31.0	1971-74
Spirit Lake Outlet at Orleans, Ia. (e)	06604100	75.6	1971-74
Milford Creek at Milford, Ia. (d)	06604400	146	1971-74
Little Sioux River at Spencer, Ia. (d)	06605100	990	1936-42
Little Sioux River at Gillett Grove, Ia. (d)	06605600	1,334	1958-73
Little Sioux River near Kennebeck, Ia. (d)	06606700	2,738	1939-69
Odebolt Creek near Arthur, Ia. (d)	06607000	39.3	1957-75
Maple River at Turin, Ia. (d)	06607300	725	1939-41
Little Sioux River near Blencoe, Ia. (d)	06607510	4,440	1939-42
Steer Creek near Magnolia, Ia. (d)	06609200	9.26	1963-69
Thompson Creek near Woodbine, Ia. (d)	06609590	6.97	1963-69
Willow Creek near Logan, Ia. (d)	06609600	129	1972-75
Indian Creek at Council Bluffs, Ia. (d)	06610500	6.92(revised)	1954-76
Mosquito Creek near Earling, Ia. (d)	06610520	32.0	1965-79
Waubonsie Creek near Bartlett, Ia. (d)	06806000	30.4	1946-69
West Nishnabotna River at Harlan, Ia. (d)	06807320	316	1977-82
West Nishnabotna River at (near) White Cloud, Ia. (d)	06807500	967	1918-24
Mule Creek near Malvern, Ia. (d)	06808000	10.6	1954-69
Spring Valley Creek near Tabor, Ia. (d)	06808200	7.6	1955-64
Davids Creek near Hamlin, Ia. (d)	06809000	26.0	1952-73
Tarkio River at Stanton, Ia. (d)	06811840	49.3	1958-91
Tarkio River at Blanchard, Ia. (d)	06812000	200	1934-40
West Nodaway River at Villisca, Ia. (d)	06816500	342	1918-25
Platte River near Diagonal, Ia. (d)	06818750*	217	1969-91
East Fork One Hundred and Two River near Bedford, Ia. (d)	06819190	92.1	1959-83
Elk River near Decatur City, Ia. (d)	06897950*	52.5	1968-94
Weldon River near Leon, Ia. (d)	06898400	104	1959-91
Honey Creek near Russell, Ia. (d)	06903500	13.2	1952-62
Chariton River near Centerville, Ia. (d)	06904000	708	1938-59

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

The following water-quality stations have been discontinued in Iowa. Continuous daily records of water temperature, specific conductance, or sediment and monthly or periodic samples of chemical quality or biological data were collected and published for the period of record shown for each station.

[Type of record: Chem.–chemical quality, Cond.–specific conductance, Temp.–water temperature, Sed.–sediment, Bio.–biological; *, periodic data available subsequent to period of daily record]

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
Upper Iowa River at Decorah, Ia.	05387500	511	Sed. Temp.	1963-68 1963-83
Upper Iowa River near Dorchester, Ia.	05388250	770	Sed., Temp.*, Cond.*	1975-81
Paint Creek at Waterville, Ia.	05388500	42.8	Temp. Sed.	1952-56 1952-57
Unnamed Creek near Luana	05412070	1.15	Chem.	1986-92
Turkey River at Garber, Ia.	05412500	1,545	Temp.*, Sed.*	1957-62
Mississippi River at Dubuque, Ia.	05414700	81,600	Chem.	1969-73
Maquoketa River near Maquoketa, Ia	05418500	1,553	Sed., Temp., Cond.	1995-97
Elk River near Almont, Ia	05420300	55.9	Sed., Temp., Cond.	1995-97
Mississippi River at Clinton, Ia	05420500	85,600	Sed.	1995-97
Wapsipinicon River at Independence, Ia.	05421000	1,048	Cond.* Temp.*, Sed.*	1968-70 1967-70
Crow Creek at Bettendorf, Ia.	05422470	17.8	Cond.*, Temp.*, Sed.	1978-82
Iowa River near Rowan, Ia.	05449500	429	Temp.*, Sed.*	1957-62
Iowa River at Marshalltown, Ia	05451500	1,532	Temp., Sed.	1988-95
Iowa River at Iowa City, Ia.	05454500	3,271	Chem.. Temp.*, Sed. Cond.	1906-07; 1944-54 1944-87 1968-87
Ralston Creek at Iowa City, Ia.	05455000	3.01	Cond Sed. Temp.	1968-87 1952-87 1967-87
Shell Rock River at Shell Rock, Ia.	05462000	1,746	Temp.*	1953-68
Cedar River at Cedar Falls, Ia	05463050	4,734	Chem.	1975-79; 1984; 1986-1995
Cedar River near (at) Gilbertville, Ia.	05464020	5,234	Chem.	1971; 1975-81
Fourmile Creek near Lincoln, Ia.	05464130	13.78	Chem., Temp., Sed.	1969-74
Half Mile Creek near Gladbrook, Ia.	05464133	1.33	Chem., Temp., Sed.	1969-74
Fourmile Creek near Traer, Ia.	05464137	19.51	Chem., Temp., Sed.	1969-74
Cedar River near Palo, Ia.	05464450	6,380	Chem.	1975-79
Cedar River at Cedar Rapids, Ia.	05464500	6,510	Chem.* Temp.* Sed.	1906-07; 1944-54 1944-54 1943-54
Cedar River near Bertram, Ia.	05464760	6,955	Chem.	1975-81
Iowa River at Wapello, Ia	05465500	12, 499	Chem.	1977-95
Mississippi River at Burlington, Ia.	05469720	114,000	Chem.	1969-73
South Skunk River at Colfax, Ia	05471050	803	Cond.*, Temp.*, Sed.	1989-93
Skunk River at Augusta, Ia	05474000	4,303	Chem.	1977-95
Mississippi River at Keokuk, Ia.	05474500	119,000	Chem.	1974-87
Des Moines River at Fort Dodge, Ia.	05480500	4,190	Chem.	1972-73
Des Moines River at 2nd Avenue at Des Moines, Ia.	05482000	6,245	Chem. Temp.*, Sed.	1954-55 1954-61
East Fork Hardin Creek near Churdan, Ia.	05483000	24.0	Temp.*, Sed.*	1952-57
Hazelbrush Creek near Maple River, Ia	05483343	9.22	Cond., Temp., Sed.	1991-94
Middle Raccoon River near Bayard, Ia.	05483450	375	Cond.*, Temp.*, Sed.	1979-85
Middle Raccoon River at Panora, Ia.	05483600	440	Cond.*, Temp.*, Sed.	1979-85
Raccoon River at Van Meter, Ia	05484500	3,441	Chem. Bio.	1974-79; 1986-94 1974-79
Raccoon River at Des Moines, Ia.	05485000	3,590	Chem., Temp.	1945-47

Discontinued Surface-Water Quality Stations—continued

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
Des Moines River below Raccoon River at Des Moines, Ia.	05485500	9,879	Chem.* Temp.*, Sed.	1944-45 1944-47
Des Moines River below Des Moines, Ia.	05485520	9,901	Chem.	1971; 1974-81
Middle River near Indianola, Ia.	05486490	503	Temp.*, Sed.	1962-67
White Breast Creek near Dallas, Ia.	05487980	342	Chem. Temp.*, Sed.	1969-73 1967-73
Big Sioux River at Sioux City, Ia.	06485950	9,410	Chem.	1969-73
Missouri River at Sioux City, Ia.	06486000	314,600	Chem.	1972-86
Floyd River at James, Ia.	06600500	886	Temp.*, Sed., Cond.*	1968-73
Floyd River at Sioux City, Ia.	06600520	921	Chem.	1969-73
Missouri River at Decatur, Neb.	06601200	316,160	Chem.	1974-81
Spirit Lake near Orleans, Ia.	06604000	75.6	Temp.	1968-75
Little Sioux River at Correctionville, Ia.	06606600	2,500	Chem.* Temp.* Sed.	1954-55 1951-62 1950-62
Little Sioux River near Kennebec, Ia.	06606700	2,738	Temp. Sed.	1951-55 1950-57
Little Sioux River at River Sioux, Ia.	06607513	3,600	Chem.	1969-73
Soldier River near Mondamin, Ia.	06608505	440	Chem.	1970-73
Steer Creek near Magnolia, Ia.	06609200	9.26	Temp., Sed., Cond.	1963-69
Thompson Creek near Woodbine, Ia.	06609590	6.97	Temp., Sed., Cond.	1963-69
Willow Creek near Logan, Ia.	06609600	129	Cond., Temp. Sed.	1972-75 1971-75
Missouri River at Omaha, Nebr.	06610000	322,800	Cond.*	1969-86
Mule Creek near Malvern, Ia.	06808000	10.6	Temp. Sed.	1958-69 1954-69
Davids Creek near Hamlin, Ia.	06809000	26.0	Temp.* Sed.	1952-53; 1965-68 1952-68
East Nishnabotna River at Red Oak, Ia.	06809500	894	Temp.*, Sed., Cond.*	1962-73
Nishnabotna River above Hamburg, Ia.	06810000	2,806	Chem. Temp.*, Cond. Bio.	1979-93 1979-81 1979-81
Nodaway River at Clarinda	06817000	762	Cond.*, Temp.*, Sed.	1976-92
Platte River near Diagonal, Ia.	06818750	217	Chem.	1969-73
Elk Creek near Decatur City, Ia.	06897950	52.5	Bio. Chem.	1970-72 1968-94
Thompson River at Davis City, Ia.	06898000	701	Chem. Temp.*, Sed., Cond.*	1967-73 1968-73
Weldon River near Leon, Ia.	06898400	104	Chem.	1968-73
Chariton River near Chariton, Ia.	06903400	182	Temp.*, Sed., Cond.*	1969-73
Honey Creek near Russell, Ia.	06903500	13.2	Sed.	1952-62
Chariton River near Rathbun, Ia.	06903900	549	Temp.*, Sed.*, Cond.*	1962-69

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State, county, municipal, and other Federal agencies, obtains a large amount of data pertaining to the water resources of Iowa 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 of the Geological Survey, the data are published annually in this report series entitled “Water Resources Data - Iowa” as part of the National Water Data System.

Water resources data for water year 1998 for Iowa consist of records of stage, discharge, and water quality of streams; stage and contents of lakes and reservoirs; and water levels and water quality of ground water. This report in two volumes contains stage or discharge records for 130 gaging stations; stage or contents for 9 lakes and reservoirs; water quality records for 2 gaging stations; sediment records for 12 gaging stations; and water levels for 185 ground-water observation wells. Also included are data for 93 crest-stage partial-record stations and water-quality data from 45 municipal wells. Additional water data were collected at various sites not included in the systematic data-collection program and are published here as miscellaneous measurements and analyses. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating local, State, and Federal agencies in Iowa.

Records of discharge or stage of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled “Surface Water Supply of the United States.” Through September 30, 1960, these water-supply papers were published in an annual series; during 1961-65 and 1966-70, they were published in 5-year series. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled “Quality of Surface Waters of the United States.” Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled “Ground-Water Levels in the United States.” Water-supply papers may be consulted in the libraries of the principal cities in the United States or they may be purchased from Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225.

For water years 1961 through 1970, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1970 were similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1971 water year, water data for streamflow, water quality, and ground water are published in official U.S. Geological Survey reports on a State-boundary basis. These official reports carry an identification number consisting of the two-letter State postal 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 IA-98-1.” These water-data reports are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

Additional information for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephone, (319) 337-4191.

COOPERATION

The U.S. Geological Survey and organizations in the State of Iowa have had cooperative agreements for the systematic collection of streamflow records since 1914, for ground-water levels since 1935, and for water-quality records since 1943. Organizations that assisted in collecting data through cooperative agreements with the U.S. Geological Survey in Iowa during water year 1998 are:

Iowa Department of Natural Resources (Geological Survey Bureau)
Iowa Department of Transportation
Iowa Highway Research Board

Iowa State University
University of Iowa, Institute of Hydraulic Research
University of Iowa, Hygienic Laboratory
University of Iowa

Appanoose County Board of Supervisors
Davis County Board of Supervisors
Van Buren County Board of Supervisors

City of Ames
City of Bloomfield
City of Cedar Rapids
City of Charles City
City of Clear Lake
City of Clinton
City of Coralville
City of Davenport
City of Des Moines
City of Des Moines Water Works
City of Fort Dodge
City of Iowa City
City of Marshalltown
City of Mt. Pleasant
City of Sioux City
City of Waterloo Sewage Treatment Plant
City of West Des Moines

Assistance in the form of funds or services was given by the U.S. Army Corps of Engineers in collecting streamflow records for 74 stream gaging stations. Assistance was also furnished by NOAA-National Weather Service, U.S. Department of Commerce, and National Biological Survey Division of U.S. Geological Survey.

The following organizations aided in collecting records: Milford Municipal Utilities, Central Iowa Energy Cooperative, Union Electric Company,

Organizations that supplied data are acknowledged in the station descriptions.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

For water year 1998 (October 1, 1997 to September 30, 1998) climatological conditions were generally wetter than normal and warmer than normal. Recorded precipitation for the year ranged from 2.00 inches above normal in the North-central Iowa Climatological District to 9.80 inches greater than normal in the Southeast Iowa Climatological District (fig. 1). The Northwest District was the only District to report below normal precipitation for the year. Precipitation recorded for the State averaged 30.77 inches, which was 5.68 inches greater than normal, or 117 percent of the normal 33.11 inches for 1961-90 (table 1). Overall, water year 1998 was the 9th wettest and the 13th warmest for 125 years of record. [In this summary of hydrologic conditions, all data and statistics pertaining to precipitation and temperature in Iowa were provided by Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, (oral and written commun., 1998)].

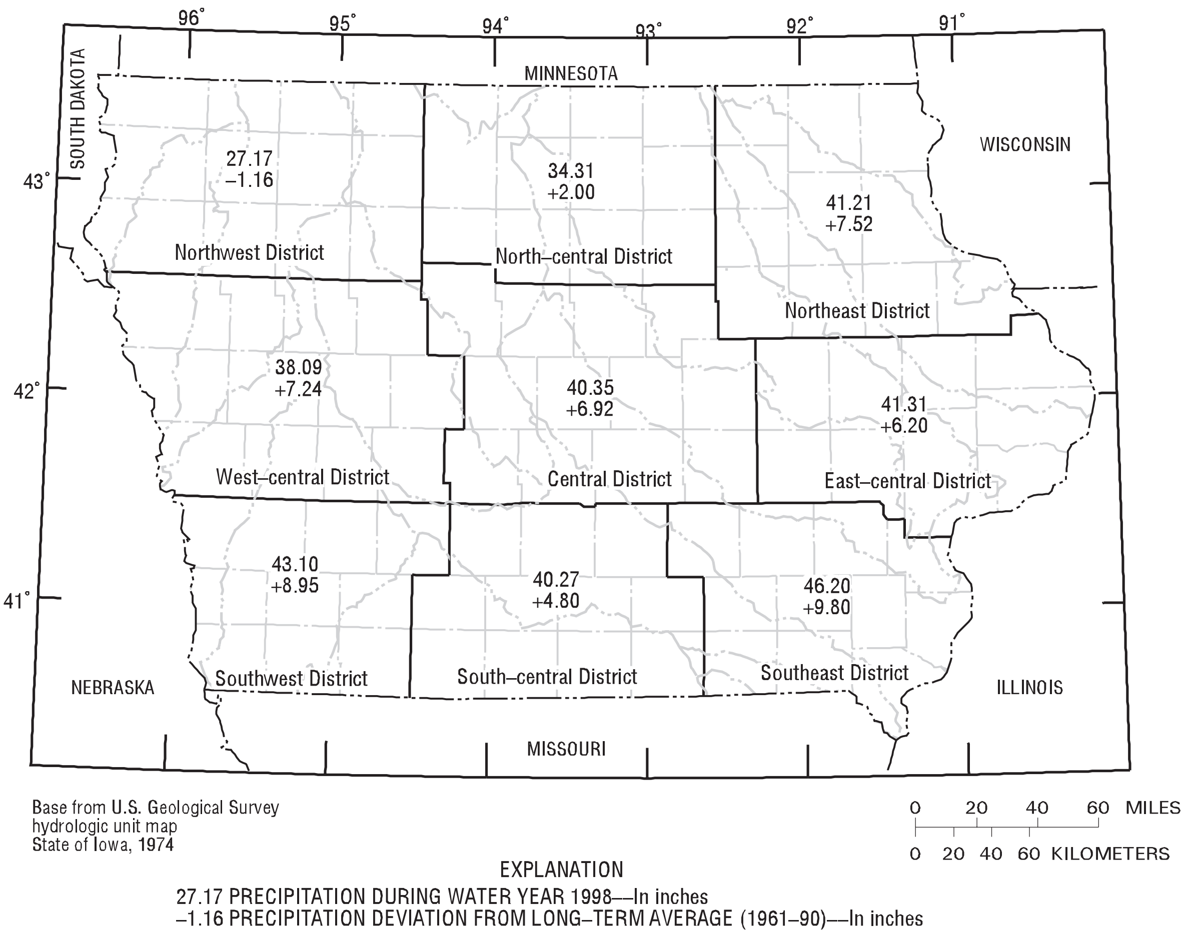

Figure 1. Precipitation record for the National Weather Service's designated Climatological Districts for water year 1998 (source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 1998).

Table 1. Monthly and annual precipitation during the 1998 water year as a percentage of normal precipitation (1961-90).
[Source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 1998]

National Weather Service Climatological District	1997			1998									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Annual
Northwest	80	51	43	166	107	145	168	86	110	85	102	34	96
North-central	104	35	53	139	129	125	135	106	178	44	143	54	106
Northeast	147	31	53	114	212	190	128	114	209	41	177	56	122
West-central	107	64	55	146	122	140	175	112	206	126	127	25	123
Central	160	58	80	122	174	171	93	120	230	60	119	42	121
East-central	117	48	81	111	241	199	121	96	169	42	150	98	118
Southwest	170	129	103	118	261	169	112	123	193	149	65	32	126
South-central	178	60	133	86	173	199	113	119	143	82	89	58	114
Southeast	128	73	111	161	258	201	135	112	183	55	134	103	127
Statewide	133	59	80	128	186	171	131	110	182	74	125	55	117

Precipitation was above normal for October. Average precipitation was 139 percent of normal throughout the state with all Climatological District reports above normal except for the Northwest District, which reported an average precipitation 80 percent of normal. October snowfall was the 2nd highest in 111 years of record and the greatest since 1925. For the three index surface-water stations in Iowa, mean monthly discharge for 05464500 Cedar River at Cedar Rapids (East-central District), 05480500 Des Moines River at Fort Dodge (Central District), and 06810000 Nishnabotna River above Hamburg (Southwest District) were all in the normal range (fig. 3). For the remainder of this section, these stations will be referred to as “Cedar Rapids,” “Fort Dodge,” and “Hamburg,” respectively.

During November, the statewide average precipitation was 59 percent of normal. Most Climatological Districts reported below normal precipitation ranging from 31 percent of normal in the Northeast District to 73 percent of normal in the Southeast District. The exception was the Southwest District which reported precipitation 129 percent of normal. Mean monthly discharge for the three index stations was within the normal range.

Below normal precipitation continued in December with statewide average precipitation 80 percent of normal. However, the Southwest, South-central, and Southeast Districts reported precipitation 103, 133, and 111 percent of normal. The mean discharge at Cedar Rapids and Fort Dodge was in the normal range while the discharge at Hamburg was above normal.

The month of January saw an increase in precipitation statewide to 128 percent of normal. Precipitation amounts ranged from 111 percent in the East-central District to 166 percent of normal in the Northwest District. The South-central District precipitation was 86 percent of normal and the only district that was below normal. Mean monthly discharges for Cedar Rapids and Fort Dodge remained in the normal range, while Hamburg was above normal for the 2nd consecutive month.

February was the 15th wettest month and the 4th warmest in 126 years of record. All Climatological District precipitation was above normal. The Southeast District recorded precipitation amounts that totalled 258 percent of normal while the state wide average was 186 percent of normal. Index stations Cedar Rapids and Fort Dodge mean discharge continued in the normal range but discharge for Hamburg was above normal.

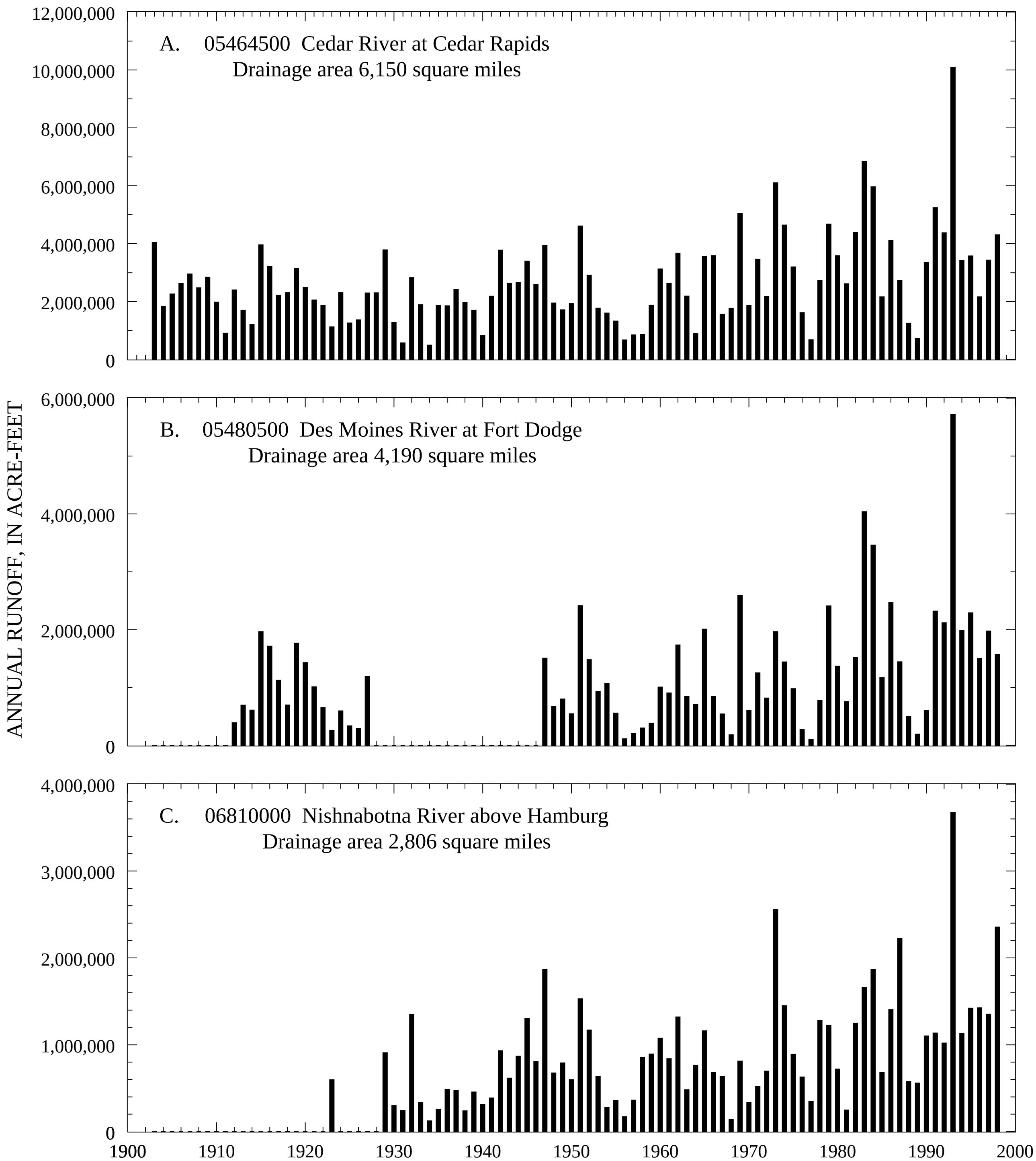

Figure 2. Annual runoff for period of record at index stations.

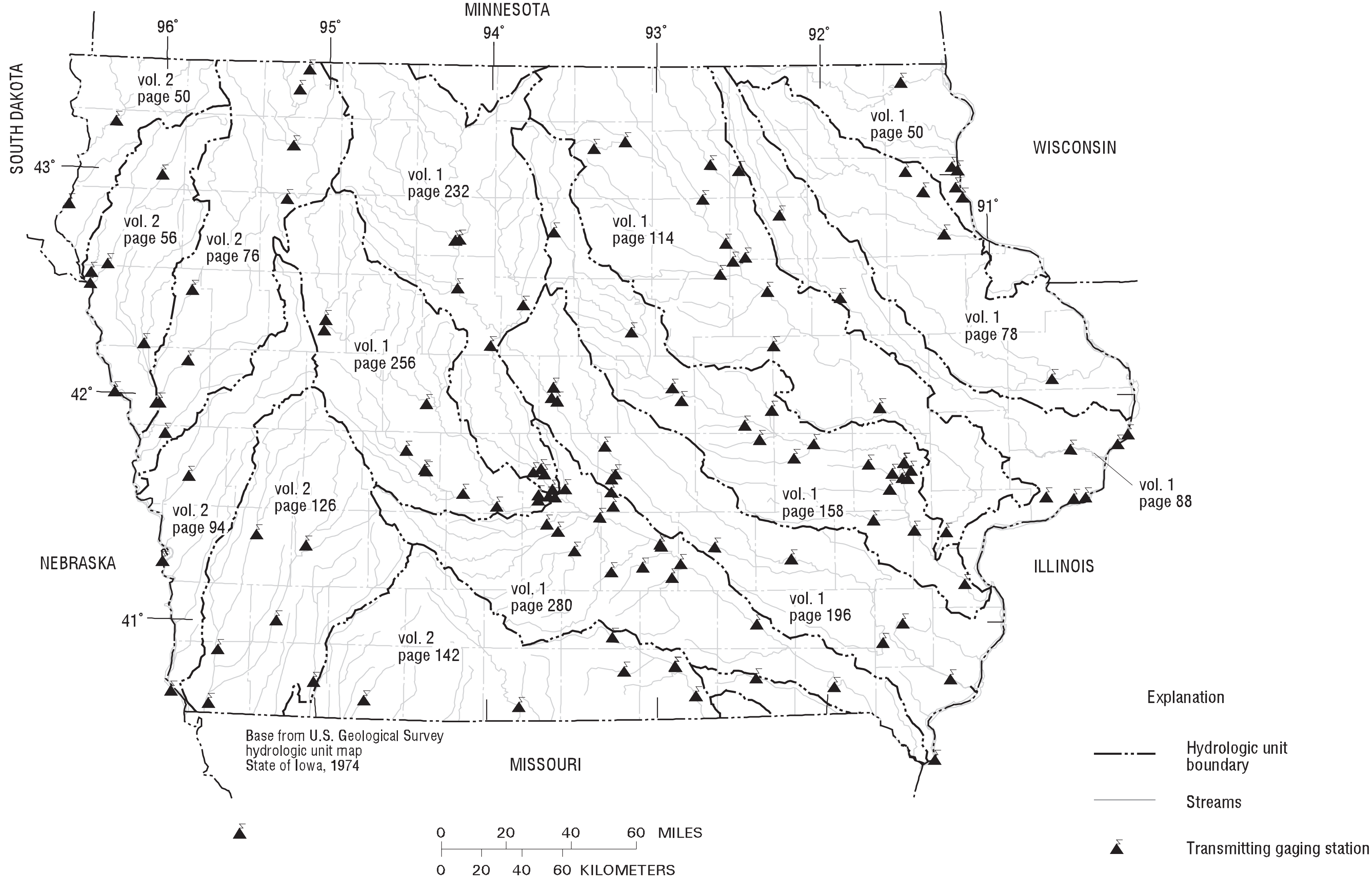

Figure 3. Location of active, continuous-record gaging stations in Iowa, water year 1998. [See indicated volume and page number for gaging-station identification.]

Statewide precipitation for March was 171 percent of normal with all Climatologic Districts again reporting above normal precipitation. Despite statewide precipitation above normal, the mean discharge continued in the normal range at Cedar Rapids and Fort Dodge while mean discharge for Hamburg remained in the above normal range. This was the 9th wettest March for 126 years of record.

Precipitation in April was 131 percent of normal. Eight Climatological Districts received precipitation above normal, but the Central District was 93 percent of normal. Cedar Rapids, Fort Dodge, and Hamburg all reported mean daily discharges above normal.

May precipitation was above normal for the 5th consecutive month. Overall precipitation was 110 percent of normal in the state with the Northwest District and the East Central District reporting below normal precipitation for the month, and the remaining districts reporting above normal precipitation. Average temperature for the month was the 13th warmest for 126 years of record. Mean daily discharge for index stations at Cedar Rapids, Fort Dodge, and Hamburg was above normal for the month.

Above normal precipitation continued in June, resulting in high flow and flooding in many streams and rivers throughout the state. The most significant flooding occurred in the Southwest District resulting in record flows for the East Nisnabotna River near Atlantic (06809210), East Nishnabotna River at Red Oak (06809500), and Nishnabotna River above Hamburg (06810000). Flooding at these stations occurred as a result of a record 24-hour rainfall total of 13.18 inches near Atlantic, Iowa on June 14. Statewide precipitation was 182 percent of normal with all Climatological Districts reporting above normal precipitation. This June was the 5th wettest for 126 years of record. Above normal mean daily discharge was determined at all index stations with the mean flow at station Nishnabotna River above Hamburg at 721 percent of normal.

After six consecutive months of above normal precipitation, July statewide average precipitation was 74 percent of normal. The Southwest and West Central Districts reported above normal precipitation 149 percent and 126 percent of normal respectively. The remaining Districts reported precipitation that ranged from 85 percent of normal in the Northwest District to 41 percent in the Northeast District. The mean daily discharge at all three index stations remained above normal for the month.

The statewide average precipitation increased to above normal for August. The statewide average was 125 percent of normal with all districts reporting above normal precipitation except the South-central and Southeast Districts, which were 65 percent and 89 percent of normal precipitation respectively. Once again, all index stations reported flow above the monthly normal flow.

September ended the water year as the 28th driest on record with precipitation 55 percent of normal. All districts, except the Southeast District, which reported precipitation 103 percent of normal, reported below normal precipitation. Precipitation in these districts ranged from 98 percent in the East Central District to 25 percent of normal precipitation in the West-central District. The mean daily discharge continued above normal for the index station at Hamburg for the ninth consecutive month, while flow for stations at Cedar Rapids and Fort Dodge receded into the normal range.

The water-year 1998 runoff at Cedar Rapids was 4,309,000 acre-feet, which is greater than the mean annual runoff for the period of record, 2,688,000 acre-feet. The water-year 1998 runoff at Fort Dodge was 1,571,000 acre-feet, which is greater than the mean for the period of record, 1,278,000 acre-feet. The water-year 1998 runoff at Hamburg was 2,355,000 acre-feet, which is greater than the mean for the period of record, 912,100 acre-feet.

The location of all active continuous-record gaging stations is shown in figure 3, and the location of all active crest-stage gaging stations is shown in figure 4.

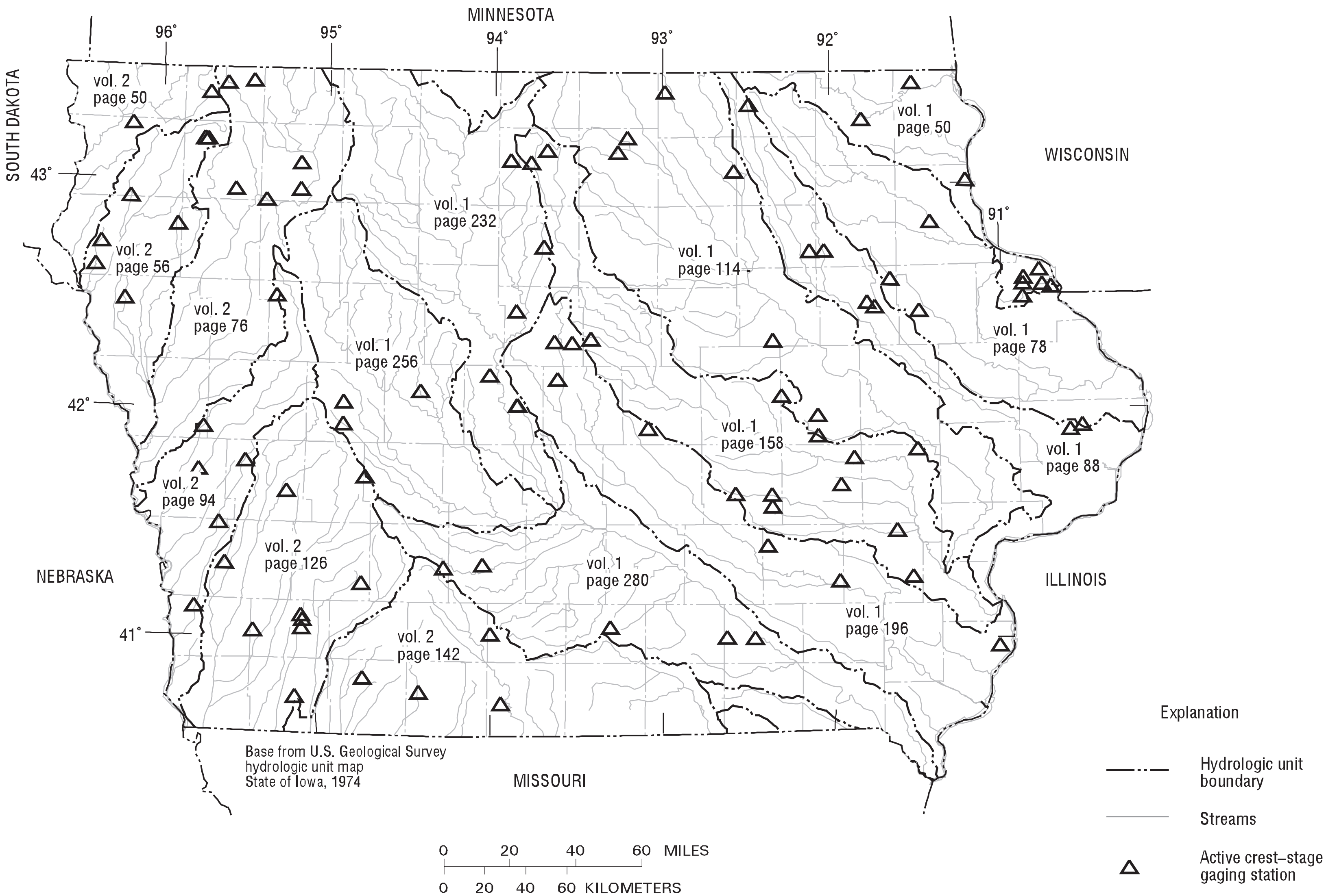

Figure 4. Location of active, crest-stage gaging stations in Iowa, water year 1998.

Suspended Sediment

Daily suspended-sediment discharge data (hereafter referred to as sediment discharge in this report) were collected at 12 streamflow-gaging stations in Iowa during the 1998 water year. Four stations have 20 years or more of record: 05389500 Mississippi River at McGregor, 05465500 Iowa River at Wapello, 05474000 Skunk River at Augusta, and 05481650 Des Moines River near Saylorville; three stations on the Missouri River have 12 years of record: 06486000 Missouri River at Sioux City, Iowa, 06610000 Missouri River at Omaha, Nebraska, and 06807000 Missouri River at Nebraska City, Nebraska; two stations in northeast Iowa have 7 years of record: 05389400 Bloody Run Creek near Marquette and 05411400 Sny Magill Creek near Clayton; and three stations in central Iowa have 3 years of record: 05471040 Squaw Creek near Colfax, 05487540 Walnut Creek near Prairie City, and 05487550 Walnut Creek near Vandalia. Three other sediment stations were discontinued at the end of the 1997 water year in east-central Iowa as the associated project was completed: 05418500 Maquoketa River near Maquoketa, 05420300 Elk River near Almont, and 05420500 Mississippi River at Clinton. The locations of active sediment and surface water-quality stations are shown in figure 5.

The peak daily sediment discharge on 5 of 12 stations occurred between March 30 and April 3, at the end of the winter period and after a significant rain event. Five others peaked between May 25 and June 25.

Mississippi River at McGregor, which has most of its drainage basin in Minnesota and Wisconsin, had an annual sediment discharge of 721,000 tons, which was the third lowest sediment discharge in 23 years of record, and 41.1 percent of the average mean sediment discharge (fig. 6).

The sediment station on the Des Moines River near Saylorville in central Iowa is downstream from a major flood-control reservoir (Saylorville Reservoir). The annual sediment discharge at this station for water year 1998 was 115,000 tons, which was the sixth smallest discharge in 21 years since the dam was completed. The mean annual sediment discharge since dam completion is 254,000 tons (fig. 6).

Sediment discharges for Iowa River at Wapello and Skunk River at Augusta in southeast Iowa were indicative of the above-normal precipitation in central and eastern Iowa. The Iowa River basin drainage includes parts of the Southeast, East-central, Central, Northeast, and North-central Climatological Districts, and drains an area nearly three times as large as the Skunk Basin. These Districts had about 119 percent of normal precipitation. Wapello had an annual sediment discharge of 2.82 million tons. This represents 101 percent of the 20-year mean sediment discharge of 2.79 million tons (fig. 6). The headwaters of the Skunk River basin are in central Iowa, and flow is southeasterly to the confluence with the Mississippi River. A substantial part of the drainage basin is located in the Southeast Climatological District. The annual precipitation for this District was 127 percent of normal for water year 1998. The 1998 annual sediment discharge for Skunk River at Augusta was 5.37 million tons, which is 189 percent of the 23-year mean sediment discharge of 2.83 million tons (fig. 6).

The 1998 annual sediment discharge for the two small drainage area stations located in northeast Iowa reflect the effect of precipitation patterns on small drainage basins. The annual sediment discharge for Bloody Run Creek near Marquette (05489400) was 2,254 tons, of which approximately 53 percent was measured during the month of March. This runoff was 44.7 percent of the 7-year mean sediment discharge of 5,030 tons. The annual sediment discharge for Sny Magill Creek near Clayton (05411400) was 7,315 tons. This runoff represents 149 percent of the 7-year mean sediment discharge of 4,924 tons. . Fifty-six percent of Sny Magill's annual sediment discharge was measured in March and approximately 45 percent of the yearly total was measured on March 30. These stations are paired in a study on sediment reduction techniques, with the Sny Magill Basin having the techniques implemented and the Bloody Run Basin not implemented.

The annual sediment discharge for the three stations located in central Iowa with less than approximately 20 square miles of drainage reflect precipitation patterns on small drainage basins. The 1998 sediment discharge for Squaw Creek near Colfax (05471040) was 20,460 tons. The 1998 sediment discharge for Walnut Creek near Prairie City (05487540) was 2,757 tons, while Walnut Creek near Vandalia (05487550) was 18,370 tons of annual sediment discharge. Vandalia has a drainage area approximately three times the size of Prairie City, but had about 6.7 times the amount of sediment discharge of Prairie City.

The three Missouri River stations (fig. 5) have large drainage areas, which the sediment discharges reflect. The annual sediment discharge at Sioux City was 12.1 million tons, which was 93 percent of the 12-year mean of 13.0 million tons. The sediment discharge at Omaha was 23.0 million tons, which was equal to the 12-year mean of 23.0 million tons. The annual sediment discharge at Nebraska City was 38.7 million tons, which was 109 percent of the 12-year mean of 35.4 million tons.

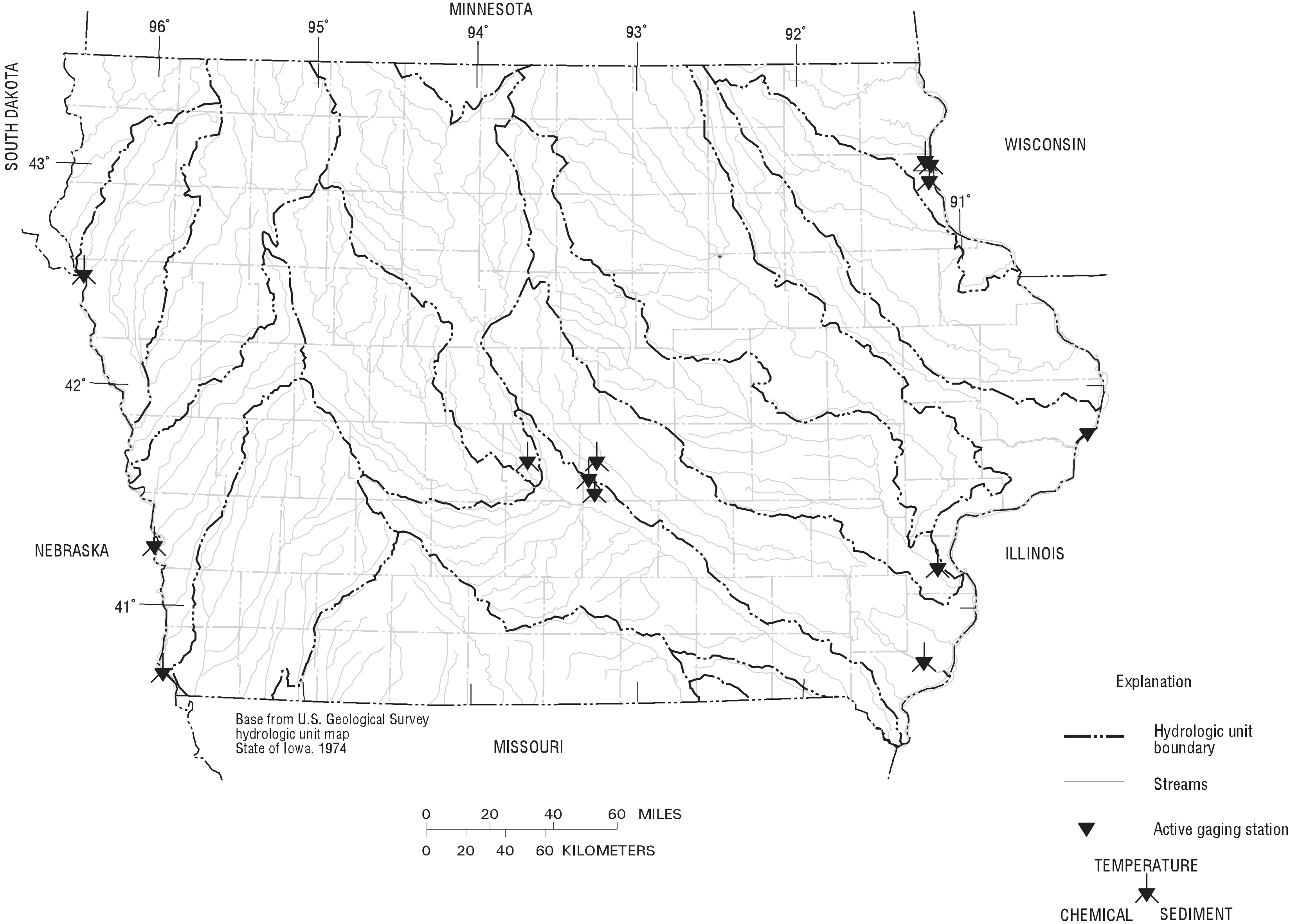

Figure 5. Location of active sediment and surface-water-quality stations in Iowa, water year 1998.

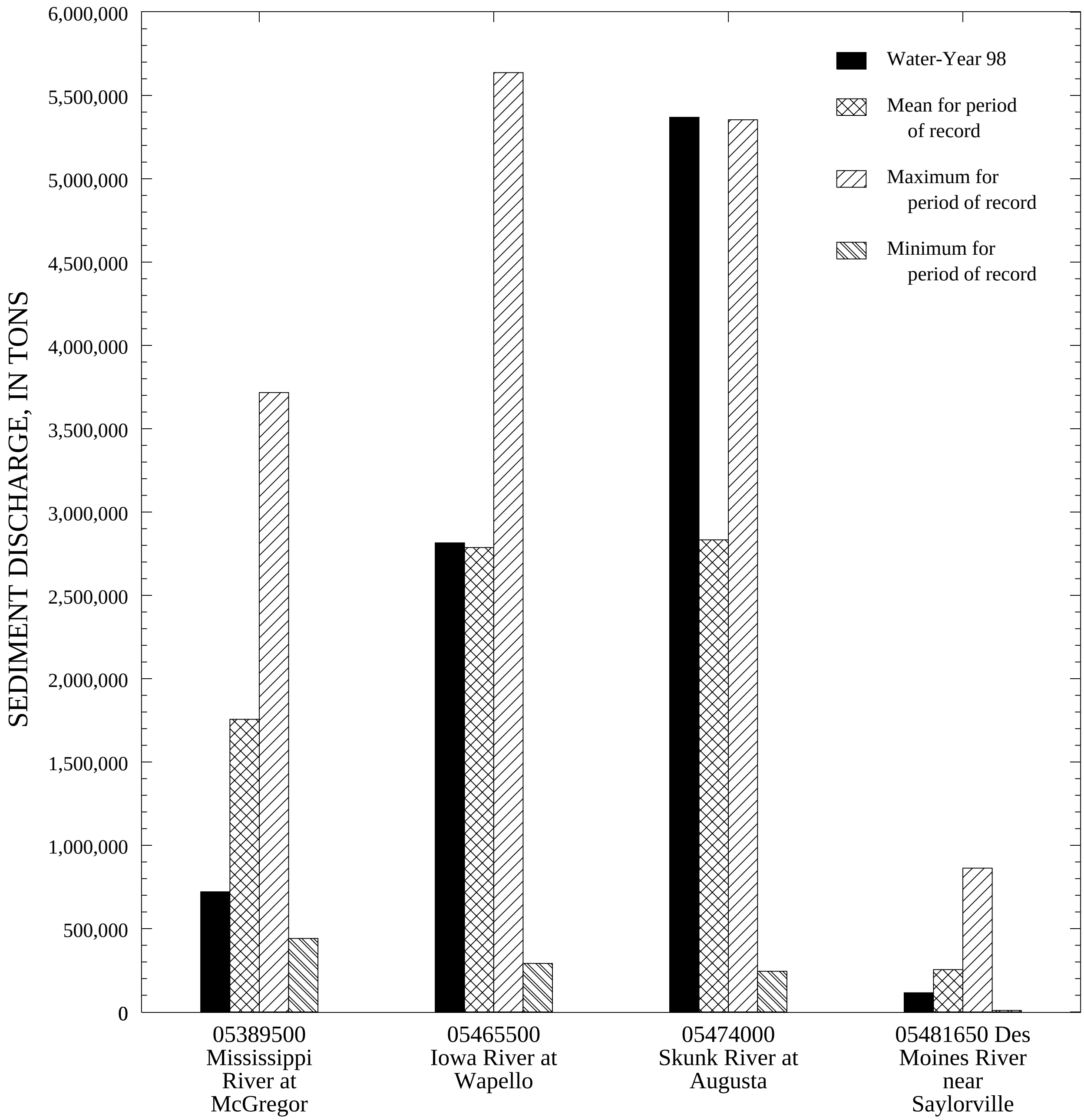

Figure 6. Comparison of annual sediment discharge for water year 1998 with mean, previous maximum, and previous minimum annual sediment discharges for periods of record at four long-term daily sediment stations in Iowa.

Ground-Water-Level Observation Network

The ground-water-level observation network in Iowa provides a historical record of the water-level changes in the State's most important aquifers. The locations of the 176 wells monitored on a quarterly, monthly, or intermittent basis during water year 1998 are shown in figure 7.

In this report, records of water levels are presented for a network of observation wells. However, many other water levels are measured through Federal, State, and local agency cooperative projects and entered into computer storage. Information for specific projects may be obtained from the District Chief, Iowa District.

Measurements of water levels are made in many types of wells under various techniques, but the methods 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.

Tables of water-level data are presented by counties arranged in alphabetical order. The principal identification number for a specific 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, an alphanumeric number derived from the township-range-section location of the well.

Water-level records are obtained from direct measurements with a steel tape or from an airline. The water-level measurements in this report are given in feet with reference to land-surface datum. Land-surface datum is a datum plane that is approximately at land surface at each well. The measuring point is the height above or below the land-surface datum and the point where the water level is measured. Both the measuring point and land-surface datum are listed for each well.

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement to a depth of water of several hundred feet, the error of 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 to a tenth of a foot or a larger unit.

Ground-water supplies in Iowa are withdrawn from unconsolidated and bedrock aquifers. There are three types of unconsolidated aquifers: (1) alluvial aquifers, which consist of sand-and-gravel deposits associated with present-day fluvial systems; (2) glacial-drift aquifers, which consist of shallow, discontinuous, permeable lenses of sand and gravel interbedded with less-permeable glacial drift; and (3) buried-channel aquifers. Buried-channel aquifers are formed in areas where coarse sand and gravel were deposited in bedrock valleys and overlain by a thick layer of glacial drift.

One well completed in an unconsolidated aquifer recorded a new measured historical high water level during the 1998 water year (table 2). There were no recorded historical low water levels.

Table 2. Historical high water level measured during the 1998 water year in a well completed in an unconsolidated aquifer.

County	Well number	Aquifer type	New historical high water level (ft below land surface)	Date measured	Previous historical high water level (ft below land surface)	Date measured
Harrison	413524095490601	Alluvial	1.68	07-07-1998	2.71	04-12-1983

The five major bedrock-aquifer units in Iowa are the Cambrian-Ordovician, Silurian-Devonian, Mississippian, Pennsylvanian, and Dakota. The Cambrian-Ordovician aquifer system consists of aquifers in sandstone of Early Cambrian age and dolomite and sandstone of Late Cambrian to Early Ordovician age. The Dresbach is the basal aquifer of the Cambrian-Ordovician aquifer system and is present locally in northeastern and east-central Iowa. Overlying the Dresbach aquifer is the more areally extensive Jordan-St. Peter aquifer. A confining shale unit separates the Jordan-St. Peter aquifer from the Galena aquifer, the uppermost aquifer in the Cambrian-Ordovician aquifer system. Overlying the Cambrian-Ordovician aquifer system is the Silurian-Devonian aquifer, which yields water from fractures in Silurian dolomite and Devonian limestone. Overlying the Silurian-Devonian aquifer is the Mississippian aquifer, which is composed of limestone and dolomite of Mississippian age and underlies about 60 percent of Iowa. Overlying the Mississippian aquifer are discontinuous lenses of sandstone in the Cherokee and Kansas City Groups of Pennsylvanian age, which form small, localized aquifers. The Dakota aquifer is the youngest bedrock-aquifer unit in the State and yields water from sandstone of Cretaceous age in northwest and western Iowa.

Twenty-nine wells completed in bedrock aquifers recorded new historical water levels during the 1998 water year. Twenty-one wells recorded historical low water levels (table 4), and eight wells recorded historical high water levels (table 5).

Table 3. Historical high water level measured during the 1998 water year in wells completed in bedrock aquifers.

County	Well number	Aquifer type	New historical high water level (ft below land surface)	Date measured	Previous historical high water level (ft below land surface)	Date measured
Audubon	415023094593801	Cretaceous	159	08-05-1998	159.73	05-07-1997
Calhoun	422339094375101	Cambrian/Ordovician	199	10-07-1997, 02-10-1998	205	02-14-1997
Delaware	423648091335701	Silurian	81.41	05-18-1998	84.32	08-07-1997
Linn	420200091363001	Cambrian/Ordovician	260	04-21-1998	283	08-12-1997
Linn	421207091312201	Silurian	12	05-04-1998, 08-03-1998	16	08-07-1998
Muscatine	412740090503201	Silurian	104.79	01-06-1998, 02-03-1998	122.79	06-10-1997
Plymouth	424833096324201	Cretaceous	136.54	05-05-1998	136.95	08-08-1998
Pottawattamie	412407095391201	Cambrian/Ordovician	72.86	08-06-1998	73.60	02-28-1997

Table 4. Historical low water level measured during the 1998 water year in wells completed in bedrock aquifers.

County	Well number	Aquifer type	New historical low water level (ft below land surface)	Date measured	Previous historical low water level (ft below land surface)	Date measured
Bremer	424224092133901	Silurian	92	05-05-1998	89	08-07-1997
Clinton	414921090450401	Silurian	95	08-07-1998	43	08-06-1997
Dallas	413613093530401	Cambrian/Ordovician	428	02-09-1998	398	08-05-1997
Greene	420146094272301	Cretaceous	19.57	11-06-1997	19.23	10-07-1985
Jackson	420433090502401	Devonian	63.19	08-04-1998	62.89	08-06-1997
Jackson	420842090165701	Cambrian/Ordovician	9.23	09-02-1998	8.25	01-08-1996, 05-13-1996
Johnson	413929091322401	Cambrian/Ordovician	216	04-30-1998	195	03-13-1996
Johnson	413950091322402	Cambrian/Ordovician	340	04-30-1998	279	01-02-1997
Johnson	414107091322901	Silurian	153.24	07-30-1998	152.21	09-05-1995
Johnson	414132091345502	Silurian	252.30	07-30-1998	251.34	07-22-1994
Lee	404306091270201	Cambrian/Ordovician	264.74	08-06-1998	263.99	08-07-1997
Linn	420200091363001	Cambrian/Ordovician	293	07-24-1998	283	08-12-1997
Linn	420219091344101	Cambrian/Ordovician	351	08-10-1998	343	08-12-1997
Linn	421207091312201	Silurian	22	02-23-1998	16	08-07-1997
Mitchell	432156092484103	Devonian	12.69	02-11-1998	12.65	05-07-1996
Muscatine	412740090503201	Silurian	160.79	09-01-1998	127.80	09-02-1997
Muscatine	412833090482001	Devonian/Silurian	260	04-07-1998	257	09-02-1997
Muscatine	412839090472601	Silurian	236.42	04-07-1998	224.28	09-02-1997
Muscatine	412952090501101	Devonian/Silurian	160	09-01-1998	142	09-02-1997
Osceola	432828095283611	Cretaceous	350.68	11-05-1997	347.02	02-07-1996
Washington	411813091411202	Cambrian/Ordovician	256	05-06-1998	251	01-31-1997

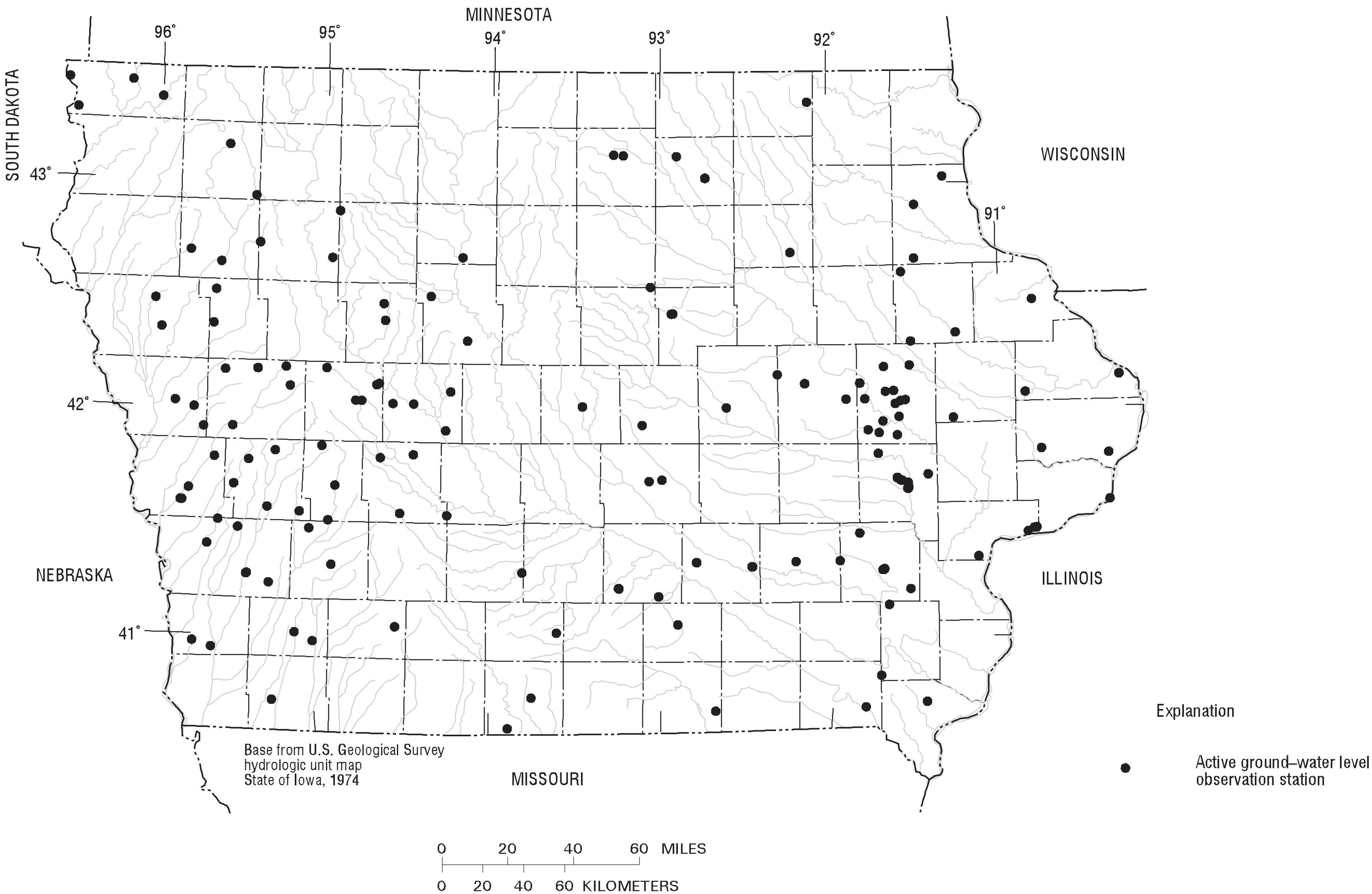

Figure 7. Location of wells in the ground-water-level observation network in Iowa, water year 1998.

Surface-Water Quality

Surface-water-quality data were collected in Iowa during water year 1998 at two National Stream-Quality Accounting Network (NASQAN) stations. The NASQAN stations in Iowa are the Mississippi River at Clinton (station number 05420500) and Missouri River at Omaha (06610000). The combined drainage area of the two stations is approximately 408,000 sq. miles. Land use throughout the two drainage basins is primarily agricultural. Fifteen water samples were collected at Missouri River at Omaha and thirteen water sample were collected at Mississippi River at Clinton during the 1998 water year.

Nearly all the samples collected at the two stations contained detectable concentrations of agricultural chemicals. Dissolved nitrite plus nitrate as nitrogen (hereafter referred to as nitrate) were common during the 1998 water year, with all samples containing concentrations greater than the detection level of 0.05 mg/L (milligrams per liter). Nitrate concentrations at Clinton ranged from 0.629 to 2.81 mg/L, and 0.233 to 3.08 mg/L at Omaha. Nitrate concentrations in these samples did not exceed 10 mg/L, which is the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) for public drinking water (USEPA, 1990 Maximum contaminant levels, subpart B of part 141, National primary drinking-water regulations: U.S.Code of Federal Regulations, Title 40, Parts 100 to 149, revised as of July 1, 1990, p.553-677).

Pesticide analysis were completed for 28 water samples collected at the NASQAN stations. Atrazine and Metolachlor, two of the most commonly used herbicides in Iowa, were detected throughout the year at both NASQAN stations. Acetochlor and cyanazine were detected at least 8 times at both sites. The largest herbicide concentration was 2.20 ug/L (micrograms per liter) of atrazine in the water sample collected from the Missouri River on June 10. The largest overall concentration of these compounds in a single event was also on the Missouri River on June 10. This water contained the 2.20 ug/L of atrazine, 1.06 ug/L of metolachlor, 0.880 ug/L of cyanazine 0.378 ug/L of acetochlor, and 0.038 ug/L of alachlor. No concentrations for any herbicides exceeded USEPA MCL's (USEPA,1992, Fact sheet: EPA 570/9-91-012FS, December 1992). Herbicide concentrations were generally larger in samples collected during May, June, and July than in samples collected at other times during water year 1998. Water samples collected in November through February had the lowest overall concentrations of the five herbicides during the 1998 water year.

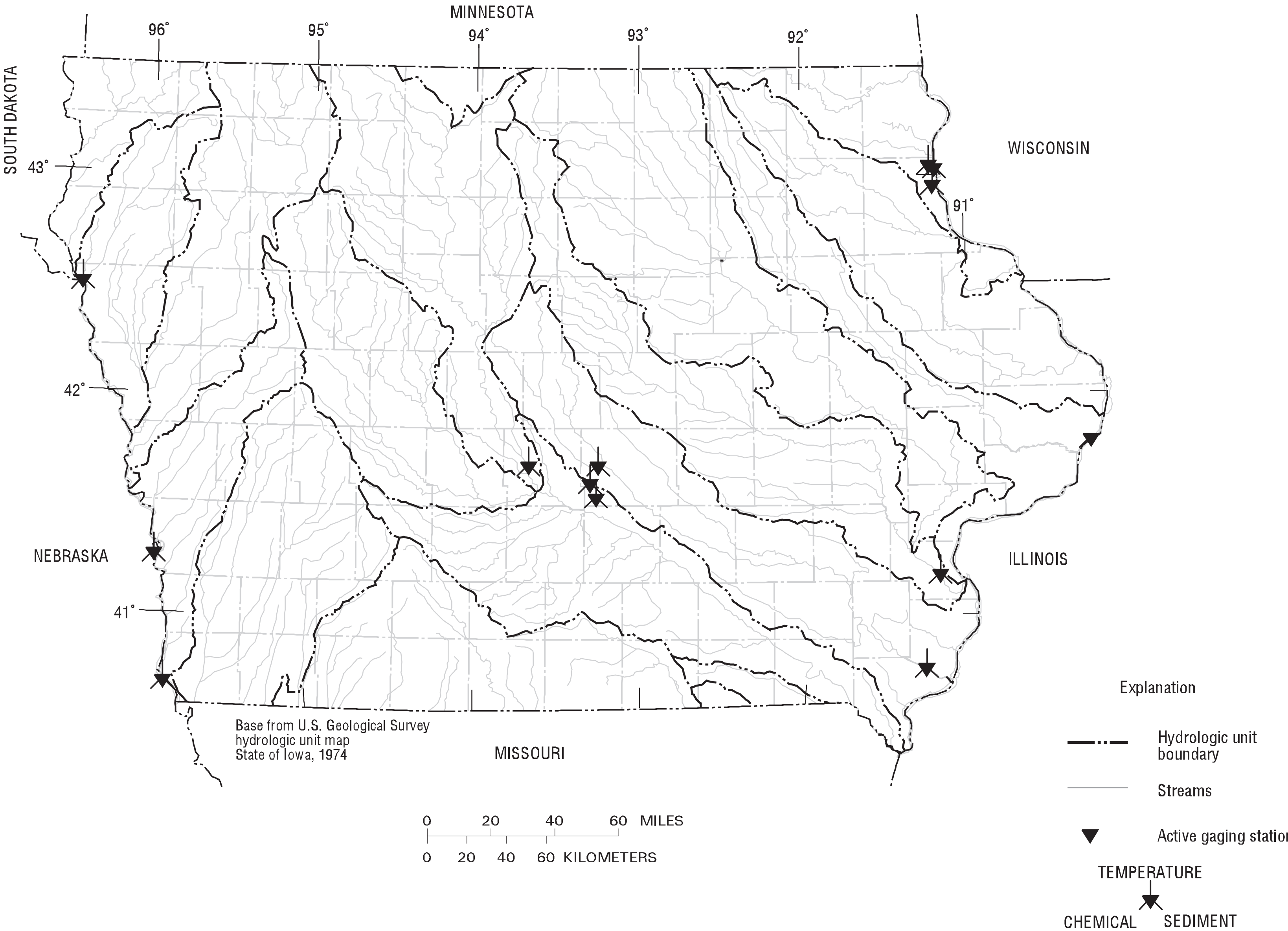

Figure 8. Location of surface-water quality gaging stations in Iowa.

Ground-Water Quality

The Iowa ground-water-quality monitoring program has been operated since 1982 by the U.S. Geological Survey in cooperation with the University of Iowa Hygienic Laboratory and the Iowa Department of Natural Resources, Geological Survey Bureau. The purpose of the program is twofold: (1) provide consistent and representative data describing the chemical water quality of the principal aquifers of the State; and (2) determine possible trends in both water quality and spatial distribution of water quality.

The ground-water-quality monitoring program was initiated to continue a program begun in 1950 by the State Health Department that consisted of periodic, nonspecific sampling of untreated water from municipal supply wells. Each year, approximately 250 wells, primarily municipal supply, were randomly-selected for sampling between April and November. Between 1985 and 1989, the emphasis of the program was on the analysis of nitrate and herbicide concentrations in samples from wells less than 200 feet in depth. Because of the random pattern of sampling both spatially (different wells each year) and seasonally (different times during the year), trends in ground-water quality were difficult to determine from the data. Therefore, in 1990, to provide year-to-year continuity of data and a more statistically sound basis for the study of long-term water-quality trends, a sampling strategy based on a random selection of wells weighted by aquifer vulnerability was implemented. Aquifer vulnerability was determined by the frequency of atrazine detections in water samples collected from wells in the respective aquifers. In 1990 and 1991, a fixed network of 50 wells was selected to be sampled annually, and approximately 200 wells continued to be selected on a rotational basis.

In 1992, the investigation of water-quality trends became the primary focus of the program, and a 10-year work plan was designed to eliminate spatial and seasonal variance, yet allow flexibility within the schedule to address additional data needs. For sampling site selection in 1992, the well inventory was divided into categories based on aquifer type and again on well depth for surficial aquifers, and into categories designated "vulnerable to contamination" and "not vulnerable to contamination" based on the map *Groundwater Vulnerability Regions of Iowa* (Hoyer, B.E., and Hallberg, G.R., 1991, Special Map Series 11: Iowa Department of Natural Resources, scale 1:500,000) for bedrock aquifers. Vulnerability was determined by the combination and interpretation of factors including geologic and soil data, thickness of Quaternary cover, proximity to agricultural injection wells and sinkholes through which contaminants can be introduced to the aquifer, and evaluation of historical ground water and well contamination. A total of 90 sites were selected for sampling from a well inventory comprising approximately 1,640 public supply wells. From the 90 sites in the fixed network, 45 wells from two surficial aquifer types were selected to be sampled annually. The other 45 wells (from the bedrock aquifers) were selected to be sampled on a rotational schedule based on aquifer vulnerability to contamination. The wells determined to be vulnerable to contamination would be sampled every 2 years and those wells categorized as not vulnerable to contamination would be sampled every 4 years. All 90 wells were sampled in the first 2 years (1992 and 1993) and the sampling rotation began in 1994. The sampling effort during the 1998 water year is the seventh year of this 10-year program to determine possible ground-water-quality trends.

During the 1998 water year, a total of 45 ground-water samples were collected from municipal wells located in two types of surficial aquifers throughout the State (fig. 9). These wells were sampled as part of the Iowa ground-water monitoring (GWM) program to determine water-quality trends.

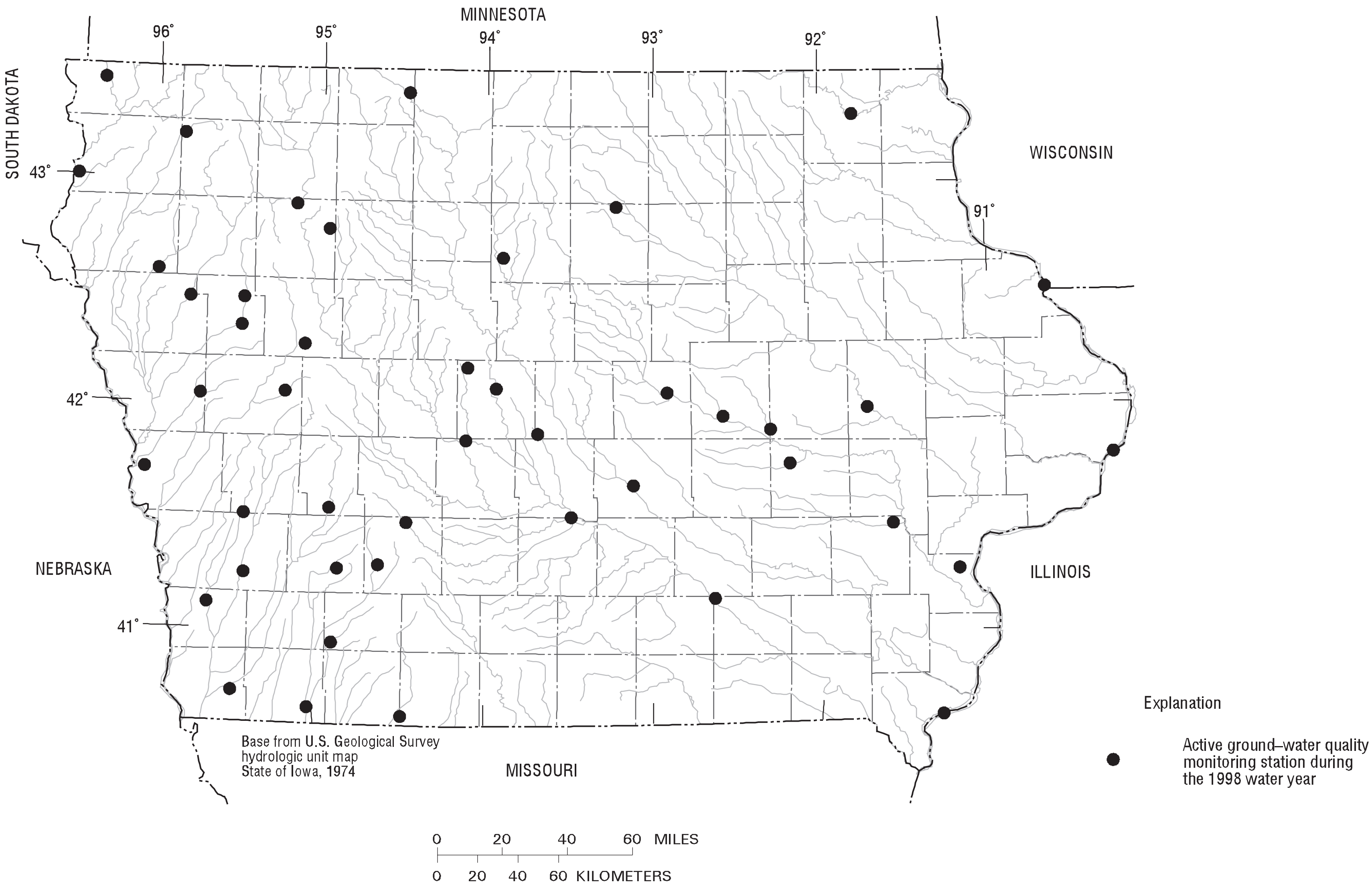

Figure 9. Location of active ground-water-quality monitoring wells in Iowa.

Ground-Water Monitoring Network

The forty-five wells that were sampled as part of the ground-water monitoring network are distributed throughout the State (fig. 9). Aquifer types include: (1) alluvial aquifers comprising sand and gravel associated with present-day fluvial systems; and (2) glacial drift and buried-channel aquifers associated with previous glaciation. Samples were collected during June, July, and August 1998. All samples were analyzed by the University of Iowa Hygienic Laboratory. Constituents analysed for include: common ions, nutrients, herbicides, and volatile organic compounds (VOC's). Results for all constituents are published in this report. Discussion of analytical results will be limited to the nitrogen species nitrate and ammonia, and herbicides.

A summary of results for nutrient and herbicide analyses are listed by compound in table 5. Nitrate or ammonia was detected in 43 of the 45 samples analyzed for these compounds, and one or more herbicides were detected in 8 of the 45 samples. The laboratory minimum reporting level (MRL) for ammonia and nitrate is 0.10 mg/L. The MRL's for the herbicides listed below are 0.10µg/L. The MRL is the lowest concentration reliably measured by the laboratory.

Table 5. Summary of nitrogen species and herbicides detected in samples from the Ground-Water-Quality Monitoring project, water year 1998
[µg/L, micrograms per liter; mg/L, milligrams per liter; <, less than detection limit]

Compound	Number of samples analyzed	Number of samples in which compound was detected	Median value	Maximum concentration detected
Acetochlor	45	0	<0.10 µg/L	<0.10 µg/L
Ammonia	45	20	< .10 mg/L	6.8 mg/L
Alachlor	45	0	< .10 µg/L	< .10 µg/L
Atrazine	45	7	< .10 µg/L	.34 µg/L
Butylate	45	0	< .10 µg/L	< .10 µg/L
Cyanazine	45	0	< .10 µg/L	< .10 µg/L
Deethylatrazine	45	3	< .10 µg/L	.22 µg/L
Deisopropylatrazine	45	2	< .10 µg/L	.19 µg/L
Metolachlor	45	3	< .10 µg/L	.94 µg/L
Metribuzin	45	0	< .10 µg/L	< .10 µg/L
Nitrate	45	27	1.10 mg/L	13.0 mg/L
Prometone	45	2	< .10 µg/L	.13 µg/L
Trifluralin	45	0	< .10 µg/L	< .10 µg/L

Concentrations of nitrate greater than 3.0 mg/L generally can be attributed to human activities, whereas concentrations less than 3.0 mg/L may indicate ambient concentrations from naturally occurring soil nitrogen or geologic deposits (Madison, R.J., and Brunett, J.O., 1984, Overview of the occurrence of nitrate in ground water of the United States, in National Water Summary 1984 -- Water quality trends: U.S. Geological Survey Water-Supply Paper 2275, p. 93-105). Nitrate concentrations were greater than 3.0 mg/L in 16 of 45 samples. Concentrations in four samples exceeded 10 mg/L, which is the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) for public drinking water. Of the 27 samples that contained detectable concentrations of nitrate, 89 percent were from wells completed in alluvial aquifers and 11 percent were from glacial drift and buried-channel aquifers. The median concentration of the 27 samples with detections was 4.1 mg/l. The median concentration of all samples was 1.1 mg/L. However when all the wells are separated into categories based on well depth, the median nitrate concentrations vary from 2.4 mg/L in wells less than 50 feet deep to 3.0 mg/L in wells from 50 to 100 feet deep to <0.10 mg/L in wells greater than 100 feet deep. The maximum nitrate concentration was 13.0 mg/L. Twenty samples had detectable ammonia concentrations. Of these samples, 50 percent were collected from alluvial aquifers and 50 percent were from glacial drift and buried-channel aquifers.

Nine commonly used herbicides and two atrazine degradation products were sampled for during the 1998 water year. Water from 8 of the 45 wells sampled for herbicides contained detectable concentrations of one or more herbicides or herbicide degradation products. No sample contained herbicide concentrations that exceeded the MCL or proposed MCL of any of the analytes. Seven of the eight samples contained atrazine or its degradates, deethylatrazine and deisopropylatrazine. Metolachlor and/or prometone were also detected in four of the samples. No detectable amounts of cyanazine, metribuzin, butylate, trifluralin, alachlor, or acetochlor were found in any of the samples. All samples with detectable herbicide concentrations were from wells completed in alluvial aquifers and with depths less than 100 ft. The detection frequency in wells less than 100 feet deep was 23 percent. The rate of occurrence during the same period of the previous six years was 15 percent in 1992; 11 percent in 1993; 20 percent in 1994; 25 percent in 1995; 25 percent 1996; 20 percent in 1997; and a 22-percent rate described for the same periods prior to 1988 (Detroy, M.G., 1988, Ground-water-quality-monitoring program in Iowa: Nitrate and pesticides in shallow aquifers: U.S. Geological Survey Water-Resources Investigations Report 88-4123, 32 p.). A direct comparison of detection frequency between 1988 and 1998 may be misleading because each year different wells were sampled. Comparison is feasible between years 1992 through 1998 because essentially the same wells were used, see table 6. Variance in detection frequency may reflect several factors including changes in agricultural practices concerning use of herbicides, and climatic conditions.

Trends in Groundwater Quality

Table 6. Trends in herbicide detection frequencies (in percent) (--, no wells sampled)

	Water Year						
Well Type	1992	1993	1994	1995	1996	1997	1998
All Wells (<100ft.)	15%	11%	20%	25%	25%	20%	23%
Vulnerable Bedrock	14%	14%	--	13%	--	9%	--
Non-Vulnerable Bedrock	9%	5%	--	--	--	5%	--

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.nrel.colostate.edu/NADP`

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of wet atmospheric deposition, which includes snow, rain, sleet and hail. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

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`

Radiochemical Programs is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1998 water year that began October 1, 1997, and ended September 30, 1998. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 3-5, 7, 9, 10. 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 streamsite or well, 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 well sites 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.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in 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 shows 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 eight-digit number for each station, such as 05388250, which appears just to the left of the station name, includes the two-digit Part number "05" plus the six-digit downstream-order number "388250." The Part number designates the major river basin; for example, Part "05" is the Mississippi River Basin.

Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites 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 1-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 below.)

Latitude and longitude coordinates for wells:

1. 414315091252001
2. 414315091252002
3. 414316091251901

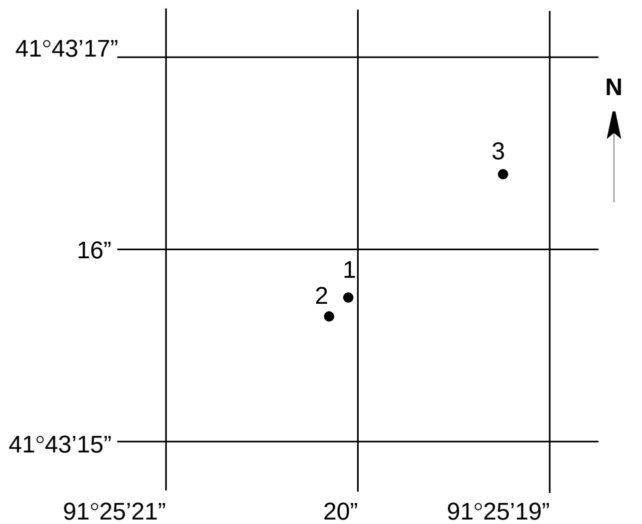

Figure 9. Latitude-longitude well number.

Numbering System For Wells

Each well is identified by means of (1) a 15-digit number that is based on the grid system of latitude and longitude, and (2) a local number that is provided for continuity with older reports and for other use as dictated by local needs. For maximum utility, latitude and longitude code numbers are determined to seconds in order that each well may have a unique number. The first six digits denote degrees, minutes, and seconds of north latitude; the next seven digits are degrees, minutes, and seconds of west longitude; and the last two numbers are a sequential number assigned in the order in which the wells are located in a 1-second quadrangle.

The local well numbers are in accordance with the Bureau of Land Management’s system of land subdivision. Each well number is made up of three segments. The first segment indicates the township, the second the range, and the third the section in which the well is located (fig. 12). The letters after the section number which are assigned in a counter-clockwise direction (beginning with “A” in the northeast quarter), represent subdivisions of the section. The first letter denotes a 160-acre tract, the second a 40-acre tract, the third a 10-acre tract, and the fourth a 2.5 acre tract. Numbers are added as suffixes to distinguish wells in the same tract. Thus, the number 96-20-3CDBD1 designates the well in the SE 1/4 NW 1/4 SE 1/4 SW 1/4 sec.3, T.96 N., R.20 W.

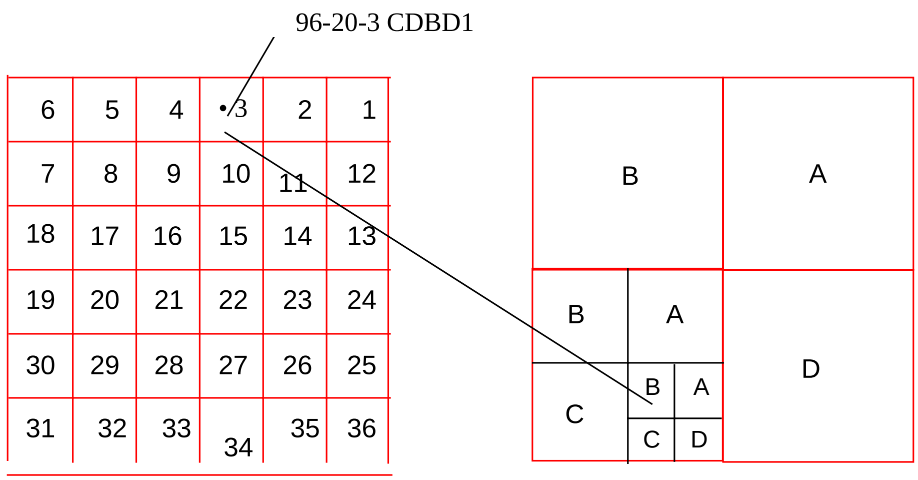

Figure 10. Local well-numbering system for well 96-20-3 CDBD1.

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 daily 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.” Location of all complete-record surface water stations which are given in this report are shown in figure 3

Partial records are obtained through discrete measurements without using a continuous stage-recording device and generally pertain only to a characteristic of either high, medium or low flow. The location of all active, crest-stage gaging stations are shown in figure 4.

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 relationships 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 relationship between stage and lake content. These data are used with stage-capacity curves or tables to compute lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adopted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the 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 daily mean 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 the 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. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

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 available from surveys, curves or tables defining the relationship 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. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed using stage-discharge relations.

For some gaging stations, there are periods when no gage-height record is obtained, or the recorded gage height is so faulty 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, the float is frozen in the well, or for various other reasons. For these periods, the daily discharges are estimated from the recorded range in stage, discharge computed before and after the missing 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 or 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 1991 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 preference.

The records published for each continuous-record surface-water discharge station (gaging station) consist of four parts, the manuscript or station description; 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; and a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration. For the first time this year, we are also including a hydrograph for the water year.

Station manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside 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. Comments to follow clarify information presented under the various headings of the station description.

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. River mileages were determined by methods given in “River Mileage Measurement,” Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

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.-- because of new information, published records 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 that only the instantaneous maximum discharge was revised; “(m)” that only the instantaneous minimum was revised; and “(P)” that only 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 sea level (see “Definition of Terms”), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, “Identifying Estimated Daily Discharge.”) If a REMARKS paragraph 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, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to 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 Geological Survey by a cooperating organization are identified here.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Extremes are published only for stations with significant flow regulation and where extremes occurred in pre-regulation periods. 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 no 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.

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 for a discontinued station 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.

Headings for AVERAGE DISCHARGE, EXTREMES FOR PERIOD OF RECORD, and EXTREMES FOR CURRENT YEAR have been deleted and the information contained in these paragraphs is now presented in the tabular summaries following the discharge table or in the REMARKS paragraph, as appropriate. EXTREMES FOR PERIOD OF RECORD are now presented only for stations with significant flow regulation and where extremes occurred in pre-regulation periods. No changes have been made to the data presentations of lake contents or reservoir storage.

Data table of daily mean values

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed “TOTAL” gives the sum of the daily figures. The line headed “MEAN” gives the average flow in cubic feet per second during the month. The lines headed “MAX” and “MIN” give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is usually expressed in cubic feet per second per square mile (line headed “CFSM”), or in inches (line headed “IN.”), or in acre-feet (line headed “AC-FT”). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

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 PERIOD OF RECORD, BY WATER YEAR (WY),” for unregulated streams for the water years listed in 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. For significantly regulated streams the first and last water years of the range of years will be given for the post-regulation period.

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, “PERIOD OF RECORD,” for unregulated streams, 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. For significantly regulated streams the period selected will be designated as “WATER YEARS ___ - ___ ,” for the post regulation period. 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 heading. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff data 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. At some stations the annual total discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period. At some stations the yearly mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

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 of 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 (CSFM) 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.

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 is exceeded 10 percent of the time for the designated period.

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

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

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage stations, and the second is a table of discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge made at sites other than continuous-record or partial-record stations. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some specail reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified by listing the dates of the estimated record in the REMARKS paragraph of the station description, and are flagged “e” in tables.

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 interpretation of records.

The accuracy attributed to the records is indicated under “REMARKS.” “Excellent” means that about 95 percent of the 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 tenth between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to 3 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 value. 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 due to 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.

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 is on file in various field offices of the Iowa District. 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 published records may be obtained from the offices whose addresses are given on the back of the title page of this report.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near streamgaging 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 once 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. 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 figure 5.

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, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, alkalinity and dissolved oxygen, are made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures are followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures of onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. C2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed on p. 54-56 of this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey 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 the representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network are obtained from at least several 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 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.

Water Temperature and Specific Conductance

Water temperatures are measured at most of the water-quality stations. The measurement of temperature and specific conductance is performed during each regular site visit (usually at a six week interval) to streamgaging stations. Records of stream temperature indicate significant thermal characteristics of the stream when analyzed over a long period of record. Large streams have small daily temperature variations while shallow streams may have a daily range of several degrees and may closely follow the changes in air temperature. Furthermore, some streams may be affected by waste-heat discharge.

Specific conductance can be used as a general indicator of stream quality. This determination is easily made in the field with a portable meter, and the results are very useful as general indicators of dissolved-solids concentration or as a base for extrapolating other analytical data. Records for temperature and specific conductance appear in the section “Analyses of samples collected at miscellaneous sites”.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samples. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

During periods of rapidly changing flow or rapidly changing 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.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. 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 and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended-sediment, records of the periodic measurements of the particle-size distribution of the suspended-sediment and bed material are included. Miscellaneous suspended-sediment samples were collected during flood events have been included with the station’s water quality data or in the section “Analyses of samples at miscellaneous sites”.

Laboratory Measurements

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the U.S. Geological Survey laboratory in Arvada, Colorado and the University of Iowa Hygienic Laboratory. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI, Book 1, Chap. D2, Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

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 temperature record, 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.--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 or 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, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency’s STORET system. 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 the appropriate computer file to insure the most recent updates.

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 for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remarks Codes

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

PRINTED OUTPUT	REMARK
E	Estimated value
>	Actual value is know 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)
&	Biological organism estimated as dominant
V	Analyte was detected in both the environmental sample and the associated blank

Water Quality-Control Data

Data generated from quality-control (QC) samples are a requisite for evaluating the quality of the sampling and processing techniques as well as data from the actual samples themselves. Without QC data, environmental sample data cannot be adequately interpreted because the errors associated with the sample data are unknown. The various types of QC samples collected by this district are described in the following section. Procedures have been established for the storage of water-quality-control data within the USGS. These procedures allow for storage of all derived QC data and are identified so that they can be related to corresponding environmental samples.

Blank Samples

Blank samples are collected and analyzed to ensure that environmental samples have not been contaminated by the overall data-collection process. The blank solution used to develop specific types of blank samples is a solution that is free of the analytes of interest. Any measured value signal in a blank sample for an analyte (a specific component measured in a chemical analysis) that was absent in the blank solution is believed to be due to contamination. There are many types of blank samples possible, each designed to segregate a different part of the overall data-collection process. The types of blank samples collect in this district are:

Field blank - a blank solution that is subjected to all aspects of sample collection, field processing preservation, transportation, and laboratory handling as an environmental sample.

Trip blank - a blank solution that is put in the same type of bottle used for an environmental sample and kept with the set of sample bottles before and after sample collection.

Equipment blank - a blank solution that is processed through all equipment used for collecting and processing an environmental sample (similar to a field blank but normally done in the more controlled conditions of the office).

Sampler blank - a blank solution that is poured or pumped through the same field sampler used for collecting an environmental sample.

Filter blank - a blank solution that is filtered in the same manner and through the same filter apparatus used for an environmental sample.

Splitter blank - a blank solution that is mixed and separated using a field splitter in the same manner and through the same apparatus used for an environmental sample.

Preservation blank - a blank solution that is treated with the sampler preservatives used for an environmental sample.

Reference Samples

Reference material is a solution or material prepared by a laboratory whose composition is certified for one or more properties so that it can be used to assess a measurement method. Samples of reference material are submitted for analysis to ensure that an analytical method is accurate for the known properties of the reference material. Generally, the selected reference material properties are similar to the environmental sample properties.

Replicate Samples

Replicate samples are a set of environmental samples collected in a manner such that the samples are thought to be essentially identical in composition. Replicate is the general case for which a duplicate is the special case consisting of two samples. Replicate samples are collected and analyzed to establish the amount of variability in the data contributed by some part of the collection and analytical process. There are many types of replicate samples possible, each of which may yield slightly different results in a dynamic hydrologic setting, such as a flowing stream. The types of replicate samples collected in this district are: Sequential samples - a type of replicate sample in which the samples are collected one after the other, typically over a short time.

Split sample - a type of replicate sample in which a sample is split into subsamples contemporaneous in time and space.

Spike Samples

Spike samples are samples to which known quantities of a solution with one or more well-established analyte concentrations have been added. These samples are analyzed to determine the extent of matrix interference or degradation on the analyte concentration during sample processing and analysis.

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 to 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

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/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (Telephone: 303-491-5643).

Records of Ground-Water Levels

Ground-water level data from a network of observation wells in Iowa are published in this report. These data provide a limited historical record of water-level changes in the State’s most important aquifers. Locations of the observation wells in this network in Iowa are shown in figure 6. Information about the availability of the data in the water-level files and reports of the U.S. Geological Survey may be obtained from the Iowa District Office (see address on back of title page).

Data Collection and Computation

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

Tables of water-level data are arranged alphabetically by counties. The site identification number, based on latitude and longitude, for a given well is the 15-digit numeric value that appears in the upper left corner of the station description. The secondary identification number is the local well number, an alphanumeric value, derived from the township, range, and section location of the well (fig. 15).

Water-level records are obtained from direct measurements with a chalked steel tape, electric line, airline, or from the graph of a water-level recorder. The water-level measurements in this report are in feet with reference to land-surface datum. Land-surface datum is a plane that is approximately at land surface at each well. The elevation of the land-surface datum is given in the well description. The height of the measuring point above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (EOM).

Water-level measurements are reported to the nearest hundredth of a foot. Estimates, indicated by an “e” may be reported in tenths of a foot. Adjustments to the water level recorder chart are indicated by an “a”. The error of water-level measurements may be, at most, a few hundredths of a foot.

Data Presentation

Each well record consists of two parts, the station description and the table of water levels observed during the water year. The description of the well is presented by headings preceding the tabular data. The following explains the information presented under each heading.

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

AQUIFER.--This entry is the aquifer(s) name (if one exists) and geologic age of the strata open to the well.

WELL CHARACTERISTICS.--This entry describes the well depth, casing diameter, casing depth, opening or screened interval(s), method of construction, and use of water from the well.

INSTRUMENTATION.--This paragraph provides information on the frequency of measurement and the collection method used.

DATUM.--This entry includes the land-surface elevation and the measuring point at the well. The elevation of the land-surface datum is describe in feet above (or below) sea level; it is reported with a precision depending on the method of determination. The measuring point is described physically and in relation to land surface.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level and any information not presented in the other parts of the station description but considered useful.

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 beginning of publication of water-level records by the U.S. Geological Survey.

REVISED RECORDS.--If any revisions of previously published data were made for water-levels, the Water Data Report in which they appeared and year published would appear here.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels for the period of record, below 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 below land-surface datum. For wells equipped with recorders, only abbreviated tables are published. The highest and lowest water levels of the water year and the dates of occurrence are shown on a line below the abbreviated table. 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.

Hydrographs are included for 59 wells which are representative of hydrologic conditions in the important aquifers in Iowa.

Only water-level data from a national network of observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the Nation’s most important aquifers. Locations of the observation wells in this network in Iowa are shown in figure 7.

Records of Ground-Water Quality

Records of ground-water quality in this report differ from other types of records in that for most sampling sites they consist of only one set of measurements for the water year. The quality of ground water ordinarily changes only slowly; therefore, for most general purposes one annual sampling, or only a few samples taken at infrequent intervals during the year, is sufficient. Frequent measurement of the same constituents is not necessary unless one is concerned with a particular problem, such as monitoring for trends in nitrate concentration. In the special cases where the quality of ground water may change more rapidly, more frequent measurements are made to identify the nature of the changes.

The records of ground-water quality in this report were obtained as a part a statewide ground-water quality monitoring network operated by the Iowa District. All samples were obtained from municipal wells throughout Iowa. This program is conducted in cooperation with the University of Iowa Hygienic Laboratory (UHL) and the Iowa Department of Natural Resources (Geological Survey Bureau). All samples are collected by USGS personnel, field-preserved and submitted to UHL for analysis. Chemical analyses include common constituents (major ions), nutrients, organic compounds, radionuclides and pesticides. Approximately 10 percent of the samples receive additional analyses for about 90 organic priority pollutants, however these analyses are not presented in this report but are on file in the Iowa District Office.

Most methods for collecting and analyzing water samples are described in the “U.S. Geological Survey Techniques of Water-Resources Investigations” manuals listed on a following page. 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. 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 comprising the casings. The samples collected represent raw water

Data Presentation

The records of ground-water quality are published in a section titled GROUND-WATER QUALITY DATA immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by county, and are identified by station number. The prime identification number for wells sampled is the 15-digit station number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the station number, date and time of sampling, depth of well, and other pertinent data are given in the table containing the chemical analyses of the ground water. The REMARK codes listed for surface-water-quality records are also applicable to ground-water-quality records.

Explanation of Quality of Ground-Water Data Tables -- Descriptive Headings

STATION NUMBER	LOCAL WELL NUMBER	DATE	LOCAL WELL NAME	COUNTY	SAMPLE DATE	SAMPLE TIME	AQUI-FER CODE	DEPTH OF WELL, TOTAL (FT)
↓	↓	↓	↓	↓	↓	↓	↓	↓
411441094401602	075N33W32CDDD	1943	BRIDGEWATER 1	ADAIR	08-11-92	1130	111ALVM	49

STATION NUMBER**:** 15-digit number based on grid system of latitude and longitude.

LOCAL WELL NUMBER**:** Refers to the Bureau of Land Management System of land subdivision.

DATE: The date that construction on the well was completed.

LOCAL WELL NAME**:** Name used by community to identify well.

COUNTY: The name of the county where the well is located.

SAMPLE DATE: Date the well was sampled.

SAMPLE TIME: Time the sample was collected.

AQUIFER CODE: Refers to the lithologic unit in which the well is completed. Derived from two digits of the GEOLOGIC UNIT, the principal unit which provides the majority of water to the well.

11 - Quaternary	33- Mississippian	36 - Ordovician
21 - Cretaceous	34 - Devonian	37 - Cambrian
32 - Pennsylvanian	35 - Silurian	

The third digit and remaining alphabetic characters refer to the more specific lithologic unit which the well is tapping. The following examples are commonly used units:

Code	General	Specific
111ALVM	Quaternary	(alluvium)
217DKOT	Cretaceous	(Dakota sandstone)
344CDVL	Devonian	(Cedar Valley limestone)

DEPTH OF WELL, TOTAL (FT): Total depth of well in feet.

ACCESS TO USGS WATER DATA

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with the necessary telemetry and historic daily-mean and peak-flow discharge data for most current or discontinued gaging stations through the world wide web (WWW). These data may be accessed at

`http://www.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.)

The Iowa District maintains a web site highlighting many of the District’s activities. Many of the continuous stream gages presented in these reports have near-real-time data available, and all gages have historic data available. These data may be accessed at

`http://diaiwc.cr.usgs.gov`

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-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.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, 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.

> Fecal coliform bacteria are bacteria that 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 Cplus or minus 0.2 Con M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

> Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as Gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35 Cplus or minus 1.0 Con KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Bottom material: See Bed material.

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.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, 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 salt water.

Cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic foot per second day 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, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,445 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 of area drained, assuming that the runoff is distributed uniformly in time and area.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Annual 7-day minimum is 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 withe the 7-day 10-year low-flow statistic).

Instantaneous discharge is the discharge at a particular instant of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Dissolved refers to that material in a representative water sample which passes through a 0.45 mm membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of “dissolved” constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water 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 of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term “stage,” although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

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 and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

Hydrologic Benchmark Network is a network of 53 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 the activities of man.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

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

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

Micrograms per gram (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 liter (µg/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute 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.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called “Sea Level Datum of 1929” or “mean sea level” in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation’s rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Parameter Code is a 5-digit number used in the U.S. Geological Survey data system, National Water Information System (NWIS),, to uniquely identify a specific constituent. The codes used in NWIS are the same as those used in the U.S. Environmental Protection Agency data system, STORET.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual- accumulation tube) 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 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	.004 - .062	Sedimentation
Sand	.062 - 2.0	Sedimentation or 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.

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

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

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from 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.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN., in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sea level. In this report “sea level” refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929) -- a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it 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 factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

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).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a 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.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total sediment discharge (tons/day) is the sum of the suspended sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

7-day 10-year low flow ($7 Q_{10}$) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).

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. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65-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.

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

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.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that 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 associated with 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 water-suspended sediment sample that is retained on a 0.45 mm 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 analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 mm membrane filter. 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 determine when the results should be reported as “suspended, total.”

Determinations of “suspended, total” constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term “temperature recorder” is used in the table headings 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 that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 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) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment 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 all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross-section per unit of time. This term needs to be qualified, such as “total sediment discharge,” “total chloride discharge,” and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment 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, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation’s surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Water year in U.S. Geological Survey 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, 1992, is called the “1992 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.

WSP is used as an abbreviation for “Water-Supply Paper” in reference to previously published reports.

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. 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.”

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.

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.

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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.

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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.

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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.

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

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

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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.

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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.

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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.

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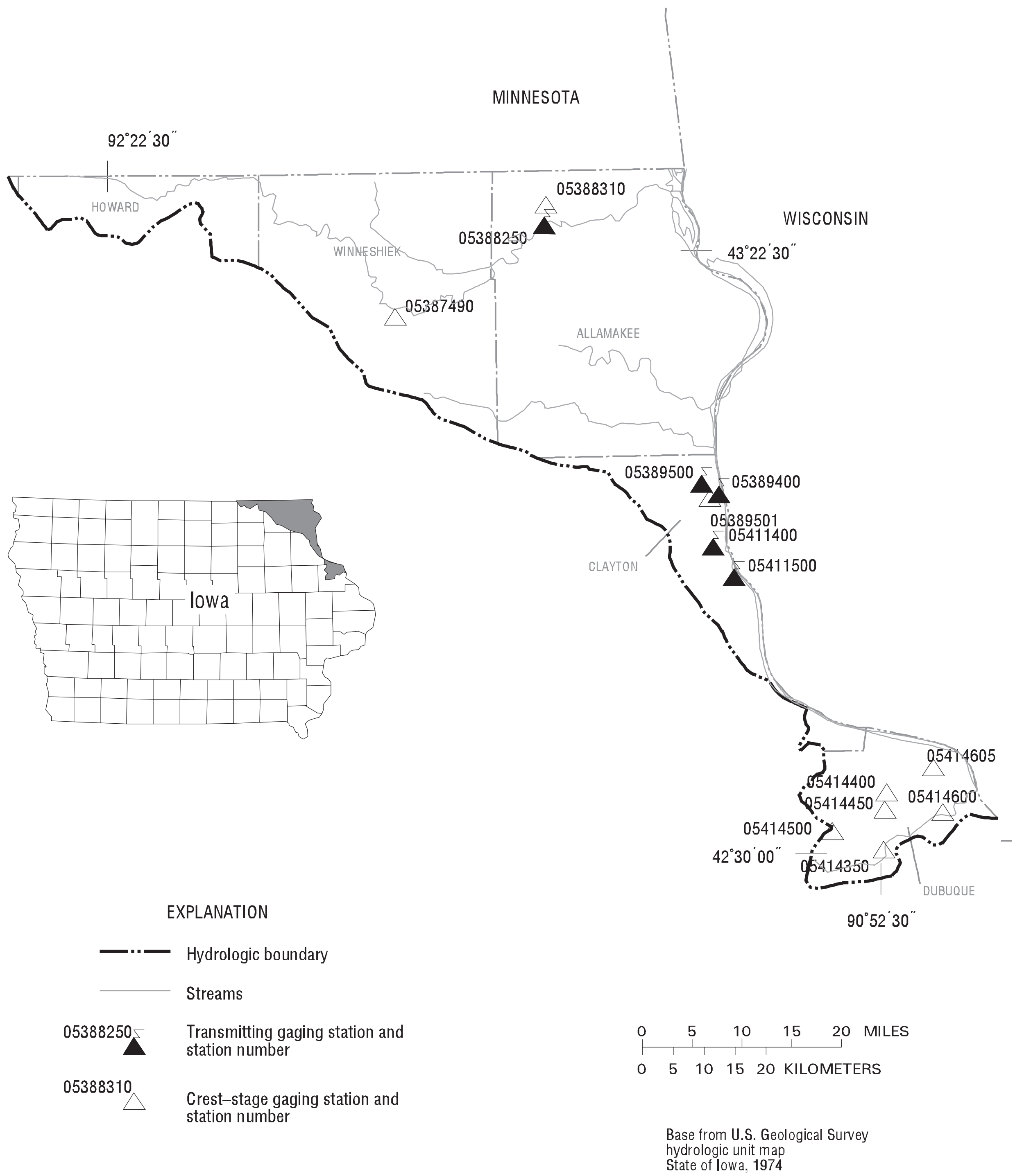
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WISCONSIN
92°22´30˝
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HOWARD
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ALLAMAKEE
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EXPLANATION
Hydrologic boundary
Streams
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Transmitting gaging station and station number
05388310
Crest–stage gaging station and station number
0 5 10 15 20 MILES
0 5 10 15 20 KILOMETERS
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA

LOCATION.--Lat 43°25'16", long 91°30'31", in $SW^1/_4$ $NW^1/_4$ sec.1, T.99 N., R.6 W., Allamakee County, Hydrologic Unit 07060002, on right bank at upstream side of bridge on State Highway 76, 650 ft. upstream from Mineral Creek, 0.5 mi upstream from Bear Creek, 3.5 mi south of Dorchester, and 18.1 mi upstream from mouth.

DRAINAGE AREA.--770 mi^2.

PERIOD OF RECORD.--September 1936 to September 1938 and October 1939 to June 1975(discharge measurements only), October 1938 to September 1939, July 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 660.00 ft. above sea level. Prior to Jan. 6, 1938, nonrecording gage on old bridge at site 0.2 mi upstream at datum 5.91 ft. higher. Jan. 6, 1938 to Apr. 26, 1948, nonrecording gage at datum 60.00 ft. lower, Apr. 27, 1948 to August 1963, nonrecording gage on old bridge and August 1963 to June 1975 nonrecording gage on new bridge at same datum.

REMARKS.--Estimated daily discharges: Dec. 13 to Jan. 3, Jan. 10, Jan. 13 to Feb. 8, and Mar. 10-14. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey satellite and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1941, reached a stage of 21.8 ft., from flood profile, discharge, 30,400 ft^3/s on basis of slope-area determination of peak flow.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	216	338	235	e180	e200	1250	2600	840	542	3680	484	933
2	201	330	230	e210	e210	1160	3320	806	601	2910	468	805
3	199	327	237	e220	e190	1060	2990	790	592	2510	475	701
4	195	318	239	235	e180	996	2420	754	555	2490	516	645
5	191	307	230	232	e170	949	2080	720	528	2160	529	599
6	185	300	220	223	e160	896	1860	688	507	1880	542	562
7	178	295	214	224	e170	838	1690	674	493	1740	503	532
8	178	293	212	227	e170	813	1570	773	477	1620	505	500
9	232	292	217	220	e180	782	1480	795	493	1530	479	476
10	233	288	221	e190	e190	e600	1350	772	535	1360	553	462
11	213	285	218	184	202	e500	1250	777	558	1240	561	446
12	217	283	213	208	202	e550	1160	761	798	1130	478	426
13	398	277	e190	e190	199	e500	1190	731	1040	1050	447	412
14	625	277	e170	e200	194	e550	1300	698	1140	981	436	418
15	710	282	e180	e210	196	621	1240	672	1050	916	428	409
16	752	272	e190	e220	376	599	1370	661	1040	852	408	391
17	652	260	e170	e200	1150	590	1440	630	1150	797	497	380
18	579	250	e170	e180	1600	596	1350	610	989	753	806	374
19	529	261	e160	e180	1360	614	1260	585	1620	786	558	370
20	489	252	e160	e160	1370	596	1180	566	1820	764	507	368
21	461	257	e150	e180	1150	580	1120	552	3420	1210	553	360
22	438	258	e140	e210	952	592	1050	531	3720	984	710	352
23	419	256	e150	e200	804	626	989	517	2740	823	730	345
24	404	244	e150	e190	768	693	938	550	2540	725	663	358
25	392	243	e160	e200	769	785	883	551	2600	665	577	351
26	377	254	e160	e190	798	879	905	531	2130	627	522	351
27	369	252	e150	e200	973	1100	913	534	1860	598	499	346
28	359	245	e140	e210	1230	1340	922	545	9150	573	755	333
29	352	245	e130	e200	---	1320	927	552	11100	540	1050	339
30	344	241	e120	e180	---	1350	888	528	6100	522	1580	348
31	340	---	e140	e190	---	1490	---	547	---	502	1140	---
TOTAL	11427	8282	5666	6243	16113	25815	43635	20241	61888	38918	18959	13692
MEAN	369	276	183	201	575	833	1455	653	2063	1255	612	456
MAX	752	338	239	235	1600	1490	3320	840	11100	3680	1580	933
MIN	178	241	120	160	160	500	883	517	477	502	408	333
AC-FT	22670	16430	11240	12380	31960	51200	86550	40150	122800	77190	37610	27160
CFSM	.48	.36	.24	.26	.75	1.08	1.89	.85	2.68	1.63	.79	.59
IN.	.55	.40	.27	.30	.78	1.25	2.11	.98	2.99	1.88	.92	.66

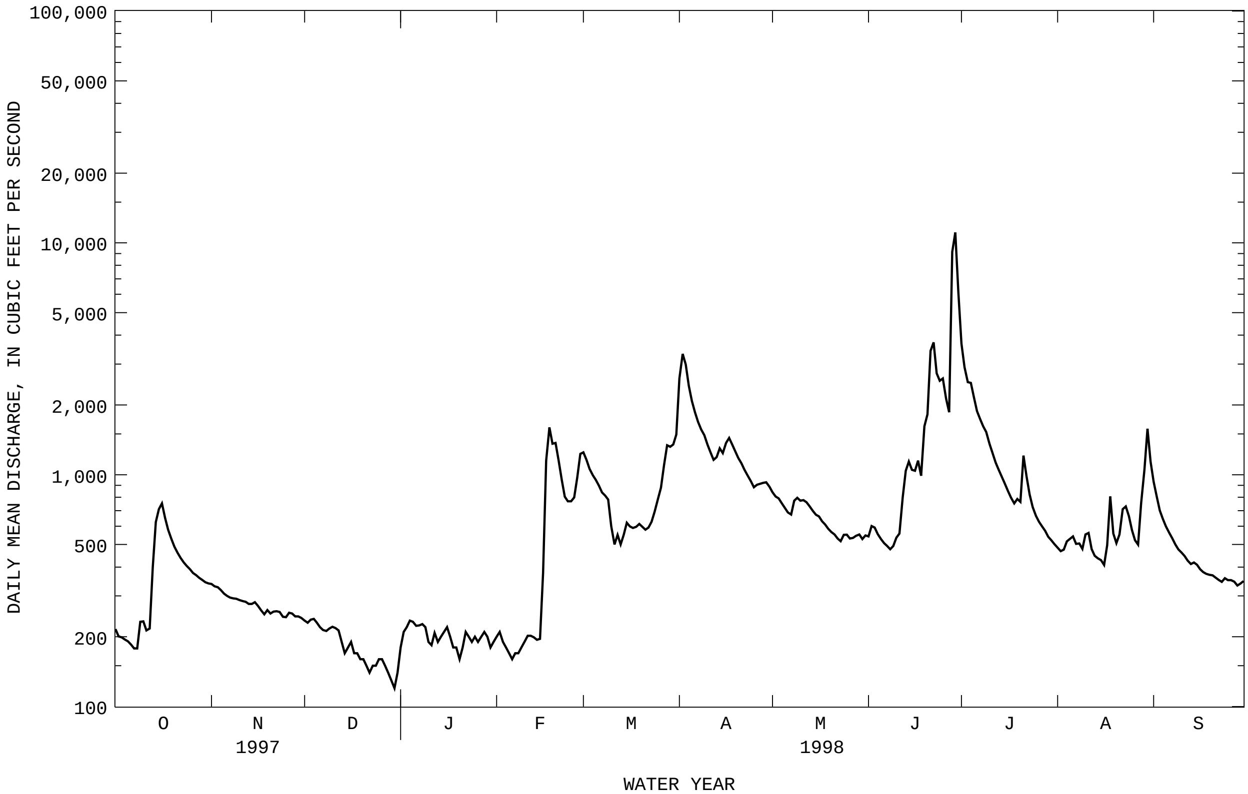
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	421	445	369	276	402	1085	1043	800	797	634	563	457
MAX	2045	1476	1421	836	1400	1922	3973	2066	2765	3318	3702	1334
(WY)	1987	1983	1983	1983	1984	1983	1993	1991	1993	1993	1993	1986
MIN	116	125	99.9	96.7	112	386	225	175	123	92.9	112	77.5
(WY)	1990	1990	1990	1977	1978	1981	1977	1977	1977	1939	1989	1939

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1939 - 1998a	
ANNUAL TOTAL	196570		270879			
ANNUAL MEAN	539		742		611	
HIGHEST ANNUAL MEAN					1726	1993
LOWEST ANNUAL MEAN					178	1977
HIGHEST DAILY MEAN	4110	Mar 23	11100	Jun 29	15100	Aug 17 1993
LOWEST DAILY MEAN	120	Dec 30	120	Dec 30	30	Sep 23 1939
ANNUAL SEVEN-DAY MINIMUM	143	Dec 25	143	Dec 25	49	Sep 20 1939
INSTANTANEOUS PEAK FLOW			12600	Jun 29	22000	Aug 17 1993
INSTANTANEOUS PEAK STAGE			16.65	Jun 29	20.00	Aug 17 1993
ANNUAL RUNOFF (AC-FT)	389900		537300		442600	
ANNUAL RUNOFF (CFSM)	.70		.96		.79	
ANNUAL RUNOFF (INCHES)	9.50		13.09		10.78	
10 PERCENT EXCEEDS	1040		1360		1310	
50 PERCENT EXCEEDS	352		528		367	
90 PERCENT EXCEEDS	193		190		140	

a Revised
e Estimated



05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA

LOCATION.--Lat 43°02'27", long 91°12'23", in Basil Giard Claim #1, sec.16, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001, on right bank 50 ft downstream from State Highway 18 bridge, 1.5 miles upstream from mouth at Mississippi River, and 1.5 miles west of Marquette.

DRAINAGE AREA.--34.1 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 624.818 ft above mean sea level.

REMARKS.--Estimated daily discharges: Dec. 12-15, Dec. 26 to Jan. 2, Jan. 15-20, and Mar. 10-15. Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	14	13	e9.5	12	20	116	15	19	31	19	27
2	15	14	12	e11	13	19	53	15	20	29	19	27
3	15	14	13	12	12	19	32	17	19	29	20	28
4	14	14	12	12	12	18	24	16	19	28	29	28
5	14	14	12	12	12	18	19	15	19	26	48	27
6	14	14	12	12	11	17	16	16	19	28	24	28
7	14	14	13	12	11	17	16	18	19	49	22	28
8	14	14	13	11	11	18	17	20	19	45	53	26
9	14	14	12	11	11	16	17	18	24	28	25	25
10	14	14	12	9.8	11	e14	15	18	22	26	59	25
11	14	14	12	11	11	e13	14	17	78	25	28	25
12	15	14	e11	11	12	e12	14	18	64	25	24	25
13	25	14	e10	11	11	e13	15	18	36	25	23	25
14	17	14	e9.5	11	11	e13	15	17	32	23	23	29
15	16	14	e11	e10	17	e14	14	18	30	23	40	27
16	15	13	12	e11	19	14	22	17	28	22	25	24
17	15	13	11	e10	16	15	19	17	32	22	125	23
18	14	13	12	e9.0	15	16	17	17	62	22	53	23
19	14	13	12	e10	14	16	17	18	59	23	41	23
20	14	13	11	e11	14	16	16	19	38	23	34	23
21	14	13	11	12	13	16	17	19	44	23	33	22
22	14	13	11	12	13	17	16	19	36	22	31	21
23	15	13	11	12	13	19	15	19	33	22	31	21
24	15	12	11	12	13	20	15	21	52	21	31	24
25	15	13	11	12	14	21	15	19	38	20	30	22
26	15	13	e10	12	15	25	17	19	33	20	28	22
27	15	13	e9.5	12	23	24	15	19	32	20	28	22
28	15	13	e9.5	12	21	22	15	19	132	20	34	21
29	14	13	e10	12	---	21	15	21	45	20	29	21
30	14	13	e9.0	12	---	69	15	20	35	20	28	21
31	14	---	e8.5	12	---	189	---	20	---	19	28	---
TOTAL	462	404	347.0	349.3	381	761	643	559	1138	779	1065	733
MEAN	14.9	13.5	11.2	11.3	13.6	24.5	21.4	18.0	37.9	25.1	34.4	24.4
MAX	25	14	13	12	23	189	116	21	132	49	125	29
MIN	14	12	8.5	9.0	11	12	14	15	19	19	19	21
AC-FT	916	801	688	693	756	1510	1280	1110	2260	1550	2110	1450
CFSM	.44	.39	.33	.33	.40	.72	.63	.53	1.11	.74	1.01	.72
IN.	.50	.44	.38	.38	.42	.83	.70	.61	1.24	.85	1.16	.80

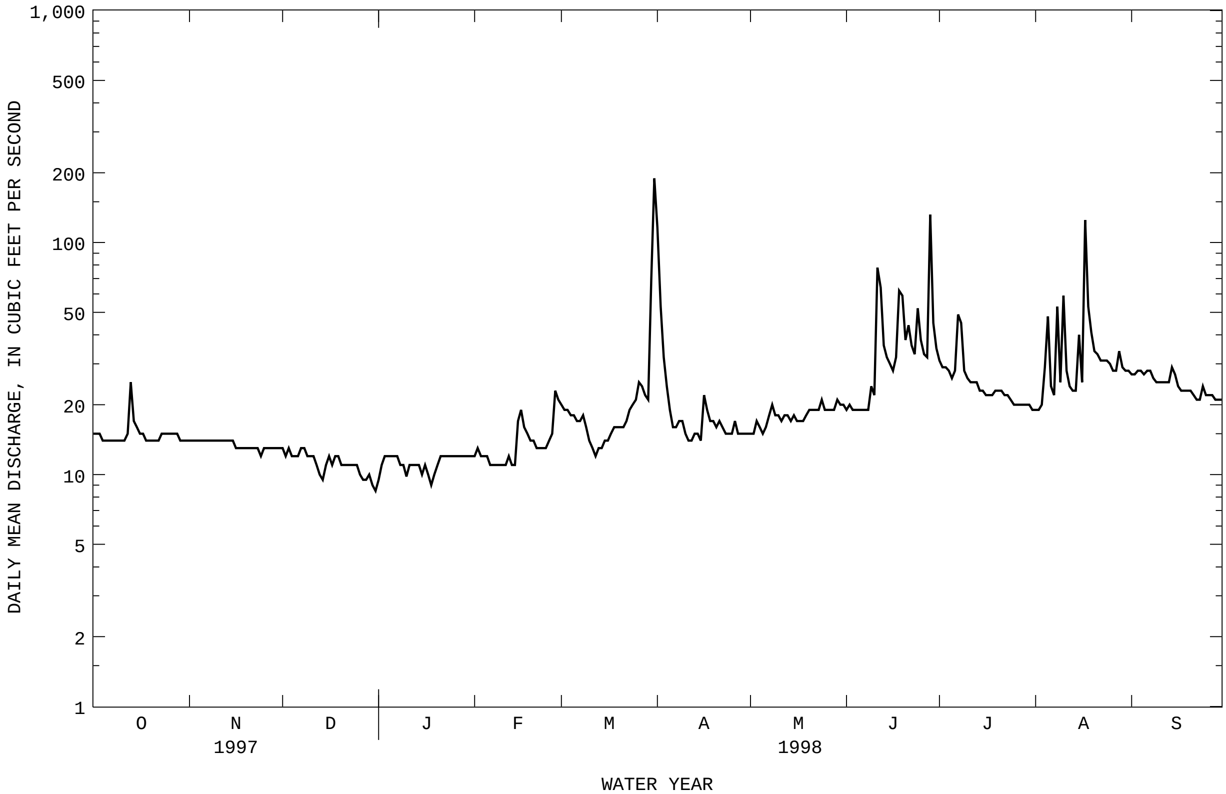
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	20.3	22.4	18.6	16.8	22.9	34.2	28.8	28.9	30.9	29.1	26.3	22.7
MAX	30.9	35.3	26.0	22.3	33.6	87.6	55.3	65.7	55.4	54.2	48.9	36.4
(WY)	1994	1992	1992	1992	1994	1993	1993	1993	1993	1993	1993	1993
MIN	14.9	13.5	11.2	11.3	13.6	20.0	15.2	17.3	16.4	15.9	12.9	13.7
(WY)	1998	1998	1998	1998	1998	1996	1997	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1992 - 1998	
ANNUAL TOTAL	6065.3		7621.3			
ANNUAL MEAN	16.6		20.9		25.2	
HIGHEST ANNUAL MEAN					42.1	1993
LOWEST ANNUAL MEAN					17.2	1997
HIGHEST DAILY MEAN	242	Feb 18	189	Mar 31	550	Mar 31 1993
LOWEST DAILY MEAN	7.3	Feb 17	8.5	Dec 31	7.3	Feb 17 1997
ANNUAL SEVEN-DAY MINIMUM	8.3	Feb 11	9.4	Dec 26	8.3	Feb 11 1997
INSTANTANEOUS PEAK FLOW			530	Aug 17	1820	Feb 18 1997
INSTANTANEOUS PEAK STAGE			6.39	Aug 17	7.68	Feb 18 1997
ANNUAL RUNOFF (AC-FT)	12030		15120		18240	
ANNUAL RUNOFF (CFSM)	.49		.61		.74	
ANNUAL RUNOFF (INCHES)	6.61		8.31		10.02	
10 PERCENT EXCEEDS	21		31		38	
50 PERCENT EXCEEDS	14		17		21	
90 PERCENT EXCEEDS	10		11		13	

e Estimated

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued



05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1991 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1991 to current year.
WATER TEMPERATURES: October 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 670 microsiemens Sept. 27, 1994; minimum daily, 140 microsiemens Oct. 14, 1997.
WATER TEMPERATURES: Maximum daily, 32.0℃ Aug. 17, 1998; minimum daily, 0.0℃ Jan. 7, 18-21, 1994, Jan. 5,7,8, Feb. 21, 1997.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,780 mg/L Mar. 31, 1993; minimum daily mean, 1 mg/L Oct. 30, 1994.
SEDIMENT LOADS: Maximum daily, 4,500 tons Mar. 31, 1993; minimum daily, 0.08 tons Oct. 30, 1994, Nov. 23-24, 1997, and Dec. 8, 1997.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 628 microsiemens Sept. 4; minimum daily, 140 microsiemens Oct. 14.
WATER TEMPERATURES: Maximum daily, 32.0℃ Aug. 17; minimum daily, 2.0℃ Feb. 13, 19, 24.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,300 mg/L Mar. 31; minimum daily mean, 2 mg/L Dec. 8.
SEDIMENT LOADS: Maximum daily, 773 tons Mar. 31; minimum daily, 0.08 tons Dec. 8.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
22...	1145	7.0	14	11	.42	36
DEC						
02...	1315	5.8	13	13	.45	40
JAN						
13...	1445	1.4	11	8	.24	54
FEB						
24...	1530	9.7	14	32	1.2	27
MAY						
19...	1610	18.6	19	12	.60	42
JUN						
23...	1530	18.1	32	58	5.0	66
AUG						
04...	1610	15.8	33	29	2.6	53
SEP						
29...	0820	13.3	21	26	1.5	44

DATE	TIME	NUMBER OF SAM-PLING POINTS (COUNT) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)
OCT							
22...	1000	1	4	5	9	27	32
SEP							
29...	0820	1	2	3	8	38	49

DATE	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)	BED MAT. SIEVE DIAM. % FINER THAN 64.0 MM (80174)
OCT						
22...	33	34	36	46	60	100
SEP						
29...	53	56	62	71	100	--

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	467	---	434	424	---	---	446	451	622	399	---	491
2	450	---	443	445	519	536	439	---	596	399	---	497
3	399	411	408	---	573	566	443	---	570	382	528	538
4	---	424	401	---	564	507	---	462	527	---	527	628
5	---	408	442	422	510	499	---	423	520	---	527	---
6	473	442	---	428	467	500	554	460	---	400	468	---
7	583	443	---	462	---	---	459	420	---	386	481	472
8	582	---	421	406	---	---	438	---	555	418	---	445
9	434	---	418	400	546	523	520	---	529	419	---	491
10	---	418	471	---	471	624	424	---	435	398	477	468
11	392	418	487	---	508	540	---	548	524	---	501	---
12	---	441	500	448	---	553	---	471	584	---	505	---
13	---	426	---	449	537	537	447	513	---	434	438	---
14	140	414	---	487	---	---	429	443	---	381	507	442
15	466	---	408	443	---	---	475	521	561	---	---	470
16	462	---	409	420	484	---	425	---	432	---	---	519
17	250	544	436	---	460	421	463	---	413	---	522	521
18	233	470	403	---	553	---	---	427	571	---	516	474
19	---	436	422	481	532	---	---	431	544	---	531	---
20	---	498	419	454	435	---	456	---	---	388	453	---
21	247	456	403	412	---	---	440	---	---	483	493	412
22	414	---	428	405	---	---	406	---	543	400	---	418
23	421	---	463	468	522	---	416	---	---	391	---	412
24	420	513	465	---	554	480	468	---	---	430	426	481
25	---	442	436	---	---	---	---	---	---	---	460	---
26	---	447	420	434	---	---	---	---	---	---	509	519
27	408	485	---	436	---	---	407	---	---	411	568	---
28	411	470	---	410	---	---	437	---	---	402	550	564
29	427	---	459	537	---	498	447	---	---	397	---	536
30	441	---	433	529	---	497	422	---	---	439	---	512
31	424	---	462	---	---	498	---	---	---	404	473	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

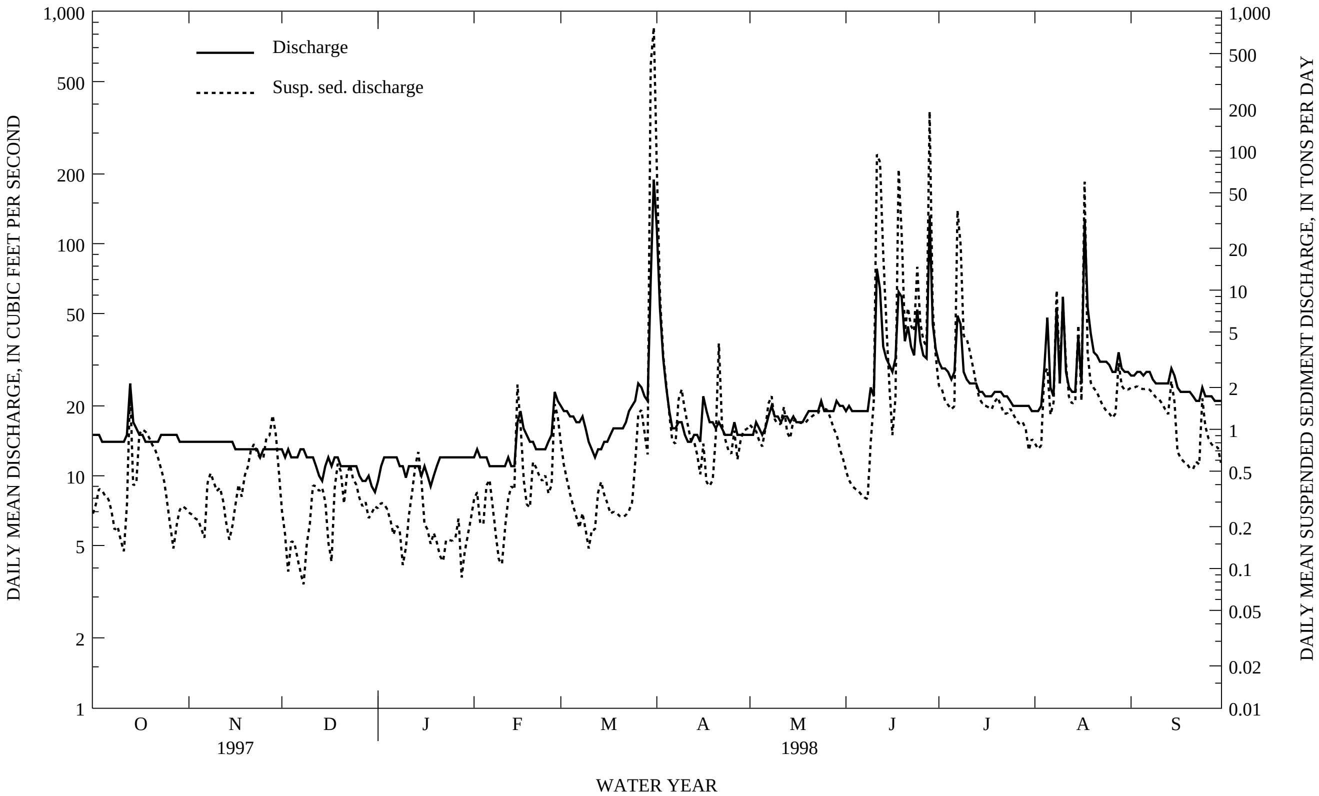
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	---	6.0	4.0	---	---	5.0	6.0	23.0	19.0	---	27.0
2	15.0	---	5.0	3.0	3.0	7.0	6.0	---	23.0	20.0	---	29.0
3	17.0	7.0	6.0	---	4.0	7.0	5.0	---	23.0	19.0	30.0	28.0
4	---	8.0	5.0	---	4.0	7.0	---	7.0	20.0	---	31.0	28.0
5	---	9.0	5.0	4.0	4.0	6.0	---	6.0	22.0	---	29.0	---
6	17.0	8.0	---	4.0	3.0	6.0	5.0	5.0	---	20.0	30.0	---
7	16.0	6.0	---	5.0	---	---	6.0	7.0	---	19.0	29.0	29.0
8	11.0	---	6.0	4.0	---	---	---	7.0	21.0	20.0	---	30.0
9	15.0	---	4.0	3.0	4.0	7.0	---	---	22.0	25.0	---	29.0
10	---	7.0	4.0	---	3.0	6.0	6.0	---	20.0	24.0	29.0	30.0
11	13.0	6.0	5.0	---	3.0	7.0	---	---	22.0	---	28.0	30.0
12	---	5.0	6.0	4.0	3.0	6.0	---	8.0	21.0	---	30.0	---
13	---	7.0	---	4.0	2.0	6.0	5.0	8.0	---	20.0	31.0	---
14	12.0	6.0	---	3.0	---	---	5.0	7.0	---	21.0	31.0	28.0
15	10.0	---	5.0	4.0	---	---	7.0	7.0	20.0	---	---	29.0
16	10.0	---	4.0	4.0	3.0	---	6.0	---	21.0	---	---	---
17	12.0	---	5.0	---	4.0	4.5	5.0	---	22.0	---	32.0	27.0
18	11.0	4.0	6.0	---	3.0	---	---	8.0	25.0	---	30.0	29.0
19	---	5.0	6.0	4.0	2.0	---	---	7.0	24.0	---	30.0	---
20	---	4.0	---	3.0	3.0	---	6.0	---	---	17.0	29.0	---
21	10.0	5.0	---	5.0	---	---	6.0	---	---	19.0	29.0	30.0
22	10.0	---	5.0	5.0	---	---	7.0	---	26.0	20.0	---	29.0
23	9.0	---	5.0	4.0	3.0	---	5.0	---	---	21.0	---	27.0
24	6.0	5.0	5.0	---	2.0	8.0	6.0	---	---	23.0	29.0	30.0
25	---	6.0	4.0	---	---	---	---	---	---	---	29.0	---
26	---	9.0	5.0	4.0	---	---	---	---	---	---	30.0	20.0
27	7.0	9.0	---	3.0	---	---	6.0	---	---	21.0	29.0	---
28	7.0	7.0	---	4.0	---	---	5.0	---	---	21.0	31.0	19.0
29	8.0	---	6.0	3.0	---	7.0	5.0	---	---	19.0	---	20.0
30	7.0	---	4.0	4.0	---	8.0	7.0	---	---	20.0	---	17.0
31	7.0	---	5.0	---	---	8.0	---	---	---	22.0	30.0	---

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	6	.25	7	.25	8	.26	10	.27	10	.32	15	.80
2	7	.29	6	.24	5	.17	9	.30	10	.35	11	.55
3	9	.37	6	.23	3	.09	9	.29	7	.21	8	.43
4	9	.36	6	.22	5	.16	8	.27	7	.21	7	.34
5	9	.33	5	.19	5	.15	7	.22	13	.40	6	.28
6	8	.31	4	.17	4	.12	5	.17	14	.43	5	.23
7	7	.26	11	.41	3	.09	6	.20	9	.28	4	.20
8	5	.19	13	.48	2	.08	6	.19	6	.18	5	.25
9	5	.20	11	.42	4	.15	4	.11	4	.12	4	.19
10	4	.16	10	.36	7	.21	5	.14	4	.11	3	.14
11	4	.13	10	.38	13	.40	8	.24	7	.19	5	.19
12	6	.29	8	.31	13	.39	12	.35	10	.32	6	.19
13	27	2.0	6	.21	14	.36	19	.54	13	.39	10	.35
14	9	.40	4	.16	14	.38	23	.69	12	.37	12	.42
15	10	.41	5	.20	10	.30	16	.43	35	2.1	9	.34
16	23	.93	8	.29	5	.15	7	.21	18	1.1	8	.29
17	25	1.0	11	.40	4	.11	7	.19	10	.44	6	.25
18	25	.96	9	.33	12	.38	6	.15	7	.29	6	.26
19	24	.89	13	.47	18	.57	6	.18	7	.28	6	.25
20	21	.79	15	.54	16	.50	5	.15	16	.58	6	.24
21	19	.72	20	.71	10	.29	4	.12	15	.53	5	.23
22	16	.62	22	.79	15	.48	4	.11	13	.47	5	.24
23	13	.52	23	.68	18	.55	5	.16	12	.43	5	.26
24	10	.42	23	.62	15	.44	5	.16	13	.47	6	.30
25	7	.29	21	.62	13	.40	5	.16	9	.35	10	.57
26	5	.20	25	.87	12	.32	5	.17	10	.40	19	1.3
27	4	.14	26	.90	11	.28	7	.23	24	1.5	21	1.4
28	5	.20	36	1.3	11	.30	3	.09	22	1.2	16	.95
29	7	.26	27	.93	9	.23	4	.13	---	---	12	.66
30	7	.28	14	.50	11	.25	5	.17	---	---	576	416
31	7	.27	---	---	11	.28	7	.23	---	---	1300	773
TOTAL	---	14.44	---	14.18	---	8.84	---	7.02	---	14.02	---	1201.10

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	212	71	26	1.1	10	.51	24	2.1	15	.79	27	2.0
2	62	9.3	25	1.0	8	.43	25	1.9	14	.72	27	2.0
3	40	3.5	22	.98	8	.39	21	1.6	14	.76	26	2.0
4	33	2.1	19	.83	7	.37	20	1.5	29	2.5	26	2.0
5	25	1.3	18	.75	7	.36	20	1.4	19	2.7	26	1.9
6	19	.82	24	1.0	7	.34	20	1.5	20	1.3	26	2.0
7	19	.79	31	1.5	6	.32	133	37	26	1.5	25	1.9
8	35	1.6	32	1.7	6	.32	143	21	63	10	25	1.8
9	42	1.9	24	1.2	12	.80	62	4.7	35	2.4	24	1.7
10	34	1.4	23	1.1	28	1.6	63	4.4	49	8.3	24	1.7
11	27	1.1	23	1.1	363	95	53	3.6	41	3.0	22	1.5
12	22	.83	30	1.5	466	83	42	2.8	26	1.7	20	1.4
13	20	.82	19	.96	189	19	33	2.2	25	1.5	18	1.3
14	17	.66	19	.86	69	6.0	26	1.7	26	1.6	26	2.2
15	13	.47	24	1.1	25	2.1	25	1.5	51	5.6	21	1.6
16	13	.79	25	1.2	12	.91	25	1.5	24	1.6	10	.69
17	8	.42	25	1.1	20	1.7	24	1.4	122	60	9	.62
18	9	.39	24	1.1	266	74	23	1.4	27	3.5	9	.58
19	10	.43	23	1.1	119	25	25	1.6	22	2.2	9	.57
20	20	.89	24	1.2	49	5.1	27	1.7	23	2.0	8	.52
21	92	4.1	24	1.2	63	7.4	24	1.5	22	1.9	8	.52
22	25	1.1	25	1.3	56	5.5	21	1.3	20	1.6	10	.58
23	21	.86	26	1.3	57	5.1	22	1.3	18	1.5	9	.56
24	17	.71	26	1.5	98	15	25	1.4	17	1.4	25	1.7
25	16	.67	27	1.4	57	5.8	24	1.3	17	1.3	17	1.0
26	21	.98	27	1.4	49	4.4	22	1.2	17	1.2	14	.86
27	15	.61	23	1.2	45	3.9	20	1.1	18	1.3	13	.78
28	21	.83	20	1.0	377	192	21	1.1	35	3.0	12	.75
29	25	.98	16	.92	59	7.4	19	1.0	27	2.1	12	.74
30	25	1.0	14	.73	35	3.3	13	.71	26	1.9	10	.58
31	---	---	12	.62	---	---	16	.85	26	1.9	---	---
TOTAL	---	112.35	---	34.95	---	567.05	---	109.26	---	132.77	---	38.05
YEAR		2254.03										


Discharge
Susp. sed. discharge
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
DAILY MEAN SUSPENDED SEDIMENT DISCHARGE, IN TONS PER DAY
1,000
500
200
100
50
20
10
5
2
1
1,000
500
200
100
50
20
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1997
1998
WATER YEAR

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--December 1991 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Water years 1992-1995 in files at the District office. Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.92 in., June 20, 1994.

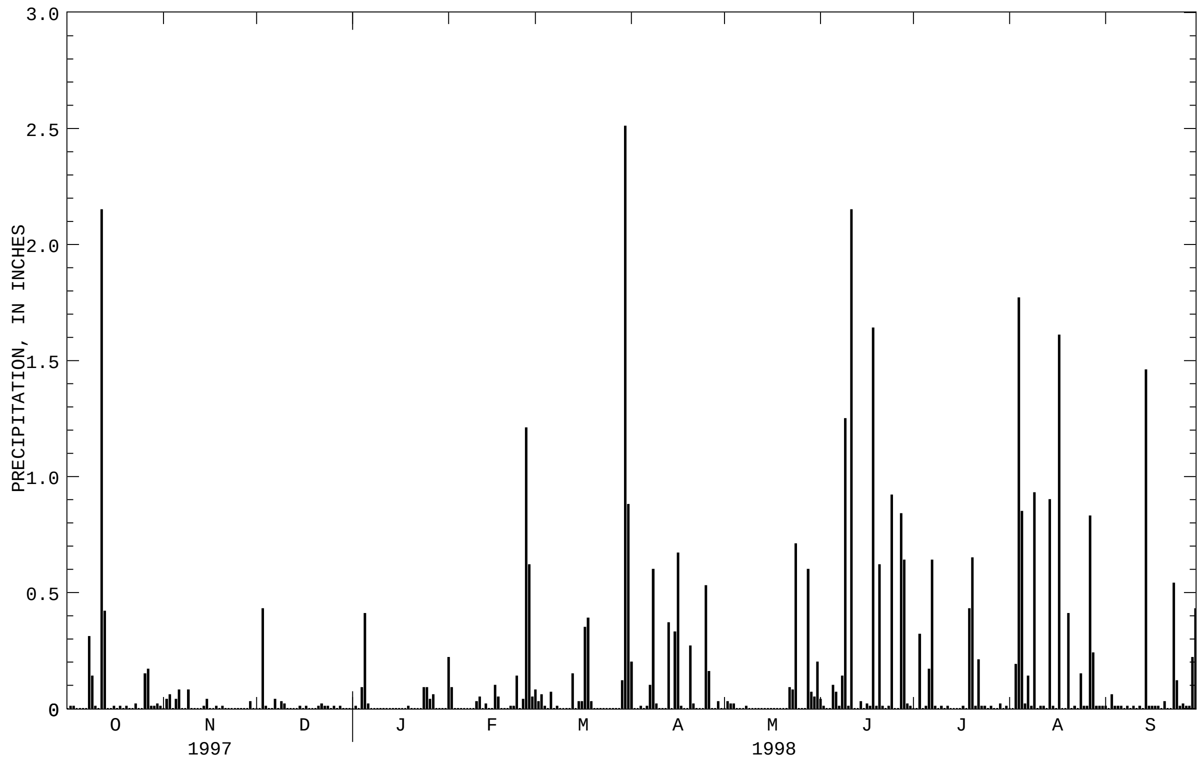
EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.51 in., Mar. 30.

ACCUMULATED PRECIPITATION, IN INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998 DAILY SUMMATION VALUES

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.22	.08	.20	.00	.04	.00	.00	.01
2	.01	.04	.00	.01	.09	.03	.00	.03	.01	.00	.00	.00
3	.01	.06	.43	.00	.00	.06	.00	.02	.00	.32	.19	.06
4	.00	.00	.01	.09	.00	.01	.01	.02	.00	.00	1.77	.01
5	.00	.04	.00	.41	.00	.00	.00	.00	.10	.01	.85	.01
6	.00	.08	.00	.02	.00	.07	.01	.00	.07	.17	.02	.01
7	.00	.00	.04	.00	.00	.00	.10	.00	.01	.64	.14	.00
8	.31	.00	.00	.00	.00	.01	.60	.01	.14	.01	.01	.01
9	.14	.08	.03	.00	.00	.00	.02	.00	1.25	.00	.93	.00
10	.01	.00	.02	.00	.03	.00	.00	.00	.01	.01	.00	.01
11	.00	.00	.00	.00	.05	.00	.00	.00	2.15	.00	.01	.00
12	2.15	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.01
13	.42	.00	.00	.00	.02	.15	.37	.00	.00	.00	.00	.00
14	.00	.01	.00	.00	.00	.00	.00	.00	.03	.00	.90	1.46
15	.00	.04	.01	.00	.00	.03	.33	.00	.00	.00	.01	.01
16	.01	.00	.00	.00	.10	.03	.67	.00	.02	.00	.00	.01
17	.00	.00	.01	.00	.05	.35	.01	.00	.01	.01	1.61	.01
18	.01	.01	.00	.00	.00	.39	.00	.00	1.64	.00	.00	.01
19	.00	.00	.00	.01	.00	.03	.00	.00	.01	.43	.00	.00
20	.01	.01	.00	.00	.00	.00	.27	.00	.62	.65	.41	.03
21	.00	.00	.01	.00	.01	.00	.02	.00	.01	.01	.00	.00
22	.00	.00	.02	.00	.01	.00	.00	.09	.00	.21	.01	.00
23	.02	.00	.01	.00	.14	.00	.00	.08	.01	.01	.00	.54
24	.00	.00	.01	.09	.00	.00	.00	.71	.92	.01	.15	.12
25	.00	.00	.00	.09	.04	.00	.53	.00	.00	.00	.01	.01
26	.15	.00	.01	.04	1.21	.00	.16	.00	.00	.01	.01	.02
27	.17	.00	.00	.06	.62	.00	.00	.00	.84	.00	.83	.01
28	.01	.00	.01	.00	.05	.00	.00	.60	.64	.00	.24	.01
29	.01	.03	.00	.00	---	.12	.03	.07	.02	.02	.01	.22
30	.02	.00	.00	.00	---	2.51	.00	.05	.01	.00	.01	.43
31	.01	---	.00	.00	---	.88	---	.20	---	.01	.01	---
TOTAL	3.47	0.40	0.62	0.82	2.64	4.75	3.33	1.88	8.56	2.54	8.14	3.02
MEAN	.11	.01	.02	.03	.09	.15	.11	.06	.29	.08	.26	.10
MAX	2.15	.08	.43	.41	1.21	2.51	.67	.71	2.15	.65	1.77	1.46
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued



05389500 MISSISSIPPI RIVER AT MCGREGOR, IA

LOCATION.--Lat 43°01'29", long 91°10'21", in $SE^1/_4$ $SE^1/_4$ sec.22, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001, on right bank in city park at east end of Main Street in McGregor, 2.6 mi upstream from Wisconsin River, 4.3 mi downstream from Yellow River, and at mile 633.4 upstream from Ohio River.

DRAINAGE AREA.--67,500 mi^2, approximately.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 604.84 ft above sea level. Prior to June 1, 1937, and since June 2, 1939, auxiliary water-stage recorder; June 1, 1937 to June 1, 1939, auxiliary nonrecording gage 14.1 mi upstream in tailwater of dam 9, at datum 5.30 ft lower.

REMARKS.--Estimated daily discharges: Dec. 31 to Jan. 2, Jan. 10-31, April 26, 27, and Sept. 13-22, 25-28. Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. U.S. Geological Survey satellite and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1828, that of Apr. 24, 1965.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31300	30300	24400	e20000	27500	62500	70000	57200	39400	95400	27300	22700
2	28800	31000	22200	e20000	27200	66800	76400	53900	39700	104000	27100	20000
3	25600	30700	23500	19600	26300	69700	85800	52700	39700	106000	26100	17400
4	23600	29600	24900	19900	25800	73400	94700	50000	37700	104000	25400	15300
5	22800	29000	25600	20800	24400	77600	104000	46900	35100	99300	27200	14800
6	24200	30000	26700	22400	23200	81000	113000	44600	34200	93500	30600	14600
7	27200	30500	26600	23600	22200	82000	121000	43800	34300	88000	33300	14900
8	26700	30600	25700	23400	21600	81400	125000	43100	35500	83800	29000	15300
9	26800	30300	25400	23400	20100	79000	125000	43600	38300	79400	21000	15400
10	28100	30200	25400	e24500	18300	73900	123000	44800	40500	75000	24700	14800
11	27100	29600	25400	e22500	18100	66900	120000	44700	40100	70500	34300	14400
12	25400	29000	25500	e20000	22000	58900	115000	40700	40500	64400	36100	14300
13	26800	29000	25500	e19000	22800	56000	112000	34500	38400	56900	24100	e15000
14	34300	28800	26500	e16000	24000	56300	109000	32700	36300	53300	17700	e17000
15	38500	29100	27300	e14000	24700	52800	103000	34100	35700	50300	19800	e19000
16	40200	29300	26200	e12500	25000	43200	101000	37600	37200	47200	26200	e18000
17	42000	27600	24300	e13000	25300	36000	97500	42100	39300	44400	26900	e16000
18	42600	26200	23200	e15000	27700	39500	93200	41100	41100	42200	26200	e15000
19	42400	25000	23100	e18000	32200	43300	90300	39800	43800	41200	24800	e14000
20	41100	23500	23900	e21500	40100	43100	88400	40400	45700	40500	28300	e14000
21	39300	21700	24000	e25000	45600	43200	85800	42100	48800	40200	34800	e13000
22	36000	18800	23900	e27000	47100	43000	83400	43000	49100	41200	33200	e15000
23	31400	18400	23400	e26000	47300	40600	80400	43000	48900	42200	25000	17100
24	30600	22000	22200	e25500	47900	35500	77900	42900	49300	39700	26100	16800
25	30700	28400	20800	e25000	47300	32800	74900	41100	50300	37400	36100	e16000
26	31400	30800	19700	e24500	48700	34100	e73000	40600	52100	33000	36200	e16000
27	31900	29500	19500	e24500	54700	35400	e70000	39700	54200	30800	28200	e15000
28	29600	28700	19700	e24500	58100	39900	66400	37800	62000	27600	18600	e17000
29	29300	28300	19500	e24500	---	47700	63700	36500	73100	25500	21300	21100
30	29400	27100	21200	e25000	---	54600	60600	35300	84000	26300	22000	24000
31	29200	---	e21000	e25500	---	63800	---	35700	---	27200	23400	---
TOTAL	974300	833000	736200	666100	895200	1713900	2803400	1306000	1344300	1810400	841000	492900
MEAN	31430	27770	23750	21490	31970	55290	93450	42130	44810	58400	27130	16430
MAX	42600	31000	27300	27000	58100	82000	125000	57200	84000	106000	36200	24000
MIN	22800	18400	19500	12500	18100	32800	60600	32700	34200	25500	17700	13000
AC-FT	1933000	1652000	1460000	1321000	1776000	3400000	5561000	2590000	2666000	3591000	1668000	977700
CFSM	.47	.41	.35	.32	.47	.82	1.38	.62	.66	.87	.40	.24
IN.	.54	.46	.41	.37	.49	.94	1.54	.72	.74	1.00	.46	.27

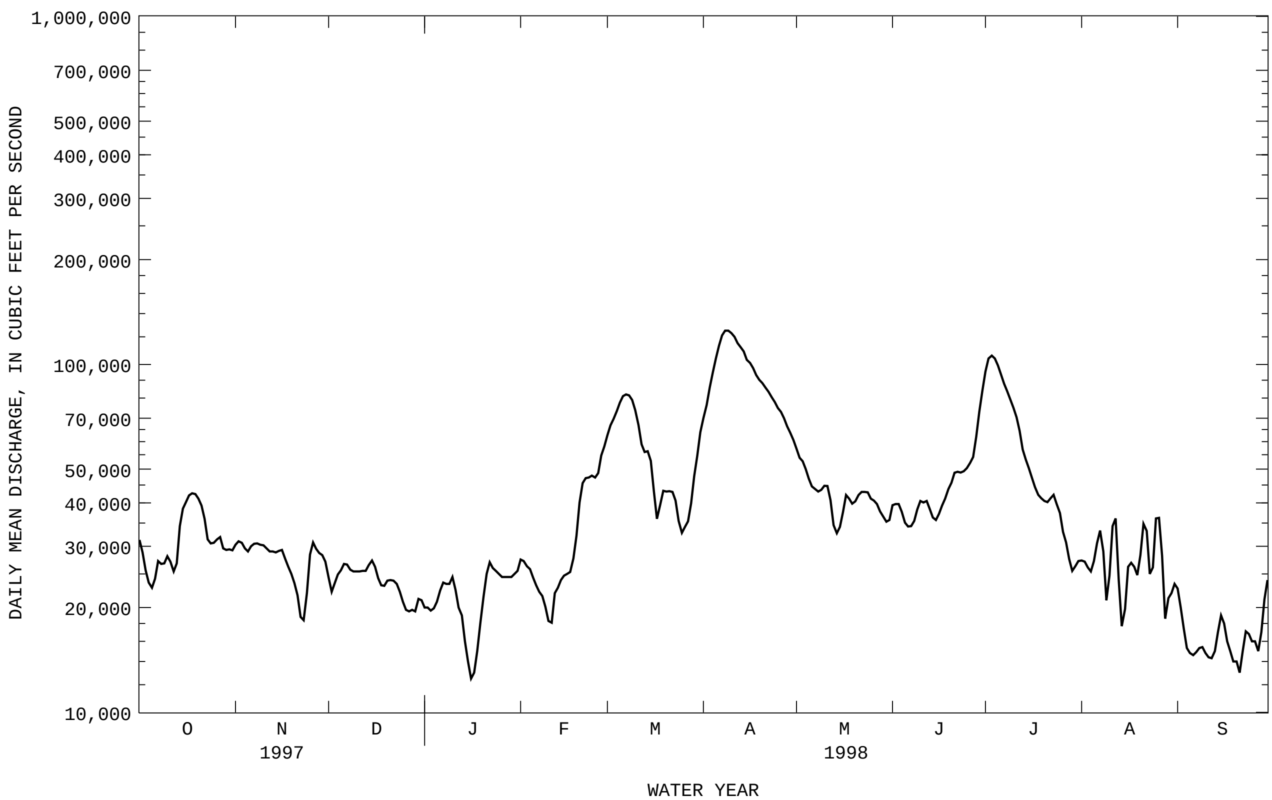
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	28920	29340	22300	19220	19900	39640	75660	61090	48880	40820	27920	28820
MAX	114600	64840	59200	35700	48540	103800	164800	119200	112600	142200	84430	72890
(WY)	1987	1983	1992	1983	1984	1983	1965	1975	1993	1993	1993	1986
MIN	9874	10870	9506	7665	9934	13190	27780	18240	13420	11220	10330	10650
(WY)	1937	1938	1937	1940	1940	1940	1990	1977	1988	1988	1964	1940

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1936 - 1998	
ANNUAL TOTAL	18189400		14416700			
ANNUAL MEAN	49830		39500		36930	
HIGHEST ANNUAL MEAN					64720	1993
LOWEST ANNUAL MEAN					17400	1977
HIGHEST DAILY MEAN	200000	Apr 16	125000	Apr 8	276000	Apr 24 1965
LOWEST DAILY MEAN	18400	Nov 23	12500	Jan 16	6200	Dec 9 1936
ANNUAL SEVEN-DAY MINIMUM	20200	Dec 25	14800	Sep 6	6490	Dec 7 1936
INSTANTANEOUS PEAK FLOW			126000	Apr 8		
INSTANTANEOUS PEAK STAGE			17.33	Apr 9	25.38	Apr 24 1965
ANNUAL RUNOFF (AC-FT)	36080000		28600000		26750000	
ANNUAL RUNOFF (CFSM)	.74		.59		.55	
ANNUAL RUNOFF (INCHES)	10.02		7.95		7.43	
10 PERCENT EXCEEDS	92500		77700		75700	
50 PERCENT EXCEEDS	35600		30700		27300	
90 PERCENT EXCEEDS	25600		18700		13200	

e Estimated



05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected from right bank dock 0.3 mi downstream from discharge station. Prior to April 1981, and March 7 to Sept. 30, 1997, samples collected at bridge on U.S. Highway 18, 1.2 mi upstream from gage.

PERIOD OF RECORD.--July 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1975 to current year.
WATER TEMPERATURES: July 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: July 1975 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 633 microsiemens Nov. 3, 1996; minimum daily, 190 microsiemens Sept. 29, 1980.
WATER TEMPERATURES: Maximum daily, 30.0°C July 7, 1977; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,350 mg/L Mar. 19, 1986; minimum daily mean, 1 mg/L on many days in 1977-92.
SEDIMENT LOADS: Maximum daily, 363,000 tons Mar. 19, 1986; minimum daily, 31 tons Dec. 25, 1976.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 513 microsiemens Apr. 27; minimum daily, 337 microsiemens April 1.
WATER TEMPERATURES: Maximum daily, 29.0°C, Sept. 9; minimum daily, 2.0°C Nov. 19, 21, and Jan. 1, 9, 14.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 74 mg/L Mar. 27; minimum daily mean, 3 mg/L Jan. 13, 14, and 22-30.
SEDIMENT LOADS: Maximum daily, 9,770 tons Apr. 3; minimum daily, 136 tons Jan. 16.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
23...	1245	9.6	48800	12	1580	86
NOV						
18...	1215	.9	41700	22	2480	52
APR						
01...	1315	--	82200	128	28400	84
MAY						
19...	1245	21.3	48000	43	5570	96
JUN						
23...	1230	24.6	58600	48	7590	95
AUG						
04...	1210	--	35200	33	3140	91
SEP						
30...	1130	20.8	36100	77	7510	98

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	390	---	432	469	---	---	337	487	428	416	---	---
2	---	---	---	---	426	464	---	---	---	---	---	419
3	404	453	426	---	---	---	342	---	426	416	422	---
4	---	---	---	---	448	470	---	476	---	---	---	422
5	---	434	440	470	---	---	---	---	484	---	421	---
6	399	---	---	---	446	472	492	476	---	414	---	---
7	---	418	---	468	---	---	---	---	---	---	425	422
8	403	---	422	---	---	---	494	478	428	415	---	---
9	---	---	---	472	424	470	---	---	---	---	---	420
10	---	420	---	---	---	---	490	---	486	406	424	---
11	401	---	---	---	424	475	---	479	---	---	---	408
12	---	414	442	486	---	---	---	---	430	---	419	---
13	---	---	---	---	426	470	490	478	---	404	---	---
14	403	413	---	481	---	---	---	---	---	---	430	416
15	---	---	446	476	---	---	492	---	431	---	---	---
16	420	---	448	---	420	466	---	---	---	---	---	418
17	---	425	456	---	---	---	493	---	430	---	424	---
18	427	420	---	---	422	466	---	---	---	---	---	414
19	---	448	456	469	---	---	---	---	430	---	421	---
20	---	---	---	---	424	450	490	---	---	406	---	---
21	418	436	---	466	---	---	---	---	---	---	428	415
22	397	---	464	---	---	---	492	---	432	406	---	---
23	360	---	---	468	423	442	---	---	---	---	---	416
24	423	436	469	---	---	---	494	---	---	407	423	---
25	---	---	---	---	---	450	---	---	---	---	---	412
26	---	441	464	465	---	---	---	---	---	---	424	---
27	443	---	---	---	---	444	513	---	---	407	---	---
28	---	431	---	477	---	---	---	---	---	---	421	414
29	440	---	469	---	---	---	480	---	---	349	---	---
30	---	---	---	476	---	438	---	---	---	---	---	413
31	461	---	460	---	---	---	---	---	---	350	424	---

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	---	4.0	2.0	---	---	4.0	8.0	22.0	22.0	---	---
2	---	---	---	---	4.0	5.0	---	---	---	---	---	27.0
3	21.0	5.0	5.0	---	---	---	3.0	---	21.0	23.0	24.0	---
4	---	---	---	---	5.0	6.0	---	7.0	---	---	---	28.0
5	---	7.0	3.0	3.0	---	---	---	---	22.0	---	26.0	---
6	20.0	---	---	---	5.0	5.0	4.0	8.0	---	22.0	---	---
7	---	6.0	---	4.0	---	---	---	---	---	---	---	28.0
8	21.0	---	4.0	---	---	---	5.0	9.0	20.0	21.0	---	---
9	---	---	---	2.0	5.0	6.0	---	---	---	---	---	29.0
10	---	5.0	---	---	---	---	5.0	---	21.0	26.0	---	---
11	17.0	---	---	---	4.0	6.0	---	7.0	---	---	---	25.0
12	---	4.0	4.0	3.0	---	---	---	---	22.0	---	---	---
13	---	---	---	---	3.0	5.0	4.0	8.0	---	23.0	---	---
14	15.0	5.0	---	2.0	---	---	---	---	---	---	---	23.0
15	---	---	4.0	---	---	---	6.0	---	23.0	---	---	---
16	12.0	---	3.0	---	4.0	5.0	---	---	---	---	---	22.0
17	---	3.0	4.0	---	---	---	4.0	---	24.0	---	---	---
18	14.0	---	---	---	5.0	5.0	---	---	---	---	---	23.0
19	---	2.0	5.0	---	---	---	---	---	23.0	---	---	---
20	---	---	---	---	4.0	6.0	5.0	---	---	22.0	---	---
21	11.0	2.0	---	4.0	---	---	---	---	---	---	---	22.0
22	10.0	---	4.0	---	---	---	6.0	---	24.0	23.0	---	---
23	9.5	---	---	4.0	4.0	5.0	---	---	---	---	---	20.0
24	7.0	3.0	4.0	---	---	---	5.0	---	---	25.0	---	---
25	---	---	---	---	---	6.0	---	---	---	---	---	21.0
26	---	4.0	2.5	3.0	---	---	---	---	---	---	---	---
27	9.0	---	---	---	---	5.0	5.0	---	---	25.0	---	---
28	---	5.0	---	3.0	---	---	---	---	---	---	---	19.0
29	8.0	---	5.0	---	---	---	7.0	---	---	21.0	---	---
30	---	---	---	3.0	---	8.0	---	---	---	---	---	19.0
31	9.0	---	4.0	---	---	---	---	---	---	20.0	---	---

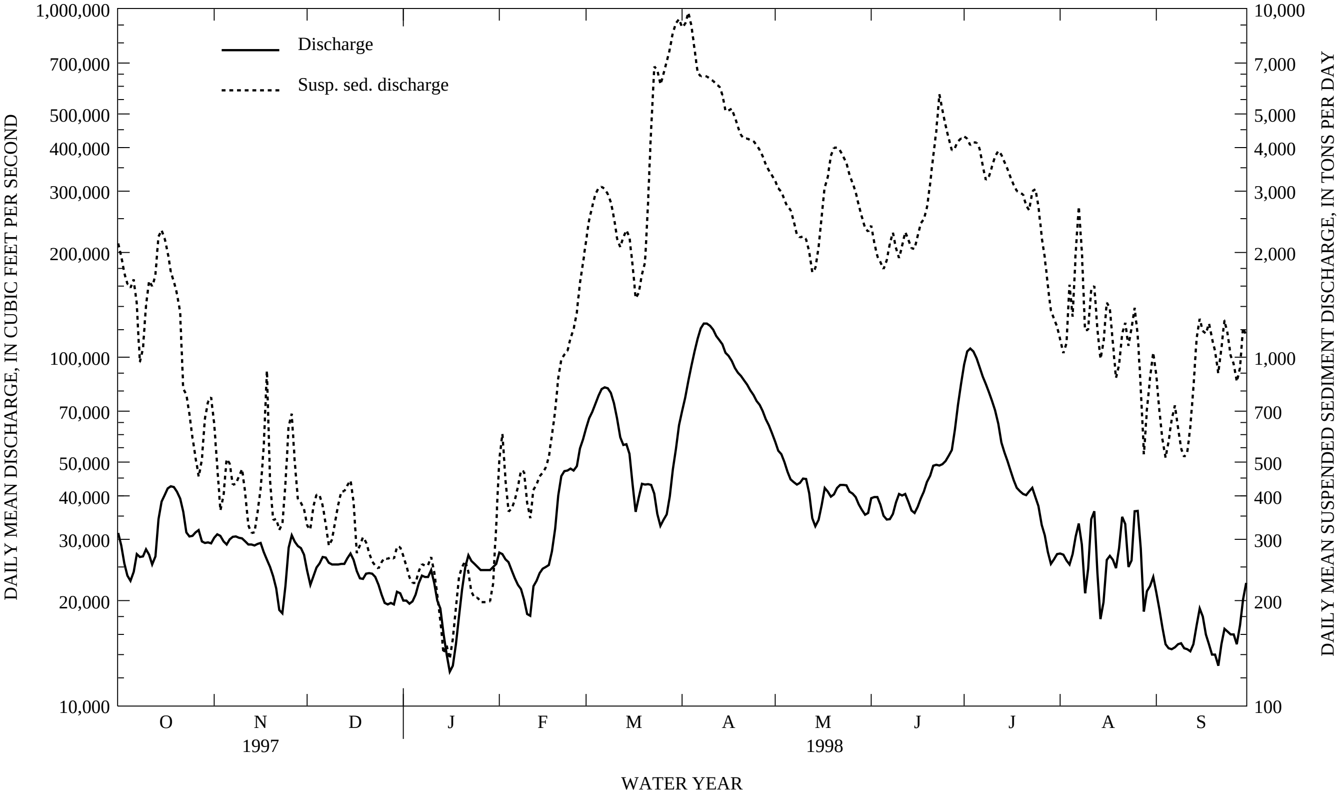
05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	25	2120	8	642	5	329	5	269	7	510	13	2160
2	25	1950	6	483	5	320	5	252	8	603	14	2480
3	25	1750	4	363	6	373	4	233	6	445	14	2710
4	26	1620	5	401	6	403	4	225	5	360	15	2940
5	26	1580	7	510	6	401	4	225	6	368	15	3060
6	26	1670	6	496	5	375	4	243	6	389	14	3090
7	19	1430	5	431	5	331	4	255	7	425	14	3040
8	13	969	5	433	4	288	4	252	8	473	13	2940
9	15	1060	6	456	4	300	4	253	9	469	13	2780
10	19	1410	6	477	5	336	4	267	8	381	13	2510
11	23	1660	5	408	6	377	4	242	7	345	12	2200
12	23	1600	4	329	6	412	4	207	7	417	13	2070
13	24	1720	4	313	6	413	3	174	7	431	15	2210
14	24	2220	4	314	6	430	3	141	7	455	15	2320
15	22	2320	5	359	6	443	4	149	7	466	16	2220
16	20	2190	5	421	5	381	4	136	7	482	16	1840
17	18	2000	8	558	4	274	5	155	8	520	15	1480
18	15	1760	13	916	5	288	5	192	8	599	14	1530
19	14	1650	7	446	5	304	5	235	8	699	15	1730
20	14	1520	5	341	5	294	4	250	8	870	16	1870
21	13	1350	6	344	4	274	4	260	8	985	24	2790
22	8	812	6	319	4	259	3	242	8	1020	39	4570
23	9	780	7	333	4	252	3	212	8	1040	63	6840
24	8	688	7	436	4	247	3	204	9	1140	70	6680
25	7	586	8	631	5	258	3	204	9	1210	69	6070
26	6	514	8	689	5	265	3	198	10	1340	71	6520
27	5	454	6	499	5	264	3	198	11	1630	74	7060
28	6	506	5	391	5	267	3	198	12	1860	71	7670
29	8	667	5	382	5	264	3	199	---	---	66	8550
30	9	745	5	366	5	286	3	224	---	---	62	9110
31	10	768	---	---	5	285	5	330	---	---	54	9350
TOTAL	---	42069	---	13487	---	9993	---	6824	---	19932	---	122390

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	47	8870	21	3220	22	2390	17	4310	15	1120	15	890
2	44	9070	21	3060	20	2130	15	4250	14	1030	13	700
3	42	9770	21	2990	18	1950	14	4060	16	1100	12	580
4	35	8940	21	2830	18	1880	15	4140	24	1620	12	515
5	27	7670	21	2700	19	1790	15	4130	18	1310	14	576
6	21	6560	22	2650	21	1900	16	3970	24	2010	17	664
7	20	6410	21	2460	23	2120	15	3550	30	2710	18	727
8	19	6440	19	2260	24	2280	14	3230	26	2000	15	629
9	19	6400	19	2210	20	2060	15	3300	21	1200	13	547
10	19	6300	18	2230	18	1930	17	3530	18	1200	13	517
11	19	6220	18	2180	19	2090	20	3770	17	1560	14	534
12	20	6070	18	2010	21	2290	23	3910	17	1600	17	633
13	20	6000	19	1750	21	2170	25	3820	19	1200	20	821
14	19	5660	20	1800	21	2060	25	3640	21	990	25	1130
15	18	5090	22	2070	21	2050	26	3470	21	1110	25	1290
16	19	5120	25	2510	22	2230	26	3280	20	1440	24	1190
17	20	5180	27	3080	23	2430	26	3120	19	1380	27	1170
18	19	4900	30	3290	22	2490	26	3000	16	1100	31	1250
19	19	4590	35	3790	23	2690	27	2960	13	872	30	1130
20	18	4340	37	4000	25	3140	27	2940	12	950	28	1040
21	18	4250	35	4000	29	3770	25	2730	12	1170	26	899
22	19	4250	34	3920	34	4450	24	2650	14	1260	26	1060
23	19	4200	33	3770	43	5690	26	3000	16	1080	27	1280
24	20	4180	31	3620	39	5130	28	3040	17	1210	26	1170
25	20	4070	30	3340	34	4640	27	2700	14	1390	23	1010
26	20	3940	29	3170	30	4260	25	2230	12	1160	22	956
27	20	3780	28	2980	27	3930	23	1940	11	817	21	851
28	20	3570	27	2730	24	3990	22	1610	10	527	20	932
29	20	3440	26	2530	21	4170	20	1360	12	711	21	1210
30	20	3330	25	2360	19	4250	18	1290	15	874	18	1160
31	---	---	24	2300	---	---	17	1220	16	1030	---	---
TOTAL	---	168610	---	87810	---	88350	---	96150	---	38731	---	27061
YEAR		721407										

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued



05411400 SNY MAGILL CREEK NEAR CLAYTON, IA

LOCATION.--Lat 42°56'55", long 91°11'10", in SW$^1/_4$ NE$^1/_4$ NW$^1/_4$ sec. 22, T.94 N., R.3 W. Clayton County, Hydrologic Unit 07060003, on right bank 130 ft downstream from bridge on county highway, 4.9 mi northwest of Clayton, and 0.9 mi upstream of county highway X56.

DRAINAGE AREA.--27.6 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 622.704 ft.

REMARKS.--Estimated daily discharge: Dec. 13-15, Dec. 27 to Jan. 2, Jan. 15-20, and Mar. 10-14. Records good except those for estimated daily discharges and discharges greater than 600 ft^3/s, which are poor. U.S. Geological Survey rain gage and data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

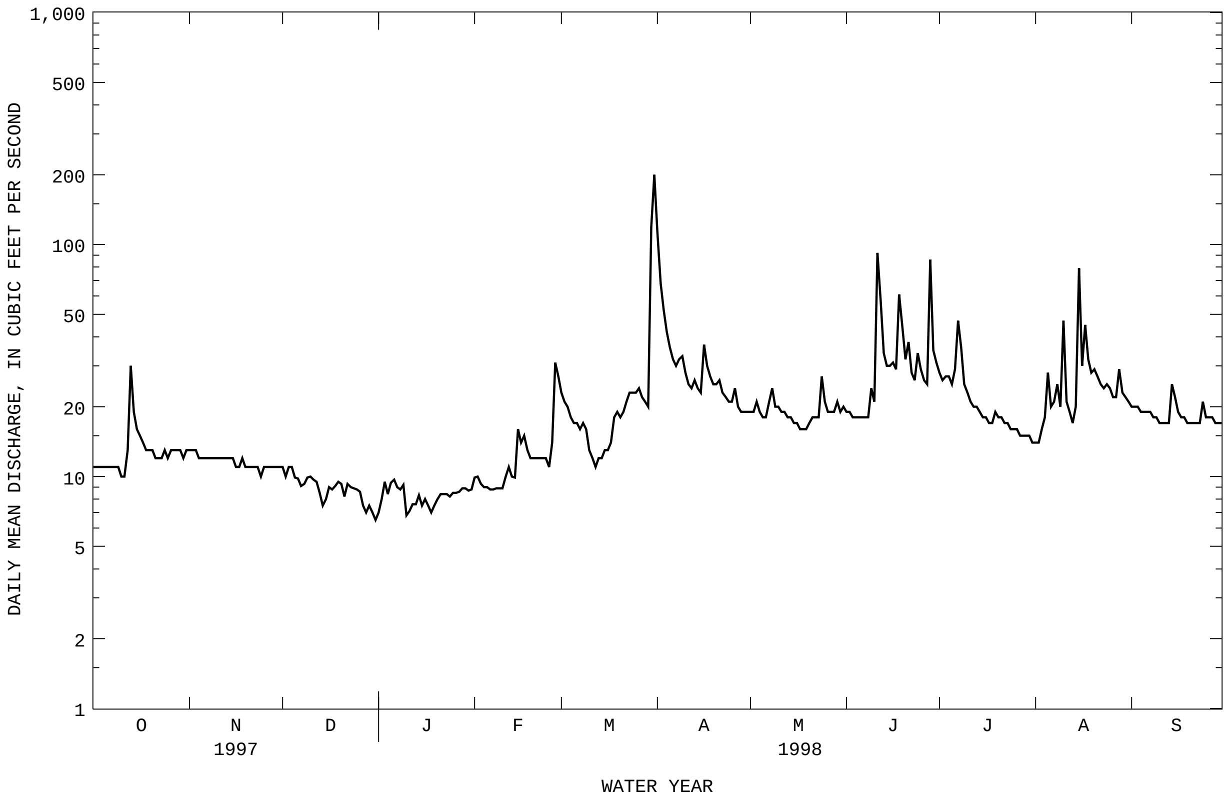
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	13	11	e7.0	9.9	23	113	19	19	28	14	20
2	11	13	10	e8.0	10	21	68	19	19	26	14	20
3	11	13	11	9.5	9.3	20	52	21	18	27	16	20
4	11	12	11	8.4	9.0	18	42	19	18	27	18	19
5	11	12	9.9	9.4	9.0	17	36	18	18	25	28	19
6	11	12	9.8	9.7	8.8	17	32	18	18	29	20	19
7	11	12	9.1	9.0	8.8	16	30	21	18	47	21	19
8	11	12	9.3	8.8	8.9	17	32	24	18	36	25	18
9	11	12	9.9	9.2	8.9	16	33	20	24	25	20	18
10	10	12	10	6.8	8.9	e13	28	20	21	23	47	17
11	10	12	9.7	7.1	10	e12	25	19	92	21	21	17
12	13	12	9.5	7.6	11	e11	24	19	57	20	19	17
13	30	12	e8.5	7.6	10	e12	26	18	34	20	17	17
14	19	12	e7.5	8.3	9.9	e12	24	18	30	19	20	25
15	16	12	e8.0	e7.5	16	13	23	17	30	18	79	22
16	15	11	9.0	e8.0	14	13	37	17	31	18	30	19
17	14	11	8.8	e7.5	15	14	30	16	29	17	45	18
18	13	12	9.1	e7.0	13	18	27	16	61	17	32	18
19	13	11	9.5	e7.5	12	19	25	16	44	19	28	17
20	13	11	9.3	e8.0	12	18	25	17	32	18	29	17
21	12	11	8.2	8.4	12	19	26	18	38	18	27	17
22	12	11	9.3	8.4	12	21	23	18	28	17	25	17
23	12	11	9.0	8.4	12	23	22	18	26	17	24	17
24	13	10	8.9	8.2	12	23	21	27	34	16	25	21
25	12	11	8.8	8.5	11	23	21	21	29	16	24	18
26	13	11	8.6	8.5	14	24	24	19	26	16	22	18
27	13	11	e7.5	8.6	31	22	20	19	25	15	22	18
28	13	11	e7.0	8.9	27	21	19	19	86	15	29	17
29	13	11	e7.5	8.9	---	20	19	21	35	15	23	17
30	12	11	e7.0	8.7	---	119	19	19	31	15	22	17
31	13	---	e6.5	8.8	---	200	---	20	---	14	21	---
TOTAL	403	348	278.2	256.2	345.4	835	946	591	989	654	807	553
MEAN	13.0	11.6	8.97	8.26	12.3	26.9	31.5	19.1	33.0	21.1	26.0	18.4
MAX	30	13	11	9.7	31	200	113	27	92	47	79	25
MIN	10	10	6.5	6.8	8.8	11	19	16	18	14	14	17
AC-FT	799	690	552	508	685	1660	1880	1170	1960	1300	1600	1100
CFSM	.47	.42	.33	.30	.45	.98	1.14	.69	1.19	.76	.94	.67
IN.	.54	.47	.37	.35	.47	1.13	1.28	.80	1.33	.88	1.09	.75

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	14.8	17.5	14.0	12.1	16.6	26.7	28.6	28.1	31.5	26.4	21.4	17.3
MAX	27.1	27.0	18.1	15.3	29.1	54.7	61.2	68.3	51.3	52.4	46.5	32.4
(WY)	1994	1994	1994	1994	1994	1993	1993	1993	1993	1993	1993	1993
MIN	8.75	11.6	8.97	8.26	10.4	18.2	13.4	14.9	13.8	16.3	12.0	9.36
(WY)	1997	1998	1998	1998	1993	1996	1997	1997	1992	1992	1992	1996

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1992 - 1998	
ANNUAL TOTAL	5405.2		7005.8			
ANNUAL MEAN	14.8		19.2		21.3	
HIGHEST ANNUAL MEAN					36.6	1993
LOWEST ANNUAL MEAN					14.7	1997
HIGHEST DAILY MEAN	121	Feb 18	200	Mar 31	313	Mar 31 1993
LOWEST DAILY MEAN	6.5	Dec 31	6.5	Dec 31	6.3	Sep 30 1996
ANNUAL SEVEN-DAY MINIMUM	7.6	Dec 25	7.2	Dec 27	7.1	Sep 29 1996
INSTANTANEOUS PEAK FLOW			543	Mar 30	1300	Aug 23 1993
INSTANTANEOUS PEAK STAGE			6.77	Mar 30	8.60	Aug 23 1993
INSTANTANEOUS LOW FLOW			3.0	Jan 10a	3.0	Jan 10 1998a
ANNUAL RUNOFF (AC-FT)	10720		13900		15400	
ANNUAL RUNOFF (CFSM)	.54		.70		.77	
ANNUAL RUNOFF (INCHES)	7.29		9.44		10.46	
10 PERCENT EXCEEDS	20		29		34	
50 PERCENT EXCEEDS	13		17		16	
90 PERCENT EXCEEDS	10		8.8		10	

a Result of freeze up
e Estimated


1,000
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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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1997
1998
WATER YEAR

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1991 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1991 to current year.
WATER TEMPERATURES: April 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 660 microsiemens Oct. 23, 1996; minimum daily, 266 microsiemens Mar. 16, 1993.
WATER TEMPERATURES: Maximum daily, 33.0°C June 21, 1997; minimum daily, 0.5°C Jan. 9, 1997.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,180 mg/L Mar. 30, 1998; minimum daily mean, 0 mg/L Mar. 21, 22, 1993.
SEDIMENT LOADS: Maximum daily, 3,310 tons Mar. 30, 1998; minimum daily, 0.01 tons Mar. 22, 1993.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 588 microsiemens Jan. 12; minimum daily, 270 microsiemens Mar. 30.
WATER TEMPERATURES: Maximum daily, 26.0°C June 25,26; minimum daily, 1.0°C Jan. 20.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,180 mg/L Mar. 30; minimum daily mean, 4 mg/L Oct. 25.
SEDIMENT LOADS: Maximum daily, 3,310 tons Mar. 30; minimum daily, 0.12 tons Dec. 18 and Feb. 9.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
22...	1440	6.8	12	12	.40	74
DEC						
03...	1105	3.6	11	10	.29	69
JAN						
14...	1415	.1	8.7	8	.19	74
FEB						
25...	1300	6.3	11	7	.21	85
MAY						
20...	1425	15.0	18	19	.93	46
JUN						
22...	1435	16.9	29	57	4.4	90
AUG						
03...	1310	16.8	16	20	.87	64
SEP						
29...	1445	16.7	18	17	.80	54

DATE	TIME	NUMBER OF SAM- PLING POINTS (COUNT) (00063)	BED MAT. FALL DIAM. % FINER THAN .004 MM (80157)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)
OCT							
22...	1440	1	--	5	6	7	11
SEP							
29...	1445	1	1	5	5	9	23

DATE	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)	BED MAT. SIEVE DIAM. % FINER THAN 64.0 MM (80174)
OCT							
22...	13	15	20	37	55	100	--
SEP							
29...	26	27	28	31	34	67	100

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

WATER-QUALITY RECORDS--Continued

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	429	427	---	---	---	---	485	401	428	400	---	437
2	477	472	426	---	436	478	478	500	---	395	400	395
3	516	436	407	495	527	---	486	448	---	386	400	394
4	545	414	421	418	421	507	---	504	396	---	399	408
5	464	462	462	440	433	485	---	433	---	---	415	403
6	482	407	---	551	411	447	443	---	465	373	---	394
7	481	---	507	533	---	471	416	462	---	467	407	---
8	430	419	467	484	---	---	429	463	428	412	---	392
9	427	---	422	460	430	534	405	---	386	442	401	---
10	459	527	456	434	429	534	431	---	437	381	477	---
11	415	471	434	461	447	515	---	420	282	386	483	404
12	455	---	401	588	534	462	---	---	502	---	400	396
13	527	420	575	440	426	487	413	411	---	---	411	411
14	450	444	---	450	462	441	418	384	469	---	---	412
15	411	---	543	436	---	412	399	406	462	---	442	397
16	---	521	424	423	462	461	454	---	432	---	---	414
17	---	427	417	---	481	487	447	404	---	380	446	392
18	---	456	---	---	461	483	407	431	396	389	405	427
19	431	449	---	447	434	469	429	446	470	---	437	---
20	419	468	---	422	---	504	419	426	467	431	---	390
21	452	478	---	439	437	516	448	---	487	371	396	392
22	472	470	426	455	---	437	400	398	374	---	---	395
23	406	---	427	408	530	461	427	---	406	405	---	397
24	---	479	445	---	449	437	429	488	398	---	407	458
25	436	448	489	---	433	463	---	452	380	---	401	---
26	---	466	426	440	418	---	497	465	385	---	---	---
27	---	---	---	457	540	517	431	463	---	432	---	---
28	423	481	---	450	461	471	429	---	311	378	419	395
29	424	485	411	470	---	442	400	530	410	---	---	474
30	428	---	489	429	---	270	469	438	386	403	---	411
31	412	---	---	420	---	352	---	409	---	384	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.0	15.0	---	---	---	---	9.0	17.0	16.0	23.0	---	17.0
2	18.0	16.0	9.0	---	5.0	6.0	9.0	14.0	---	24.0	22.0	21.0
3	18.0	17.0	3.0	6.0	5.0	---	10.0	14.0	---	21.0	20.0	23.0
4	19.0	16.0	4.0	6.0	5.0	8.0	---	17.0	17.0	---	21.0	24.0
5	18.0	16.0	4.0	7.0	4.0	7.0	---	18.0	---	---	21.0	23.0
6	21.0	16.0	---	6.0	4.0	6.0	14.0	---	15.0	20.0	---	23.0
7	21.0	---	4.0	5.0	---	5.0	13.0	15.0	---	20.0	24.0	---
8	21.0	16.0	4.0	8.0	---	---	9.0	15.0	16.0	20.0	---	20.0
9	17.0	---	4.0	8.0	3.0	8.0	12.0	---	16.0	21.0	24.0	---
10	17.0	16.0	4.0	4.0	6.0	4.0	14.0	---	19.0	24.0	24.0	---
11	17.0	15.0	3.0	6.0	6.0	6.0	---	17.0	20.0	25.0	24.0	24.0
12	17.0	---	5.0	2.0	6.0	6.0	---	---	21.0	---	24.0	24.0
13	16.0	12.0	4.0	2.0	5.0	5.0	13.0	18.0	---	---	---	24.0
14	15.0	8.0	---	2.0	5.0	4.0	16.0	17.0	17.0	---	---	21.0
15	13.0	---	6.0	3.0	---	4.0	12.0	17.0	20.0	---	23.0	21.0
16	---	4.0	2.0	4.0	6.0	6.0	12.0	---	19.0	---	---	21.0
17	---	6.0	7.0	---	6.0	6.0	12.0	20.0	---	24.0	24.0	21.0
18	---	6.0	---	---	6.0	7.0	13.0	23.0	19.0	24.0	19.0	20.0
19	18.0	4.0	---	3.0	6.0	5.0	13.0	21.0	18.0	---	21.0	---
20	16.0	4.0	---	1.0	---	10.0	12.0	18.0	18.0	24.0	---	20.0
21	17.0	4.0	---	4.0	5.0	10.0	13.0	---	21.0	24.0	24.0	19.0
22	17.0	7.0	8.0	3.0	---	11.0	15.0	17.0	21.0	---	---	13.5
23	17.0	---	8.0	5.0	8.0	11.0	16.0	---	21.0	23.0	---	18.0
24	---	4.0	6.0	---	12.0	10.0	17.0	15.0	21.0	---	23.0	18.0
25	16.0	7.0	7.0	---	9.0	12.0	---	19.0	26.0	---	24.0	---
26	---	7.0	7.0	5.0	9.0	---	13.0	18.0	26.0	---	---	---
27	---	---	---	5.0	7.0	15.0	15.0	20.0	---	23.0	---	---
28	18.0	12.0	---	5.0	6.0	13.0	13.0	---	22.0	24.0	24.0	21.0
29	17.0	8.0	4.0	7.0	---	12.0	16.0	20.0	20.0	---	---	15.5
30	17.0	---	7.0	6.0	---	15.0	17.0	20.0	24.0	24.0	---	16.0
31	16.0	---	---	8.0	---	16.0	---	20.0	---	24.0	---	---

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

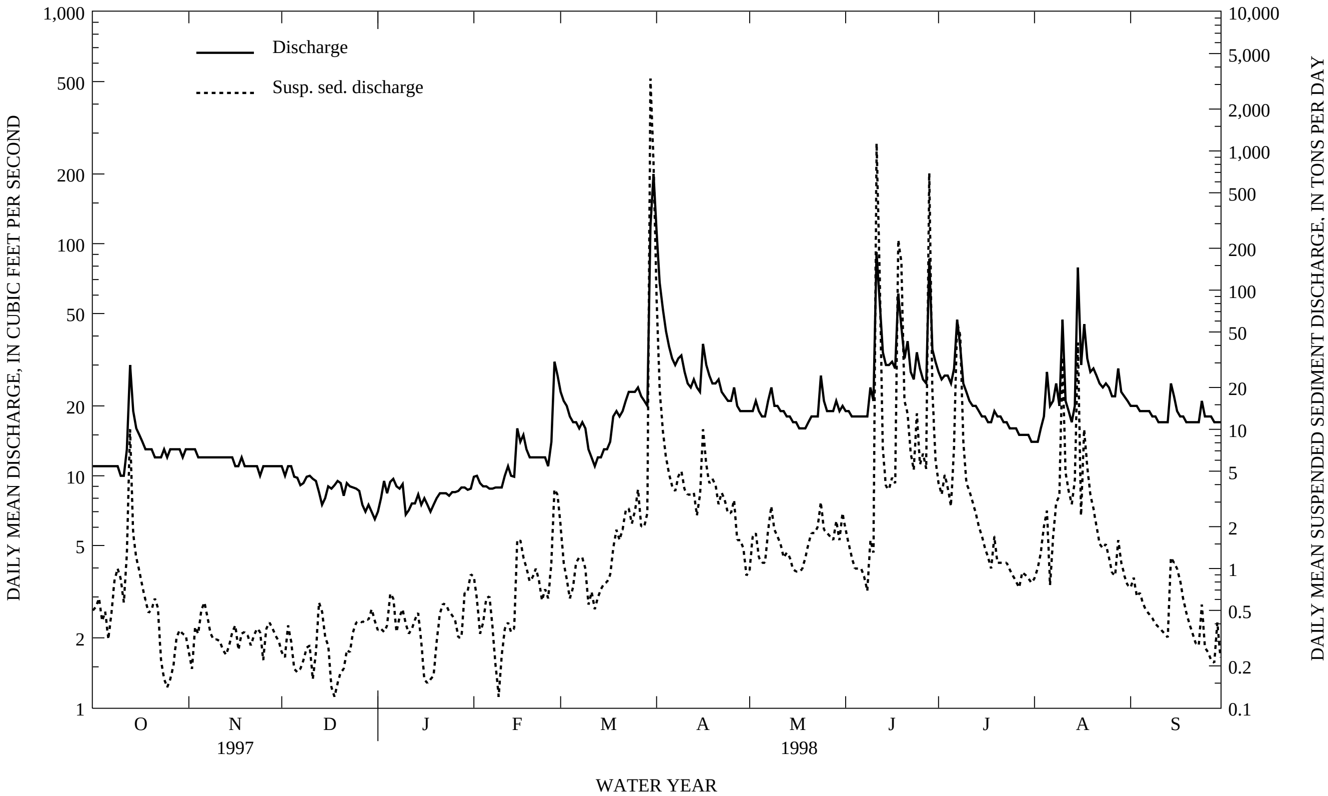
WATER-QUALITY RECORDS--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	OCTOBER MEAN CONCEN-TRATION (MG/L)	OCTOBER LOAD (TONS/DAY)	NOVEMBER MEAN CONCEN-TRATION (MG/L)	NOVEMBER LOAD (TONS/DAY)	DECEMBER MEAN CONCEN-TRATION (MG/L)	DECEMBER LOAD (TONS/DAY)	JANUARY MEAN CONCEN-TRATION (MG/L)	JANUARY LOAD (TONS/DAY)	FEBRUARY MEAN CONCEN-TRATION (MG/L)	FEBRUARY LOAD (TONS/DAY)	MARCH MEAN CONCEN-TRATION (MG/L)	MARCH LOAD (TONS/DAY)
1	17	.50	8	.25	10	.25	19	.36	33	.87	32	2.0
2	18	.53	6	.19	10	.23	16	.37	22	.60	19	1.1
3	20	.61	11	.38	14	.39	14	.35	14	.34	16	.83
4	15	.42	11	.34	11	.30	17	.39	17	.41	12	.61
5	17	.49	16	.50	7	.19	26	.66	25	.61	16	.73
6	11	.31	18	.57	7	.18	23	.61	27	.63	24	1.1
7	16	.48	14	.45	8	.19	14	.35	16	.38	28	1.2
8	29	.83	11	.34	9	.22	19	.45	8	.20	26	1.2
9	34	1.0	10	.31	10	.27	21	.51	5	.12	23	.99
10	31	.84	10	.31	10	.28	22	.40	10	.24	17	.55
11	21	.57	10	.30	6	.16	18	.34	13	.37	22	.68
12	29	1.3	9	.26	10	.25	18	.37	14	.41	19	.51
13	116	10	8	.24	25	.57	21	.43	13	.35	21	.62
14	36	1.8	10	.28	24	.49	22	.48	14	.37	24	.71
15	28	1.2	12	.35	15	.32	14	.30	30	1.6	24	.78
16	24	.96	14	.39	12	.28	8	.16	40	1.6	22	.80
17	20	.74	10	.26	6	.14	7	.15	31	1.2	24	.90
18	16	.59	12	.34	5	.12	8	.16	29	1.0	28	1.4
19	14	.48	12	.35	6	.15	9	.17	24	.81	36	1.9
20	15	.51	12	.33	7	.18	15	.30	27	.87	32	1.6
21	19	.61	10	.28	9	.19	21	.47	33	1.0	37	1.9
22	16	.52	12	.33	10	.26	25	.56	26	.83	46	2.6
23	7	.22	14	.37	10	.25	24	.55	18	.59	45	2.7
24	5	.16	14	.35	15	.35	22	.49	22	.71	34	2.1
25	4	.14	8	.22	17	.41	20	.46	20	.61	42	2.6
26	5	.16	14	.37	18	.42	18	.42	27	1.1	56	3.7
27	6	.20	16	.41	19	.41	14	.32	44	3.7	34	2.0
28	9	.32	14	.37	21	.43	14	.32	47	3.4	35	2.0
29	11	.36	13	.33	23	.43	28	.67	---	---	46	2.5
30	11	.34	11	.30	27	.51	30	.69	---	---	4180	3310
31	10	.33	---	---	24	.42	38	.91	---	---	1370	812
TOTAL	---	27.52	---	10.07	---	9.24	---	13.17	---	24.92	---	4164.31

DAY	APRIL MEAN CONCEN-TRATION (MG/L)	APRIL LOAD (TONS/DAY)	MAY MEAN CONCEN-TRATION (MG/L)	MAY LOAD (TONS/DAY)	JUNE MEAN CONCEN-TRATION (MG/L)	JUNE LOAD (TONS/DAY)	JULY MEAN CONCEN-TRATION (MG/L)	JULY LOAD (TONS/DAY)	AUGUST MEAN CONCEN-TRATION (MG/L)	AUGUST LOAD (TONS/DAY)	SEPTEMBER MEAN CONCEN-TRATION (MG/L)	SEPTEMBER LOAD (TONS/DAY)
1	264	84	19	.97	37	1.9	54	4.1	23	.85	17	.73
2	103	19	34	1.7	29	1.5	48	3.4	27	1.0	21	.86
3	69	9.7	31	1.8	25	1.2	66	4.7	32	1.3	15	.63
4	55	6.3	24	1.2	21	1.0	52	3.8	40	2.0	17	.67
5	50	4.8	23	1.1	21	1.0	42	2.8	34	2.6	15	.56
6	45	3.9	22	1.1	22	1.0	88	7.4	14	.76	13	.50
7	44	3.6	32	1.9	18	.87	352	59	30	1.7	12	.47
8	53	4.6	44	2.8	15	.69	459	47	37	3.0	12	.44
9	56	5.0	35	1.9	24	1.6	117	8.2	40	3.3	12	.40
10	49	3.7	32	1.7	24	1.3	67	4.1	207	33	11	.38
11	49	3.4	29	1.5	1780	1130	62	3.6	85	4.9	11	.36
12	51	3.4	23	1.2	596	129	55	3.0	71	3.6	11	.34
13	50	3.5	26	1.3	79	7.3	47	2.5	61	2.9	10	.32
14	38	2.4	25	1.2	48	3.9	40	2.0	63	4.3	21	1.2
15	55	3.4	21	.99	45	3.7	34	1.7	123	42	25	1.1
16	103	10	21	.95	54	4.5	29	1.4	37	2.4	27	1.0
17	70	5.6	22	.95	53	4.1	25	1.2	84	10	23	.82
18	57	4.1	23	.99	769	229	23	1.0	78	5.4	17	.60
19	64	4.4	28	1.2	1220	158	33	1.7	57	3.4	14	.48
20	59	4.0	33	1.5	189	16	24	1.1	44	2.7	12	.40
21	42	2.9	37	1.8	125	13	23	1.1	35	2.0	10	.34
22	56	3.5	37	1.8	91	6.8	24	1.1	29	1.5	9	.29
23	53	3.1	41	2.0	73	5.1	24	1.1	27	1.4	9	.28
24	43	2.5	40	3.0	131	13	23	.98	29	1.5	13	.55
25	44	2.5	35	1.9	71	5.6	21	.89	24	1.2	8	.27
26	48	3.1	34	1.8	94	6.7	19	.81	21	.93	7	.25
27	30	1.6	32	1.7	78	5.2	18	.73	19	.89	7	.22
28	30	1.6	31	1.6	1820	692	23	.94	26	1.6	6	.21
29	28	1.4	39	2.2	196	19	22	.90	22	1.1	9	.41
30	17	.89	30	1.6	72	6.1	21	.85	20	.89	5	.23
31	---	---	46	2.5	---	---	20	.79	18	.76	---	---
TOTAL	---	211.89	---	49.85	---	2470.06	---	173.89	---	144.88	---	15.31

YEAR 7315.11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Discharge
Susp. sed. discharge
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
DAILY MEAN SUSPENDED SEDIMENT DISCHARGE, IN TONS PER DAY
O N D J F M A M J J A S
1997
1998
WATER YEAR

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--April 1992 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Water years 1992-1995 in files at the District office. Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.42 in., Mar. 30, 1998.

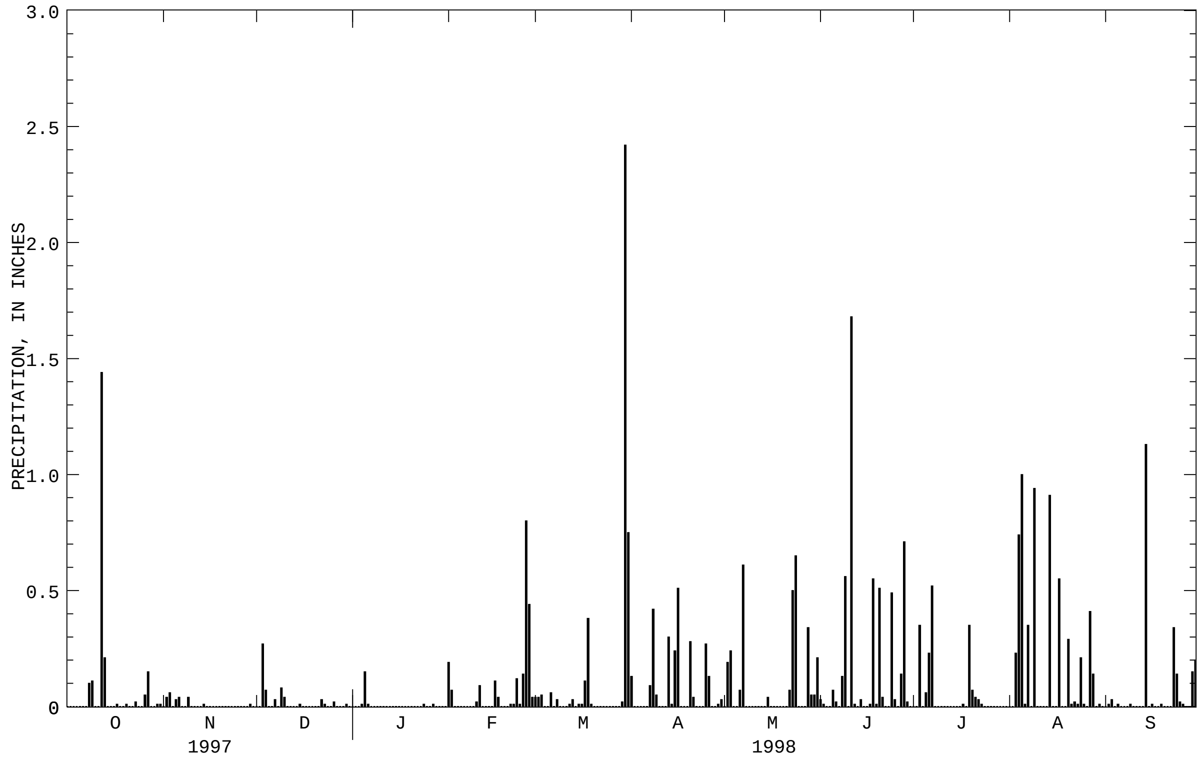
EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.42 in., Mar. 30.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.19	.04	.13	.00	.03	.00	.00	.00
2	.00	.04	.00	.00	.07	.04	.00	.19	.01	.00	.00	.01
3	.00	.06	.27	.00	.00	.05	.00	.24	.00	.35	.23	.03
4	.00	.00	.07	.01	.00	.00	.00	.00	.00	.00	.74	.00
5	.00	.03	.00	.15	.00	.00	.00	.00	.07	.06	1.00	.01
6	.00	.04	.00	.01	.00	.06	.00	.07	.02	.23	.01	.00
7	.00	.00	.03	.00	.00	.00	.09	.61	.00	.52	.35	.00
8	.10	.00	.00	.00	.00	.03	.42	.00	.13	.00	.00	.00
9	.11	.04	.08	.00	.00	.00	.05	.00	.56	.00	.94	.01
10	.00	.00	.04	.00	.02	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.09	.00	.00	.00	1.68	.00	.00	.00
12	1.44	.00	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00
13	.21	.00	.00	.00	.00	.03	.30	.00	.00	.00	.00	.00
14	.00	.01	.00	.00	.00	.00	.01	.00	.03	.00	.91	1.13
15	.00	.00	.01	.00	.00	.01	.24	.04	.00	.00	.00	.00
16	.00	.00	.00	.00	.11	.01	.51	.00	.00	.00	.00	.01
17	.01	.00	.00	.00	.04	.11	.00	.00	.01	.01	.55	.00
18	.00	.00	.00	.00	.00	.38	.00	.00	.55	.00	.00	.00
19	.00	.00	.00	.00	.00	.01	.00	.00	.01	.35	.00	.01
20	.01	.00	.00	.00	.00	.00	.28	.00	.51	.07	.29	.00
21	.00	.00	.00	.00	.01	.00	.04	.00	.04	.04	.01	.00
22	.00	.00	.03	.00	.01	.00	.00	.07	.00	.03	.02	.00
23	.02	.00	.01	.00	.12	.00	.00	.50	.00	.01	.01	.34
24	.00	.00	.00	.01	.01	.00	.00	.65	.49	.00	.21	.14
25	.00	.00	.00	.00	.14	.00	.27	.00	.03	.00	.01	.02
26	.05	.00	.02	.00	.80	.00	.13	.00	.00	.00	.00	.01
27	.15	.00	.00	.01	.44	.00	.00	.00	.14	.00	.41	.00
28	.00	.00	.00	.00	.04	.00	.00	.34	.71	.00	.14	.00
29	.00	.01	.00	.00	---	.02	.01	.05	.02	.00	.00	.15
30	.01	.00	.01	.00	---	2.42	.03	.05	.00	.00	.01	.20
31	.01	---	.00	.00	---	.75	---	.21	---	.00	.00	---
TOTAL	2.12	0.23	0.57	0.19	2.09	3.97	2.51	3.02	5.05	1.67	5.84	2.07
MEAN	.07	.01	.02	.01	.07	.13	.08	.10	.17	.05	.19	.07
MAX	1.44	.06	.27	.15	.80	2.42	.51	.65	1.68	.52	1.00	1.13
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

PRECIPITATION RECORDS--Continued



05411500 MISSISSIPPI RIVER AT CLAYTON, IA

LOCATION.--Lat 42°54'13", long 91°08'45", NE 1/4 NW 1/4 sec. 1, T.93 N., R.3 W., Clayton County, Hydrologic Unit 07060003,6 miles below the Wisconsin River.

DRAINAGE AREA.--79,200 mi^2.

PERIOD OF RECORD.--April 1930 to June 1936, January 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 602.60 ft.

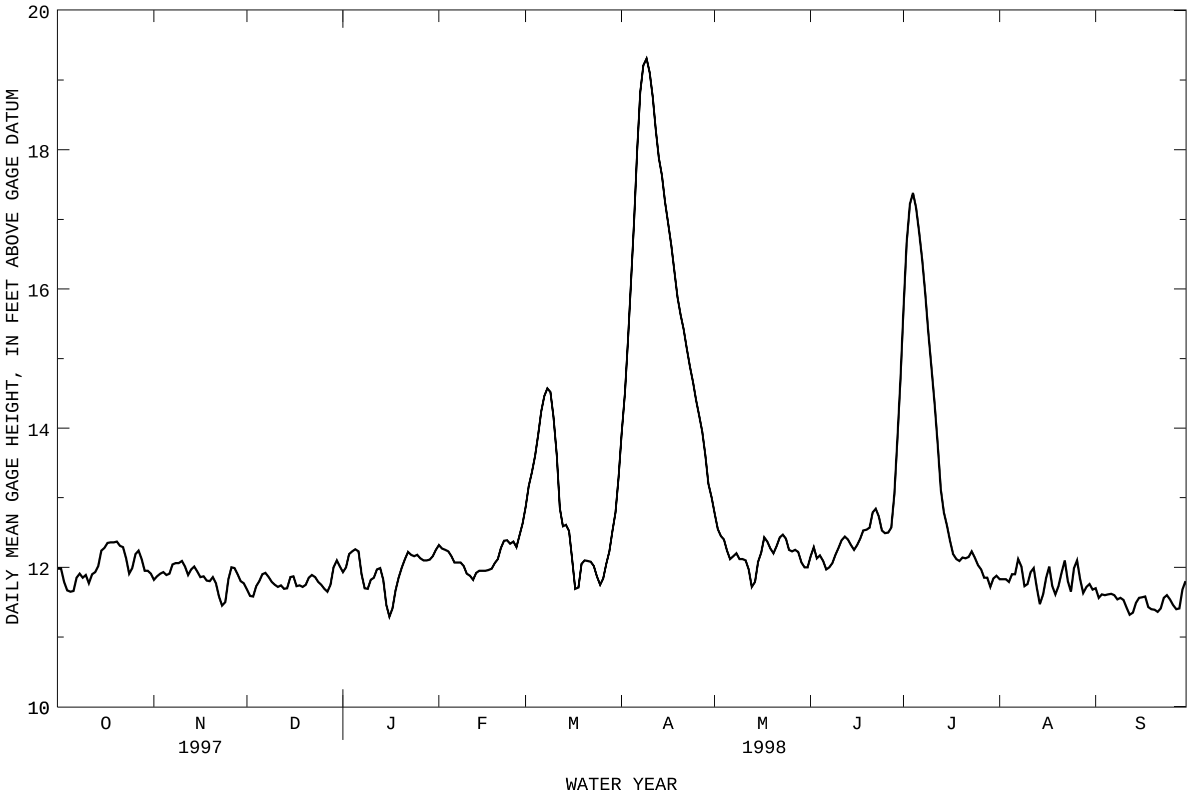
REMARKS.--Records good. U.S. Geological Survey satellite data collection platform with telephone modem at station.

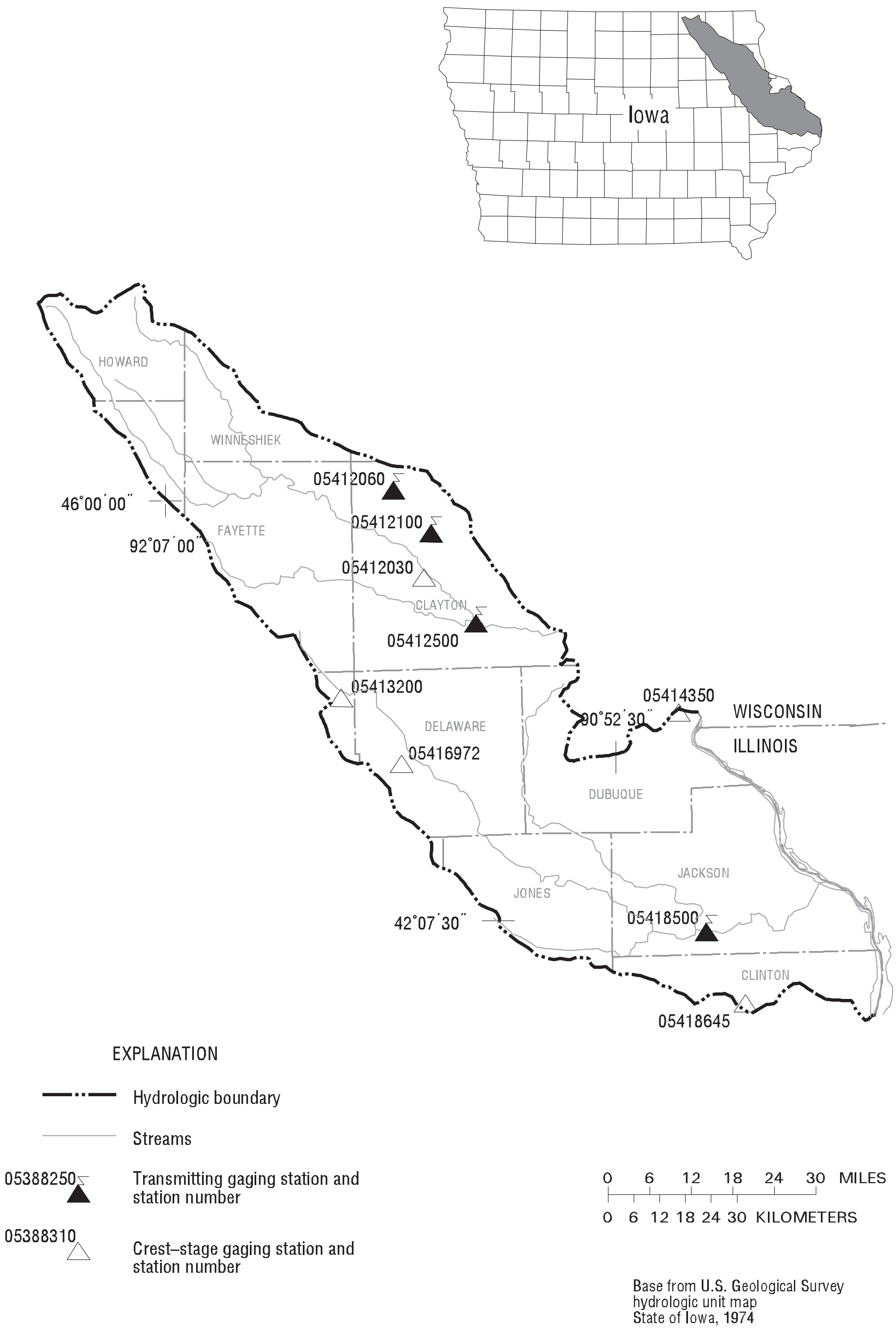
EXTREMES FOR CURRENT WATER YEAR.--Maximum gage height 19.36 ft Apr. 9; minimum gage height 11.26 ft Jan. 16.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.98	11.82	11.68	11.93	12.32	12.87	13.92	12.77	12.16	15.73	11.83	11.70
2	11.98	11.87	11.59	12.00	12.27	13.17	14.50	12.55	12.29	16.66	11.83	11.56
3	11.79	11.91	11.58	12.19	12.25	13.36	15.26	12.45	12.13	17.22	11.83	11.61
4	11.67	11.93	11.73	12.23	12.23	13.60	16.11	12.40	12.17	17.38	11.79	11.60
5	11.65	11.89	11.80	12.26	12.16	13.90	16.98	12.24	12.09	17.17	11.90	11.61
6	11.66	11.91	11.90	12.23	12.07	14.24	18.00	12.12	11.97	16.82	11.90	11.62
7	11.85	12.04	11.92	11.90	12.07	14.46	18.83	12.16	12.00	16.42	12.12	11.60
8	11.91	12.06	11.86	11.70	12.07	14.57	19.21	12.20	12.06	15.93	12.01	11.54
9	11.85	12.06	11.79	11.69	12.02	14.52	19.31	12.12	12.18	15.37	11.73	11.56
10	11.89	12.09	11.75	11.82	11.91	14.16	19.11	12.12	12.28	14.85	11.76	11.53
11	11.77	12.01	11.72	11.85	11.88	13.61	18.76	12.10	12.39	14.34	11.93	11.42
12	11.90	11.89	11.74	11.97	11.82	12.85	18.28	11.97	12.44	13.76	11.99	11.32
13	11.93	11.97	11.69	11.99	11.92	12.59	17.88	11.72	12.40	13.12	11.71	11.35
14	12.02	12.01	11.70	11.82	11.95	12.61	17.63	11.79	12.32	12.79	11.47	11.49
15	12.24	11.94	11.86	11.46	11.95	12.52	17.25	12.08	12.25	12.60	11.61	11.56
16	12.28	11.86	11.87	11.29	11.95	12.12	16.93	12.21	12.32	12.38	11.85	11.57
17	12.35	11.87	11.73	11.41	11.96	11.69	16.62	12.43	12.41	12.19	12.01	11.58
18	12.36	11.81	11.74	11.67	11.98	11.71	16.25	12.37	12.53	12.12	11.73	11.43
19	12.36	11.80	11.72	11.85	12.06	12.05	15.88	12.27	12.54	12.09	11.61	11.40
20	12.37	11.86	11.75	12.00	12.12	12.10	15.63	12.20	12.57	12.14	11.73	11.39
21	12.31	11.77	11.85	12.12	12.28	12.09	15.42	12.31	12.79	12.13	11.92	11.36
22	12.29	11.58	11.89	12.22	12.38	12.08	15.15	12.43	12.84	12.15	12.10	11.41
23	12.13	11.45	11.86	12.18	12.39	12.02	14.88	12.47	12.73	12.23	11.80	11.56
24	11.91	11.50	11.79	12.16	12.34	11.87	14.66	12.41	12.53	12.14	11.65	11.60
25	11.99	11.83	11.75	12.18	12.37	11.75	14.40	12.25	12.49	12.03	11.99	11.54
26	12.19	12.00	11.69	12.13	12.29	11.84	14.18	12.23	12.50	11.97	12.10	11.46
27	12.24	11.99	11.65	12.10	12.46	12.05	13.95	12.25	12.57	11.85	11.83	11.40
28	12.12	11.90	11.75	12.10	12.63	12.23	13.61	12.22	13.05	11.85	11.63	11.41
29	11.95	11.80	12.00	12.11	---	12.52	13.20	12.07	13.85	11.72	11.72	11.68
30	11.95	11.77	12.10	12.16	---	12.79	13.00	12.00	14.71	11.84	11.76	11.80
31	11.91	---	12.01	12.25	---	13.29	---	12.00	---	11.88	11.68	---
MEAN	12.03	11.87	11.79	11.97	12.15	12.81	16.16	12.22	12.52	13.64	11.82	11.52
MAX	12.37	12.09	12.10	12.26	12.63	14.57	19.31	12.77	14.71	17.38	12.12	11.80
MIN	11.65	11.45	11.58	11.29	11.82	11.69	13.00	11.72	11.97	11.72	11.47	11.32

05411500 MISSISSIPPI RIVER AT CLAYTON, IA--Continued




Iowa
HOWARD
WINNESHIEK
FAYETTE
CLAYTON
DELAWARE
DUBUQUE
JONES
JACKSON
CLINTON
WISCONSIN
ILLINOIS
05412060
05412100
05412030
05412500
05413200
05416972
05414350
05418500
05418645
46°00´00´´
92°07´00´´
90°52´30´´
42°07´30´´
EXPLANATION
Hydrologic boundary
Streams
05388250
Transmitting gaging station and station number
05388310
Crest–stage gaging station and station number
0 6 12 18 24 30 MILES
0 6 12 18 24 30 KILOMETERS
Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05412060 SILVER CREEK NEAR LUANA, IA

LOCATION.--Lat 43°01'19", long 91°29'21", in NE1/4 sec.25, T.95 N., R.6 W., Clayton County, Hydrologic Unit 07060004, on right upstream bank at bridge on county road W70, 2.3 miles south of Highway 52 and 18, and 3.2 miles south of Luana.

DRAINAGE AREA.--4.39 mi^2.

PERIOD OF RECORD.--May 1986 to September 30, 1998 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1027.57 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 15-25, Dec. 5-21, Dec. 26 to Jan. 1, Jan. 13-27, Feb. 2-9, and Mar. 6-14. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	3.3	1.5	e.75	2.1	7.0	46	5.0	2.3	14	2.2	1.3
2	1.6	3.1	1.4	1.4	e1.2	6.6	32	4.5	2.2	14	2.6	1.5
3	1.5	2.4	1.4	1.5	e1.1	6.5	16	4.7	2.0	14	2.8	1.2
4	1.4	2.1	1.4	1.2	e1.0	6.1	12	3.9	2.0	12	2.1	1.2
5	1.4	2.1	e.90	1.4	e.90	5.8	10	3.6	1.9	12	5.8	1.3
6	1.3	2.0	e1.0	1.7	e1.0	e4.4	8.9	3.7	1.9	16	3.2	1.4
7	1.4	2.2	e1.1	1.4	e.90	e3.0	8.5	5.2	1.8	12	2.7	1.3
8	1.8	2.1	e1.0	1.4	e.90	e2.5	8.4	5.3	1.8	12	2.7	.91
9	7.1	2.2	e1.0	1.2	e1.1	e2.3	8.7	4.3	3.8	11	3.5	1.0
10	4.4	2.0	e1.0	1.2	1.6	e2.0	7.8	4.1	3.0	8.1	5.4	1.1
11	3.5	1.9	e.90	1.2	5.1	e1.8	7.4	3.6	8.1	6.7	2.6	1.2
12	7.9	1.8	e.80	1.2	3.1	e2.0	7.4	3.7	9.9	6.0	2.2	.88
13	53	1.6	e.80	e.45	2.9	e2.2	10	3.3	8.7	5.3	2.3	.91
14	9.3	1.6	e.90	e.55	3.8	e2.4	9.2	3.3	7.8	5.0	2.2	1.1
15	7.0	e1.3	e.90	e.50	6.4	2.4	9.1	3.5	7.0	4.3	2.2	.96
16	6.0	e1.3	e1.0	e.55	4.5	2.4	18	3.0	6.4	4.5	2.1	.84
17	5.7	e1.1	e.90	e.65	5.0	4.3	10	2.8	5.5	4.7	8.0	.83
18	5.5	e1.2	e1.0	e.60	4.1	5.1	9.2	2.8	21	4.6	4.1	.78
19	5.4	e1.4	e1.1	e.65	3.5	4.0	8.7	2.8	16	4.8	3.1	.86
20	5.0	e1.2	e1.0	e.55	3.2	3.7	8.4	2.8	13	4.5	4.0	1.1
21	4.5	e1.2	e.90	e.65	2.6	4.7	8.3	2.7	18	4.4	3.5	.90
22	3.9	e1.1	1.1	e.75	2.5	7.0	7.8	2.5	12	4.2	3.3	1.0
23	3.9	e1.0	1.0	e.80	3.3	8.3	7.5	2.4	12	3.8	3.5	1.2
24	3.5	e1.1	1.0	e.65	3.8	8.3	7.2	4.3	22	3.3	3.4	1.2
25	3.2	e1.4	.99	e.55	3.0	10	6.6	2.8	13	3.1	2.3	.98
26	3.2	1.7	e.80	e.70	5.3	10	7.4	2.5	12	3.0	1.7	1.2
27	3.1	1.7	e.55	e.85	12	7.3	6.4	2.5	12	2.9	2.1	.99
28	3.1	1.7	e.60	1.1	8.3	6.4	5.9	2.5	83	2.5	4.1	1.0
29	3.0	1.8	e.65	1.1	---	6.2	5.4	2.9	37	2.3	2.6	1.4
30	3.1	1.9	e.50	1.1	---	28	5.3	2.6	25	2.5	2.0	1.1
31	3.2	---	e.60	1.1	---	68	---	2.5	---	2.4	1.4	---
TOTAL	169.5	52.5	29.69	29.40	94.20	240.7	323.5	106.1	372.1	209.9	95.7	32.64
MEAN	5.47	1.75	.96	.95	3.36	7.76	10.8	3.42	12.4	6.77	3.09	1.09
MAX	53	3.3	1.5	1.7	12	68	46	5.3	83	16	8.0	1.5
MIN	1.3	1.0	.50	.45	.90	1.8	5.3	2.4	1.8	2.3	1.4	.78
AC-FT	336	104	59	58	187	477	642	210	738	416	190	65
CFSM	1.25	.40	.22	.22	.77	1.77	2.46	.78	2.83	1.54	.70	.25
IN.	1.44	.44	.25	.25	.80	2.04	2.74	.90	3.15	1.78	.81	.28

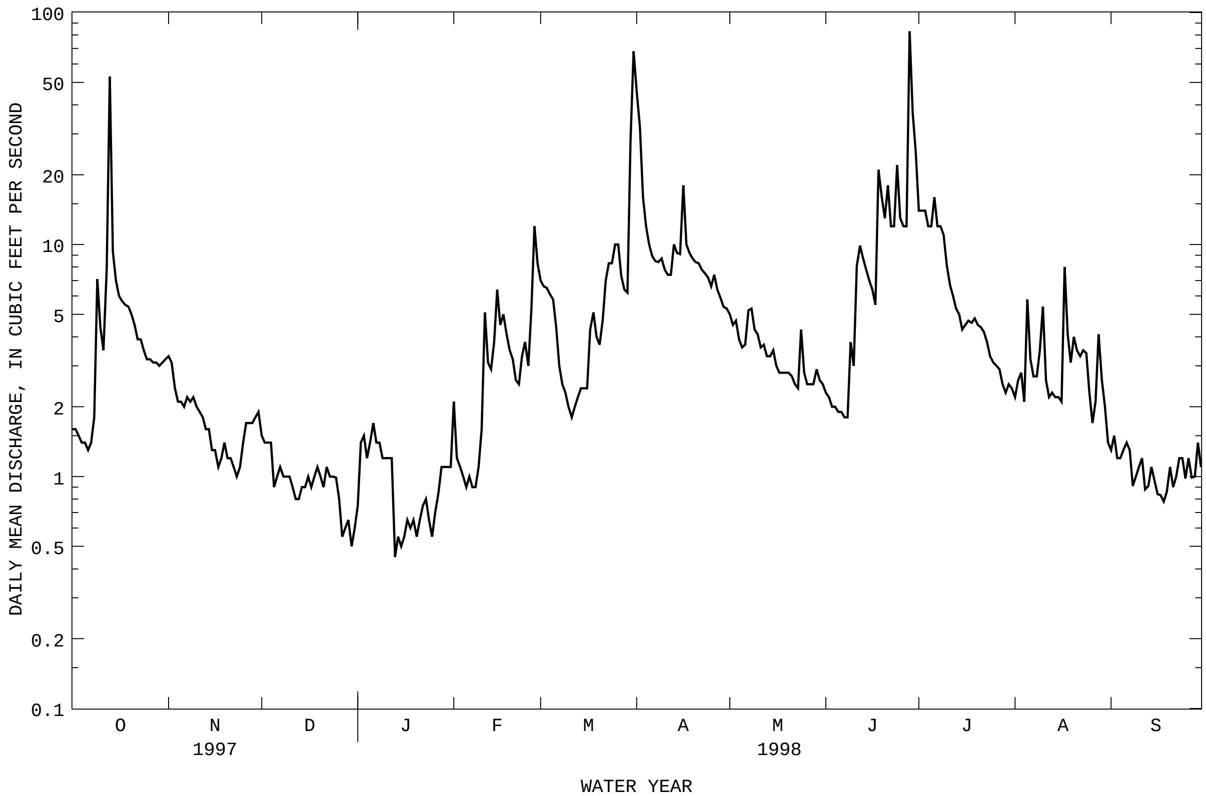
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1.51	2.17	1.83	1.42	2.78	5.90	4.84	3.08	6.53	2.92	2.30	2.23
MAX	5.47	11.1	9.34	5.21	12.4	17.7	12.1	8.17	32.3	14.0	6.74	8.65
(WY)	1998	1992	1992	1992	1997	1993	1993	1993	1991	1993	1993	1992
MIN	.12	.11	.023	.006	.18	2.06	.12	.20	.16	.14	.18	.24
(WY)	1990	1990	1990	1990	1990	1996	1989	1989	1989	1989	1988	1989

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1986 - 1998	
ANNUAL TOTAL	1288.42		1755.93			
ANNUAL MEAN	3.53		4.81		3.18	
HIGHEST ANNUAL MEAN					7.90	1993
LOWEST ANNUAL MEAN					.76	1989
HIGHEST DAILY MEAN	243	Feb 18	83	Jun 28	431	Jun 15 1991
LOWEST DAILY MEAN	.40	Jan 20	.45	Jan 13	.00	Aug 21 1989a
ANNUAL SEVEN-DAY MINIMUM	.47	Jan 15	.56	Jan 13	.00	Dec 12 1989
INSTANTANEOUS PEAK FLOW			367	Jun 28	3300	Jun 15 1991
INSTANTANEOUS PEAK STAGE			12.17	Jun 28	14.97	Jun 15 1991
INSTANTANEOUS LOW FLOW			.44	Dec 26		
ANNUAL RUNOFF (AC-FT)	2560		3480		2310	
ANNUAL RUNOFF (CFSM)	.80		1.10		.72	
ANNUAL RUNOFF (INCHES)	10.92		14.88		9.85	
10 PERCENT EXCEEDS	4.5		9.9		6.2	
50 PERCENT EXCEEDS	1.4		2.6		1.3	
90 PERCENT EXCEEDS	.69		.90		.22	

a Also Dec 12, 1989 to Jan 7, 1990, Jan 12-15, Jan 24 to Feb 4, 1990
e Estimated

05412060 SILVER CREEK NEAR LUANA, IA--Continued



05412100 ROBERTS CREEK ABOVE SAINT OLAF, IA

LOCATION.--Lat 42°55'49", long 91°23'03", in $SW^1/_4$ $NW^1/_4$ sec.25, T.94 N., R.5 W., Clayton County, Hydrologic Unit 07060004, on left downstream bank at bridge on road X28, 0.1 mi north of county road B65, on north edge of Saint Olaf.

DRAINAGE AREA.--70.7 mi^2.

PERIOD OF RECORD.--September 1957 to July 1977 (operated as a low-flow station only), March 1986 to current year.

GAGE.--Water-stage recorder. Datum of gage is 826.73 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 16-25, Dec. 4 to Jan. 2, Jan. 11 to Feb. 11, Mar. 10-19, May 31, and Sept. 24. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	28	11	e6.0	e6.0	84	726	47	19	99	9.9	6.3
2	16	26	11	e7.5	e7.0	70	377	43	19	77	8.2	5.6
3	16	26	13	16	e7.0	70	247	47	16	66	8.5	5.4
4	14	24	e10	13	e6.5	64	187	43	15	65	13	5.0
5	12	23	e7.5	12	e6.0	55	151	39	15	54	30	4.3
6	11	22	e8.5	16	e6.5	51	128	36	13	100	31	4.0
7	11	21	e9.0	16	e6.0	48	112	39	12	76	19	3.5
8	11	21	e8.5	14	e6.0	44	108	57	11	59	19	3.2
9	95	20	e8.5	13	e6.0	25	120	48	23	47	17	3.3
10	61	19	e8.5	5.2	e6.0	e30	98	41	33	41	33	3.7
11	43	18	e8.0	e5.5	e8.5	e25	85	38	128	37	25	3.6
12	40	18	e7.0	e10	32	e23	77	37	213	34	16	3.6
13	358	18	e6.0	e4.0	17	e18	96	34	101	32	13	3.6
14	153	18	e6.5	e4.5	15	e21	134	31	69	29	12	5.0
15	97	18	e7.0	e4.0	23	e23	98	30	56	27	15	7.2
16	77	e13	e7.5	e5.0	64	e25	184	29	45	24	11	5.8
17	66	e11	e7.0	e5.0	36	e29	143	26	49	22	13	4.2
18	59	e12	e7.5	e4.8	32	e36	110	24	55	20	42	3.8
19	53	e13	e7.5	e5.0	21	e42	94	22	211	20	17	4.1
20	47	e12	e7.0	e4.8	18	47	86	19	77	17	14	3.8
21	44	e11	e6.0	e5.0	19	50	88	18	146	16	25	3.5
22	40	e11	e8.5	e5.0	14	61	75	18	84	14	17	3.3
23	39	e10	e8.0	e5.5	16	94	68	19	61	13	12	3.5
24	37	e9.0	e7.5	e5.0	24	109	62	36	166	11	10	e5.0
25	34	e11	e7.0	e5.5	23	111	57	32	105	10	10	7.1
26	33	13	e6.0	e5.0	27	173	71	25	65	10	8.0	5.0
27	32	13	e4.5	e5.5	137	118	59	23	51	10	7.0	4.6
28	32	12	e5.5	e6.0	126	86	52	22	769	12	20	3.7
29	31	12	e6.0	e5.5	---	76	50	29	217	12	19	3.5
30	29	12	e4.0	e5.0	---	161	49	24	138	12	9.4	4.9
31	29	---	e4.5	e5.5	---	1030	---	e22	---	11	6.8	---
TOTAL	1637	495.0	234.0	229.8	715.5	2899	3992	998	2982	1077	510.8	133.1
MEAN	52.8	16.5	7.55	7.41	25.6	93.5	133	32.2	99.4	34.7	16.5	4.44
MAX	358	28	13	16	137	1030	726	57	769	100	42	7.2
MIN	11	9.0	4.0	4.0	6.0	18	49	18	11	10	6.8	3.2
AC-FT	3250	982	464	456	1420	5750	7920	1980	5910	2140	1010	264
CFSM	.75	.23	.11	.10	.36	1.32	1.88	.46	1.41	.49	.23	.06
IN.	.86	.26	.12	.12	.38	1.53	2.10	.53	1.57	.57	.27	.07

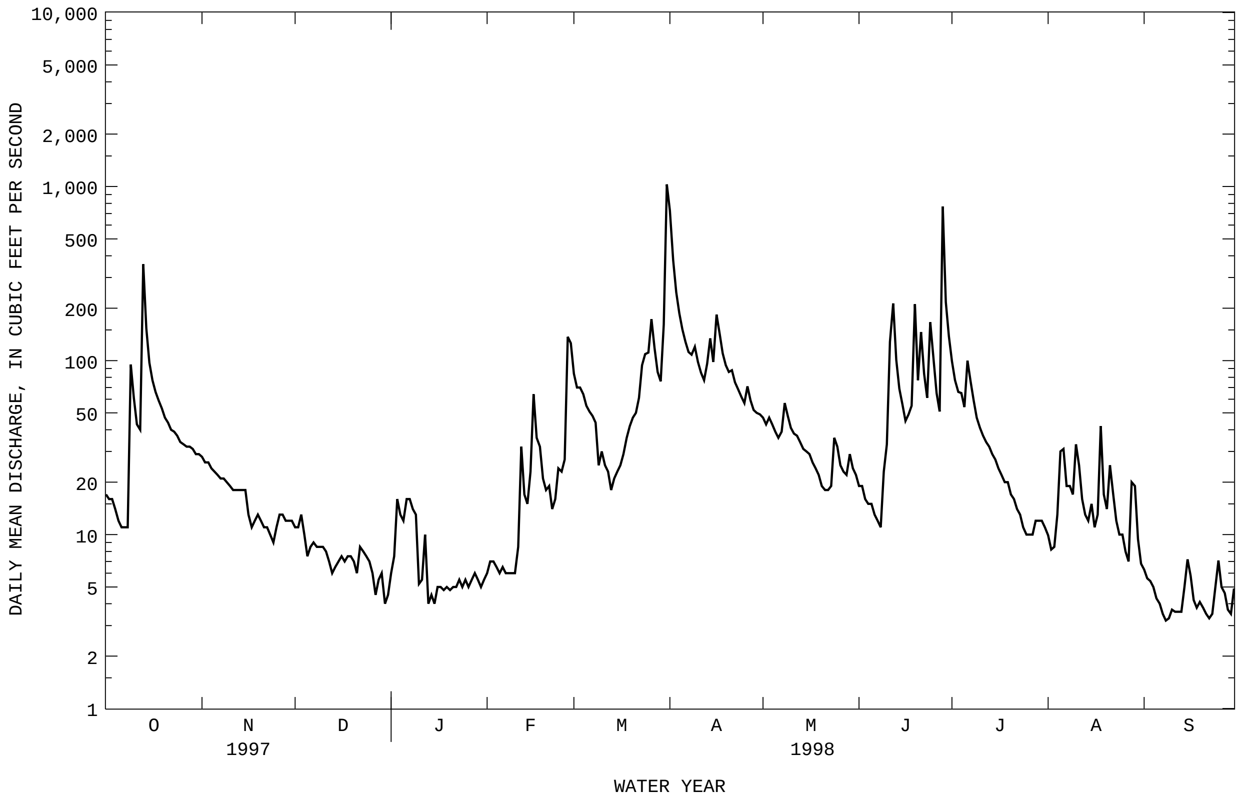
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	12.5	18.2	14.5	8.69	17.9	61.0	54.4	28.6	54.1	26.3	17.0	15.6
MAX	52.8	82.5	65.7	38.9	63.5	198	167	88.5	313	192	87.4	49.9
(WY)	1998	1992	1992	1992	1997	1993	1993	1993	1991	1993	1993	1993
MIN	.075	.003	.000	.11	.15	23.3	1.63	.86	.29	.098	.86	.53
(WY)	1990	1990	1990	1991	1991	1996	1989	1989	1989	1989	1988	1989

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1986 - 1998	
ANNUAL TOTAL	11463.5		15903.2			
ANNUAL MEAN	31.4		43.6		28.0	
HIGHEST ANNUAL MEAN					85.6	1993
LOWEST ANNUAL MEAN					4.36	1989
HIGHEST DAILY MEAN	900	Feb 18	1030	Mar 31	7090	Jun 15 1991
LOWEST DAILY MEAN	2.0	Jan 28	3.2	Sep 8	.00	Many days
ANNUAL SEVEN-DAY MINIMUM	2.4	Feb 1	3.5	Sep 7	.00	Many days
INSTANTANEOUS PEAK FLOW			1500	Jun 28	19600	Jun 15 1991
INSTANTANEOUS PEAK STAGE			15.86	Jun 28	27.88	Jun 15 1991
INSTANTANEOUS LOW FLOW			2.5	Jan 10		
ANNUAL RUNOFF (AC-FT)	22740		31540		20270	
ANNUAL RUNOFF (CFSM)	.44		.62		.40	
ANNUAL RUNOFF (INCHES)	6.03		8.37		5.38	
10 PERCENT EXCEEDS	54		98		59	
50 PERCENT EXCEEDS	19		19		10	
90 PERCENT EXCEEDS	4.5		5.0		.70	

e Estimated

05412100 ROBERTS CREEK ABOVE SAINT OLAF, IA--Continued



05412500 TURKEY RIVER AT GARBER, IA

LOCATION.--Lat 42°44'24", long 91°15'42", in SE$^1/_4$ NW$^1/_4$ sec.36, T.92 N., R.4 W., Clayton County, Hydrologic Unit 07060004, on right bank 10 ft. upstream from bridge on county highway C43, 800 ft. upstream from Wayman Creek, 1,000 ft. southeast of Garber, 2,000 ft. downstream from Elk Creek, 1 mi downstream from Volga River, and 21.2 mi upstream from mouth.

DRAINAGE AREA.--1,545 mi^2.

PERIOD OF RECORD.--August 1913 to November 1916, May 1919 to September 1927, April 1929 to September 1930, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1922-25 (M), 1927 (M). WSP 1438: Drainage area; WDR IA-95-1: location.

GAGE.--Water-stage recorder. Datum of gage is 634.46 ft. above sea level. Prior to Feb. 7, 1935, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 13 to Jan. 3, Jan. 9 to Feb. 15, Mar. 11-16, and May 23 to June 11. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, that of June 15, 1991.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	497	868	511	e500	e440	3100	15100	2120	e1200	7570	863	1070
2	482	840	504	e650	e440	2660	11700	2020	e1230	4440	836	994
3	474	820	517	e600	e420	2390	8590	2020	e1220	3620	827	922
4	462	789	525	519	e400	2280	6570	1950	e1160	3470	942	889
5	443	757	507	515	e380	2160	5230	1820	e1110	3070	1850	831
6	426	733	484	554	e360	2000	4500	1750	e1080	2940	2340	793
7	418	709	468	577	e400	1870	3970	1780	e1040	2930	1600	754
8	411	695	478	590	e420	1830	3740	2060	e953	2820	1290	720
9	530	686	484	e500	e440	1730	3730	2170	e1070	2590	1100	689
10	956	674	485	e400	e440	1480	3430	2260	e1290	2410	1600	669
11	857	654	478	e420	e460	e1200	3160	2150	e2090	2220	1730	655
12	791	640	467	e440	e440	e1100	2970	2010	4850	2050	1280	639
13	2210	626	e400	e340	e420	e1200	2890	1900	4310	1920	1080	629
14	4160	626	e360	e360	e460	e1100	3570	1770	3790	1800	989	693
15	3630	631	e380	e380	e500	e1100	3340	1670	3160	1700	1160	764
16	2810	611	e400	e420	833	e1200	4640	1600	3130	1600	999	675
17	2150	566	e360	e400	1080	1290	4480	1510	3050	1510	907	624
18	1840	573	e340	e340	1280	1370	3750	1430	3220	1440	1170	598
19	1650	567	e340	e400	1560	1560	3350	1380	4480	1430	993	592
20	1490	572	e320	e360	1580	1620	3190	1320	4980	1380	914	585
21	1350	580	e300	e460	1470	1700	3450	1270	5550	1320	1070	569
22	1250	567	e300	e500	1310	1880	3480	1230	7280	1300	1230	553
23	1170	550	e320	e460	1230	2250	3130	e1200	6920	1260	1260	543
24	1110	512	e340	e460	1200	2590	2880	e1150	6390	1200	1150	587
25	1060	509	e360	e480	1230	2700	2680	e1190	6180	1140	1070	600
26	1020	528	e380	e440	1350	3010	2670	e1290	4990	1100	979	588
27	979	556	e340	e480	2020	3110	2580	e1220	3910	1060	916	575
28	934	541	e320	e500	2940	2990	2400	e1180	7980	1040	1040	557
29	906	529	e320	e460	---	2700	2290	e1220	11200	962	1150	555
30	887	522	e300	e420	---	4330	2210	e1230	13000	914	1280	569
31	876	---	e360	e400	---	14000	---	e1240	---	889	1230	---
TOTAL	38229	19031	12448	14325	25503	75500	129670	50110	121813	65095	36845	20481
MEAN	1233	634	402	462	911	2435	4322	1616	4060	2100	1189	683
MAX	4160	868	525	650	2940	14000	15100	2260	13000	7570	2340	1070
MIN	411	509	300	340	360	1100	2210	1150	953	889	827	543
AC-FT	75830	37750	24690	28410	50590	149800	257200	99390	241600	129100	73080	40620
CFSM	.80	.41	.26	.30	.59	1.58	2.80	1.05	2.63	1.36	.77	.44
IN.	.92	.46	.30	.34	.61	1.82	3.12	1.21	2.93	1.57	.89	.49

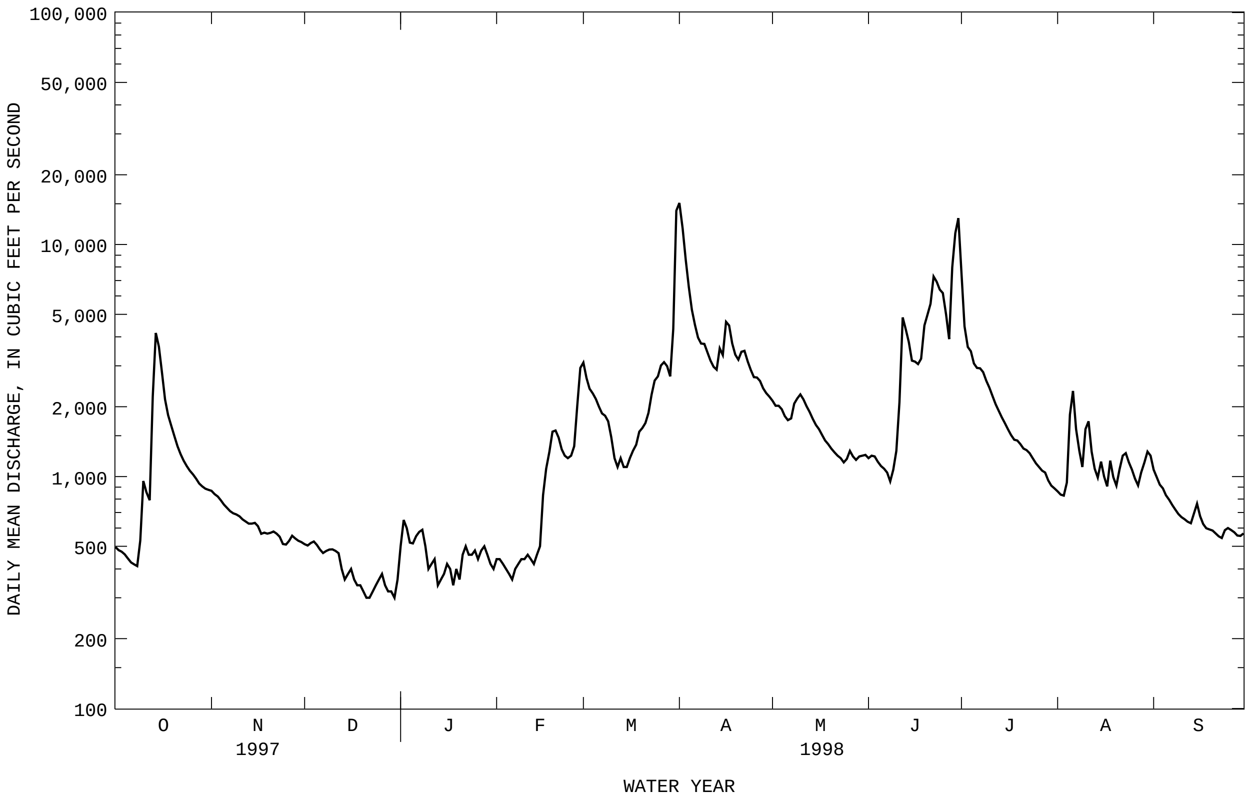
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	568	609	482	517	826	2056	1713	1291	1376	946	844	639
MAX	2527	2834	2889	3306	4265	4832	6382	3896	5316	5772	5119	3011
(WY)	1987	1962	1983	1916	1922	1979	1951	1983	1947	1993	1993	1938
MIN	88.2	92.2	78.5	62.0	60.9	188	288	95.7	103	121	140	108
(WY)	1950	1950	1959	1940	1959	1934	1957	1934	1934	1936	1964	1958

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1913 - 1998	
ANNUAL TOTAL	393371		609050			
ANNUAL MEAN	1078		1669		992	
HIGHEST ANNUAL MEAN					2905	1993
LOWEST ANNUAL MEAN					249	1934
HIGHEST DAILY MEAN	6850	Mar 10	15100	Apr 1	33700	Jun 15 1991
LOWEST DAILY MEAN	240	Feb 13	300	Dec 21,22,30	49	Jan 28 1940
ANNUAL SEVEN-DAY MINIMUM	319	Jan 12	323	Dec 18	51	Jan 25 1940
INSTANTANEOUS PEAK FLOW			15500	Apr 1	49900	Jun 15 1991
INSTANTANEOUS PEAK STAGE			20.52	Apr 1	30.10	Jun 15 1991
ANNUAL RUNOFF (AC-FT)	780300		1208000		718900	
ANNUAL RUNOFF (CFSM)	.70		1.08		.64	
ANNUAL RUNOFF (INCHES)	9.47		14.66		8.73	
10 PERCENT EXCEEDS	2220		3470		2090	
50 PERCENT EXCEEDS	770		1100		520	
90 PERCENT EXCEEDS	386		420		169	

e Estimated

05412500 TURKEY RIVER AT GARBER, IA--Continued



05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA

LOCATION.--Lat 42°05'00", long 90°37'58", in SW$^1/_4$ NE$^1/_4$ sec.17, T.84 N., R.3 E., Jackson County, Hydrologic Unit 07060006, on right downstream bank at State Highway 62 bridge, 900 ft. upstream from Prairie Creek, 2.0 mi northeast of Maquoketa, 2.2 mi downstream from North Fork, and 26.7 mi upstream from mouth.

DRAINAGE AREA.--1,553 mi^2.

PERIOD OF RECORD.--September 1913 to current year. Prior to October 1939, published as "below North Fork near Maquoketa". Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 405: 1914. WSP 1438: Drainage area. WSP 1508: 1914-17, 1919-25, 1926 (M), 1929, 1933-34 (M), 1943.

GAGE.--Water-stage recorder. Datum of gage is 625.96 ft. above sea level. Prior to July 14, 1924, nonrecording gage, and July 15, 1924 to Sept. 30, 1972, recording gage at site 300 ft. upstream from State Highway 62 bridge at datum 10.00 ft. higher. On Aug. 3, 1995 the gage was moved to the current location.

REMARKS.--Estimated daily discharges: Oct. 5-8, Dec. 25 to Jan. 2, Jan. 10 to Feb 1, and July 27 to Aug 5. Records good except those estimated daily discharges, which are poor. Diurnal fluctuation caused by power plant 4 mi upstream of station. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood, probably in 1903, reached a stage of 23.5 ft., discharge, 43,000 ft.3/s, at datum in use prior to Oct. 1, 1972.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	438	612	495	e280	e650	2500	14500	2200	2270	2560	e850	1790
2	475	636	584	e340	771	2280	15100	2120	2020	2170	e800	1490
3	450	617	595	649	816	2040	9440	2050	1840	2090	e800	1300
4	438	547	667	820	688	1800	5580	2030	1740	1910	e850	1230
5	e420	501	603	855	814	1740	4450	1950	1620	1880	e900	1160
6	e420	506	526	873	711	1720	3860	1950	1500	1720	1030	1030
7	e400	523	602	903	682	1370	3400	1900	1480	1730	1140	995
8	e400	549	508	939	725	1490	3450	1950	1440	1880	1130	942
9	467	567	597	944	640	1740	4080	2030	1560	1740	1060	846
10	722	535	514	e650	662	1390	3620	1990	3220	1640	1060	837
11	542	493	603	e460	750	1150	3520	1920	3040	1560	1040	878
12	479	493	504	e550	756	1110	2840	1930	4200	1480	1040	743
13	593	470	499	e500	810	1150	2860	1790	4600	1390	1030	802
14	571	463	523	e480	861	1170	2930	1870	4500	1330	1020	1190
15	626	483	498	e420	718	1160	2750	1730	3770	1250	903	1790
16	949	475	516	e500	801	1120	2990	1690	3570	1240	1120	1560
17	735	391	565	e550	782	1100	5000	1590	5140	1190	1160	1410
18	837	415	493	e500	858	1320	4620	1540	4660	1140	1160	1210
19	637	475	513	e480	882	1750	3590	1470	9400	1120	1090	1120
20	613	483	503	e460	905	2000	3280	1530	5620	1110	1030	1060
21	631	489	495	e480	903	2000	3430	1510	5090	1070	1050	1020
22	522	466	503	e500	927	1930	4040	1410	4840	1060	1050	910
23	503	455	504	e480	904	2110	3670	1410	4240	1040	1010	941
24	539	422	503	e460	913	1970	3270	1540	3630	1040	1080	950
25	540	407	e480	e440	935	1990	2830	1930	3590	1020	1410	901
26	537	531	e420	e440	964	1970	2810	1890	3640	1020	1450	944
27	554	465	e360	e460	1600	1960	2670	1920	3140	e1000	1200	957
28	526	508	e380	e480	2290	1940	2420	1770	3320	e950	2230	857
29	563	568	e400	e500	---	1760	2280	1790	3390	e950	2790	889
30	576	487	e360	e550	---	1620	2280	1890	2980	e900	2770	864
31	586	---	e320	e600	---	6530	---	2820	---	e850	2290	---
TOTAL	17289	15032	15633	17543	24718	56880	131560	57110	105050	43030	38543	32616
MEAN	558	501	504	566	883	1835	4385	1842	3502	1388	1243	1087
MAX	949	636	667	944	2290	6530	15100	2820	9400	2560	2790	1790
MIN	400	391	320	280	640	1100	2280	1410	1440	850	800	743
AC-FT	34290	29820	31010	34800	49030	112800	260900	113300	208400	85350	76450	64690
CFSM	.36	.32	.32	.36	.57	1.18	2.82	1.19	2.25	.89	.80	.70
IN.	.41	.36	.37	.42	.59	1.36	3.15	1.37	2.52	1.03	.92	.78

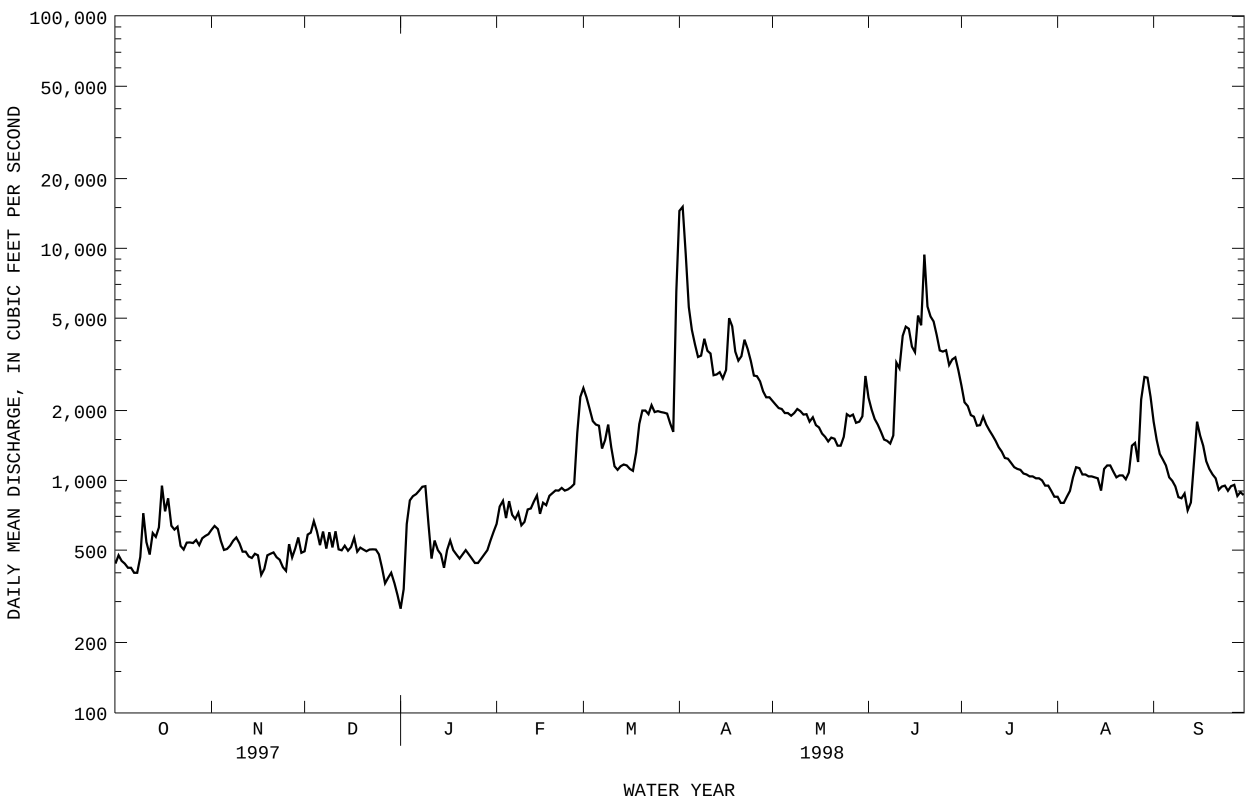
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1998, BY WATER YEAR (WY)

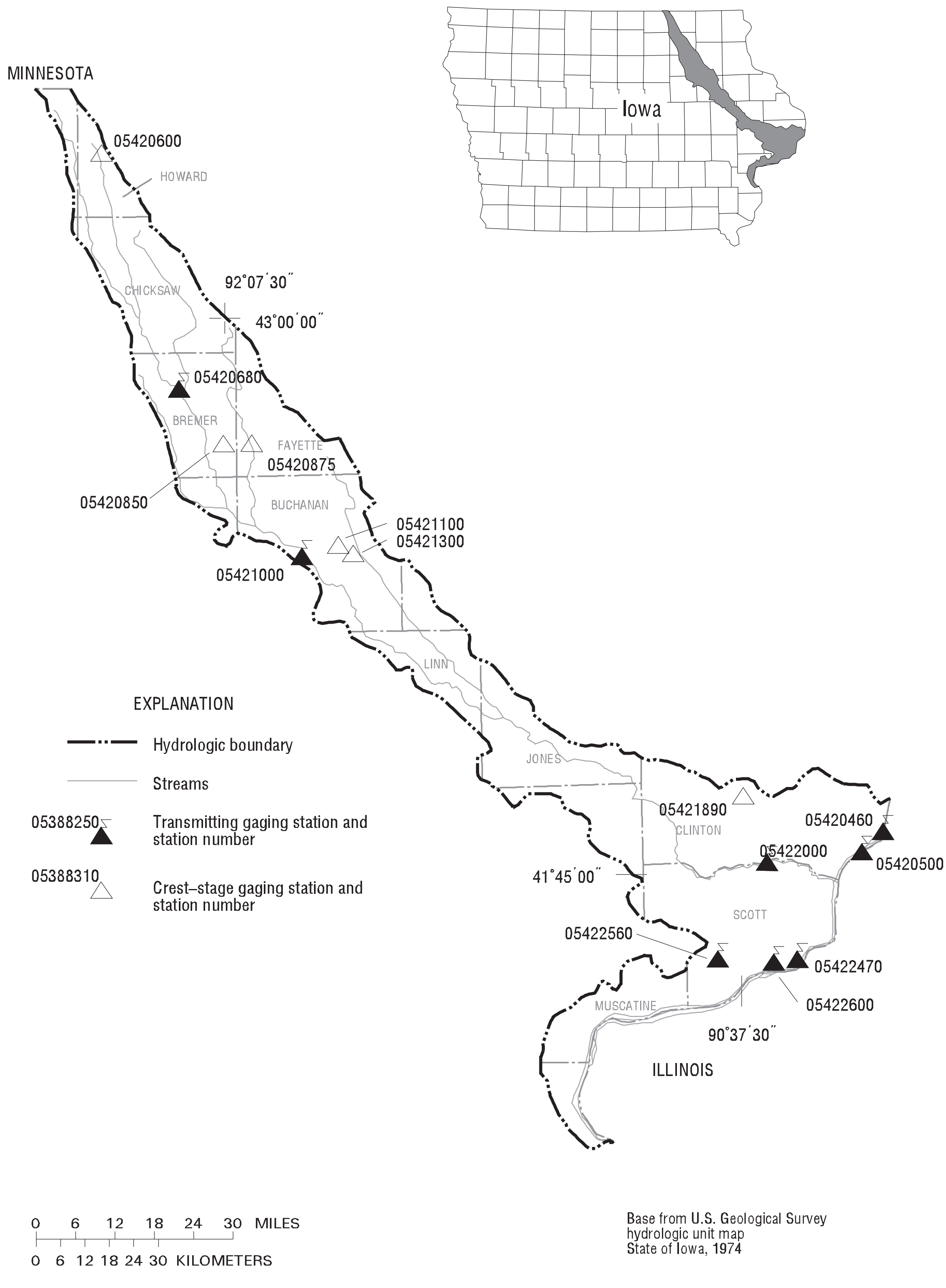
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	720	785	659	693	1105	1868	1374	1233	1458	1060	831	886
MAX	2486	4983	2397	2851	4161	4798	4843	4267	6670	8835	3340	3074
(WY)	1987	1962	1983	1960	1971	1993	1973	1974	1947	1993	1924	1981
MIN	210	198	177	150	196	241	305	198	170	177	227	182
(WY)	1957	1959	1959	1940	1936	1934	1934	1934	1934	1936	1958	1958

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1914 - 1998	
ANNUAL TOTAL	390449		555004			
ANNUAL MEAN	1070		1521		1055	
HIGHEST ANNUAL MEAN					2874	1993
LOWEST ANNUAL MEAN					306	1958
HIGHEST DAILY MEAN	18800	Feb 22	15100	Apr 2	34800	Jun 27 1944
LOWEST DAILY MEAN	290	Jan 18	280	Jan 1	105	Feb 11 1936
ANNUAL SEVEN-DAY MINIMUM	347	Jan 12	349	Dec 27	105	Feb 11 1936
INSTANTANEOUS PEAK FLOW			15600	Apr 2	48000	Jun 27 1944
INSTANTANEOUS PEAK STAGE			25.85	Apr 2	24.70	Jun 27 1944
ANNUAL RUNOFF (AC-FT)	774500		1101000		764200	
ANNUAL RUNOFF (CFSM)	.69		.98		.68	
ANNUAL RUNOFF (INCHES)	9.35		13.29		9.23	
10 PERCENT EXCEEDS	1870		3270		1990	
50 PERCENT EXCEEDS	629		1030		650	
90 PERCENT EXCEEDS	438		480		300	

e Estimated





Iowa
MINNESOTA
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HOWARD
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BREMER
FAYETTE
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05420850
BUCHANAN
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LINN
JONES
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CLINTON
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SCOTT
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ILLINOIS
EXPLANATION
Hydrologic boundary
Streams
05388250
Transmitting gaging station and station number
05388310
Crest–stage gaging station and station number
0 6 12 18 24 30 MILES
0 6 12 18 24 30 KILOMETERS
Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05420460 BEAVER SLOUGH AT THIRD STREET CLINTON, IA

LOCATION.--Lat 41°49'38", long 90°11'25", in SW 1/4 SE 1/4 NW 1/4 sec.18, T.81 N., R.7 E., Clinton County, Hydrologic Unit 07080101, at river end of 3rd street, at downstream end of ADM repair dock, 10.3 miles upstream from Wapsipinicon River, 4.8 miles upstream from Camanche gage, 5.9 miles downstream from Lock and Dam 13, and at mile 516.6 upstream from Ohio River.

DRAINAGE AREA.--85,600 mi^2, approximately, at Fulton-Lyons Bridge at Clinton.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft above sea level.

REMARKS.--Estimated daily discharges: Jan. 11-21, June 12-16, and June 21. Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8700	10500	9230	6830	9180	19600	27000	21800	12600	25300	8250	8650
2	8780	10600	8630	6500	9580	20400	32000	19900	12000	26500	8680	8130
3	8800	10600	8200	6430	9650	21500	32500	19100	11400	29000	8480	7650
4	8750	10500	8350	6880	9450	21300	30500	18500	12600	31300	8450	7280
5	8480	10200	8780	8180	9450	21800	31000	17600	12800	32800	8730	7330
6	7280	10100	8930	9380	9400	22400	32500	16600	12400	34000	10300	7030
7	7400	10200	9100	10100	9200	23500	35000	15800	11800	34800	11300	6880
8	8280	10200	9050	10100	9000	24900	38000	15300	11200	34500	11600	7100
9	9050	10200	9100	9030	8750	25500	41000	15100	11200	33300	11500	7180
10	9580	10200	9400	7630	8430	25000	43300	15000	12200	31300	10300	7180
11	8900	10400	9350	e6750	8000	24400	44500	15300	13200	28300	9950	6980
12	8300	10300	9080	e6250	8950	23600	44000	15100	e13800	26000	11300	6650
13	8880	10000	8630	e6000	9100	21700	43800	14600	e14000	24200	11800	6330
14	10700	9780	8480	e5250	9330	19200	42800	13100	e14500	21600	10000	6600
15	12300	9930	8350	e5000	9250	17700	41300	10700	e14500	18900	6600	8030
16	12900	10200	8550	e4500	9350	17400	40000	11000	e14800	17400	7180	8250
17	13400	10200	8780	e4500	10000	16200	39000	12700	15000	16100	9050	7680
18	14000	10200	8980	e4750	10000	14800	38000	12400	15500	15100	9850	7300
19	14300	9600	8950	e5500	9980	14400	36800	13500	18200	13600	9800	6680
20	14800	8830	8780	e6250	11700	15100	34800	14000	21300	12900	9050	6380
21	14700	8600	8430	e7500	13800	15100	32800	13600	e21500	13000	9380	6150
22	14100	8230	8280	9380	13600	14800	31300	13200	19300	13600	10400	5830
23	13500	7550	8350	10300	14200	15200	30000	12800	19300	13900	11400	5750
24	12600	6330	8250	10400	14900	15400	29300	13000	19600	12900	10900	6430
25	12900	6030	8480	10300	15000	14600	27500	14000	19800	12200	9500	7280
26	11400	8430	8400	10300	15200	13500	26800	14500	19600	11700	11800	6800
27	10300	10100	7580	10200	16200	12800	25500	14200	18700	11500	12600	6350
28	10500	9680	7080	10100	18000	12800	23800	12600	19000	10400	12100	6250
29	10900	9800	6350	9750	---	14600	23300	12200	21300	9280	10100	6100
30	11000	9280	6230	9480	---	15300	23100	13100	23200	8230	9000	7450
31	10500	---	6330	9250	---	19900	---	13500	---	7830	9230	---
TOTAL	335980	286770	260460	242770	308650	574400	1021200	453800	476300	631440	308580	209680
MEAN	10840	9559	8402	7831	11020	18530	34040	14640	15880	20370	9954	6989
MAX	14800	10600	9400	10400	18000	25500	44500	21800	23200	34800	12600	8650
MIN	7280	6030	6230	4500	8000	12800	23100	10700	11200	7830	6600	5750
AC-FT	666400	568800	516600	481500	612200	1139000	2026000	900100	944700	1252000	612100	415900
CFSM	.13	.11	.10	.09	.13	.22	.40	.17	.19	.24	.12	.08
IN.	.15	.12	.11	.11	.13	.25	.44	.20	.21	.27	.13	.09

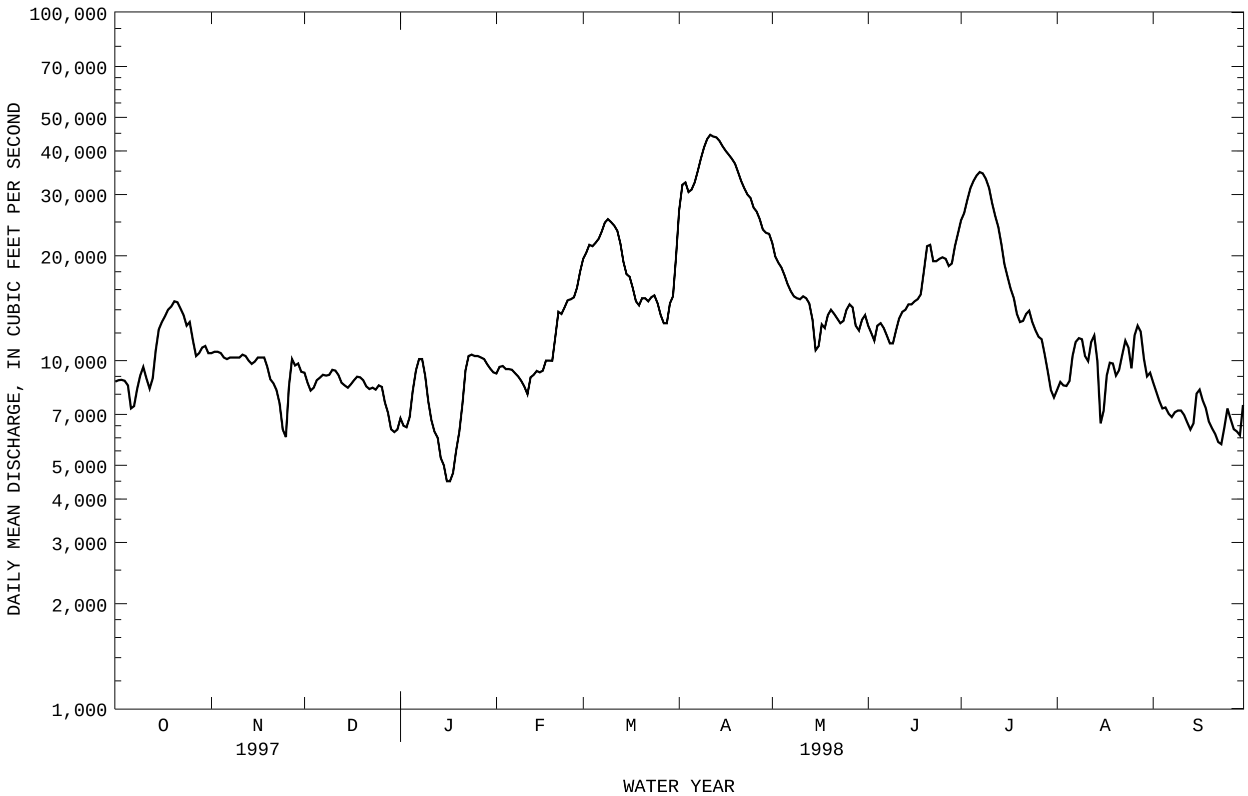
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	12390	13890	10800	10210	11020	17140	31980	26140	19810	21780	15070	12500
MAX	15960	18320	11680	12780	14510	19900	43980	34520	35240	49690	28330	21640
(WY)	1996	1996	1997	1995	1994	1995	1997	1993	1993	1993	1993	1993
MIN	7741	9559	8402	7831	8358	13260	21540	14640	13010	11950	8985	6083
(WY)	1997	1998	1998	1998	1993	1993	1994	1998	1997	1995	1996	1996

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1993 - 1998	
ANNUAL TOTAL	5882290		5110030			
ANNUAL MEAN	16120		14000		16910	
HIGHEST ANNUAL MEAN					23060	1993
LOWEST ANNUAL MEAN					14000	1998
HIGHEST DAILY MEAN	59300	Apr 19	44500	Apr 11	59500	Jul 7 1993
LOWEST DAILY MEAN	6030	Nov 25	4500	Jan 16,17	4370	Sep 22 1996
ANNUAL SEVEN-DAY MINIMUM	7210	Dec 25	5070	Jan 13	4860	Sep 18 1996
INSTANTANEOUS PEAK FLOW			44500	Apr 11		
INSTANTANEOUS PEAK STAGE			21.07	Apr 11,12		
ANNUAL RUNOFF (AC-FT)	11670000		10140000		12250000	
ANNUAL RUNOFF (CFSM)	.19		.16		.20	
ANNUAL RUNOFF (INCHES)	2.56		2.22		2.68	
10 PERCENT EXCEEDS	28300		26200		29700	
50 PERCENT EXCEEDS	13000		10700		13400	
90 PERCENT EXCEEDS	8820		7060		8600	

e Estimated

05420460 BEAVER SLOUGH AT THIRD STREET CLINTON, IA--Continued



05420500 MISSISSIPPI RIVER AT CLINTON, IA

(National stream-quality accounting network station)

LOCATION.--Lat 41°46'50", long 90°15'07", in NW$^1/_4$ sec.34, T.81 N., R.6 E., Clinton County, Hydrologic Unit 07080101, on right bank at end of Eighth Avenue in Camanche, 5.0 mi upstream from Wapsipinicon River, 6.4 mi downstream from Clinton, 10.6 mi downstream from Lock and Dam 13, and at mile 511.8 upstream from Ohio River.

DRAINAGE AREA.--85,600 mi^2, approximately, at Fulton-Lyons Bridge at Clinton.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June to August 1873 (fragmentary), October 1873 to current year (October 1932 to September 1939, published as "at Le Claire")(June 1873 to December 1932 published in the Iowa State Planning Board report "Stream-flow records of Iowa, 1873-1932").

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft above sea level. June 6, 1969 to Sept. 16, 1988, water-stage recorder at site 400 ft upstream at same datum. Auxiliary water-stage recorder at Lock and Dam 13 since Oct. 1, 1958. See WSP 1728 for history of changes prior to Oct. 1, 1955.

REMARKS.--Estimated daily discharges: Jan. 11-21, June 12-16, and June 21. Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1828, that of Apr. 28, 1965.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34800	42000	36900	27300	36700	78500	108000	87300	50200	101000	33000	34600
2	35100	42400	34500	26000	38300	81500	128000	79500	47800	106000	34700	32500
3	35200	42200	32800	25700	38600	85900	130000	76300	45400	116000	33900	30600
4	35000	41900	33400	27500	37800	85000	122000	73900	50500	125000	33800	29100
5	33900	40700	35100	32700	37800	87300	124000	70200	51100	131000	34900	29300
6	29100	40400	35700	37500	37600	89700	130000	66400	49600	136000	41200	28100
7	29600	40600	36400	40400	36800	94100	140000	63000	47100	139000	45200	27500
8	33100	40600	36200	40300	36000	99600	152000	61200	44600	138000	46300	28400
9	36200	40600	36400	36100	35000	102000	164000	60200	44600	133000	46000	28700
10	38300	40600	37600	30500	33700	99800	173000	59900	48600	125000	41200	28700
11	35600	41400	37400	e27000	32000	97600	178000	61000	52800	113000	39800	27900
12	33200	41100	36300	e25000	35800	94300	176000	60300	e55000	104000	45300	26600
13	35500	40100	34500	e24000	36400	86600	175000	58500	e56000	96900	47300	25300
14	42600	39100	33900	e21000	37300	76800	171000	52300	e58000	86300	40000	26400
15	49100	39700	33400	e20000	37000	70700	165000	42900	e58000	75700	26400	32100
16	51600	40900	34200	e18000	37400	69400	160000	44000	e59000	69400	28700	33000
17	53700	40800	35100	e18000	40000	64700	156000	50600	60000	64300	36200	30700
18	55900	40800	35900	e19000	40100	59300	152000	49500	61900	60400	39400	29200
19	57300	38400	35800	e22000	39900	57600	147000	53900	72900	54200	39200	26700
20	59000	35300	35100	e25000	46700	60300	139000	55900	85100	51700	36200	25500
21	58800	34400	33700	e30000	55100	60500	131000	54500	e86000	52100	37500	24600
22	56500	32900	33100	37500	54400	59200	125000	52700	77000	54500	41700	23300
23	53900	30200	33400	41100	56600	60800	120000	51300	77100	55500	45400	23000
24	50400	25300	33000	41400	59400	61400	117000	52100	78400	51400	43500	25700
25	51400	24100	33900	41100	59900	58500	110000	55800	79000	48600	38000	29100
26	45600	33700	33600	41000	60600	53800	107000	58000	78400	46600	47100	27200
27	41300	40300	30300	40900	64800	51100	102000	56600	74900	46100	50200	25400
28	42000	38700	28300	40300	71900	51100	95200	50400	75900	41400	48200	25000
29	43500	39200	25400	39000	---	58500	93300	48900	85000	37100	40500	24400
30	44000	37100	24900	37900	---	61100	92500	52400	92800	32900	36000	29800
31	42100	---	25300	37000	---	79500	---	54000	---	31300	36900	---
TOTAL	1343300	1145500	1041500	970200	1233600	2296200	4083000	1813500	1902700	2523400	1233700	838400
MEAN	43330	38180	33600	31300	44060	74070	136100	58500	63420	81400	39800	27950
MAX	59000	42400	37600	41400	71900	102000	178000	87300	92800	139000	50200	34600
MIN	29100	24100	24900	18000	32000	51100	92500	42900	44600	31300	26400	23000
AC-FT	2664000	2272000	2066000	1924000	2447000	4555000	8099000	3597000	3774000	5005000	2447000	1663000
CFSM	.51	.45	.39	.37	.51	.87	1.59	.68	.74	.95	.46	.33
IN.	.58	.50	.45	.42	.54	1.00	1.77	.79	.83	1.10	.54	.36

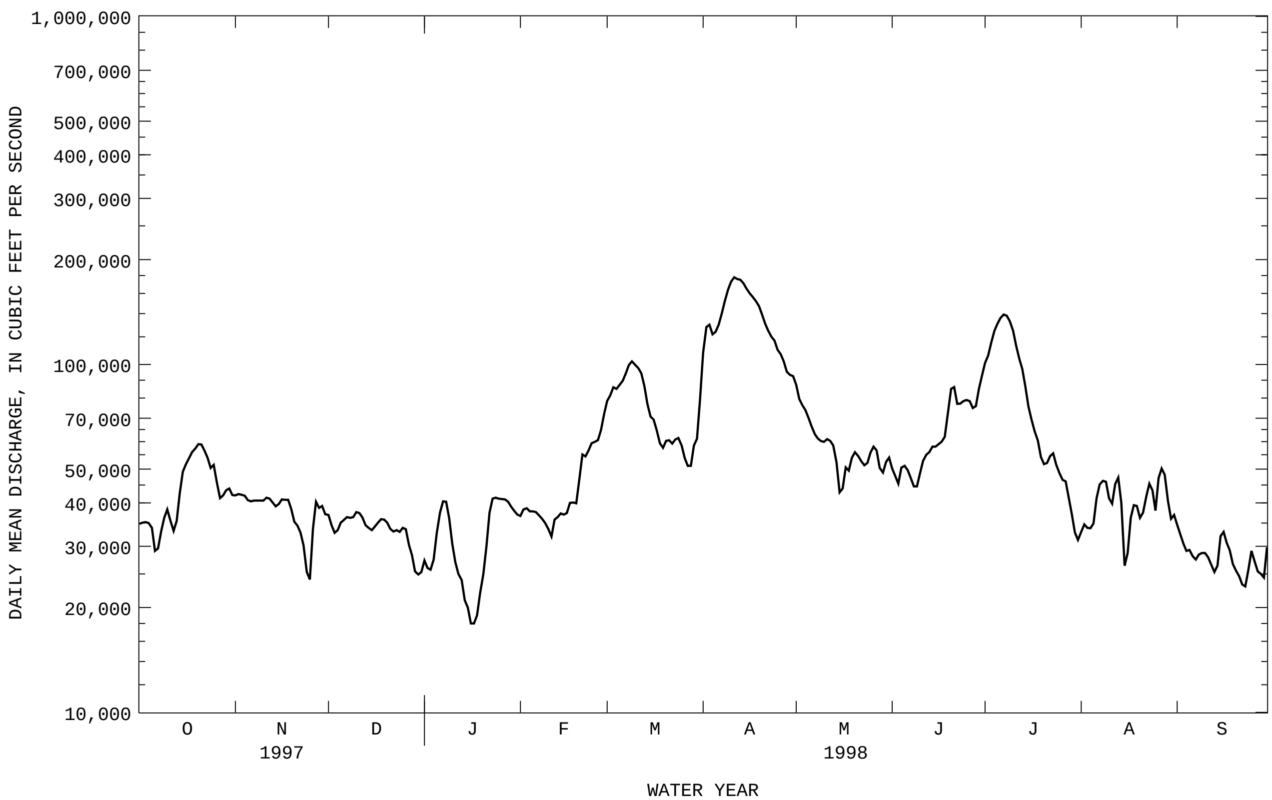
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1874 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	41090	39300	27910	25740	27970	50760	90230	81660	68210	55780	37950	38080
MAX	203600	146800	73590	54100	65680	127500	175900	212400	182100	198900	113400	92410
(WY)	1882	1882	1882	1973	1966	1973	1997	1888	1892	1993	1993	1938
MIN	13490	13760	11120	11390	14000	17600	26040	23190	15420	14690	12460	13870
(WY)	1934	1934	1934	1890	1893	1934	1931	1977	1988	1988	1936	1933

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1874 - 1998	
ANNUAL TOTAL	23480300		20425000			
ANNUAL MEAN	64330		55960		48770	
HIGHEST ANNUAL MEAN					94690	1882
LOWEST ANNUAL MEAN					18870	1934
HIGHEST DAILY MEAN	237000	Apr 19	178000	Apr 11,12	307000	Apr 28 1965
LOWEST DAILY MEAN	24100	Nov 25	18000	Jan 16,17	6500	Dec 25 1933
ANNUAL SEVEN-DAY MINIMUM	28800	Dec 25	20300	Jan 13	7430	Dec 24 1933
INSTANTANEOUS PEAK FLOW			178000	Apr 11,12		
INSTANTANEOUS PEAK STAGE			18.21	Apr 11,12	24.65	Apr 28 1965
ANNUAL RUNOFF (AC-FT)	46570000		40510000		35330000	
ANNUAL RUNOFF (CFSM)	.75		.65		.57	
ANNUAL RUNOFF (INCHES)	10.20		8.88		7.74	
10 PERCENT EXCEEDS	113000		105000		94300	
50 PERCENT EXCEEDS	51400		42600		37500	
90 PERCENT EXCEEDS	35300		28200		19000	

e Estimated



05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
(National stream-quality accounting network station)

WATER QUALITY RECORDS

PERIOD OF RECORD.--October 1974 to September 1987, October 1994 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT												
15...	0930	50500	378	--	--	--	7.5	--	--	--	170	39
NOV												
21...	0930	36000	349	7.8	1.0	1.3	2.8	13.8	99	748	170	39
JAN												
30...	1030	39000	426	8.0	.5	.0	1.8	--	--	--	180	43
MAR												
25...	1030	57500	387	8.2	4.5	16.5	3.8	14.1	111	746	180	43
APR												
07...	1230	139000	316	7.6	7.5	9.0	27	8.6	75	735	140	33
MAY												
11...	1145	57700	450	8.2	19.0	24.0	7.1	9.0	100	743	210	45
27...	0935	56500	461	7.6	20.5	20.5	9.4	5.0	57	745	200	45
JUN												
10...	1230	47500	478	7.4	18.5	23.3	10	6.5	71	745	210	48
JUL												
01...	0920	97000	440	7.4	25.7	28.0	59	4.7	59	746	190	46
09...	1230	131000	363	6.8	26.8	29.0	19	4.4	56	750	160	38
28...	0930	43500	425	8.0	25.5	30.2	7.4	7.6	95	746	190	45
AUG												
25...	0925	34700	409	8.1	25.7	27.7	15	6.3	79	745	180	42
SEP												
23...	0930	22500	442	7.8	20.1	21.1	12	7.3	81	753	200	43

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	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)
OCT												
15...	18	10	11	.3	2.5	143	0	175	22	15	.15	7.9
NOV												
21...	17	10	12	.3	2.1	150	0	183	20	15	<.10	8.9
JAN												
30...	18	12	12	.4	2.2	154	0	188	26	17	.14	8.2
MAR												
25...	17	9.0	10	.3	2.8	156	19	151	28	16	.13	9.3
APR												
07...	13	7.0	10	.3	2.8	118	0	144	23	13	.12	8.6
MAY												
11...	23	9.7	9	.3	2.6	142	3	167	59	15	.16	1.0
27...	22	9.9	9	.3	2.7	161	0	197	51	15	.14	4.1
JUN												
10...	22	10	10	.3	2.5	170	0	207	43	17	.21	8.2
JUL												
01...	18	8.4	9	.3	2.9	152	0	185	31	14	.20	11
09...	15	7.3	9	.3	2.7	130	0	159	22	12	.13	15
28...	19	7.6	8	.2	.28	176	11	193	26	14	.18	10
AUG												
25...	19	8.4	9	.3	2.3	164	6	188	21	13	.16	5.1
SEP												
23...	21	9.6	9	.3	2.6	206	0	251	23	15	.17	3.7

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
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WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT												
15...	218	204	.30	29700	.56	.629	.021	.074	.64	.085	.089	.140
NOV												
21...	211	208	.29	20500	--	1.30	<.010	<.020	.52	.056	.043	.057
JAN												
30...	260	226	.35	27400	.35	1.55	.016	.085	.43	.017	<.010	.010
MAR												
25...	245	231	.33	38000	--	2.81	.032	<.020	.79	.002	.015	.092
APR												
07...	203	183	.28	76200	.79	2.69	.022	.046	.84	.047	.058	.183
MAY												
11...	276	249	.38	43000	.68	1.89	.024	.066	.75	.012	.019	.103
27...	262	253	.36	40000	.57	1.17	.063	.033	.60	.065	.026	.129
JUN												
10...	287	262	.39	36800	.61	2.00	.051	.138	.75	.007	.048	.134
JUL												
01...	261	235	.35	68400	--	2.80	.146	<.020	1.2	.141	.132	.446
09...	225	199	.31	79600	.89	1.94	.087	.075	.96	.113	.100	.232
28...	260	236	.35	30500	--	1.53	.023	<.020	.74	.126	.090	.151
AUG												
25...	236	214	.32	22100	.75	.698	.019	.126	.88	.128	.118	.199
SEP												
23...	251	247	.34	15200	--	.869	.027	.125	--	.115	.121	.177

DATE	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT												
15...	32	4360	98	1	1.5	39	<1.0	<1.0	1.5	<1.0	1.4	7.4
NOV												
21...	13	1260	93	<1	2.9	31	<1.0	<1.0	2.6	<1.0	1.4	33
JAN												
30...	19	2000	74	<1	3.4	34	<1.0	<1.0	4.1	<1.0	<1.0	60
MAR												
25...	32	4970	96	<1	2.5	35	<1.0	<1.0	1.5	<1.0	1.4	58
APR												
07...	158	59300	98	<1	6.4	36	<1.0	<1.0	1.6	<1.0	4.0	66
MAY												
11...	41	6390	96	1	1.7	43	<1.0	<1.0	1.4	<1.0	1.3	<10
27...	40	6100	96	<1	1.7	50	<1.0	<1.0	2.0	<1.0	1.4	<10
JUN												
10...	35	4490	97	<1	3.6	51	<1.0	<1.0	2.2	<1.0	1.3	<10
JUL												
01...	227	59500	99	<1	1.9	54	<1.0	<1.0	1.9	<1.0	1.2	<10
09...	121	42800	99	1	2.5	45	<1.0	<1.0	1.8	<1.0	1.1	12
28...	27	3170	97	2	1.7	47	<1.0	<1.0	1.7	<1.0	1.1	<10
AUG												
25...	51	4780	99	2	1.9	43	<1.0	<1.0	1.8	<1.0	<1.0	<10
SEP												
23...	--	--	--	2	1.9	48	<1.0	<1.0	1.9	<1.0	1.3	<10

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	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)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)
OCT												
15...	<1.0	4	6.3	1.2	1.7	<1	<1.0	86	<6	<1.0	1.2	E.0367
NOV												
21...	<1.0	<4	16	<1.0	1.3	<1	<1.0	78	<6	2.8	<1.0	E.0215
JAN												
30...	<1.0	4	17	<1.0	1.1	<1	<1.0	84	<10	7.9	<1.0	E.0209
MAR												
25...	<1.0	6	5.0	<1.0	1.3	<1	<1.0	85	<10	4.5	1.7	E.0274
APR												
07...	1.7	<4	6.2	<1.0	1.5	<1	<1.0	69	<10	47	1.1	E.0320
MAY												
11...	<1.0	11	1.8	1.3	1.9	<1	<1.0	121	<10	2.3	3.3	E.0183
27...	<1.0	9	14	1.3	1.9	<1	<1.0	117	<10	4.7	2.5	E.0276
JUN												
10...	<1.0	9	16	1.3	1.7	<1	<1.0	117	<10	3.9	2.3	E.0379
JUL												
01...	<1.0	8	<1.0	1.2	1.6	<1	<1.0	102	<10	21	1.8	E.130
09...	<1.0	6	4.5	1.1	1.7	<1	<1.0	85	<10	4.1	1.2	E.0940
28...	<1.0	7	2.0	1.4	1.6	<1	<1.0	102	<10	2.8	1.9	E.0592
AUG												
25...	<1.0	6	1.7	1.3	1.4	<1	<1.0	90	<10	2.1	1.3	E.0391
SEP												
23...	<1.0	5	1.8	1.3	1.6	<1	<1.0	86	<10	2.0	1.2	E.0512

DATE	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	NITRO- GEN DIS- SOLVED (MG/L AS N) (00602)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4) (00660)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C) (00689)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	HARD- NESS NONCARB DISSOLV LAB AS CACO3 (MG/L) (00905)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)
OCT												
15...	8.1	1.3	1.1	.40	.608	.47	.26	5.8	.50	28	21	<1.0
NOV												
21...	8.1	1.8	1.8	--	--	.45	.17	5.6	.40	16	13	<1.0
JAN												
30...	8.2	2.0	2.0	.32	1.54	.40	.05	5.7	.50	28	13	<1.0
MAR												
25...	8.3	3.6	3.3	--	2.77	.44	.01	.80	.80	22	26	<1.0
APR												
07...	8.0	3.5	3.1	.40	2.66	.44	.14	6.5	2.9	18	17	<1.0
MAY												
11...	8.3	2.6	2.4	.47	1.86	.54	.04	5.9	2.5	66	58	<1.0
27...	8.0	1.8	1.8	.56	1.10	.59	.20	6.5	.80	42	43	<1.0
JUN												
10...	8.1	2.7	2.5	.38	1.95	.52	.02	5.2	1.0	38	34	<1.0
JUL												
01...	7.9	4.0	3.3	--	2.65	.47	.43	5.0	>10	36	29	<1.0
09...	7.8	2.9	2.5	.51	1.85	.58	.35	6.9	1.6	26	20	<1.0
28...	8.2	2.3	2.0	--	1.50	.46	.39	6.4	.80	14	18	<1.0
AUG												
25...	8.4	1.6	1.2	.36	.679	.49	.39	5.5	2.9	21	15	<1.0
SEP												
23...	8.2	--	--	--	.842	--	.35	5.2	--	--	15	<1.0

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
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WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	ALKA-LINITY WAT.DIS FET LAB CACO3 (MG/L) (29801)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	LINDANE DIS-SOLVED (UG/L) (39341)
OCT											
15...	<.0070	<.0020	.0059	E.0068	.0117	<.0030	150	<.0020	<.0060	<.0040	<.004
NOV											
21...	<.0070	<.0020	.0052	<.0180	<.0040	<.0030	150	<.0020	<.0060	<.0040	<.004
JAN											
30...	<.0070	<.0020	E.0032	E.0031	<.0040	<.0030	170	<.0020	E.0008	<.0040	<.004
MAR											
25...	<.0070	<.0020	<.0050	<.0180	<.0090	<.0030	150	<.0020	E.0016	<.0040	<.004
APR											
07...	<.0070	<.0020	.0069	<.0180	.0082	<.0030	120	<.0020	E.0014	<.0040	<.004
MAY											
11...	<.0070	<.0020	<.0050	<.0180	.0116	<.0030	150	<.0020	<.0060	<.0040	<.004
27...	<.0070	<.0020	.0126	E.0049	.0707	<.0030	160	<.0020	<.0060	.0047	<.004
JUN											
10...	<.0070	<.0020	.0138	E.0088	.0948	<.0030	170	<.0020	<.0060	<.0040	<.004
JUL											
01...	<.0070	<.0020	.0162	<.0180	.110	<.0030	160	<.0020	<.0060	<.0040	<.004
09...	<.0070	<.0020	.0119	E.0072	.117	<.0030	140	<.0020	<.0060	<.0040	<.004
28...	<.0070	<.0020	.0106	<.0180	.0405	<.0030	170	<.0020	<.0060	<.0040	<.004
AUG											
25...	<.0070	<.0020	<.0050	<.0180	<.0040	<.0030	170	<.0020	<.0060	<.0040	<.004
SEP											
23...	<.0070	<.0020	E.0033	<.0180	<.0040	<.0030	180	<.0020	<.0060	<.0040	<.004

DATE	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	MALA-THION, DIS-SOLVED (UG/L) (39532)	PARA-THION, DIS-SOLVED (UG/L) (39542)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS NO2) (71856)
OCT											
15...	<.001	.016	<.005	<.004	<.002	.066	<.002	<.0020	.10	2.7	.07
NOV											
21...	<.001	.011	<.005	<.004	<.002	.041	<.002	<.0020	--	--	--
JAN											
30...	<.001	.007	<.005	<.004	<.002	.029	<.002	<.0020	.11	6.8	.05
MAR											
25...	<.001	.230	<.005	<.004	<.002	.042	<.002	.0206	--	12	.11
APR											
07...	<.001	.074	<.005	<.004	<.002	.039	<.002	.0048	.06	12	.07
MAY											
11...	<.001	.174	<.005	<.004	<.002	.056	<.002	.0307	.08	8.2	.08
27...	<.001	.161	<.005	<.004	<.002	.400	.029	.252	.04	4.9	.21
JUN											
10...	<.001	.141	<.005	<.004	<.002	.386	.028	.152	.18	8.6	.17
JUL											
01...	<.001	.368	<.005	<.004	<.002	.847	.028	.138	--	12	.48
09...	<.001	.267	<.005	<.004	<.002	.547	.023	.0608	.10	8.2	.29
28...	<.001	.065	<.005	<.004	<.002	.284	<.002	.0153	--	6.7	.08
AUG											
25...	<.001	.019	<.005	<.004	<.002	.119	<.002	<.0020	.16	3.0	.06
SEP											
23...	<.001	.012	<.005	<.004	<.002	.085	<.002	<.0020	.16	3.7	.09

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
OCT											
15...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
NOV											
21...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
JAN											
30...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
MAR											
25...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
APR											
07...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
MAY											
11...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	E.0025	<.0040	<.0100
27...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	E.0037	<.0040	<.0100
JUN											
10...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	E.0025	<.0040	<.0100
JUL											
01...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	E.0051
09...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
28...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
AUG											
25...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
SEP											
23...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	E.0042

DATE	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)
OCT											
15...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
NOV											
21...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
JAN											
30...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
MAR											
25...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
APR											
07...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
MAY											
11...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
27...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
JUN											
10...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
JUL											
01...	<.0040	<.0030	<.0020	E.0248	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
09...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
28...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
AUG											
25...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
SEP											
23...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)	BORON, DIS- SOLVED (UG/L AS B) (01020)
OCT											
15...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	378	113	147	111	28
NOV											
21...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	388	131	122	120	24
JAN											
30...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	433	92.9	96.3	96.3	24
MAR											
25...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	413	105	100	86.2	19
APR											
07...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	347	97.2	110	90.3	18
MAY											
11...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	447	102	108	97.3	30
27...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	446	107	125	104	33
JUN											
10...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	469	112	121	92.3	30
JUL											
01...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	432	116	125	98.0	27
09...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	357	106	118	78.6	43
28...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	419	98.6	107	110	25
AUG											
25...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	407	93.6	101	89.0	26
SEP											
23...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	434	92.9	106	89.3	22

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA

LOCATION.--Lat 42°50'10", long 92°15'26", in NW$^1/_4$ SW$^1/_4$ SW$^1/_4$ sec. 27, T.93 N., R.12 W., Bremer County, Hydrologic Unit 07080102, 1.0 mile upstream of the mouth of the East Fork of the Wapsipinicon River, and 2.0 miles north of Tripoli.

DRAINAGE AREA.--343 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to July 1977 (operated as a partial-record low flow measurement site), April 1996 to September 30, 1998. (discontinued)

REVISIONS.--The maximum discharge for the water year 1997 has been revised to 3,080 cfs, March 12, 1997, gage height, 13.79 ft.

GAGE.--Water stage recorder. Datum of gage is 1,000 ft above sea level, from map.

REMARKS.--Estimated daily discharges: Nov. 16-26, Dec. 5 to Feb. 16, Mar. 9-16, 18-23, and June 29, 30. Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

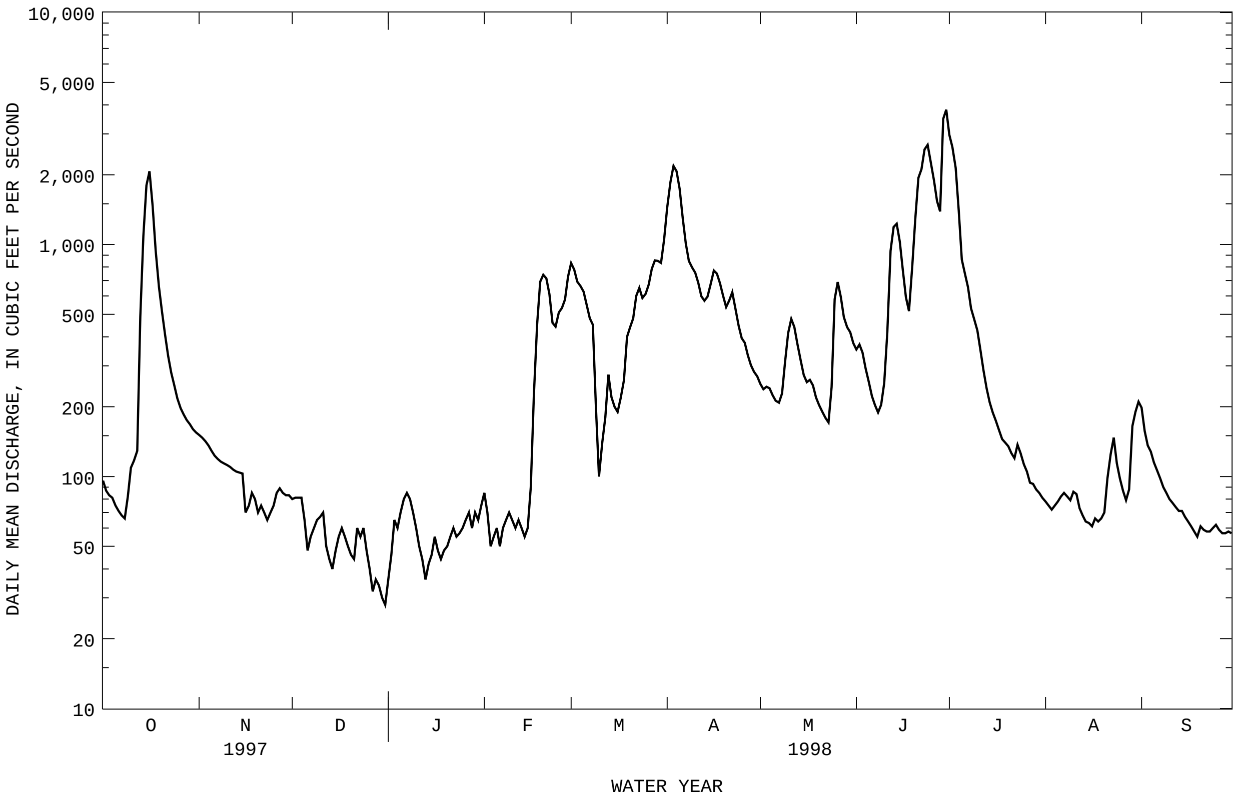
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96	151	80	e36	e85	832	1440	251	353	2970	78	198
2	87	147	81	e46	e70	780	1860	238	371	2630	75	157
3	83	142	81	e65	e50	692	2180	244	342	2140	72	136
4	81	136	81	e60	e55	662	2070	240	293	1400	75	128
5	75	129	e65	e70	e60	626	1740	224	255	860	78	115
6	71	123	e48	e80	e50	549	1300	212	222	750	82	106
7	68	119	e55	e85	e60	481	1010	208	203	656	85	98
8	66	116	e60	e80	e65	451	850	228	189	531	82	90
9	82	114	e65	e70	e70	e200	796	313	204	478	79	85
10	109	112	e67	e60	e65	e100	756	416	253	426	86	80
11	117	110	e70	e50	e60	e140	684	478	417	350	84	77
12	129	107	e50	e44	e65	e180	598	441	939	286	73	74
13	490	105	e44	e36	e60	e275	573	373	1190	240	68	71
14	1090	104	e40	e42	e55	e220	596	317	1230	209	64	71
15	1800	103	e48	e46	e60	e200	673	274	1030	189	63	67
16	2070	e70	e55	e55	e90	e190	772	255	774	174	61	64
17	1470	e75	e60	e48	225	218	749	261	592	159	66	61
18	941	e85	e55	e44	454	e260	681	247	517	145	64	58
19	658	e80	e50	e48	692	e400	602	219	809	140	66	55
20	514	e70	e46	e50	741	e440	538	203	1300	135	70	61
21	408	e75	e44	e55	714	e480	574	190	1940	126	98	59
22	331	e70	e60	e60	611	e600	623	179	2110	120	125	58
23	280	e65	e55	e55	460	e650	525	171	2570	137	147	58
24	247	e70	e60	e57	443	588	447	243	2690	126	114	60
25	217	e75	e48	e60	510	613	395	581	2270	113	98	62
26	197	e85	e40	e65	533	672	377	689	1890	105	87	59
27	185	89	e32	e70	579	786	333	595	1540	94	79	57
28	175	85	e36	e60	728	854	302	486	1390	93	88	57
29	168	83	e34	e70	---	849	283	440	e3480	88	165	58
30	160	83	e30	e65	---	833	270	419	e3810	85	190	57
31	155	---	e28	e75	---	1050	---	376	---	81	210	---
TOTAL	12620	2978	1668	1807	7710	15871	24597	10011	35173	16036	2872	2437
MEAN	407	99.3	53.8	58.3	275	512	820	323	1172	517	92.6	81.2
MAX	2070	151	81	85	741	1050	2180	689	3810	2970	210	198
MIN	66	65	28	36	50	100	270	171	189	81	61	55
AC-FT	25030	5910	3310	3580	15290	31480	48790	19860	69770	31810	5700	4830
CFSM	1.18	.29	.16	.17	.80	1.48	2.37	.93	3.39	1.50	.27	.23
IN.	1.36	.32	.18	.19	.83	1.71	2.64	1.08	3.78	1.72	.31	.26

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	217	96.0	69.2	67.7	261	933	622	326	721	264	75.6	78.2
MAX	407	99.3	84.5	77.0	275	1354	820	481	1172	517	92.6	128
(WY)	1998	1998	1997	1997	1998	1997	1998	1997	1998	1998	1998	1997
MIN	27.1	92.7	53.8	58.3	246	512	425	174	188	109	49.1	25.3
(WY)	1997	1997	1998	1998	1997	1998	1997	1996	1997	1996	1996	1996

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1996 - 1998	
ANNUAL TOTAL	113394		133780			
ANNUAL MEAN	311		367		323	
HIGHEST ANNUAL MEAN					367	1998
LOWEST ANNUAL MEAN					280	1997
HIGHEST DAILY MEAN	2910	Mar 12	3810	Jun 30	3810	Jun 30 1998
LOWEST DAILY MEAN	28	Dec 31	28	Dec 31	16	Oct 7 1996
ANNUAL SEVEN-DAY MINIMUM	35	Dec 25	34	Dec 26	18	Oct 5 1996
INSTANTANEOUS PEAK FLOW			4730	Jun 29	4730	Jun 29 1998
INSTANTANEOUS PEAK STAGE			14.91	Jun 29	14.91	Jun 29 1998
INSTANTANEOUS LOW FLOW					14	Oct 7 1996
ANNUAL RUNOFF (AC-FT)	224900		265400		234400	
ANNUAL RUNOFF (CFSM)	.90		1.06		.93	
ANNUAL RUNOFF (INCHES)	12.19		14.38		12.70	
10 PERCENT EXCEEDS	929		839		794	
50 PERCENT EXCEEDS	131		136		116	
90 PERCENT EXCEEDS	59		55		44	

e Estimated



10,000
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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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1997
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WATER YEAR

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA

PRECIPITATION RECORDS

PERIOD OF RECORD.--April 10, 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Estimated totals: Mar. 18-23, and May 14. Estimated values taken from National Weather Service rain gage at Tripoli. Records good except for estimated days, and the winter period due to intermittent snow accumulation and subsequent melting, which are poor.

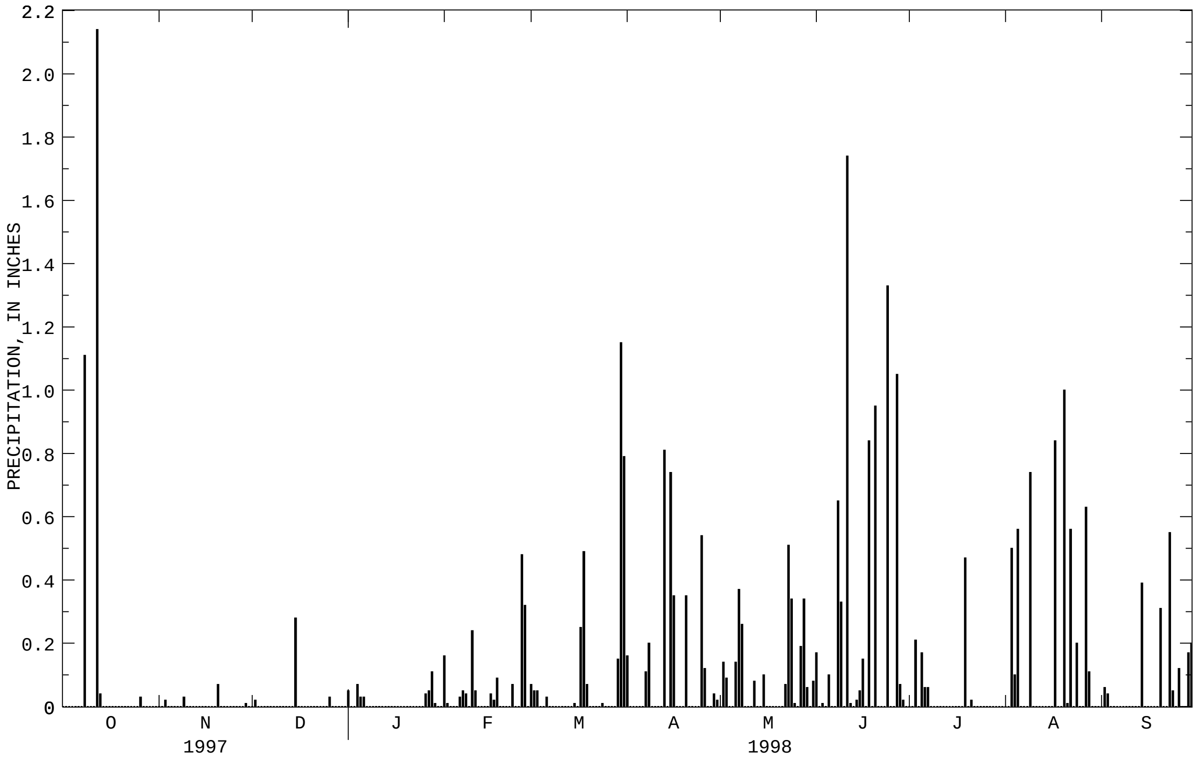
EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation 2.40 in., June 21, 1997.

EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.14 in., Oct. 12.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.05	.16	.07	.16	.00	.17	.00	.00	.00
2	.00	.00	.02	.00	.01	.05	.00	.14	.00	.00	.00	.06
3	.00	.02	.00	.00	.00	.05	.00	.09	.01	.21	.50	.04
4	.00	.00	.00	.07	.00	.00	.00	.00	.00	.00	.10	.00
5	.00	.00	.00	.03	.00	.00	.00	.00	.10	.17	.56	.00
6	.00	.00	.00	.03	.03	.03	.00	.14	.00	.06	.00	.00
7	.00	.00	.00	.00	.05	.00	.11	.37	.00	.06	.00	.00
8	1.11	.00	.00	.00	.04	.00	.20	.26	.65	.00	.00	.00
9	.00	.03	.00	.00	.00	.00	.00	.00	.33	.00	.74	.00
10	.00	.00	.00	.00	.24	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.05	.00	.00	.00	1.74	.00	.00	.00
12	2.14	.00	.00	.00	.00	.00	.00	.08	.01	.00	.00	.00
13	.04	.00	.00	.00	.00	.00	.81	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	e.00	.02	.00	.00	.39
15	.00	.00	.28	.00	.00	.01	.74	.10	.05	.00	.00	.00
16	.00	.00	.00	.00	.04	.00	.35	.00	.15	.00	.00	.00
17	.00	.00	.00	.00	.02	.25	.00	.00	.00	.00	.84	.00
18	.00	.00	.00	.00	.09	e.49	.00	.00	.84	.00	.00	.00
19	.00	.00	.00	.00	.00	e.07	.00	.00	.00	.47	.00	.00
20	.00	.07	.00	.00	.00	e.00	.35	.00	.95	.00	1.00	.31
21	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.02	.01	.00
22	.00	.00	.00	.00	.00	e.00	.00	.07	.00	.00	.56	.00
23	.00	.00	.00	.00	.07	e.00	.00	.51	.00	.00	.00	.55
24	.00	.00	.00	.00	.00	.01	.00	.34	1.33	.00	.20	.05
25	.00	.00	.00	.00	.00	.00	.54	.01	.00	.00	.00	.00
26	.03	.00	.03	.04	.48	.00	.12	.00	.00	.00	.00	.12
27	.00	.00	.00	.05	.32	.00	.00	.19	1.05	.00	.63	.00
28	.00	.00	.00	.11	.00	.00	.00	.34	.07	.00	.11	.00
29	.00	.01	.00	.01	---	.15	.04	.06	.02	.00	.00	.17
30	.00	.00	.00	.00	---	1.15	.02	.00	.00	.00	.00	.20
31	.00	---	.00	.00	---	.79	---	.08	---	.00	.00	---
TOTAL	3.32	0.13	0.33	0.39	1.60	3.12	3.44	2.78	7.49	0.99	5.25	1.89
MEAN	.11	.00	.01	.01	.06	.10	.11	.09	.25	.03	.17	.06
MAX	2.14	.07	.28	.11	.48	1.15	.81	.51	1.74	.47	1.00	.55
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

e Estimated


PRECIPITATION, IN INCHES
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
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O
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1997
1998

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IA

LOCATION.--Lat 42°27'49", long 91°53'42", in SE 1/4 sec.4, T.88 N., R.9 W., Buchanan County, Hydrologic Unit 07080102, on right bank at Sixth Street in Independence, 1,800 ft downstream from dam at abandoned hydroelectric plant, 4.9 mi downstream from Otter Creek, 9.7 mi upstream from Pine Creek, and at mile 142.5.

DRAINAGE AREA.--1,048 mi^2.

PERIOD OF RECORD.--July 1933 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1938-39, 1940 (M), 1947.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 882.85 ft above sea level. Prior to May 24, 1941 nonrecording gage in tailrace of powerplant 1,800 ft upstream at datum 80.00 ft lower.

REMARKS.--Estmated daily discharges: March 11-16. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1901, that of July 18, 1968.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	215	584	376	166	210	2100	8350	1120	1920	3640	202	817
2	202	541	360	200	236	2140	7640	1060	1570	5380	187	716
3	189	512	367	235	258	2180	6520	1020	1360	5660	181	615
4	175	479	362	248	261	2190	5470	976	1220	4670	191	518
5	157	455	348	277	254	2070	5080	938	1100	3830	539	455
6	139	433	308	331	236	1930	4720	895	987	3100	1080	411
7	131	415	352	369	224	1790	4150	901	883	2430	598	368
8	127	404	373	381	224	1690	3500	964	796	1830	434	327
9	181	395	344	371	230	1440	2940	1110	1020	1480	357	291
10	490	381	351	186	237	1110	2470	1200	1560	1140	337	261
11	482	369	330	214	268	e950	2120	1270	1820	1060	301	243
12	455	356	309	261	379	e825	1910	1310	4560	935	351	229
13	1040	346	234	242	455	e800	1770	1270	4340	820	311	227
14	2520	358	201	232	460	e780	1770	1150	3370	718	268	254
15	2530	370	234	206	404	e760	2060	1030	3380	649	236	255
16	2320	333	273	199	405	e810	2240	944	3690	571	212	235
17	2340	252	251	195	595	819	2450	832	3710	510	352	218
18	2390	299	266	177	808	864	2720	765	3300	469	592	206
19	2530	309	280	173	956	1030	2760	734	4090	446	387	193
20	2360	326	270	174	1130	1200	2490	680	3630	410	345	190
21	1690	334	200	169	1270	1370	2170	630	3460	396	797	175
22	1240	322	220	159	1340	1550	2080	575	3720	374	1010	167
23	1040	307	256	157	1370	1720	2040	543	3770	354	807	157
24	926	250	263	157	1340	1840	1970	929	4330	331	735	179
25	823	265	231	157	1240	1890	1750	1530	5360	329	912	181
26	757	304	227	158	1260	2010	1590	1520	5190	315	722	196
27	690	297	167	162	1510	2100	1470	1550	5240	297	542	192
28	645	308	165	169	1960	2030	1390	1590	5000	277	1230	174
29	621	323	218	175	---	1890	1280	2570	4580	250	2260	175
30	616	366	183	180	---	2080	1190	3720	3820	230	1440	176
31	604	---	160	186	---	5010	---	2570	---	216	1000	---
TOTAL	30625	10993	8479	6666	19520	50968	90060	37896	92776	43117	18916	8801
MEAN	988	366	274	215	697	1644	3002	1222	3093	1391	610	293
MAX	2530	584	376	381	1960	5010	8350	3720	5360	5660	2260	817
MIN	127	250	160	157	210	760	1190	543	796	216	181	157
AC-FT	60740	21800	16820	13220	38720	101100	178600	75170	184000	85520	37520	17460
CFSM	.94	.35	.26	.21	.67	1.57	2.86	1.17	2.95	1.33	.58	.28
IN.	1.09	.39	.30	.24	.69	1.81	3.20	1.35	3.29	1.53	.67	.31

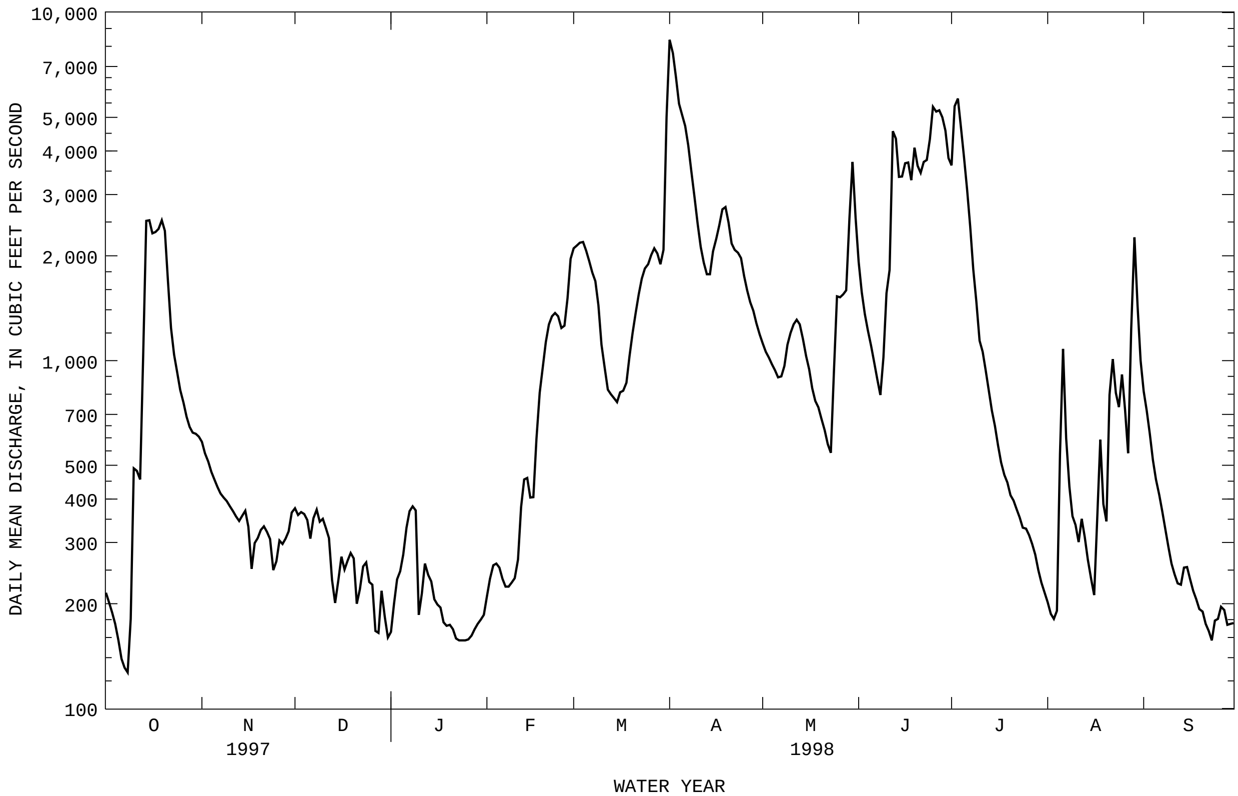
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	388	442	305	227	353	1443	1364	917	949	689	551	376
MAX	2306	2280	1962	1411	1698	3201	5578	3860	4721	4836	5443	1940
(WY)	1973	1992	1992	1946	1984	1986	1993	1991	1947	1993	1993	1981
MIN	29.3	42.2	26.9	12.6	19.0	68.4	199	45.3	12.4	18.9	21.5	20.5
(WY)	1989	1977	1977	1977	1956	1934	1957	1934	1934	1936	1934	1976

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1934 - 1998	
ANNUAL TOTAL	288672		418817			
ANNUAL MEAN	791		1147		668	
HIGHEST ANNUAL MEAN					2304	1993
LOWEST ANNUAL MEAN					74.5	1934
HIGHEST DAILY MEAN	3860	Mar 16	8350	Apr 1	23500	Jul 18 1968
LOWEST DAILY MEAN	96	Aug 22	127	Oct 8	7.0	Oct 1 1933a
ANNUAL SEVEN-DAY MINIMUM	107	Aug 18	157	Oct 3	7.1	Jan 24 1977
INSTANTANEOUS PEAK FLOW			8990	Apr 1	26800	Jul 18 1968
INSTANTANEOUS PEAK STAGE			11.79	Apr 1	21.11	Jul 18 1968
ANNUAL RUNOFF (AC-FT)	572600		830700		484000	
ANNUAL RUNOFF (CFSM)	.75		1.09		.64	
ANNUAL RUNOFF (INCHES)	10.25		14.87		8.66	
10 PERCENT EXCEEDS	2300		2830		1650	
50 PERCENT EXCEEDS	395		584		271	
90 PERCENT EXCEEDS	165		188		51	

a Many days in 1934, when power plant shutdown, Jan 25-30, 1977
e Estimated

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IA--Continued



05422000 WAPSIPINICON RIVER NEAR DE WITT, IA

LOCATION.--Lat 41°46'01", long 90°32'05", in SW$^{1}/_{4}$ NE$^{1}/_{4}$ sec.6, T.80 N., R.4 E., Clinton County, Hydrologic Unit 07080103, on left bank 5 ft upstream from bridge on Highway 956, 0.9 mi downstream from Silver Creek, 4.0 mi south of water tower in De Witt, 6.2 mi upstream from Brophy Creek, and 18.2 mi upstream from mouth.

DRAINAGE AREA.--2,330 mi^2.

PERIOD OF RECORD.--July 1934 to current year.

REVISED RECORDS.--WSP 1308: 1937 (M). WSP 1438: Drainage area. WSP 1708: 1951.

GAGE.--Water-stage recorder. Datum of gage is 598.81 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 26 to Jan. 1, and Jan. 10 to Feb. 1. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U. S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	636	1300	919	e650	e1100	4470	8700	3550	3450	7810	856	2950
2	622	1310	928	765	1330	4310	9160	3350	4170	7520	819	2630
3	587	1290	1040	1000	1290	4330	8630	3150	4340	7280	798	2060
4	555	1250	1120	1250	1250	4260	8770	2980	3670	7010	827	1740
5	524	1200	1120	1310	1200	4150	9860	2830	3080	6440	799	1540
6	505	1180	1090	1470	1160	4080	10600	2760	2720	6200	792	1380
7	474	1140	1060	1830	1110	4010	10300	2720	2470	6260	801	1260
8	469	1100	1020	1780	1120	4110	9940	2830	2280	6420	926	1130
9	458	1060	997	1670	1060	4900	9550	2780	2490	6400	1190	1040
10	451	1030	983	e1100	1020	4410	9140	2720	2820	5550	1250	959
11	434	1010	979	e900	1080	3780	8730	2710	3250	4290	1100	895
12	444	989	955	e1000	1810	3190	8170	2760	4200	3480	978	843
13	489	970	939	e850	1690	2920	7270	2760	4970	2940	912	792
14	613	951	911	e800	1510	2770	6310	2730	5240	2610	856	1010
15	786	959	893	e800	1440	2580	5720	2670	5720	2370	837	1450
16	1350	942	837	e850	1450	2500	5710	2590	6190	2160	854	1440
17	2020	925	856	e900	1490	2490	5610	2450	6440	1970	899	1230
18	2450	889	854	e800	1510	2930	5510	2290	6820	1820	872	1120
19	2520	881	838	e750	1470	3380	5780	2140	7580	1690	868	1010
20	2520	881	847	e750	1550	3460	5830	2020	7760	1570	1010	966
21	2540	861	822	e800	1680	3520	5660	1930	8310	1470	1130	928
22	2590	856	832	e850	1800	3520	5730	1830	8530	1410	1040	863
23	2620	854	827	e750	1930	3550	5840	1760	8540	1370	943	823
24	2310	862	826	e750	2070	3610	5570	1750	8170	1280	1140	799
25	1940	852	848	e700	2180	3710	5160	1770	7870	1210	1330	780
26	1720	827	e750	e700	2290	3800	4890	1730	7640	1150	1300	764
27	1620	837	e600	e750	3640	3840	4630	1910	7170	1070	1410	727
28	1500	818	e650	e800	4860	3920	4300	2410	6840	1030	1700	735
29	1420	817	e700	e850	---	3920	3990	2600	6890	998	2140	751
30	1360	877	e650	e900	---	3890	3740	2790	7620	956	2200	807
31	1310	---	e600	e1000	---	6320	---	2970	---	917	2430	---
TOTAL	39837	29718	27291	30075	47090	116630	208800	78240	167240	104651	35007	35422
MEAN	1285	991	880	970	1682	3762	6960	2524	5575	3376	1129	1181
MAX	2620	1310	1120	1830	4860	6320	10600	3550	8540	7810	2430	2950
MIN	434	817	600	650	1020	2490	3740	1730	2280	917	792	727
AC-FT	79020	58950	54130	59650	93400	231300	414200	155200	331700	207600	69440	70260
CFSM	.55	.42	.38	.42	.72	1.61	2.98	1.08	2.39	1.45	.48	.51
IN.	.63	.47	.43	.48	.75	1.86	3.33	1.25	2.66	1.67	.56	.56

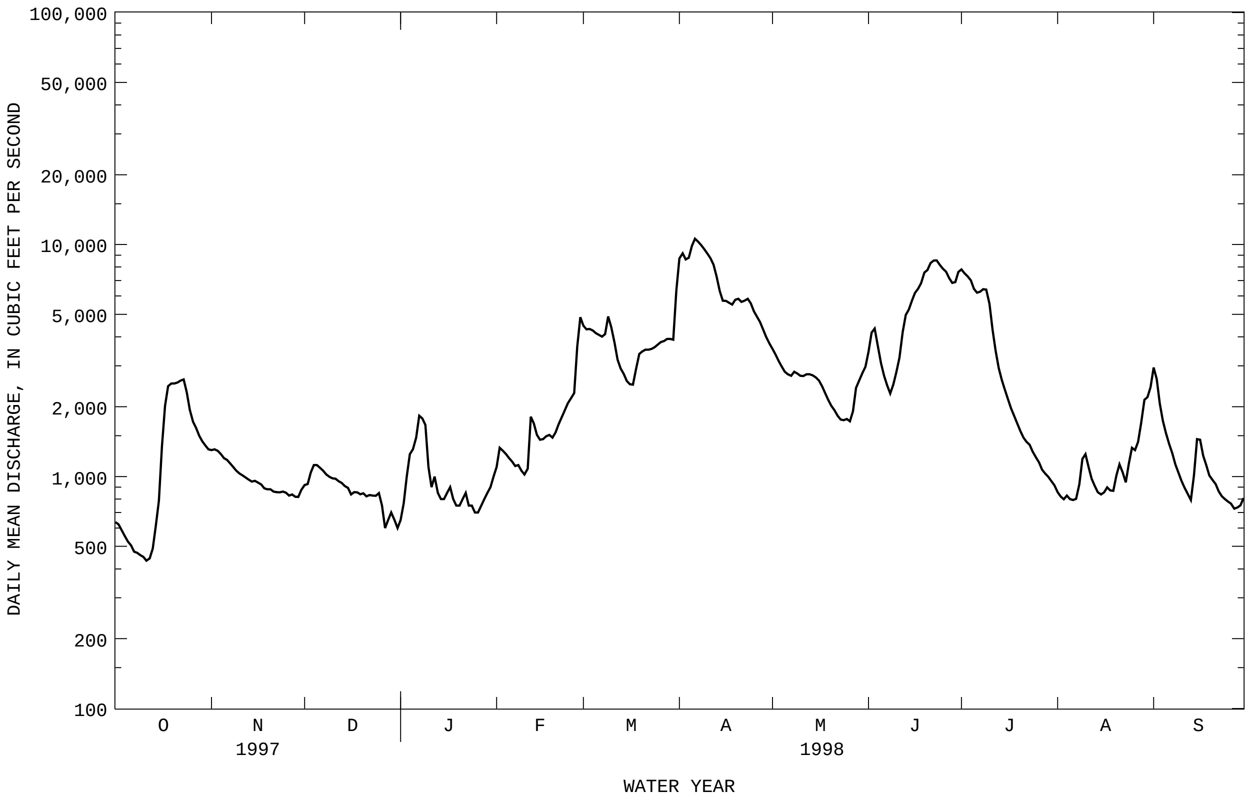
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	903	1111	923	842	1252	3012	3029	2317	2351	1727	1131	1043
MAX	3549	6435	4945	4086	3798	7137	9768	6351	10950	14280	8550	5647
(WY)	1973	1962	1983	1946	1984	1986	1993	1974	1947	1993	1993	1993
MIN	137	159	104	59.4	104	301	453	323	234	165	103	133
(WY)	1977	1965	1977	1977	1940	1954	1977	1977	1977	1936	1936	1976

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1935 - 1998	
ANNUAL TOTAL	671744		920001			
ANNUAL MEAN	1840		2521		1637	
HIGHEST ANNUAL MEAN					5461	1993
LOWEST ANNUAL MEAN					374	1989
HIGHEST DAILY MEAN	16400	Feb 22	10600	Apr 6	25400	Apr 22 1973
LOWEST DAILY MEAN	434	Oct 11	434	Oct 11	46	Jan 22 1977
ANNUAL SEVEN-DAY MINIMUM	460	Oct 7	460	Oct 7	47	Jan 18 1977
INSTANTANEOUS PEAK FLOW			10800	Apr 6	31100	Jun 17 1990
INSTANTANEOUS PEAK STAGE			12.69	Apr 6	14.19	Jun 17 1990
INSTANTANEOUS LOW FLOW			424	Oct 11		
ANNUAL RUNOFF (AC-FT)	1332000		1825000		1186000	
ANNUAL RUNOFF (CFSM)	.79		1.08		.70	
ANNUAL RUNOFF (INCHES)	10.70		14.65		9.52	
10 PERCENT EXCEEDS	3980		6280		3900	
50 PERCENT EXCEEDS	1060		1470		907	
90 PERCENT EXCEEDS	600		792		229	

e Estimated

05422000 WAPSIPINICON RIVER NEAR DE WITT, IA--Continued



05422470 CROW CREEK AT BETTENDORF, IA

LOCATION.--Lat 41°33'03", long 90°27'15", in $NW^1/_4$ $NW^1/_4$ sec.24, T.78 N., R.4 E., Scott County, Hydrologic Unit 07080101, on left bank 200 ft upstream from bridge on Valley Road (old U.S. Highway 67), 3.5 mi east of U.S. Highway 6, and 0.7 mi upstream from mouth.

DRAINAGE AREA.--17.8 mi^2.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 576.23 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 13-17, Dec. 24 to Jan. 2, Jan. 10 to Feb. 1, and Aug. 1-3. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

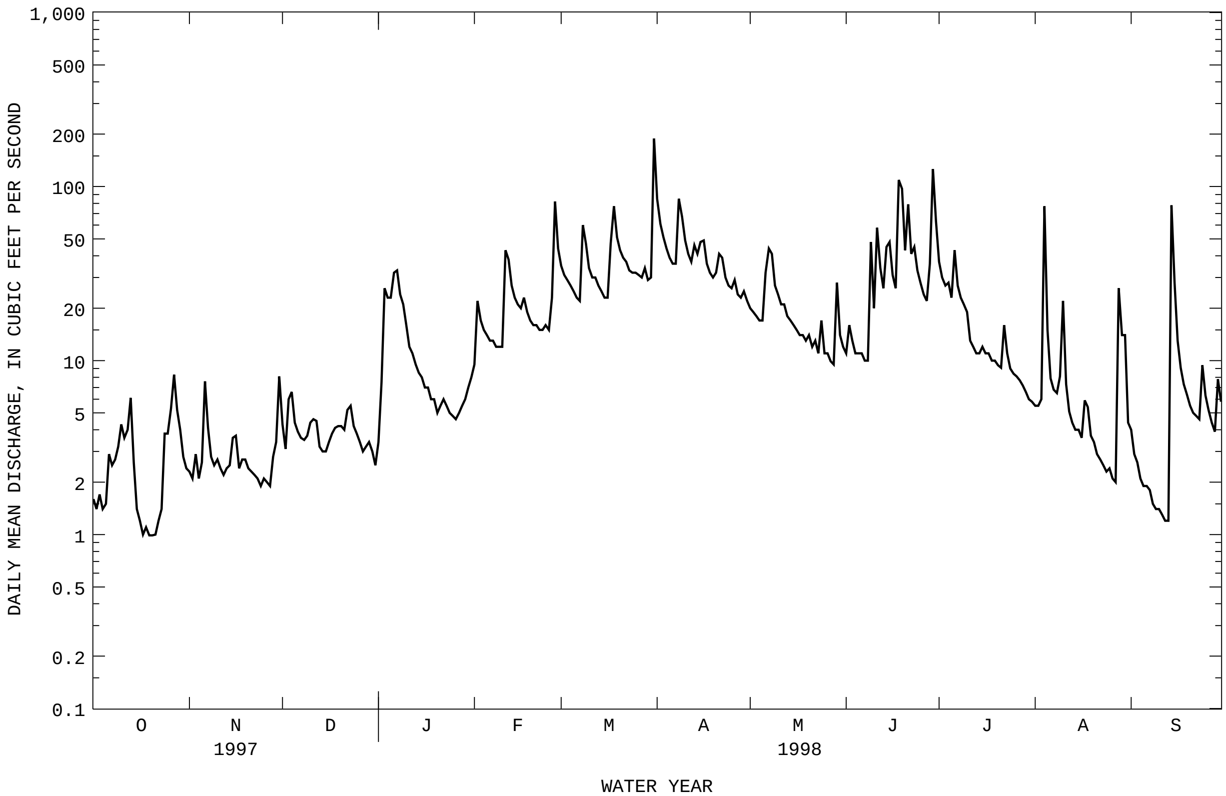
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	2.3	4.3	e3.4	e9.5	35	85	20	11	37	e5.5	4.0
2	1.4	2.1	3.1	e7.5	22	31	61	19	16	30	e5.5	2.9
3	1.7	2.9	6.0	26	17	29	51	18	13	27	e6.0	2.6
4	1.4	2.1	6.6	23	15	27	44	17	11	28	77	2.1
5	1.5	2.6	4.4	23	14	25	39	17	11	23	15	1.9
6	2.9	7.6	3.9	32	13	23	36	32	11	43	7.9	1.9
7	2.5	4.1	3.6	33	13	22	36	44	10	27	6.8	1.8
8	2.7	2.8	3.5	24	12	60	85	41	10	23	6.5	1.5
9	3.2	2.5	3.7	21	12	47	67	27	48	21	8.1	1.4
10	4.3	2.7	4.4	e16	12	34	49	24	20	19	22	1.4
11	3.6	2.4	4.6	e12	43	30	41	21	58	13	7.3	1.3
12	4.0	2.2	4.5	e11	38	30	37	21	34	12	5.1	1.2
13	6.1	2.4	e3.2	e9.5	27	27	46	18	26	11	4.4	1.2
14	2.6	2.5	e3.0	e8.5	23	25	41	17	45	11	4.0	78
15	1.4	3.6	e3.0	e8.0	21	23	48	16	48	12	4.0	28
16	1.2	3.7	e3.4	e7.0	20	23	49	15	31	11	3.6	13
17	1.0	2.4	e3.8	e7.0	23	47	36	14	26	11	5.9	9.1
18	1.1	2.7	4.1	e6.0	19	77	32	14	109	10	5.4	7.3
19	.99	2.7	4.2	e6.0	17	51	30	13	97	10	3.7	6.4
20	.99	2.4	4.2	e5.0	16	43	32	14	43	9.4	3.4	5.5
21	1.0	2.3	4.0	e5.5	16	39	41	12	79	9.1	2.9	5.0
22	1.2	2.2	5.2	e6.0	15	37	39	13	41	16	2.7	4.8
23	1.4	2.1	5.5	e5.5	15	33	30	11	45	11	2.5	4.6
24	3.8	1.9	e4.2	e5.0	16	32	27	17	33	9.0	2.3	9.4
25	3.8	2.1	e3.8	e4.8	15	32	26	11	28	8.4	2.4	6.3
26	5.3	2.0	e3.4	e4.6	23	31	29	11	24	8.1	2.1	5.2
27	8.3	1.9	e3.0	e5.0	82	30	24	9.9	22	7.7	2.0	4.4
28	5.2	2.8	e3.2	e5.5	44	34	23	9.5	36	7.2	26	3.9
29	4.0	3.4	e3.4	e6.0	---	29	25	28	126	6.6	14	7.8
30	2.8	8.1	e3.0	e7.0	---	30	22	14	63	6.0	14	5.8
31	2.4	---	e2.5	e8.0	---	189	---	12	---	5.8	4.4	---
TOTAL	85.38	87.5	122.7	351.8	612.5	1225	1231	570.4	1175	483.3	282.4	229.7
MEAN	2.75	2.92	3.96	11.3	21.9	39.5	41.0	18.4	39.2	15.6	9.11	7.66
MAX	8.3	8.1	6.6	33	82	189	85	44	126	43	77	78
MIN	.99	1.9	2.5	3.4	9.5	22	22	9.5	10	5.8	2.0	1.2
AC-FT	169	174	243	698	1210	2430	2440	1130	2330	959	560	456
CFSM	.15	.16	.22	.64	1.23	2.22	2.31	1.03	2.20	.88	.51	.43
IN.	.18	.18	.26	.74	1.28	2.56	2.57	1.19	2.46	1.01	.59	.48

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	10.3	12.2	12.8	7.88	13.1	22.4	20.5	24.0	26.3	14.8	16.6	7.46
MAX	50.9	45.4	44.1	25.0	42.1	54.6	61.3	111	157	65.4	99.8	34.7
(WY)	1982	1993	1983	1988	1985	1979	1983	1996	1990	1992	1990	1992
MIN	.67	1.19	.77	1.18	.76	3.45	2.33	1.68	3.17	.74	.85	.49
(WY)	1989	1990	1990	1979	1989	1989	1989	1989	1988	1988	1978	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1978 - 1998	
ANNUAL TOTAL	2851.08		6456.68			
ANNUAL MEAN	7.81		17.7		15.7	
HIGHEST ANNUAL MEAN					31.7	1990
LOWEST ANNUAL MEAN					3.35	1989
HIGHEST DAILY MEAN	319	Feb 21	189	Mar 31	1660	Jun 16 1990
LOWEST DAILY MEAN	.53	Aug 2	.99	Oct 19,20	.13	Aug 16 1988
ANNUAL SEVEN-DAY MINIMUM	.77	Jul 27	1.1	Oct 16	.21	Aug 13 1988
INSTANTANEOUS PEAK FLOW			612	Jun 29	7700	Jun 16 1990
INSTANTANEOUS PEAK STAGE			6.12	Jun 29	11.03	Jun 16 1990
INSTANTANEOUS LOW FLOW			.82	Oct 17a		
ANNUAL RUNOFF (AC-FT)	5660		12810		11370	
ANNUAL RUNOFF (CFSM)	.44		.99		.88	
ANNUAL RUNOFF (INCHES)	5.96		13.49		11.98	
10 PERCENT EXCEEDS	15		41		33	
50 PERCENT EXCEEDS	4.2		11		7.3	
90 PERCENT EXCEEDS	1.4		2.3		1.4	

a Also Oct 18,19,21
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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1997
1998
WATER YEAR

05422560 DUCK CREEK AT 110th AVENUE, DAVENPORT, IA

LOCATION.--Lat 41°33'24", long 90°41'15", in NW1/4 SW1/4, Sec. 13, T.78 N., R.2 E., Scott County, Hydrologic Unit 07080101, on left bank 20 ft. downstream from the bridge on County Road Y48 (110th Street), 0.3 miles downstream from unnamed creek, 3 miles west of Davenport, and 13.95 miles from the mouth.

DRAINAGE AREA.--16.1 mi^2.

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

GAGE.--Water stage recorder. Datum of gage is 659.00 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 13-17, Dec. 24 to Jan. 2, and Jan. 10 to Feb. 1. Records good except those for estimated daily discharge, which is poor. Periodic observations of water temperature and specific conductance are published in this report as Miscellaneous Water Quality data. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.43	.88	1.6	e1.7	e8.5	51	139	14	8.6	32	3.2	2.5
2	.46	.80	1.5	e3.8	17	42	76	14	8.7	26	2.9	2.2
3	.48	.77	1.8	18	13	37	53	13	8.3	23	2.8	2.1
4	.51	.76	2.1	13	12	31	42	12	8.2	22	9.2	1.9
5	.43	.80	1.9	15	11	28	35	12	8.1	19	4.3	1.7
6	.45	1.4	1.8	19	9.9	26	30	32	7.7	19	3.5	1.7
7	.52	1.3	1.7	31	9.3	24	36	79	7.3	17	9.7	1.6
8	.77	1.1	1.7	23	8.7	64	128	97	7.3	16	5.4	1.5
9	1.0	1.1	1.7	17	8.5	59	75	57	18	15	3.8	1.5
10	.93	1.1	1.7	e10	8.2	40	51	42	13	14	6.9	1.4
11	.85	.97	1.6	e8.5	29	33	41	34	40	13	3.7	1.4
12	.91	.95	1.5	e8.0	44	29	35	30	34	12	3.0	1.2
13	1.4	.99	e1.3	e7.0	31	28	40	27	23	11	2.8	1.2
14	.89	.98	e1.2	e6.5	25	25	40	22	26	10	2.6	83
15	.70	1.1	e1.2	e6.0	22	22	36	20	75	9.9	2.4	34
16	.59	.92	e1.3	e5.5	20	21	37	18	39	9.2	2.3	17
17	.47	.93	e1.4	e5.5	20	39	31	16	30	8.7	8.1	13
18	.46	1.0	1.5	e4.8	18	91	27	15	141	8.3	5.3	11
19	.46	1.0	1.5	e4.4	16	60	25	15	101	7.7	3.5	9.0
20	.44	1.0	1.5	e4.0	15	46	24	14	51	7.2	2.9	8.1
21	.41	1.1	1.5	e3.8	14	37	23	13	168	6.6	2.6	7.3
22	.40	.99	1.7	e4.2	13	33	21	14	56	8.0	2.4	6.7
23	.48	.90	1.7	e4.0	13	29	20	12	43	6.9	2.2	6.1
24	.76	.98	e1.6	e3.8	13	28	18	13	36	6.0	2.2	6.5
25	.70	.95	e1.4	e3.4	13	27	17	12	31	5.5	2.1	6.0
26	.94	.98	e1.3	e3.4	14	25	18	11	27	5.2	1.9	5.6
27	1.3	.94	e1.2	e3.6	149	24	16	10	24	4.8	1.9	5.1
28	1.1	1.1	e1.4	e4.0	71	23	16	9.7	24	4.5	7.5	4.9
29	1.1	1.2	e1.6	e4.2	---	21	16	11	79	4.2	4.7	5.6
30	.99	2.4	e1.2	e4.4	---	22	15	9.7	50	3.7	3.5	5.2
31	.92	---	e.90	e5.0	---	487	---	9.2	---	3.5	2.7	---
TOTAL	22.25	31.39	47.00	255.5	646.1	1552	1181	707.6	1193.2	358.9	122.0	256.0
MEAN	.72	1.05	1.52	8.24	23.1	50.1	39.4	22.8	39.8	11.6	3.94	8.53
MAX	1.4	2.4	2.1	31	149	487	139	97	168	32	9.7	83
MIN	.40	.76	.90	1.7	8.2	21	15	9.2	7.3	3.5	1.9	1.2
AC-FT	44	62	93	507	1280	3080	2340	1400	2370	712	242	508
CFSM	.04	.06	.09	.51	1.43	3.11	2.45	1.42	2.47	.72	.24	.53
IN.	.05	.07	.11	.59	1.49	3.59	2.73	1.63	2.76	.83	.28	.59

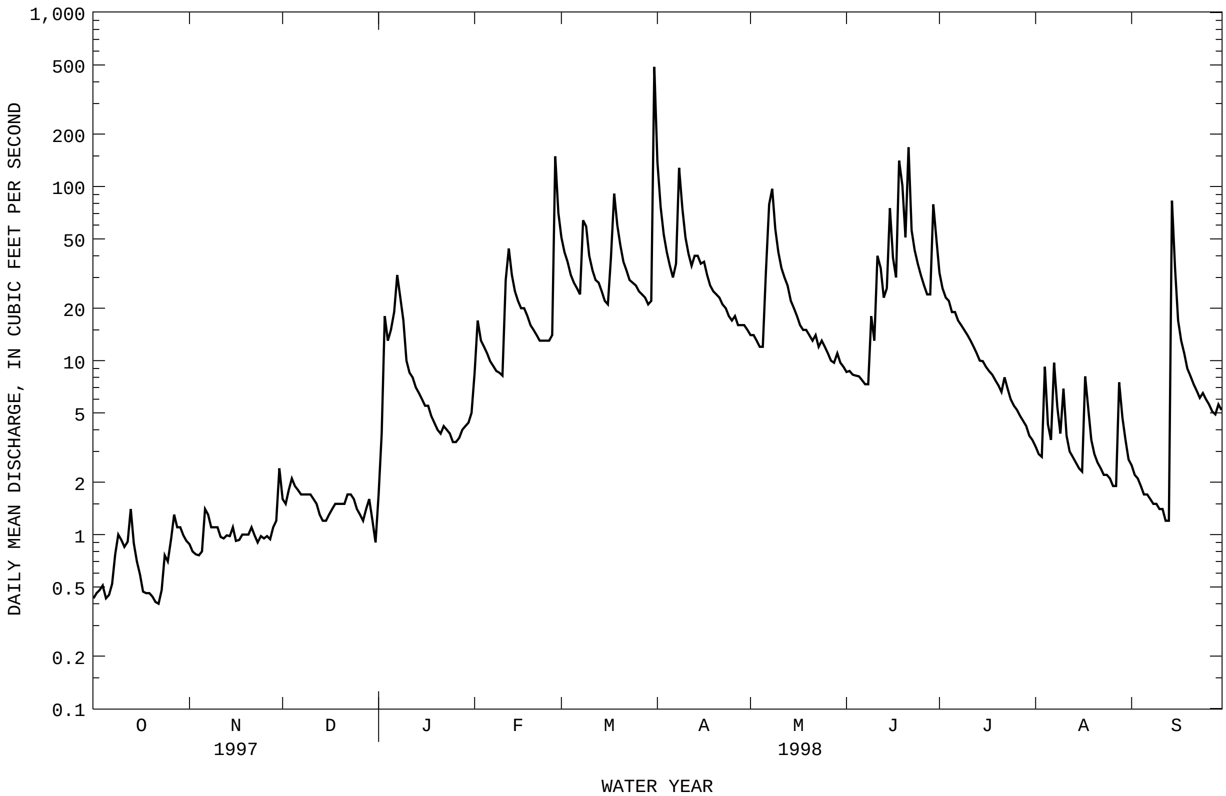
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	.86	1.49	1.36	3.09	14.6	16.5	21.5	40.1	22.6	7.56	2.87	2.89
MAX	1.27	2.86	1.67	8.24	24.8	50.1	39.4	68.8	39.8	11.6	3.94	8.53
(WY)	1996	1996	1995	1998	1997	1998	1998	1996	1998	1998	1998	1998
MIN	.30	.97	.74	.73	4.30	3.28	2.60	14.0	9.13	3.03	1.31	.75
(WY)	1995	1995	1997	1997	1995	1996	1996	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1995 - 1998	
ANNUAL TOTAL	2054.23		6372.94			
ANNUAL MEAN	5.63		17.5		11.3	
HIGHEST ANNUAL MEAN					17.5	1998
LOWEST ANNUAL MEAN					5.60	1997
HIGHEST DAILY MEAN	300	Feb 21	487	Mar 31	648	May 28 1996
LOWEST DAILY MEAN	.40	Oct 22	.40	Oct 22	.22	Oct 16 1994
ANNUAL SEVEN-DAY MINIMUM	.45	Oct 17	.45	Oct 17	.24	Oct 11 1994
INSTANTANEOUS PEAK FLOW			1290	Mar 31	1870	May 28 1996
INSTANTANEOUS PEAK STAGE			17.31	Mar 31	18.44	May 28 1996
INSTANTANEOUS LOW FLOW			.39	Oct 1a		
ANNUAL RUNOFF (AC-FT)	4070		12640		8150	
ANNUAL RUNOFF (CFSM)	.35		1.08		.70	
ANNUAL RUNOFF (INCHES)	4.75		14.73		9.50	
10 PERCENT EXCEEDS	10		40		29	
50 PERCENT EXCEEDS	1.7		8.1		2.9	
90 PERCENT EXCEEDS	.61		.95		.70	

a Several days in Oct
e Estimated

05422560 DUCK CREEK AT 110th AVENUE, DAVENPORT, IA--Continued



05422600 DUCK CREEK AT DUCK CREEK GOLF COURSE, DAVENPORT, IA

LOCATION.--Lat 41°32'46", long 90°31'26", in SW $^{1}/_{4}$ SE $^{1}/_{4}$, NW $^{1}/_{4}$, Sec. 20, T.78 N., R.4 E., Scott County, Hydrologic Unit 07080101, on right bank 500 feet upstream from Kimberly Road, 100 feet upstream of golf cart bridge, 0.5 miles downstream from Pheasant Creek, in Davenport, and 4.45 miles from the mouth.

DRAINAGE AREA.--53.0 mi^2.

PERIOD OF RECORD.--November 1993 to current year.

GAGE.--Water stage recorder. Datum of gage is 597.00 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 13-17, Dec. 24 to Jan. 2, and Jan. 10 to Feb. 1. Records good except those for periods of estimated daily discharges, which are poor. Periodic observations of water temperature and conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	5.3	8.6	e7.0	e32	131	398	59	33	106	9.5	9.3
2	2.4	3.8	6.7	e13	58	108	223	57	93	78	8.8	8.2
3	2.3	4.6	28	65	41	94	169	52	44	92	8.6	7.1
4	2.2	4.0	14	68	37	82	137	49	34	84	292	6.5
5	1.9	11	9.0	54	33	72	118	47	37	54	42	5.5
6	1.9	24	7.9	122	31	67	104	213	32	87	20	5.2
7	1.7	7.1	7.5	94	29	62	163	184	30	61	19	4.7
8	2.4	5.3	7.4	69	27	255	405	211	45	57	28	4.5
9	7.1	4.7	10	55	26	161	237	126	208	44	17	4.4
10	2.4	6.4	15	e38	26	103	166	101	62	40	71	4.1
11	3.8	4.8	11	e34	192	86	134	87	351	37	17	3.9
12	2.2	4.2	8.3	e32	131	76	117	85	124	35	13	4.0
13	24	4.9	e6.5	e28	90	74	179	72	89	33	11	3.8
14	3.5	5.3	e5.5	e26	74	68	131	65	206	31	10	532
15	2.0	16	e5.5	e24	65	61	160	59	198	28	11	117
16	1.9	6.6	e6.0	e21	67	60	156	54	116	27	8.8	46
17	1.8	4.2	e7.0	e20	70	202	112	50	96	25	46	33
18	1.9	4.8	7.6	e19	57	293	98	48	426	24	23	27
19	1.9	4.8	7.7	e17	51	156	91	47	387	22	12	23
20	1.6	4.5	7.5	e15	49	120	113	63	139	21	10	20
21	1.7	5.0	6.7	e14	46	98	118	48	472	20	8.9	18
22	1.5	4.4	15	e16	44	86	96	60	151	57	8.3	17
23	4.5	4.1	9.0	e15	44	78	80	45	144	24	7.5	15
24	26	4.0	e8.0	e14	49	72	74	76	101	18	6.8	37
25	8.4	4.1	e7.0	e13	41	71	75	44	86	17	6.9	17
26	32	4.4	e6.5	e13	91	65	103	41	76	16	6.2	14
27	26	5.7	e6.0	e14	461	61	69	38	66	15	6.3	13
28	8.8	9.3	e6.5	e16	173	79	67	37	123	14	126	12
29	5.6	23	e7.5	e17	---	55	78	106	410	13	35	28
30	4.5	26	e5.0	e19	---	84	65	40	219	11	21	14
31	3.9	---	e4.0	e22	---	1350	---	36	---	11	11	---
TOTAL	194.4	226.3	267.9	994.0	2135	4430	4236	2300	4598	1202	921.6	1054.2
MEAN	6.27	7.54	8.64	32.1	76.3	143	141	74.2	153	38.8	29.7	35.1
MAX	32	26	28	122	461	1350	405	213	472	106	292	532
MIN	1.5	3.8	4.0	7.0	26	55	65	36	30	11	6.2	3.8
AC-FT	386	449	531	1970	4230	8790	8400	4560	9120	2380	1830	2090
CFSM	.12	.14	.16	.60	1.44	2.70	2.66	1.40	2.89	.73	.56	.66
IN.	.14	.16	.19	.70	1.50	3.11	2.97	1.61	3.23	.84	.65	.74

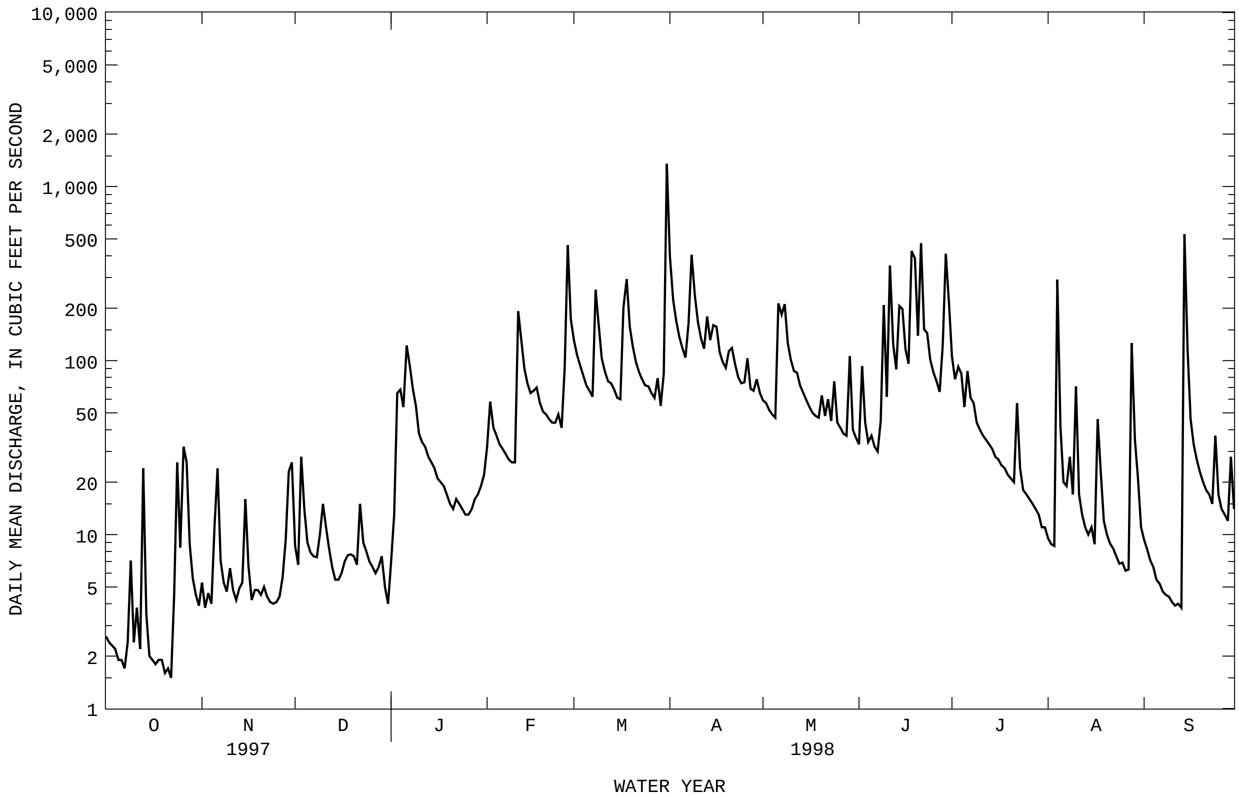
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1998, BY WATER YEAR (WY)

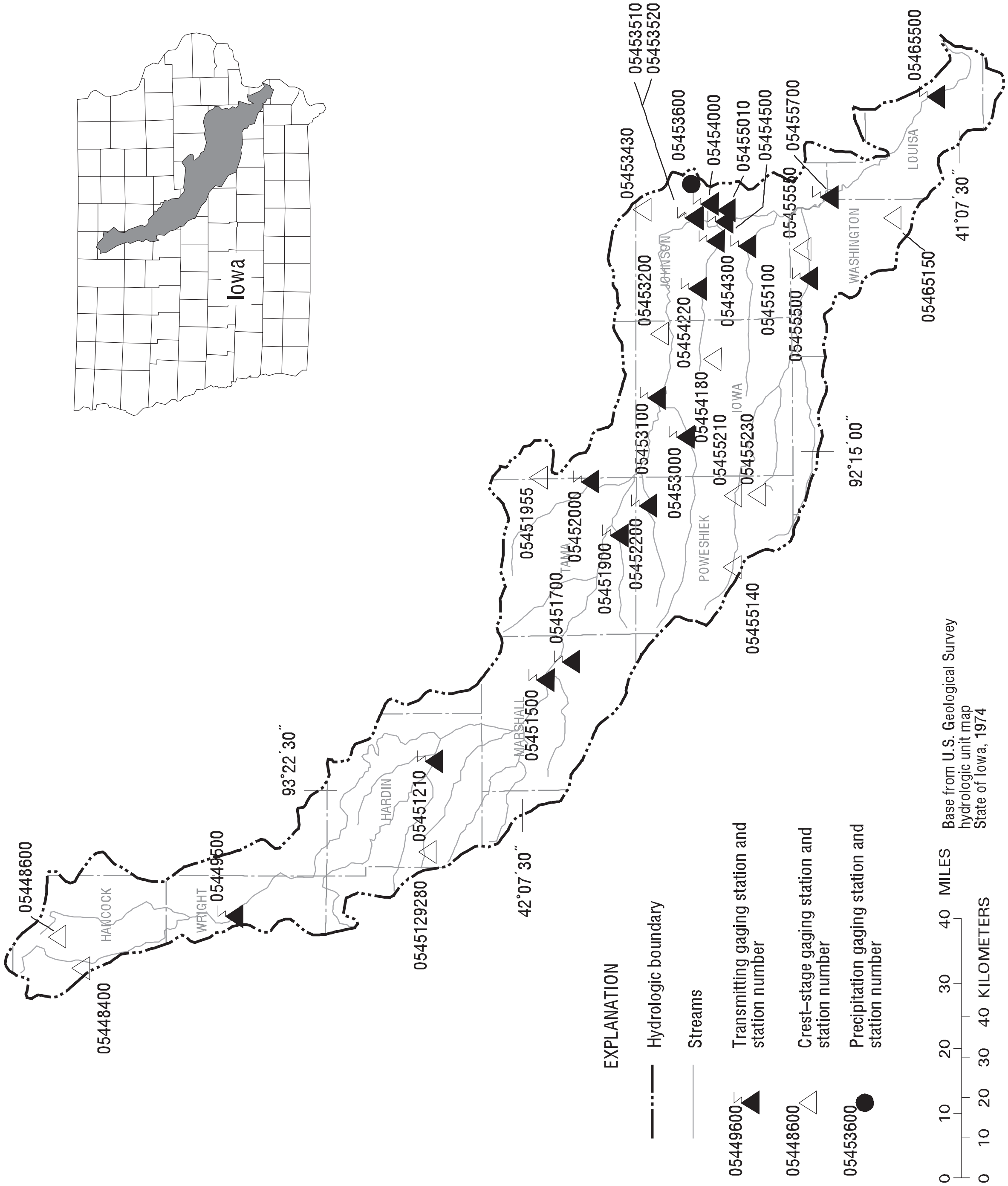
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6.73	13.0	6.83	12.8	48.5	53.7	78.8	143	79.0	29.2	28.6	14.4
MAX	11.6	19.8	9.32	32.1	77.8	143	141	250	153	38.8	34.6	35.1
(WY)	1997	1995	1995	1998	1997	1998	1998	1996	1998	1998	1995	1998
MIN	3.26	6.52	3.74	4.78	13.8	16.0	16.5	56.3	41.0	10.4	23.7	4.96
(WY)	1995	1997	1997	1996	1995	1996	1996	1997	1997	1997	1996	1995

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1995 - 1998	
ANNUAL TOTAL	9255.1		22559.4			
ANNUAL MEAN	25.4		61.8		42.8	
HIGHEST ANNUAL MEAN					61.8	1998
LOWEST ANNUAL MEAN					25.3	1997
HIGHEST DAILY MEAN	1100	Feb 21	1350	Mar 31	2250	May 28 1996
LOWEST DAILY MEAN	1.5	Oct 22	1.5	Oct 22	.86	Oct 4 1994
ANNUAL SEVEN-DAY MINIMUM	1.8	Oct 16	1.8	Oct 16	1.0	Oct 11 1994
INSTANTANEOUS PEAK FLOW			2040	Mar 31	5320	May 28 1996
INSTANTANEOUS PEAK STAGE			10.93	Mar 31	14.94	May 28 1996
INSTANTANEOUS LOW FLOW			1.1	Oct 22		
ANNUAL RUNOFF (AC-FT)	18360		44750		30990	
ANNUAL RUNOFF (CFSM)	.48		1.17		.81	
ANNUAL RUNOFF (INCHES)	6.50		15.83		10.97	
10 PERCENT EXCEEDS	52		138		98	
50 PERCENT EXCEEDS	11		30		14	
90 PERCENT EXCEEDS	3.0		4.5		3.2	

e Estimated

05422600 DUCK CREEK AT DUCK CREEK GOLF COURSE, DAVENPORT, IA--Continued




Iowa
HANCOCK
WRIGHT
HARDIN
MARSHALL
TAMA
POWESHIEK
IOWA
JOHNSON
WASHINGTON
LOUISA
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92°15´00´´
41°07´30´´
EXPLANATION
Hydrologic boundary
Streams
05449600 Transmitting gaging station and station number
05448600 Crest–stage gaging station and station number
05453600 Precipitation gaging station and station number
0 10 20 30 40 MILES
0 10 20 30 40 KILOMETERS
Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05449500 IOWA RIVER NEAR ROWAN, IA

LOCATION.--Lat 42°45'36", long 93°37'23", in $NW^1/_4$ $NE^1/_4$ sec.25, T.92 N., R.24 W., Wright County, Hydrologic Unit 07080207, on left bank 10 ft downstream from bridge on county highway C38, 0.9 mi downstream from drainage ditch 123, 3.8 mi northwest of Rowan, 10.7 mi downstream from confluence of East and West Branches, and at mile 316.4.

DRAINAGE AREA.--429 mi^2.

PERIOD OF RECORD.--October 1940 to September 1976, June 1977 to current year.

REVISED RECORDS.--WSP 1308: 1942-43 (M). WSP 1438: Drainage area. WDR IA-80-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,143.35 ft above sea level. Prior to Oct. 14, 1948, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 16-19, Dec. 5-8, 13-15, Dec. 27 to Jan. 2, Jan. 9 to Feb. 17, and March 9-14. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corp of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	45	44	e30	e80	301	971	435	288	1340	77	88
2	37	46	44	e42	e75	254	922	404	276	1020	75	82
3	38	48	43	51	e70	233	789	377	281	822	76	77
4	39	43	41	55	e55	226	647	360	271	875	128	73
5	38	44	e30	67	e65	211	551	341	263	779	598	69
6	36	46	e36	64	e70	196	479	326	249	659	728	65
7	36	44	e38	63	e65	184	786	312	235	604	535	62
8	36	44	e40	62	e70	181	1250	304	227	525	396	59
9	46	44	41	e50	e75	e140	1420	312	255	447	301	56
10	42	44	41	e29	e80	e75	1430	305	301	387	235	55
11	41	45	40	e27	e80	e80	1290	294	347	338	186	55
12	43	39	37	e34	e70	e95	1020	289	520	300	154	54
13	90	37	e34	e29	e75	e120	804	280	591	271	136	51
14	101	40	e32	e25	e65	e150	776	258	539	243	123	48
15	76	34	e38	e28	e80	158	788	252	504	231	111	49
16	66	e42	41	e32	e160	136	1130	263	577	247	105	49
17	60	e34	42	e36	e300	120	1350	284	638	231	101	48
18	56	e38	43	e29	912	119	1380	264	757	206	97	46
19	52	e34	41	e32	942	135	1270	252	1270	190	90	45
20	51	39	38	e34	869	127	1090	232	1480	173	92	58
21	48	37	46	e40	792	172	1220	218	1780	157	87	55
22	45	40	48	e48	658	195	1270	213	2120	148	83	51
23	46	35	40	e44	560	227	1160	208	2490	137	83	48
24	45	41	38	e42	513	238	965	242	2730	125	98	59
25	47	43	34	e44	441	234	788	454	2600	117	104	71
26	49	38	37	e48	378	304	668	508	2450	111	100	66
27	45	40	e34	e55	381	426	596	427	2360	104	91	61
28	42	43	e38	e50	354	523	534	361	2460	98	95	58
29	42	46	e40	e65	---	692	491	383	2220	90	124	57
30	45	46	e38	e60	---	776	462	357	1760	85	117	57
31	44	---	e36	e60	---	913	---	317	---	81	99	---
TOTAL	1520	1239	1213	1375	8335	7941	28297	9832	32839	11141	5425	1772
MEAN	49.0	41.3	39.1	44.4	298	256	943	317	1095	359	175	59.1
MAX	101	48	48	67	942	913	1430	508	2730	1340	728	88
MIN	36	34	30	25	55	75	462	208	227	81	75	45
AC-FT	3010	2460	2410	2730	16530	15750	56130	19500	65140	22100	10760	3510
CFSM	.12	.10	.09	.11	.71	.61	2.26	.76	2.62	.86	.42	.14
IN.	.14	.11	.11	.12	.74	.71	2.52	.88	2.92	.99	.48	.16

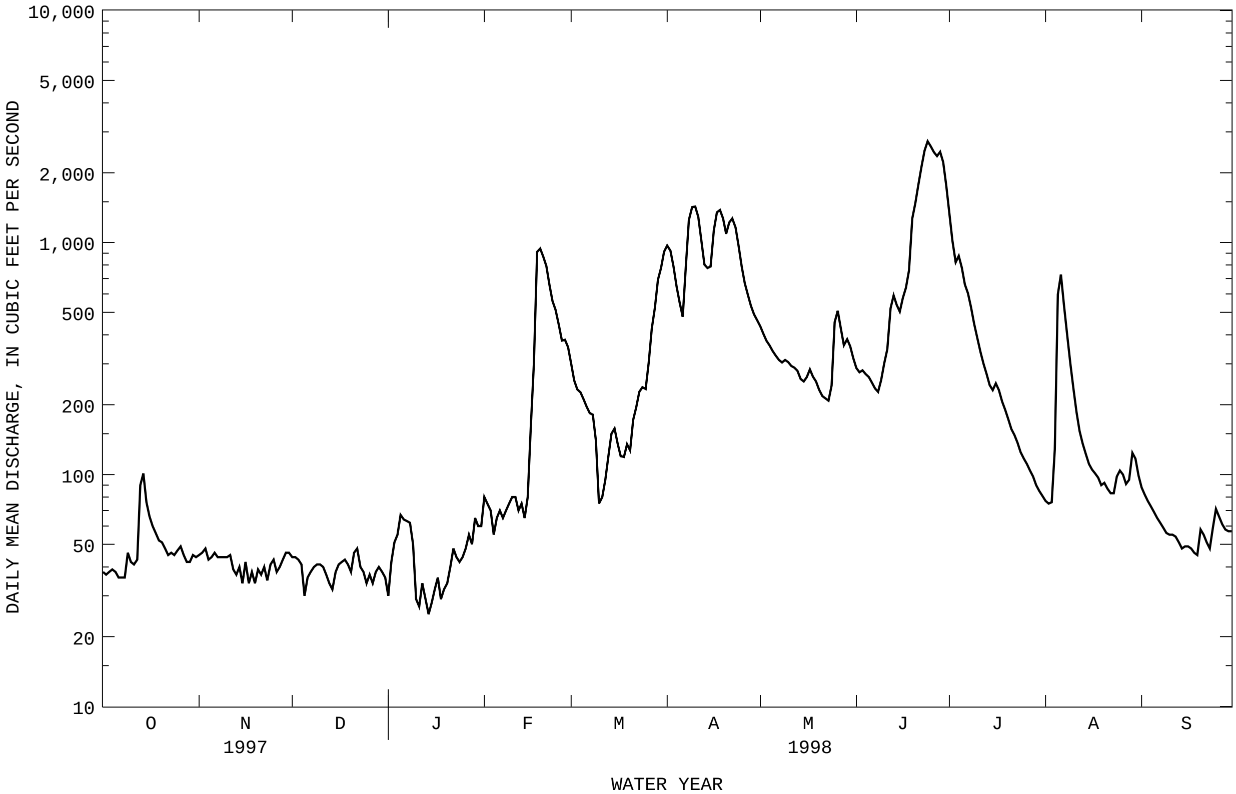
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	137	134	86.9	56.3	113	404	480	349	480	296	160	145
MAX	720	695	588	298	931	1415	2439	1793	2452	1922	1684	1213
(WY)	1987	1993	1983	1983	1984	1973	1965	1991	1984	1993	1979	1965
MIN	8.14	9.49	5.62	3.63	3.54	23.9	32.4	44.3	19.2	14.9	14.3	8.83
(WY)	1990	1990	1990	1959	1959	1968	1957	1989	1989	1989	1948	1958

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	113278		110929			
ANNUAL MEAN	310		304		238	
HIGHEST ANNUAL MEAN					869	1993
LOWEST ANNUAL MEAN					30.4	1956
HIGHEST DAILY MEAN	1860	Mar 13	2730	Jun 24	7640	Jun 21 1954
LOWEST DAILY MEAN	30	Dec 5	25	Jan 14	2.8	Dec 22 1989
ANNUAL SEVEN-DAY MINIMUM	37	Nov 17	29	Jan 10	3.0	Jan 19 1959
INSTANTANEOUS PEAK FLOW			2750	Jun 24	8460	Jun 21 1954
INSTANTANEOUS PEAK STAGE			11.79	Jun 24	14.88	Jun 21 1954
ANNUAL RUNOFF (AC-FT)	224700		220000		172100	
ANNUAL RUNOFF (CFSM)	.74		.73		.57	
ANNUAL RUNOFF (INCHES)	10.08		9.87		7.72	
10 PERCENT EXCEEDS	937		811		600	
50 PERCENT EXCEEDS	113		95		84	
90 PERCENT EXCEEDS	40		38		17	

e Estimated

05449500 IOWA RIVER NEAR ROWAN, IA--Continued



05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA

LOCATION.--Lat 42°18'55", long 93°09'07", in SE$^1/_4$ NW$^1/_4$ SW$^1/_4$ sec. 26, T.87 N., R.20 W., Hardin County, Hydrologic Unit 07080207, located 15 ft from the left bank downstream side of the bridge on County Road, 4.0 miles upstream of the confluence with the Iowa River, and 2.0 miles NE of New Providence.

DRAINAGE AREA.--230 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1995 to current year.

GAGE.--Water stage recorder. Datum of gage is 945 ft above sea level, from map.

REMARKS.--Estimated daily discharges: Nov. 24, 25, Dec. 5 to Feb. 16, March 8-15, June 20-22, June 24, 25, and June 29 to July 1. Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	9.6	17	e7.5	e34	142	470	194	550	e2280	35	34
2	3.2	12	15	e12	e40	132	402	185	429	1540	32	30
3	2.9	12	16	e17	e32	132	333	178	357	1170	33	27
4	2.8	11	15	e22	e23	133	285	167	305	948	40	24
5	2.7	11	e7.5	e30	e26	127	257	160	270	792	54	22
6	2.7	12	e8.0	e29	e27	122	239	155	242	680	111	20
7	2.7	12	e9.0	e27	e24	119	225	156	219	656	98	19
8	3.7	11	e9.5	e32	e26	e85	321	150	209	555	75	17
9	6.2	12	e10	e44	e28	e60	359	142	403	487	63	16
10	5.8	12	e11	e34	e29	e44	334	136	400	434	54	15
11	5.7	11	e9.5	e27	e28	e50	290	131	826	388	45	14
12	16	11	e8.5	e20	e26	e55	260	134	1160	349	39	14
13	46	11	e7.0	e15	e29	e65	238	126	1020	307	37	13
14	47	12	e8.5	e12	e32	e80	219	116	796	269	34	13
15	38	13	e9.5	e14	e50	e85	217	117	943	237	34	12
16	28	e8.5	e11	e17	e110	93	284	120	982	212	47	11
17	23	e8.0	e13	e15	500	96	435	110	786	194	43	11
18	20	e11	e12	e14	460	115	343	109	1160	179	35	10
19	19	15	e11	e16	431	125	292	111	1790	161	31	9.7
20	17	12	e12	e17	350	135	318	109	e1800	143	28	9.5
21	16	12	e13	e19	291	172	518	107	e2840	126	101	9.5
22	15	15	e15	e20	256	263	573	110	e2600	114	401	9.1
23	14	12	e13	e17	234	357	451	110	1480	102	244	9.7
24	14	e14	e14	e16	226	345	367	226	e2190	91	137	10
25	13	e15	e11	e17	209	337	316	339	e2230	84	96	9.8
26	15	15	e10	e19	195	521	284	318	1670	75	76	11
27	15	13	e8.5	e21	175	611	241	273	1220	67	68	11
28	14	13	e9.0	e23	157	412	217	282	1360	59	63	11
29	13	14	e9.5	e25	---	310	207	833	e2020	52	52	16
30	13	21	e8.5	e23	---	329	203	1110	e2920	45	43	16
31	12	---	e8.0	e28	---	458	---	832	---	39	37	---
TOTAL	449.5	371.1	339.5	649.5	4048	6110	9498	7346	35177	12835	2286	454.3
MEAN	14.5	12.4	11.0	21.0	145	197	317	237	1173	414	73.7	15.1
MAX	47	21	17	44	500	611	573	1110	2920	2280	401	34
MIN	2.7	8.0	7.0	7.5	23	44	203	107	209	39	28	9.1
AC-FT	892	736	673	1290	8030	12120	18840	14570	69770	25460	4530	901
CFSM	.06	.06	.05	.09	.65	.88	1.41	1.06	5.23	1.85	.33	.07
IN.	.07	.06	.06	.11	.67	1.01	1.58	1.22	5.84	2.13	.38	.08

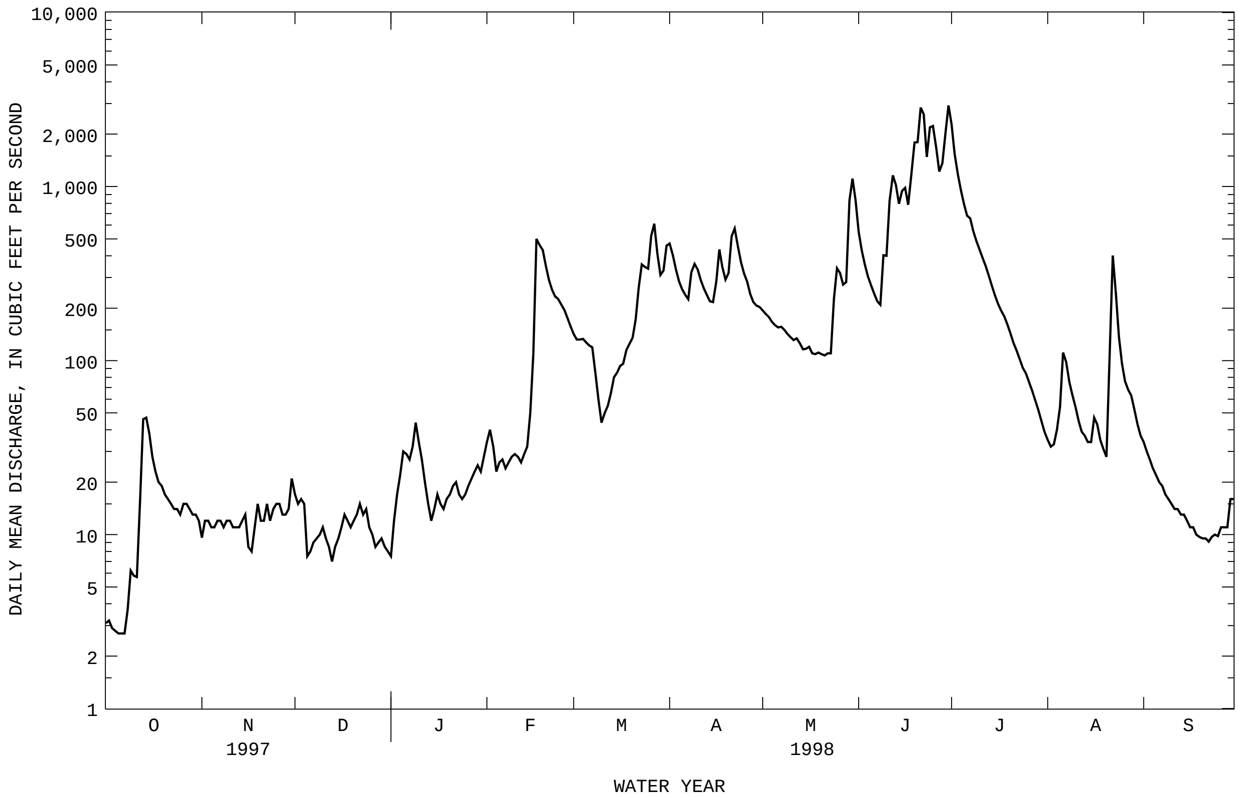
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	18.3	76.3	48.1	33.4	167	203	192	231	666	245	41.4	11.4
MAX	22.0	199	119	65.7	250	334	317	312	1173	414	73.7	15.1
(WY)	1997	1997	1997	1997	1997	1997	1998	1997	1998	1998	1998	1998
MIN	14.5	12.4	11.0	13.6	110	77.3	51.0	145	353	59.9	19.9	7.40
(WY)	1998	1998	1998	1996	1996	1996	1996	1996	1996	1996	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1996 - 1998	
ANNUAL TOTAL	59587.0		79563.9			
ANNUAL MEAN	163		218		203	
HIGHEST ANNUAL MEAN					218	1998
LOWEST ANNUAL MEAN					188	1997
HIGHEST DAILY MEAN	2330	Jun 22	2920	Jun 30	2920	Jun 30 1998
LOWEST DAILY MEAN	2.7	Oct 5a	2.7	Oct 5a	2.7	Oct 5 1997a
ANNUAL SEVEN-DAY MINIMUM	2.9	Oct 1	2.9	Oct 1	2.9	Oct 1 1997
INSTANTANEOUS PEAK FLOW			3550	Jun 21	3550	Jun 21 1998
INSTANTANEOUS PEAK STAGE			11.59	Jun 21	11.59	Jun 21 1998
INSTANTANEOUS LOW FLOW			2.1	Oct 6,7	2.1	Oct 6 1997b
ANNUAL RUNOFF (AC-FT)	118200		157800		147200	
ANNUAL RUNOFF (CFSM)	.73		.97		.91	
ANNUAL RUNOFF (INCHES)	9.90		13.21		12.32	
10 PERCENT EXCEEDS	416		507		395	
50 PERCENT EXCEEDS	65		45		60	
90 PERCENT EXCEEDS	8.0		10		9.7	

a Also Oct 6, 7
b Also Oct 7
e Estimated

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA--Continued



05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA

PRECIPITATION RECORDS

PERIOD OF RECORD.-- October 1995 to current year.

INSTRUMENTATION.-- Tipping bucket rain gage.

REMARKS.-- Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

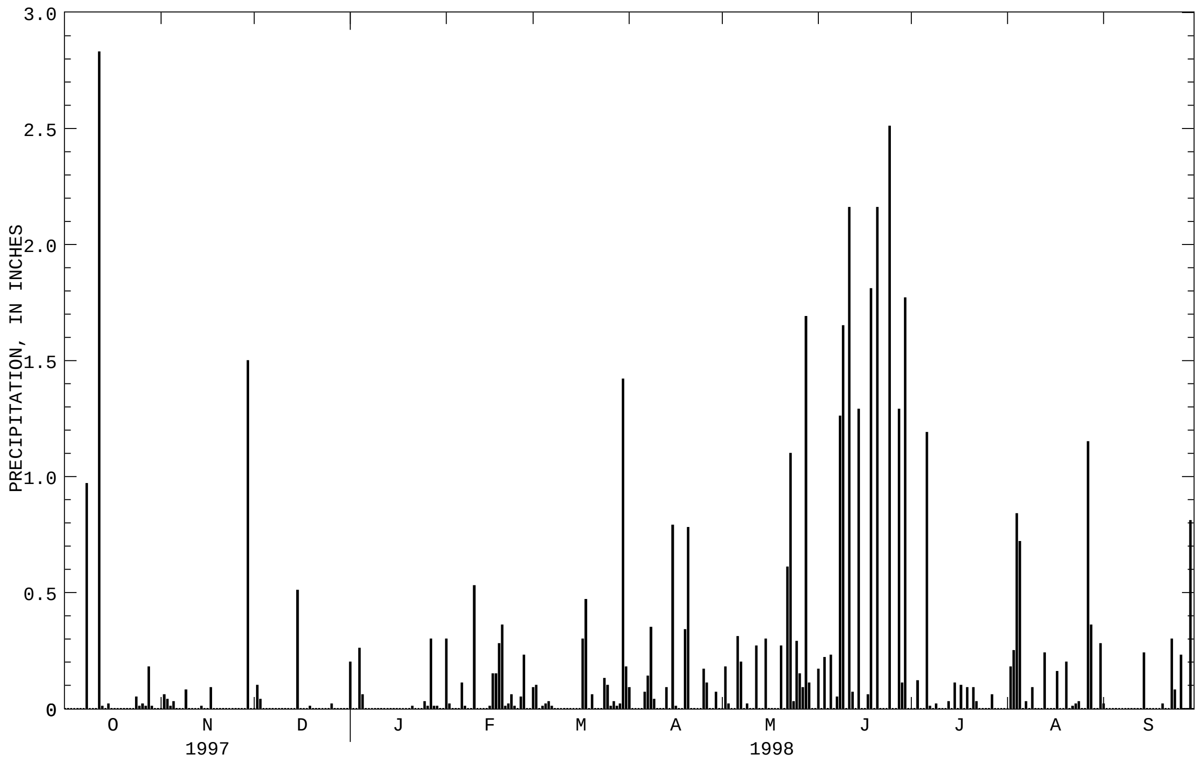
EXTREME FOR PERIOD OF RECORD.-- Maximum daily accumulation, 5.37 in., June 21, 1997.

EXTREME FOR CURRENT YEAR.-- Maximum daily accumulation 2.83 in., Oct. 12.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.20	.30	.09	.09	.00	.17	.00	.00	.02
2	.00	.06	.10	.00	.02	.10	.00	.18	.00	.00	.18	.00
3	.00	.04	.04	.00	.00	.00	.00	.02	.22	.12	.25	.00
4	.00	.01	.00	.26	.00	.01	.00	.00	.00	.00	.84	.00
5	.00	.03	.00	.06	.00	.02	.00	.00	.23	.00	.72	.00
6	.00	.00	.00	.00	.11	.03	.07	.31	.00	1.19	.00	.00
7	.00	.00	.00	.00	.01	.01	.14	.20	.05	.01	.03	.00
8	.97	.00	.00	.00	.00	.00	.35	.00	1.26	.00	.00	.00
9	.00	.08	.00	.00	.00	.00	.04	.02	1.65	.02	.09	.00
10	.00	.00	.00	.00	.53	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	2.16	.00	.00	.00
12	2.83	.00	.00	.00	.00	.00	.00	.27	.07	.00	.00	.00
13	.01	.00	.00	.00	.00	.00	.09	.00	.00	.03	.24	.00
14	.00	.01	.00	.00	.00	.00	.00	.00	1.29	.00	.00	.24
15	.02	.00	.51	.00	.01	.00	.79	.30	.00	.11	.00	.00
16	.00	.00	.00	.00	.15	.00	.01	.00	.00	.00	.00	.00
17	.00	.09	.00	.00	.15	.30	.00	.00	.06	.10	.16	.00
18	.00	.00	.00	.00	.28	.47	.00	.00	1.81	.00	.00	.00
19	.00	.00	.01	.00	.36	.00	.34	.00	.00	.09	.00	.00
20	.00	.00	.00	.00	.01	.06	.78	.27	2.16	.00	.20	.02
21	.00	.00	.00	.01	.02	.00	.00	.00	.00	.09	.00	.00
22	.00	.00	.00	.00	.06	.00	.00	.61	.00	.03	.01	.00
23	.00	.00	.00	.00	.01	.00	.00	1.10	.00	.00	.02	.30
24	.05	.00	.00	.00	.00	.13	.00	.03	2.51	.00	.03	.08
25	.01	.00	.00	.03	.05	.10	.17	.29	.00	.00	.00	.00
26	.02	.00	.02	.01	.23	.01	.11	.15	.00	.00	.00	.23
27	.01	.00	.00	.30	.00	.03	.00	.09	1.29	.06	1.15	.00
28	.18	.00	.00	.01	.00	.01	.00	1.69	.11	.00	.36	.00
29	.01	1.50	.00	.01	---	.02	.07	.11	1.77	.00	.00	.81
30	.00	.00	.00	.00	---	1.42	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.18	---	.00	---	.00	.28	---
TOTAL	4.11	1.82	0.68	0.89	2.30	2.99	3.05	5.64	16.81	1.85	4.56	1.70
MEAN	.13	.06	.02	.03	.08	.10	.10	.18	.56	.06	.15	.06
MAX	2.83	1.50	.51	.30	.53	1.42	.79	1.69	2.51	1.19	1.15	.81
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA--Continued



05451500 IOWA RIVER AT MARSHALLTOWN, IA

LOCATION.--Lat 42°03'57", long 92°54'27", in SE$^1/_4$ SE$^1/_4$ sec.23, T.84 N., R.18 W., Marshall County, Hydrologic Unit 07080208, on right bank 10 ft downstream from bridge on State Highway 14, 1,500 ft upstream from Burnett Creek, 2.2 mi upstream from Linn Creek, and at mile 222.8.

DRAINAGE AREA.--1,532 mi^2.

PERIOD OF RECORD.--October 1902 to September 1903, October 1914 to September 1927, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1915-18, 1919 (M), 1920, 1921-23 (M), 1924-27, 1933, 1934 (M), 1936, 1938, 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 853.10 ft above sea level. See WSP 1728 for history of changes prior to Sept. 21, 1934.

REMARKS.--Estimated daily discharges: Dec. 5 to Feb. 16, Mar. 10-14, and Aug. 28 to Sept. 1. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	292	186	289	e95	e320	948	3230	1710	2080	11600	621	e600
2	259	178	257	e140	e300	897	2870	1640	1800	9740	578	393
3	263	188	259	e170	e240	861	2650	1590	1610	7470	570	369
4	271	183	251	e210	e180	839	2490	1510	1470	5960	589	343
5	274	178	e110	e250	e210	798	2320	1450	1390	4700	726	315
6	289	176	e140	e290	e220	769	2150	1390	1320	3930	902	294
7	286	178	e170	e320	e200	748	2030	1380	1250	3960	1290	277
8	326	174	e190	e300	e220	725	2000	1360	1210	3510	1370	259
9	438	179	e220	e180	e240	521	2260	1310	1680	3090	1290	247
10	430	185	e200	e90	e340	e240	2440	1280	2480	2820	1100	239
11	437	181	e220	e85	e320	e260	2570	1240	3090	2500	913	226
12	491	183	e160	e110	e300	e300	2670	1260	6560	2240	800	216
13	676	184	e130	e95	e340	e400	2700	1230	4840	2050	720	209
14	587	187	e120	e80	e290	e550	2610	1190	4080	1880	635	222
15	482	189	e160	e90	e420	649	2350	1150	7450	1730	596	219
16	476	241	e220	e105	e650	632	2270	1160	6000	1610	569	213
17	441	155	e210	e110	1040	665	2480	1140	4160	1520	549	201
18	396	180	e200	e90	1230	723	2570	1100	3660	1460	525	195
19	363	156	e190	e100	1370	911	2570	1090	6800	1380	477	190
20	332	169	e180	e110	1530	952	2830	1110	7920	1290	455	192
21	311	149	e160	e130	1640	1040	3360	1070	9300	1200	487	184
22	291	190	e200	e150	1620	1270	3300	1100	12100	1130	666	186
23	282	190	e180	e140	1410	1570	3090	1070	10300	1070	744	186
24	288	251	e190	e130	1320	1640	2880	1210	10000	988	587	207
25	285	211	e160	e140	1230	1640	2750	1520	11600	930	498	199
26	299	199	e140	e150	1160	2100	2600	1600	9760	881	426	192
27	315	192	e120	e170	1100	2480	2300	1530	7990	849	429	196
28	220	206	e130	e160	1010	2110	2040	1530	7310	797	e950	203
29	341	205	e140	e230	---	1870	1870	1990	8000	738	e1100	230
30	216	276	e130	e220	---	2090	1790	2750	11100	697	e1000	248
31	197	---	e120	e230	---	3400	---	2560	---	650	e850	---
TOTAL	10854	5699	5546	4870	20450	34598	76040	44220	168310	84370	23012	7450
MEAN	350	190	179	157	730	1116	2535	1426	5610	2722	742	248
MAX	676	276	289	320	1640	3400	3360	2750	12100	11600	1370	600
MIN	197	149	110	80	180	240	1790	1070	1210	650	426	184
AC-FT	21530	11300	11000	9660	40560	68630	150800	87710	333800	167300	45640	14780
CFSM	.23	.12	.12	.10	.48	.73	1.65	.93	3.66	1.78	.48	.16
IN.	.26	.14	.13	.12	.50	.84	1.85	1.07	4.09	2.05	.56	.18

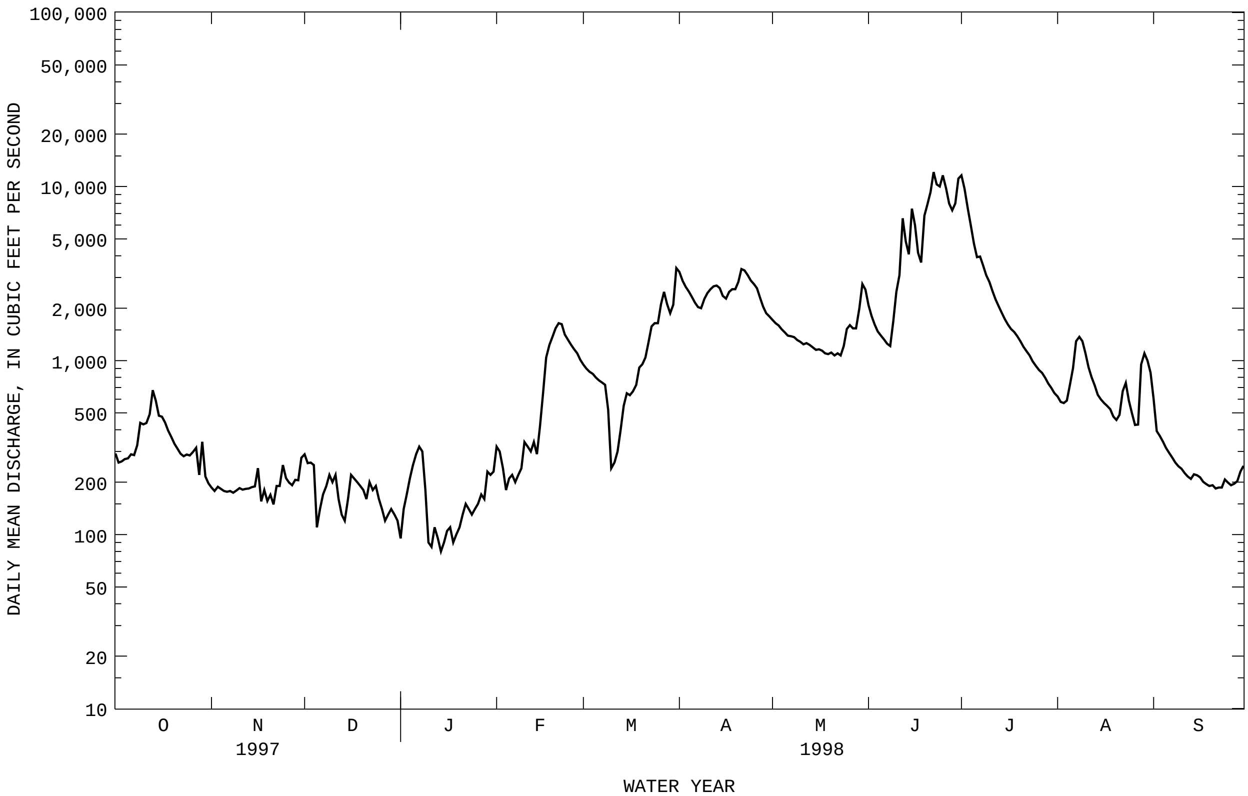
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	499	498	362	306	635	1593	1494	1301	1768	1025	565	502
MAX	2721	2593	2139	2231	3424	4206	6796	5559	7619	8389	7062	3362
(WY)	1987	1973	1983	1973	1915	1973	1965	1991	1918	1993	1993	1993
MIN	39.2	46.2	31.0	10.2	20.9	98.4	99.3	49.9	16.0	41.8	35.9	27.5
(WY)	1940	1940	1990	1977	1940	1934	1934	1934	1934	1977	1934	1939

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1903 - 1998	
ANNUAL TOTAL	390478		485419			
ANNUAL MEAN	1070		1330		879	
HIGHEST ANNUAL MEAN					3456	1993
LOWEST ANNUAL MEAN					77.3	1934
HIGHEST DAILY MEAN	8180	Jun 22	12100	Jun 22	39400	Jun 4 1918
LOWEST DAILY MEAN	81	Aug 24	80	Jan 14	4.7	Jan 25 1977
ANNUAL SEVEN-DAY MINIMUM	100	Aug 19	94	Jan 10	5.2	Jan 20 1977
INSTANTANEOUS PEAK FLOW			12600	Jun 22	42000	Jun 4 1918
INSTANTANEOUS PEAK STAGE			19.66	Jun 22	20.77	Aug 17 1993
ANNUAL RUNOFF (AC-FT)	774500		962800		636800	
ANNUAL RUNOFF (CFSM)	.70		.87		.57	
ANNUAL RUNOFF (INCHES)	9.48		11.79		7.80	
10 PERCENT EXCEEDS	2770		2850		2160	
50 PERCENT EXCEEDS	500		587		396	
90 PERCENT EXCEEDS	140		160		73	

e Estimated

05451500 IOWA RIVER AT MARSHALLTOWN, IA--Continued



05451700 TIMBER CREEK NEAR MARSHALLTOWN, IA

LOCATION.--Lat 42°00'32", long 92°51'08", in SE$^1/_4$ SW$^1/_4$ sec.8, T.83 N., R.17 W., Marshall County, Hydrologic Unit 07080208, on left bank 20 ft upstream from bridge on Shady Oaks Road, 3.0 mi upstream from mouth, and 3.0 mi southeast of Marshalltown.

DRAINAGE AREA.--118 mi^2.

PERIOD OF RECORD.--October 1949 to current year.

REVISED RECORDS.--WSP 1708: 1950-55, 1957-59.

GAGE.--Water stage recorder. Datum of gage is 849.44 ft above sea level. Prior to Oct. 1, 1991 at site 1/8 mile upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 16, 17, Dec. 5-8, 13-17, 21, Dec. 25 to Jan. 4, Jan. 9 to Feb. 7, Mar. 9-12, and Aug. 22-25. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 16.8 ft, discharge, 5,700 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	50	27	e17	e60	93	861	135	248	676	43	28
2	16	44	26	e25	e55	88	553	127	205	589	41	27
3	14	42	28	e30	e36	89	433	132	196	445	42	25
4	11	41	28	e36	e32	86	372	135	176	353	55	26
5	8.9	37	e14	38	e38	82	334	115	166	292	58	22
6	8.1	36	e15	40	e42	80	275	115	155	257	50	21
7	7.2	36	e21	40	e38	77	246	128	146	218	47	20
8	8.1	35	e25	40	39	62	228	128	140	185	44	19
9	29	34	29	e38	40	e50	215	122	433	162	43	19
10	18	33	26	e36	57	e40	206	125	260	224	44	18
11	14	33	25	e32	213	e95	208	111	1060	150	48	19
12	29	32	23	e34	74	e110	173	112	1960	139	47	17
13	178	31	e21	e17	64	120	254	103	572	122	44	16
14	74	31	e19	e15	67	137	229	98	927	118	45	20
15	51	32	e22	e17	53	95	212	92	1410	105	45	21
16	42	e27	e30	e22	72	82	240	89	684	106	47	17
17	39	e22	e36	e23	67	72	218	91	511	95	46	17
18	33	29	27	e18	70	122	192	82	662	88	46	17
19	30	29	26	e19	86	182	181	82	1170	82	46	15
20	28	28	30	e23	112	165	240	216	692	77	49	15
21	28	29	e26	e25	106	186	288	165	2550	73	63	15
22	27	27	34	e30	98	238	250	174	916	73	e46	15
23	27	26	27	e28	92	253	208	168	715	72	e42	17
24	28	27	26	e27	100	220	188	1250	827	64	e38	17
25	27	27	e25	e28	93	247	184	457	620	61	e34	15
26	28	28	e23	e30	89	428	177	332	543	58	30	15
27	32	26	e21	e33	109	310	160	275	429	56	31	15
28	33	25	e22	e32	100	228	150	238	652	54	90	15
29	37	25	e23	e48	---	176	139	438	956	51	40	20
30	53	29	e22	e44	---	671	137	315	1150	47	32	18
31	60	---	e19	e40	---	1780	---	262	---	46	30	---
TOTAL	1034.3	951	766	925	2102	6664	7751	6412	21131	5138	1406	561
MEAN	33.4	31.7	24.7	29.8	75.1	215	258	207	704	166	45.4	18.7
MAX	178	50	36	48	213	1780	861	1250	2550	676	90	28
MIN	7.2	22	14	15	32	40	137	82	140	46	30	15
AC-FT	2050	1890	1520	1830	4170	13220	15370	12720	41910	10190	2790	1110
CFSM	.28	.27	.21	.25	.64	1.82	2.19	1.75	5.97	1.40	.38	.16
IN.	.33	.30	.24	.29	.66	2.10	2.44	2.02	6.66	1.62	.44	.18

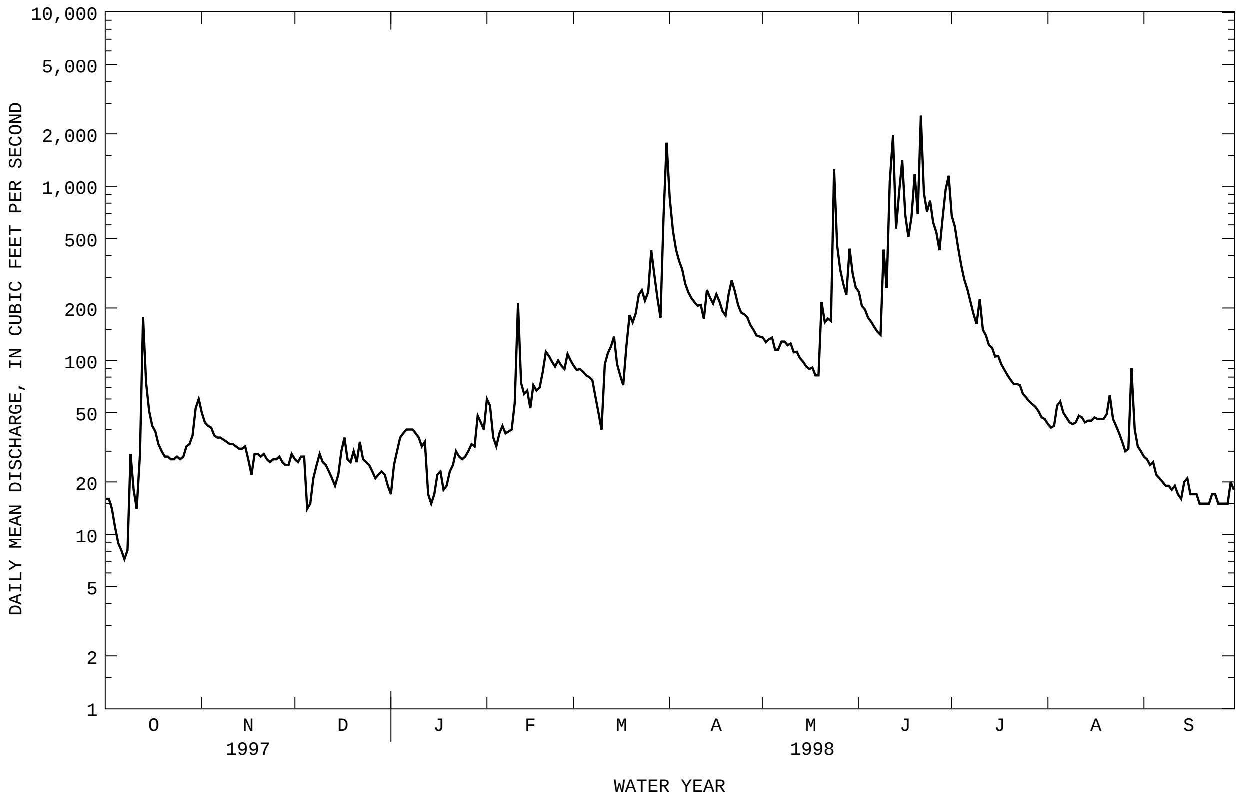
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	37.3	39.8	36.2	36.8	87.9	145	109	128	153	95.0	59.5	39.3
MAX	286	265	183	200	351	597	385	447	704	866	635	341
(WY)	1987	1984	1984	1973	1971	1979	1993	1974	1998	1993	1993	1986
MIN	.76	1.11	.60	.054	3.07	5.11	2.84	3.08	1.09	1.03	1.16	1.21
(WY)	1951	1951	1956	1977	1954	1956	1956	1977	1977	1956	1956	1950

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1950 - 1998	
ANNUAL TOTAL	24591.7		54841.3			
ANNUAL MEAN	67.4		150		80.5	
HIGHEST ANNUAL MEAN					299	1993
LOWEST ANNUAL MEAN					2.84	1956
HIGHEST DAILY MEAN	900	Feb 19	2550	Jun 21	6570	Aug 16 1977
LOWEST DAILY MEAN	7.2	Oct 7	7.2	Oct 7	.00	Jul 24 1956a
ANNUAL SEVEN-DAY MINIMUM	10	Oct 2	10	Oct 2	.00	Oct 4 1956
INSTANTANEOUS PEAK FLOW			3160	Jun 21	12000	Aug 16 1977
INSTANTANEOUS PEAK STAGE			14.71	Jun 21	17.69	Aug 16 1977
INSTANTANEOUS LOW FLOW			6.1	Oct 8		
ANNUAL RUNOFF (AC-FT)	48780		108800		58330	
ANNUAL RUNOFF (CFSM)	.57		1.27		.68	
ANNUAL RUNOFF (INCHES)	7.75		17.29		9.27	
10 PERCENT EXCEEDS	132		333		175	
50 PERCENT EXCEEDS	41		49		33	
90 PERCENT EXCEEDS	19		19		3.1	

a Several days in July, Oct 1956; Jan, Feb, July 1977
e Estimated

05451700 TIMBER CREEK NEAR MARSHALLTOWN, IA--Continued



05451900 RICHLAND CREEK NEAR HAVEN, IA

LOCATION.--Lat 41°53'58", long 92°28'27", in SE1/4 NE1/4 sec.21, T.82 N., R.14 W., Tama County, Hydrologic Unit 07080208, on right bank 5 ft upstream from bridge on county highway, 0.5 mi northeast of Haven, and 3.0 mi upstream from mouth.

DRAINAGE AREA.--56.1 mi^2.

PERIOD OF RECORD.--October 1949 to current year.

REVISED RECORDS.--WSP 1708: 1950-55, 1956 (M), 1957, 1958 (M), 1959.

GAGE.--Water-stage recorder. Datum of gage is 788.69 ft above sea level. Prior to Oct. 1, 1971, at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 5-9, 12-21, Dec. 25 to Jan. 3, Jan. 10-31, Mar. 9-18, May 16, 17, and June 21. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1918 reached a stage of 24.3 ft present datum, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	88	23	e15	119	65	325	60	97	159	22	17
2	10	74	23	e21	82	62	232	56	91	134	21	15
3	10	67	25	e28	41	64	192	55	86	122	23	15
4	9.5	59	24	37	34	61	165	54	81	112	31	14
5	9.6	55	e20	47	31	58	148	52	76	107	73	13
6	9.6	52	e19	67	29	56	135	57	71	111	36	13
7	9.5	50	e20	56	29	54	124	97	66	101	28	12
8	10	47	e21	52	28	54	119	82	65	89	24	12
9	17	46	e22	46	29	e38	110	75	304	83	23	12
10	15	45	23	e40	32	e34	99	69	123	78	21	12
11	13	43	21	e36	77	e38	94	63	293	73	21	11
12	32	41	e18	e40	51	e32	90	64	234	68	20	10
13	217	40	e17	e32	36	e34	86	56	154	63	19	9.5
14	85	38	e24	e34	33	e32	80	54	255	59	19	18
15	56	36	e21	e36	31	e34	79	55	509	55	17	14
16	45	35	e20	e38	36	e38	84	e50	221	52	16	11
17	39	42	e19	e36	42	e44	74	e45	188	49	21	11
18	35	32	e18	e28	45	e90	70	50	576	46	19	10
19	32	30	e17	e30	50	147	67	50	430	44	15	10
20	30	29	e17	e26	55	124	84	127	296	43	15	9.5
21	28	28	e19	e24	54	132	113	82	e500	41	33	9.6
22	28	27	24	e26	52	148	93	104	260	42	21	9.4
23	28	26	22	e23	52	143	84	97	215	38	17	9.1
24	29	25	22	e22	53	117	78	504	197	35	16	9.8
25	28	24	e19	e21	53	171	76	223	172	32	15	9.6
26	38	23	e17	e21	62	213	75	164	157	31	14	9.4
27	47	23	e16	e22	80	136	65	136	146	30	17	8.8
28	53	23	e20	e23	71	103	62	118	184	28	97	8.5
29	69	22	e17	e23	---	86	60	142	530	27	44	11
30	107	25	e14	e24	---	274	61	123	287	25	23	11
31	119	---	e13	e26	---	580	---	109	---	24	19	---
TOTAL	1268.2	1195	615	1000	1387	3262	3224	3073	6864	2001	800	345.2
MEAN	40.9	39.8	19.8	32.3	49.5	105	107	99.1	229	64.5	25.8	11.5
MAX	217	88	25	67	119	580	325	504	576	159	97	18
MIN	9.5	22	13	15	28	32	60	45	65	24	14	8.5
AC-FT	2520	2370	1220	1980	2750	6470	6390	6100	13610	3970	1590	685
CFSM	.73	.71	.35	.58	.88	1.88	1.92	1.77	4.08	1.15	.46	.21
IN.	.84	.79	.41	.66	.92	2.16	2.14	2.04	4.55	1.33	.53	.23

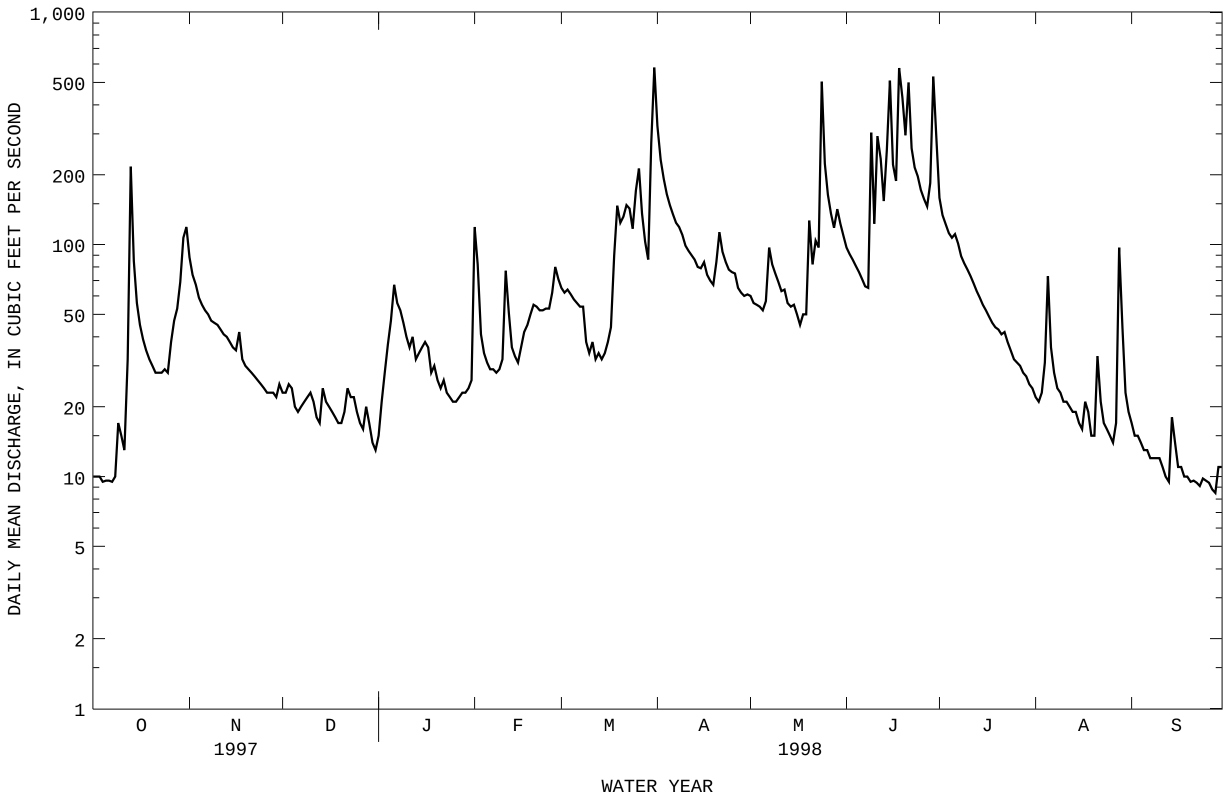
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	18.0	22.7	17.5	19.9	43.7	67.9	58.4	61.4	66.9	46.0	32.3	20.2
MAX	105	122	85.8	104	165	270	323	337	270	463	427	159
(WY)	1987	1984	1983	1960	1965	1979	1991	1974	1990	1993	1993	1993
MIN	.24	.31	.25	.020	.32	1.05	.85	2.04	.25	.66	.76	.58
(WY)	1957	1951	1957	1977	1989	1956	1956	1956	1956	1977	1955	1950

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1950 - 1998	
ANNUAL TOTAL	13950.2		25034.4			
ANNUAL MEAN	38.2		68.6		39.5	
HIGHEST ANNUAL MEAN					162	1993
LOWEST ANNUAL MEAN					2.49	1956
HIGHEST DAILY MEAN	700	Feb 18	580	Mar 31	2880	Aug 16 1977
LOWEST DAILY MEAN	8.0	Sep 1	8.5	Sep 28	.00	Jan 22 1977a
ANNUAL SEVEN-DAY MINIMUM	8.4	Aug 31	9.2	Sep 22	.00	Jan 22 1977a
INSTANTANEOUS PEAK FLOW			2760	Jun 29	12200	Apr 12 1991
INSTANTANEOUS PEAK STAGE			21.38	Jun 29	26.71	Apr 12 1991
INSTANTANEOUS LOW FLOW			8.0	Sep 27		
ANNUAL RUNOFF (AC-FT)	27670		49660		28630	
ANNUAL RUNOFF (CFSM)	.68		1.22		.70	
ANNUAL RUNOFF (INCHES)	9.25		16.60		9.57	
10 PERCENT EXCEEDS	67		146		80	
50 PERCENT EXCEEDS	25		41		14	
90 PERCENT EXCEEDS	10		14		1.1	

a Also Jan 23 to Feb 2, 1977, July 9 and 10, 1989
e Estimated

05451900 RICHLAND CREEK NEAR HAVEN, IA--Continued



05452000 SALT CREEK NEAR ELBERON, IA

LOCATION.--Lat 41°57'51", long 92°18'47", in $NW^1/_4$ $NW^1/_4$ sec.36, T.83 N., R.13 W., Tama County, Hydrologic Unit 07080208, on left bank 20 ft upstream from bridge on U.S. Highway 30, 2.0 mi upstream from Hog Run, 3.0 mi south of Elberon, and 9.0 mi upstream from mouth.

DRAINAGE AREA.--201 mi^2.

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946.

GAGE.--Water-stage recorder. Datum of gage is 781.58 ft above sea level (Iowa Highway Commission bench mark). Prior to Oct. 15, 1945 and June 14, 1947 to Feb. 10, 1949, nonrecording gage on upstream side of bridge at present datum.

REMARKS.--Estimated daily discharges: Nov. 24, Dec. 13-21, Dec. 25 to Jan. 2, Jan. 10 to Feb. 1, Mar. 9-18, Apr. 11-22, and June 9. Records good except those for estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1944 reached a stage of 19.9 ft, from floodmark at downstream side of bridge, discharge, about 30,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	160	63	e44	e95	208	1930	218	170	712	85	59
2	34	138	62	e65	243	196	872	208	166	511	80	56
3	35	129	68	135	105	193	641	199	160	476	77	52
4	32	114	68	100	91	191	551	196	153	534	77	52
5	32	109	54	112	82	188	497	188	144	441	109	47
6	32	105	63	184	78	183	442	194	139	413	115	46
7	31	102	66	154	76	179	411	228	134	383	102	46
8	31	101	65	143	76	163	401	207	132	355	92	43
9	47	98	66	130	75	e65	380	194	e850	329	83	42
10	52	97	64	e75	83	e60	360	186	330	323	80	41
11	40	92	60	e65	190	e70	e340	176	523	293	74	40
12	65	91	58	e80	214	e65	e320	177	1050	273	70	40
13	632	90	e50	e65	114	e70	e320	167	497	256	66	38
14	329	89	e65	e70	107	e65	e300	159	736	238	65	58
15	213	87	e70	e80	99	e70	e300	154	1980	223	63	55
16	166	74	e65	e85	127	e75	e320	158	1030	208	62	42
17	144	88	e60	e75	140	e90	e280	144	555	197	62	41
18	130	99	e55	e60	155	e190	e260	141	973	188	60	41
19	120	78	e50	e65	157	431	e250	139	2190	178	54	41
20	108	80	e50	e60	154	398	e320	141	1120	166	53	44
21	101	79	e55	e55	148	436	e400	138	1860	152	59	42
22	98	76	71	e60	143	492	e360	139	1530	155	55	38
23	97	72	67	e55	145	525	320	136	632	143	60	37
24	94	e65	64	e50	148	434	279	203	1210	131	57	42
25	90	65	e55	e50	148	505	270	207	1030	126	51	40
26	92	64	e50	e48	156	681	268	182	553	122	49	39
27	102	61	e46	e50	211	490	236	167	476	116	48	38
28	98	62	e55	e55	218	377	222	159	495	109	182	38
29	114	59	e48	e55	---	326	217	211	812	101	124	40
30	153	66	e44	e60	---	539	217	210	1800	95	73	41
31	199	---	e40	e70	---	1870	---	187	---	89	64	---
TOTAL	3544	2690	1817	2455	3778	9825	12284	5513	23430	8036	2351	1319
MEAN	114	89.7	58.6	79.2	135	317	409	178	781	259	75.8	44.0
MAX	632	160	71	184	243	1870	1930	228	2190	712	182	59
MIN	31	59	40	44	75	60	217	136	132	89	48	37
AC-FT	7030	5340	3600	4870	7490	19490	24370	10940	46470	15940	4660	2620
CFSM	.57	.45	.29	.39	.67	1.58	2.04	.88	3.89	1.29	.38	.22
IN.	.66	.50	.34	.45	.70	1.82	2.27	1.02	4.34	1.49	.44	.24

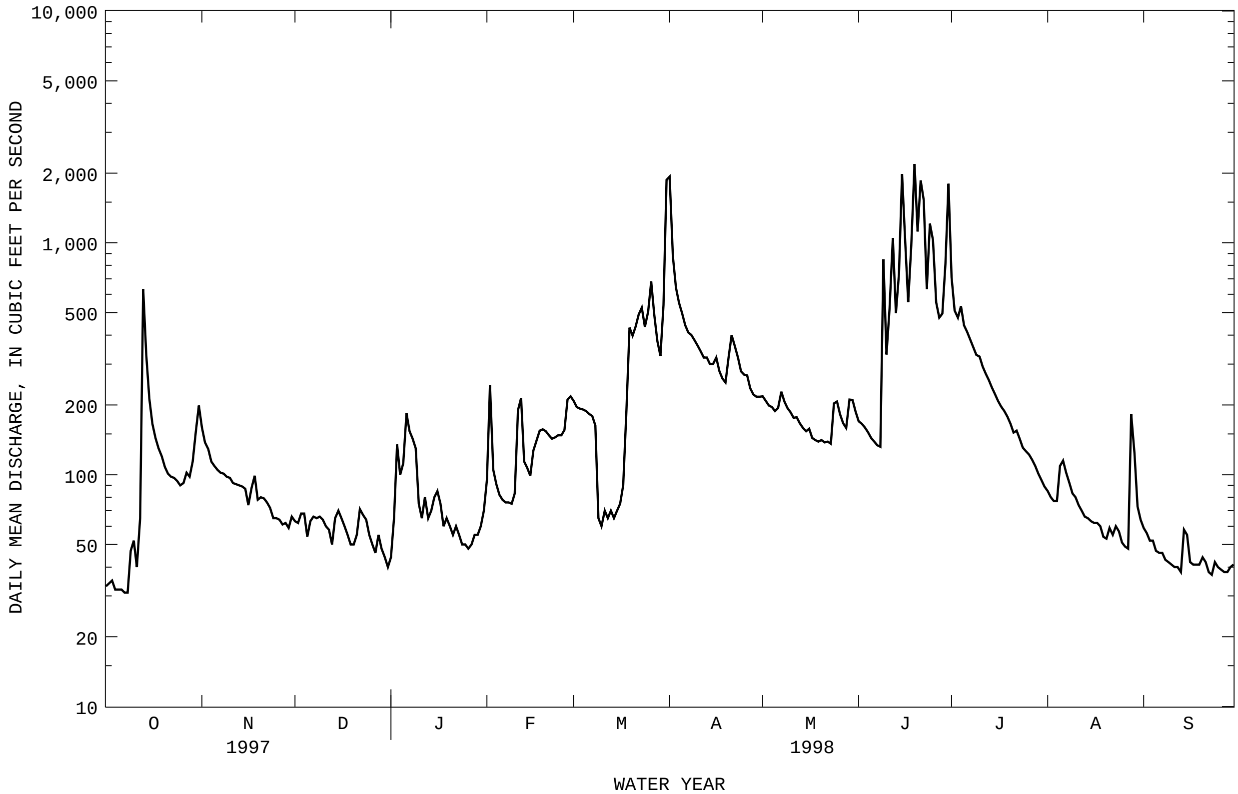
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	64.9	80.5	65.3	73.5	142	269	196	195	265	196	104	68.6
MAX	250	425	314	337	607	844	652	573	1826	1803	1157	441
(WY)	1978	1983	1983	1973	1982	1993	1983	1982	1947	1993	1993	1993
MIN	4.85	4.08	2.29	1.14	7.02	11.7	11.0	5.75	7.79	3.84	5.65	5.43
(WY)	1951	1951	1977	1977	1977	1954	1989	1977	1977	1989	1949	1950

05452000 SALT CREEK NEAR ELBERON, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1946 - 1998	
ANNUAL TOTAL	41259		77042			
ANNUAL MEAN	113		211		143	
HIGHEST ANNUAL MEAN					569	1993
LOWEST ANNUAL MEAN					23.2	1989
HIGHEST DAILY MEAN	1800	Feb 19	2190	Jun 19	14000	Jul 9 1993
LOWEST DAILY MEAN	21	Sep 6	31	Oct 7,8	.85	Jan 31 1977
ANNUAL SEVEN-DAY MINIMUM	22	Sep 1	32	Oct 2	.95	Jan 25 1977
INSTANTANEOUS PEAK FLOW			2650	Mar 31	41800	Jul 9 1993
INSTANTANEOUS PEAK STAGE			16.09	Mar 31	20.85	Jul 9 1993
INSTANTANEOUS LOW FLOW			29	Oct 5,8		
ANNUAL RUNOFF (AC-FT)	81840		152800		103800	
ANNUAL RUNOFF (CFSM)	.56		1.05		.71	
ANNUAL RUNOFF (INCHES)	7.64		14.26		9.69	
10 PERCENT EXCEEDS	199		482		282	
50 PERCENT EXCEEDS	83		109		56	
90 PERCENT EXCEEDS	32		47		9.0	

e Estimated



05452200 WALNUT CREEK NEAR HARTWICK, IA

LOCATION.--Lat 41°50'06", long 92°23'10", in SE 1/4 SW 1/4 sec.8, T.81 N, R.13 W., Poweshiek County, Hydrologic Unit 07080208, on right bank 5 ft downstream from bridge on county highway V21, 1.2 mi downstream from North Walnut Creek, 4.0 mi northwest of Hartwick, and 6.5 mi upstream from mouth.

DRAINAGE AREA.--70.9 mi^2.

PERIOD OF RECORD.--October 1949 to current year.

REVISED RECORDS.--WSP 1558: 1950 (P), 1951-57.

GAGE.--Water-stage recorder. Datum of gage is 786.59 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 24, Dec. 5-9, 12-21, Dec. 25 to Jan. 3, Jan. 10-31, Mar. 9-18, April 8, 16-18, July 25 to Aug. 4, and Aug. 9. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 17.7 ft, from information by local residents, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	53	23	e23	143	81	382	69	111	163	e17	22
2	3.2	43	22	e32	82	77	275	63	101	136	e16	18
3	3.0	38	24	e42	50	78	227	60	94	124	e18	16
4	2.6	35	23	53	43	74	190	57	87	114	e26	14
5	2.7	33	e18	70	39	69	170	54	82	106	116	12
6	2.7	31	e17	97	37	66	153	62	75	106	48	12
7	2.9	30	e18	77	36	64	145	117	70	100	34	10
8	3.7	28	e19	68	35	63	e150	96	69	89	27	8.8
9	6.7	28	e20	58	34	e60	142	87	217	82	e25	8.5
10	4.7	28	23	e48	37	e50	116	79	122	78	24	7.8
11	4.0	27	21	e44	81	e55	111	73	296	72	20	7.2
12	17	26	e17	e55	67	e46	103	73	219	67	18	6.9
13	88	27	e16	e44	47	e50	100	65	153	62	17	6.4
14	32	26	e20	e46	43	e46	93	61	265	57	17	27
15	22	25	e22	e48	42	e48	95	58	347	52	16	18
16	17	22	e21	e55	45	e50	e100	54	239	47	15	14
17	15	25	e19	e46	54	e55	e95	50	182	45	20	12
18	13	27	e18	e40	58	e140	e90	48	652	43	15	11
19	11	25	e17	e44	67	237	89	52	395	40	14	9.5
20	9.9	24	e16	e38	76	202	100	175	319	36	13	8.5
21	9.2	22	e20	e32	71	212	109	102	593	33	23	8.2
22	8.6	22	25	e34	66	230	102	123	247	35	15	8.0
23	9.5	21	23	e32	65	216	92	111	201	31	15	7.5
24	14	e20	24	e30	67	172	86	491	169	27	13	8.2
25	14	22	e20	e27	67	274	88	210	143	e24	12	7.8
26	22	21	e19	e27	78	274	90	162	125	e23	9.7	7.0
27	28	20	e18	e28	103	175	77	136	110	e22	15	6.3
28	29	20	e22	e29	89	139	73	116	126	e20	121	5.8
29	35	20	e19	e30	---	122	71	217	430	e19	59	7.6
30	59	26	e17	e34	---	428	72	158	262	e18	33	6.9
31	75	---	e16	e40	---	707	---	132	---	e18	24	---
TOTAL	567.5	815	617	1371	1722	4560	3786	3411	6501	1889	855.7	322.9
MEAN	18.3	27.2	19.9	44.2	61.5	147	126	110	217	60.9	27.6	10.8
MAX	88	53	25	97	143	707	382	491	652	163	121	27
MIN	2.6	20	16	23	34	46	71	48	69	18	9.7	5.8
AC-FT	1130	1620	1220	2720	3420	9040	7510	6770	12890	3750	1700	640
CFSM	.26	.38	.28	.62	.87	2.07	1.78	1.55	3.06	.86	.39	.15
IN.	.30	.43	.32	.72	.90	2.39	1.99	1.79	3.41	.99	.45	.17

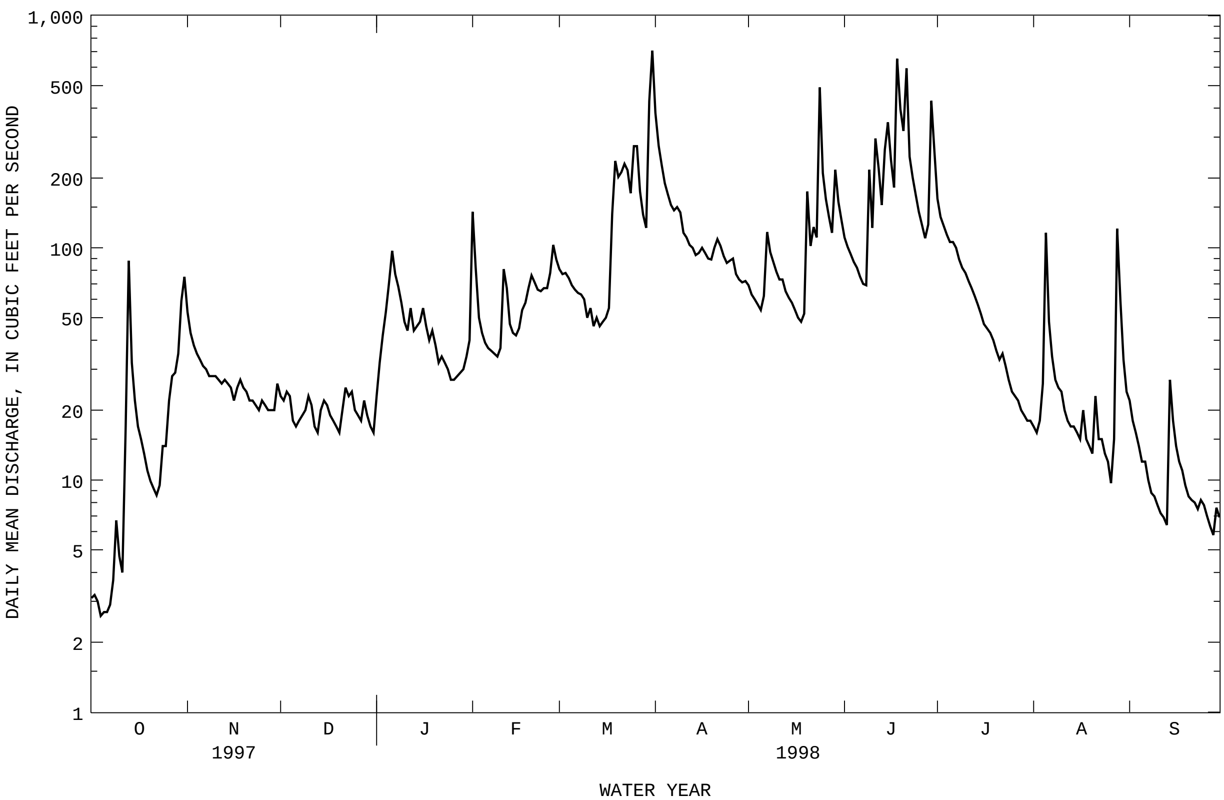
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	18.9	27.5	23.3	26.4	51.1	83.7	77.1	79.3	81.5	55.4	36.3	25.2
MAX	137	171	109	179	191	300	365	452	450	461	498	185
(WY)	1987	1984	1993	1960	1971	1993	1991	1974	1990	1993	1993	1993
MIN	.003	.29	.060	.006	1.40	1.64	1.03	1.62	.76	1.01	.38	.28
(WY)	1957	1956	1977	1956	1954	1954	1957	1977	1956	1954	1955	1953

05452200 WALNUT CREEK NEAR HARTWICK, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1950 - 1998	
ANNUAL TOTAL	13378.6		26418.1			
ANNUAL MEAN	36.7		72.4		48.7	
HIGHEST ANNUAL MEAN					200	1993
LOWEST ANNUAL MEAN					4.76	1956
HIGHEST DAILY MEAN	800	Feb 18	707	Mar 31	4840	Jul 2 1983
LOWEST DAILY MEAN	2.6	Oct 4	2.6	Oct 4	.00	Many days a
ANNUAL SEVEN-DAY MINIMUM	2.9	Oct 1	2.9	Oct 1	.00	Aug 27 1955
INSTANTANEOUS PEAK FLOW			1610	Jun 29	7900	Apr 29 1991
INSTANTANEOUS PEAK STAGE			12.11	Jun 29	16.93	Apr 29 1991
INSTANTANEOUS LOW FLOW			2.0	Oct 5		
ANNUAL RUNOFF (AC-FT)	26540		52400		35300	
ANNUAL RUNOFF (CFSM)	.52		1.02		.69	
ANNUAL RUNOFF (INCHES)	7.02		13.86		9.34	
10 PERCENT EXCEEDS	64		165		103	
50 PERCENT EXCEEDS	25		43		17	
90 PERCENT EXCEEDS	6.0		11		1.2	

a Many days in 1954, 55, 56, 57, and 77
e Estimated



05453000 BIG BEAR CREEK AT LADORA, IA

LOCATION.--Lat 41°44'58", long 92°10'55", in SW$^1/_4$ SW$^1/_4$ sec.7, T.80 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 10 ft downstream from bridge on county highway V52, 0.4 mi south of Ladora, 1.2 mi downstream from Coats Creek, 2.8 mi upstream from Little Bear Creek, and 8.1 mi upstream from mouth.

DRAINAGE AREA.--189 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as "Bear Creek at Ladora".

REVISED RECORDS.--WSP 1308: 1947 (M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.94 ft above sea level. Oct. 1945 to June 26, 1946, non-recording gage and June 27, 1946 to Sept. 30, 1980, water-stage recorder at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 26-27, Dec. 5-9, 12-21, Dec. 27 to Jan. 3, Jan. 10-31, Feb. 22-24, and Mar. 9-18. Records good except those for periods of estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	201	66	e50	350	224	1380	247	398	411	59	48
2	13	154	58	e65	566	211	930	224	349	355	57	44
3	14	131	62	e140	219	211	714	210	304	303	57	42
4	13	109	65	215	122	203	589	199	281	271	57	40
5	13	99	e50	215	110	192	507	190	258	250	116	37
6	14	92	e46	322	94	184	428	241	238	303	75	37
7	13	86	e48	277	90	178	387	527	219	282	65	35
8	13	82	e50	241	86	196	375	425	210	238	59	32
9	16	78	e55	211	85	e110	342	365	736	212	55	31
10	25	76	58	e140	88	e100	308	313	415	221	54	31
11	19	71	52	e110	129	e120	285	268	720	197	46	31
12	24	70	e46	e130	209	e110	271	264	951	178	41	29
13	315	69	e44	e100	125	e120	265	240	498	166	39	28
14	161	68	e60	e110	113	e120	252	223	478	153	39	65
15	84	63	e55	e120	106	e130	249	213	824	143	37	71
16	63	59	e50	e120	113	e140	264	206	566	133	36	43
17	53	63	e48	e110	138	e160	241	184	556	128	42	37
18	47	76	e46	e85	161	e320	221	177	857	127	39	34
19	42	61	e44	e90	179	701	210	170	1640	119	36	33
20	37	56	e46	e75	212	541	251	240	639	112	33	32
21	34	54	e48	e70	208	523	351	276	1190	105	36	30
22	32	51	70	e80	e200	572	305	288	641	103	38	29
23	34	50	61	e75	e195	593	274	337	520	101	34	28
24	53	48	59	e70	e195	452	249	1340	452	92	32	29
25	64	54	66	e65	192	541	242	707	380	87	31	29
26	e75	49	64	e70	193	794	387	550	328	83	29	29
27	e85	46	e40	e75	271	508	287	443	294	79	37	27
28	107	46	e46	e85	244	375	258	390	305	75	172	26
29	122	45	e55	e90	---	318	247	759	362	70	169	27
30	185	65	e46	e100	---	763	243	616	860	65	68	31
31	292	---	e44	e140	---	2690	---	481	---	61	53	---
TOTAL	2075	2272	1648	3846	4993	12400	11312	11313	16469	5223	1741	1065
MEAN	66.9	75.7	53.2	124	178	400	377	365	549	168	56.2	35.5
MAX	315	201	70	322	566	2690	1380	1340	1640	411	172	71
MIN	13	45	40	50	85	100	210	170	210	61	29	26
AC-FT	4120	4510	3270	7630	9900	24600	22440	22440	32670	10360	3450	2110
CFSM	.35	.40	.28	.66	.94	2.12	2.00	1.93	2.90	.89	.30	.19
IN.	.41	.45	.32	.76	.98	2.44	2.23	2.23	3.24	1.03	.34	.21

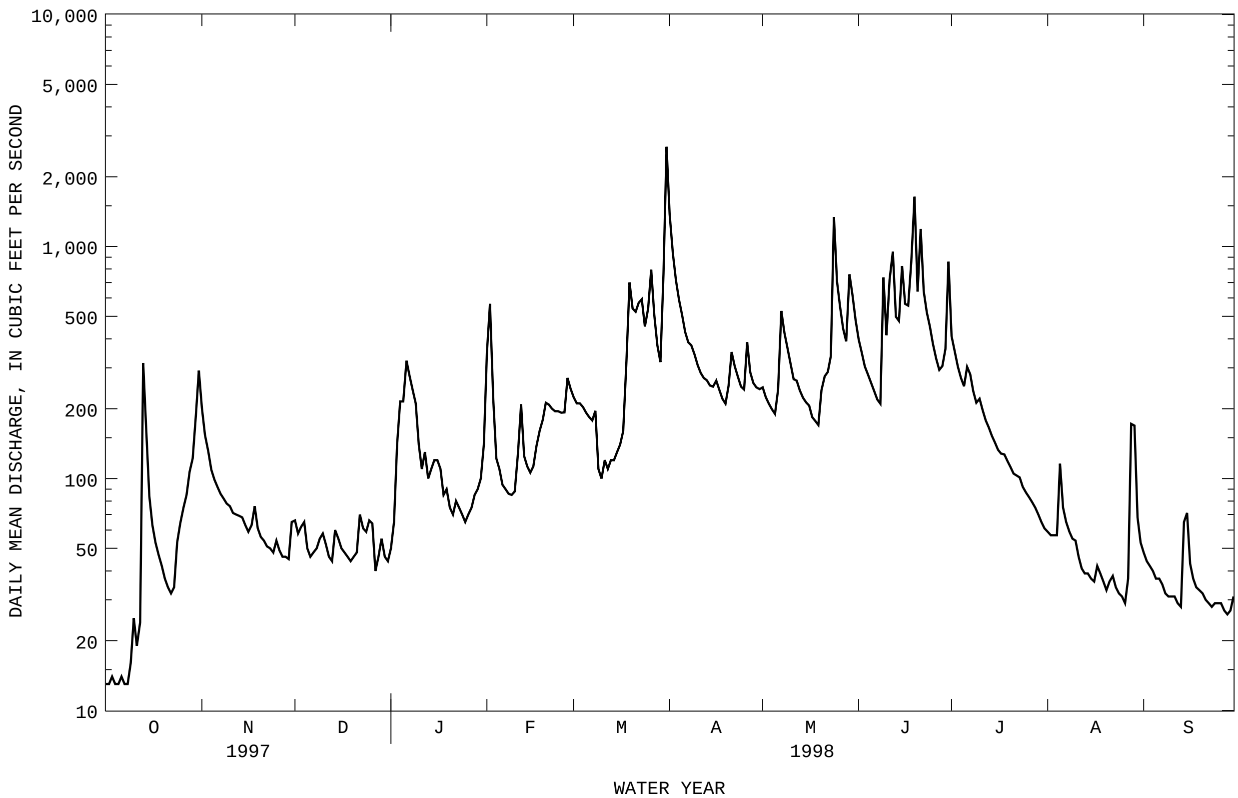
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	57.0	73.9	63.4	75.1	123	237	200	213	225	141	92.9	75.7
MAX	375	341	294	432	543	895	704	1185	1136	1011	1537	559
(WY)	1987	1993	1983	1960	1971	1979	1973	1974	1947	1993	1993	1993
MIN	.49	1.68	.33	.021	2.07	5.99	4.17	2.25	2.94	5.00	2.36	1.34
(WY)	1957	1956	1956	1977	1977	1957	1956	1956	1956	1988	1955	1956

05453000 BIG BEAR CREEK AT LADORA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1946 - 1998	
ANNUAL TOTAL	37497		74357			
ANNUAL MEAN	103		204		131	
HIGHEST ANNUAL MEAN					516	1993
LOWEST ANNUAL MEAN					8.26	1956
HIGHEST DAILY MEAN	2150	Feb 21	2690	Mar 31	9480	Mar 30 1960
LOWEST DAILY MEAN	13	Sep 12	13	Oct 1b	.00	Jan 22 1956a
ANNUAL SEVEN-DAY MINIMUM	13	Sep 29	13	Oct 1	.00	Jan 22 1956
INSTANTANEOUS PEAK FLOW			4040	Mar 31	10500	Mar 30 1960
INSTANTANEOUS PEAK STAGE			21.89	Mar 31	15.32c	Sep 8 1977
INSTANTANEOUS LOW FLOW			12	Oct 8		
ANNUAL RUNOFF (AC-FT)	74380		147500		95240	
ANNUAL RUNOFF (CFSM)	.54		1.08		.70	
ANNUAL RUNOFF (INCHES)	7.38		14.64		9.45	
10 PERCENT EXCEEDS	193		488		280	
50 PERCENT EXCEEDS	63		112		46	
90 PERCENT EXCEEDS	18		34		5.2	

a Jan 22 to Feb 8, 1956, Jan 19 to Feb 3, 1977
b Many days Oct
c Datum in use prior to Oct 1, 1980
e Estimated



05453100 IOWA RIVER AT MARENGO, IA

LOCATION.-- Lat 41°48'48", long 92°03'51", in $SE^{1}/_{4}$ $NE^{1}/_{4}$ sec.24, T.81 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 5 ft upstream from bridge on county highway V66, 1.0 mi downstream from Big Bear Creek, 0.8 mi north of Marengo, 4.6 mi upstream from Hilton Creek, and at mile 139.1.

DRAINAGE AREA.--2,794 mi^2.

PERIOD OF RECORD.--October 1956 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WSP 1558: 1957.

GAGE.--Water-stage recorder. Datum of gage is 720.52 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 26 to Jan. 4, Jan. 10 to Feb. 1, Mar. 9-16, and Sep. 24-28. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	333	1210	578	e470	e1200	2780	8590	3580	4450	17700	1300	1290
2	337	1060	601	e650	2230	2600	9170	3390	4170	16500	1220	1130
3	343	955	647	e800	2070	2480	9690	3190	3700	15600	1180	1050
4	327	875	660	e950	1780	2410	9040	3080	3380	16200	1170	952
5	336	831	628	1070	1600	2330	8200	2950	3120	16800	1340	870
6	316	801	590	1230	1480	2250	7310	2930	2900	16100	1690	820
7	313	775	568	1300	1410	2160	6240	3530	2740	14500	1700	742
8	318	750	577	1210	1360	2180	5470	3460	2600	12600	1760	674
9	344	728	592	1140	1320	e1200	4950	3190	3300	11000	2000	624
10	384	721	601	e750	1070	e850	4680	2950	3860	9430	2090	587
11	460	682	587	e600	1030	e650	4660	2750	4790	8070	1920	545
12	442	658	581	e700	1770	e800	4640	2630	6210	6870	1710	523
13	831	650	548	e600	1920	e1100	4650	2500	6290	5570	1460	501
14	1710	646	508	e500	1470	e1200	4740	2410	6580	4660	1280	614
15	1440	633	552	e550	1310	e1300	4910	2380	7440	4110	1150	747
16	1200	598	575	e600	1250	e1500	4840	2320	8280	3710	1060	646
17	1010	568	556	e600	1360	1940	4650	2260	10700	3410	1030	579
18	902	589	590	e550	1880	2480	4400	2210	11800	3200	1010	531
19	835	596	621	e480	2280	3430	4400	2150	13200	3010	948	506
20	767	595	588	e480	2600	3590	4500	2230	13000	2850	892	513
21	709	581	585	e550	2880	3700	4930	2360	14200	2650	840	485
22	666	562	587	e600	3020	3840	5230	2320	13600	2490	906	471
23	661	548	580	e550	3120	4120	5390	2410	12800	2370	940	449
24	672	534	568	e500	3050	4210	5380	3830	13500	2200	1060	e440
25	681	538	604	e500	2910	4410	5230	4400	15500	2040	1120	e440
26	706	529	e500	e550	2830	5030	5210	4190	17400	1910	961	e430
27	751	513	e440	e500	2920	5110	4880	3810	16700	1790	872	e420
28	786	529	e420	e600	2940	5080	4440	3520	16400	1690	1960	e410
29	806	529	e460	e700	---	4900	3990	3730	17000	1600	2390	399
30	902	553	e420	e850	---	4800	3710	3970	19000	1480	2170	374
31	1180	---	e380	e1000	---	8300	---	4310	---	1380	1620	---
TOTAL	21468	20337	17292	22130	56060	92730	168120	94940	278610	213490	42749	18762
MEAN	693	678	558	714	2002	2991	5604	3063	9287	6887	1379	625
MAX	1710	1210	660	1300	3120	8300	9690	4400	19000	17700	2390	1290
MIN	313	513	380	470	1030	650	3710	2150	2600	1380	840	374
AC-FT	42580	40340	34300	43890	111200	183900	333500	188300	552600	423500	84790	37210
CFSM	.25	.24	.20	.26	.72	1.07	2.01	1.10	3.32	2.46	.49	.22
IN.	.29	.27	.23	.29	.75	1.23	2.24	1.26	3.71	2.84	.57	.25

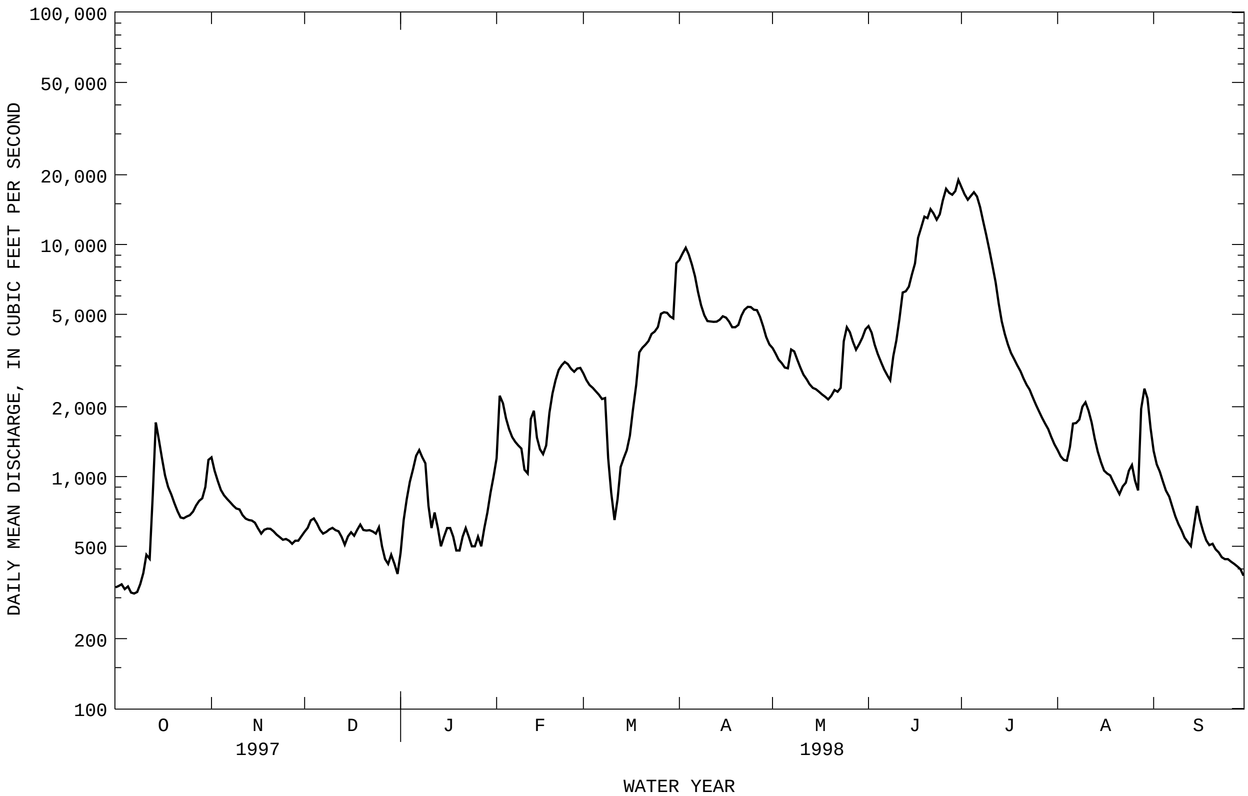
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1021	1164	986	859	1416	3244	3391	2970	3309	2733	1536	1047
MAX	5078	3878	3633	4194	5424	8227	11310	9340	9287	19620	15290	7901
(WY)	1987	1973	1983	1973	1984	1979	1993	1991	1998	1993	1993	1993
MIN	80.8	90.0	63.0	31.3	79.0	256	259	179	114	116	108	123
(WY)	1957	1957	1990	1977	1977	1964	1977	1977	1977	1977	1989	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1957 - 1998	
ANNUAL TOTAL	645601		1046688			
ANNUAL MEAN	1769		2868		1974	
HIGHEST ANNUAL MEAN					7192	1993
LOWEST ANNUAL MEAN					283	1989
HIGHEST DAILY MEAN	9000	Feb 22	19000	Jun 30	35600	Jul 12 1993
LOWEST DAILY MEAN	288	Sep 20	313	Oct 7	24	Jan 29 1977
ANNUAL SEVEN-DAY MINIMUM	311	Sep 16	327	Oct 2	25	Jan 28 1977
INSTANTANEOUS PEAK FLOW			19500	Jun 30	38000	Jul 19 1993
INSTANTANEOUS PEAK STAGE			18.92	Jun 30	20.31	Jul 19 1993
ANNUAL RUNOFF (AC-FT)	1281000		2076000		1430000	
ANNUAL RUNOFF (CFSM)	.63		1.03		.71	
ANNUAL RUNOFF (INCHES)	8.60		13.94		9.60	
10 PERCENT EXCEEDS	3970		6410		4880	
50 PERCENT EXCEEDS	1160		1340		1010	
90 PERCENT EXCEEDS	386		504		200	

e Estimated

05453100 IOWA RIVER AT MARENGO, IA--Continued



05453510 CORALVILLE LAKE NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'29", long 91°31'40", in SW$^1/_4$ NE$^1/_4$ sec.22, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080208, at outlet works at left end of Coralville Dam on Iowa River, 2.3 mi upstream from Rapid Creek, 4.3 mi northeast of Coralville post office, and at mile 83.3.

DRAINAGE AREA.--3,115 mi^2.

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Dec. 1. Reservoir is formed by earthfill dam completed in 1957. Storage began in September 1958. Releases controlled by three gates, 8.33 ft wide and 20 ft high, into forechamber of 23-ft diameter concrete conduit through dam. Inlet invert elevation at 646.0 ft. No dead storage. Maximum design discharge through gates is 20,000 ft^3/s. Ungated spillway is concrete overflow section 500 ft in length at elevation 712 ft above sea level, contents, 469,000 acre-ft, surface area, 24,800 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will lower the elevation from 683 ft. (surface area 5,430 acres) on Feb. 15 to 679 ft (surface area 3,270 acres) on Mar 1, maintaining 679 ft. Mar. 1 to June 15, 683 ft June 15 to Sept. 15, 686 ft. (surface area 7,000 acres) Sept. 15 to Dec. 15, and 683 ft Dec. 15 to Feb. 15, with a minimum release of 150 ft^3/s and maximum release of 10,000 ft^3/s Dec. 15 to May 1 and 6,000 ft^3/s May 1 to Dec. 15.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 586,000 acre-ft July 20, 1993, maximum elevation, 716.75 ft July 24, 1993; minimum daily contents, 456 acre-ft Jan. 15, 1975; minimum elevation, 658.77 ft Mar. 10, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 410,000 acre-ft July 11; maximum elevation, 709.85 ft June 12; minimum daily contents, 26,060 acre-ft Mar. 4; minimum elevation, 678.87 ft Mar. 10.

REVISIONS.--Extremes for 1997 water year; maximum daily contents, 84,700 acre-ft Feb. 25; maximum elevation, 688.99 ft Feb. 26; minimum daily contents, 25,600 acre-ft Mar. 15; minimum elevation, 678.72 ft Mar. 15.

Capacity table (elevation in feet, contents in acre-feet)

655	55	675	15,100	692	115,000	704	287,000	712	461,000
660	621	680	29,600	696	160,000	706	327,000	714	512,000
665	2,770	684	52,800	700	215,000	708	370,000	716	566,000
670	7,230	688	81,200	702	251,000	710	413,000	718	622,000

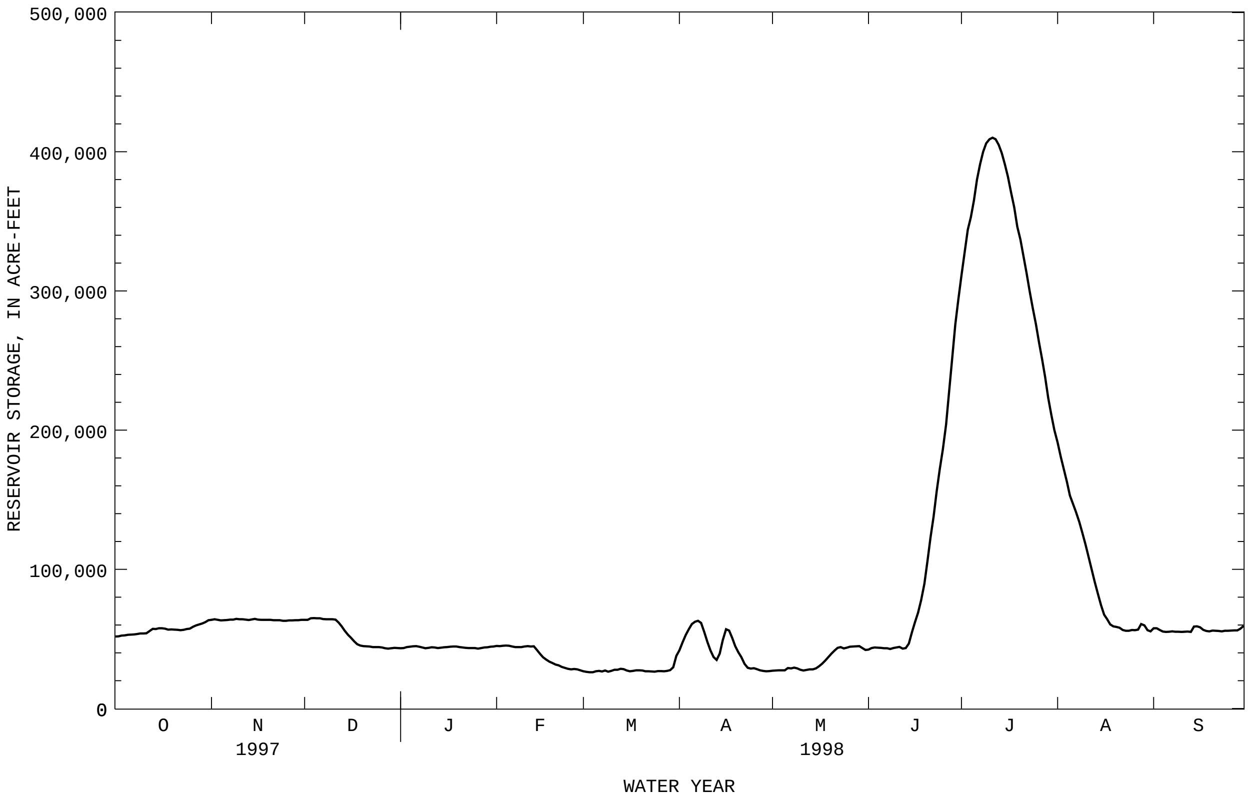
RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51700	63700	e63700	43300	45000	26800	41800	27200	42400	311000	191000	57700
2	51900	64100	63700	43500	44800	26400	47700	27300	43500	327000	181000	57700
3	52400	63700	64800	44100	45100	26100	52800	27500	43900	344000	172000	56400
4	52600	63300	64900	44400	45300	26100	57000	27500	43700	353000	163000	55300
5	52900	63500	64800	44700	45100	26700	60700	27400	43600	365000	153000	55000
6	53100	63600	64800	44800	44500	27000	62400	29100	43300	380000	147000	55200
7	53200	63900	64300	44400	44100	26600	63100	28800	43300	391000	141000	55400
8	53500	63900	64200	43800	44100	27300	61500	29400	42700	400000	134000	55200
9	54000	64400	64200	43300	44200	26500	54700	28800	43400	406000	126000	55200
10	54000	64200	64200	43600	44500	27100	47700	27900	43900	409000	118000	55100
11	54100	64100	63900	44000	44800	27800	41700	27300	44300	410000	109000	55200
12	55700	63900	61800	43900	44600	27900	37000	27700	43100	409000	100000	55300
13	57300	63600	59100	43400	44700	28600	34900	28100	43400	405000	91000	55000
14	57100	64000	55900	43700	42000	28300	39500	28100	46600	399000	82800	58900
15	57600	64400	52900	44000	39300	27300	49300	28800	54700	391000	74200	59100
16	57600	63900	50700	44200	36800	26700	56900	30400	62100	382000	67400	58300
17	57400	63700	48300	44400	35200	27100	56000	32200	68800	371000	64200	56500
18	56700	63700	46200	44600	33700	27400	50800	34400	77800	360000	60400	55700
19	56800	63700	45200	44600	32700	27500	44700	36800	89700	346000	59000	55400
20	56700	63700	44800	44100	31600	27300	40400	39300	106000	337000	58600	56000
21	56500	63500	44700	43800	31100	26800	36800	41700	123000	325000	58000	55900
22	56300	63500	44500	43600	30000	26700	32200	43600	138000	313000	56400	55700
23	56500	63400	44200	43500	29200	26600	29300	44200	156000	300000	55800	55500
24	57100	63100	44200	43500	28500	26500	28700	43200	172000	288000	55800	55800
25	57400	63100	44100	43400	28100	26900	29000	43700	186000	276000	56400	55800
26	58800	63300	43900	43100	28400	26900	28300	44400	204000	263000	56300	56000
27	59700	63300	43300	43400	28200	26800	27500	44500	228000	251000	56700	56100
28	60400	63400	43100	43800	27500	27000	27000	44700	252000	238000	60700	56100
29	61100	63500	43300	44000	---	27600	26700	44800	276000	223000	59700	57400
30	62100	63700	43600	44400	---	29600	26900	43400	294000	211000	56300	59300
31	63400	---	43500	44600	---	37800	---	42100	---	200000	55400	---
MEAN	56300	63700	53400	43900	38000	27500	43100	34700	103000	335000	94200	56200
MAX	63400	64400	64900	44800	45300	37800	63100	44800	294000	410000	191000	59300
MIN	51700	63100	43100	43100	27500	26100	26700	27200	42400	200000	55400	55000

CAL YR 1997 MEAN 45700 MAX 84700 MIN 25600
WTR YR 1998 MEAN 79600 MAX 410000 MIN 26100

e Estimated

05453510 CORALVILLE LAKE NEAR CORALVILLE, IA--Continued



05453520 IOWA RIVER BELOW CORALVILLE DAM NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'23", long 91°31'47", in SW$^{1}/_{4}$ NE$^{1}/_{4}$ sec.22, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080208, on left bank about 500 ft downstream of Coralville Dam control house, 2.3 miles upstream from Rapid Creek, 4.3 miles northeast of Coralville post office, and at mile 83.2.

DRAINAGE AREA.--3,115 mi^2.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 600.00 ft above sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Aug. 17-19, and Aug. 28. Records good except those for estimated daily discharges, which are fair. Periodic observations of water temperatures and specific conductance are published in this report as miscellaneous water-quality data. U.S. Army Corps of Engineers satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	965	486	249	655	3660	5670	4060	4190	7720	6210	857
2	154	1090	477	244	1030	3330	6300	3830	3910	7910	5930	1480
3	162	1080	486	411	1280	3090	7550	3540	4160	8080	5890	1740
4	154	996	529	889	1270	2760	8260	3390	3980	8110	5850	1650
5	160	796	565	1190	1270	2290	8680	3250	3610	8150	5880	1110
6	159	713	543	1360	1290	2420	8710	3000	3300	8270	5910	867
7	157	721	539	1610	1060	2580	8740	3270	3000	8240	5870	810
8	159	721	539	1680	905	2630	8930	3850	2970	8270	5870	809
9	160	710	538	1490	903	2940	9380	4030	3160	8310	5840	734
10	158	699	594	701	903	1820	9100	3940	3390	8330	5880	682
11	167	706	656	285	1200	1330	7980	3520	4320	8330	5880	628
12	185	708	1280	401	1410	1630	7270	2950	5440	8320	5870	585
13	402	617	1640	488	2020	1760	6920	2810	5390	8310	5840	586
14	742	567	1610	338	2950	2000	3850	2830	5590	8290	5750	1030
15	1280	566	1610	345	2910	2390	1200	2440	5490	8270	5680	1230
16	1280	570	1580	530	2510	2310	2410	2000	4970	8240	4580	1600
17	1200	566	1570	656	2190	2070	5230	1790	5010	8200	e3200	1730
18	1060	559	1420	656	2200	2540	7040	1500	5120	8160	e2900	1170
19	847	554	1050	781	2460	3130	7330	1250	5620	8120	e2300	784
20	760	549	628	859	2780	3870	7020	1090	5970	8080	1310	670
21	746	533	483	853	2920	4200	7030	1040	6060	8050	1380	656
22	644	539	634	758	3240	4050	7140	1480	6060	8050	1620	650
23	476	538	621	694	3440	4100	6550	2250	6050	8000	1360	577
24	397	473	508	682	3440	4220	5860	3140	6060	7950	1130	513
25	389	432	510	682	3310	4200	5630	3650	6100	7900	877	513
26	397	423	513	682	3130	4610	5970	4010	6060	7840	1130	519
27	413	425	513	546	3520	4860	6020	4260	6060	7590	1130	489
28	408	417	342	457	3720	4950	5710	4060	6160	7760	e2900	472
29	408	408	220	452	---	4980	5210	3960	6700	7550	3480	334
30	408	446	225	465	---	5100	4630	4410	7310	7190	4130	181
31	619	---	239	576	---	5640	---	4680	---	6780	2470	---
TOTAL	14798	19087	23148	22010	59916	101460	197320	95280	151210	248370	124047	25656
MEAN	477	636	747	710	2140	3273	6577	3074	5040	8012	4002	855
MAX	1280	1090	1640	1680	3720	5640	9380	4680	7310	8330	6210	1740
MIN	147	408	220	244	655	1330	1200	1040	2970	6780	877	181
AC-FT	29350	37860	45910	43660	118800	201200	391400	189000	299900	492600	246000	50890
CFSM	.15	.20	.24	.23	.69	1.05	2.11	.99	1.62	2.57	1.28	.27
IN.	.18	.23	.28	.26	.72	1.21	2.36	1.14	1.81	2.97	1.48	.31

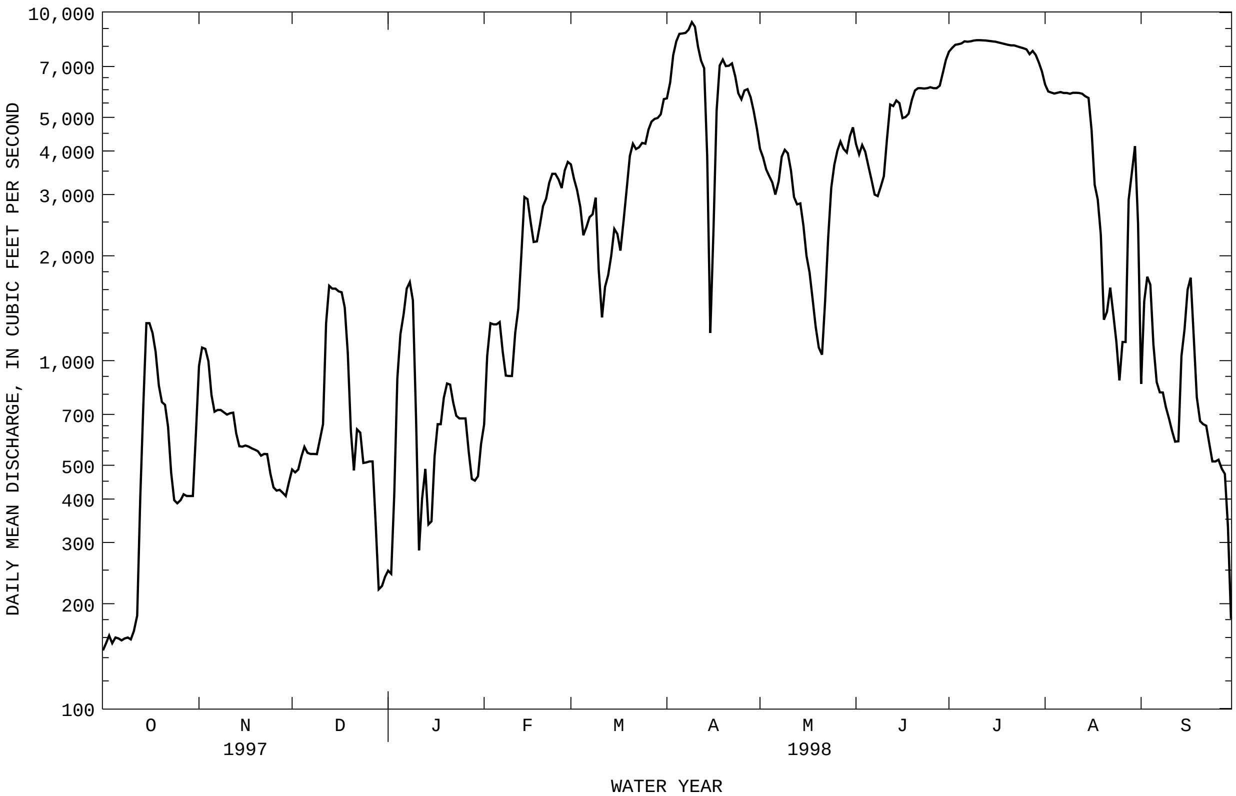
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1238	1352	1676	937	2104	3697	3996	4315	4768	6621	4284	2583
MAX	4012	2771	4229	1723	3006	6587	7776	9347	7203	20610	18500	13050
(WY)	1994	1993	1993	1993	1997	1993	1993	1993	1993	1993	1993	1993
MIN	331	636	643	311	1424	1105	965	1305	2362	2318	581	275
(WY)	1997	1998	1996	1996	1995	1996	1996	1994	1994	1995	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1993 - 1998	
ANNUAL TOTAL	704435		1082302			
ANNUAL MEAN	1930		2965		3138	
HIGHEST ANNUAL MEAN					7910	1993
LOWEST ANNUAL MEAN					1541	1996
HIGHEST DAILY MEAN	9040	Feb 27	9380	Apr 9	25000	Jul 21 1993
LOWEST DAILY MEAN	147	Oct 1	147	Oct 1	136	Sep 3 1995
ANNUAL SEVEN-DAY MINIMUM	155	Sep 30	156	Oct 1	146	Oct 16 1996
INSTANTANEOUS PEAK FLOW			9460	Apr 9	25800	Jul 19 1993
INSTANTANEOUS PEAK STAGE			56.22	Apr 9	63.95	Jul 19 1993
ANNUAL RUNOFF (AC-FT)	1397000		2147000		2274000	
ANNUAL RUNOFF (CFSM)	.62		.95		1.01	
ANNUAL RUNOFF (INCHES)	8.41		12.93		13.69	
10 PERCENT EXCEEDS	4880		7570		7420	
50 PERCENT EXCEEDS	1150		1790		1560	
90 PERCENT EXCEEDS	313		424		401	

e Estimated

05453520 IOWA RIVER BELOW CORALVILLE DAM NEAR CORALVILLE, IA--Continued



05453600 RAPID CREEK BELOW MORSE, IA

LOCATION.--Lat 41°43'45", long 91°25'38", in NE corner of sec. 21, T.80 N., R.5 W., Johnson County, Hydrologic Unit 07080209, at bridge on county highway 1, 1.5 miles southwest of Morse.

DRAINAGE AREA.--8.12 mi^2.

PERIOD OF RECORD.--March 1994 to current year. Operated May 1951 to September 1992 as a crest-stage partial record station.

GAGE.--Tipping bucket rain gage.

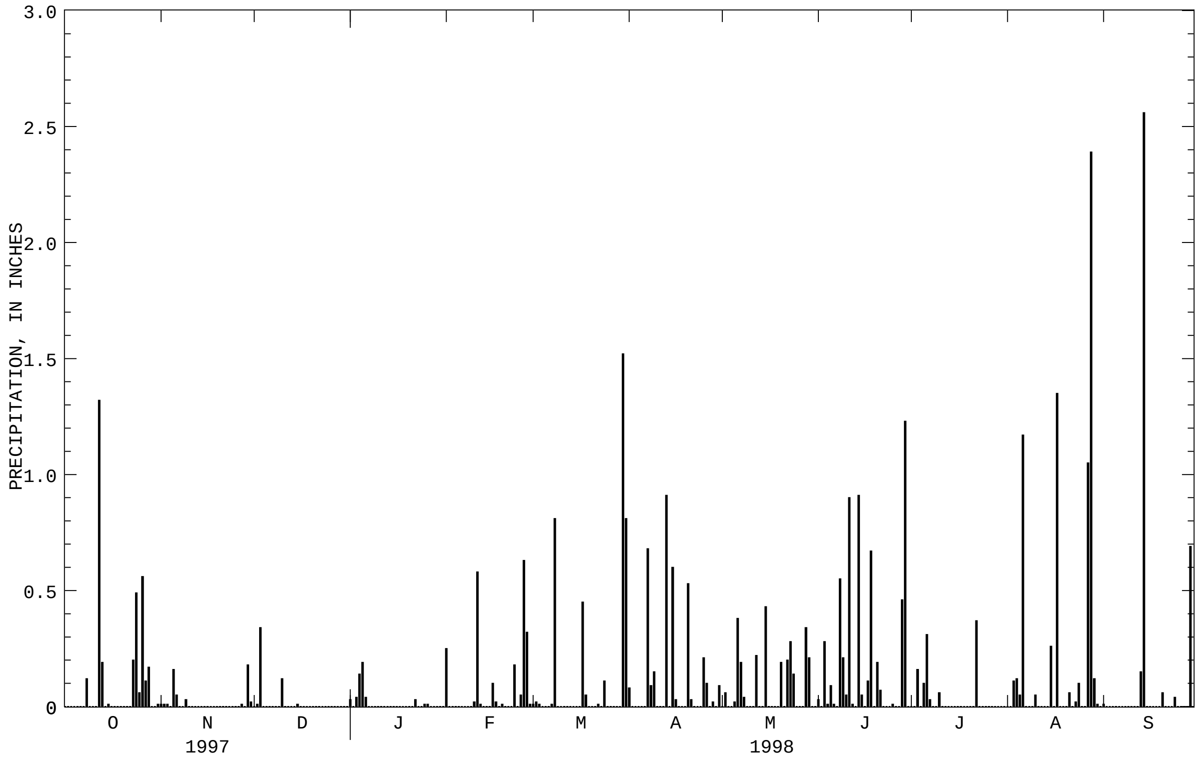
REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.65 in., May 9, 1996.

EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.56 in., Sept. 14.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.01	.00	.03	.25	.01	.08	.00	.03	.00	.00	.01
2	.00	.01	.01	.00	.00	.02	.00	.06	.00	.00	.00	.00
3	.00	.01	.34	.04	.00	.01	.00	.00	.28	.16	.11	.00
4	.00	.00	.00	.14	.00	.00	.00	.00	.01	.00	.12	.00
5	.00	.16	.00	.19	.00	.00	.00	.02	.09	.10	.05	.00
6	.00	.05	.00	.04	.00	.00	.00	.38	.01	.31	1.17	.00
7	.00	.00	.00	.00	.00	.01	.68	.19	.00	.03	.00	.00
8	.12	.00	.00	.00	.00	.81	.09	.04	.55	.00	.00	.00
9	.00	.03	.00	.00	.00	.00	.15	.00	.21	.00	.00	.00
10	.00	.00	.12	.00	.02	.00	.00	.00	.05	.06	.05	.00
11	.00	.00	.00	.00	.58	.00	.00	.00	.90	.00	.00	.00
12	1.32	.00	.00	.00	.01	.00	.00	.22	.01	.00	.00	.00
13	.19	.00	.00	.00	.00	.00	.91	.00	.00	.00	.00	.15
14	.00	.00	.00	.00	.00	.00	.00	.00	.91	.00	.00	2.56
15	.01	.00	.01	.00	.00	.00	.60	.43	.05	.00	.26	.00
16	.00	.00	.00	.00	.10	.00	.03	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.02	.45	.00	.00	.11	.00	1.35	.00
18	.00	.00	.00	.00	.00	.05	.00	.00	.67	.00	.00	.00
19	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.53	.19	.19	.00	.00	.06
21	.00	.00	.00	.00	.00	.00	.03	.00	.07	.00	.06	.00
22	.00	.00	.00	.03	.00	.01	.00	.20	.00	.37	.00	.00
23	.20	.00	.00	.00	.18	.00	.00	.28	.00	.00	.02	.00
24	.49	.00	.00	.00	.00	.11	.00	.14	.00	.00	.10	.04
25	.06	.00	.00	.01	.05	.00	.21	.00	.01	.00	.00	.00
26	.56	.00	.00	.01	.63	.00	.10	.00	.00	.00	.00	.00
27	.11	.01	.00	.00	.32	.00	.00	.00	.00	.00	1.05	.00
28	.17	.00	.00	.00	.01	.00	.02	.34	.46	.00	2.39	.00
29	.00	.18	.00	.00	---	.00	.00	.21	1.23	.00	.12	.69
30	.00	.02	.00	.00	---	1.52	.09	.00	.00	.00	.01	.00
31	.01	---	.00	.00	---	.81	---	.00	---	.00	.00	---
TOTAL	3.24	0.48	0.48	0.49	2.18	3.81	3.52	2.70	5.84	1.03	6.86	3.51
MEAN	.10	.02	.02	.02	.08	.12	.12	.09	.19	.03	.22	.12
MAX	1.32	.18	.34	.19	.63	1.52	.91	.43	1.23	.37	2.39	2.56
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00


3.0
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PRECIPITATION, IN INCHES
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05454000 RAPID CREEK NEAR IOWA CITY, IA

LOCATION.--Lat 41°41'19", long 91°29'15", in $NE^1/_4$ $NE^1/_4$ sec.36. T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on left bank 80 ft upstream from bridge on State Highway 1, 3.5 mi northeast of Iowa City, and 4.7 mi upstream from mouth.

DRAINAGE AREA.--25.3 mi^2.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1558: 1941 (M), 1943 (P), 1944 (M), 1946. WSP 1708: 1951 (P), 1952. WDR IA-67-1: Drainage area.

GAGE.--Water-stage recorder and concrete control with sharp-crested weir. Datum of gage is 673.72 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 26 to Jan. 5 and Jan. 9-30. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem, and U.S. Army Corps of Engineers rain gage and data collection platform.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	1.6	1.0	e.70	9.7	39	153	27	14	43	1.9	16
2	.03	2.2	.89	e.95	15	33	91	24	14	33	1.6	12
3	.02	2.0	1.3	e3.4	11	30	69	23	13	28	2.0	10
4	.01	1.5	1.7	e8.0	8.9	26	55	22	13	26	2.2	8.2
5	.02	1.2	1.2	e13	8.2	23	47	20	13	23	3.1	6.8
6	.01	1.5	1.0	18	7.6	22	41	26	12	41	5.5	6.3
7	.01	1.5	1.0	16	7.1	20	46	29	11	25	14	5.4
8	.00	1.4	1.1	14	6.8	61	90	31	11	21	4.7	4.5
9	.00	1.5	1.1	e8.5	6.6	58	81	31	21	19	3.3	3.9
10	.00	1.4	1.2	e6.0	6.8	40	67	27	18	18	2.6	3.6
11	.00	1.4	1.2	e6.5	16	31	54	25	50	16	2.2	3.3
12	.05	1.3	1.0	e5.5	28	28	46	24	47	14	1.9	3.0
13	1.3	1.4	.94	e4.4	21	26	124	21	34	13	1.7	2.7
14	.72	1.4	.93	e4.6	18	22	97	20	39	12	1.6	101
15	.35	1.4	.94	e5.0	16	20	118	22	130	11	5.1	61
16	.30	1.2	1.1	e4.8	16	19	212	26	56	9.9	2.0	34
17	.11	.96	1.1	e4.4	18	23	81	21	44	9.2	15	25
18	.10	.92	1.1	e3.8	18	42	60	19	75	8.6	8.5	20
19	.11	.99	1.1	e4.0	16	37	50	17	92	7.9	4.6	16
20	.09	.99	1.1	e3.6	15	33	67	17	53	7.6	3.2	14
21	.11	1.1	1.0	e3.4	14	29	70	16	62	7.1	2.7	13
22	.13	1.0	1.3	e3.4	13	27	55	16	44	8.3	2.2	12
23	.22	.94	1.3	e3.2	13	24	47	15	37	7.5	1.8	10
24	.63	.88	1.2	e3.0	13	21	42	19	33	6.2	1.6	9.9
25	.78	.89	1.5	e3.0	12	21	40	16	29	5.9	1.7	9.6
26	1.8	1.0	e1.1	e2.9	16	20	38	15	25	5.8	1.3	8.9
27	2.9	1.0	e.85	e3.0	63	19	33	14	23	5.4	2.2	8.0
28	1.6	.98	e.95	e3.2	50	18	30	13	23	4.8	206	7.2
29	1.9	1.0	e.90	e3.4	---	16	29	19	169	3.9	52	15
30	2.0	1.1	e.75	e3.8	---	37	29	17	83	3.1	34	13
31	2.4	---	e.60	4.3	---	278	---	16	---	2.2	21	---
TOTAL	17.74	37.65	33.45	171.75	463.7	1143	2062	648	1288	446.4	413.2	463.3
MEAN	.57	1.25	1.08	5.54	16.6	36.9	68.7	20.9	42.9	14.4	13.3	15.4
MAX	2.9	2.2	1.7	18	63	278	212	31	169	43	206	101
MIN	.00	.88	.60	.70	6.6	16	29	13	11	2.2	1.3	2.7
AC-FT	35	75	66	341	920	2270	4090	1290	2550	885	820	919
CFSM	.02	.05	.04	.22	.65	1.46	2.72	.83	1.70	.57	.53	.61
IN.	.03	.06	.05	.25	.68	1.68	3.03	.95	1.89	.66	.61	.68

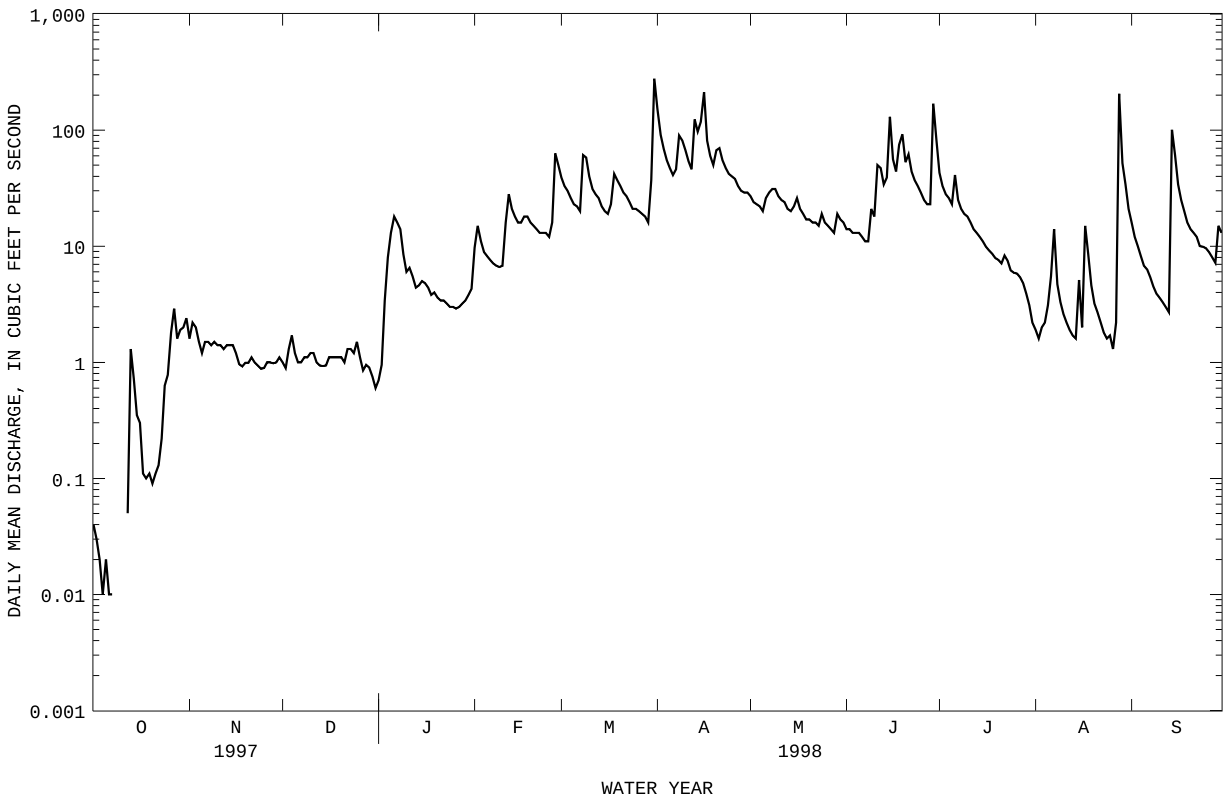
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6.51	10.1	9.11	9.74	22.4	29.4	24.1	27.2	24.5	16.0	12.1	8.19
MAX	36.5	84.0	66.6	56.8	77.5	106	98.6	167	134	105	176	66.6
(WY)	1942	1993	1983	1946	1953	1979	1973	1974	1990	1969	1993	1965
MIN	.000	.000	.000	.000	.22	.42	1.25	1.13	.21	.000	.032	.000
(WY)	1954	1956	1956	1940	1989	1956	1956	1977	1956	1957	1955	1955

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1938 - 1998	
ANNUAL TOTAL	4149.25		7188.19			
ANNUAL MEAN	11.4		19.7		16.6	
HIGHEST ANNUAL MEAN					63.8	1993
LOWEST ANNUAL MEAN					1.09	1957
HIGHEST DAILY MEAN	1000	Feb 21	278	Mar 31	1720	May 17 1986
LOWEST DAILY MEAN	.00	Oct 8	.00	Oct 8a	.00	Many days
ANNUAL SEVEN-DAY MINIMUM	.01	Oct 5	.01	Oct 5	.00	Jan 1 1940
INSTANTANEOUS PEAK FLOW			958	Jun 29	6700	Aug 10 1993
INSTANTANEOUS PEAK STAGE			9.93	Jun 29	15.61	Aug 10 1993
ANNUAL RUNOFF (AC-FT)	8230		14260		12000	
ANNUAL RUNOFF (CFSM)	.45		.78		.65	
ANNUAL RUNOFF (INCHES)	6.10		10.57		8.89	
10 PERCENT EXCEEDS	23		48		34	
50 PERCENT EXCEEDS	1.6		9.9		4.9	
90 PERCENT EXCEEDS	.10		.94		.10	

a Also Oct 9-11
e Estimated

05454000 RAPID CREEK NEAR IOWA CITY, IA--Continued



05454220 CLEAR CREEK NEAR OXFORD, IA

LOCATION.--Lat 41°43'06", long 91°44'24", in $SW^1/_4$ $SE^1/_4$ $SE^1/_4$ sec. 23, T.80 N., R.8 W., Johnson County, Hydrologic Unit 07080209, on left bank 15 ft. downstream of bridge on NW Eagle Avenue, 0.2 miles west of Kent Park, 2.6 miles upstream of Buffalo Creek, 2.8 miles east of Oxford, and 4.2 miles west of Tiffin.

DRAINAGE AREA.--58.4 mi^2.

PERIOD OF RECORD.--November 1993 to current year.

GAGE.--Water stage recorder. Datum of gage is 696.50 ft., above sea level.

REMARKS.--Estimated daily discharge: Dec. 6,7, Dec. 12-22, Dec. 25 to Jan. 5, and Jan. 10-30. Records good except for those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	42	9.1	e7.0	36	77	338	75	63	182	12	39
2	1.5	33	8.1	e10	59	71	207	67	60	120	11	32
3	1.5	29	12	e21	42	68	159	63	57	105	12	27
4	1.3	23	13	e46	36	65	135	60	54	98	14	25
5	1.2	20	9.6	e70	34	60	120	56	51	93	32	21
6	1.1	21	e9.0	96	32	58	110	91	47	117	123	19
7	1.4	20	e9.5	82	32	55	105	167	44	94	91	18
8	1.7	19	9.9	72	32	87	121	121	44	82	39	15
9	2.0	18	10	61	32	82	116	102	78	73	29	14
10	2.3	17	11	e46	34	106	109	92	61	72	48	13
11	2.3	16	9.4	e38	59	98	99	83	129	64	30	12
12	3.9	15	e7.5	e42	94	71	92	89	128	60	22	11
13	28	15	e6.5	e34	68	65	119	108	92	55	20	10
14	9.7	14	e8.0	e36	59	61	99	80	114	49	18	99
15	4.2	12	e11	e40	56	56	92	73	304	47	17	102
16	3.5	13	e10	e42	56	55	89	86	155	44	14	53
17	3.2	21	e9.5	e38	59	69	78	67	124	41	33	42
18	3.4	12	e9.5	e30	57	147	70	61	120	40	38	37
19	3.2	10	e9.0	e29	52	134	67	57	129	36	21	32
20	3.0	10	e8.0	e27	50	112	115	56	101	33	17	34
21	2.7	9.8	e8.5	e25	47	102	174	54	96	30	16	31
22	2.6	8.5	e9.0	e22	45	92	120	55	84	31	14	27
23	3.0	7.8	9.4	e19	45	84	103	51	77	30	12	25
24	8.3	9.7	12	e17	47	75	92	72	70	26	11	24
25	18	8.7	e10	e16	46	76	88	60	64	24	10	23
26	23	8.5	e9.0	e16	54	73	85	55	58	22	8.0	21
27	39	7.1	e8.0	e18	92	65	74	51	52	20	10	19
28	37	7.7	e8.5	e20	85	61	70	48	52	18	409	18
29	41	7.3	e7.0	e22	---	57	67	119	229	16	135	21
30	54	11	e6.5	e24	---	98	68	90	721	14	67	19
31	56	---	e5.5	25	---	579	---	75	---	13	46	---
TOTAL	364.2	466.1	283.0	1091.0	1440	2959	3381	2384	3458	1749	1379.0	883
MEAN	11.7	15.5	9.13	35.2	51.4	95.5	113	76.9	115	56.4	44.5	29.4
MAX	56	42	13	96	94	579	338	167	721	182	409	102
MIN	1.1	7.1	5.5	7.0	32	55	67	48	44	13	8.0	10
MED	3.2	14	9.1	29	49	73	101	72	78	44	20	24
AC-FT	722	925	561	2160	2860	5870	6710	4730	6860	3470	2740	1750
CFSM	.20	.27	.16	.60	.88	1.63	1.93	1.32	1.97	.97	.76	.50
IN.	.23	.30	.18	.69	.92	1.88	2.15	1.52	2.20	1.11	.88	.56

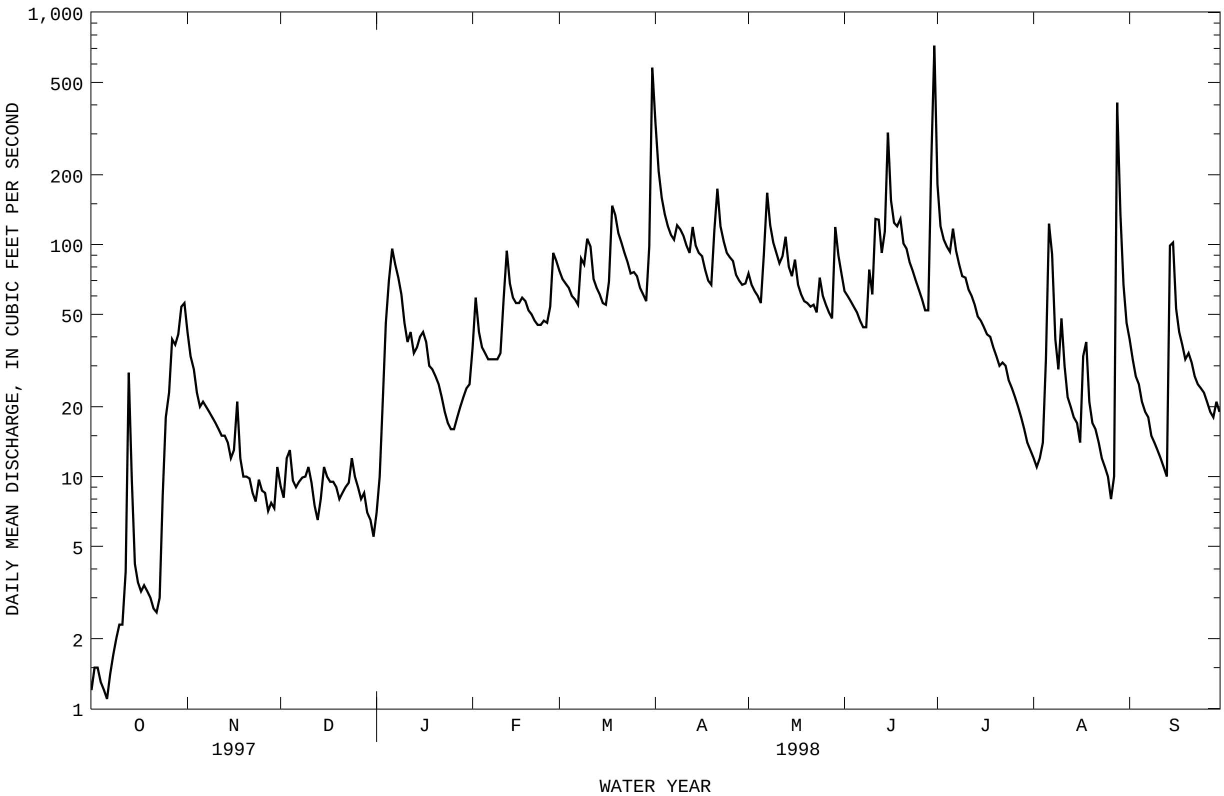
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6.16	9.71	8.20	14.3	49.0	42.9	61.2	142	74.4	28.0	15.2	9.85
MAX	11.7	15.5	16.2	35.2	104	95.5	113	269	115	56.4	44.5	29.4
(WY)	1998	1998	1995	1998	1997	1998	1998	1996	1998	1998	1998	1998
MIN	1.74	4.28	3.07	4.02	18.4	11.6	8.16	49.1	32.0	10.4	4.14	2.18
(WY)	1996	1997	1996	1996	1995	1996	1996	1997	1997	1997	1996	1996

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1995 - 1998	
ANNUAL TOTAL	9220.9		19837.3			
ANNUAL MEAN	25.3		54.3		38.3	
HIGHEST ANNUAL MEAN					54.3	1998
LOWEST ANNUAL MEAN					23.4	1997
HIGHEST DAILY MEAN	1810	Feb 21	721	Jun 30	2400	May 10 1996
LOWEST DAILY MEAN	1.1	Sep 30	1.1	Oct 6	.74	Dec 11 1995a
ANNUAL SEVEN-DAY MINIMUM	1.3	Sep 30	1.3	Oct 1	1.3	Sep 30 1997
INSTANTANEOUS PEAK FLOW			876	Aug 28	4230	May 10 1996
INSTANTANEOUS PEAK STAGE			11.65	Aug 28	14.89	May 10 1996
INSTANTANEOUS LOW FLOW			.95	Oct 1		
ANNUAL RUNOFF (AC-FT)	18290		39350		27780	
ANNUAL RUNOFF (CFSM)	.43		.93		.66	
ANNUAL RUNOFF (INCHES)	5.87		12.64		8.92	
10 PERCENT EXCEEDS	42		108		92	
50 PERCENT EXCEEDS	11		41		14	
90 PERCENT EXCEEDS	2.4		8.2		2.3	

a Ice affected
e Estimated

05454220 CLEAR CREEK NEAR OXFORD, IA--Continued



05454300 CLEAR CREEK NEAR CORALVILLE, IA

LOCATION.--Lat 41°40'36", long 91°35'55", in NE 1/4 SE 1/4 sec.1, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank about 15 ft upstream from bridge on county highway, 1.1 mi west of post office in Coralville, 1.5 mi downstream from Deer Creek, and 2.7 mi upstream from mouth.

DRAINAGE AREA.--98.1 mi^2.

PERIOD OF RECORD.--October 1952 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WDR IA-93-1: 1974 (M), 1982 (M), 1990 (M).

GAGE.--Water-stage recorder. Datum of gage is 647.48 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Jan. 7, 1957, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 12-22, Dec. 25 to Jan. 4, and Jan. 10 to Feb. 4. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	61	20	e14	e85	114	308	119	81	326	20	72
2	3.8	46	18	e23	e90	103	314	105	75	147	19	67
3	3.9	39	25	e36	e75	98	299	97	71	123	20	55
4	3.6	33	27	e95	e60	91	278	93	69	110	22	44
5	3.6	30	22	119	52	86	207	86	63	102	33	40
6	3.8	31	21	133	48	79	192	104	60	187	112	39
7	3.7	29	24	121	45	74	200	244	56	126	238	35
8	3.8	27	22	107	44	132	248	174	57	107	46	32
9	4.3	26	22	93	44	135	156	143	101	93	36	26
10	4.2	25	22	e65	46	120	173	124	82	87	39	24
11	4.3	24	21	e60	71	131	169	110	170	77	34	23
12	11	23	e17	e65	109	103	151	108	223	69	23	22
13	36	23	e14	e53	100	107	346	129	127	64	20	20
14	25	23	e16	e55	84	82	246	101	137	60	18	355
15	13	22	e21	e60	77	75	201	93	488	56	27	224
16	10	21	e20	e65	76	70	246	102	255	52	16	93
17	9.1	22	e20	e55	83	92	170	82	184	48	30	69
18	8.2	30	e19	e44	79	138	147	77	177	47	44	59
19	8.0	28	e18	e46	76	138	132	75	197	45	26	50
20	7.7	19	e17	e41	71	142	168	73	155	42	20	46
21	8.0	19	e18	e40	65	139	332	72	187	38	18	45
22	7.4	18	e20	e38	62	124	214	72	133	41	16	39
23	7.9	20	20	e37	61	115	175	69	122	38	15	36
24	16	19	28	e34	64	106	151	88	112	35	14	35
25	22	22	e23	e34	59	106	144	79	104	32	13	34
26	38	17	e19	e36	78	102	136	71	95	31	11	32
27	58	17	e16	e38	149	93	119	68	88	29	15	29
28	57	16	e20	e42	133	87	112	63	91	28	724	27
29	55	17	e17	e50	---	79	108	129	226	25	341	45
30	65	19	e14	e58	---	108	110	115	696	23	113	32
31	75	---	e12	e75	---	729	---	95	---	21	82	---
TOTAL	579.9	766	613	1832	2086	3898	5952	3160	4682	2309	2205	1749
MEAN	18.7	25.5	19.8	59.1	74.5	126	198	102	156	74.5	71.1	58.3
MAX	75	61	28	133	149	729	346	244	696	326	724	355
MIN	3.6	16	12	14	44	70	108	63	56	21	11	20
AC-FT	1150	1520	1220	3630	4140	7730	11810	6270	9290	4580	4370	3470
CFSM	.19	.26	.20	.60	.76	1.28	2.02	1.04	1.59	.76	.73	.59
IN.	.22	.29	.23	.69	.79	1.48	2.26	1.20	1.78	.88	.84	.66

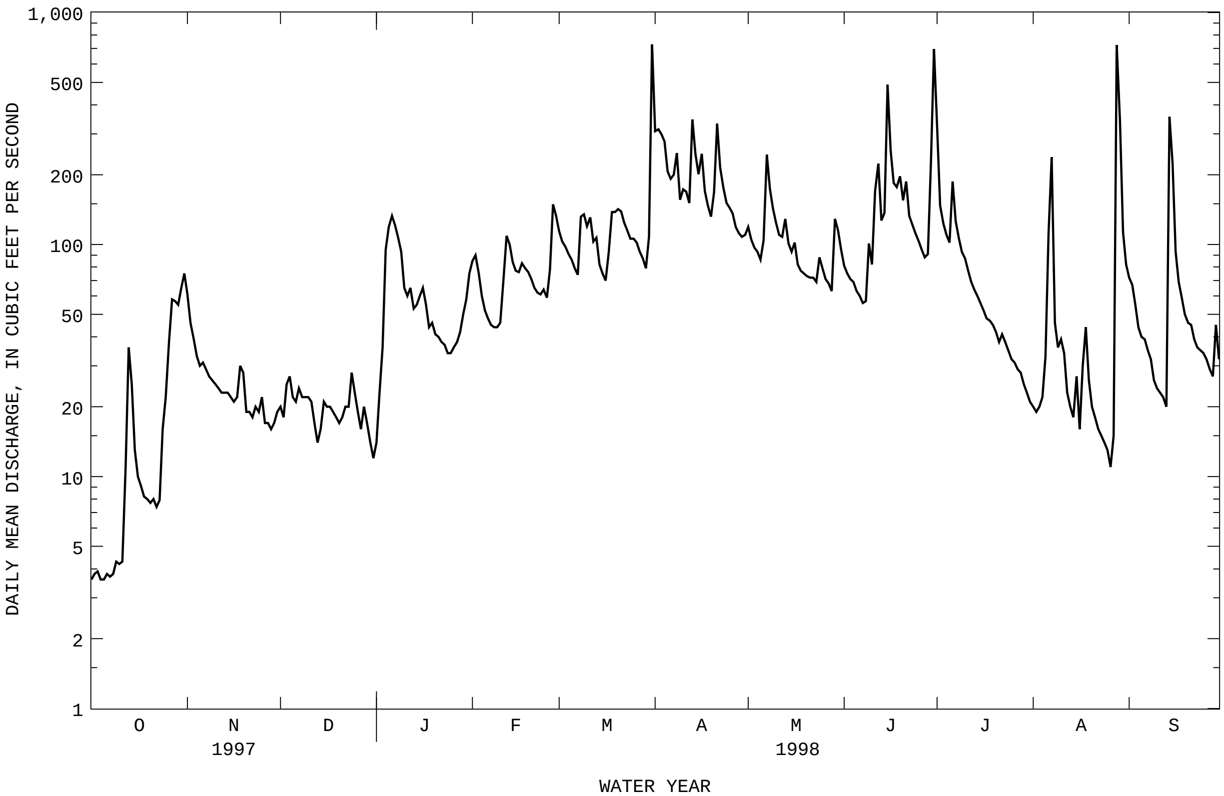
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	29.1	44.0	39.1	39.8	71.2	113	103	113	104	92.6	61.9	44.9
MAX	143	246	162	206	229	402	452	589	566	991	759	337
(WY)	1987	1962	1993	1960	1959	1979	1973	1974	1990	1993	1993	1965
MIN	.55	.95	.54	.10	2.79	4.49	4.15	3.79	.83	1.69	1.94	.69
(WY)	1958	1956	1956	1977	1954	1954	1956	1956	1956	1954	1953	1953

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1953 - 1998	
ANNUAL TOTAL	15193.3		29831.9			
ANNUAL MEAN	41.6		81.7		71.3	
HIGHEST ANNUAL MEAN					327	1993
LOWEST ANNUAL MEAN					6.57	1957
HIGHEST DAILY MEAN	2690	Feb 21	729	Mar 31	7310	Jun 17 1990
LOWEST DAILY MEAN	3.0	Feb 14	3.6	Oct 1,4,5	.00	Jan 18 1977a
ANNUAL SEVEN-DAY MINIMUM	3.7	Feb 10	3.7	Oct 1	.00	Jan 18 1977a
INSTANTANEOUS PEAK FLOW			1160	Aug 28	10200	Jun 17 1990
INSTANTANEOUS PEAK STAGE			8.77	Aug 28	16.36	Jun 17 1990
INSTANTANEOUS LOW FLOW			3.3	Oct 4,5		
ANNUAL RUNOFF (AC-FT)	30140		59170		51630	
ANNUAL RUNOFF (CFSM)	.42		.83		.73	
ANNUAL RUNOFF (INCHES)	5.76		11.31		9.87	
10 PERCENT EXCEEDS	71		170		148	
50 PERCENT EXCEEDS	20		59		27	
90 PERCENT EXCEEDS	4.9		17		2.8	

a Also Jan 19 to Feb 4, 1977
e Estimated

05454300 CLEAR CREEK NEAR CORALVILLE, IA--Continued



05454500 IOWA RIVER AT IOWA CITY, IA

LOCATION.--Lat 41°39'24", long 91°32'27", in $SE^1/_4$ $SE^1/_4$ sec.9, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 25 ft downstream from Hydraulics Laboratory of University of Iowa in Iowa City, 175 ft downstream from University Dam, 0.8 mi upstream from Ralston Creek, 3.6 mi downstream from Clear Creek, and at mile 74.2.

DRAINAGE AREA.--3,271 mi^2.

PERIOD OF RECORD.--June 1903 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 29.00 ft above Iowa City datum, and 617.27 ft above sea level. Oct. 1, 1934 to Sept. 30, 1972, at datum 10.00 ft higher. See WSP 1708 for history of changes prior to Oct. 1, 1934.

REMARKS.--No estimated daily discharge. Records good. Slight fluctuation at low stages caused by powerplant above station. Flow regulated by Coralville Lake (station 05453510), 9.1 mi upstream, since Sept. 17, 1958. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers raingage and satellite data collection platform and U.S. Geological Survey data collection platform with telephone modem backup at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,500 ft^3/s June 8, 1918, gage height, 19.6 ft, from graph based on gage readings, site and datum then in use; minimum daily discharge, 29 ft^3/s Oct. 21, 22, 1916, regulated.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 17, 1881, reached a stage of 21.1 ft, from floodmarks at site and datum in use 1913-21, from information by local resident, discharge, 51,000 ft^3/s. Maximum stage known since at least 1850, about 3 ft higher than that of July 17, 1881, occurred in June 1851, discharge, 70,000 ft^3/s, estimated

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	137	922	569	385	725	3730	6510	4200	4360	8510	6320	879
2	138	1070	567	398	1020	3410	6290	3950	3940	8370	5870	1430
3	139	1060	591	558	1310	3120	7720	3650	4120	8570	5830	1600
4	139	988	610	1070	1300	2860	8270	3460	4090	8590	5770	1640
5	140	823	636	1540	1290	2440	8970	3340	3660	8640	5770	1110
6	140	725	630	1680	1290	2380	9040	3140	3350	9160	5850	868
7	139	721	629	1890	1100	2610	9090	3400	3050	8840	6110	808
8	140	720	632	1950	925	2780	9420	3920	2840	8790	5800	797
9	140	717	632	1780	920	2970	9870	4190	3150	8850	5750	742
10	139	716	677	973	924	2180	9760	4050	3430	8920	5750	683
11	142	716	744	431	1210	1360	8610	3690	4120	8790	5780	649
12	154	715	1060	516	1520	1640	7570	3110	5600	8730	5720	609
13	296	670	1600	636	1870	1780	7620	2910	5640	8690	5710	608
14	548	614	1620	474	2750	2040	4950	2930	5550	8650	5610	1240
15	1140	615	1620	484	2930	2400	1470	2650	6140	8600	5590	1450
16	1200	611	1620	610	2600	2420	2620	2160	5280	8550	4860	1480
17	1150	608	1600	736	2350	2230	4910	1870	5200	8510	3380	1700
18	1010	616	1490	723	2260	2630	7030	1550	5330	8450	2960	1230
19	832	610	1170	816	2500	3180	7560	1280	5770	8400	2020	842
20	728	611	787	915	2740	3760	7420	1120	6080	8350	1290	715
21	723	604	613	912	2910	4230	7420	1060	6290	8290	1300	703
22	649	604	727	820	3090	4120	7500	1360	6130	8300	1510	692
23	528	601	756	739	3370	4060	6940	2170	6100	8220	1360	641
24	483	558	633	734	3380	4260	6120	2980	6010	8140	1080	577
25	473	525	626	729	3320	4170	5810	3660	6010	8070	880	574
26	522	524	631	726	3120	4540	6020	3900	6000	8010	1060	568
27	521	524	617	638	3560	4830	6200	4260	5930	7740	1090	546
28	512	523	511	557	3740	4970	5860	4120	6070	7800	2860	521
29	507	526	391	560	---	4980	5400	4100	6690	7700	3580	426
30	509	539	386	560	---	5110	4840	4380	8470	7340	4310	177
31	632	---	383	629	---	6480	---	4750	---	6890	2860	---
TOTAL	14650	20376	25758	26169	60024	103670	206810	97310	154400	259460	123630	26505
MEAN	473	679	831	844	2144	3344	6894	3139	5147	8370	3988	884
MAX	1200	1070	1620	1950	3740	6480	9870	4750	8470	9160	6320	1700
MIN	137	523	383	385	725	1360	1470	1060	2840	6890	880	177
AC-FT	29060	40420	51090	51910	119100	205600	410200	193000	306300	514600	245200	52570
CFSM	.14	.21	.25	.26	.66	1.02	2.11	.96	1.57	2.56	1.22	.27
IN.	.17	.23	.29	.30	.68	1.18	2.35	1.11	1.76	2.95	1.41	.30

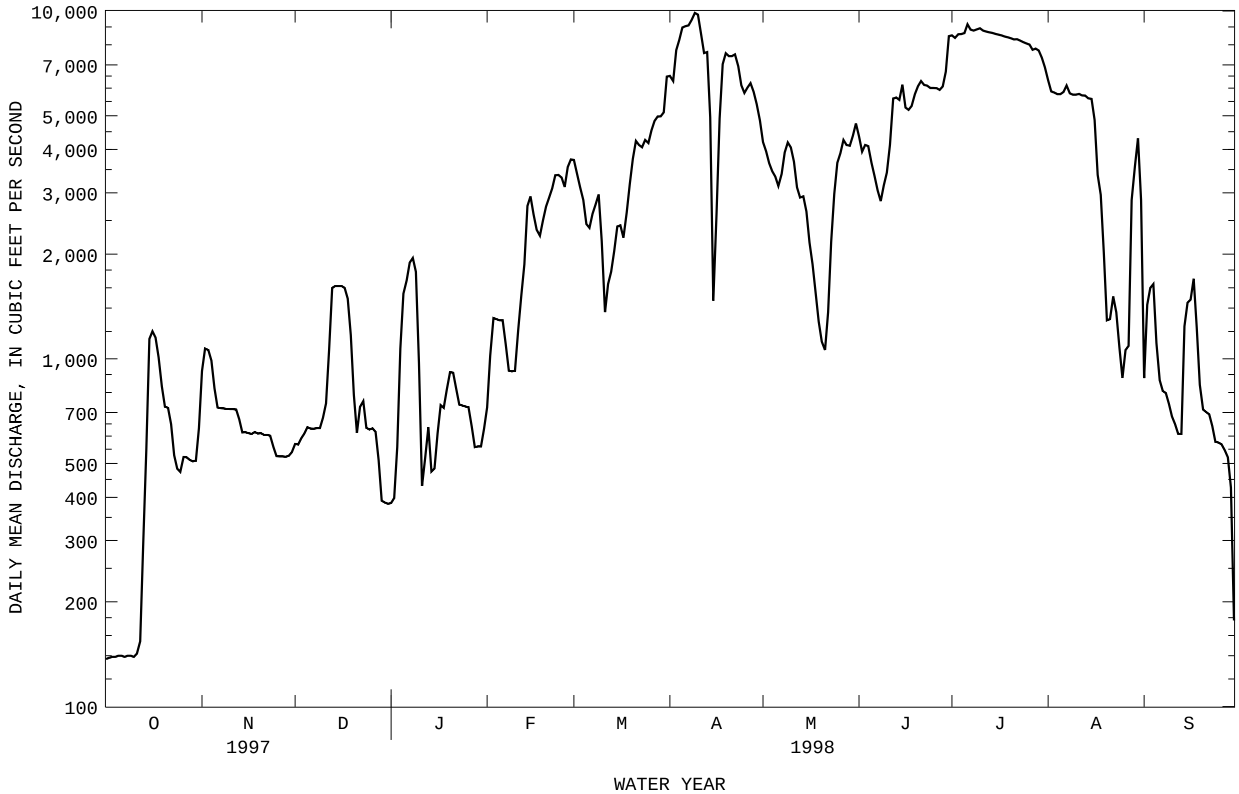
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1150	1485	1470	1104	1799	3474	3862	3246	3555	3498	2280	1523
MAX	4277	5395	4580	5381	5789	7988	9764	9763	11590	22220	20060	13760
(WY)	1994	1987	1983	1973	1973	1971	1979	1993	1991	1993	1993	1993
MIN	135	121	130	141	125	366	348	184	99.1	72.8	162	147
(WY)	1990	1967	1989	1990	1977	1977	1989	1977	1977	1977	1989	1976

05454500 IOWA RIVER AT IOWA CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1959 - 1998a	
ANNUAL TOTAL	723106		1118762			
ANNUAL MEAN	1981		3065		2372	
HIGHEST ANNUAL MEAN					8502	1993
LOWEST ANNUAL MEAN					304	1989
HIGHEST DAILY MEAN	9980	Mar 1	9870	Apr 9	26200	Jul 21 1993
LOWEST DAILY MEAN	137	Oct 1	137	Oct 1	49	Aug 1 1977b
ANNUAL SEVEN-DAY MINIMUM	139	Sep 30	139	Oct 1	50	Jul 31 1977
INSTANTANEOUS PEAK FLOW			9960	Apr 9	28200	Aug 10 1993
INSTANTANEOUS PEAK STAGE			20.36	Apr 9	28.52	Aug 10 1993
ANNUAL RUNOFF (AC-FT)	1434000		2219000		1719000	
ANNUAL RUNOFF (CFSM)	.61		.94		.73	
ANNUAL RUNOFF (INCHES)	8.22		12.72		9.85	
10 PERCENT EXCEEDS	5010		7760		6000	
50 PERCENT EXCEEDS	1100		1890		1320	
90 PERCENT EXCEEDS	351		525		211	

a Post regulation
b Also Aug 2, 1977



05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IA

LOCATION.--Lat 41°39'05", long 91°30'27", in SW 1/4 NE 1/4 sec.14, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 60 ft downstream from bridge on Muscatine Avenue in Iowa City, and 1.2 mi upstream from mouth.

DRAINAGE AREA.--2.94 mi^2.

PERIOD OF RECORD.--Discharge records from October 1963 to September 1995. Stage-only records from October 29, 1996 to present year.

REVISED RECORDS.--WDR IA-66-1: Drainage area.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 678.03 ft above sea level.

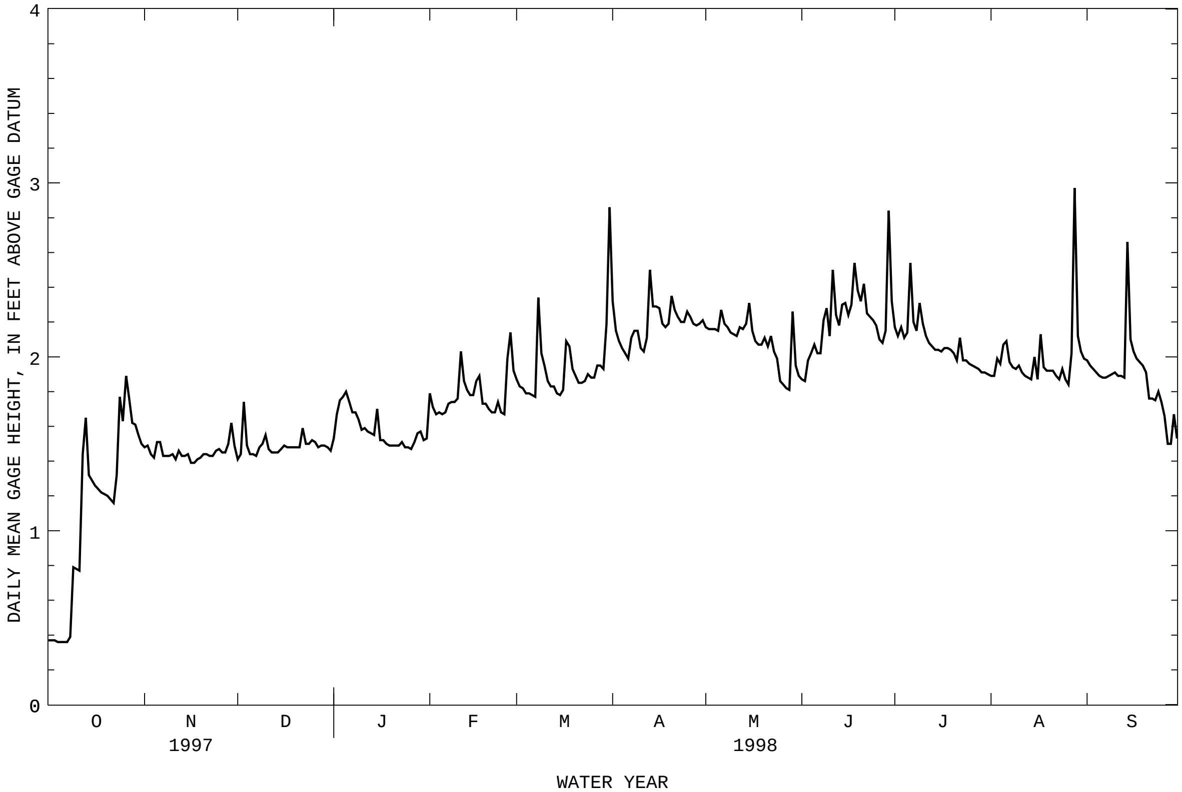
REMARKS.--Minor regulation from retention dam 2 miles upstream may affect peaks. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 14, 1962, reached a stage of 10.5 ft, from flood profile, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum instantaneous gage height 7.75 ft on June 29. Minimum gage height of .36 on Oct. 4-7.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.37	1.48	1.41	1.53	1.79	1.87	2.32	2.17	1.87	2.17	1.89	1.98
2	.37	1.49	1.44	1.67	1.71	1.83	2.15	2.16	1.86	2.12	1.89	1.95
3	.37	1.44	1.74	1.75	1.67	1.82	2.09	2.16	1.98	2.17	1.99	1.93
4	.36	1.42	1.49	1.77	1.68	1.79	2.05	2.16	2.02	2.11	1.96	1.91
5	.36	1.51	1.44	1.80	1.67	1.79	2.02	2.15	2.07	2.14	2.07	1.89
6	.36	1.51	1.44	1.74	1.68	1.78	1.99	2.27	2.02	2.54	2.09	1.88
7	.36	1.43	1.43	1.68	1.73	1.77	2.11	2.19	2.02	2.20	1.97	1.88
8	.39	1.43	1.48	1.68	1.74	2.34	2.15	2.17	2.21	2.15	1.94	1.89
9	.79	1.43	1.50	1.64	1.74	2.02	2.15	2.14	2.28	2.31	1.93	1.90
10	.78	1.44	1.55	1.58	1.76	1.95	2.05	2.13	2.12	2.19	1.95	1.91
11	.77	1.41	1.47	1.59	2.03	1.86	2.03	2.12	2.50	2.12	1.91	1.89
12	1.44	1.46	1.45	1.57	1.86	1.83	2.11	2.17	2.24	2.08	1.89	1.89
13	1.65	1.43	1.45	1.56	1.81	1.83	2.50	2.16	2.18	2.06	1.88	1.88
14	1.32	1.43	1.45	1.55	1.78	1.79	2.29	2.19	2.30	2.04	1.87	2.66
15	1.29	1.44	1.47	1.70	1.78	1.78	2.29	2.31	2.31	2.04	2.00	2.10
16	1.26	1.39	1.49	1.52	1.86	1.81	2.28	2.15	2.24	2.03	1.87	2.03
17	1.24	1.39	1.48	1.52	1.89	2.09	2.19	2.09	2.30	2.05	2.13	1.99
18	1.22	1.41	1.48	1.50	1.73	2.06	2.17	2.07	2.54	2.05	1.94	1.97
19	1.21	1.42	1.48	1.49	1.73	1.93	2.19	2.07	2.38	2.04	1.92	1.95
20	1.20	1.44	1.48	1.49	1.70	1.89	2.35	2.11	2.32	2.02	1.92	1.91
21	1.18	1.44	1.48	1.49	1.68	1.85	2.27	2.06	2.42	1.98	1.92	1.76
22	1.16	1.43	1.59	1.49	1.68	1.85	2.23	2.12	2.25	2.11	1.89	1.76
23	1.32	1.43	1.50	1.51	1.74	1.86	2.20	2.03	2.23	1.98	1.87	1.75
24	1.77	1.46	1.50	1.48	1.68	1.90	2.20	1.99	2.21	1.98	1.93	1.80
25	1.63	1.47	1.52	1.48	1.67	1.88	2.26	1.86	2.18	1.96	1.87	1.74
26	1.89	1.45	1.51	1.47	1.99	1.88	2.23	1.84	2.10	1.95	1.84	1.66
27	1.76	1.45	1.48	1.51	2.14	1.95	2.19	1.82	2.08	1.94	2.02	1.50
28	1.62	1.50	1.49	1.56	1.92	1.95	2.18	1.81	2.15	1.93	2.97	1.50
29	1.61	1.62	1.49	1.57	---	1.93	2.19	2.26	2.84	1.91	2.12	1.67
30	1.55	1.49	1.48	1.52	---	2.19	2.21	1.95	2.32	1.91	2.03	1.53
31	1.50	---	1.46	1.53	---	2.86	---	1.89	---	1.90	1.99	---
MEAN	1.10	1.45	1.49	1.58	1.78	1.93	2.19	2.09	2.22	2.07	1.98	1.87
MAX	1.89	1.62	1.74	1.80	2.14	2.86	2.50	2.31	2.84	2.54	2.97	2.66
MIN	.36	1.39	1.41	1.47	1.67	1.77	1.99	1.81	1.86	1.90	1.84	1.50


DAILY MEAN GAGE HEIGHT, IN FEET ABOVE GAGE DATUM
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1997
1998
WATER YEAR

05455100 OLD MANS CREEK NEAR IOWA CITY, IA

LOCATION.--Lat. 41°36'23", long. 91°36'56", in SE$\frac{1}{4}$ SW$\frac{1}{4}$ NW$\frac{1}{4}$ sec. 36, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank 10 ft downstream from bridge on county highway W62, 5 miles southwest of Iowa City, 5.9 miles upstream of Dirty Face Creek, and 8.6 miles upstream from mouth.

DRAINAGE AREA.--201 mi^2.

PERIOD OF RECORD.--October 1950 to September 1964, published in WSP 1914. Annual maximum, water years 1965-84. Occasional low-flow measurements, water years 1964-77; October 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 637.49 ft above sea level. Prior to Nov. 16, 1984, nonrecording gage at same site at datum 2.00 ft higher. Prior to Oct. 1, 1987, at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 13-17, Dec. 24 to Jan. 3, Jan. 10 to Feb. 2, and June 9. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

COOPERATION.--Gage height record and discharge measurements for water years 1951-64 were collected by the U.S. Army Corps of Engineers and computed by the U.S. Geological Survey.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 13,500 ft^3/s, on the basis of contracted-opening of peak flow, June 15, 1982, gage height, 17.25 ft, present datum.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	114	31	e24	e95	219	1470	447	180	320	36	104
2	2.7	82	29	e34	e190	200	759	272	169	221	35	89
3	2.9	69	31	e65	163	189	555	233	156	187	36	78
4	2.5	59	39	245	118	180	453	214	156	170	37	66
5	2.2	52	35	240	105	168	391	201	146	172	111	59
6	1.9	50	28	259	96	160	348	225	139	378	97	55
7	2.6	51	32	225	92	153	335	758	131	261	343	50
8	2.3	49	32	193	90	296	480	462	129	188	86	45
9	2.6	47	32	168	87	381	404	352	e440	159	59	42
10	2.8	44	34	e100	87	256	369	288	209	167	56	40
11	5.0	42	33	e90	117	278	322	250	328	148	71	38
12	5.3	39	30	e100	240	230	299	237	625	132	47	36
13	30	39	e21	e85	184	231	708	226	332	122	42	34
14	49	38	e23	e95	156	207	599	197	286	113	41	616
15	21	36	e29	e105	142	192	421	183	1000	101	41	521
16	14	32	e28	e120	138	179	723	180	619	94	42	204
17	11	29	e26	e110	147	208	398	156	406	87	116	138
18	9.8	40	38	e90	150	574	324	144	386	84	93	108
19	10	34	35	e83	140	582	292	139	533	81	52	94
20	9.2	34	33	e77	136	424	325	136	362	75	41	86
21	7.6	33	29	e72	130	357	581	138	505	70	38	79
22	7.1	30	36	e68	125	323	415	137	324	67	36	71
23	7.4	28	38	e71	123	295	344	149	284	66	36	66
24	14	23	e34	e67	126	263	302	188	255	60	35	66
25	40	29	e31	e66	126	256	287	211	235	55	36	65
26	48	30	e28	e66	139	262	283	176	217	53	36	60
27	88	28	e30	e65	275	238	249	161	197	51	37	55
28	87	27	e34	e64	254	216	228	151	189	48	1250	51
29	95	27	e28	e65	---	198	221	194	776	44	498	56
30	117	28	e25	e70	---	206	288	277	840	40	196	57
31	135	---	e21	e75	---	1430	---	216	---	38	128	---
TOTAL	835.5	1263	953	3257	3971	9351	13173	7298	10554	3852	3808	3129
MEAN	27.0	42.1	30.7	105	142	302	439	235	352	124	123	104
MAX	135	114	39	259	275	1430	1470	758	1000	378	1250	616
MIN	1.9	23	21	24	87	153	221	136	129	38	35	34
AC-FT	1660	2510	1890	6460	7880	18550	26130	14480	20930	7640	7550	6210
CFSM	.13	.21	.15	.52	.71	1.50	2.18	1.17	1.75	.62	.61	.52
IN.	.15	.23	.18	.60	.73	1.73	2.44	1.35	1.95	.71	.70	.58

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	47.6	92.0	56.4	63.1	118	247	168	235	181	158	112	65.7
MAX	307	636	337	436	346	793	625	1071	907	1515	1190	598
(WY)	1987	1962	1993	1960	1953	1962	1993	1996	1990	1993	1993	1993
MIN	.21	.39	.35	.26	2.50	2.12	1.29	4.97	5.34	1.43	2.97	.36
(WY)	1958	1956	1956	1956	1954	1954	1956	1956	1956	1954	1988	1957

05455100 OLD MANS CREEK NEAR IOWA CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1951 - 1998	
ANNUAL TOTAL	29969.5		61444.5			
ANNUAL MEAN	82.1		168		129	
HIGHEST ANNUAL MEAN					607	1993
LOWEST ANNUAL MEAN					10.3	1954
HIGHEST DAILY MEAN	3490	Feb 21	1470	Apr 1	8780	Jul 6 1993
LOWEST DAILY MEAN	1.9	Oct 6	1.9	Oct 6	.10	Sep 6 1957
ANNUAL SEVEN-DAY MINIMUM	2.4	Oct 4	2.4	Oct 4	.10	Sep 6 1957
INSTANTANEOUS PEAK FLOW			2510	Jun 29	13000	Jul 6 1993
INSTANTANEOUS PEAK STAGE			12.89	Jun 29	17.61	Jul 6 1993
INSTANTANEOUS LOW FLOW			1.2	Oct 6		
ANNUAL RUNOFF (AC-FT)	59440		121900		93290	
ANNUAL RUNOFF (CFSM)	.41		.84		.64	
ANNUAL RUNOFF (INCHES)	5.55		11.37		8.70	
10 PERCENT EXCEEDS	174		379		280	
50 PERCENT EXCEEDS	34		104		38	
90 PERCENT EXCEEDS	7.4		28		1.6	

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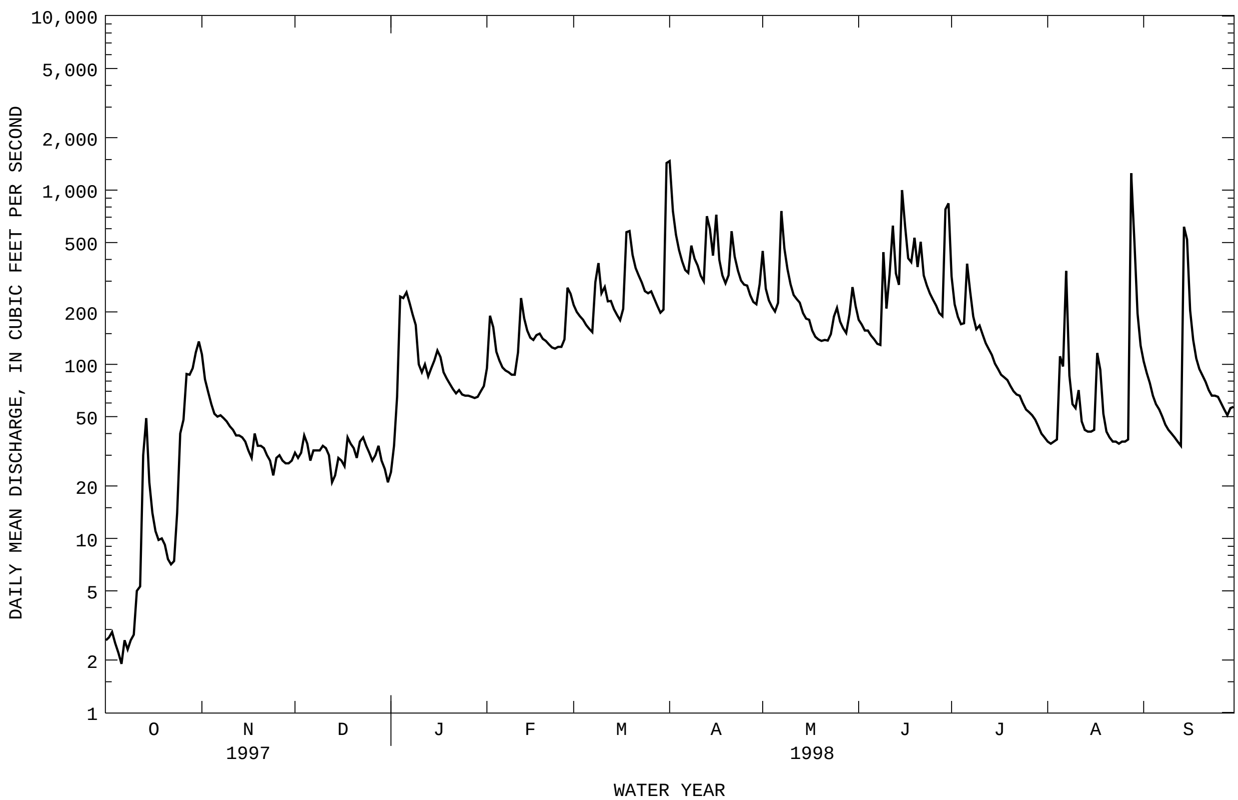


05455500 ENGLISH RIVER AT KALONA, IA

LOCATION.--Lat 41°28'11", long 91°42'52",(revised) in SE1/4 SE1/4 sec.13, T.77 N., R.8 W., Washington County, Hydrologic Unit 07080209, on right bank 30 ft upstream from bridge on State Highway 1, 0.8 mi south of Kalona, 1.1 mi upstream from Camp Creek, 4.5 mi downstream from Smith Creek, and 14.5 mi upstream from mouth.

DRAINAGE AREA.--573 mi^2.

PERIOD OF RECORD.--September 1939 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1940 (M), 1941. WSP 1708: 1956, 1957 (P), 1958 (P).

GAGE.--Water-stage recorder. Datum of gage is 633.45 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Dec. 27, 1939, nonrecording gage 30 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 13-17, Dec. 26 to Jan. 3, Jan. 10 to Feb. 4, and Aug. 13-20. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 19.9 ft, from floodmark, from information by local residents, discharge, 18,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	862	153	e95	e340	683	5110	1450	699	1990	107	104
2	14	509	205	e120	e510	614	3640	1040	609	1160	105	85
3	15	353	181	e250	e440	582	1870	773	551	789	103	74
4	15	280	193	1270	e360	555	1380	657	517	672	109	65
5	15	236	197	978	353	511	1140	587	487	602	129	56
6	15	222	163	1040	276	468	986	740	444	711	157	52
7	16	219	155	930	259	436	887	2730	400	900	242	47
8	16	209	173	721	240	999	1060	2560	397	664	162	43
9	16	197	162	602	234	1470	1130	1570	713	534	120	39
10	17	186	167	e360	232	740	1010	1100	994	499	103	36
11	18	174	160	e320	313	769	861	910	974	641	98	35
12	23	164	146	e360	616	688	775	814	2290	481	79	34
13	86	158	e110	e300	544	599	1670	824	1350	386	e67	33
14	229	153	e90	e320	420	528	1650	717	1050	343	e63	675
15	200	147	e100	e355	374	484	1030	636	4540	313	e61	803
16	101	131	e120	e400	362	412	1290	609	3770	290	e57	391
17	73	122	e140	e340	398	509	939	530	3230	263	e54	188
18	60	117	156	e260	466	1910	782	471	2490	245	e54	136
19	52	131	166	e270	477	2800	693	436	3380	228	e50	111
20	46	141	159	e250	556	1910	692	439	2280	205	e46	95
21	41	130	163	e240	600	1380	1150	642	2150	183	39	84
22	37	119	152	e230	537	1220	1080	714	1490	167	38	75
23	37	108	173	e220	486	1130	874	857	1090	162	38	69
24	51	102	172	e210	473	979	754	1470	944	160	39	71
25	87	103	148	e190	477	851	675	2280	839	145	36	71
26	246	113	e129	e180	492	947	699	1370	720	137	34	68
27	432	112	e110	e178	814	933	888	998	629	132	39	63
28	433	106	e129	e180	836	728	687	823	657	127	1040	56
29	496	105	e114	e190	---	611	609	740	1040	124	947	64
30	576	114	e95	e210	---	580	637	1090	3030	119	296	66
31	747	---	e80	e260	---	3540	---	869	---	111	145	---
TOTAL	4224	5823	4561	11829	12485	30566	36648	31446	43754	13483	4657	3789
MEAN	136	194	147	382	446	986	1222	1014	1458	435	150	126
MAX	747	862	205	1270	836	3540	5110	2730	4540	1990	1040	803
MIN	14	102	80	95	232	412	609	436	397	111	34	33
AC-FT	8380	11550	9050	23460	24760	60630	72690	62370	86790	26740	9240	7520
CFSM	.24	.34	.26	.66	.78	1.72	2.13	1.77	2.54	.76	.26	.22
IN.	.27	.38	.30	.77	.81	1.98	2.38	2.04	2.84	.87	.30	.25

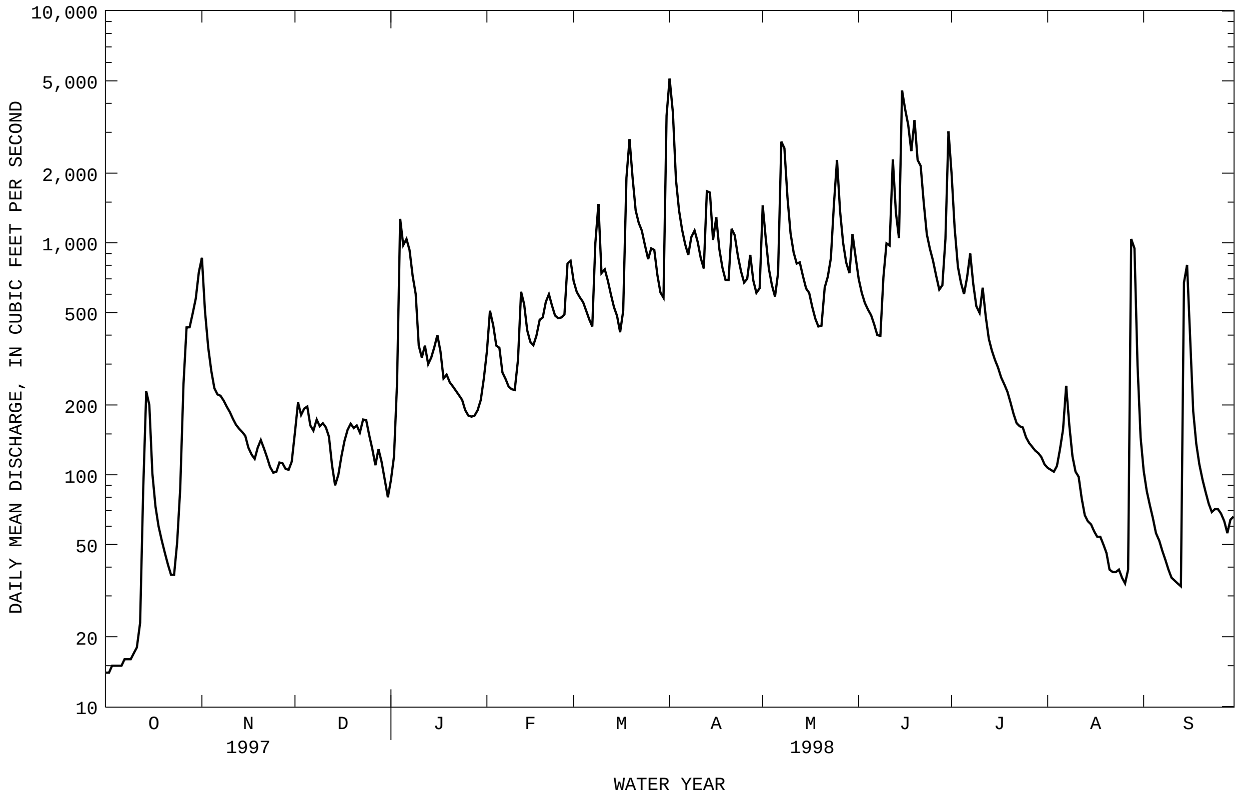
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	147	247	190	213	365	698	646	680	587	419	279	239
MAX	1004	2060	1085	1429	1066	2957	2736	3529	2570	4207	3696	3169
(WY)	1987	1962	1983	1946	1984	1979	1973	1974	1990	1993	1993	1965
MIN	2.98	2.38	2.19	.76	13.8	10.8	5.35	9.62	21.7	7.31	6.34	3.10
(WY)	1954	1956	1956	1977	1954	1954	1956	1956	1940	1954	1955	1955

05455500 ENGLISH RIVER AT KALONA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1940 - 1998	
ANNUAL TOTAL	89847		203265			
ANNUAL MEAN	246		557		392	
HIGHEST ANNUAL MEAN					1721	1993
LOWEST ANNUAL MEAN					41.7	1954
HIGHEST DAILY MEAN	7810	Feb 22	5110	Apr 1	22300	Jul 6 1993
LOWEST DAILY MEAN	12	Jan 12	14	Oct 1	.66	Feb 5 1977
ANNUAL SEVEN-DAY MINIMUM	14	Jan 11	15	Oct 1	.68	Feb 1 1977
INSTANTANEOUS PEAK FLOW			5170	Apr 1	36100	Jul 6 1993
INSTANTANEOUS PEAK STAGE			15.19	Apr 1	22.55	Jul 6 1993
INSTANTANEOUS LOW FLOW			14	Oct 1,2,3		
ANNUAL RUNOFF (AC-FT)	178200		403200		284200	
ANNUAL RUNOFF (CFSM)	.43		.97		.68	
ANNUAL RUNOFF (INCHES)	5.82		13.17		9.29	
10 PERCENT EXCEEDS	493		1140		865	
50 PERCENT EXCEEDS	120		320		120	
90 PERCENT EXCEEDS	19		54		11	

e Estimated



05455700 IOWA RIVER NEAR LONE TREE, IA

LOCATION.--Lat 41°25'15", long 91°28'25", in NW$^1/_4$ NE$^1/_4$ sec.6, T.76 N., R.5 W., Louisa County, Hydrologic Unit 07080209, on left bank 2,000 ft downstream from tri-county bridge on county highway W66, 5 mi southwest of Lone Tree, 6.2 mi downstream from English River, and at mile 47.2.

DRAINAGE AREA.--4,293 mi^2.

PERIOD OF RECORD.--October 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 588.16 ft above sea level. Prior to Dec. 28, 1956, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 27 to Jan. 3, and Jan. 10 to Feb. 1. Records good except those for estimated daily discharges, which are fair. Flow regulated by Coralville Lake (station 05453510), 36.1 mi upstream, since Sept. 17, 1958. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 25, 1944, reached a stage of 19.94 ft, discharge not determined, from information by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

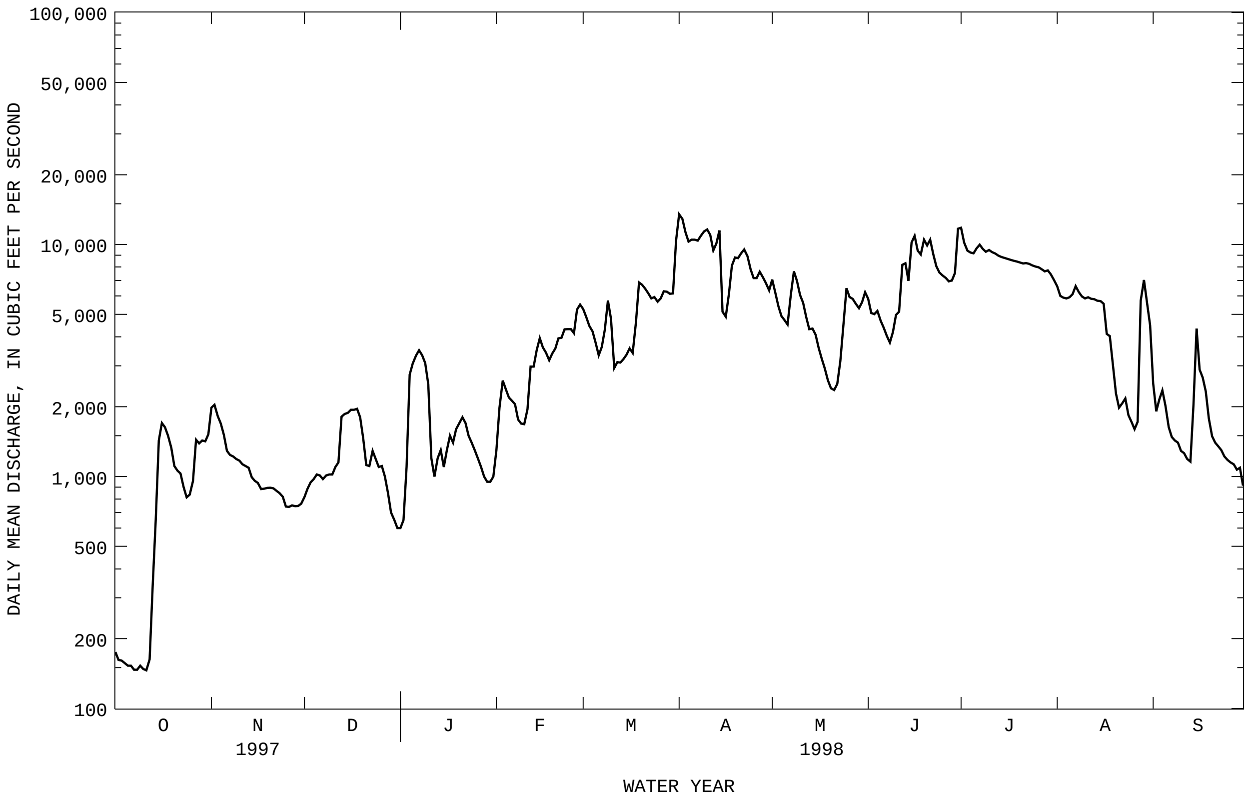
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	175	1980	816	e600	e1300	5270	13500	7060	5830	11800	6600	2520
2	162	2040	886	e650	1980	4870	12900	6200	5070	10200	6010	1910
3	161	1820	944	e1100	2590	4460	11300	5430	5010	9420	5900	2150
4	157	1690	975	2750	2380	4220	10300	4920	5180	9240	5860	2350
5	153	1510	1020	3070	2190	3770	10500	4720	4700	9170	5930	2020
6	153	1290	1010	3320	2120	3330	10500	4520	4380	9630	6110	1630
7	147	1240	975	3500	2050	3620	10400	6090	4040	9990	6620	1480
8	147	1220	1010	3330	1760	4300	10900	7670	3780	9570	6230	1430
9	153	1190	1020	3080	1690	5740	11400	6970	4200	9310	5970	1400
10	148	1170	1020	e2500	1680	4790	11600	6060	4970	9460	5860	1290
11	146	1130	1100	e1200	1950	2940	11000	5610	5140	9280	5930	1260
12	163	1110	1150	e1000	2980	3110	9430	4870	8170	9150	5830	1190
13	338	1090	1810	e1200	2980	3100	10100	4320	8300	8960	5810	1160
14	652	994	1860	e1300	3510	3210	11500	4340	6980	8840	5730	2040
15	1430	959	1880	e1100	3950	3350	5140	4090	10200	8750	5700	4340
16	1700	938	1940	e1300	3600	3570	4890	3580	10900	8670	5550	2890
17	1630	883	1940	e1500	3420	3410	6090	3220	9410	8590	4120	2670
18	1500	887	1960	e1400	3170	4620	8120	2920	9060	8510	4030	2330
19	1330	893	1800	e1600	3390	6860	8790	2600	10500	8440	3040	1780
20	1110	894	1460	e1700	3560	6710	8740	2400	9910	8360	2280	1490
21	1060	890	1120	e1800	3940	6460	9160	2360	10500	8290	1980	1400
22	1030	868	1110	e1700	3960	6170	9520	2510	9090	8320	2070	1350
23	901	849	1290	e1500	4310	5860	8900	3150	8070	8250	2170	1300
24	814	818	1190	e1400	4320	5940	7840	4510	7580	8130	1840	1220
25	835	743	1100	e1300	4320	5670	7170	6480	7360	8040	1720	1180
26	956	740	1110	e1200	4150	5860	7170	5940	7180	7970	1600	1150
27	1440	751	e1000	e1100	5240	6280	7640	5830	6940	7830	1720	1130
28	1390	745	e850	e1000	5510	6260	7240	5560	7000	7670	5720	1070
29	1430	746	e700	e950	---	6130	6820	5320	7530	7740	7040	1090
30	1420	764	e650	e950	---	6150	6340	5640	11700	7430	5610	914
31	1520	---	e600	e1000	---	10400	---	6230	---	7040	4490	---
TOTAL	24351	32842	37296	51100	88000	156430	274900	151120	218680	272050	145070	51134
MEAN	786	1095	1203	1648	3143	5046	9163	4875	7289	8776	4680	1704
MAX	1700	2040	1960	3500	5510	10400	13500	7670	11700	11800	7040	4340
MIN	146	740	600	600	1300	2940	4890	2360	3780	7040	1600	914
AC-FT	48300	65140	73980	101400	174500	310300	545300	299700	433800	539600	287700	101400
CFSM	.18	.26	.28	.38	.73	1.18	2.13	1.14	1.70	2.04	1.09	.40
IN.	.21	.28	.32	.44	.76	1.36	2.38	1.31	1.89	2.36	1.26	.44

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1509	2022	1937	1554	2495	4805	5221	4640	4660	4455	2932	2148
MAX	6115	6347	6678	7814	7205	10410	12230	14030	13150	30320	26150	18150
(WY)	1994	1962	1983	1973	1973	1993	1979	1993	1974	1993	1993	1993
MIN	192	190	168	154	158	539	533	282	147	180	186	210
(WY)	1989	1967	1989	1977	1977	1977	1989	1977	1977	1977	1989	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1959 - 1998a	
ANNUAL TOTAL	938963		1502973			
ANNUAL MEAN	2573		4118		3200	
HIGHEST ANNUAL MEAN					11900	1993
LOWEST ANNUAL MEAN					483	1989
HIGHEST DAILY MEAN	20100	Feb 22	13500	Apr 1	55100	Jul 7 1993
LOWEST DAILY MEAN	146	Oct 11	146	Oct 11	69	Aug 4 1977
ANNUAL SEVEN-DAY MINIMUM	150	Oct 5	150	Oct 5	75	Jul 30 1977
INSTANTANEOUS PEAK FLOW			13800	Apr 1	57100	Jul 7 1993
INSTANTANEOUS PEAK STAGE			14.15	Apr 1	22.94	Jul 7 1993
ANNUAL RUNOFF (AC-FT)	1862000		2981000		2318000	
ANNUAL RUNOFF (CFSM)	.60		.96		.75	
ANNUAL RUNOFF (INCHES)	8.14		13.02		10.13	
10 PERCENT EXCEEDS	5750		9110		7660	
50 PERCENT EXCEEDS	1700		3220		1800	
90 PERCENT EXCEEDS	488		892		319	

a Post regulation
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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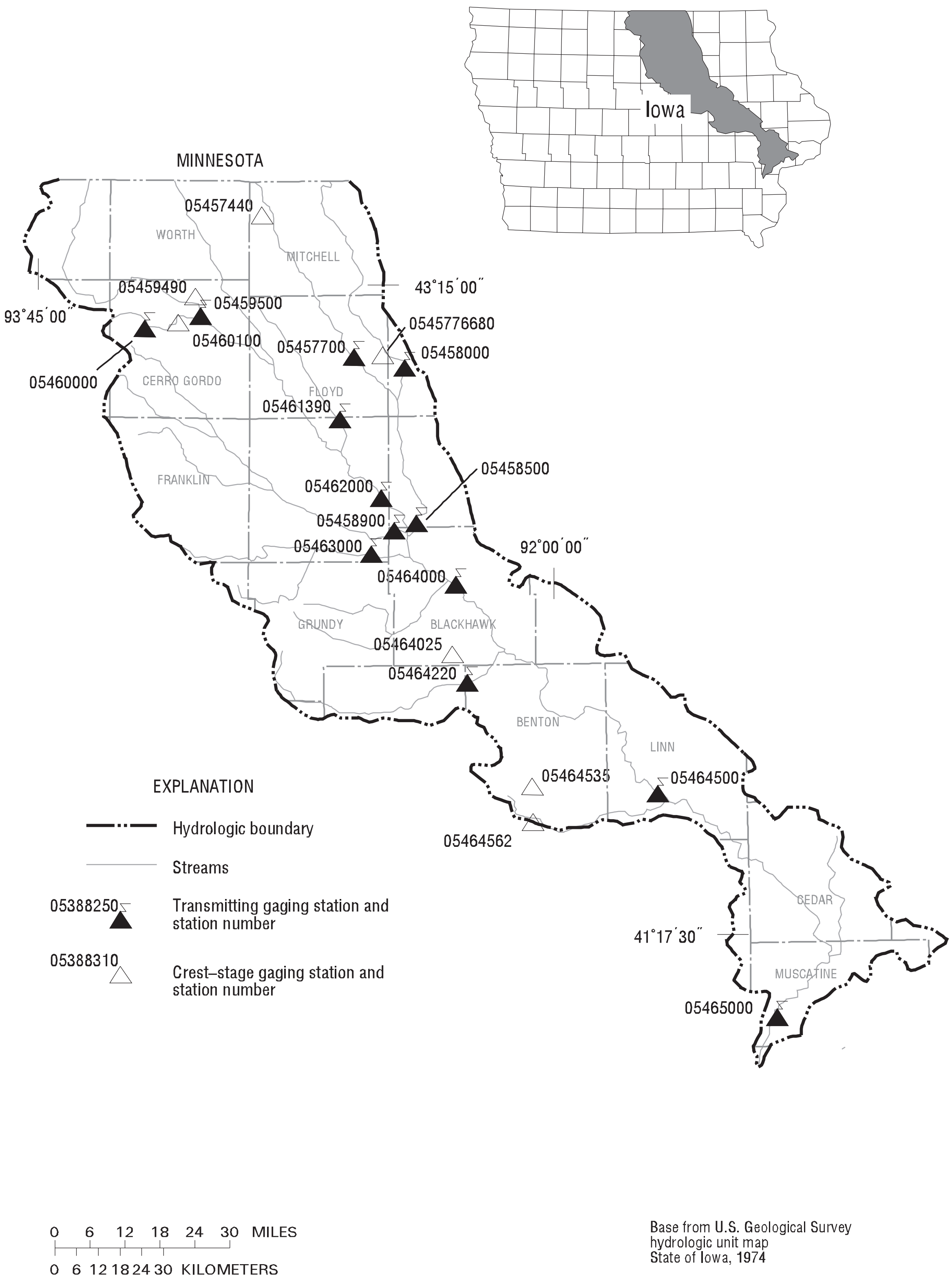
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05457700
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05460000
CERRO GORDO
FLOYD
05461390
FRANKLIN
05458500
05462000
05458900
05463000
92°00´00˝
05464000
GRUNDY
BLACKHAWK
05464025
05464220
BENTON
LINN
05464535
05464500
05464562
CEDAR
41°17´30˝
MUSCATINE
05465000
EXPLANATION
Hydrologic boundary
Streams
05388250
Transmitting gaging station and station number
05388310
Crest–stage gaging station and station number
0 6 12 18 24 30 MILES
0 6 12 18 24 30 KILOMETERS
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05457700 CEDAR RIVER AT CHARLES CITY, IA

LOCATION.--Lat 43°03'45", long 92°40'23", in SE$^1/_4$ NE$^1/_4$, sec.12, T.95 N., R.16 W., Floyd County, Hydrologic Unit 07080201, on right bank 800 ft downstream from bridge on U.S. Highway 18 (Brantingham Street) in Charles City, 10.6 mi upstream from Gizzard Creek, and at mile 252.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,054 mi^2.

PERIOD OF RECORD.--Discharge records from October 1964 to September 1995. Stage-only records from October 1995 to current year.

GAGE.--Water-stage recorder. Datum of gage is 973.02 ft above sea level.

REMARKS.--Occasional minor regulation by dam 0.2 mi upstream from gage. Daily wire-weight gage readings available in district office for period Sept. 13, 1945 to June 30, 1954, at same site and datum. Discharge not published for this period because of extreme regulation of streamflow by power dam 0.2 mi upstream. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum instantaneous discharge 21,000 ft^3/s, Apr. 7, 1965, gage height 19.14 ft; maximum gage height, 21.64 ft Mar. 2, 1965, backwater from ice; minimum daily discharge, 60 ft^3/s Nov. 23, 1977 and Jan. 7, 1978.

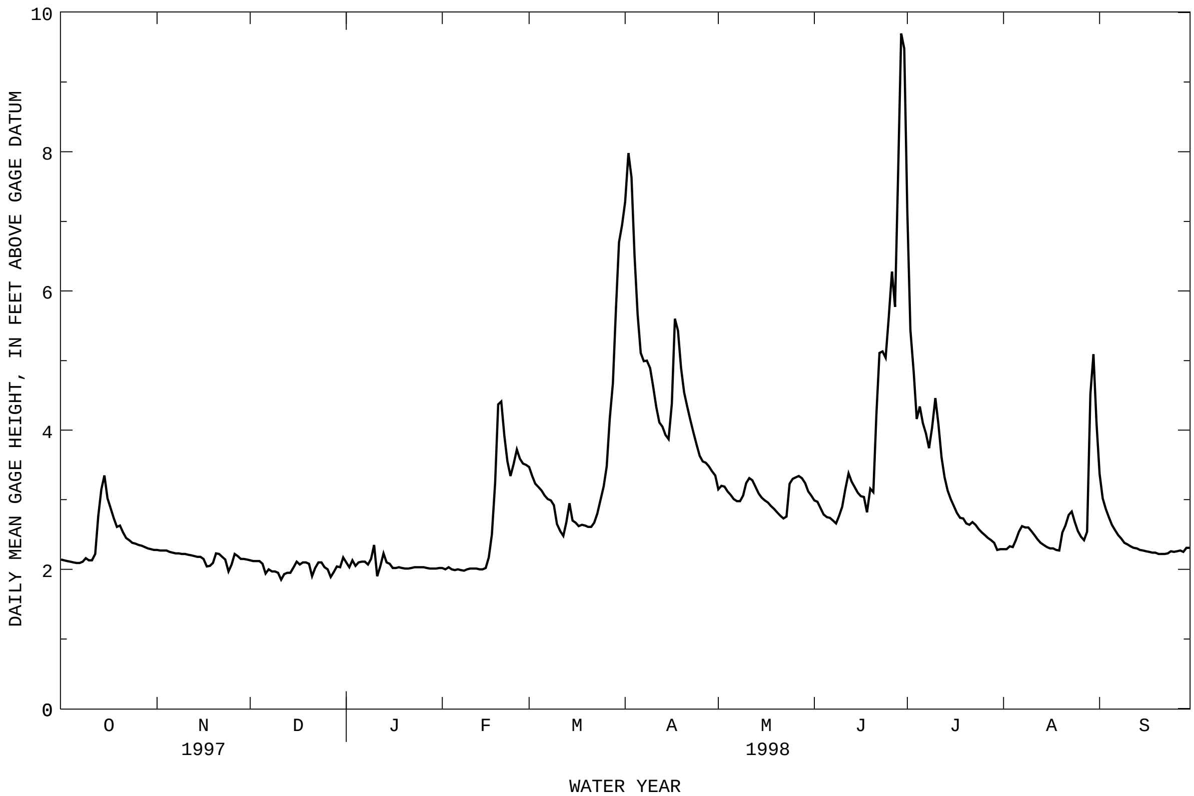
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 27, 1961, reached a stage of 21.6 ft, from flood marks, discharge, 29,200 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum gage height 9.89 ft. on June 29, minimum gage height 1.73 ft. on Dec. 6.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.14	2.28	2.13	2.10	2.02	3.47	7.28	3.15	2.99	7.14	2.29	3.37
2	2.13	2.27	2.12	2.03	2.00	3.34	7.98	3.20	2.97	5.44	2.29	3.02
3	2.12	2.27	2.12	2.13	2.03	3.23	7.63	3.19	2.88	4.84	2.33	2.87
4	2.11	2.27	2.12	2.05	2.00	3.18	6.50	3.12	2.79	4.16	2.32	2.75
5	2.10	2.25	2.08	2.10	1.99	3.13	5.66	3.07	2.75	4.34	2.42	2.64
6	2.09	2.24	1.94	2.11	2.00	3.06	5.11	3.01	2.74	4.10	2.54	2.56
7	2.09	2.23	2.00	2.11	1.99	3.01	4.99	2.98	2.70	3.95	2.62	2.49
8	2.11	2.23	1.97	2.07	1.98	2.99	5.00	2.98	2.66	3.74	2.60	2.44
9	2.16	2.22	1.97	2.15	2.00	2.92	4.89	3.06	2.77	4.04	2.60	2.38
10	2.13	2.22	1.95	2.35	2.01	2.65	4.62	3.24	2.90	4.46	2.55	2.36
11	2.13	2.21	1.85	1.90	2.01	2.55	4.33	3.31	3.15	4.08	2.49	2.33
12	2.22	2.20	1.93	2.04	2.01	2.48	4.11	3.28	3.38	3.61	2.43	2.31
13	2.77	2.19	1.95	2.23	2.00	2.68	4.05	3.19	3.26	3.32	2.38	2.30
14	3.15	2.18	1.95	2.10	2.00	2.95	3.93	3.09	3.18	3.13	2.35	2.28
15	3.35	2.18	2.03	2.08	2.02	2.70	3.87	3.03	3.10	3.01	2.32	2.27
16	3.02	2.15	2.11	2.02	2.17	2.67	4.38	2.99	3.05	2.91	2.30	2.26
17	2.88	2.04	2.07	2.02	2.50	2.62	5.60	2.96	3.04	2.81	2.30	2.25
18	2.74	2.05	2.10	2.03	3.24	2.64	5.43	2.91	2.82	2.74	2.28	2.24
19	2.61	2.09	2.10	2.02	4.37	2.63	4.89	2.87	3.16	2.73	2.27	2.24
20	2.63	2.23	2.08	2.01	4.41	2.61	4.54	2.82	3.11	2.66	2.53	2.22
21	2.53	2.22	1.90	2.01	3.92	2.61	4.34	2.77	4.23	2.64	2.63	2.22
22	2.45	2.18	2.02	2.02	3.55	2.67	4.15	2.73	5.11	2.68	2.78	2.22
23	2.42	2.14	2.10	2.03	3.34	2.80	3.96	2.76	5.13	2.64	2.83	2.23
24	2.38	1.97	2.10	2.03	3.51	2.99	3.79	3.23	5.04	2.58	2.68	2.26
25	2.37	2.07	2.03	2.03	3.72	3.19	3.63	3.30	5.61	2.53	2.55	2.25
26	2.35	2.22	2.00	2.03	3.59	3.48	3.55	3.32	6.28	2.49	2.47	2.26
27	2.34	2.19	1.89	2.02	3.52	4.17	3.53	3.34	5.77	2.45	2.42	2.27
28	2.32	2.15	1.96	2.01	3.50	4.67	3.48	3.31	7.69	2.42	2.54	2.25
29	2.30	2.15	2.04	2.01	---	5.74	3.41	3.24	9.70	2.38	4.52	2.31
30	2.29	2.14	2.03	2.01	---	6.70	3.35	3.12	9.48	2.28	5.09	2.31
31	2.28	---	2.17	2.02	---	6.95	---	3.06	---	2.29	4.10	---
MEAN	2.41	2.18	2.03	2.06	2.69	3.34	4.73	3.08	4.11	3.37	2.67	2.41
MAX	3.35	2.28	2.17	2.35	4.41	6.95	7.98	3.34	9.70	7.14	5.09	3.37
MIN	2.09	1.97	1.85	1.90	1.98	2.48	3.35	2.73	2.66	2.28	2.27	2.22

05457700 CEDAR RIVER AT CHARLES CITY, IA--Continued



05458000 LITTLE CEDAR RIVER NEAR IONIA, IA

LOCATION.--Lat 43°02'05", long 92°30'05", in SW 1/4 NE 1/4 sec.21, T.95 N., R.14 W., Chickasaw County, Hydrologic Unit 07080201, on left bank 12 ft downstream from bridge on county highway B57, 2.4 mi west of Ionia, 6.4 mi upstream from mouth, and 7.6 mi downstream from Beaver Creek.

DRAINAGE AREA.--306 mi^2.

PERIOD OF RECORD.--October 1954 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1959.

GAGE.--Water-stage recorder. Datum of gage is 973.35 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 8-16, 18-21, Nov. 3, 12, 15-24, Jan. 12-20, Feb. 2-17, and Mar. 9-16. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1954, reached a stage of 11.37 ft, discharge, 4,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	131	69	51	49	401	1420	227	259	1440	83	144
2	69	127	69	55	e46	352	1440	220	263	785	80	122
3	68	e120	70	59	e42	342	1180	216	242	583	82	125
4	64	115	70	58	e40	339	880	203	220	488	87	105
5	62	111	58	63	e42	311	698	191	203	414	99	94
6	60	107	57	68	e46	284	569	182	191	364	96	88
7	58	104	69	71	e42	265	592	180	178	335	93	82
8	e75	102	65	65	e44	255	662	193	169	313	90	76
9	e65	100	68	50	e44	e160	614	221	181	299	87	72
10	e70	97	68	31	e46	e130	517	298	192	298	84	70
11	e65	93	67	53	e48	e110	437	292	250	260	78	67
12	e70	e90	58	e46	e46	e120	382	269	492	230	76	65
13	e130	88	43	e42	e50	e130	396	245	495	208	74	64
14	e490	88	46	e36	e46	e150	387	223	409	189	71	63
15	e470	e85	63	e38	e55	e160	369	210	352	177	71	63
16	e400	e70	69	e40	e95	e170	467	216	309	161	68	61
17	370	e55	54	e40	e200	160	516	200	270	148	69	60
18	e320	e65	68	e36	395	178	487	183	368	137	68	59
19	e280	e60	67	e38	521	190	419	173	440	140	67	58
20	e260	e70	56	e40	496	182	381	163	509	130	100	59
21	e240	e70	30	41	396	198	362	154	1390	125	120	58
22	214	e65	58	41	301	237	327	148	960	134	131	57
23	202	e60	71	41	271	280	297	150	794	124	106	56
24	192	e60	62	42	305	299	273	404	1020	116	93	60
25	179	77	52	43	321	319	256	386	926	109	86	60
26	167	82	51	44	310	404	247	354	660	104	79	60
27	158	77	32	46	369	502	275	326	637	100	76	57
28	152	77	54	48	438	542	260	299	2580	95	112	54
29	145	73	57	50	---	681	248	284	3100	91	170	58
30	140	71	51	50	---	763	239	256	3270	88	228	61
31	136	---	39	52	---	1040	---	253	---	85	186	---
TOTAL	5441	2590	1811	1478	5104	9654	15597	7319	21329	8270	3010	2178
MEAN	176	86.3	58.4	47.7	182	311	520	236	711	267	97.1	72.6
MAX	490	131	71	71	521	1040	1440	404	3270	1440	228	144
MIN	58	55	30	31	40	110	239	148	169	85	67	54
AC-FT	10790	5140	3590	2930	10120	19150	30940	14520	42310	16400	5970	4320
CFSM	.57	.28	.19	.16	.60	1.02	1.70	.77	2.32	.87	.32	.24
IN.	.66	.31	.22	.18	.62	1.17	1.90	.89	2.59	1.01	.37	.26

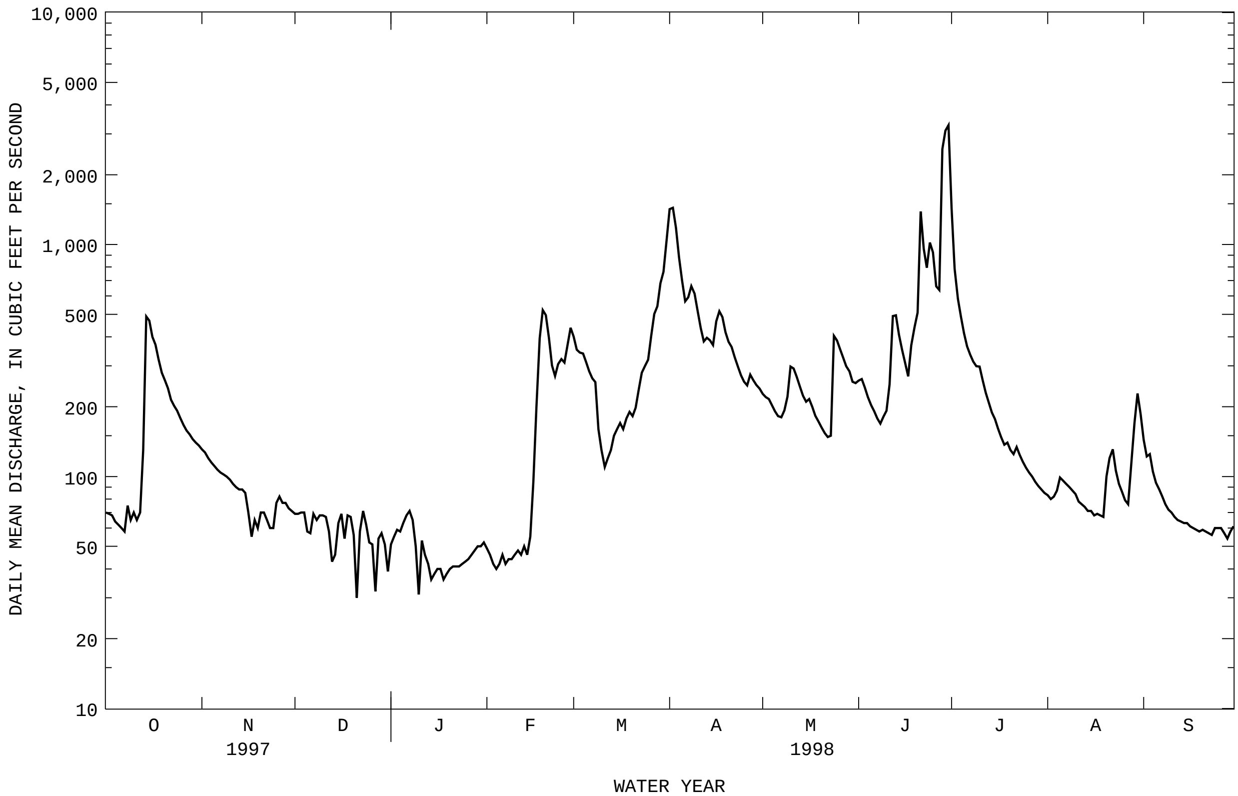
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	146	123	79.1	49.0	85.0	379	356	233	270	173	173	138
MAX	902	632	503	265	644	1056	1466	906	1136	959	1744	807
(WY)	1987	1983	1983	1973	1984	1961	1965	1991	1969	1993	1993	1965
MIN	9.64	12.4	4.93	4.20	3.40	34.5	47.3	30.5	18.4	14.2	7.23	12.7
(WY)	1990	1990	1990	1959	1959	1964	1957	1958	1989	1964	1989	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1955 - 1998	
ANNUAL TOTAL	71289		83781			
ANNUAL MEAN	195		230		184	
HIGHEST ANNUAL MEAN					584	1993
LOWEST ANNUAL MEAN					32.0	1977
HIGHEST DAILY MEAN	2480	Mar 12	3270	Jun 30	9930	Mar 27 1961
LOWEST DAILY MEAN	30	Dec 21	30	Dec 21	3.0	Feb 4 1959a
ANNUAL SEVEN-DAY MINIMUM	44	Jan 23	38	Jan 14	3.0	Feb 3 1959
INSTANTANEOUS PEAK FLOW			4270	Jun 29	14000	Aug 16 1993
INSTANTANEOUS PEAK STAGE			11.33	Jun 29	18.99	Aug 16 1993
INSTANTANEOUS LOW FLOW			15	Jan 10		
ANNUAL RUNOFF (AC-FT)	141400		166200		133300	
ANNUAL RUNOFF (CFSM)	.64		.75		.60	
ANNUAL RUNOFF (INCHES)	8.67		10.19		8.17	
10 PERCENT EXCEEDS	396		487		388	
50 PERCENT EXCEEDS	101		122		72	
90 PERCENT EXCEEDS	54		50		18	

a Also Feb 5-9, 1959
e Estimated

05458000 LITTLE CEDAR RIVER NEAR IONIA, IA--Continued



05458500 CEDAR RIVER AT JANESVILLE, IA

LOCATION.--Lat 42°38'54", long 92°27'54", in $NE^1/_4$ $SW^1/_4$ sec.35, T.91 N., R.14 W., Bremer County, Hydrologic Unit 07080201, on left bank 300 ft downstream from bridge on county highway at Janesville, 3.6 mi upstream from West Fork Cedar River, and at mile 207.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,661 mi^2.

PERIOD OF RECORD.--October 1904 to Sept. 1906, October 1914 to September 1927, October 1932 to September 1942, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "Red Cedar River at Janesville", 1905-06.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1906 (M), 1915-16 (M), 1917, 1918-19 (M), 1920-27, 1933-37 (M), 1940-42 (M), WDR IA-97-1:1996.

GAGE.--Water-stage recorder. Datum of gage is 868.26 ft above sea level. Prior to July 26, 1919, nonrecording gage at site 1,000 ft downstream at datum 4.0 ft lower. July 26, 1919 to Sept. 30, 1927, Nov. 14, 1932 to Sept 30, 1942, and Apr. 26, 1946 to Nov. 10, 1949, nonrecording gage at county bridge 300 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 17-19, Dec. 4-10, Dec. 25 to Jan. 3, 10-24, Feb. 2-18, and Mar. 10-14. Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation during low water caused by powerplant at Waverly, 10 mi upstream. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 17, 1945, reached a stage of 16.2 ft, from floodmark at site 300 ft upstream, discharge, 34,300 ft^3/s. Flood of Mar. 16, 1929, reached a stage of about 16 ft, from information by City of Waterloo, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	437	674	485	e260	383	2010	5790	1590	1400	10400	680	1820
2	406	680	491	e320	e340	1940	6380	1470	1300	8330	685	1370
3	418	676	488	e400	e260	1860	6680	1440	1270	4750	704	1140
4	395	641	e460	529	e240	1770	6570	1480	1180	3530	758	997
5	398	629	e300	428	e280	1680	5460	1300	1130	2870	822	944
6	393	614	e320	442	e300	1540	4070	1310	1070	2720	812	813
7	380	593	e360	466	e270	1450	3500	1260	1020	2560	837	787
8	537	587	e380	453	e280	1450	3260	1250	892	2370	903	692
9	397	579	e400	429	e290	1340	3260	1250	1040	2210	838	662
10	418	568	e380	e320	e300	e900	3140	1270	1120	2220	849	607
11	409	562	404	e270	e340	e700	2890	1530	1310	2510	770	592
12	450	553	384	e320	e320	e750	2620	1490	2110	2290	700	587
13	989	548	362	e240	e360	e850	2500	1440	2280	1850	680	573
14	2330	548	371	e180	e320	e900	2570	1330	2040	1710	682	566
15	2220	552	367	e250	e360	963	2420	1340	1740	1450	616	540
16	1780	523	386	e290	e400	992	2730	1210	1760	1460	604	529
17	1590	e440	403	e300	e550	994	2890	1210	1680	1190	625	503
18	1440	e500	421	e220	e700	1000	3430	1150	1680	1250	599	467
19	1300	e460	428	e250	1320	1050	3490	1120	2490	1120	567	430
20	1170	478	427	e300	2120	1070	3130	1070	2510	1080	650	490
21	1090	489	400	e320	2420	1070	2820	988	2850	1030	785	525
22	1010	528	398	e380	2230	1130	2620	840	4090	1010	872	493
23	949	524	392	e360	1910	1230	2490	956	3920	1020	984	494
24	905	518	406	e340	1440	1310	2340	1170	4540	995	1020	520
25	862	472	e360	362	1730	1390	2090	1740	4590	951	813	504
26	831	450	e320	341	1920	1600	1980	1620	4380	910	818	511
27	795	494	e280	339	1980	1830	1870	1720	4600	773	699	491
28	719	535	e300	342	2000	2210	1810	1620	4730	903	732	507
29	687	522	e320	349	---	2570	1760	1680	7560	751	830	491
30	688	502	e320	357	---	3170	1660	1580	9080	724	2070	595
31	693	---	e280	360	---	4560	---	1490	---	742	2400	---
TOTAL	27086	16439	11793	10517	25363	47279	98220	41914	81362	67679	26404	20240
MEAN	874	548	380	339	906	1525	3274	1352	2712	2183	852	675
MAX	2330	680	491	529	2420	4560	6680	1740	9080	10400	2400	1820
MIN	380	440	280	180	240	700	1660	840	892	724	567	430
AC-FT	53730	32610	23390	20860	50310	93780	194800	83140	161400	134200	52370	40150
CFSM	.53	.33	.23	.20	.55	.92	1.97	.81	1.63	1.31	.51	.41
IN.	.61	.37	.26	.24	.57	1.06	2.20	.94	1.82	1.52	.59	.45

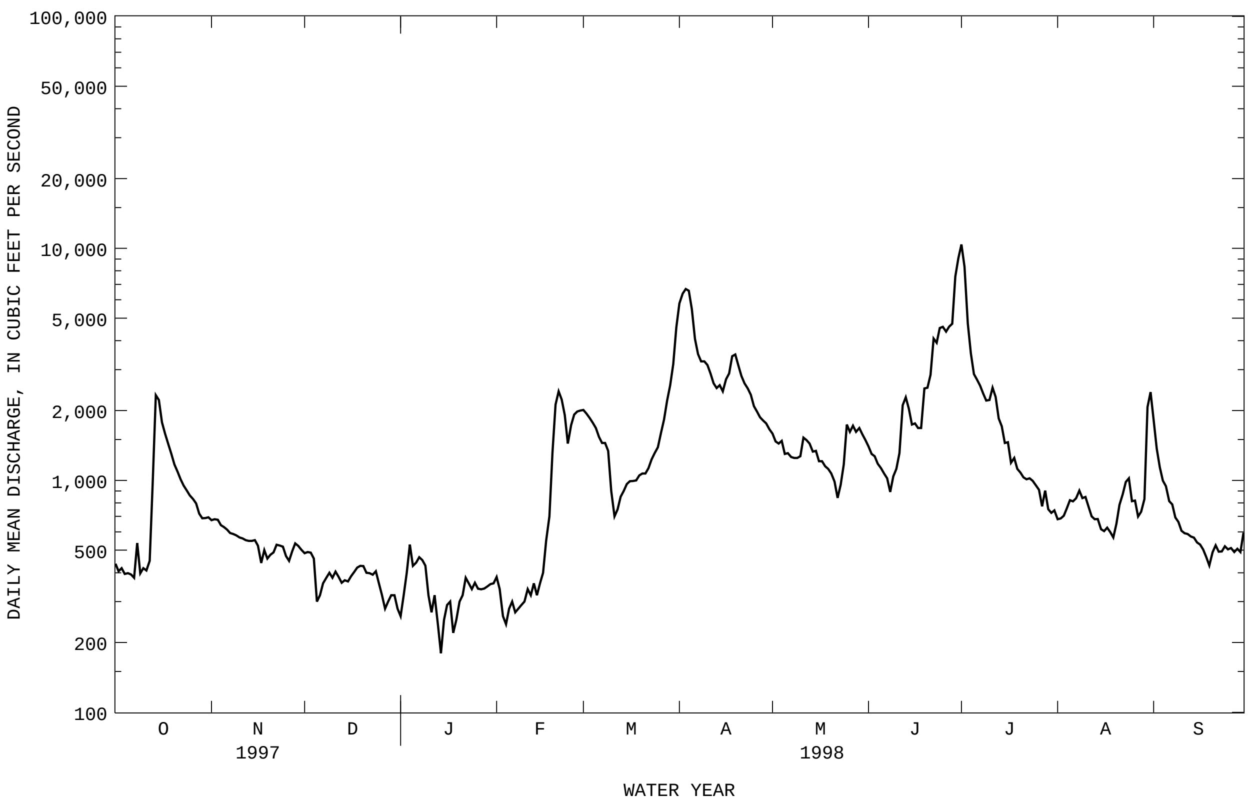
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1905 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	617	580	435	345	548	1866	1826	1214	1288	976	780	629
MAX	3793	2672	2404	1293	3393	4851	8966	5668	6223	6024	7762	2805
(WY)	1987	1983	1983	1983	1984	1973	1993	1991	1993	1993	1993	1993
MIN	101	121	75.2	80.3	61.2	124	247	134	95.2	84.7	83.6	117
(WY)	1935	1934	1934	1917	1959	1934	1957	1934	1934	1934	1934	1934

05458500 CEDAR RIVER AT JANESVILLE, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1905 - 1998	
ANNUAL TOTAL	445546		474296			
ANNUAL MEAN	1221		1299		926	
HIGHEST ANNUAL MEAN					3454	1993
LOWEST ANNUAL MEAN					187	1934
HIGHEST DAILY MEAN	10500	Mar 25	10400	Jul 1	34800	Mar 28 1961
LOWEST DAILY MEAN	280	Dec 27	180	Jan 14	28	Oct 21 1922
ANNUAL SEVEN-DAY MINIMUM	311	Dec 25	247	Jan 13	50	Feb 1 1918
INSTANTANEOUS PEAK FLOW			10700	Jul 1	37000	Mar 28 1961
INSTANTANEOUS PEAK STAGE			8.83	Jul 1	16.33	Mar 28 1961
ANNUAL RUNOFF (AC-FT)	883700		940800		671200	
ANNUAL RUNOFF (CFSM)	.73		.78		.56	
ANNUAL RUNOFF (INCHES)	9.98		10.62		7.58	
10 PERCENT EXCEEDS	2480		2620		2040	
50 PERCENT EXCEEDS	688		838		470	
90 PERCENT EXCEEDS	418		341		160	

e Estimated



05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA

LOCATION.--Lat 42°37'50", long 92°32'24", in SW$^1/_4$ SE$^1/_4$ sec.6, T.90 N., R.14 W., Black Hawk County, Hydrologic Unit 07080204, on left bank 100 ft downstream from bridge on county highway C55 at Finchford, 3.2 mi upstream from Shell Rock River, and 5.0 mi upstream from mouth.

DRAINAGE AREA.--846 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1955, published as "West Fork Shell Rock River at Finchford."

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946 (M), 1947.

GAGE.--Water-stage recorder. Datum of gage is 867.54 ft above sea level. Prior to June 10, 1955, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 17-19, 26, 27, Dec. 3-13, Dec. 25 to Jan. 3, Jan. 10 to Feb. 17, and Mar. 10-14. Records good except those for estimated daily discharges, which are poor. An authorized diversion of 2,100 acre-ft is made into Big Marsh, 16 mi upstream from gage, each year between September 1 and November 15. Net effect on daily flows at gage is unknown. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey Data Collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of about 14 ft, from information by local resident, discharge, about 12,800 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	182	153	e90	e180	718	1910	935	636	3420	287	476
2	91	182	152	e120	e160	657	2010	883	602	2840	288	382
3	85	180	e150	e160	e120	627	2040	847	571	2150	291	350
4	83	177	e130	180	e100	625	1900	804	545	1790	313	324
5	80	174	e110	182	e110	616	1610	759	523	1730	456	301
6	80	168	e130	196	e130	594	1380	716	508	1690	707	285
7	79	165	e150	205	e120	555	1250	693	496	1510	1100	273
8	81	162	e170	195	e130	542	1240	679	482	1380	1520	261
9	87	162	e180	189	e130	479	1510	669	531	1250	1610	245
10	85	161	e170	e160	e140	e340	1800	649	611	1120	1100	234
11	84	161	e180	e130	e150	e290	1870	620	736	1000	854	228
12	102	159	e160	e150	e140	e320	1630	600	1190	903	717	221
13	183	155	e150	e130	e160	e340	1410	585	1280	834	624	213
14	275	154	167	e85	e140	e380	1290	564	1300	767	559	216
15	290	158	167	e100	e150	414	1280	543	1200	715	506	211
16	272	152	164	e130	e200	434	1430	588	1110	667	461	202
17	252	e120	164	e140	e360	431	1650	588	1030	627	433	198
18	239	e140	164	e100	911	437	1970	552	1000	592	397	193
19	229	e130	166	e110	1260	475	2220	530	2160	552	369	188
20	219	145	167	e130	1360	539	2320	512	2850	529	355	189
21	215	150	146	e150	1260	596	2190	492	3100	491	523	192
22	211	151	153	e180	1020	705	2070	481	4860	441	595	201
23	208	150	152	e170	896	865	2210	474	5990	417	543	195
24	206	148	167	e150	854	998	2100	542	5920	391	490	196
25	203	138	e150	e160	854	1060	1740	568	5220	363	511	205
26	202	e120	e120	e150	832	1160	1510	569	4870	346	526	218
27	200	e130	e100	e150	810	1300	1320	578	4450	330	499	224
28	196	140	e110	e160	778	1420	1150	580	3980	314	596	228
29	192	146	e120	e160	---	1360	1040	682	3750	309	687	230
30	186	151	e120	e160	---	1400	980	753	3490	302	641	233
31	185	---	e100	e170	---	1640	---	688	---	280	550	---
TOTAL	5190	4611	4582	4642	13455	22317	50030	19723	64991	30050	19108	7312
MEAN	167	154	148	150	481	720	1668	636	2166	969	616	244
MAX	290	182	180	205	1360	1640	2320	935	5990	3420	1610	476
MIN	79	120	100	85	100	290	980	474	482	280	287	188
AC-FT	10290	9150	9090	9210	26690	44270	99230	39120	128900	59600	37900	14500
CFSM	.20	.18	.17	.18	.57	.85	1.97	.75	2.56	1.15	.73	.29
IN.	.23	.20	.20	.20	.59	.98	2.20	.87	2.86	1.32	.84	.32

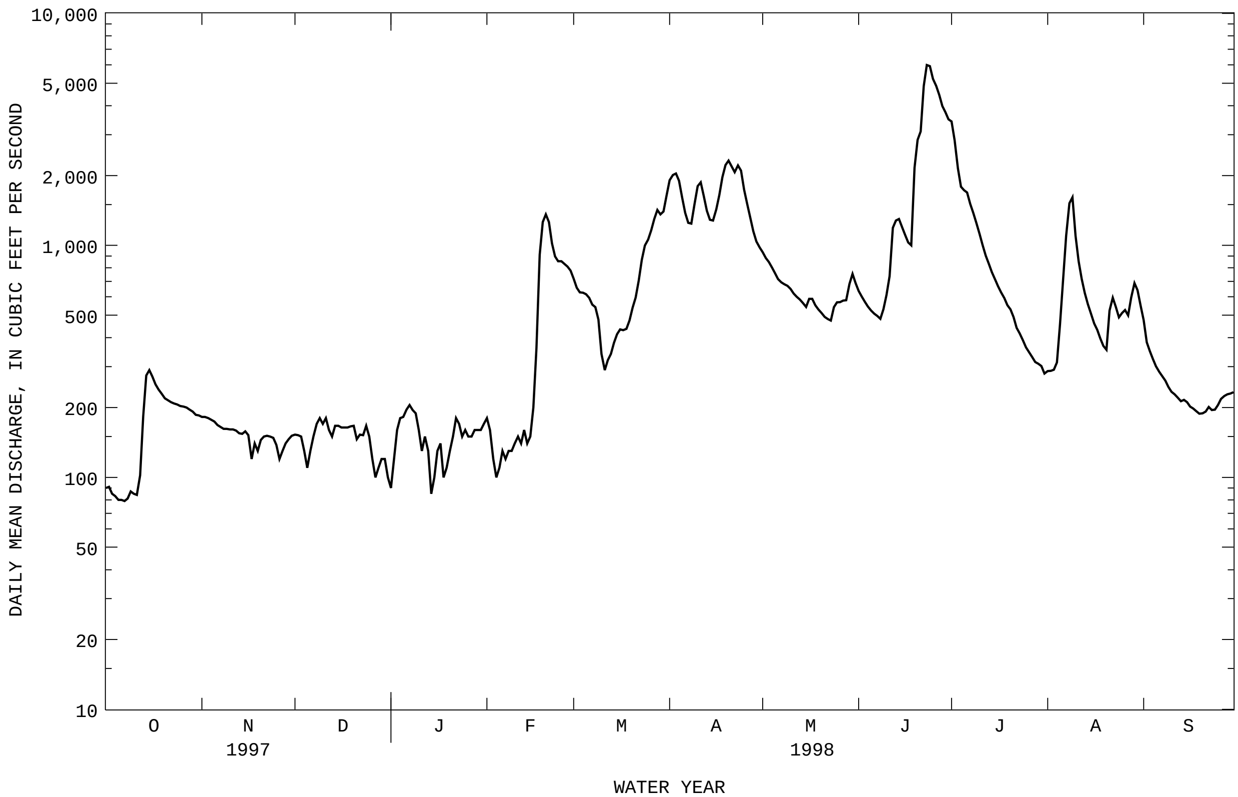
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	314	315	249	170	309	1025	1043	794	978	718	381	315
MAX	1412	1502	1165	995	2303	2456	4170	3434	3358	3995	3023	2149
(WY)	1973	1973	1983	1973	1984	1961	1965	1991	1984	1993	1993	1965
MIN	14.9	22.3	14.2	9.35	6.37	86.2	81.8	80.1	39.5	26.6	15.2	16.9
(WY)	1990	1959	1959	1959	1959	1954	1957	1957	1977	1977	1989	1989

05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1946 - 1998	
ANNUAL TOTAL	251051		246011			
ANNUAL MEAN	688		674		551	
HIGHEST ANNUAL MEAN					1800	1993
LOWEST ANNUAL MEAN					65.5	1956
HIGHEST DAILY MEAN	5460	Jun 26	5990	Jun 23	25100	Jun 27 1951
LOWEST DAILY MEAN	79	Oct 7	79	Oct 7	5.9	Feb 26 1959a
ANNUAL SEVEN-DAY MINIMUM	82	Oct 3	82	Oct 3	6.1	Feb 23 1959
INSTANTANEOUS PEAK FLOW			6250	Jun 23	31900	Jun 27 1951
INSTANTANEOUS PEAK STAGE			12.93	Jun 23	18.45	Jul 29 1990
INSTANTANEOUS LOW FLOW			78	Oct 7		
ANNUAL RUNOFF (AC-FT)	498000		488000		399500	
ANNUAL RUNOFF (CFSM)	.81		.80		.65	
ANNUAL RUNOFF (INCHES)	11.04		10.82		8.86	
10 PERCENT EXCEEDS	1890		1610		1330	
50 PERCENT EXCEEDS	315		360		240	
90 PERCENT EXCEEDS	108		130		46	

a Also Feb 27, 1959
e Estimated



05459500 WINNEBAGO RIVER AT MASON CITY, IA

LOCATION.--Lat 43°09'54", long 93°11'33", in $NE^{1}/_{4}$ $NW^{1}/_{4}$ sec.3, T.96 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, on right bank 650 ft upstream from Thirteenth Street Bridge in Mason City, 0.1 mi downstream from Calmus Creek, 1.0 mi upstream from Willow Creek, and at mile 275.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--526 mi^2.

PERIOD OF RECORD.--October 1932 to current year. Prior to December 1932, monthly discharge only, published in WSP 1308. Prior to October 1959, published as "Lime Creek at Mason City".

REVISED RECORDS.--WSP 825: 1935-36. WSP 1438: Drainage area. WSP 1558: 1933-37, 1943 (M), 1945, 1948.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,069.59 ft above sea level. Prior to Oct. 15, 1934, nonrecording gage at datum 6.47 ft lower. Oct. 15 to Nov. 6, 1934, nonrecording gage at different datum, and Nov. 7, 1934, to Mar. 22, 1935, nonrecording gage at present datum.

REMARKS.--Estimated daily discharges: Dec. 14-16, and Jan. 14-21. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	118	96	64	74	523	1140	402	433	1570	151	206
2	83	114	94	75	70	473	1030	396	498	1410	144	189
3	82	112	99	81	68	450	919	414	468	1280	177	190
4	74	113	98	79	73	429	844	403	422	1180	381	175
5	71	115	64	93	74	403	774	387	393	1100	324	161
6	69	116	58	100	75	381	715	365	373	1030	308	152
7	67	109	91	96	79	358	922	357	353	971	300	139
8	71	108	89	90	82	350	1150	364	334	891	317	126
9	89	109	91	85	83	282	1090	360	373	816	287	120
10	77	108	88	75	84	237	963	355	415	737	252	115
11	72	106	87	73	85	216	853	347	432	663	219	107
12	111	103	78	73	86	265	759	343	552	594	191	100
13	302	100	76	71	86	287	709	332	505	534	174	95
14	322	106	e74	e69	85	228	657	308	460	469	162	90
15	280	101	e73	e68	91	253	650	295	462	448	151	87
16	235	76	e72	e69	127	239	1020	299	512	447	142	86
17	209	71	74	e70	459	234	1040	338	583	400	135	86
18	192	96	91	e70	915	234	926	376	603	355	127	84
19	174	104	91	e68	1190	241	841	355	871	348	119	85
20	159	99	74	e70	1020	250	780	312	949	322	138	86
21	146	93	47	e68	930	275	742	286	2550	302	185	84
22	144	94	89	69	816	297	678	270	2200	283	184	81
23	140	82	92	64	769	319	613	303	1870	269	175	82
24	139	64	80	64	759	312	562	792	2420	251	164	89
25	128	100	79	62	713	316	518	914	2460	236	172	92
26	119	99	72	62	667	375	489	808	2230	221	153	93
27	116	95	51	63	632	444	464	704	2120	205	143	90
28	117	98	76	65	581	635	445	602	2390	190	183	88
29	115	101	71	68	---	828	421	517	2030	178	217	106
30	114	100	69	69	---	871	413	460	1780	167	225	106
31	119	---	60	71	---	934	---	447	---	157	220	---
TOTAL	4216	3010	2444	2264	10773	11939	23127	13211	32041	18024	6220	3390
MEAN	136	100	78.8	73.0	385	385	771	426	1068	581	201	113
MAX	322	118	99	100	1190	934	1150	914	2550	1570	381	206
MIN	67	64	47	62	68	216	413	270	334	157	119	81
AC-FT	8360	5970	4850	4490	21370	23680	45870	26200	63550	35750	12340	6720
CFSM	.26	.19	.15	.14	.73	.73	1.47	.81	2.03	1.11	.38	.21
IN.	.30	.21	.17	.16	.76	.84	1.64	.93	2.27	1.27	.44	.24

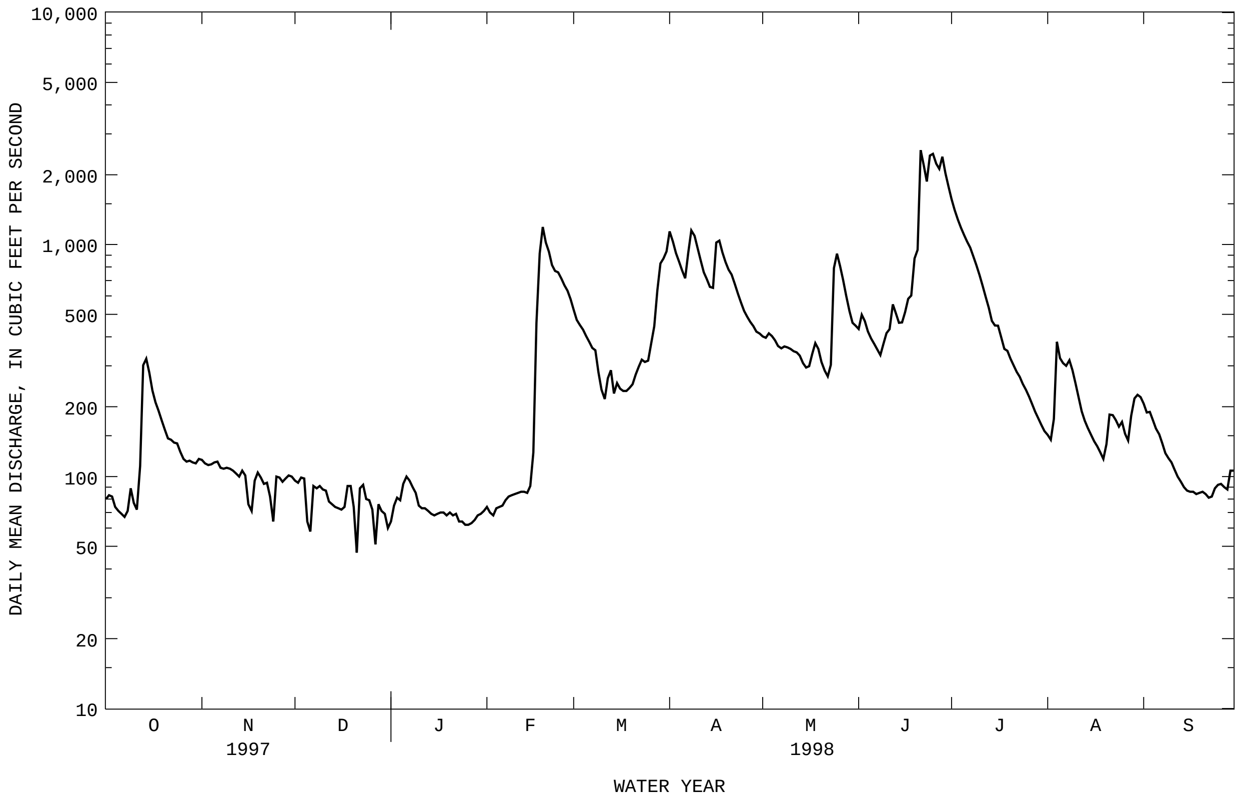
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	172	167	112	75.5	119	528	597	404	474	301	214	182
MAX	840	811	724	378	1002	1707	2880	1807	2160	1915	2054	1073
(WY)	1966	1942	1983	1983	1984	1973	1965	1991	1993	1993	1979	1938
MIN	11.3	12.7	7.45	6.61	7.50	17.6	61.0	16.1	21.9	7.29	4.89	12.6
(WY)	1935	1934	1934	1977	1959	1934	1957	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1933 - 1998	
ANNUAL TOTAL	134522		130659			
ANNUAL MEAN	369		358		279	
HIGHEST ANNUAL MEAN					947	1993
LOWEST ANNUAL MEAN					28.1	1934
HIGHEST DAILY MEAN	2930	Mar 21	2550	Jun 21	9370	Mar 27 1961
LOWEST DAILY MEAN	47	Dec 21	47	Dec 21	1.2	Aug 19 1989
ANNUAL SEVEN-DAY MINIMUM	68	Dec 25	64	Jan 23	3.1	Dec 29 1933
INSTANTANEOUS PEAK FLOW			2750	Jun 24	10800	Mar 30 1933
INSTANTANEOUS PEAK STAGE			8.01	Jun 24	15.70	Mar 30 1933
INSTANTANEOUS LOW FLOW			32	Dec 6	.86	Aug 18 1988a
ANNUAL RUNOFF (AC-FT)	266800		259200		202200	
ANNUAL RUNOFF (CFSM)	.70		.68		.53	
ANNUAL RUNOFF (INCHES)	9.51		9.24		7.21	
10 PERCENT EXCEEDS	793		871		705	
50 PERCENT EXCEEDS	164		189		111	
90 PERCENT EXCEEDS	76		72		20	

a Also Aug 19, 1988
e Estimated

05459500 WINNEBAGO RIVER AT MASON CITY, IA--Continued



05460000 CLEAR LAKE AT CLEAR LAKE, IA

LOCATION.--Lat 43°08'01", long 93°22'57", in SE 1/4 NE 1/4 sec.13, T.96 N., R.22 W., Cerro Gordo County, Hydrologic Unit 07080203, at the public bathing beach in the town of Clear Lake, near dam across Clear Creek.

DRAINAGE AREA.--22.6 mi^2.

PERIOD OF RECORD.--May 1933 to current year. No winter records 1933-52. Record fragmentary November 1952 to June 1959.

GAGE.--Water-stage recorder. Datum of gage is 1,222.24 ft above sea level, and 4.60 ft below crest of spillway of dam at outlet. See WSP 1708 for history of changes prior to June 25, 1959.

REMARKS.--Lake is formed by concrete dam on Clear Creek with ungated overflow spillway 50 ft long at elevation 1,226.84 ft above sea level. Dam constructed in 1903. A previous outlet works had been constructed in 1887. Lake is used for conservation and recreation. Area of lake is approximately 3,600 acres. U.S. Geological Survey satellite data collection platform at station.

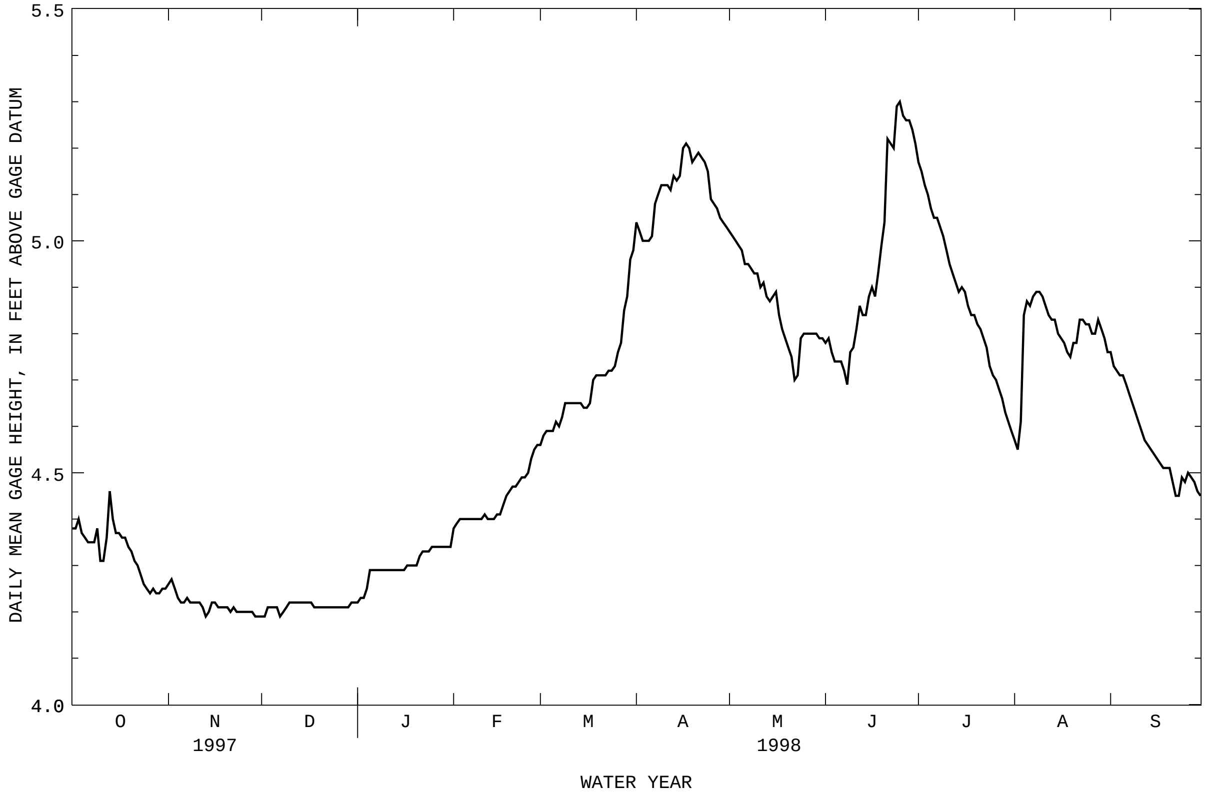
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.94 ft July 3, 1951; minimum observed, 0.76 ft Oct. 26, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, (a) 5.41 ft June 23; minimum, 4.19 ft Nov. 13, Nov. 29 to Dec. 2, and Dec. 7 as affected by wind.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.38	4.26	4.19	4.22	4.38	4.56	5.04	5.02	4.78	5.17	4.57	4.76
2	4.38	4.27	4.19	4.23	4.39	4.58	5.02	5.01	4.79	5.15	4.55	4.73
3	4.40	4.25	4.21	4.23	4.40	4.59	5.00	5.00	4.76	5.12	4.61	4.72
4	4.37	4.23	4.21	4.25	4.40	4.59	5.00	4.99	4.74	5.10	4.84	4.71
5	4.36	4.22	4.21	4.29	4.40	4.59	5.00	4.98	4.74	5.07	4.87	4.71
6	4.35	4.22	4.21	4.29	4.40	4.61	5.01	4.95	4.74	5.05	4.86	4.69
7	4.35	4.23	4.19	4.29	4.40	4.60	5.08	4.95	4.72	5.05	4.88	4.67
8	4.35	4.22	4.20	4.29	4.40	4.62	5.10	4.94	4.69	5.03	4.89	4.65
9	4.38	4.22	4.21	4.29	4.40	4.65	5.12	4.93	4.76	5.01	4.89	4.63
10	4.31	4.22	4.22	4.29	4.40	4.65	5.12	4.93	4.77	4.98	4.88	4.61
11	4.31	4.22	4.22	4.29	4.41	4.65	5.12	4.90	4.81	4.95	4.86	4.59
12	4.36	4.21	4.22	4.29	4.40	4.65	5.11	4.91	4.86	4.93	4.84	4.57
13	4.46	4.19	4.22	4.29	4.40	4.65	5.14	4.88	4.84	4.91	4.83	4.56
14	4.40	4.20	4.22	4.29	4.40	4.65	5.13	4.87	4.84	4.89	4.83	4.55
15	4.37	4.22	4.22	4.29	4.41	4.64	5.14	4.88	4.88	4.90	4.80	4.54
16	4.37	4.22	4.22	4.29	4.41	4.64	5.20	4.89	4.90	4.89	4.79	4.53
17	4.36	4.21	4.22	4.30	4.43	4.65	5.21	4.84	4.88	4.86	4.78	4.52
18	4.36	4.21	4.21	4.30	4.45	4.70	5.20	4.81	4.93	4.84	4.76	4.51
19	4.34	4.21	4.21	4.30	4.46	4.71	5.17	4.79	4.99	4.84	4.75	4.51
20	4.33	4.21	4.21	4.30	4.47	4.71	5.18	4.77	5.04	4.82	4.78	4.51
21	4.31	4.20	4.21	4.32	4.47	4.71	5.19	4.75	5.22	4.81	4.78	4.48
22	4.30	4.21	4.21	4.33	4.48	4.71	5.18	4.70	5.21	4.79	4.83	4.45
23	4.28	4.20	4.21	4.33	4.49	4.72	5.17	4.71	5.20	4.77	4.83	4.45
24	4.26	4.20	4.21	4.33	4.49	4.72	5.15	4.79	5.29	4.73	4.82	4.49
25	4.25	4.20	4.21	4.34	4.50	4.73	5.09	4.80	5.30	4.71	4.82	4.48
26	4.24	4.20	4.21	4.34	4.53	4.76	5.08	4.80	5.27	4.70	4.80	4.50
27	4.25	4.20	4.21	4.34	4.55	4.78	5.07	4.80	5.26	4.68	4.80	4.49
28	4.24	4.20	4.21	4.34	4.56	4.85	5.05	4.80	5.26	4.66	4.83	4.48
29	4.24	4.19	4.21	4.34	---	4.88	5.04	4.80	5.24	4.63	4.81	4.46
30	4.25	4.19	4.22	4.34	---	4.96	5.03	4.79	5.21	4.61	4.79	4.45
31	4.25	---	4.22	4.34	---	4.98	---	4.79	---	4.59	4.76	---
MEAN	4.33	4.21	4.21	4.30	4.44	4.69	5.10	4.86	4.96	4.88	4.80	4.57
MAX	4.46	4.27	4.22	4.34	4.56	4.98	5.21	5.02	5.30	5.17	4.89	4.76
MIN	4.24	4.19	4.19	4.22	4.38	4.56	5.00	4.70	4.69	4.59	4.55	4.45

05460000 CLEAR LAKE AT CLEAR LAKE, IA--Continued



05461390 FLOOD CREEK NEAR POWERSVILLE, IA

LOCATION.--Lat 42°54'26", long 92°43'14", in $SW^1/_4$ $SW^1/_4$ $SE^1/_4$ sec.34, T.94 N., R.16 W., Butler County, Hydrologic Unit 07080202, on left bank 20 ft downstream of bridge on Floyd Line Road, 5.0 miles upstream of the confluence with the Shell Rock River, and 4.0 miles east of Greene.

DRAINAGE AREA.--127 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 24, 1995 to September 30, 1998. (discontinued)

GAGE.--Water-stage recorder. Datum of gage is 965 ft above sea level, from map.

REMARKS.--Estimated daily discharges: Nov. 16-20, 25, Dec. 5-13, 21-31, Jan. 5-30, Feb. 5-15, and Mar. 8-18. Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

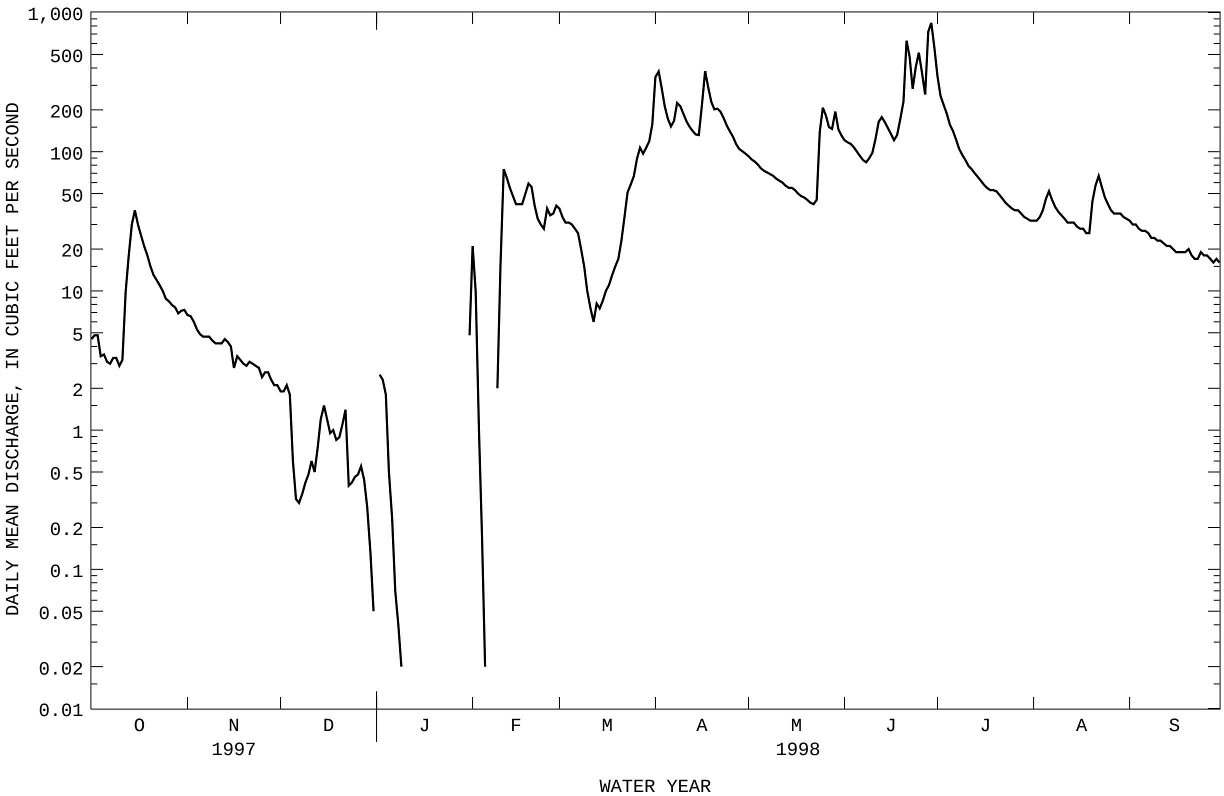
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	6.7	1.9	.00	21	39	344	93	121	351	32	32
2	4.8	6.6	1.9	2.5	9.9	34	377	88	117	252	32	30
3	4.8	6.0	2.1	2.3	1.0	31	285	85	114	216	34	30
4	3.4	5.3	1.8	1.8	.17	31	211	81	108	187	38	28
5	3.5	4.9	e.60	e.50	e.02	30	172	76	100	156	46	27
6	3.1	4.7	e.32	e.23	e.00	28	152	73	93	141	52	27
7	3.0	4.7	e.30	e.07	e.00	26	167	71	87	122	45	26
8	3.3	4.7	e.35	e.04	e.00	e20	224	69	84	105	40	24
9	3.3	4.4	e.42	e.02	e2.0	e15	212	67	90	95	37	24
10	2.9	4.2	e.48	e.00	e15	e10	187	64	98	87	35	23
11	3.2	4.2	e.60	e.00	e75	e7.5	165	62	123	79	33	23
12	9.9	4.2	e.50	e.00	e65	e6.0	151	60	164	75	31	22
13	18	4.5	e.75	e.00	e55	e8.1	141	57	177	70	31	21
14	30	4.3	1.2	e.00	e48	e7.5	133	55	163	66	31	21
15	38	4.0	1.5	e.00	e42	e8.5	132	55	148	62	29	20
16	30	e2.8	1.2	e.00	42	e10	221	53	134	58	28	19
17	25	e3.4	.95	e.00	42	e11	380	50	121	55	28	19
18	21	e3.2	1.0	e.00	50	e13	291	48	132	53	26	19
19	18	e3.0	.85	e.00	59	15	228	47	173	53	26	19
20	15	e2.9	.89	e.00	56	17	202	45	229	52	44	20
21	13	3.1	e1.1	e.00	41	23	204	43	627	49	57	18
22	12	3.0	e1.4	e.00	33	34	194	42	482	46	67	17
23	11	2.9	e.40	e.00	30	51	174	45	283	43	56	17
24	10	2.8	e.42	e.00	28	58	154	139	406	41	47	19
25	8.8	e2.4	e.46	e.00	39	67	140	207	515	39	42	18
26	8.4	2.6	e.48	e.00	35	89	128	182	365	38	38	18
27	7.9	2.6	e.55	e.00	36	107	114	150	258	38	36	17
28	7.6	2.3	e.44	e.00	41	97	105	146	727	36	36	16
29	6.9	2.1	e.28	e.00	---	107	101	194	843	34	36	17
30	7.2	2.1	e.13	e.00	---	119	97	145	559	33	34	16
31	7.3	---	e.05	4.8	---	158	---	131	---	32	33	---
TOTAL	344.8	114.6	25.32	12.26	866.09	1277.6	5786	2723	7641	2764	1180	647
MEAN	11.1	3.82	.82	.40	30.9	41.2	193	87.8	255	89.2	38.1	21.6
MAX	38	6.7	2.1	4.8	75	158	380	207	843	351	67	32
MIN	2.9	2.1	.05	.00	.00	6.0	97	42	84	32	26	16
AC-FT	684	227	50	24	1720	2530	11480	5400	15160	5480	2340	1280
CFSM	.09	.03	.01	.00	.25	.33	1.56	.71	2.05	.72	.31	.17
IN.	.10	.03	.01	.00	.26	.38	1.74	.82	2.29	.83	.35	.19

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5.59	2.80	.69	.19	12.9	147	103	80.0	155	81.0	28.0	11.4
MAX	11.1	4.30	1.00	.40	30.9	396	193	142	255	120	38.1	21.6
(WY)	1998	1996	1996	1998	1998	1997	1998	1997	1998	1997	1998	1998
MIN	.065	.27	.25	.082	.77	2.53	4.83	10.7	65.8	33.7	9.20	2.75
(WY)	1997	1997	1997	1997	1996	1996	1996	1996	1997	1996	1996	1996

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1996 - 1998	
ANNUAL TOTAL	27827.59		23381.67			
ANNUAL MEAN	76.2		64.1		69.5	
HIGHEST ANNUAL MEAN					75.0	1997
LOWEST ANNUAL MEAN					64.1	1998
HIGHEST DAILY MEAN	781	Mar 11	843	Jun 29	843	Jun 29 1998
LOWEST DAILY MEAN	.00	Jan 6	.00	Jan 1a	.00	Jan 6 1996a
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 6	.00	Jan 10	.00	Jan 6 1996
INSTANTANEOUS PEAK FLOW			1130	Jun 28	1130	Jun 28 1998
INSTANTANEOUS PEAK STAGE			8.49	Jun 28	8.49	Jun 28 1998
ANNUAL RUNOFF (AC-FT)	55200		46380		50360	
ANNUAL RUNOFF (CFSM)	.61		.52		.56	
ANNUAL RUNOFF (INCHES)	8.35		7.01		7.62	
10 PERCENT EXCEEDS	214		169		150	
50 PERCENT EXCEEDS	22		30		8.8	
90 PERCENT EXCEEDS	.10		.34		.00	

a Many days
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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05461390 FLOOD CREEK NEAR POWERSVILLE, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--October 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

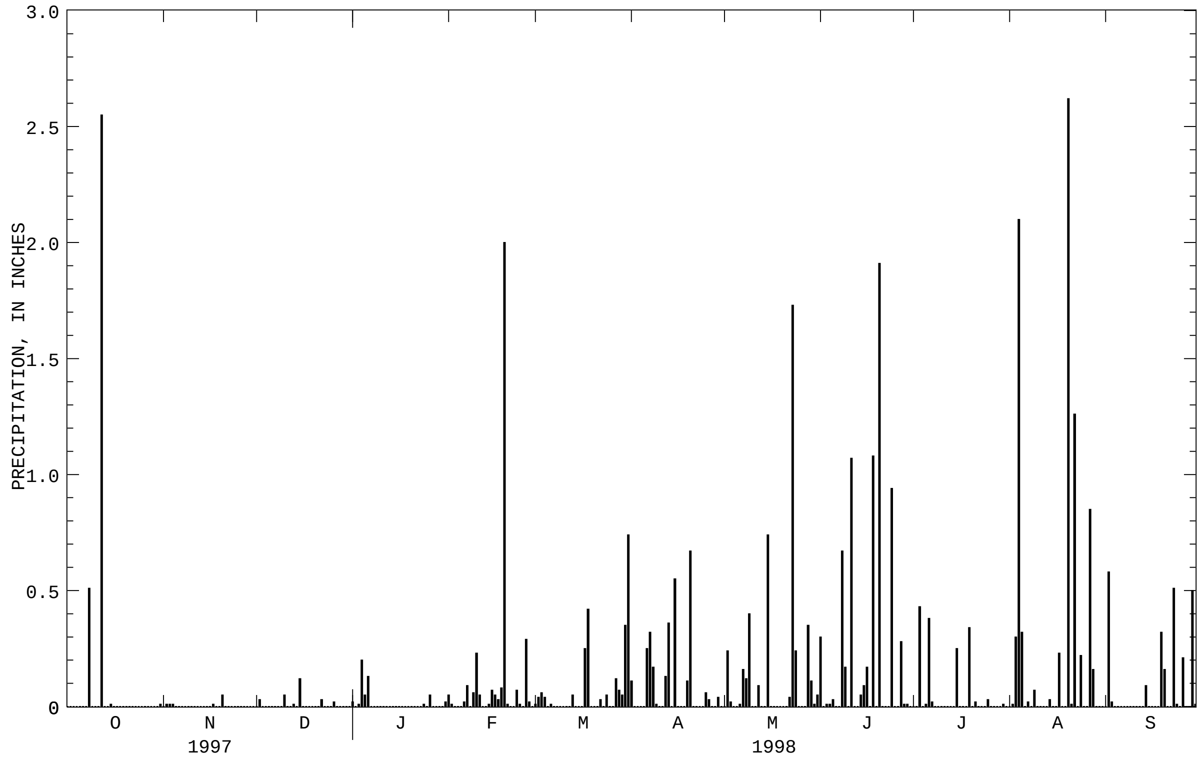
REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 4.65 in., June 20, 1977.

EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.62 in., Aug. 20.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.02	.05	.01	.11	.00	.30	.00	.00	.00
2	.00	.01	.03	.00	.01	.04	.00	.24	.00	.00	.01	.58
3	.00	.01	.00	.01	.00	.06	.00	.02	.01	.43	.30	.02
4	.00	.01	.00	.20	.00	.04	.00	.00	.01	.00	2.10	.00
5	.00	.00	.00	.05	.00	.00	.00	.00	.03	.01	.32	.00
6	.00	.00	.00	.13	.02	.01	.25	.01	.00	.38	.00	.00
7	.00	.00	.00	.00	.09	.00	.32	.16	.00	.02	.02	.00
8	.51	.00	.00	.00	.00	.00	.17	.12	.67	.00	.00	.00
9	.00	.00	.00	.00	.06	.00	.01	.40	.17	.00	.07	.00
10	.00	.00	.05	.00	.23	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.05	.00	.00	.00	1.07	.00	.00	.00
12	2.55	.00	.00	.00	.00	.00	.13	.09	.00	.00	.00	.00
13	.00	.00	.01	.00	.00	.05	.36	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.01	.00	.00	.00	.05	.00	.03	.09
15	.01	.00	.12	.00	.07	.00	.55	.74	.09	.25	.00	.00
16	.00	.00	.00	.00	.05	.00	.00	.00	.17	.00	.00	.00
17	.00	.01	.00	.00	.03	.25	.00	.00	.00	.00	.23	.00
18	.00	.00	.00	.00	.08	.42	.00	.00	1.08	.00	.00	.00
19	.00	.00	.00	.00	2.00	.00	.11	.00	.00	.34	.00	.32
20	.00	.05	.00	.00	.01	.00	.67	.00	1.91	.00	2.62	.16
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.01	.00
22	.00	.00	.03	.00	.00	.03	.00	.04	.00	.00	1.26	.00
23	.00	.00	.00	.00	.07	.00	.00	1.73	.00	.00	.00	.51
24	.00	.00	.00	.01	.01	.05	.00	.24	.94	.00	.22	.01
25	.00	.00	.00	.00	.00	.00	.06	.00	.00	.03	.00	.00
26	.00	.00	.02	.05	.29	.00	.03	.00	.00	.00	.00	.21
27	.00	.00	.00	.00	.02	.12	.00	.00	.28	.00	.85	.00
28	.00	.00	.00	.00	.00	.07	.00	.35	.01	.00	.16	.00
29	.00	.00	.00	.00	---	.05	.04	.11	.01	.00	.00	.50
30	.00	.00	.00	.00	---	.35	.00	.01	.00	.01	.00	.01
31	.01	---	.00	.02	---	.74	---	.05	---	.00	.00	---
TOTAL	3.08	0.09	0.26	0.49	3.15	2.29	2.81	4.31	6.80	1.49	8.20	2.41
MEAN	.10	.00	.01	.02	.11	.07	.09	.14	.23	.05	.26	.08
MAX	2.55	.05	.12	.20	2.00	.74	.67	1.73	1.91	.43	2.62	.58
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00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05462000 SHELL ROCK RIVER AT SHELL ROCK, IA

LOCATION.--Lat 42°42'43", long 92°34'58", in NW $^1/_4$ NE $^1/_4$ sec.11, T.91 N., R.15 W., Butler County, Hydrologic Unit 07080202 on right bank 400 ft upstream from bridge on county highway C45 in Shell Rock, 2.2 mi downstream from Curry Creek, and 10.4 mi upstream from mouth.

DRAINAGE AREA.--1,746 mi^2.

PERIOD OF RECORD.--June 1953 to current year. Prior to July 1953, monthly discharge only, published in WSP 1728.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Rockfill dam since Oct. 19, 1957. Datum of gage is 885.34 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 4-6, Jan. 14-19, and Feb. 3-5. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1856 reached a stage of 17.7 ft at bridge 400 ft downstream, from information provided by U.S. Army Corps of Engineers, discharge, about 45,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	412	478	400	297	319	1530	3970	1590	1640	5620	753	1190
2	409	478	395	325	316	1390	4740	1540	1590	5030	734	1110
3	401	475	405	351	e280	1290	4390	1520	1610	4490	739	1050
4	384	473	e380	357	e260	1240	3840	1490	1530	3950	798	1040
5	375	473	e290	364	e280	1200	3410	1430	1460	3400	1240	975
6	363	468	e300	381	295	1140	3060	1370	1350	3360	1490	901
7	353	460	318	394	297	1080	2950	1320	1260	2950	1330	839
8	357	453	337	398	306	1070	3720	1290	1270	2700	1230	781
9	379	447	391	364	309	998	4040	1290	1520	2490	1190	741
10	391	443	390	215	318	718	3690	1290	1380	2270	1120	707
11	385	440	386	310	325	612	3210	1240	1900	2070	1030	672
12	412	437	375	304	317	598	2820	1230	2030	1840	934	649
13	544	432	349	287	316	691	2600	1200	2160	1670	866	627
14	961	425	340	e210	318	782	2490	1150	2020	1600	816	614
15	984	440	353	e240	320	758	2350	1120	1840	1480	789	598
16	882	430	368	e260	383	746	3040	1150	1870	1430	752	578
17	782	376	376	e270	547	742	4590	1100	1900	1360	732	566
18	721	354	355	e250	1280	754	4250	1110	2250	1270	706	558
19	680	387	373	e260	2140	753	3530	1140	3540	1210	675	546
20	636	408	380	274	2300	754	3150	1120	3310	1210	712	553
21	603	434	331	276	2080	802	3160	1060	5510	1140	1110	534
22	576	414	312	284	1980	918	3030	1010	7060	1090	1190	519
23	559	419	338	290	1890	1050	2700	1020	6370	1050	1220	519
24	549	366	382	288	1930	1130	2420	1890	5810	994	1040	556
25	537	358	346	288	1830	1160	2190	2560	6970	953	972	556
26	523	380	338	292	1750	1300	2040	2640	7010	916	930	547
27	506	422	281	295	1700	1540	1870	2530	6140	881	862	541
28	494	422	309	297	1650	1660	1770	2250	6220	855	851	515
29	491	415	317	304	---	2170	1690	2280	7680	841	931	524
30	485	407	320	307	---	2720	1620	1880	7080	814	1250	543
31	478	---	244	308	---	3160	---	1710	---	780	1250	---
TOTAL	16612	12814	10779	9340	26036	36456	92330	46520	103280	61714	30242	20649
MEAN	536	427	348	301	930	1176	3078	1501	3443	1991	976	688
MAX	984	478	405	398	2300	3160	4740	2640	7680	5620	1490	1190
MIN	353	354	244	210	260	598	1620	1010	1260	780	675	515
AC-FT	32950	25420	21380	18530	51640	72310	183100	92270	204900	122400	59990	40960
CFSM	.31	.24	.20	.17	.53	.67	1.76	.86	1.97	1.14	.56	.39
IN.	.35	.27	.23	.20	.55	.78	1.97	.99	2.20	1.31	.64	.44

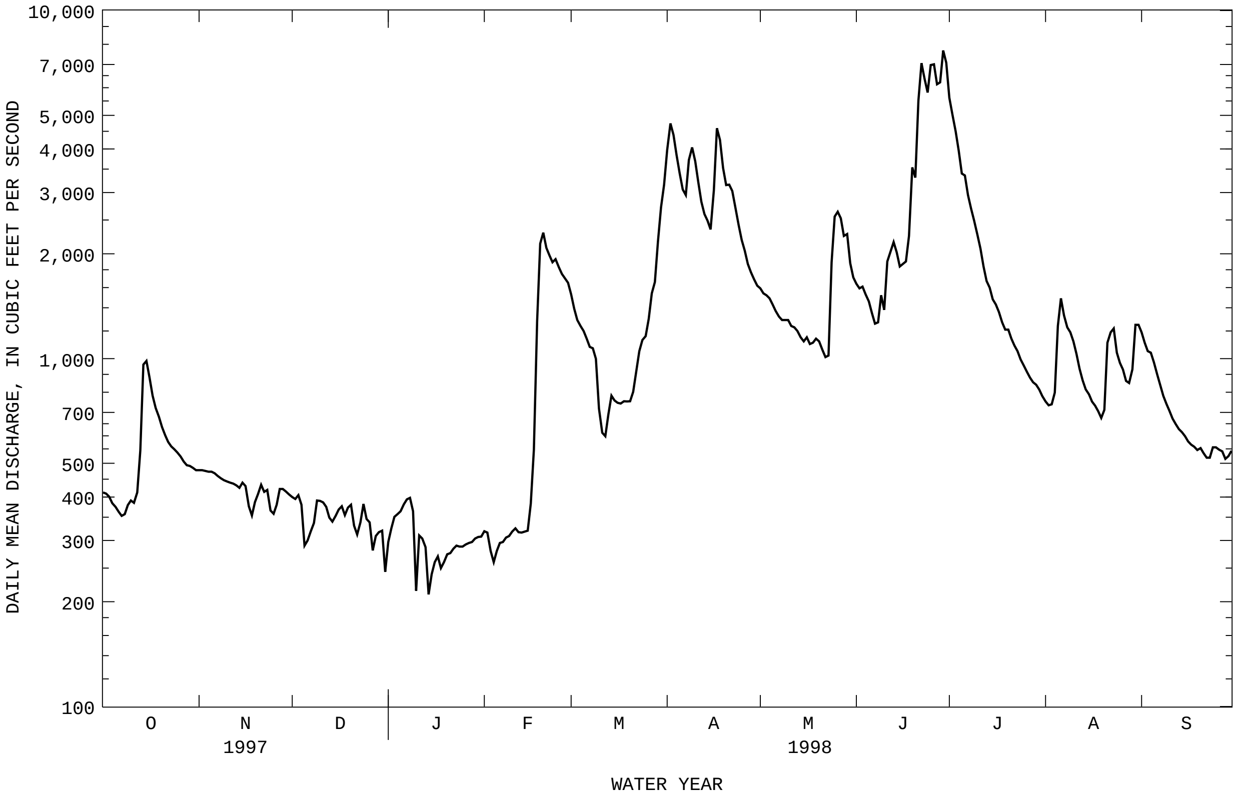
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	744	687	525	352	495	1699	2027	1555	1691	1250	893	719
MAX	2544	2326	2381	1375	2833	5426	8540	5889	6239	6461	5637	2816
(WY)	1987	1983	1983	1983	1984	1992	1965	1991	1993	1993	1979	1993
MIN	74.1	77.7	39.8	45.6	44.7	193	226	243	138	114	66.7	96.6
(WY)	1990	1990	1990	1959	1959	1968	1957	1958	1977	1977	1989	1989

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1954 - 1998	
ANNUAL TOTAL	501614		466772			
ANNUAL MEAN	1374		1279		1055	
HIGHEST ANNUAL MEAN					3231	1993
LOWEST ANNUAL MEAN					171	1977
HIGHEST DAILY MEAN	10900	Mar 12	7680	Jun 29	32100	Mar 28 1961
LOWEST DAILY MEAN	244	Dec 31	210	Jan 14	27	Dec 22 1989a
ANNUAL SEVEN-DAY MINIMUM	308	Dec 25	252	Jan 14	29	Dec 16 1989
INSTANTANEOUS PEAK FLOW			7860	Jun 29	33500	Mar 28 1961
INSTANTANEOUS PEAK STAGE			11.83	Jun 29	16.26	Mar 28 1961
INSTANTANEOUS LOW FLOW			168	Jan 10		
ANNUAL RUNOFF (AC-FT)	995000		925800		764200	
ANNUAL RUNOFF (CFSM)	.79		.73		.60	
ANNUAL RUNOFF (INCHES)	10.69		9.94		8.21	
10 PERCENT EXCEEDS	3010		2980		2470	
50 PERCENT EXCEEDS	710		802		537	
90 PERCENT EXCEEDS	374		314		151	

a Ice affected
e Estimated

05462000 SHELL ROCK RIVER AT SHELL ROCK, IA--Continued



05463000 BEAVER CREEK AT NEW HARTFORD, IA

LOCATION.--Lat 42°34'22", long 92°37'04", in $SE^1/_4$ $SE^1/_4$ sec.28, T.90 N., R.15 W., Butler County, Hydrologic Unit 07080205, on right bank 5 ft. from right end of bridge on county highway T55, 0.2 mi north of New Hartford, and 8 mi upstream from mouth.

DRAINAGE AREA.--347 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to April 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1948-49. WSP 1708: 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 882.44 ft. above sea level. Prior to July 14, 1959, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 2-6, Dec. 5-8, Dec. 26 to Feb. 15, and Apr. 4-13. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	85	76	e38	e75	311	1200	417	490	1470	97	82
2	47	e84	72	e42	e70	286	1040	397	432	1120	93	77
3	46	e83	72	e46	e50	299	835	383	374	949	95	74
4	45	e82	72	e50	e46	318	e750	364	342	840	105	69
5	45	e81	e44	e60	e55	304	e700	339	324	743	129	66
6	45	e80	e46	e65	e60	289	e650	325	304	677	132	63
7	43	78	e50	e70	e55	277	e550	327	287	645	123	61
8	45	85	e55	e75	e55	254	e500	321	278	588	115	57
9	53	83	62	e80	e60	124	e460	303	400	531	110	56
10	53	81	62	e70	e70	107	e440	290	680	487	99	55
11	50	79	59	e60	e70	128	e420	280	692	445	89	53
12	57	76	52	e65	e65	152	e400	278	1300	407	85	51
13	266	78	47	e42	e85	235	e420	266	1300	375	82	50
14	367	76	58	e32	e80	272	450	251	918	343	81	51
15	220	75	67	e36	e110	231	471	247	998	314	78	52
16	170	63	65	e40	679	218	598	270	1080	289	74	49
17	144	70	64	e42	920	213	807	259	848	261	75	48
18	129	85	65	e36	750	222	699	246	792	240	74	46
19	119	80	61	e42	609	287	601	240	1780	227	70	46
20	108	75	55	e48	521	348	688	230	3690	210	69	49
21	101	70	54	e55	454	408	1220	223	3040	195	98	53
22	97	68	61	e60	422	530	1150	218	6030	181	108	49
23	95	64	70	e55	409	709	876	219	3510	167	93	46
24	93	63	64	e50	404	735	741	331	2250	153	102	50
25	89	75	60	e55	382	709	645	418	2760	143	108	50
26	87	75	e50	e60	361	954	590	435	2540	137	100	51
27	88	68	e42	e65	364	1040	525	386	1460	130	89	50
28	85	68	e44	e60	345	775	478	354	1450	122	98	47
29	84	68	e46	e70	---	603	457	550	2450	114	108	51
30	83	73	e44	e65	---	581	447	818	2470	108	111	66
31	86	---	e40	e70	---	954	---	622	---	103	90	---
TOTAL	3087	2271	1779	1704	7626	12873	19808	10607	45269	12714	2980	1668
MEAN	99.6	75.7	57.4	55.0	272	415	660	342	1509	410	96.1	55.6
MAX	367	85	76	80	920	1040	1220	818	6030	1470	132	82
MIN	43	63	40	32	46	107	400	218	278	103	69	46
AC-FT	6120	4500	3530	3380	15130	25530	39290	21040	89790	25220	5910	3310
CFSM	.29	.22	.17	.16	.78	1.20	1.90	.99	4.35	1.18	.28	.16
IN.	.33	.24	.19	.18	.82	1.38	2.12	1.14	4.85	1.36	.32	.18

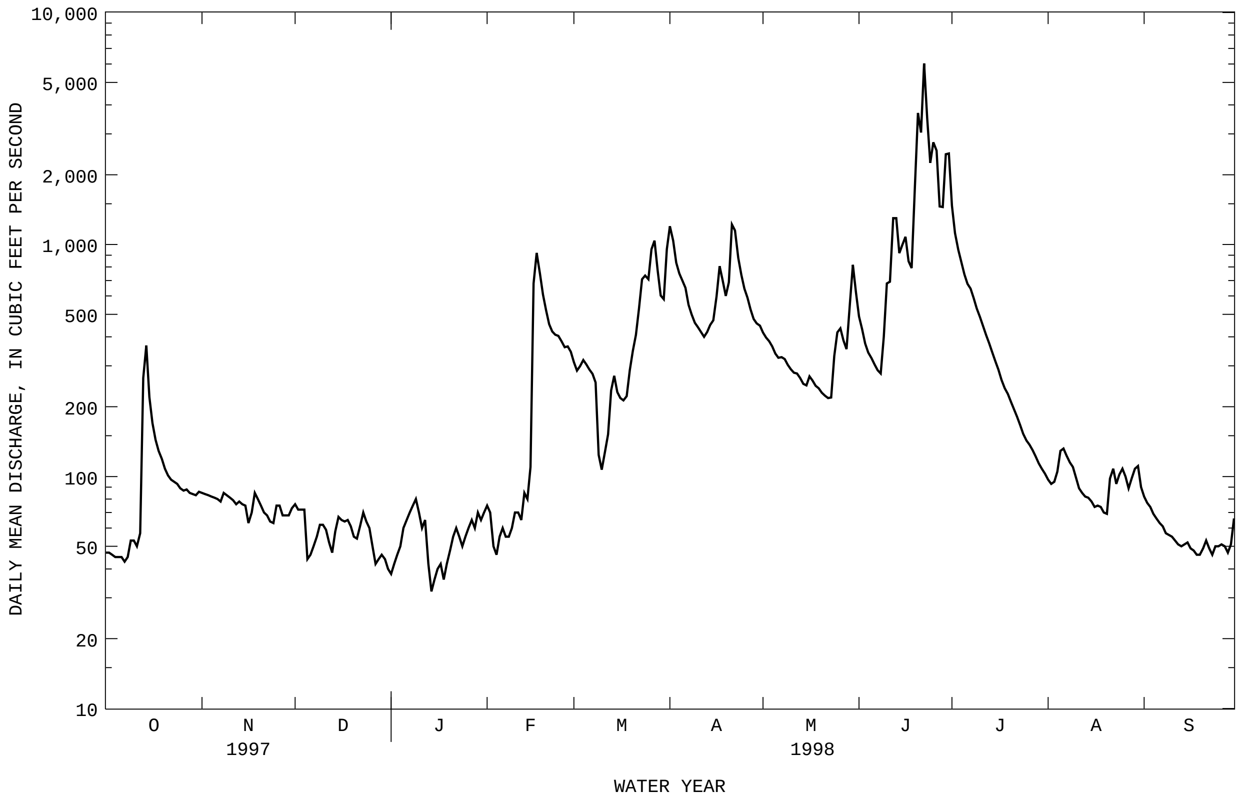
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	117	125	87.4	74.6	154	468	389	321	409	263	145	109
MAX	495	673	514	403	651	1606	1578	1606	2213	1686	1368	1028
(WY)	1987	1973	1983	1946	1983	1993	1993	1991	1947	1993	1993	1965
MIN	4.98	8.80	7.13	2.88	3.84	28.1	33.8	23.2	12.5	4.47	4.22	6.02
(WY)	1957	1957	1990	1956	1956	1954	1954	1977	1956	1956	1989	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1946 - 1998	
ANNUAL TOTAL	94983		122386			
ANNUAL MEAN	260		335		222	
HIGHEST ANNUAL MEAN					874	1993
LOWEST ANNUAL MEAN					21.8	1956
HIGHEST DAILY MEAN	4580	Jun 24	6030	Jun 22	16300	Jun 13 1947
LOWEST DAILY MEAN	40	Dec 31	32	Jan 14	2.0	Sep 30 1989
ANNUAL SEVEN-DAY MINIMUM	45	Oct 2	39	Jan 13	2.3	Jan 19 1956
INSTANTANEOUS PEAK FLOW			7010	Jun 22	18000	Jun 13 1947
INSTANTANEOUS PEAK STAGE			12.07	Jun 22	13.50	Jun 13 1947
ANNUAL RUNOFF (AC-FT)	188400		242800		160800	
ANNUAL RUNOFF (CFSM)	.75		.97		.64	
ANNUAL RUNOFF (INCHES)	10.18		13.12		8.69	
10 PERCENT EXCEEDS	527		760		480	
50 PERCENT EXCEEDS	144		107		88	
90 PERCENT EXCEEDS	52		50		16	

e Estimated

05463000 BEAVER CREEK AT NEW HARTFORD, IA--Continued



05464000 CEDAR RIVER AT WATERLOO, IA

LOCATION.--Lat 42°29'44", long 92°20'03", in $NW^1/_4$ $NW^1/_4$ sec.25, T.89 N., R.13 W., Black Hawk County, Hydrologic Unit 07080205, on left bank at foot of East Seventh Street, 0.3 mi upstream from Eleventh Avenue bridge in Waterloo, 1.1 mi downstream from Black Hawk Creek, and at mile 187.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--5,146 mi^2.

PERIOD OF RECORD.--October 1940 to current year. Prior to April 1941, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1950.

GAGE.--Water-stage recorder. Datum of gage is 824.14 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 28 to Jan. 3, and Jan. 10-15. Records good except those for estimated daily discharges, which are poor. Slight diurnal fluctuation during low flow caused by powerplant upstream from station. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. National Weather Service Limited Automatic Remote Collector (LARC) and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 16, 1929, reached a stage of about 20 ft, determined by U. S. Army Corps of Engineers, from information by City of Waterloo, discharge, 65,000 ft^3/s. Flood of Apr. 2, 1933, reached a stage of about 19.5 ft from information by City of Waterloo, discharge, 61,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1400	1780	1380	e700	1130	5330	14300	5710	5770	23200	2290	3890
2	1380	1740	1370	e750	1130	5050	16000	5530	5490	21400	2180	3230
3	1330	1700	1390	e1100	1080	4830	16000	5460	5320	16700	2320	2750
4	1310	1670	1390	1270	1080	4700	15500	5250	5040	13100	2340	2460
5	1290	1640	1390	1320	1080	4410	14200	5020	4830	11300	4070	2290
6	1270	1600	1350	1330	1040	4330	11900	4880	4570	10300	4140	2080
7	1260	1570	1340	1370	1020	4090	10100	4820	4320	9810	4170	1900
8	1610	1540	1280	1380	1030	4040	9500	4730	4080	9170	4430	1730
9	1550	1520	1280	1320	1070	3620	10000	4640	4600	8400	4490	1580
10	1410	1480	1290	e1100	1140	2760	10400	4590	5640	7720	3940	1510
11	1390	1460	1280	e850	1410	2530	10000	4650	7060	7560	3420	1440
12	1720	1450	1250	e950	1580	2220	9200	4670	9280	7230	3070	1390
13	2460	1430	1130	e800	1410	2580	8790	4620	11600	6510	2770	1360
14	3960	1410	1060	e900	1350	2730	8360	4470	10600	5940	2530	1390
15	4580	1420	1120	e1100	1300	2900	8040	4360	8710	5290	2360	1350
16	4110	1350	1190	1140	1980	2870	8430	4260	7840	5080	2200	1300
17	3640	1230	1200	1130	3110	2880	9920	4260	7500	4740	2280	1280
18	3340	1310	1210	1160	3810	3000	11300	4150	7120	4490	2090	1240
19	3080	1240	1210	1110	5120	3150	11500	4110	9080	4260	1950	1180
20	2830	1280	1240	1080	6180	3360	11000	4040	12400	4150	1950	1200
21	2590	1290	1170	1050	6540	3520	10700	3940	15200	3960	2180	1230
22	2420	1330	1110	1050	6340	3910	10700	3590	18300	3760	2910	1230
23	2310	1320	1140	1040	5830	4490	9840	3620	22800	3620	2940	1210
24	2210	1250	1180	1020	5330	4970	9180	4190	22100	3470	3110	1280
25	2130	1240	1200	1000	5240	5150	8310	5830	21100	3300	2710	1290
26	2080	1220	1130	984	5420	5770	7590	6790	21900	3160	2540	1310
27	2010	1260	1010	975	5530	6310	7020	6590	20000	2980	2350	1320
28	1920	1310	e800	992	5500	6590	6490	6280	18000	2840	2570	1310
29	1850	1370	e850	1010	---	6800	6140	6350	18300	2650	2520	1310
30	1830	1410	e800	1040	---	8270	5910	7090	22400	2510	3250	1320
31	1800	---	e750	1040	---	11800	---	6550	---	2410	4160	---
TOTAL	68070	42820	36490	33061	83780	138960	306320	155040	340950	221010	90230	49360
MEAN	2196	1427	1177	1066	2992	4483	10210	5001	11370	7129	2911	1645
MAX	4580	1780	1390	1380	6540	11800	16000	7090	22800	23200	4490	3890
MIN	1260	1220	750	700	1020	2220	5910	3590	4080	2410	1950	1180
AC-FT	135000	84930	72380	65580	166200	275600	607600	307500	676300	438400	179000	97910
CFSM	.43	.28	.23	.21	.58	.87	1.98	.97	2.21	1.39	.57	.32
IN.	.49	.31	.26	.24	.61	1.00	2.21	1.12	2.46	1.60	.65	.36

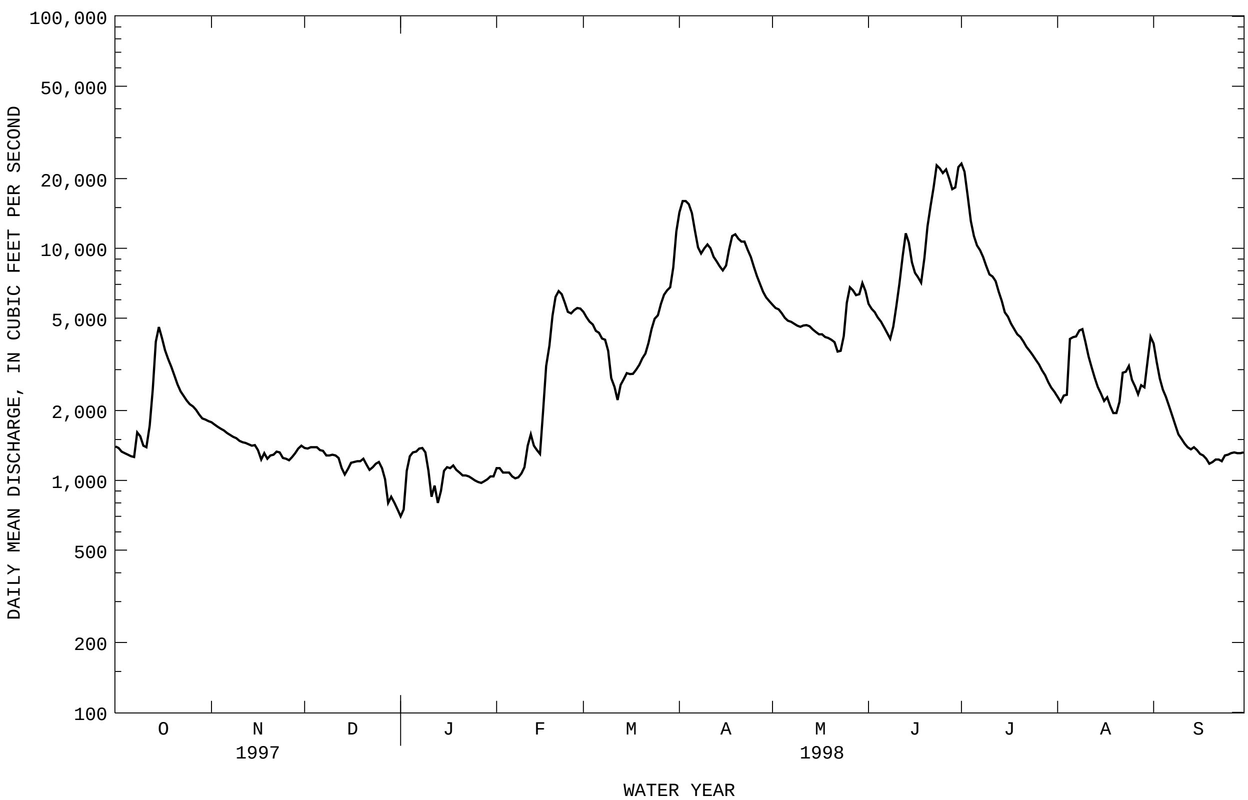
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2119	2055	1559	1242	1778	5710	6242	4528	5128	3866	2680	2067
MAX	8499	7434	6891	5479	9448	13760	24940	19010	18320	21210	18770	9258
(WY)	1987	1973	1983	1973	1984	1973	1993	1991	1993	1993	1993	1993
MIN	364	370	266	252	188	687	741	732	474	455	328	387
(WY)	1990	1990	1990	1959	1959	1964	1957	1977	1977	1989	1989	1955

05464000 CEDAR RIVER AT WATERLOO, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	1474760		1566091			
ANNUAL MEAN	4040		4291		3252	
HIGHEST ANNUAL MEAN					10580	1993
LOWEST ANNUAL MEAN					636	1977
HIGHEST DAILY MEAN	22400	Mar 14	23200	Jul 1	74000	Mar 29 1961
LOWEST DAILY MEAN	750	Dec 31	700	Jan 1	152	Jan 28 1959
ANNUAL SEVEN-DAY MINIMUM	934	Dec 25	809	Dec 27	173	Feb 13 1959
INSTANTANEOUS PEAK FLOW			23300	Jun 23,30	76700	Mar 29 1961
INSTANTANEOUS PEAK STAGE			11.79	Jun 30	21.86	Mar 29 1961
ANNUAL RUNOFF (AC-FT)	2925000		3106000		2356000	
ANNUAL RUNOFF (CFSM)	.79		.83		.63	
ANNUAL RUNOFF (INCHES)	10.66		11.32		8.59	
10 PERCENT EXCEEDS	8950		9870		7430	
50 PERCENT EXCEEDS	2460		2730		1780	
90 PERCENT EXCEEDS	1250		1120		552	

e Estimated



05464220 WOLF CREEK NEAR DYSART, IA

LOCATION.--Lat 42°15'06", long 92°17'55", in SE1/4 NE1/4 NE1/4 sec.24, T.86 N., R.13 W., Tama County, Hydrologic Unit 07080205, on bank 20 ft upstream of right bank side of bridge on County Highway V37, 10.0 miles upstream of confluence with the Cedar River, and 5.0 miles north of Dysart.

DRAINAGE AREA.--299 mi^2.

WATER DISCHARGE RECORDS.

PERIOD OF RECORD.--October 24, 1995 to September 30, 1998. (discontinued)

GAGE.--Water stage recorder. Datum of gage is 835 ft above sea level, from map.

REMARKS.--Estimated daily discharges: Nov. 12-18, Dec. 5-10, Dec. 25 to Jan. 1, Jan. 10 to Feb. 8, and Mar. 4-14. Records good except those for estimated daily discharges, which is poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	144	160	e130	e110	305	2800	376	467	2380	171	109
2	31	130	147	126	e130	284	1610	358	431	1390	164	95
3	31	121	144	159	e95	289	1140	371	392	1050	163	88
4	28	112	140	145	e80	e270	938	356	371	1280	166	81
5	27	107	e95	148	e88	e250	811	341	351	865	348	70
6	26	103	e70	159	e95	e160	723	333	334	766	345	68
7	24	100	e95	160	e100	e100	662	347	322	938	254	65
8	26	101	e100	161	e110	e70	610	340	315	1140	217	61
9	124	100	e95	158	117	e95	569	322	636	744	193	61
10	142	98	e110	e120	131	e120	534	311	1060	720	179	59
11	96	93	119	e85	429	e150	493	298	1520	592	168	57
12	101	e85	114	e90	386	e190	468	292	4810	536	160	55
13	737	e90	123	e50	203	e230	533	284	3810	494	154	55
14	501	e90	127	e32	181	e200	707	270	2320	458	152	65
15	314	e85	146	e44	162	277	582	264	1830	428	146	63
16	245	e75	124	e50	360	226	602	260	2080	397	141	57
17	207	e60	115	e47	351	232	567	243	1250	373	140	55
18	182	e100	120	e42	329	274	519	236	1600	354	134	52
19	162	85	121	e48	311	392	488	232	2270	330	126	51
20	144	90	120	e55	300	446	490	232	1950	309	122	61
21	134	89	112	e60	285	481	658	236	3200	291	122	57
22	125	88	118	e70	273	580	658	233	3630	278	123	52
23	123	85	128	e65	264	678	584	234	2360	268	119	51
24	118	84	121	e65	263	619	533	300	2110	253	114	59
25	109	89	e110	e70	259	623	491	457	3590	240	109	59
26	105	93	e110	e78	263	900	475	430	3090	235	104	57
27	106	88	e120	e85	318	825	433	375	1180	223	112	55
28	103	89	e120	e90	327	600	404	343	1760	212	145	54
29	112	89	e120	e85	---	487	393	643	1970	199	187	58
30	142	137	e110	e95	---	680	386	770	2170	189	151	58
31	159	---	e130	e100	---	2600	---	563	---	180	122	---
TOTAL	4514	2900	3684	2872	6320	13633	20861	10650	53179	18112	5051	1888
MEAN	146	96.7	119	92.6	226	440	695	344	1773	584	163	62.9
MAX	737	144	160	161	429	2600	2800	770	4810	2380	348	109
MIN	24	60	70	32	80	70	386	232	315	180	104	51
AC-FT	8950	5750	7310	5700	12540	27040	41380	21120	105500	35930	10020	3740
CFSM	.49	.32	.40	.31	.75	1.47	2.33	1.15	5.93	1.95	.54	.21
IN.	.56	.36	.46	.36	.79	1.70	2.60	1.33	6.62	2.25	.63	.23

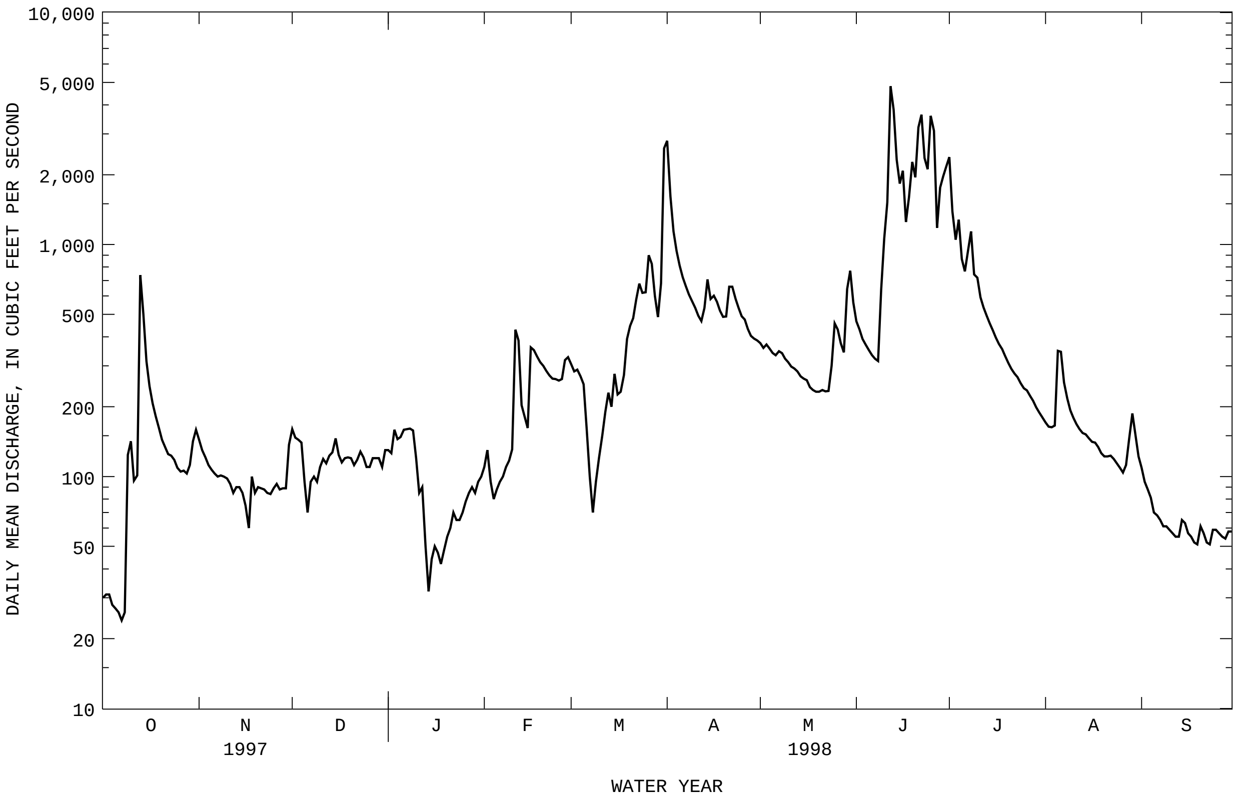
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	94.0	78.2	77.4	60.7	279	240	302	277	840	298	89.9	46.5
MAX	146	101	119	92.6	513	440	695	344	1773	584	163	62.9
(WY)	1998	1997	1998	1998	1997	1998	1998	1998	1998	1998	1998	1998
MIN	42.5	36.6	17.2	19.9	104	71.9	51.8	200	327	149	45.1	38.2
(WY)	1997	1996	1996	1996	1996	1996	1996	1996	1997	1996	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1995 - 1998	
ANNUAL TOTAL	65008		143664			
ANNUAL MEAN	178		394		281	
HIGHEST ANNUAL MEAN					394	1998
LOWEST ANNUAL MEAN					168	1997
HIGHEST DAILY MEAN	3770	Feb 19	4810	Jun 12	4810	Jun 12 1998
LOWEST DAILY MEAN	24	Sep 6	24	Oct 7	10	Dec 10 1995
ANNUAL SEVEN-DAY MINIMUM	28	Oct 2	28	Oct 2	12	Jan 5 1996
INSTANTANEOUS PEAK FLOW			5800	Jun 12	5800	Jun 12 1998
INSTANTANEOUS PEAK STAGE			13.33	Jun 12	13.33	Jun 12 1998
INSTANTANEOUS LOW FLOW			24	Oct 7,8	18	Oct 19 1996
ANNUAL RUNOFF (AC-FT)	128900		285000		203400	
ANNUAL RUNOFF (CFSM)	.60		1.32		.94	
ANNUAL RUNOFF (INCHES)	8.09		17.87		12.76	
10 PERCENT EXCEEDS	314		786		450	
50 PERCENT EXCEEDS	122		162		110	
90 PERCENT EXCEEDS	36		61		28	

e Estimated

05464220 WOLF CREEK NEAR DYSART, IA--Continued



05464220 WOLF CREEK NEAR DYSART, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--October 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Estimated totals Apr. 4, and Apr. 16 to June 12. Estimated values taken from U.S. Geological Survey gage at Waterloo. Records good except for estimated days, and the winter period due to intermittent snow accumulation and subsequent melting, which are poor.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.33 in., Oct. 12, 1998.

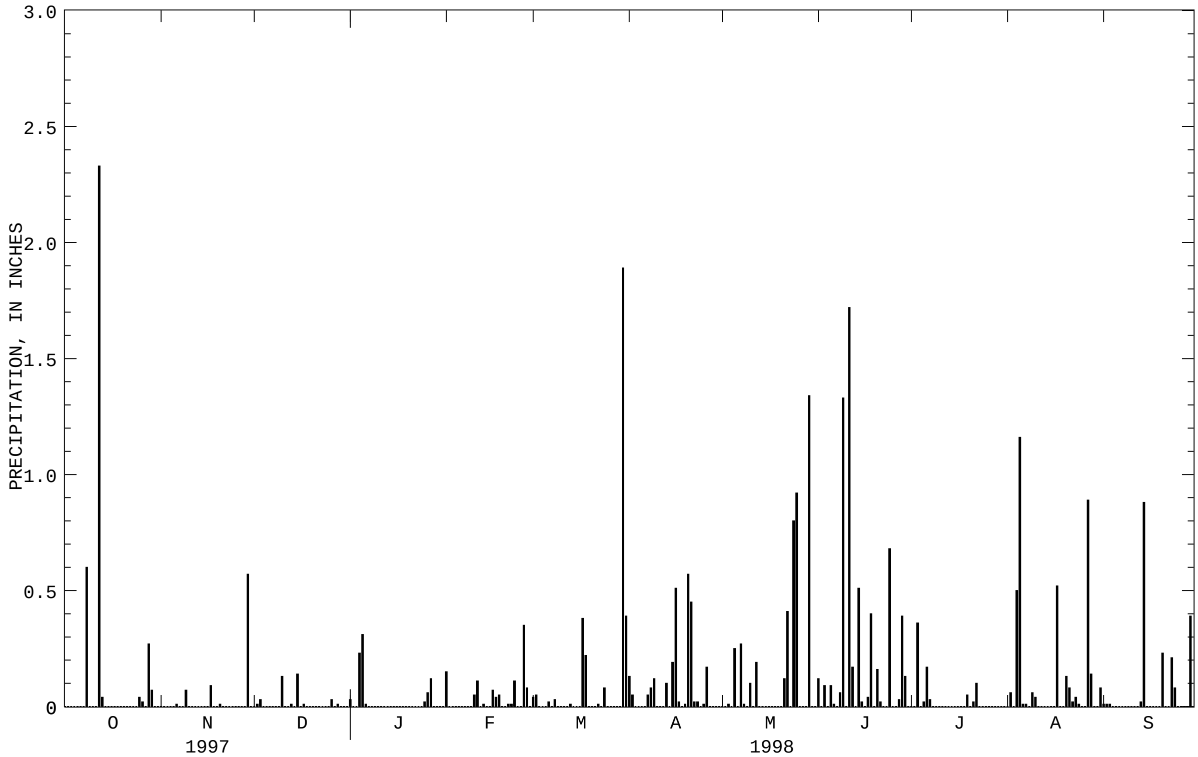
EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.33 in., Oct. 12.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.03	.15	.04	.13	e.00	e.12	.00	.00	.01
2	.00	.00	.01	.00	.00	.05	.05	e.00	e.00	.00	.06	.01
3	.00	.00	.03	.00	.00	.00	.00	e.01	e.09	.36	.00	.01
4	.00	.00	.00	.23	.00	.00	e.00	e.00	e.00	.00	.50	.00
5	.00	.00	.00	.31	.00	.00	.00	e.25	e.09	.02	1.16	.00
6	.00	.01	.00	.01	.00	.02	.00	e.00	e.01	.17	.01	.00
7	.00	.00	.00	.00	.00	.00	.05	e.27	e.00	.03	.01	.00
8	.60	.00	.00	.00	.00	.03	.08	e.01	e.06	.00	.00	.00
9	.00	.07	.00	.00	.00	.00	.12	e.00	e1.33	.00	.06	.00
10	.00	.00	.13	.00	.05	.00	.00	e.10	e.00	.00	.04	.00
11	.00	.00	.00	.00	.11	.00	.00	e.00	e1.72	.00	.00	.00
12	2.33	.00	.00	.00	.00	.00	.00	e.19	e.17	.00	.00	.00
13	.04	.00	.01	.00	.01	.01	.10	e.00	.00	.00	.00	.02
14	.00	.00	.00	.00	.00	.00	.00	e.00	.51	.00	.00	.88
15	.00	.00	.14	.00	.00	.00	.19	e.00	.02	.00	.00	.00
16	.00	.00	.00	.00	.07	.00	e.51	e.00	.00	.00	.00	.00
17	.00	.09	.01	.00	.04	.38	e.02	e.00	.04	.00	.52	.00
18	.00	.00	.00	.00	.05	.22	e.00	e.00	.40	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	e.01	e.00	.00	.05	.00	.00
20	.00	.01	.00	.00	.00	.00	e.57	e.00	.16	.00	.13	.23
21	.00	.00	.00	.00	.01	.00	e.45	e.12	.02	.02	.08	.00
22	.00	.00	.00	.00	.01	.01	e.02	e.41	.00	.10	.02	.00
23	.00	.00	.00	.00	.11	.00	e.02	e.00	.00	.00	.04	.21
24	.00	.00	.00	.00	.00	.08	e.00	e.80	.68	.00	.01	.08
25	.04	.00	.00	.02	.00	.00	e.01	e.92	.00	.00	.00	.00
26	.02	.00	.03	.06	.35	.00	e.17	e.00	.00	.00	.00	.00
27	.00	.00	.00	.12	.08	.00	e.00	e.00	.03	.00	.89	.00
28	.27	.00	.01	.00	.00	.00	e.00	e.00	.39	.00	.14	.00
29	.07	.57	.00	.00	---	.00	e.00	e1.34	.13	.00	.00	.39
30	.00	.00	.00	.00	---	1.89	e.00	e.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.39	---	e.00	---	.00	.08	---
TOTAL	3.37	0.75	0.37	0.78	1.04	3.12	2.50	4.42	5.97	0.75	3.75	1.84
MEAN	.11	.03	.01	.03	.04	.10	.08	.14	.20	.02	.12	.06
MAX	2.33	.57	.14	.31	.35	1.89	.57	1.34	1.72	.36	1.16	.88
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

e Estimated

05464220 WOLF CREEK NEAR DYSART, IA--Continued



05464500 CEDAR RIVER AT CEDAR RAPIDS, IA

LOCATION.--Lat 41°58'14", long 91°40'01", in SE$^1/_4$ NW$^1/_4$ sec.28, T.83 N., R.7 W., Linn County, Hydrologic Unit 07080205, on right bank 400 ft upstream from bridge on Eighth Avenue in Cedar Rapids, 2.7 mi upstream from Prairie Creek, and at mile 112.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--6,510 mi^2.

PERIOD OF RECORD.--October 1902 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: 1924. WSP 1308: 1904, 1906-13, 1915, 1917, 1919-24, 1928, 1930,. WSP 1438: Drainage area. WSP 1558: 1915-18 (M), 1920 (M), 1922 (M), 1929, 1933, 1943.

GAGE.--Water-stage recorder. Datum of gage is 700.47 ft above sea level. Prior to Aug. 20, 1920, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 31 to Jan. 1, Jan. 13, 18-21, and July 24 to Aug. 3. Records good except those for estimated daily discharges, which are poor. Flow affected by city hydroelectric dam 0.5 mile upstream since June 1979. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U. S. Army Corps of Engineers rain gage and satellite data collection platform and U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1851 reached a stage of about 20 ft, discharge, 65,000 ft^3/s, estimated.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1550	2920	2520	e1200	2080	7680	19500	8020	8620	21300	e3300	5220
2	1510	2780	2580	1320	2220	7370	21400	7750	7770	22900	e3200	5280
3	1460	2680	2630	2320	2330	7080	21800	7430	7140	25200	e3100	4800
4	1440	2550	2560	2750	2180	6800	20800	7260	6760	24900	2810	4300
5	1410	2490	2520	2780	2090	6560	19800	7070	6440	20900	3530	3930
6	1360	2440	2420	3270	2050	6260	18800	6820	6090	16800	5220	3710
7	1370	2380	2380	3090	2040	6000	17600	6860	5780	13900	5450	3470
8	1340	2380	2330	2950	2040	5950	15600	6820	5590	12500	5210	3230
9	1410	2400	2320	2820	2050	5600	13500	6730	6110	11900	5210	3020
10	1870	2340	2240	1990	2080	4840	12800	6430	8010	11100	5460	2830
11	1690	2320	2240	1320	2390	4230	12800	6210	9610	10000	4900	2660
12	1850	2280	2200	1170	2880	3750	12700	6130	12100	9350	4240	2520
13	3010	2280	2060	e1100	3150	3810	12200	6070	14600	9000	3820	2400
14	4660	2280	1950	1350	2790	3830	11400	5930	18100	8120	3520	3020
15	5080	2310	1970	1640	2570	3980	11200	5690	20300	7370	3310	2810
16	5590	2260	2030	1650	2500	4150	11200	5410	18000	6660	3160	2520
17	5260	2130	2030	1870	2870	4210	11800	5260	15000	6090	3480	2340
18	4710	2180	2060	e1600	4130	4700	11700	5130	13600	5840	3920	2250
19	4310	2090	2070	e1500	4850	5590	12400	5030	14000	5690	3290	e2100
20	3980	2130	2070	e1600	5780	5920	13500	4900	14700	5620	2890	2100
21	3690	2100	2080	e1700	6780	6160	13900	4810	15600	5440	2730	2040
22	3400	2130	2130	1830	7400	6410	13500	4700	18800	5120	2940	e2020
23	3250	2110	2060	1830	7540	6750	13200	4490	20800	e4950	3430	2000
24	3130	2110	2020	1880	7230	7180	12900	4630	22000	e5000	3620	2110
25	2920	2110	2040	1860	6740	7520	12100	5290	26400	e4600	3800	2080
26	3020	2070	2030	1860	6630	7870	11400	6450	27900	e4400	3800	2090
27	2910	2060	1920	1880	7320	8350	10400	7600	26400	e4200	3470	2070
28	2790	2050	1510	1910	7770	8820	9600	7860	26200	e4000	3850	2030
29	2780	2120	1650	2020	---	8810	8860	8270	25000	e3800	4400	2200
30	2820	2230	1470	2000	---	9810	8390	8630	22800	e3600	4250	2100
31	2960	---	e1300	1990	---	17000	---	8920	---	e3400	4300	---
TOTAL	88530	68710	65390	60050	112480	202990	416750	198600	450220	303650	119610	85250
MEAN	2856	2290	2109	1937	4017	6548	13890	6406	15010	9795	3858	2842
MAX	5590	2920	2630	3270	7770	17000	21800	8920	27900	25200	5460	5280
MIN	1340	2050	1300	1100	2040	3750	8390	4490	5590	3400	2730	2000
AC-FT	175600	136300	129700	119100	223100	402600	826600	393900	893000	602300	237200	169100
CFSM	.44	.35	.32	.30	.62	1.01	2.13	.98	2.31	1.50	.59	.44
IN.	.51	.39	.37	.34	.64	1.16	2.38	1.13	2.57	1.74	.68	.49

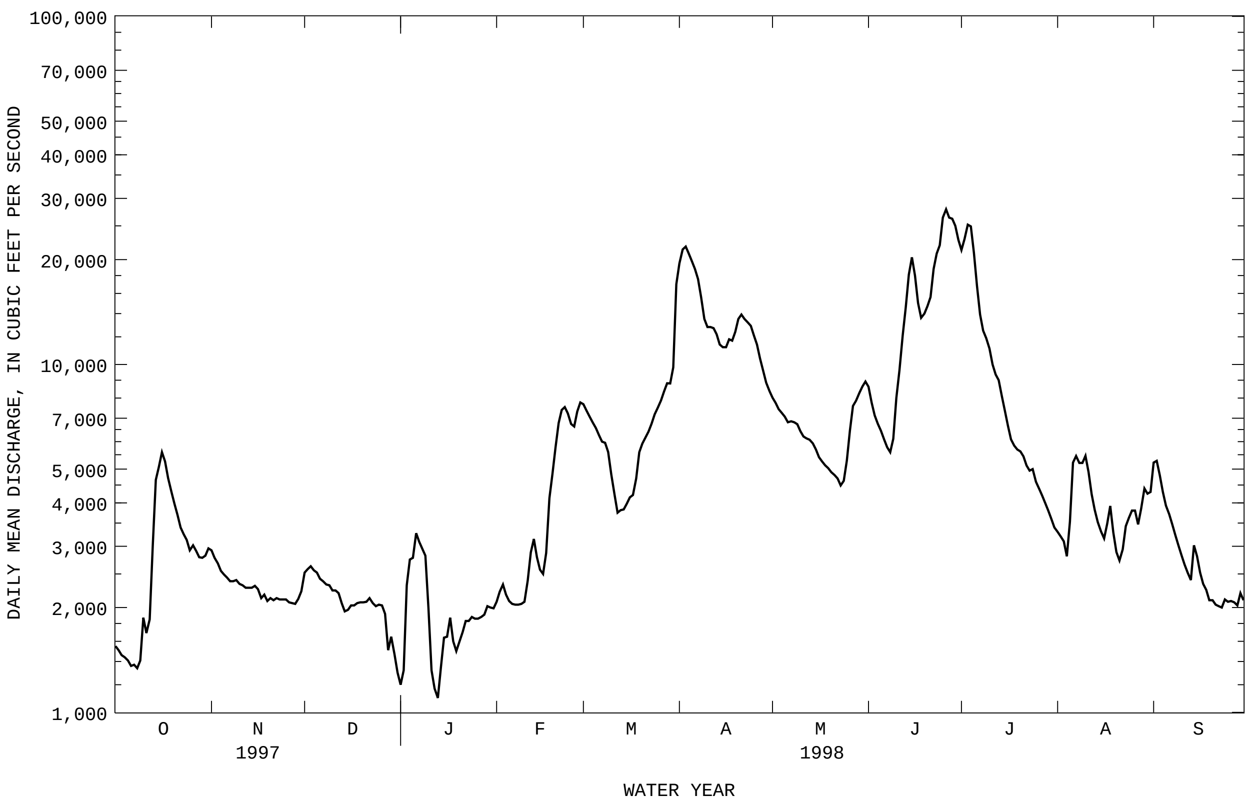
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2337	2406	1868	1587	2483	6759	6811	5130	5663	4098	2955	2405
MAX	10570	9327	8675	8529	12230	17420	35320	24500	23420	33910	28700	13990
(WY)	1987	1973	1983	1973	1984	1929	1993	1991	1947	1993	1993	1993
MIN	463	410	290	299	304	664	1045	527	350	533	377	466
(WY)	1990	1990	1990	1911	1940	1934	1957	1934	1934	1989	1934	1934

05464500 CEDAR RIVER AT CEDAR RAPIDS, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1903 - 1998	
ANNUAL TOTAL	1735720		2172230			
ANNUAL MEAN	4755		5951		3711	
HIGHEST ANNUAL MEAN					15130	1993
LOWEST ANNUAL MEAN					689	1934
HIGHEST DAILY MEAN	23000	Mar 17	27900	Jun 26	71500	Mar 31 1961
LOWEST DAILY MEAN	1300	Dec 31	1100	Jan 13	140	Nov 18 1989
ANNUAL SEVEN-DAY MINIMUM	1400	Oct 3	1400	Oct 3	224	Dec 20 1989
INSTANTANEOUS PEAK FLOW			28400	Jun 26	73000	Mar 31 1961
INSTANTANEOUS PEAK STAGE			11.31	Jun 26	20.00	Mar 18 1929
ANNUAL RUNOFF (AC-FT)	3443000		4309000		2688000	
ANNUAL RUNOFF (CFSM)	.73		.91		.57	
ANNUAL RUNOFF (INCHES)	9.92		12.41		7.75	
10 PERCENT EXCEEDS	10100		13500		8250	
50 PERCENT EXCEEDS	3370		3830		2120	
90 PERCENT EXCEEDS	1790		1920		670	

e Estimated



05465000 CEDAR RIVER NEAR CONESVILLE, IA

LOCATION.--Lat 41°24'36", long 91°17'06", in $SW^1/_4$ $SW^1/_4$ sec.2, T.76 N., R.4 W., Muscatine County, Hydrologic Unit 07080206, on right bank 10 ft downstream from bridge on county highway G28, 3.4 mi northeast of Conesville, 5.2 mi downstream from Wapsinonoc Creek, 10.7 mi upstream from mouth, and at mile 39.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--7,785 mi^2.

PERIOD OF RECORD.--September 1939 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 581.95 ft above sea level. Prior to Feb. 2, 1940, and Apr. 11, 1952, to July 1, 1954, nonrecording gage, Feb. 2, 1940, to Apr. 10, 1952, and July 2, 1954, to Sept. 16, 1963, water-stage recorder, at site 150 ft downstream on left bank at same datum.

REMARKS.-- Estimated daily discharges: Oct.7, Dec. 27 to Jan. 2, Jan. 10 to Feb. 18, and July 28. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of 15.8 ft, from information by local residents to U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2120	3470	2350	e1500	e2300	10600	20700	10300	10100	31200	3790	4720
2	2040	3520	2430	e1600	e2500	10000	25400	9760	9940	27900	3660	5130
3	1970	3420	2640	1660	e2600	9430	25500	9350	9190	25000	3530	5440
4	1920	3270	2690	2140	e2700	8860	24500	8990	8470	24500	3450	5110
5	1850	3140	2700	3010	e2400	8370	23900	8680	8010	26300	3390	4630
6	1810	3060	2630	3450	e2300	7910	22700	8580	7690	26900	4120	4280
7	e1760	3000	2550	4010	e2250	7510	21600	8600	7320	23300	5460	3990
8	1720	2920	2460	4190	e2200	7550	20900	9020	7050	17700	6150	3790
9	1690	2880	2460	3820	e2200	8640	20200	9280	7260	15200	5590	3560
10	1680	2840	2430	e2800	e2300	7780	18100	8910	7970	14200	5590	3360
11	1750	2830	2400	e2300	e2800	6670	16300	8320	9500	13200	5810	3180
12	2040	2720	2330	e2000	e3200	5940	15500	7970	12100	11900	5510	3030
13	2110	2700	2310	e1600	e3400	5390	15500	7810	14500	10900	4990	2920
14	2550	2660	2220	e1400	e3600	5220	16500	7670	15500	10300	4590	3330
15	3760	2650	2100	e1700	e3400	5260	15200	7410	18100	9540	4360	4720
16	4740	2640	2050	e1900	e3000	5120	15500	7210	22000	8720	4240	4290
17	5200	2610	2120	e2000	e2900	5310	15000	6930	24500	8050	4200	3550
18	5320	2540	2100	e2100	e3700	5930	14800	6630	21700	7420	4660	3170
19	4940	2520	2090	e1900	4560	6730	14400	6480	19800	7040	4720	2980
20	4560	2500	2100	e1700	5410	7500	14600	6390	19900	6590	4430	2820
21	4290	2470	2090	e1900	6200	7800	15400	6270	19600	6250	3880	2750
22	4000	2440	2090	e2100	7400	7770	16000	6150	20000	6110	3670	2610
23	3820	2430	2110	e2000	8340	7890	15700	5980	19700	5820	3650	2530
24	3690	2410	2140	e2100	8750	8070	15200	6090	21200	5460	3850	2510
25	3590	2400	2170	e2100	8560	8380	14800	6150	22600	5170	4160	2570
26	3530	2380	2060	e2000	8240	8690	14200	6560	24000	4970	4180	2530
27	3550	2350	e1600	e2100	9100	8990	13500	7270	26300	4770	4370	2500
28	3520	2310	e1500	e2200	10700	9380	12700	8410	28500	e4560	6130	2460
29	3420	2280	e1800	e2200	---	9680	11700	8950	28800	4360	7120	2470
30	3360	2310	e1700	e2300	---	9740	10900	9700	31200	4150	5720	2800
31	3380	---	e1600	e2200	---	13800	---	10000	---	3990	5190	---
TOTAL	95680	81670	68020	69980	127010	245910	516900	245820	502500	381470	144160	103730
MEAN	3086	2722	2194	2257	4536	7933	17230	7930	16750	12310	4650	3458
MAX	5320	3520	2700	4190	10700	13800	25500	10300	31200	31200	7120	5440
MIN	1680	2280	1500	1400	2200	5120	10900	5980	7050	3990	3390	2460
AC-FT	189800	162000	134900	138800	251900	487800	1025000	487600	996700	756600	285900	205700
CFSM	.40	.35	.28	.29	.58	1.02	2.21	1.02	2.15	1.58	.60	.44
IN.	.46	.39	.32	.33	.61	1.17	2.47	1.17	2.40	1.82	.69	.50

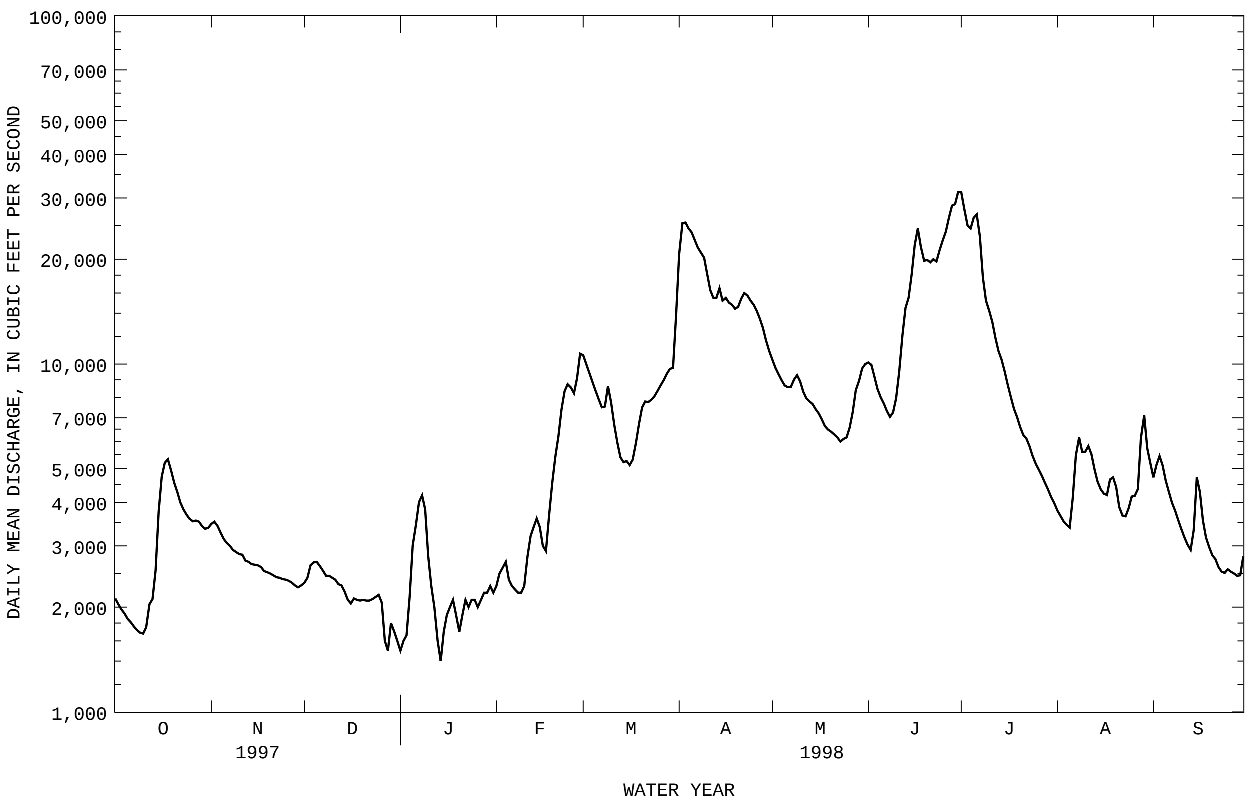
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3088	3296	2616	2418	3248	8175	9550	7355	7901	6252	4176	3326
MAX	12380	10240	11110	11860	12000	17590	36790	24440	27780	42110	34190	19530
(WY)	1987	1973	1983	1973	1984	1948	1993	1991	1993	1993	1993	1993
MIN	599	590	429	365	359	1056	1244	1219	768	815	700	620
(WY)	1957	1956	1990	1977	1940	1954	1957	1940	1977	1989	1989	1955

05465000 CEDAR RIVER NEAR CONESVILLE, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1940 - 1998	
ANNUAL TOTAL	2120270		2582850			
ANNUAL MEAN	5809		7076		5121	
HIGHEST ANNUAL MEAN					18710	1993
LOWEST ANNUAL MEAN					1176	1956
HIGHEST DAILY MEAN	31700	Feb 22	31200	Jun 30b	69800	Apr 6 1993
LOWEST DAILY MEAN	1500	Dec 28	1400	Jan 14	250	Nov 28 1955a
ANNUAL SEVEN-DAY MINIMUM	1750	Oct 5	1610	Dec 27	329	Jan 30 1940
INSTANTANEOUS PEAK FLOW			33400	Jul 1	74000	Apr 6 1993
INSTANTANEOUS PEAK STAGE			14.74	Jul 1	17.11	Apr 6 1993
ANNUAL RUNOFF (AC-FT)	4206000		5123000		3710000	
ANNUAL RUNOFF (CFSM)	.75		.91		.66	
ANNUAL RUNOFF (INCHES)	10.13		12.34		8.93	
10 PERCENT EXCEEDS	12000		16100		11700	
50 PERCENT EXCEEDS	3690		4560		3140	
90 PERCENT EXCEEDS	2130		2100		914	

a Result of freeze-up
b Also July 1
e Estimated



05465500 IOWA RIVER AT WAPELLO, IA

LOCATION.--Lat 41°10'41", long 91°10'55", in NW$^1/_4$ SE$^1/_4$ sec.27, T.74 N., R.3 W., Louisa County, Hydrologic Unit 07080209, on right bank, 1200 ft. downstream from bridge on State Highway 99 at east edge of Wapello, 13.2 mi downstream from Cedar River, and at mile 15.8.

DRAINAGE AREA.--12,499 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1914 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1917, 1923-30, 1932. WSP 1438: Drainage area. WSP 1558: 1918, 1923-25 (M), 1929. WSP 1708: 1955(P), 1956. WDR IA-95-1:location.

GAGE.--Water-stage recorder. Datum of gage is 538.17 ft above sea level; Oct. 1, 1914 to Apr. 15, 1934, nonrecording gage and Apr. 16, 1934 to Sept. 30, 1972, water-stage recorder at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 24 to Jan. 3, and Jan. 12-27. Records good except those for estimated daily discharges, which are poor. Flow regulated by Coralville Lake (station 05453510) 67.3 mi upstream, since Sept. 17, 1958. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum instantaneous discharge, 111,000 ft^3/s, July 8, 1993, gage height, 29.53 ft; minimum daily discharge, 300 ft^3/s, Nov. 28, 1955.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2880	5280	3700	e2400	4310	15600	34200	19900	16700	47500	11800	9800
2	2740	5830	3840	e3000	4930	14800	39400	18400	16100	48000	11200	7850
3	2660	5700	4130	e4000	5170	13800	44000	16500	15000	43400	10700	8430
4	2600	5360	4330	4870	5230	13100	43000	15200	14400	39900	10600	8460
5	2570	5130	4400	6610	4910	12300	40700	14400	13700	39400	10400	8090
6	2490	4870	4420	7880	4640	11500	40000	14000	13000	40700	10900	7240
7	2440	4640	4310	9590	4440	11100	38900	14500	12200	41600	12100	6580
8	2410	4560	4250	9280	4230	12100	38200	17100	11600	38200	13800	6170
9	2360	4490	4230	8500	3940	15700	37900	17600	12600	30900	12900	5900
10	2360	4430	4220	7500	3890	14300	37100	16400	13600	28200	12600	5620
11	2380	4380	4180	6260	4260	11300	33800	15200	14500	26300	12600	5340
12	2590	4350	4180	e4400	6550	9490	30200	14200	18300	24000	12600	5130
13	2820	4290	4270	e3500	6990	9090	28600	13300	24000	22200	12000	4940
14	3070	4220	4760	e2800	7060	8760	33400	12900	24600	21200	11500	5740
15	4110	4120	4630	e3050	7640	8860	29800	12500	28800	20200	11100	9430
16	6030	4090	4570	e3300	7370	8950	23100	11900	34100	19100	10900	9800
17	6680	4070	4580	e3600	6920	9170	23900	11200	36800	18100	10100	7830
18	7070	3980	4670	e3450	6700	11200	24400	10500	38300	17300	9450	7080
19	6760	3880	4610	e3300	6780	13400	25400	9930	37200	16800	9320	6270
20	6150	3910	4430	e3600	7900	14900	25500	9580	35900	16200	8210	5560
21	5610	3860	4150	e3900	8850	14800	26400	9280	35200	15700	7030	5170
22	5290	3860	3920	e4200	9960	14500	28000	9230	35200	15800	6520	4970
23	5060	3820	3950	e4050	11100	14200	28100	9350	33200	15600	6490	4790
24	4880	3830	e3800	e3950	12000	14100	26600	10600	32000	15000	6520	4710
25	4710	3750	e3600	e3800	12100	14300	25000	12600	32900	14500	6540	4610
26	4690	3640	e3400	e4000	11800	14400	23900	13500	34100	14100	6470	4630
27	4940	3680	e3200	e4100	14100	15100	23100	13400	35400	13800	6720	4510
28	5290	3690	e3400	4250	15800	15700	22100	14300	37800	13400	10700	4440
29	5140	3640	e3000	4240	---	15900	20300	14700	40200	13300	18100	4440
30	5100	3620	e2700	4270	---	16000	18800	15400	42600	12900	13800	4470
31	5080	---	e2500	4180	---	24700	---	16700	---	12400	12100	---
TOTAL	128960	128970	124330	145830	209570	413120	913800	424270	790000	755700	325770	188000
MEAN	4160	4299	4011	4704	7485	13330	30460	13690	26330	24380	10510	6267
MAX	7070	5830	4760	9590	15800	24700	44000	19900	42600	48000	18100	9800
MIN	2360	3620	2500	2400	3890	8760	18800	9230	11600	12400	6470	4440
MED	4690	4110	4180	4050	6850	14100	28400	14000	30400	19100	10900	5680
AC-FT	255800	255800	246600	289300	415700	819400	1813000	841500	1567000	1499000	646200	372900
CFSM	.33	.34	.32	.38	.60	1.07	2.44	1.09	2.11	1.95	.84	.50
IN.	.38	.38	.37	.43	.62	1.23	2.72	1.26	2.35	2.25	.97	.56

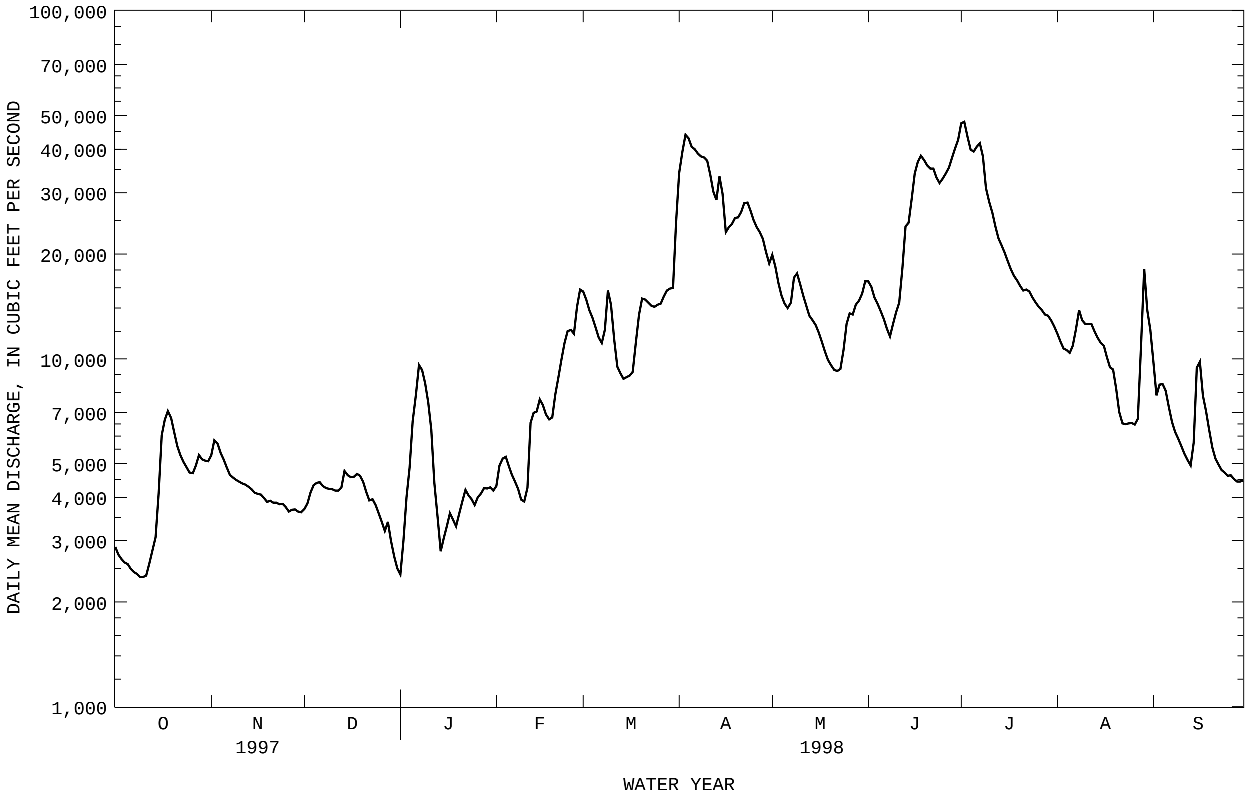
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5377	6099	5393	4592	6284	13860	16510	13510	13380	12150	7996	6222
MAX	17200	16080	18150	20420	17080	26130	45840	33030	36630	77320	61750	37270
(WY)	1987	1993	1983	1973	1984	1982	1993	1993	1993	1993	1993	1993
MIN	926	882	664	533	661	2273	2536	1709	1022	1019	873	982
(WY)	1990	1990	1990	1977	1977	1977	1977	1977	1977	1989	1989	1988

05465500 IOWA RIVER AT WAPELLO, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1959 - 1998a	
ANNUAL TOTAL	3359160		4548320			
ANNUAL MEAN	9203		12460		9290	
HIGHEST ANNUAL MEAN					30550	1993
LOWEST ANNUAL MEAN					1908	1989
HIGHEST DAILY MEAN	71500	Feb 23	48000	Jul 2	106000	Jul 8 1993
LOWEST DAILY MEAN	2360	Oct 9	2360	Oct 9,10	460	Jan 21 1977
ANNUAL SEVEN-DAY MINIMUM	2430	Oct 5	2430	Oct 5	470	Jan 20 1977
INSTANTANEOUS PEAK FLOW			49000	Jul 1	111000	Jul 8 1993
INSTANTANEOUS PEAK STAGE			22.97	Jul 1	29.53	Jul 7 1993
ANNUAL RUNOFF (AC-FT)	6663000		9022000		6730000	
ANNUAL RUNOFF (CFSM)	.74		1.00		.74	
ANNUAL RUNOFF (INCHES)	10.00		13.54		10.10	
10 PERCENT EXCEEDS	19100		30500		20900	
50 PERCENT EXCEEDS	6000		9230		6010	
90 PERCENT EXCEEDS	3220		3700		1700	

a Post regulation
e Estimated



05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY RECORDS

LOCATION --Samples collected at bridge on State Highway 99, 1200 ft. upstream of gage. PERIOD OF RECORD.--January 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1978 to current year.
WATER TEMPERATURE: January 1978 to current year.
SUSPENDED-SEDIMENT DISCHARGE: April 1978 to current year.

REMARKS.--During periods of ice effect samples are collected in open water channel or through ice cover. Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 920 microsiemens Dec. 17, 1988; minimum daily, 168 microsiemens June 21, 1990.
WATER TEMPERATURES: Maximum daily, 33.0°C July 25, 1987; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,970 mg/L June 25, 1981; minimum daily mean, 1 mg/L Jan. 21, 22, 1981.
SEDIMENT LOADS: Maximum daily 604,000 tons June 20, 1990; minimum daily, 4.7 tons Dec. 23, 24, 1989.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 641 microsiemens Nov. 15, 17; minimum daily, 384 microsiemens Apr. 1.
WATER TEMPERATURES: Maximum daily, 30.0°C, Aug. 22; minimum daily, 0.0°C Jan. 23.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 750 mg/L Apr. 1; minimum daily mean, 11 mg/L Jan. 22.
SEDIMENT LOADS: Maximum daily, 68,300 tons July 2; minimum daily, 125 tons Jan. 22.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV						
06...	1200	5.6	4900	114	1510	71
MAR						
10...	1435	1.8	14600	314	12400	81
APR						
03...	1515	--	41900	252	28500	2
27...	1310	13.6	23000	181	11200	75
JUN						
08...	1220	18.7	11100	112	3360	92
JUL						
20...	1245	29.2	11100	146	4380	93
AUG						
31...	1215	21.6	12300	201	6680	94

DATE	TIME	NUMBER OF SAM-PLING POINTS (COUNT) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
NOV											
06...	1245	4	1	3	23	60	75	91	98	100	--
MAR											
10...	1510	3	--	0	5	58	96	100	--	--	--
APR											
27...	1405	4	0	4	7	43	82	91	96	99	100
JUN											
08...	1305	3	--	0	5	48	87	99	100	--	--
JUL											
20...	1335	3	--	0	3	40	84	97	100	--	--
AUG											
31...	1300	3	0	1	13	83	99	100	--	--	--

05465500 IOWA RIVER AT WAPELLO, IA--Continued

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	613	---	---	---	384	509	528	398	---	---
2	---	---	599	---	---	---	393	---	---	465	---	---
3	---	590	---	---	---	551	420	---	---	417	458	---
4	520	---	603	---	---	---	455	581	530	---	---	---
5	---	---	---	554	---	---	465	526	529	---	---	553
6	526	612	---	545	525	---	---	538	---	---	---	552
7	---	---	---	544	---	---	---	---	---	---	---	---
8	516	626	606	576	---	---	---	---	569	449	---	---
9	---	---	---	---	---	520	---	512	---	---	---	540
10	554	627	601	---	544	530	511	521	---	---	---	535
11	---	624	---	---	516	---	---	528	---	447	---	---
12	---	634	---	---	---	---	---	504	498	---	---	---
13	---	---	---	618	---	---	545	---	---	449	---	---
14	552	630	---	---	---	---	483	477	---	---	---	---
15	553	641	---	---	---	---	536	477	423	454	---	---
16	---	---	---	637	---	---	---	478	---	---	---	---
17	---	641	615	---	567	---	---	466	393	---	---	---
18	547	636	---	631	---	---	---	---	---	---	---	---
19	551	619	---	---	572	---	551	455	393	436	---	---
20	553	621	---	---	531	548	---	470	408	430	---	---
21	568	---	---	---	530	551	542	472	---	447	---	543
22	586	---	---	640	---	---	535	460	407	---	521	---
23	---	---	---	621	---	501	553	476	---	---	---	549
24	---	---	---	---	---	484	553	468	---	---	527	531
25	---	628	---	---	---	---	549	---	---	---	525	515
26	---	---	---	---	---	552	---	472	---	---	---	492
27	---	---	---	---	---	545	525	514	---	---	550	476
28	---	---	---	---	---	---	535	496	---	---	---	486
29	---	---	---	---	---	549	---	---	390	---	551	---
30	---	---	---	---	---	---	---	507	385	---	---	515
31	---	---	---	---	---	---	---	495	---	---	494	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

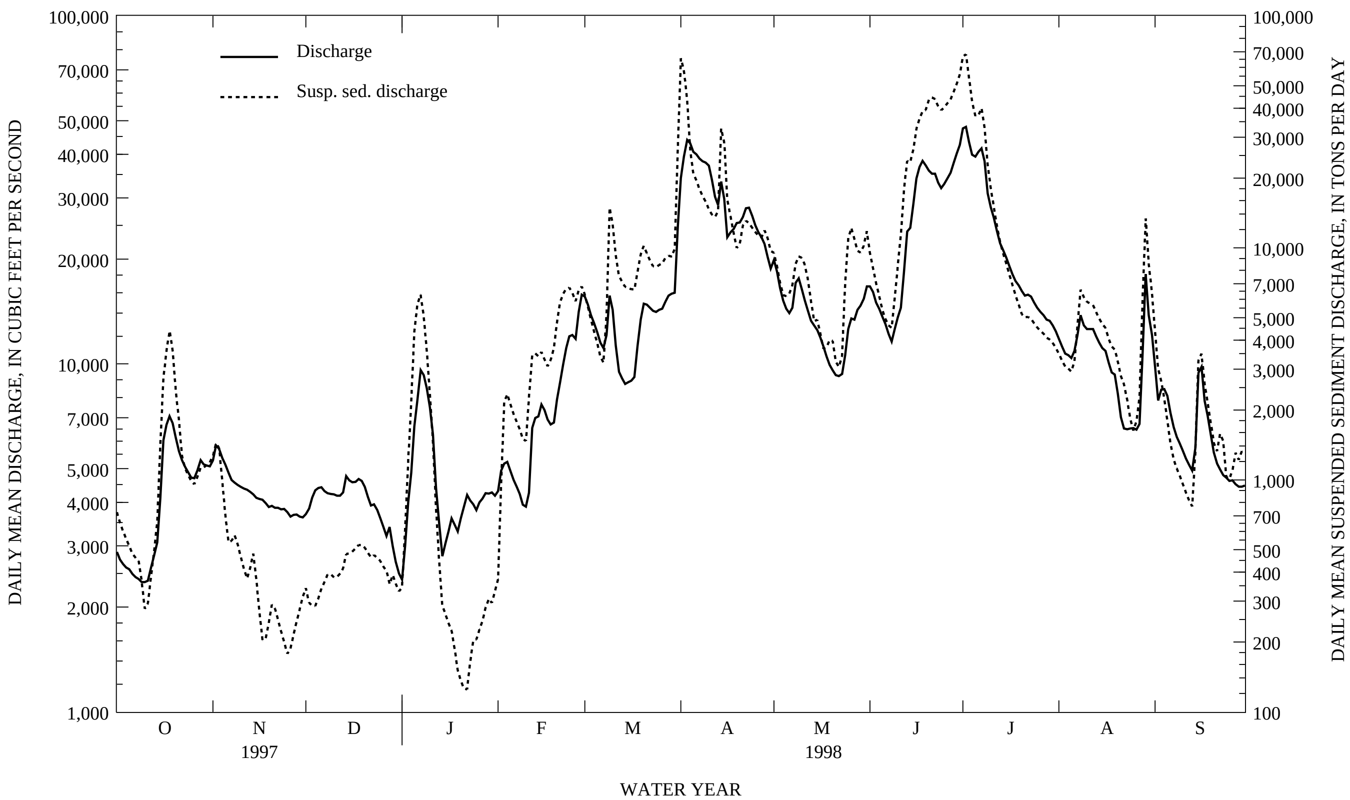
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	5.5	---	---	---	9.0	16.0	22.5	25.0	---	---
2	---	---	2.0	---	---	---	9.0	---	---	25.0	---	---
3	---	6.0	---	---	---	1.0	9.0	---	---	27.0	25.0	---
4	---	---	2.0	---	---	---	9.0	14.5	19.0	---	---	---
5	---	---	---	5.5	---	---	10.0	18.0	18.0	---	---	29.0
6	21.0	8.0	---	5.0	4.0	---	---	18.0	---	---	---	29.0
7	---	---	---	3.0	---	---	---	---	---	---	---	---
8	---	7.0	2.0	3.0	---	---	---	---	18.5	29.0	---	---
9	---	---	---	---	---	2.5	---	20.0	---	---	---	24.0
10	---	7.0	2.0	---	4.0	2.0	13.0	20.0	---	---	---	27.0
11	---	7.0	---	---	5.0	---	---	20.0	---	27.0	---	---
12	---	4.0	---	---	---	---	---	20.0	20.0	---	---	---
13	---	---	---	.5	---	---	13.0	---	---	28.0	---	---
14	---	4.0	---	---	---	---	14.0	23.0	---	---	---	---
15	---	3.0	---	---	---	---	14.0	23.0	20.0	28.0	---	---
16	---	---	---	.5	---	---	---	24.0	---	---	---	---
17	---	3.0	1.0	---	4.5	---	---	24.0	24.0	---	---	---
18	15.0	3.0	---	.5	---	---	---	---	---	---	---	---
19	15.0	1.5	---	---	5.0	---	14.0	24.0	24.0	28.0	---	---
20	11.0	2.0	---	---	---	7.0	---	24.0	24.0	29.0	---	---
21	15.0	---	---	---	---	7.0	14.0	23.0	---	29.0	---	21.0
22	15.0	---	---	.5	---	---	15.0	22.0	24.0	---	30.0	---
23	---	---	---	.0	---	9.0	15.0	22.0	---	---	---	20.0
24	---	---	---	---	---	4.0	18.0	20.0	---	---	29.0	18.0
25	---	1.0	---	---	---	---	17.0	---	---	---	29.0	18.0
26	---	---	---	---	---	14.0	---	20.0	---	---	---	21.0
27	---	---	---	---	---	14.0	15.0	20.0	---	---	29.0	22.0
28	---	---	---	---	---	---	15.0	24.0	---	---	---	22.0
29	---	---	---	---	---	15.0	---	---	25.0	---	29.0	---
30	---	---	---	---	---	---	---	25.0	25.0	---	---	17.0
31	---	---	---	---	---	---	---	25.0	---	---	25.0	---

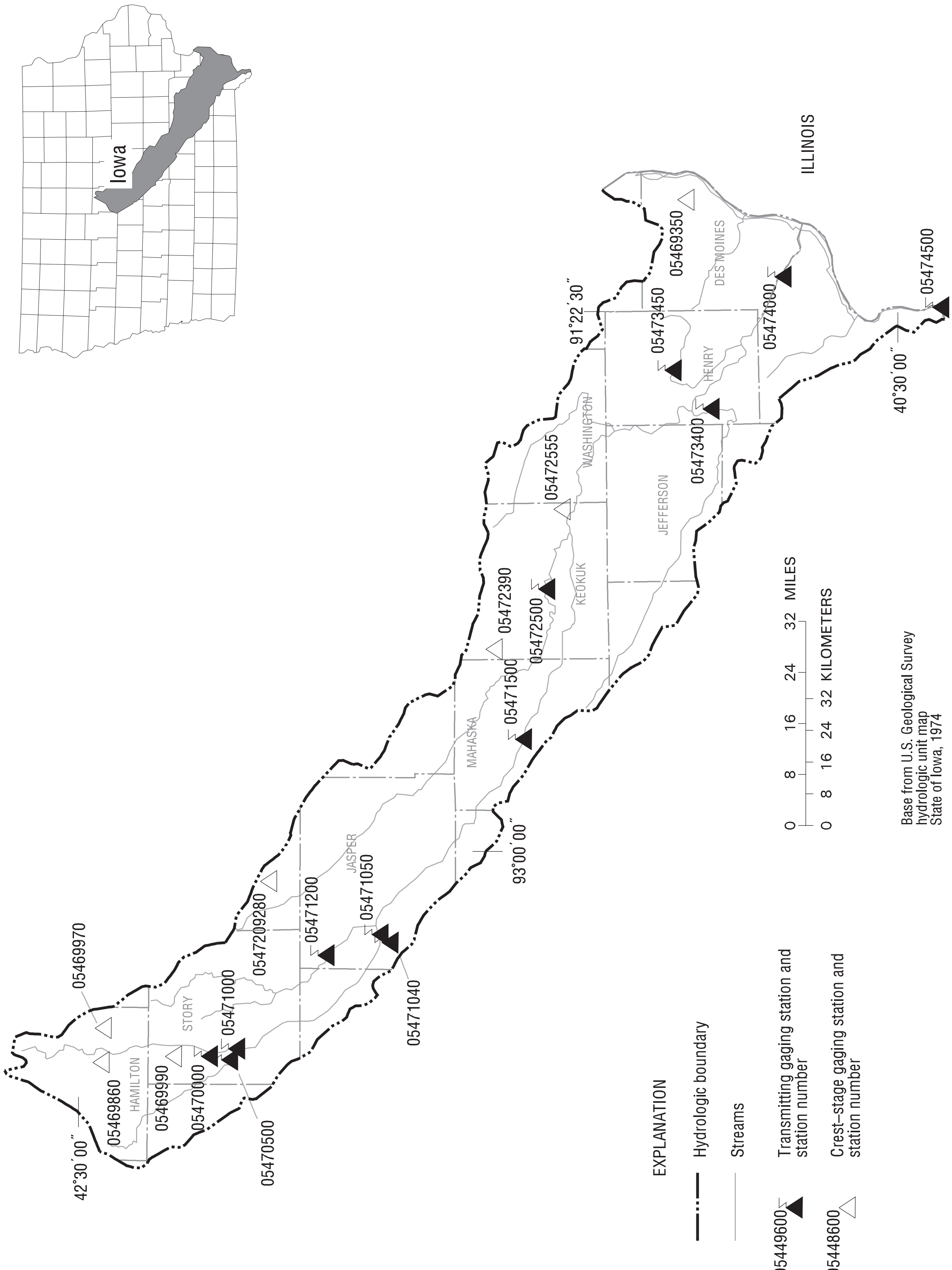
05465500 IOWA RIVER AT WAPELLO, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	93	726	89	1270	34	342	53	343	30	373	134	6280
2	88	653	92	1440	28	295	75	608	72	972	127	5580
3	84	600	89	1370	26	287	112	1210	146	2170	119	4880
4	79	556	68	989	24	286	166	2210	143	2340	114	4360
5	75	518	51	705	26	308	244	4390	137	2110	109	3880
6	71	480	41	539	28	340	269	5740	132	1920	104	3410
7	70	462	44	546	31	363	243	6290	127	1780	102	3200
8	69	448	47	577	34	391	204	5110	122	1650	148	5100
9	57	365	43	527	34	392	156	3590	118	1500	347	14900
10	44	278	39	463	33	380	115	2340	116	1470	325	12600
11	46	293	35	413	34	381	85	1450	168	2290	308	9280
12	54	382	32	376	35	394	63	748	167	3430	301	7580
13	65	494	36	417	36	416	47	444	161	3510	295	7160
14	78	654	42	481	37	479	38	287	155	3410	289	6790
15	124	1400	33	372	38	482	32	264	149	3560	282	6720
16	168	2740	24	268	40	491	27	241	143	3300	276	6630
17	198	3590	19	204	41	507	23	224	143	3090	270	6620
18	230	4390	19	207	42	524	20	186	157	3290	265	7870
19	197	3600	23	242	42	524	17	151	174	3690	259	9380
20	145	2420	27	290	43	510	14	136	192	4760	253	10200
21	120	1820	27	279	43	485	12	126	209	5810	236	9480
22	89	1270	24	250	44	464	11	125	204	6350	225	8830
23	82	1120	22	222	44	474	15	164	192	6660	217	8340
24	80	1050	19	200	45	462	19	203	181	6740	217	8250
25	78	986	18	178	46	447	20	205	170	6380	219	8450
26	76	958	19	187	46	422	21	227	161	5890	221	8580
27	77	1030	22	215	47	406	22	247	151	6550	222	9060
28	79	1130	25	246	47	355	24	282	143	6820	219	9260
29	81	1130	28	277	48	389	25	307	---	---	214	9160
30	84	1160	32	314	49	357	26	295	---	---	230	9910
31	86	1190	---	---	49	331	28	333	---	---	415	26800
TOTAL	---	37893	---	14064	---	12684	---	38476	---	101815	---	258540

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	750	65600	182	9520	212	9480	512	66800	111	3490	168	4390
2	567	57800	171	8330	188	8160	516	68300	110	3260	140	3010
3	371	43700	160	7070	173	7040	462	53700	109	3080	117	2660
4	231	26500	152	6260	159	6180	409	42600	108	3020	97	2230
5	196	20900	159	6190	146	5410	362	37000	106	2930	81	1790
6	187	19500	168	6350	142	4930	349	37300	112	3240	71	1430
7	178	17900	177	6930	141	4630	363	40000	144	4680	66	1230
8	170	16700	186	8510	145	4520	333	32900	177	6610	63	1120
9	162	15800	196	9180	179	6060	293	22800	176	6130	60	1040
10	155	14700	205	9060	228	8390	258	18100	173	5860	58	956
11	162	13900	206	8440	290	11400	227	14900	170	5760	55	880
12	181	13600	190	7290	367	17900	204	12400	167	5660	53	817
13	203	14400	164	5870	389	23700	186	10600	164	5280	51	768
14	384	32700	139	4830	376	23400	172	9450	161	4960	78	1320
15	373	28400	146	4900	369	26600	162	8550	158	4690	128	3280
16	271	16000	134	4270	376	32600	152	7680	156	4520	134	3500
17	225	13700	123	3670	384	36100	143	6910	153	4080	121	2590
18	187	11600	134	3720	392	38800	135	6240	150	3760	109	2150
19	156	9980	153	4010	411	39200	127	5690	147	3650	98	1760
20	163	10400	157	3970	475	43500	119	5170	145	3230	88	1440
21	190	12500	131	3230	496	44500	118	5020	142	2800	86	1330
22	188	13100	125	3070	489	43800	119	5040	139	2580	105	1580
23	183	12800	137	3420	486	40800	118	4950	120	2220	100	1470
24	184	12200	245	7030	485	39200	117	4730	99	1830	71	1030
25	185	11700	324	11000	485	40300	116	4540	88	1630	71	1010
26	185	11300	334	12200	484	42000	115	4390	97	1790	77	1100
27	187	11100	300	10900	484	43600	114	4270	119	2270	94	1310
28	208	11900	252	9710	484	47000	114	4100	201	6130	88	1220
29	208	11000	239	9540	483	50900	113	4030	277	13400	96	1330
30	195	9700	245	10200	493	55900	112	3890	228	8490	93	1300
31	---	---	263	11800	---	---	111	3700	198	6410	---	---
TOTAL	---	581080	---	220470	---	806000	---	555750	---	137440	---	51041
YEAR		2815253										


Discharge
Susp. sed. discharge
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
100,000
70,000
50,000
40,000
30,000
20,000
10,000
7,000
5,000
4,000
3,000
2,000
1,000
DAILY MEAN SUSPENDED SEDIMENT DISCHARGE, IN TONS PER DAY
100,000
70,000
50,000
40,000
30,000
20,000
10,000
7,000
5,000
4,000
3,000
2,000
1,000
700
500
400
300
200
100
O N D J F M A M J J A S
1997
1998
WATER YEAR



Iowa
ILLINOIS
05469970
05469860
05469990
05470000
05470500
05471000
05471040
05471050
05471200
05472092̶80
05471500
05472390
05472500
05472555
05473400
05473450
05469350
05474000
05474500
HAMILTON
STORY
JASPER
MAHASKA
KEOKUK
WASHINGTON
JEFFERSON
HENRY
DES MOINES
42°30´00´´
93°00´00´´
91°22´30´´
40°30´00´´
0 8 16 24 32 MILES
0 8 16 24 32 KILOMETERS
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974
EXPLANATION
Hydrologic boundary
Streams
05449600 Transmitting gaging station and station number
05448600 Crest–stage gaging station and station number

Gaging Stations

Crest Stage Gaging Stations

05470000 SOUTH SKUNK RIVER NEAR AMES, IA

LOCATION.--Lat 42°04'06", long 93°37'09", in $NW^1/_4$ $SW^1/_4$ sec.23, T.84 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 2.5 mi north of Ames, 3.5 mi downstream from Keigley Branch, 5.2 mi upstream from Squaw Creek, and at mile 228.1 upstream from mouth of Skunk River.

DRAINAGE AREA.--315 mi^2.

PERIOD OF RECORD.--July 1920 to September 1927, October 1932 to September 1995, October 1, 1996 to current year. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1966, published as "Skunk River near Ames".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1921, 1925-26, 1934-35 (M), 1937 (M), 1939 (M), 1947-50 (M). WDR IA-67-1: 1965. WDR IA-74-1: 1973 (P).

GAGE.--Water-stage recorder. Concrete control since July 21, 1934. Datum of gage is 893.61 ft above sea level (Iowa Highway Commission benchmark). Prior to Aug. 25, 1921, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 4-17, 23-31, and Jan. 6-28. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with phone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 17, 1996 reached about 14,000 ft^3/s, from rating curve extension, gage height 15.89 ft, from highwater mark.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	32	98	51	50	225	673	245	538	1900	106	112
2	48	31	81	55	68	213	533	236	437	1080	101	102
3	54	33	77	62	60	225	460	229	362	851	95	93
4	60	28	e60	69	61	222	402	215	318	719	91	83
5	75	27	e42	87	53	209	360	208	290	611	115	77
6	81	26	e48	e65	48	205	334	203	260	542	140	71
7	95	26	e50	e60	51	206	419	204	245	730	169	66
8	110	26	e46	e65	51	178	537	198	251	710	168	61
9	130	28	e48	e38	59	110	530	188	554	532	143	55
10	84	28	e44	e30	110	146	480	182	601	443	125	50
11	71	26	e38	e27	176	140	414	176	1460	383	112	44
12	106	25	e34	e25	142	150	368	181	2250	340	98	40
13	169	26	e34	e19	113	182	339	176	1620	304	87	37
14	115	27	e36	e16	104	166	307	164	1920	272	82	34
15	76	27	e38	e23	155	174	299	163	2780	248	100	31
16	58	20	e36	e29	842	171	370	168	1800	228	170	29
17	49	23	e34	e30	696	174	433	158	1260	408	142	26
18	42	26	53	e23	596	208	377	151	2430	740	126	24
19	39	23	52	e24	525	270	336	148	4040	440	118	22
20	32	31	49	e28	581	301	382	144	3200	318	110	20
21	29	27	43	e30	500	408	590	141	2820	256	234	18
22	27	26	71	e34	429	516	599	148	2180	221	576	17
23	28	22	e55	e34	409	515	485	147	1360	197	334	17
24	27	18	e46	e32	394	456	420	504	2050	173	236	16
25	26	24	e40	e32	357	473	377	713	3260	159	189	15
26	29	24	e32	e32	321	756	343	464	1920	146	156	14
27	30	22	e28	e30	283	746	294	364	1240	135	136	14
28	27	22	e30	e32	248	526	269	305	1060	128	190	13
29	28	26	e34	35	---	450	260	768	1110	123	159	12
30	32	106	e36	33	---	609	255	1240	2010	117	129	11
31	34	---	e21	36	---	781	---	791	---	111	120	---
TOTAL	1848	856	1434	1186	7482	10111	12245	9322	45626	13565	4857	1224
MEAN	59.6	28.5	46.3	38.3	267	326	408	301	1521	438	157	40.8
MAX	169	106	98	87	842	781	673	1240	4040	1900	576	112
MIN	26	18	21	16	48	110	255	141	245	111	82	11
AC-FT	3670	1700	2840	2350	14840	20060	24290	18490	90500	26910	9630	2430
CFSM	.19	.09	.15	.12	.85	1.04	1.30	.95	4.83	1.39	.50	.13
IN.	.22	.10	.17	.14	.88	1.19	1.45	1.10	5.39	1.60	.57	.14

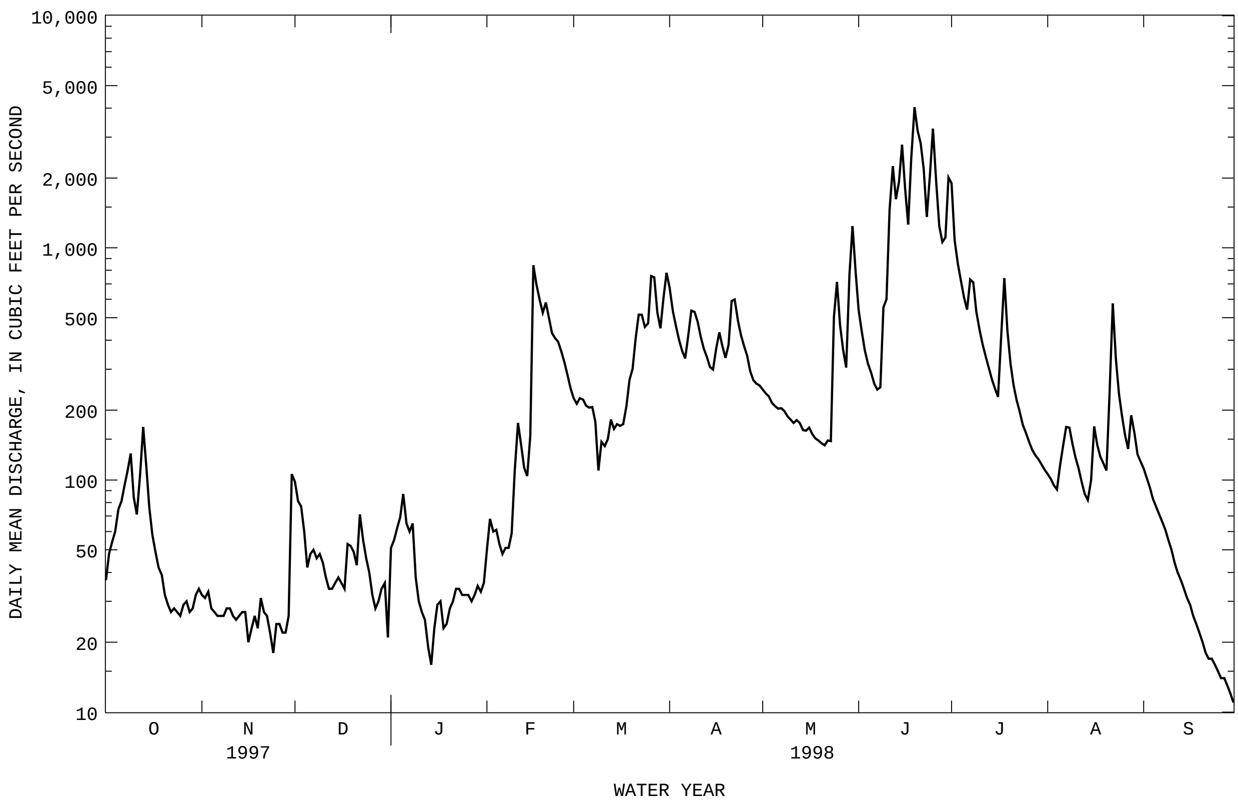
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	96.5	99.8	71.8	50.8	120	318	279	275	387	228	116	97.5
MAX	723	726	537	315	623	1034	1208	1193	1900	2628	1782	577
(WY)	1987	1973	1983	1973	1984	1979	1965	1944	1947	1993	1993	1926
MIN	.12	.14	.000	.000	.31	6.35	6.67	2.28	.011	.017	.087	.081
(WY)	1954	1956	1977	1977	1956	1981	1956	1934	1977	1977	1934	1976

05470000 SOUTH SKUNK RIVER NEAR AMES, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1921 - 1998	
ANNUAL TOTAL	69344.3		109756			
ANNUAL MEAN	190		301		178	
HIGHEST ANNUAL MEAN					752	1993
LOWEST ANNUAL MEAN					5.58	1956
HIGHEST DAILY MEAN	1860	Jun 22	4040	Jun 19	8980	Jul 9 1993
LOWEST DAILY MEAN	5.0	Sep 5	11	Sep 30	.00	Jun 20 1934a
ANNUAL SEVEN-DAY MINIMUM	6.1	Aug 31	14	Sep 24	.00	Jun 20 1934
INSTANTANEOUS PEAK FLOW			4760	Jun 18	11200	Aug 16 1993
INSTANTANEOUS PEAK STAGE			8.70	Jun 18	14.23	Aug 16 1993
INSTANTANEOUS LOW FLOW			6.1	Nov 24		
ANNUAL RUNOFF (AC-FT)	137500		217700		129200	
ANNUAL RUNOFF (CFSM)	.60		.95		.57	
ANNUAL RUNOFF (INCHES)	8.19		12.96		7.70	
10 PERCENT EXCEEDS	434		682		435	
50 PERCENT EXCEEDS	99		128		58	
90 PERCENT EXCEEDS	19		26		2.3	

a Many days in 1934, 1953-56, 1976-1977
e Estimated



05470500 SQUAW CREEK AT AMES, IA

LOCATION.--Lat 42°01'21", long 93°37'45", in NE$^{1}/_{4}$ NW$^{1}/_{4}$ sec.10, T.83 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 65 ft downstream from Lincoln Way Bridge in Ames, 0.2 mi downstream from College Creek, and 2.4 mi upstream from mouth.

DRAINAGE AREA.--204 mi^2.

PERIOD OF RECORD.--May 1919 to September 1927, May 1965 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: Drainage area, 1920-22 (M), 1923, 1924-25 (M), 1926, 1927 (M), WDR IA-66-1: 1965, WDR IA-71-1: 1970 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 881.00 ft. above sea level (levels by Iowa State University). Prior to Mar. 11, 1925, nonrecording gage at site 0.6 mi upstream at different datum. Mar. 11, 1925 to Apr. 30, 1927, nonrecording gage at site 65 ft. upstream at datum about 4 ft. higher.

REMARKS.--Estimated daily discharges: Dec. 25-28, and Jan. 13-21. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with phone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 4, 1918 reached a stage of 14.5 ft. from floodmarks, site and datum used 1919-25, discharge, 6,900 ft^3/s. Flood of Mar. 1, 1965 reached a stage of 10.7 ft. from graph based on gage readings, at present site and datum, discharge, 4,200 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	25	58	34	48	192	616	165	386	490	28	24
2	4.1	24	49	45	58	176	441	160	295	374	27	22
3	3.3	24	53	58	48	139	359	153	247	317	28	21
4	2.8	22	46	58	41	165	305	143	213	270	37	17
5	3.0	21	29	81	36	166	273	139	196	245	37	19
6	3.0	20	41	60	33	161	260	135	178	279	53	19
7	2.8	21	42	58	34	160	316	139	173	427	41	16
8	14	21	38	59	35	147	446	130	211	388	35	14
9	8.4	23	40	62	38	76	510	124	801	277	31	12
10	4.9	22	38	54	71	93	439	120	556	231	28	11
11	4.5	21	35	47	109	133	348	118	1490	189	25	10
12	51	21	28	47	91	141	300	130	1860	171	22	9.5
13	57	21	28	e19	73	156	264	114	1050	154	25	8.7
14	60	22	32	e16	66	132	228	109	2060	137	29	8.2
15	40	21	39	e22	189	133	245	116	3810	133	96	11
16	33	14	38	e27	829	129	330	116	1500	116	27	10
17	29	17	33	e28	817	135	324	105	1090	197	21	7.5
18	26	21	47	e21	806	161	272	102	1930	187	21	6.5
19	25	19	45	e23	628	233	244	98	2630	131	21	6.4
20	22	23	47	e27	559	256	307	104	1440	110	25	10
21	21	21	47	e30	479	372	381	94	1630	94	135	7.2
22	20	20	63	32	403	469	371	115	1100	90	121	6.5
23	20	19	52	32	373	439	309	108	863	78	68	6.3
24	23	18	43	31	343	370	269	657	1040	69	47	7.7
25	21	20	e38	31	301	355	244	418	935	64	39	7.6
26	29	21	e30	30	274	725	224	284	656	59	33	10
27	24	18	e27	30	246	712	191	227	508	53	57	8.7
28	22	18	e30	31	215	448	179	203	485	47	60	7.0
29	23	37	32	33	---	365	176	488	601	42	41	6.7
30	26	50	35	31	---	528	173	468	842	35	31	6.0
31	26	---	17	32	---	772	---	749	---	31	28	---
TOTAL	652.7	665	1220	1189	7243	8639	9344	6331	30776	5485	1317	336.5
MEAN	21.1	22.2	39.4	38.4	259	279	311	204	1026	177	42.5	11.2
MAX	60	50	63	81	829	772	616	749	3810	490	135	24
MIN	2.8	14	17	16	33	76	173	94	173	31	21	6.0
AC-FT	1290	1320	2420	2360	14370	17140	18530	12560	61040	10880	2610	667
CFSM	.10	.11	.19	.19	1.27	1.37	1.53	1.00	5.03	.87	.21	.05
IN.	.12	.12	.22	.22	1.32	1.58	1.70	1.15	5.61	1.00	.24	.06

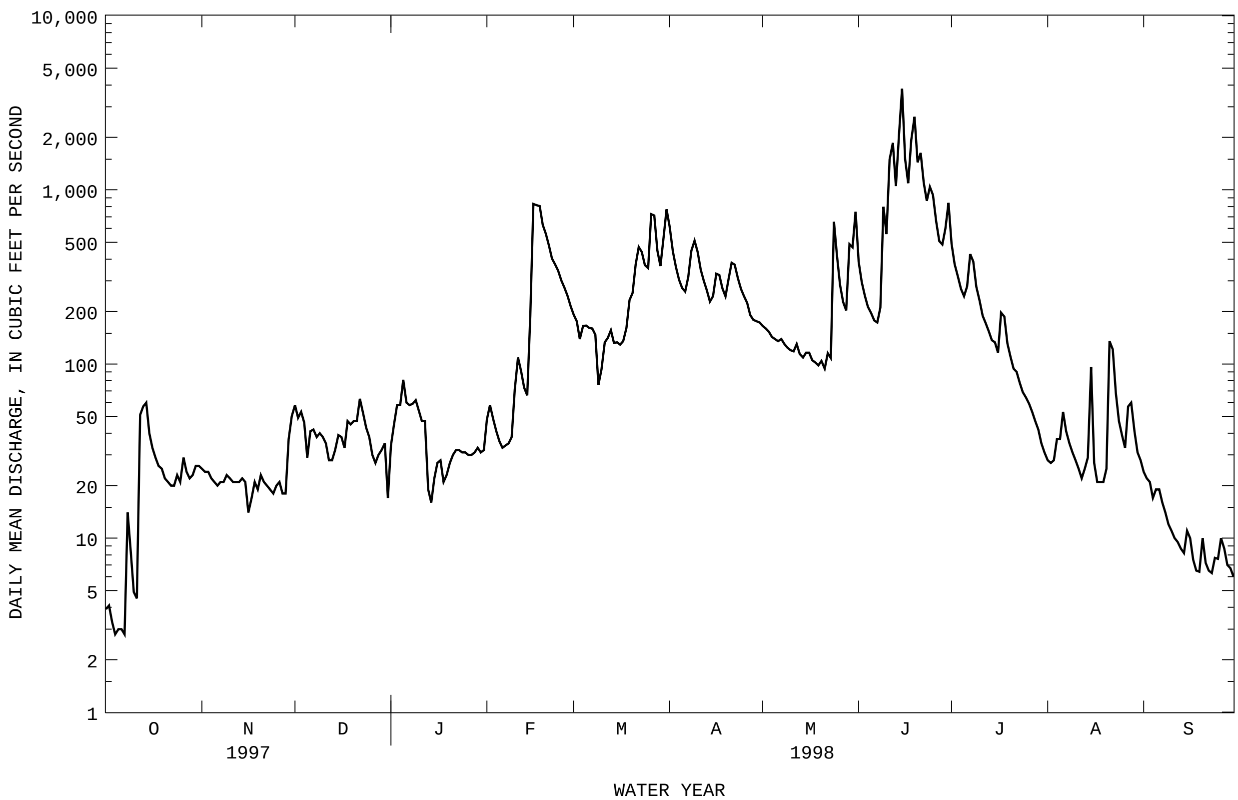
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	84.0	88.5	63.6	41.9	102	215	215	229	323	178	88.2	84.4
MAX	505	491	372	275	465	777	773	817	1107	2128	1177	568
(WY)	1974	1973	1983	1973	1973	1979	1991	1990	1975	1993	1993	1926
MIN	.36	.63	.001	.000	.093	2.51	4.32	1.42	2.97	3.61	.95	.071
(WY)	1989	1967	1977	1977	1977	1981	1977	1981	1977	1927	1989	1971

05470500 SQUAW CREEK AT AMES, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1920 - 1998	
ANNUAL TOTAL	43952.3		73198.2			
ANNUAL MEAN	120		201		143	
HIGHEST ANNUAL MEAN					528	1993
LOWEST ANNUAL MEAN					13.6	1981
HIGHEST DAILY MEAN	2130	Feb 19	3810	Jun 15	12200	Jul 9 1993
LOWEST DAILY MEAN	2.8	Oct 4	2.8	Oct 4	.00	Jul 31 1925a
ANNUAL SEVEN-DAY MINIMUM	3.3	Oct 1	3.3	Oct 1	.00	Oct 7 1971
INSTANTANEOUS PEAK FLOW			5290	Jun 15	24300	Jul 9 1993
INSTANTANEOUS PEAK STAGE			11.57	Jun 15	18.54	Jul 9 1993
INSTANTANEOUS LOW FLOW			2.3	Oct 3		
ANNUAL RUNOFF (AC-FT)	87180		145200		103700	
ANNUAL RUNOFF (CFSM)	.59		.98		.70	
ANNUAL RUNOFF (INCHES)	8.01		13.35		9.53	
10 PERCENT EXCEEDS	228		486		350	
50 PERCENT EXCEEDS	57		58		48	
90 PERCENT EXCEEDS	8.6		16		1.8	

a Many days in 1925, 1971, 1972, 1976, 1977, 1988
e Estimated



05471000 SOUTH SKUNK RIVER BELOW SQUAW CREEK NEAR AMES, IA

LOCATION.--Lat 42°00'24", long 93°35'43", in NE$^1/_4$ NW$^1/_4$ sec.13, T.83 N., R.24 W., Story County, Hydrologic Unit 07080105, on right bank 500 ft downstream from bridge on county highway, 0.2 mi downstream from Squaw Creek, 200 ft upstream from bridge on U.S. Highway 30, 2 mi southeast of Ames, and at mile 222.6 upstream from mouth of Skunk River.

DRAINAGE AREA.--556 mi^2.

PERIOD OF RECORD.--October 1952 to December 1979, October 1991 to current year. Prior to October 1966, published as "Skunk River below Squaw Creek near Ames".

REVISED RECORDS.--WDR IA-95-1: Location.

GAGE.--Water-stage recorder. Datum of gage is 857.10 ft above sea level. Prior to Oct. 1, 1973, at datum 10.00 ft higher. Prior to Oct. 1991, at site 500 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 21 to Jan. 1, Jan. 6 to Feb. 15, and Mar. 9-12. Records good except those for estimated daily discharges, which are poor. Low flows are affected by pumpage by City of Ames from surficial aquifer and do not represent the natural flow of the stream. Several observations of water temperature were made during the year. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1944, reached a stage of 13 ft, from floodmarks, discharge, 10,000 ft^3/s, datum then in use.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	48	139	e85	e100	388	1370	513	996	2900	135	103
2	1.0	47	117	109	e125	358	1100	498	805	1670	124	92
3	.74	49	119	123	e110	356	941	483	693	1360	119	81
4	.47	45	108	156	e100	360	831	464	611	1180	139	72
5	.40	43	87	173	e90	334	758	446	567	1040	182	66
6	.51	41	102	e125	e80	321	713	428	512	1070	200	61
7	.62	41	102	e120	e85	315	758	428	487	1290	217	55
8	14	41	97	e125	e85	302	1060	407	498	1240	204	50
9	25	43	98	e100	e100	e150	1130	390	1250	943	168	45
10	14	44	93	e85	e180	e170	1060	374	1200	798	137	42
11	7.8	41	85	e75	e280	e220	919	361	2770	696	117	40
12	92	41	72	e70	e230	e240	828	372	4600	622	102	36
13	167	40	78	e38	e190	315	757	342	2780	563	98	34
14	162	43	95	e32	e170	285	687	324	3600	510	90	32
15	113	42	98	e45	e240	293	691	329	8240	478	256	31
16	90	27	91	e55	1490	272	788	328	4050	434	197	30
17	74	40	81	e60	1360	278	874	307	2640	575	139	29
18	64	47	97	e44	1220	317	780	301	4190	946	113	25
19	58	38	90	e48	997	423	710	297	7880	640	95	23
20	50	48	92	e55	974	478	779	306	5520	494	87	26
21	45	41	e90	e60	897	642	1040	293	5350	416	192	23
22	43	39	e130	e65	764	869	1100	322	3810	375	644	22
23	41	34	e105	e65	701	903	930	301	2460	333	386	22
24	46	29	e90	e60	670	821	814	871	3080	297	276	23
25	40	39	e80	e55	609	767	744	1150	4420	273	217	23
26	51	41	e60	e50	553	1230	688	795	3110	253	177	24
27	49	36	e55	e55	495	1480	611	645	1970	232	181	24
28	43	34	e60	e60	434	1050	565	562	1750	210	241	22
29	45	61	e65	e70	---	872	545	1080	1820	188	187	20
30	48	120	e70	e65	---	1030	535	1640	2880	168	142	18
31	52	---	e38	e70	---	1520	---	1500	---	151	119	---
TOTAL	1439.24	1323	2784	2398	13329	17359	25106	16857	84539	22345	5681	1194
MEAN	46.4	44.1	89.8	77.4	476	560	837	544	2818	721	183	39.8
MAX	167	120	139	173	1490	1520	1370	1640	8240	2900	644	103
MIN	.40	27	38	32	80	150	535	293	487	151	87	18
MED	45	41	91	65	260	358	784	407	2710	563	168	31
AC-FT	2850	2620	5520	4760	26440	34430	49800	33440	167700	44320	11270	2370
CFSM	.08	.08	.16	.14	.86	1.01	1.51	.98	5.07	1.30	.33	.07
IN.	.10	.09	.19	.16	.89	1.16	1.68	1.13	5.66	1.50	.38	.08

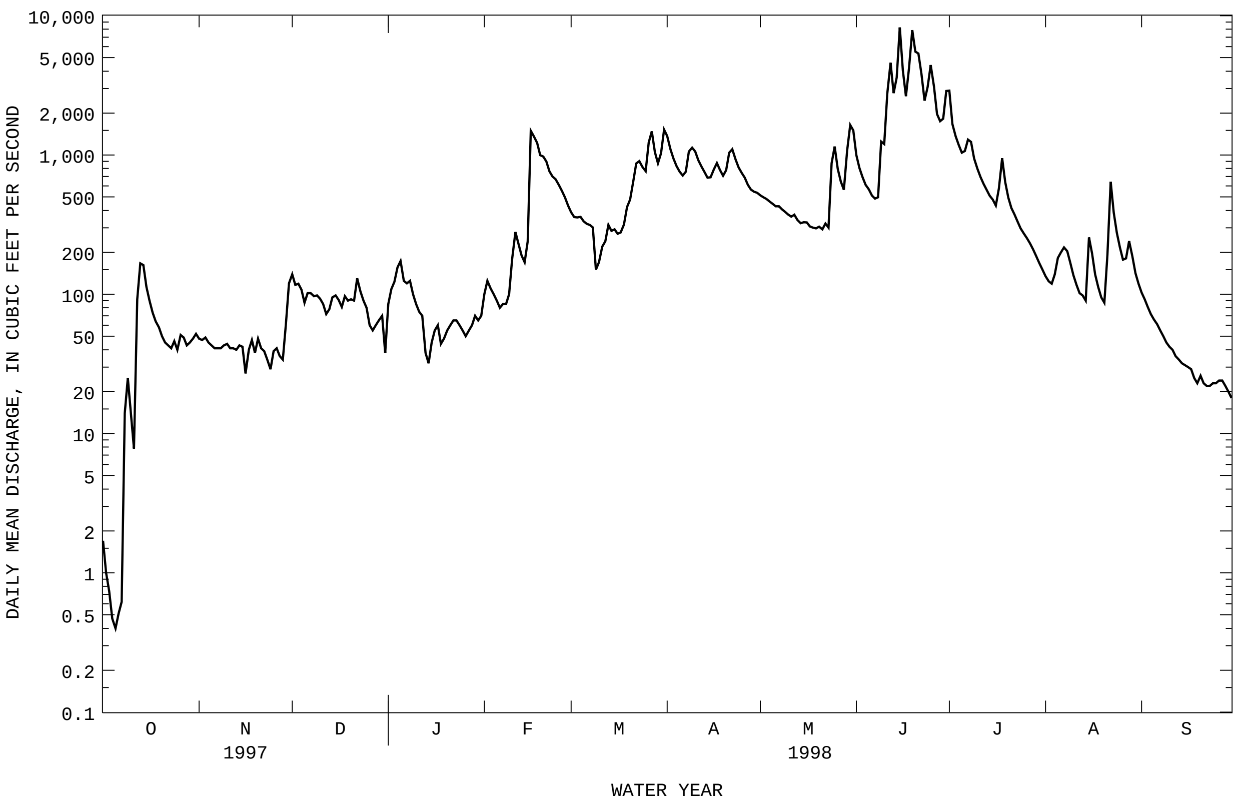
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	175	189	128	86.9	190	558	537	513	825	521	303	171
MAX	1079	1270	438	599	919	2026	2037	1421	2818	5220	3921	1157
(WY)	1974	1973	1997	1973	1973	1979	1965	1974	1998	1993	1993	1993
MIN	.000	.005	.003	.000	.000	8.71	3.62	6.71	.000	.000	.032	.16
(WY)	1957	1977	1977	1956	1956	1956	1956	1967	1977	1956	1956	1976

05471000 SOUTH SKUNK RIVER BELOW SQUAW CREEK NEAR AMES, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1953 - 1998	
ANNUAL TOTAL	119378.74		194354.24			
ANNUAL MEAN	327		532		350	
HIGHEST ANNUAL MEAN					1475	1993
LOWEST ANNUAL MEAN					5.95	1956
HIGHEST DAILY MEAN	3100	Feb 19	8240	Jun 15	20500	Jul 9 1993
LOWEST DAILY MEAN	.40	Oct 5	.40	Oct 5	.00	Dec 17 1953a
ANNUAL SEVEN-DAY MINIMUM	.78	Oct 1	.78	Oct 1	.00	Jan 11 1954
INSTANTANEOUS PEAK FLOW			9970	Jun 15	26500	Jul 9 1993
INSTANTANEOUS PEAK STAGE			22.81	Jun 15	25.57	Jun 27 1975
INSTANTANEOUS LOW FLOW			.31	Oct 5		
ANNUAL RUNOFF (AC-FT)	236800		385500		253300	
ANNUAL RUNOFF (CFSM)	.59		.96		.63	
ANNUAL RUNOFF (INCHES)	7.99		13.00		8.54	
10 PERCENT EXCEEDS	745		1190		834	
50 PERCENT EXCEEDS	150		173		114	
90 PERCENT EXCEEDS	26		37		1.3	

a Many days in 1953-56, 1963-68, 1976-77
e Estimated



05471040 SQUAW CREEK NEAR COLFAX, IA

LOCATION.--Lat 41°39'33", long 93°16'14", in NE$^1/_4$ NE$^1/_4$ sec.15, T.79 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on right bank at downstream side of bridge on county road S44 Ave. W.

DRAINAGE AREA.--18.4 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1995 to current year.

GAGE.--Water-stage recorder. Datum of gage is 785.96 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 1-7, Dec. 4-6, 13, 27, 31, Jan. 10-18, Feb. 4, 5, 13, 14, and Mar. 2, 6, 10-16. Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.60	18	10	9.8	20	18	73	35	37	43	14	6.2
2	e.55	16	9.7	15	13	e17	58	33	35	37	14	5.8
3	e.70	14	10	19	9.1	18	52	35	33	35	13	5.4
4	e1.0	13	e9.0	15	e8.0	17	46	32	30	35	13	5.1
5	e.85	12	e8.0	15	e8.0	16	44	31	28	32	14	4.8
6	e.80	11	e9.0	16	8.4	e15	41	34	26	88	12	4.6
7	e.65	11	9.8	14	8.3	15	41	90	25	130	12	4.4
8	.84	10	9.9	14	8.1	11	43	50	30	51	11	4.3
9	2.1	9.9	9.7	12	8.1	6.4	48	42	67	43	10	4.2
10	.81	9.5	9.4	e10	8.3	e5.5	44	38	34	38	10	4.0
11	.79	9.0	9.1	e9.5	8.8	e5.0	41	35	73	35	9.2	3.9
12	11	8.9	9.0	e8.0	8.5	e4.6	40	35	53	32	8.6	3.9
13	35	8.9	e8.5	e6.0	e8.8	e9.0	49	31	41	30	11	3.7
14	8.0	8.5	8.8	e7.0	e9.0	e8.5	49	29	137	28	9.2	4.1
15	6.4	8.1	9.0	e7.0	9.3	e9.5	47	27	113	27	8.5	3.8
16	5.9	7.7	9.2	e8.0	10	e12	44	25	72	25	7.8	3.5
17	5.7	7.8	9.4	e7.0	12	17	40	23	96	30	7.2	3.5
18	5.6	7.8	9.5	e7.0	16	41	38	22	847	25	6.9	3.4
19	5.4	7.5	9.8	7.6	32	44	37	37	114	23	6.6	3.3
20	5.3	7.5	10	7.5	25	39	62	49	86	22	6.2	3.3
21	5.3	7.2	10	7.7	21	44	56	39	74	20	6.7	3.1
22	5.2	7.3	10	7.2	20	49	50	52	60	61	6.1	3.1
23	5.7	7.2	9.8	7.1	19	45	45	41	47	27	5.6	3.0
24	11	7.1	9.9	6.9	19	37	42	222	43	23	5.4	3.0
25	13	7.3	9.5	7.1	19	51	43	55	39	21	5.2	2.9
26	16	7.0	9.2	7.1	19	57	42	45	36	20	4.8	2.9
27	20	7.0	e8.5	7.0	21	39	38	40	34	19	27	2.7
28	18	6.9	9.3	7.4	19	31	37	36	45	17	20	2.7
29	26	7.3	8.9	7.9	---	27	36	56	74	16	8.6	2.7
30	33	13	8.9	7.7	---	164	36	48	62	15	6.9	2.6
31	25	---	e8.5	7.6	---	123	---	41	---	14	6.6	---
TOTAL	276.19	283.4	289.3	295.1	395.7	995.5	1362	1408	2491	1062	307.1	113.9
MEAN	8.91	9.45	9.33	9.52	14.1	32.1	45.4	45.4	83.0	34.3	9.91	3.80
MAX	35	18	10	19	32	164	73	222	847	130	27	6.2
MIN	.55	6.9	8.0	6.0	8.0	4.6	36	22	25	14	4.8	2.6
AC-FT	548	562	574	585	785	1970	2700	2790	4940	2110	609	226
CFSM	.48	.51	.51	.52	.77	1.75	2.47	2.47	4.51	1.86	.54	.21
IN.	.56	.57	.58	.60	.80	2.01	2.75	2.85	5.04	2.15	.62	.23

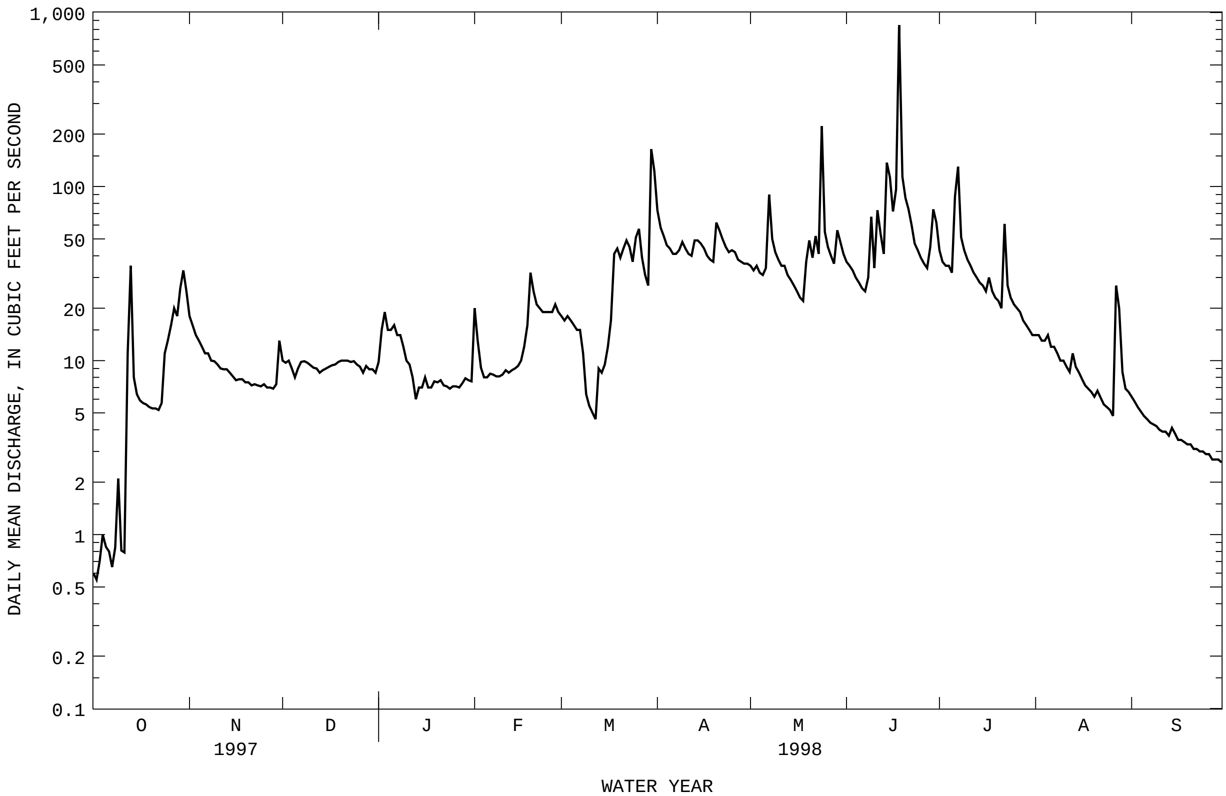
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3.88	4.64	4.49	5.22	35.5	15.4	19.5	45.7	36.8	16.1	5.30	1.86
MAX	8.91	9.45	9.33	9.52	65.0	32.1	45.4	65.7	83.0	34.3	9.91	3.80
(WY)	1998	1998	1998	1998	1996	1998	1998	1996	1998	1998	1998	1998
MIN	.90	1.44	1.31	1.72	14.1	5.14	4.40	25.9	12.5	7.96	2.90	1.03
(WY)	1996	1996	1996	1996	1998	1996	1996	1997	1997	1997	1997	1995

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1995 - 1998	
ANNUAL TOTAL	3810.95		9279.19			
ANNUAL MEAN	10.4		25.4		16.8	
HIGHEST ANNUAL MEAN					25.4	1998
LOWEST ANNUAL MEAN					8.76	1997
HIGHEST DAILY MEAN	318	Feb 18	847	Jun 18	847	Jun 18 1998
LOWEST DAILY MEAN	.55	Oct 2	.55	Oct 2	.30	Jan 7 1996
ANNUAL SEVEN-DAY MINIMUM	.72	Sep 27	.74	Oct 1	.54	Jan 3 1996
INSTANTANEOUS PEAK FLOW			7020	Jun 18	7020	Jun 18 1998
INSTANTANEOUS PEAK STAGE			13.94	Jun 18	13.94	Jun 18 1998
ANNUAL RUNOFF (AC-FT)	7560		18410		12180	
ANNUAL RUNOFF (CFSM)	.57		1.38		.91	
ANNUAL RUNOFF (INCHES)	7.70		18.76		12.41	
10 PERCENT EXCEEDS	20		49		38	
50 PERCENT EXCEEDS	8.0		13		7.1	
90 PERCENT EXCEEDS	1.2		4.6		1.1	

e Estimated

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued



05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1995 to current year.
WATER TEMPERATURES: May 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: May 1995 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 620 microsiemens Oct.2, 1995; minimum daily, 170 microsiemens May 24, 1996.
WATER TEMPERATURES: Maximum daily, 29.5°C Aug. 25, 1995; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,270 mg/L May 24, 1996; minimum daily mean, 6.0 mg/L Apr. 22, 1996.
SEDIMENT LOADS: Maximum daily, 11,400 tons June 18, 1998; minimum daily, 0.01 tons Jan. 6, 7, 1996.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 586 microsiemens Jan. 6; minimum daily, 214 microsiemens June 18.
WATER TEMPERATURES: Maximum daily, 22.5°C Sept. 28; minimum daily, 2.5°C Jan. 8.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,250 mg/L March 30; minimum daily mean, 14.0 mg/L Oct. 6.
SEDIMENT LOADS: Maximum daily, 11,400 tons June 18; minimum daily, 0.03 tons Oct. 2, 3, 6, 7.

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	564	---	---	475	---	---	---	537	---	---
2	---	---	569	---	515	---	525	---	529	---	---	---
3	---	---	478	---	---	---	560	---	---	---	---	545
4	527	---	---	---	---	---	---	---	499	---	---	---
5	---	554	---	---	485	550	---	---	---	---	---	---
6	---	---	---	586	---	500	---	535	---	513	---	---
7	557	---	---	---	---	---	---	---	---	428	---	---
8	571	---	---	551	---	---	545	549	508	534	---	---
9	500	---	---	545	---	---	549	550	548	534	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	547	---	---	522	529	---	---	381	473	454	---
12	---	548	---	---	538	---	---	---	---	---	544	---
13	---	548	---	---	---	522	---	---	---	---	494	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	574	---	---	---	535	---	---	554	---	---	---	547
16	---	---	---	468	524	---	---	---	---	455	---	---
17	---	557	---	---	---	528	527	---	---	---	462	535
18	---	---	469	446	---	527	475	---	214	---	---	541
19	---	487	---	496	---	538	---	497	---	---	468	475
20	---	541	---	---	555	550	---	441	510	---	---	564
21	---	546	---	466	---	546	---	---	---	467	---	448
22	520	---	569	---	---	---	---	---	523	511	---	573
23	---	---	---	451	550	---	---	---	535	---	---	432
24	559	---	---	---	---	---	---	---	---	---	453	---
25	568	498	---	---	---	447	534	---	---	519	---	548
26	---	543	---	---	520	415	547	---	---	---	---	---
27	567	---	---	---	529	512	474	---	---	---	376	571
28	---	---	---	451	487	538	---	---	---	---	---	479
29	556	---	500	---	---	---	---	526	---	---	---	---
30	548	---	---	---	---	290	---	---	---	---	545	---
31	---	---	---	526	---	470	---	---	---	---	---	---

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	17.5	---	---
2	---	---	---	---	---	---	6.5	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	4.5	---	---	---	---	---	---	---	---
7	19.5	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	2.5	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	22.0	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	14.0	---	---	---	---
20	---	7.0	---	---	4.0	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	16.5
22	---	---	---	---	---	---	---	---	---	---	---	12.5
23	---	---	---	---	---	---	---	---	---	---	---	11.5
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	22.5
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---

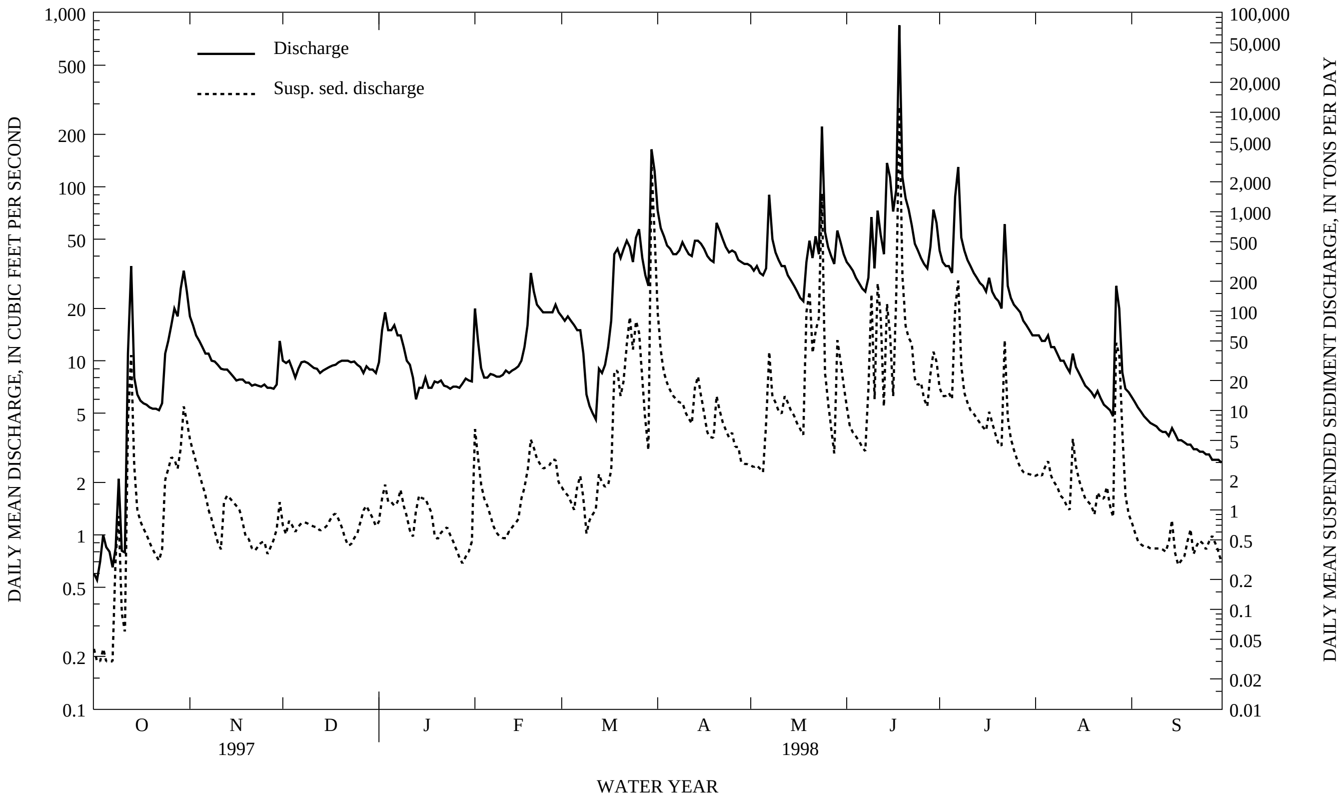
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	23	.04	103	5.1	26	.70	29	.76	88	6.5	35	1.7
2	20	.03	89	3.9	22	.57	31	1.3	95	3.4	33	1.5
3	18	.03	77	3.0	28	.78	35	1.8	73	1.8	29	1.4
4	16	.04	66	2.3	29	.70	30	1.2	60	1.3	26	1.2
5	15	.03	56	1.8	28	.60	28	1.2	50	1.1	23	1.0
6	14	.03	45	1.4	28	.68	27	1.1	39	.88	41	1.7
7	19	.03	36	1.0	28	.74	31	1.2	30	.68	54	2.2
8	125	.33	29	.81	28	.75	43	1.6	27	.59	42	1.3
9	133	.87	23	.61	28	.73	35	1.1	25	.54	33	.58
10	40	.09	18	.47	28	.70	32	.86	23	.52	53	.79
11	30	.06	16	.40	28	.68	24	.62	22	.52	67	.90
12	116	7.9	51	1.2	27	.67	25	.54	27	.61	83	1.0
13	331	36	60	1.4	27	.62	62	1.0	28	.67	94	2.3
14	127	2.8	56	1.3	27	.65	73	1.4	30	.73	83	1.9
15	58	1.0	55	1.2	28	.68	67	1.3	32	.81	67	1.7
16	48	.77	55	1.1	31	.77	61	1.3	47	1.3	55	1.8
17	42	.65	49	1.0	35	.88	57	1.1	52	1.7	55	2.5
18	37	.56	35	.75	36	.92	49	.93	56	2.5	214	25
19	32	.47	27	.54	30	.80	27	.55	60	5.1	205	25
20	28	.40	25	.51	24	.67	25	.51	61	4.2	134	14
21	25	.35	21	.41	19	.53	28	.59	57	3.3	163	20
22	22	.31	20	.39	16	.44	33	.63	53	2.9	342	46
23	24	.40	22	.43	17	.45	35	.67	50	2.6	703	87
24	65	2.0	25	.47	20	.52	30	.56	52	2.7	411	41
25	74	2.6	24	.48	23	.58	25	.48	56	2.8	566	79
26	77	3.4	19	.36	30	.75	21	.40	60	3.2	390	61
27	59	3.2	22	.42	43	.99	17	.33	56	3.2	190	21
28	53	2.6	27	.50	44	1.1	15	.29	37	1.9	95	7.9
29	57	4.1	32	.64	40	.95	16	.34	---	---	55	4.0
30	127	11	34	1.2	34	.82	19	.38	---	---	3250	2930
31	119	7.9	---	---	30	.69	23	.48	---	---	1460	574
TOTAL	---	89.99	---	35.09	---	22.11	---	26.52	---	58.05	---	3960.37

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEA CON TRA (MG	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	483	96	30	2.8	108	11	151	17	61	2.2	45	.75
2	256	40	30	2.7	75	7.0	144	14	62	2.3	39	.60
3	174	24	30	2.8	68	6.0	147	14	62	2.2	33	.49
4	148	19	29	2.6	67	5.5	164	15	74	2.7	33	.45
5	135	16	29	2.4	64	4.9	155	13	82	3.1	33	.43
6	123	14	72	7.5	61	4.3	414	106	67	2.2	34	.43
7	112	13	151	39	58	3.9	474	203	62	1.9	35	.41
8	102	12	107	14	153	16	198	28	57	1.7	36	.41
9	89	12	104	12	653	148	130	15	52	1.4	37	.41
10	81	9.5	102	10	138	13	113	12	49	1.3	38	.41
11	74	8.3	99	9.3	660	190	110	10	46	1.1	38	.40
12	68	7.4	143	14	567	86	106	9.3	44	1.0	37	.38
13	120	17	146	12	100	11	103	8.3	161	5.2	48	.48
14	165	22	133	10	220	118	99	7.5	112	2.8	71	.79
15	114	14	121	8.9	160	59	95	6.8	86	2.0	36	.37
16	79	9.3	112	7.4	74	14	93	6.3	76	1.6	29	.28
17	56	6.0	104	6.5	418	144	120	9.7	66	1.3	33	.31
18	53	5.4	96	5.7	2680	11400	110	7.5	62	1.2	37	.34
19	53	5.3	570	97	680	227	93	5.8	59	1.1	54	.48
20	81	14	1290	157	304	71	79	4.6	53	.90	73	.64
21	67	10	366	38	274	54	83	4.4	84	1.5	43	.36
22	57	7.6	434	64	293	47	283	51	79	1.3	52	.44
23	52	6.3	407	85	161	21	115	8.5	83	1.3	60	.49
24	47	5.4	1380	1520	157	18	83	5.2	118	1.7	56	.46
25	52	6.0	162	24	182	19	70	4.0	80	1.1	50	.40
26	38	4.3	99	12	136	13	61	3.2	65	.85	61	.48
27	42	4.3	61	6.6	118	11	53	2.7	448	48	75	.55
28	30	3.0	38	3.7	190	23	51	2.4	655	36	63	.46
29	30	2.9	305	51	190	39	53	2.3	250	6.0	52	.38
30	30	2.9	246	32	185	31	56	2.3	72	1.4	42	.30
31	---	---	156	18	---	---	58	2.2	52	.92	---	---
TOTAL	---	416.9	---	2277.9	---	12815.6	---	601.0	---	139.27	---	13.58
YEAR		20456.38										



Discharge
Susp. sed. discharge
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
DAILY MEAN SUSPENDED SEDIMENT DISCHARGE, IN TONS PER DAY
1,000
500
200
100
50
20
10
5
2
1
0.5
0.2
0.1
100,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
5
2
1
0.5
0.2
0.1
0.05
0.02
0.01
O N D J F M A M J J A S
1997
1998
WATER YEAR

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--July 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

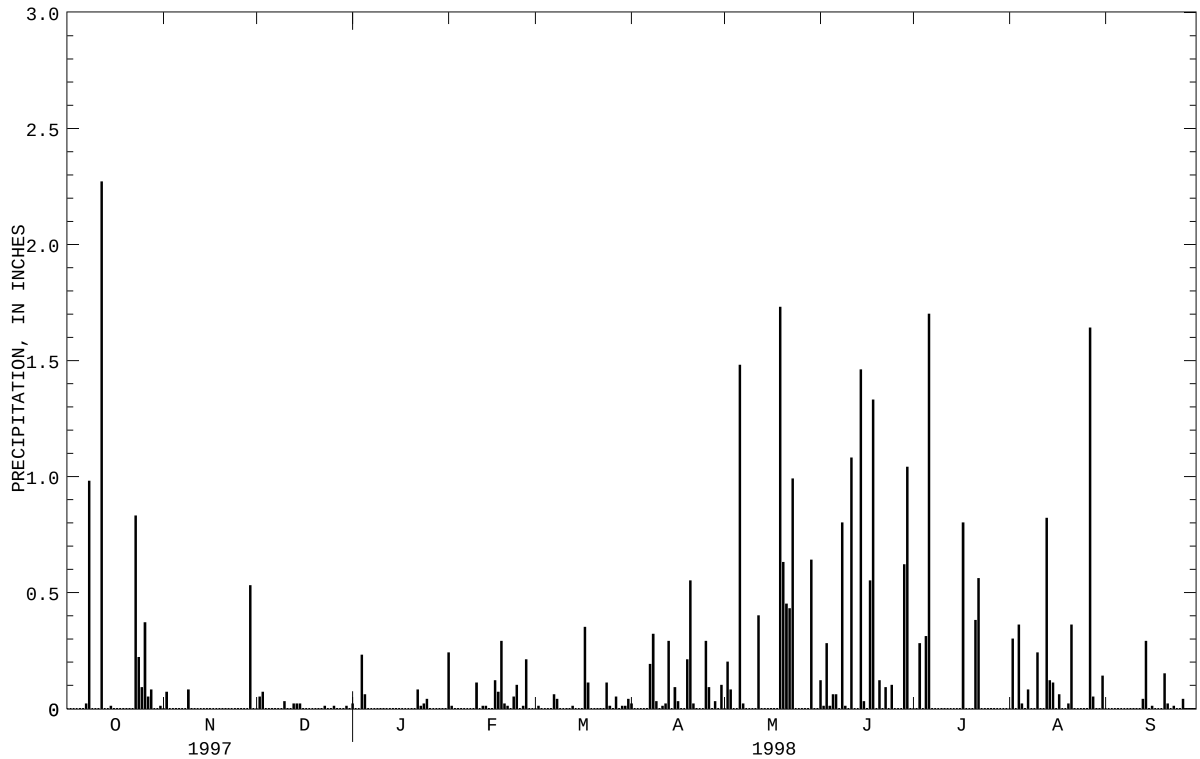
REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.69 in., July 17, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.27 in., Oct. 12.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.02	.24	.00	.02	.00	.12	.00	.00	.00
2	.00	.07	.05	.00	.01	.01	.00	.20	.01	.00	.30	.00
3	.00	.00	.07	.00	.00	.00	.00	.08	.28	.28	.00	.00
4	.00	.00	.00	.23	.00	.00	.00	.00	.01	.00	.36	.00
5	.00	.00	.00	.06	.00	.00	.00	.00	.06	.31	.02	.00
6	.00	.00	.00	.00	.00	.00	.00	1.48	.06	1.70	.00	.00
7	.02	.00	.00	.00	.00	.06	.19	.02	.00	.00	.08	.00
8	.98	.00	.00	.00	.00	.04	.32	.00	.80	.00	.00	.00
9	.00	.08	.00	.00	.00	.00	.03	.00	.01	.00	.00	.00
10	.00	.00	.03	.00	.11	.00	.00	.00	.00	.00	.24	.00
11	.00	.00	.00	.00	.00	.00	.01	.00	1.08	.00	.00	.00
12	2.27	.00	.00	.00	.01	.00	.02	.40	.00	.00	.00	.00
13	.00	.00	.02	.00	.01	.01	.29	.00	.00	.00	.82	.04
14	.00	.00	.02	.00	.00	.00	.00	.00	1.46	.00	.12	.29
15	.01	.00	.02	.00	.00	.00	.09	.00	.03	.00	.11	.00
16	.00	.00	.00	.00	.12	.00	.03	.00	.00	.00	.00	.01
17	.00	.00	.00	.00	.07	.35	.00	.00	.55	.80	.06	.00
18	.00	.00	.00	.00	.29	.11	.00	.00	1.33	.00	.00	.00
19	.00	.00	.00	.00	.02	.00	.21	1.73	.00	.00	.00	.00
20	.00	.00	.00	.00	.01	.00	.55	.63	.12	.00	.02	.15
21	.00	.00	.00	.00	.00	.00	.02	.45	.00	.38	.36	.02
22	.00	.00	.00	.08	.05	.00	.00	.43	.09	.56	.00	.00
23	.83	.00	.01	.01	.10	.00	.00	.99	.00	.00	.00	.01
24	.22	.00	.00	.02	.00	.11	.00	.00	.10	.00	.00	.00
25	.09	.00	.00	.04	.01	.01	.29	.00	.00	.00	.00	.00
26	.37	.00	.01	.00	.21	.00	.09	.00	.00	.00	.00	.04
27	.05	.00	.00	.00	.00	.05	.00	.00	.00	.00	1.64	.00
28	.08	.00	.00	.00	.00	.00	.03	.00	.62	.00	.05	.00
29	.00	.53	.00	.00	---	.01	.00	.64	1.04	.00	.00	.00
30	.00	.00	.01	.00	---	.01	.10	.00	.00	.00	.00	.00
31	.01	---	.00	.00	---	.04	---	.00	---	.00	.14	---
TOTAL	4.93	0.68	0.24	0.46	1.26	0.81	2.29	7.05	7.77	4.03	4.32	0.56
MEAN	.16	.02	.01	.01	.04	.03	.08	.23	.26	.13	.14	.02
MAX	2.27	.53	.07	.23	.29	.35	.55	1.73	1.46	1.70	1.64	.29
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00


3.0
2.5
2.0
1.5
1.0
0.5
0
PRECIPITATION, IN INCHES
O
N
D
J
F
M
A
M
J
J
A
S
1997
1998

05471050 SOUTH SKUNK RIVER AT COLFAX, IA

LOCATION.--Lat 41°40'55", long 93°14'47", in NE1/4 NE1/4 SW1/4 sec.1, T.79 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on left bank 15 ft downstream of bridge on State Highway 117 at north edge of Colfax, 1 mi downstream from Sugar Creek, 2.8 mi upstream from Indian Creek, and at mile 191 upstream from mouth of Skunk River.

DRAINAGE AREA.--803 mi^2.

PERIOD OF RECORD.--June 1974 to June 1977, (operated as a partial-record low-flow measurement site), October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 770.00 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 23 to Jan. 1, Jan. 7-28, Mar. 9-12, and April 3-13. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published as miscellaneous water quality data in this report. U.S. Geological Survey data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

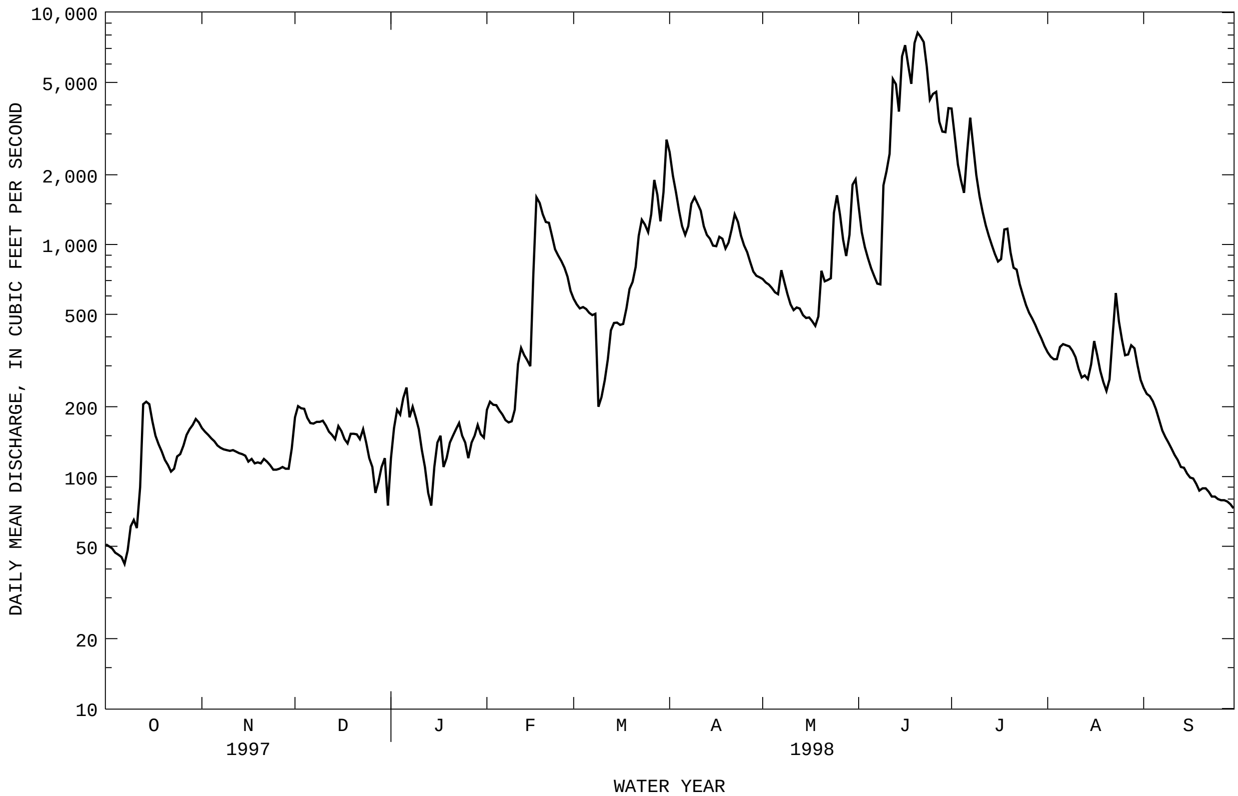
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	162	180	e120	194	584	2500	710	1460	3860	343	241
2	50	156	201	162	210	552	1980	686	1130	2960	328	227
3	49	151	197	194	204	531	e1680	672	976	2210	320	222
4	47	146	196	185	203	538	e1400	649	875	1890	321	211
5	46	142	179	218	193	527	e1200	623	790	1670	362	195
6	45	136	170	242	185	508	e1100	611	730	2490	372	175
7	42	133	169	e180	175	496	e1200	775	678	3520	368	158
8	48	131	172	e200	171	503	e1500	688	673	2650	364	148
9	61	130	172	e180	173	e200	e1600	611	1800	1990	348	140
10	65	129	174	e160	194	e220	e1500	552	2070	1610	327	132
11	60	130	166	e130	305	e260	e1400	521	2460	1380	291	124
12	90	128	156	e110	358	e320	e1200	536	5170	1210	267	118
13	205	126	151	e85	334	427	e1100	529	4910	1090	273	110
14	210	125	145	e75	317	459	1060	496	3740	993	263	109
15	205	123	165	e110	299	461	989	482	6470	909	304	103
16	173	116	157	e140	746	450	983	485	7230	845	384	99
17	150	119	145	e150	1600	455	1080	467	5930	866	333	98
18	138	114	139	e110	1510	531	1060	446	4930	1160	285	93
19	128	115	153	e120	1350	643	962	490	7390	1170	255	87
20	118	114	153	e140	1250	690	1020	771	8180	927	234	89
21	112	119	152	e150	1240	800	1160	694	7850	795	262	89
22	105	116	145	e160	1090	1090	1350	704	7450	779	412	86
23	108	112	e160	e170	955	1280	1250	716	5830	676	618	82
24	122	107	e140	e150	897	1220	1090	1370	4210	608	466	82
25	125	107	e120	e140	848	1130	991	1630	4460	548	388	80
26	136	108	e110	e120	794	1350	928	1340	4550	508	333	79
27	151	110	e85	e140	726	1900	840	1050	3390	480	336	79
28	160	108	e95	e150	631	1640	765	892	3070	451	368	78
29	167	108	e110	167	---	1260	734	1100	3050	420	357	76
30	177	132	e120	152	---	1680	722	1810	3870	393	302	73
31	171	---	e75	147	---	2830	---	1910	---	365	261	---
TOTAL	3515	3753	4652	4657	17152	25535	36344	25016	115322	41423	10445	3683
MEAN	113	125	150	150	613	824	1211	807	3844	1336	337	123
MAX	210	162	201	242	1600	2830	2500	1910	8180	3860	618	241
MIN	42	107	75	75	171	200	722	446	673	365	234	73
AC-FT	6970	7440	9230	9240	34020	50650	72090	49620	228700	82160	20720	7310
CFSM	.14	.16	.19	.19	.76	1.03	1.51	1.00	4.79	1.66	.42	.15
IN.	.16	.17	.22	.22	.79	1.18	1.68	1.16	5.34	1.92	.48	.17

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	357	323	296	189	368	857	893	1089	1457	1122	601	344
MAX	1807	981	626	451	849	2094	2435	2481	3844	5640	3549	1911
(WY)	1987	1997	1993	1992	1997	1993	1991	1991	1998	1993	1993	1993
MIN	11.9	17.5	12.4	12.3	16.2	168	62.1	182	96.7	31.8	12.6	6.75
(WY)	1989	1989	1989	1989	1990	1989	1989	1989	1988	1988	1988	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1986 - 1998	
ANNUAL TOTAL	176863		291497			
ANNUAL MEAN	485		799		659	
HIGHEST ANNUAL MEAN					1831	1993
LOWEST ANNUAL MEAN					69.6	1989
HIGHEST DAILY MEAN	3400	Feb 19	8180	Jun 20	13100	Jul 12 1993
LOWEST DAILY MEAN	42	Oct 7	42	Oct 7	1.4	Aug 18 1988
ANNUAL SEVEN-DAY MINIMUM	47	Oct 2	47	Oct 2	3.2	Sep 8 1988
INSTANTANEOUS PEAK FLOW			8340	Jun 20	14200	Jul 12 1993
INSTANTANEOUS PEAK STAGE			18.68	Jun 20	21.53	Jul 12 1993
INSTANTANEOUS LOW FLOW			41	Oct 6,7	1.2	Aug 18 1988b
ANNUAL RUNOFF (AC-FT)	350800		578200		477600	
ANNUAL RUNOFF (CFSM)	.60		.99		.82	
ANNUAL RUNOFF (INCHES)	8.19		13.50		11.15	
10 PERCENT EXCEEDS	1050		1730		1580	
50 PERCENT EXCEEDS	270		321		300	
90 PERCENT EXCEEDS	65		108		39	

b Also Aug 19, 1988
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05471200 INDIAN CREEK NEAR MINGO, IA

LOCATION.--Lat 41°48'17", long 93°18'36", in $NW^1/_4$ $NW^1/_4$ sec. 28, T.81 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on right bank 30 ft downstream from bridge on State Highway 117, 0.7 mi downstream from Wolf Creek, 2.2 mi upstream from Byers Branch, 2.9 mi northwest of Mingo, and 11.3 mi upstream from South Skunk River.

DRAINAGE AREA.--276 mi^2.

PERIOD OF RECORD.--May 1958 to September 1975; October 1985 to current year.

REVISED RECORDS.--WSP 1728: 1958 (M), 1959 (M).

GAGE.--Water-stage recorder. Datum of gage is 810.47 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 17-19, Dec. 4 to Feb. 17, Mar. 10-15, and June 16-18. Records good except those for estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 20, 1944, reached a stage of 21.4 ft, from information by local resident, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

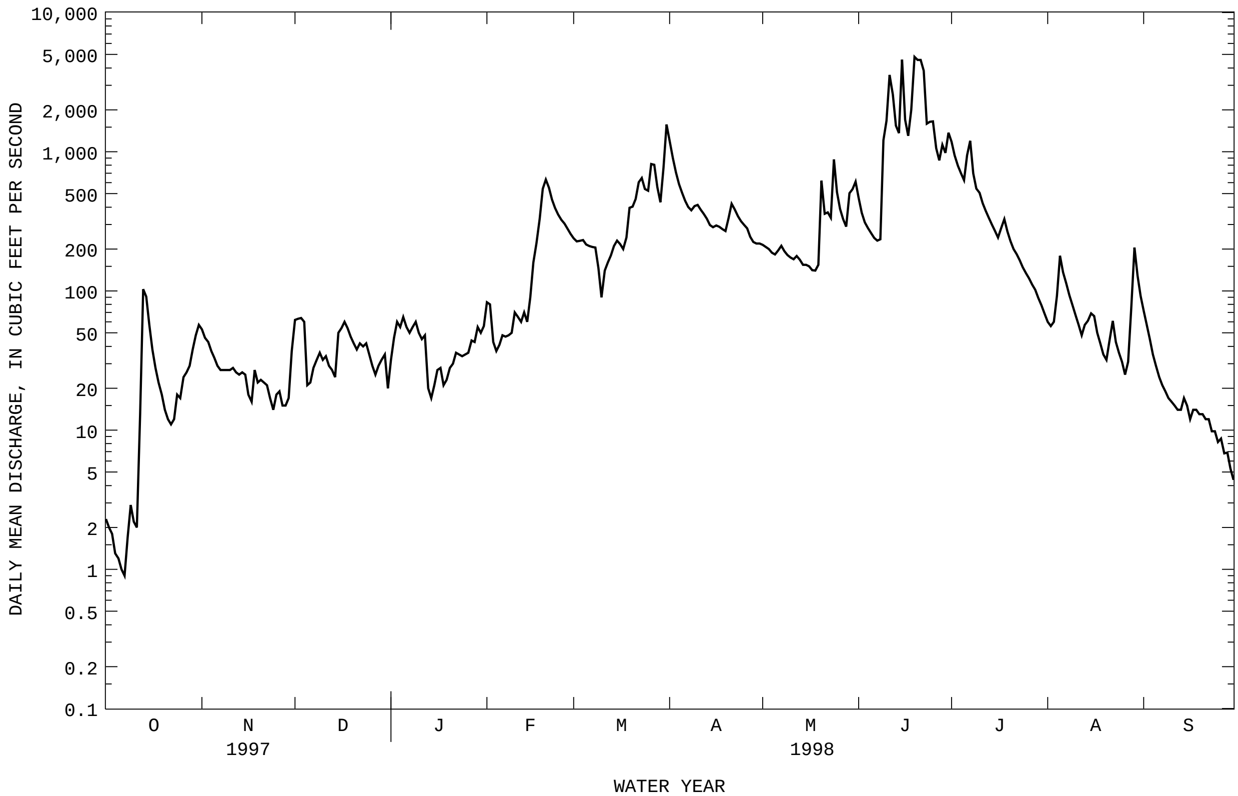
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	53	62	e32	e83	239	1200	214	465	1180	60	72
2	2.0	46	63	e46	e80	227	898	207	364	942	56	57
3	1.8	43	64	e60	e43	229	709	200	311	794	60	45
4	1.3	37	e60	e55	e37	232	585	188	283	700	92	35
5	1.2	33	e21	e65	e41	216	507	183	260	625	179	29
6	1.0	29	e22	e55	e48	210	443	195	240	943	136	24
7	.90	27	e28	e50	e47	207	401	211	230	1200	114	21
8	1.7	27	e32	e55	e48	205	379	193	235	698	93	19
9	2.9	27	e36	e60	e50	146	407	181	1210	544	79	17
10	2.2	27	e32	e50	e70	e90	415	174	1670	506	67	16
11	2.0	28	e34	e45	e65	e140	383	169	3560	427	57	15
12	13	26	e29	e48	e60	e160	357	178	2580	376	48	14
13	103	25	e27	e20	e70	e180	330	168	1540	335	57	14
14	91	26	e24	e17	e60	e210	297	154	1360	300	61	17
15	57	25	e50	e21	e90	e230	287	154	4600	270	69	15
16	38	18	e54	e27	e160	217	295	150	e1700	242	66	12
17	28	e16	e60	e28	e220	200	289	141	e1300	282	50	14
18	22	e27	e54	e21	330	242	278	140	e2000	328	42	14
19	18	e22	e47	e23	541	396	269	154	4800	268	35	13
20	14	23	e42	e28	631	403	333	619	4570	228	32	13
21	12	22	e38	e30	553	458	423	359	4570	200	44	12
22	11	21	e42	e36	454	603	386	366	3820	184	61	12
23	12	17	e40	e35	394	647	344	335	1590	166	43	9.8
24	18	14	e42	e34	354	540	317	882	1640	148	36	9.8
25	17	18	e35	e35	324	525	298	512	1650	134	31	8.2
26	24	19	e29	e36	305	817	282	388	1060	123	25	8.7
27	26	15	e25	e44	280	806	245	328	867	111	31	6.8
28	29	15	e29	e43	257	555	225	290	1120	102	74	6.9
29	38	17	e32	e55	---	434	219	503	980	89	205	5.3
30	48	37	e35	e50	---	765	219	538	1370	79	129	4.4
31	57	---	e20	e56	---	1570	---	610	---	69	92	---
TOTAL	695.30	780	1208	1260	5695	12099	12020	9084	51945	12593	2224	559.9
MEAN	22.4	26.0	39.0	40.6	203	390	401	293	1732	406	71.7	18.7
MAX	103	53	64	65	631	1570	1200	882	4800	1200	205	72
MIN	.90	14	20	17	37	90	219	140	230	69	25	4.4
AC-FT	1380	1550	2400	2500	11300	24000	23840	18020	103000	24980	4410	1110
CFSM	.08	.09	.14	.15	.74	1.41	1.45	1.06	6.27	1.47	.26	.07
IN.	.09	.11	.16	.17	.77	1.63	1.62	1.22	7.00	1.70	.30	.08

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	112	100	82.3	63.1	125	320	287	379	509	328	163	88.8
MAX	689	549	319	289	619	816	834	936	1732	2809	1500	678
(WY)	1987	1973	1973	1973	1971	1993	1965	1974	1998	1993	1993	1993
MIN	1.11	4.12	2.05	1.87	2.25	10.9	8.07	5.58	10.9	3.49	1.44	.91
(WY)	1972	1968	1990	1968	1967	1968	1989	1967	1989	1988	1988	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1959 - 1998	
ANNUAL TOTAL	57039.60		110163.20			
ANNUAL MEAN	156		302		213	
HIGHEST ANNUAL MEAN					751	1993
LOWEST ANNUAL MEAN					11.9	1989
HIGHEST DAILY MEAN	1700	Jun 30	4800	Jun 19	12000	Jul 10 1993
LOWEST DAILY MEAN	.90	Oct 7	.90	Oct 7	.01	Aug 18 1989
ANNUAL SEVEN-DAY MINIMUM	1.4	Oct 2	1.4	Oct 2	.15	Aug 16 1989
INSTANTANEOUS PEAK FLOW			4900	Jun 19	23500	Jun 4 1991
INSTANTANEOUS PEAK STAGE			14.83	Jun 19	19.16	Jun 4 1991
INSTANTANEOUS LOW FLOW			.78	Oct 7		
ANNUAL RUNOFF (AC-FT)	113100		218500		154700	
ANNUAL RUNOFF (CFSM)	.57		1.09		.77	
ANNUAL RUNOFF (INCHES)	7.69		14.85		10.51	
10 PERCENT EXCEEDS	359		699		500	
50 PERCENT EXCEEDS	68		70		74	
90 PERCENT EXCEEDS	5.6		15		4.7	

e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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1997
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WATER YEAR

05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA

LOCATION.--Lat 41°21'21", long 92°39'24", in NW$^1/_4$ SW$^1/_4$ sec.25, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080105, on left bank downstream from bridge on U.S. Highway 63, 0.3 mi downstream from Painter Creek, 4.0 mi north of Oskaloosa, 52.0 mi upstream from confluence with North Skunk River, and at mile 147.3 upstream from mouth of Skunk River. Gage was moved to the left bank on downstream side of the Highway 63 bridge on May 3, 1995.

DRAINAGE AREA.--1,635 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as "Skunk River near Oskaloosa." Prior to October 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WDR IA-95-1: Location.

GAGE.--Water-stage recorder. Datum of gage is 685.50 ft above sea level. Prior to Nov. 21, 1947, nonrecording gage at site 400 ft downstream at same datum. Accubar pressure sensor installed at site on May 3, 1995.

REMARKS.--Estimated daily discharges: Dec. 13-15, Dec. 26 to Jan. 2, Jan. 9-27, Mar. 8, Mar. 10-16, Aug. 5-11, and Aug. 18, 19. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 25.8 ft, from floodmarks, discharge, 37,000 ft^3/s, from rating curve extended above 18,000 ft^3/s on basis of velocity-area study.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	99	842	527	e320	686	1720	7790	1850	3490	8840	1050	754
2	99	726	517	e480	1030	1600	6270	1740	3000	8570	997	656
3	101	662	579	835	764	1530	4850	1670	2560	7420	982	590
4	92	598	606	787	634	1490	4010	1620	2410	6240	e1050	534
5	88	565	562	932	591	1480	3480	1530	2200	5320	e1200	492
6	88	534	495	1080	545	1440	3110	1510	2010	5830	e1400	461
7	86	507	495	977	522	1430	2850	3530	1880	7490	e1500	429
8	88	486	507	911	512	e1600	2930	2680	1950	7470	e1200	399
9	129	471	530	e750	498	1300	3070	2120	3010	6160	e1000	373
10	202	461	518	e550	514	e1200	3130	1850	5170	4920	e900	358
11	129	444	499	e480	706	e1000	2980	1690	5240	4050	e800	344
12	192	434	470	e440	1100	e850	2720	1620	6760	3400	713	328
13	1170	430	e380	e380	998	e950	2610	1590	7620	3010	661	315
14	782	421	e340	e360	866	e1300	2730	1520	8270	2660	699	575
15	502	406	e360	e400	818	e1200	2540	1450	9060	2400	681	459
16	423	381	453	e460	795	e1200	2410	1380	8740	2200	667	370
17	352	357	457	e500	1430	1340	2310	1320	9320	2130	814	331
18	302	373	452	e480	2280	1960	2310	1280	10100	2350	e700	315
19	270	365	456	e460	2680	2400	2220	1240	10900	2500	e600	299
20	243	363	469	e480	2850	2480	2210	1440	10400	2300	566	285
21	223	355	456	e480	2700	2560	2750	2320	10500	2000	646	272
22	209	349	459	e490	2550	2830	2710	2100	10800	3750	575	263
23	206	335	482	e470	2310	3220	2720	2290	11500	2320	709	254
24	342	316	526	e460	2150	3200	2500	4910	11700	1860	1030	249
25	436	315	520	e500	2020	3040	2340	4440	11100	1660	838	247
26	528	323	e400	e500	1950	3290	2410	3760	10000	1530	704	240
27	719	314	e340	e600	2040	3670	2180	3090	9240	1450	797	231
28	693	314	e370	736	1860	3770	1970	2640	8510	1360	2860	218
29	801	343	e340	813	---	3110	1850	2560	7960	1280	1140	209
30	1030	562	e300	771	---	3270	1800	3280	8660	1190	979	212
31	1020	---	e270	728	---	7350	---	3590	---	1110	859	---
TOTAL	11644	13352	14135	18610	38399	68780	89760	69610	214060	114770	29317	11062
MEAN	376	445	456	600	1371	2219	2992	2245	7135	3702	946	369
MAX	1170	842	606	1080	2850	7350	7790	4910	11700	8840	2860	754
MIN	86	314	270	320	498	850	1800	1240	1880	1110	566	209
AC-FT	23100	26480	28040	36910	76160	136400	178000	138100	424600	227600	58150	21940
CFSM	.23	.27	.28	.37	.84	1.36	1.83	1.37	4.36	2.26	.58	.23
IN.	.26	.30	.32	.42	.87	1.56	2.04	1.58	4.87	2.61	.67	.25

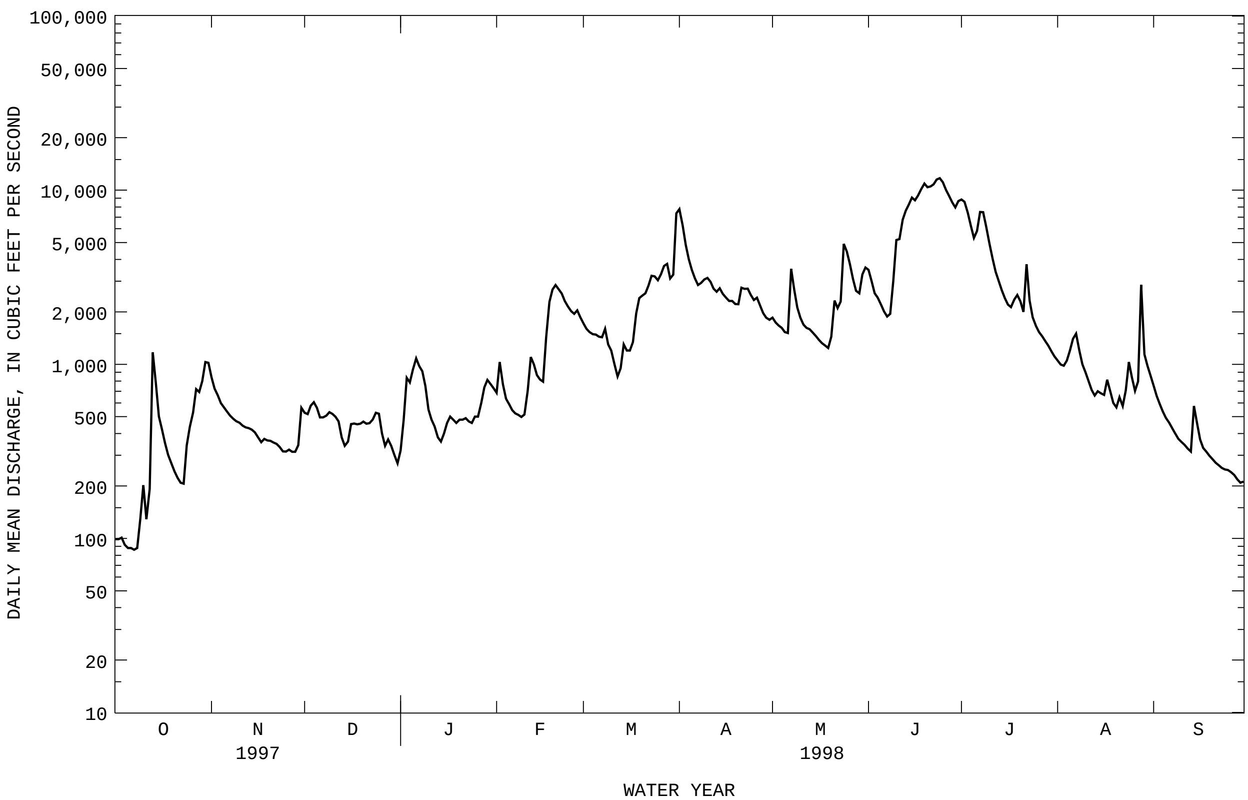
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	508	559	465	472	834	1641	1644	1697	2154	1454	675	485
MAX	3646	3576	2322	3906	3587	4841	5366	6168	9222	11770	7772	5140
(WY)	1987	1984	1983	1973	1973	1979	1983	1974	1947	1993	1993	1993
MIN	8.47	14.5	7.55	5.30	42.9	45.9	42.1	74.2	39.4	27.3	43.3	27.8
(WY)	1957	1957	1956	1956	1954	1954	1956	1956	1977	1977	1988	1956

05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1946 - 1998	
ANNUAL TOTAL	344317		693499			
ANNUAL MEAN	943		1900		1049	
HIGHEST ANNUAL MEAN					3884	1993
LOWEST ANNUAL MEAN					40.1	1956
HIGHEST DAILY MEAN	4600	Feb 21	11700	Jun 24	20400	Jul 15 1993
LOWEST DAILY MEAN	86	Oct 7	86	Oct 7	1.8	Oct 11 1956a
ANNUAL SEVEN-DAY MINIMUM	92	Oct 2	92	Oct 2	2.0	Oct 7 1956
INSTANTANEOUS PEAK FLOW			11900	Jun 24	20700	Jul 15 1993
INSTANTANEOUS PEAK STAGE			22.84	Jun 24	24.78	Jul 15 1993
ANNUAL RUNOFF (AC-FT)	683000		1376000		759800	
ANNUAL RUNOFF (CFSM)	.58		1.16		.64	
ANNUAL RUNOFF (INCHES)	7.83		15.78		8.72	
10 PERCENT EXCEEDS	1880		4600		2600	
50 PERCENT EXCEEDS	650		979		458	
90 PERCENT EXCEEDS	164		315		55	

a Also Oct 12, 13, 1956
e Estimated



05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA

LOCATION.--Lat 41°18'03", long 92°12'16", in NE$^1/_4$ SE$^1/_4$ sec.14, T.75 N., R.12 W., Keokuk County, Hydrologic Unit 07080106, on right bank 10 ft downstream from bridge on State Highway 149, 1.2 mi downstream from Cedar Creek, 2.2 mi south of Sigourney, 4.0 mi upstream from Bridge Creek, and 16.2 mi upstream from confluence with South Skunk River.

DRAINAGE AREA.--730 mi^2.

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946-47 (M).

GAGE.--Water stage recorder. Datum of gage is 651.53 ft above sea level. Prior to June 10, 1953, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 13-15, Dec. 25 to Jan. 3, Jan. 10-27, and March 11-13. Records good except those estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 22.8 ft, from floodmark, discharge, 14,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	1160	539	e200	416	925	3620	1840	1460	2810	287	276
2	32	825	497	e290	528	846	3840	1210	1270	2770	279	224
3	29	663	420	e650	1070	800	5310	964	1140	1710	254	192
4	28	585	432	1050	762	781	4560	848	1050	1330	253	169
5	28	517	444	1040	525	739	2710	797	1020	1200	308	154
6	28	473	389	1090	440	697	1640	956	976	1320	673	143
7	26	447	335	1120	409	665	1440	2720	930	1480	462	134
8	27	420	342	889	375	1120	1680	2840	919	1500	343	126
9	27	402	338	754	352	1330	1530	2020	1600	1140	300	118
10	28	384	333	e480	334	784	1410	1520	1810	1210	264	111
11	38	366	323	e380	371	e600	1250	1290	1720	2400	244	108
12	75	348	303	e320	550	e550	1120	1150	2420	2460	227	106
13	95	330	e230	e280	685	e650	1150	1250	2610	1360	212	103
14	899	324	e190	e260	518	842	1250	1060	2870	985	197	680
15	628	312	e220	e300	475	791	1230	933	3680	822	184	1250
16	291	291	314	e360	466	712	1170	871	3220	718	180	504
17	201	253	339	e380	490	861	1150	801	2960	653	171	298
18	155	253	342	e360	570	2500	1130	729	2920	703	162	224
19	128	275	327	e340	707	2870	997	673	3280	891	155	185
20	109	277	328	e320	1090	2450	942	715	2930	645	154	171
21	95	258	313	e320	1160	1850	1160	1140	3350	544	169	158
22	102	254	310	e340	1000	1640	1370	1360	3300	734	193	147
23	100	240	323	e350	883	1630	1200	1430	2850	1320	157	137
24	114	227	342	e300	831	1570	1050	2260	1790	824	149	132
25	229	222	e300	e320	812	1380	963	2860	1510	570	141	130
26	457	225	e260	e300	797	1450	1060	3060	1350	480	136	126
27	496	231	e220	e320	952	1800	1330	3210	1190	433	140	120
28	716	227	e240	357	1050	1610	1030	2240	1220	400	2400	116
29	723	228	e220	404	---	1210	890	1540	1630	365	2480	117
30	862	317	e180	467	---	1100	1010	1840	2800	335	990	116
31	1310	---	e140	434	---	3650	---	1850	---	308	382	---
TOTAL	8110	11334	9833	14775	18618	40403	50192	47977	61775	34420	12646	6575
MEAN	262	378	317	477	665	1303	1673	1548	2059	1110	408	219
MAX	1310	1160	539	1120	1160	3650	5310	3210	3680	2810	2480	1250
MIN	26	222	140	200	334	550	890	673	919	308	136	103
AC-FT	16090	22480	19500	29310	36930	80140	99560	95160	122500	68270	25080	13040
CFSM	.36	.52	.43	.65	.91	1.79	2.29	2.12	2.82	1.52	.56	.30
IN.	.41	.58	.50	.75	.95	2.06	2.56	2.44	3.15	1.75	.64	.34

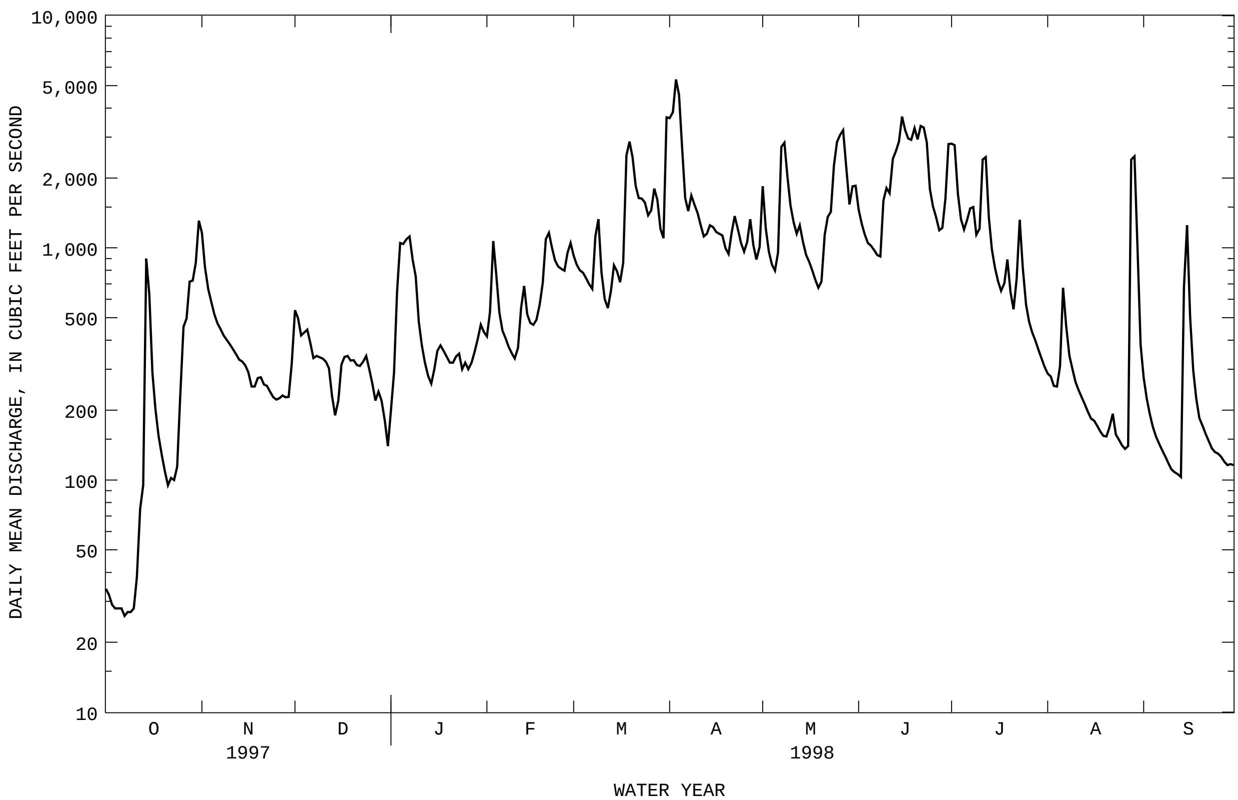
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	212	289	233	267	424	860	787	826	785	564	298	294
MAX	1603	1890	1208	1767	1311	2996	2826	4170	4145	5098	3668	2708
(WY)	1987	1962	1983	1946	1973	1979	1993	1974	1947	1993	1993	1993
MIN	.13	3.38	2.58	2.26	12.8	17.0	11.2	14.4	20.1	11.2	7.90	4.35
(WY)	1957	1957	1956	1954	1954	1954	1956	1956	1977	1977	1955	1956

05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1946 - 1998	
ANNUAL TOTAL	123735		316658			
ANNUAL MEAN	339		868		486	
HIGHEST ANNUAL MEAN					2041	1993
LOWEST ANNUAL MEAN					27.7	1956
HIGHEST DAILY MEAN	5000	Feb 22	5310	Apr 3	23200	Mar 31 1960
LOWEST DAILY MEAN	26	Oct 7	26	Oct 7	.10	Oct 7 1956a
ANNUAL SEVEN-DAY MINIMUM	27	Oct 4	27	Oct 4	.10	Oct 7 1956
INSTANTANEOUS PEAK FLOW			5510	Apr 3	27500	Mar 31 1960
INSTANTANEOUS PEAK STAGE			18.11	Apr 3	25.33	Mar 31 1960
INSTANTANEOUS LOW FLOW			25	Oct 5a		
ANNUAL RUNOFF (AC-FT)	245400		628100		352400	
ANNUAL RUNOFF (CFSM)	.46		1.19		.67	
ANNUAL RUNOFF (INCHES)	6.31		16.14		9.05	
10 PERCENT EXCEEDS	673		1920		1200	
50 PERCENT EXCEEDS	228		550		171	
90 PERCENT EXCEEDS	49		140		18	

a Also Oct 7, 8 to Nov 15, 1956
e Estimated



05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA

LOCATION.--Lat. 40°55'20", long 91°40'10", in SE$^1/_4$ NW$^1/_4$ sec.28, T.71 N., R.7 W., Henry County, Hydrologic Unit 07080107, on left bank 30 ft upstream from bridge on county highway H46, 3.0 mi west of Oakland Mills, 2.9 mi upstream from Wolf Creek, and 4.3 mi upstream from mouth.

DRAINAGE AREA.--530 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1957 to 1977. July 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 565.07 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 17 to Jan. 4, Jan. 10 to Feb. 2, and Aug. 4, 19-26. Records good except those for estimated daily discharges, which are poor. Occasional high-water measurements were made by U.S. Army Corps of Engineers in 1965, 1966, 1970, and 1974 and by U.S. Geological Survey in 1966 and 1967. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 22, 1973 reached a stage of 24.09 ft, discharge not determined. Flood of June 1905 reached a stage approximately 2 feet higher from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.9	306	211	e70	e320	471	6740	3080	351	2450	21	284
2	6.1	230	202	e140	e480	381	4180	2680	287	1050	18	298
3	5.7	172	153	e320	684	343	1540	965	269	843	17	179
4	3.8	141	193	e850	442	312	1160	622	249	732	e28	101
5	2.9	125	261	2020	357	274	972	477	224	653	67	70
6	2.1	113	198	2570	321	241	883	421	209	2450	491	51
7	2.2	117	148	3440	292	222	953	979	190	4880	1180	37
8	2.3	111	130	1280	232	1820	3220	868	179	4350	527	29
9	3.1	106	118	751	199	4100	5470	598	773	1700	173	24
10	4.2	105	118	e380	197	1350	3590	445	2050	766	149	20
11	3.8	94	114	e260	1180	704	1330	373	822	756	110	18
12	4.7	89	106	e240	2640	500	878	323	819	477	127	16
13	13	87	85	e200	1100	422	1530	416	763	378	51	16
14	42	81	78	e160	636	476	4760	332	695	298	32	640
15	154	79	122	e180	492	465	2090	248	3450	225	26	3300
16	79	76	105	e200	424	378	1480	223	4570	181	22	3110
17	50	61	e96	e165	434	1100	850	229	2330	152	20	760
18	36	58	e91	e140	462	4350	624	186	1420	130	18	452
19	30	61	e85	e150	521	4350	514	165	3160	133	e17	305
20	27	64	e80	e130	1180	1790	451	161	2830	123	e16	201
21	22	59	e77	e120	773	1040	412	204	1800	101	e15	149
22	18	53	e74	e130	523	722	381	451	3120	82	e14	126
23	17	52	e80	e130	429	578	331	585	1760	68	e13	109
24	20	47	e85	e120	381	490	296	2950	1480	58	e12	95
25	22	44	e80	e110	339	432	279	5050	1350	54	e11	85
26	69	44	e75	e100	384	414	270	4410	1200	45	e10	82
27	293	41	e65	e115	1570	394	252	1290	1030	39	11	86
28	573	76	e70	e150	831	362	205	744	937	35	29	73
29	381	103	e65	e180	---	348	195	552	1070	31	2750	73
30	465	206	e60	e190	---	430	443	454	3110	28	3170	72
31	374	---	e57	e240	---	5240	---	419	---	24	658	---
TOTAL	2732.8	3001	3482	15231	17823	34499	46279	30900	42497	23292	9803	10861
MEAN	88.2	100	112	491	637	1113	1543	997	1417	751	316	362
MAX	573	306	261	3440	2640	5240	6740	5050	4570	4880	3170	3300
MIN	2.1	41	57	70	197	222	195	161	179	24	10	16
AC-FT	5420	5950	6910	30210	35350	68430	91790	61290	84290	46200	19440	21540
CFSM	.17	.19	.21	.92	1.19	2.09	2.89	1.87	2.66	1.41	.59	.68
IN.	.19	.21	.24	1.06	1.24	2.41	3.23	2.16	2.97	1.63	.68	.76

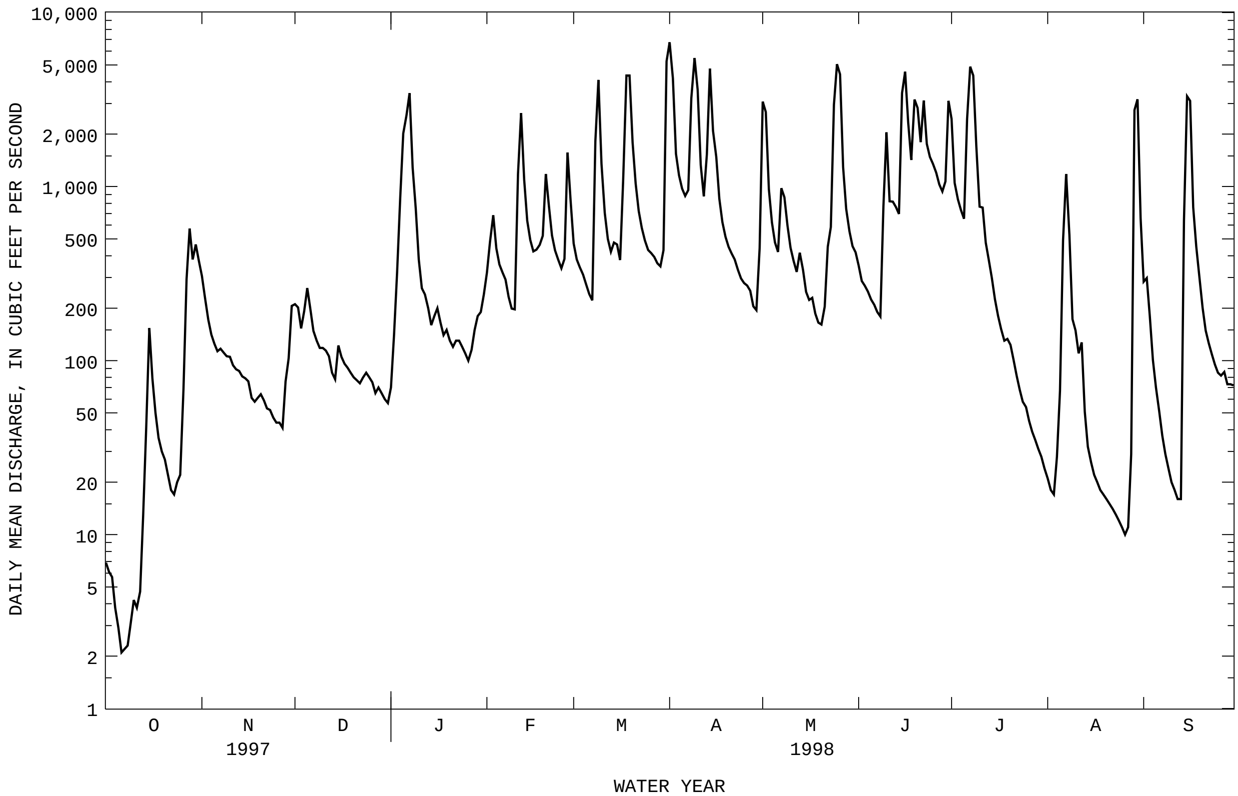
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	211	302	256	104	330	633	647	731	537	608	212	250
MAX	1711	1340	1364	545	1091	1987	1863	3116	2199	4565	2186	1245
(WY)	1987	1993	1983	1993	1985	1979	1983	1996	1990	1993	1993	1986
MIN	5.93	10.2	4.43	9.42	6.36	32.3	37.7	33.3	14.6	3.52	5.35	6.28
(WY)	1989	1990	1990	1997	1989	1989	1989	1988	1988	1988	1983	1991

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1978 - 1998	
ANNUAL TOTAL	80031.6		240400.8			
ANNUAL MEAN	219		659		402	
HIGHEST ANNUAL MEAN					1424	1993
LOWEST ANNUAL MEAN					73.0	1989
HIGHEST DAILY MEAN	5780	Feb 22	6740	Apr 1	11500	May 28 1996
LOWEST DAILY MEAN	2.1	Oct 6	2.1	Oct 6	.42	Sep 17 1988
ANNUAL SEVEN-DAY MINIMUM	2.9	Oct 4	2.9	Oct 4	.55	Sep 14 1988
INSTANTANEOUS PEAK FLOW			7150	Apr 1	12300	May 28 1996
INSTANTANEOUS PEAK STAGE			18.39	Apr 1	21.27	Jul 9 1993
INSTANTANEOUS LOW FLOW			1.8	Oct 6		
ANNUAL RUNOFF (AC-FT)	158700		476800		291200	
ANNUAL RUNOFF (CFSM)	.41		1.24		.75	
ANNUAL RUNOFF (INCHES)	5.59		16.78		10.25	
10 PERCENT EXCEEDS	495		1900		953	
50 PERCENT EXCEEDS	71		229		82	
90 PERCENT EXCEEDS	7.3		22		8.7	

e Estimated

05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA--Continued



05473450 BIG CREEK NEAR MT. PLEASANT, IA

LOCATION.--Lat. 45°00'26", long 91°33'05", in $NW^1/_4$ $SE^1/_4$ sec.28, T.72 N., R.6 W., Henry County, Hydrologic Unit 07080107, on right bank 20 ft upstream from bridge on old U.S. highway 218 (Mt. Pleasant business route) about 2 miles north of Mt. Pleasant, 1.6 miles upstream from Brandy Wine Creek, and 2.3 miles upstream from Lynn Creek.

DRAINAGE AREA.--58 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1957 to 1977. Oct. 1, 1997 to Sept. 30, 1998.

GAGE.--Water-stage recorder. Datum of gage is 643.00 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 13-16, Dec. 19 to Jan. 4, Jan. 12-26, and Jan. 29 to Feb. 1. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data.

EXTREMES OUTSIDE PERIOD OF RECORD.--None are known at this time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.36	7.9	48	e6.0	e44	139	991	478	39	36	1.3	3.1
2	.23	6.5	33	e15	145	109	261	189	42	30	1.2	1.7
3	.16	5.0	32	e42	107	101	172	118	35	28	1.2	1.3
4	.17	4.4	45	e100	89	83	132	88	33	26	95	1.1
5	.21	5.1	36	277	72	68	106	73	32	26	42	1.0
6	.20	6.6	25	460	56	60	89	67	29	58	8.1	1.0
7	.19	20	20	657	48	56	115	68	27	44	3.6	1.0
8	.12	17	16	252	44	456	531	59	32	32	2.6	.92
9	.21	13	16	176	42	449	782	51	169	25	2.5	.83
10	.17	9.6	15	128	44	151	263	48	120	31	2.2	.81
11	.18	7.6	12	99	301	100	155	44	85	32	1.9	.85
12	.35	6.1	8.5	e55	466	73	114	48	68	22	1.5	.84
13	3.0	5.6	e6.8	e36	189	68	313	43	53	18	1.3	.88
14	2.0	5.9	e6.0	e25	138	75	573	38	68	15	1.2	131
15	.90	5.4	e6.9	e19	113	62	222	38	338	13	1.2	51
16	.45	4.4	e7.6	e15	95	54	332	37	546	11	1.2	13
17	.28	3.6	10	e17	111	216	151	31	169	8.3	2.0	5.4
18	.27	3.1	11	e14	96	503	108	32	145	8.1	2.0	3.0
19	.24	3.1	e9.3	e12	83	252	86	33	166	7.6	1.4	2.3
20	.19	3.4	e8.8	e10	106	159	72	32	101	6.0	1.2	2.1
21	.15	3.2	e7.5	e11	88	112	60	32	153	4.9	1.1	1.9
22	.28	3.2	e7.0	e11	74	89	54	34	94	4.2	1.0	1.6
23	4.1	3.2	e7.5	e12	65	72	49	34	73	3.7	.96	1.3
24	9.6	2.7	e8.0	e11	56	57	45	56	62	3.3	.94	2.6
25	2.3	2.2	e7.5	e10	49	54	43	173	52	2.8	.91	1.9
26	5.2	2.6	e6.5	e10	89	50	42	143	44	2.4	.90	1.7
27	17	2.1	e6.0	13	588	44	32	89	39	2.0	2.4	1.7
28	25	6.2	e6.5	17	223	45	29	67	33	1.9	65	1.6
29	26	32	e6.0	e16	---	37	32	55	37	1.7	14	4.9
30	21	50	e5.5	e20	---	66	76	50	49	1.5	3.3	10
31	13	---	e5.0	e27	---	1600	---	48	---	1.4	1.9	---
TOTAL	133.51	250.7	445.9	2573.0	3621	5460	6030	2396	2933	506.8	267.01	252.33
MEAN	4.31	8.36	14.4	83.0	129	176	201	77.3	97.8	16.3	8.61	8.41
MAX	26	50	48	657	588	1600	991	478	546	58	95	131
MIN	.12	2.1	5.0	6.0	42	37	29	31	27	1.4	.90	.81
AC-FT	265	497	884	5100	7180	10830	11960	4750	5820	1010	530	500
CFSM	.07	.14	.25	1.43	2.23	3.04	3.47	1.33	1.69	.28	.15	.15
IN.	.09	.16	.29	1.65	2.32	3.50	3.87	1.54	1.88	.33	.17	.16

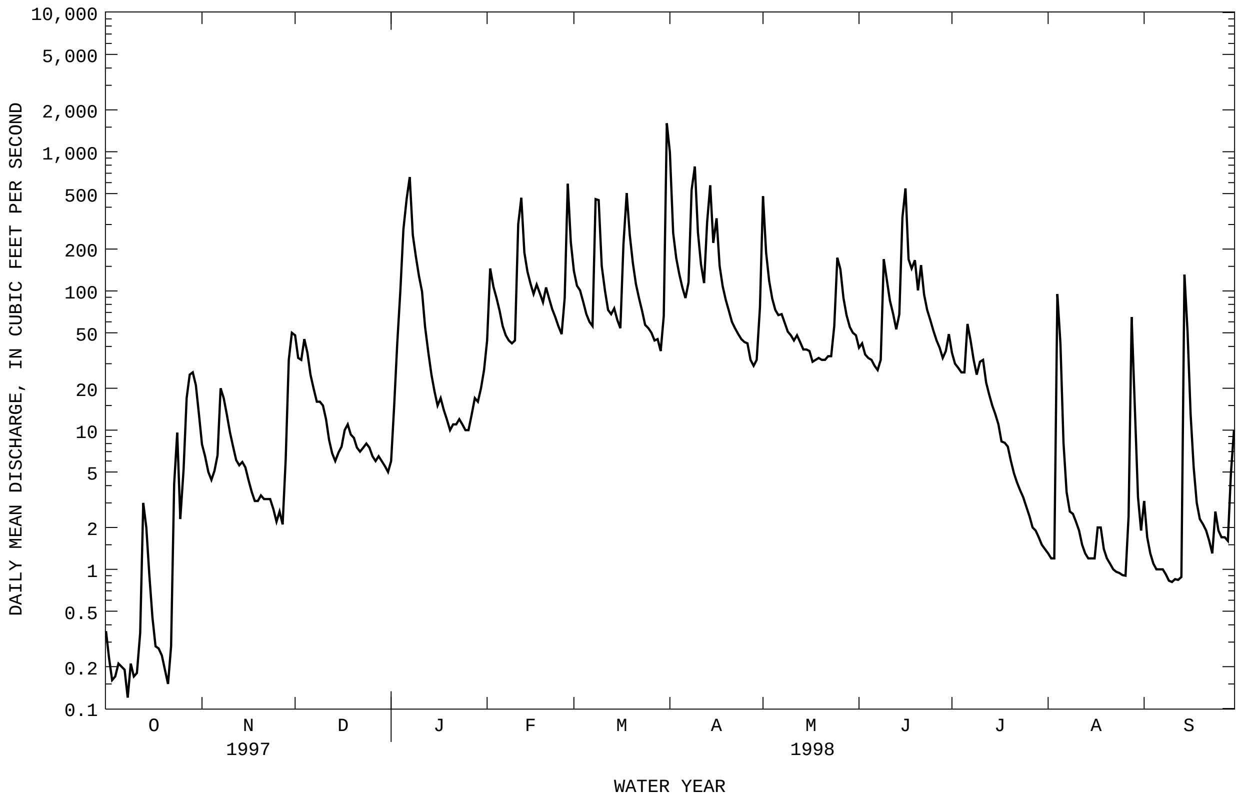
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4.31	8.36	14.4	83.0	129	176	201	77.3	97.8	16.3	8.61	8.41
MAX	4.31	8.36	14.4	83.0	129	176	201	77.3	97.8	16.3	8.61	8.41
(WY)	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
MIN	4.31	8.36	14.4	83.0	129	176	201	77.3	97.8	16.3	8.61	8.41
(WY)	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998

SUMMARY STATISTICS	FOR 1998 WATER YEAR		WATER YEARS 1997 - 1998	
ANNUAL TOTAL	24869.25			
ANNUAL MEAN	68.1		68.1	
HIGHEST ANNUAL MEAN			68.1	1998
LOWEST ANNUAL MEAN			68.1	1998
HIGHEST DAILY MEAN	1600	Mar 31	1600	Mar 31 1998
LOWEST DAILY MEAN	.12	Oct 8	.12	Oct 8 1997
ANNUAL SEVEN-DAY MINIMUM	.18	Oct 3	.18	Oct 3 1997
INSTANTANEOUS PEAK FLOW	2280	Mar 31	2280	Mar 31 1998
INSTANTANEOUS PEAK STAGE	11.97	Mar 31	11.97	Mar 31 1998
INSTANTANEOUS LOW FLOW	.08	Oct 3a		
ANNUAL RUNOFF (AC-FT)	49330		49360	
ANNUAL RUNOFF (CFSM)	1.17		1.17	
ANNUAL RUNOFF (INCHES)	15.95		15.96	
10 PERCENT EXCEEDS	154		153	
50 PERCENT EXCEEDS	26		25	
90 PERCENT EXCEEDS	1.2		1.0	

a Many days in Oct
e Estimated

05473450 BIG CREEK NEAR MT. PLEASANT, IA--Continued



05474000 SKUNK RIVER AT AUGUSTA, IA

LOCATION.--Lat 40°45'13", long 91°16'40", in NE$^1/_4$ NE$^1/_4$ sec.26, T.69 N., R.4 W., Des Moines County, Hydrologic Unit 07080107, on left bank 300 ft upstream from bridge on State Highway 394 at Augusta, 2.0 mi upstream from Long Creek, and at mile 12.5.

DRAINAGE AREA.--4,303 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September to November 1913, October 1914 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1915 (M), 1919-27 (M), 1932-34 (M), 1936, 1937-38 (M), 1942 (M). WSP 1438: Drainage area. WDR IA-71-1: 1966 (M).

GAGE.--Water-stage recorder. Datum of gage is 521.24 ft above NGVD. Prior to Nov. 15, 1913, nonrecording gage at site 400 ft upstream at datum about 0.7 ft higher. May 27, 1915 to Jan. 14, 1935, nonrecording gage at site 400 ft upstream at present datum.

REMARKS.--Estimated daily discharges: Oct. 27 to Nov. 13, Dec. 13 - 15, Dec. 26 to Jan. 4, and Jan. 10 - 27. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1903, reached a stage of about 21 ft, discharge, about 45,000 ft^3/s. Stage and discharge for flood of April 1973 are believed to be the greatest since 1851.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	287	e3200	1540	e1300	2840	5830	24800	14400	5780	16500	1670	3670
2	254	e2800	1530	e2050	3190	4970	23000	15800	5670	14100	1550	2490
3	229	e2500	1720	e3300	3470	4280	16900	10200	5430	13100	1450	2100
4	221	e2310	1800	e5450	3320	3940	13300	6180	5180	12600	1410	1740
5	213	e2100	1920	8010	3190	3600	12000	5110	4670	12200	1620	1510
6	202	e1900	1880	9100	2570	3360	12000	4710	4290	12300	1650	1340
7	200	e1720	1710	13600	2190	3180	12600	5980	3970	15200	2190	1200
8	196	e1650	1570	8530	1980	6600	15000	9110	3730	15200	3470	1090
9	192	e1600	1470	5680	1840	15400	19500	8380	5090	13000	2310	1000
10	188	e1610	1460	e3200	1780	11100	16500	7770	10100	10300	1760	941
11	186	e1500	1450	e2000	3060	6010	11000	6020	8020	11200	1600	886
12	191	e1430	1410	e1500	9000	4060	8690	5130	7230	10000	1490	842
13	228	e1350	e1100	e1300	6170	3470	10000	4770	8320	9390	1340	816
14	390	1290	e950	e1200	4550	3540	17900	4620	8810	9100	1190	1870
15	729	1250	e1000	e1350	3720	3600	16200	4400	14000	7550	1080	6830
16	1740	1200	1120	e1450	3070	3530	11700	4030	18100	6010	999	9220
17	1610	1130	1130	e1600	2900	4590	8640	3800	17100	4810	972	5420
18	1180	1070	1210	e1500	2930	12700	7120	3560	14400	4080	976	2690
19	993	1030	1350	e1400	3060	15200	6300	3320	16500	3610	939	1940
20	869	997	1430	e1500	4530	12600	5850	3170	17900	3570	979	1580
21	773	1010	1470	e1500	5510	9210	5590	3100	16900	3650	933	1360
22	705	1010	1510	e1600	5360	7460	5530	3570	18000	3390	873	1190
23	663	974	1510	e1400	5010	6400	5670	4690	18200	3610	862	1090
24	683	938	1540	e1400	4630	6000	5620	8770	16500	4420	919	1040
25	1200	910	1550	e1500	4280	6000	5430	15600	15800	4270	873	983
26	1370	896	e1300	e1500	4160	5940	5240	15600	15100	3190	905	928
27	e1900	870	e1100	e1850	8580	5690	4980	11100	14200	2630	1050	901
28	e2400	1110	e1300	2330	7850	5790	4950	8890	13500	2320	1360	860
29	e2500	1230	e1100	2530	---	6030	4840	8300	13600	2110	7300	840
30	e3250	1440	e840	2600	---	5890	5150	6720	15900	1940	12200	899
31	e3600	---	e750	2930	---	19300	---	5620	---	1800	7720	---
TOTAL	29342	44025	42720	96160	114740	215270	322000	222420	341990	237150	65640	59266
MEAN	947	1468	1378	3102	4098	6944	10730	7175	11400	7650	2117	1976
MAX	3600	3200	1920	13600	9000	19300	24800	15800	18200	16500	12200	9220
MIN	186	870	750	1200	1780	3180	4840	3100	3730	1800	862	816
AC-FT	58200	87320	84740	190700	227600	427000	638700	441200	678300	470400	130200	117600
CFSM	.22	.34	.32	.72	.95	1.61	2.49	1.66	2.64	1.77	.49	.46
IN.	.25	.38	.37	.83	.99	1.86	2.78	1.92	2.95	2.05	.57	.51

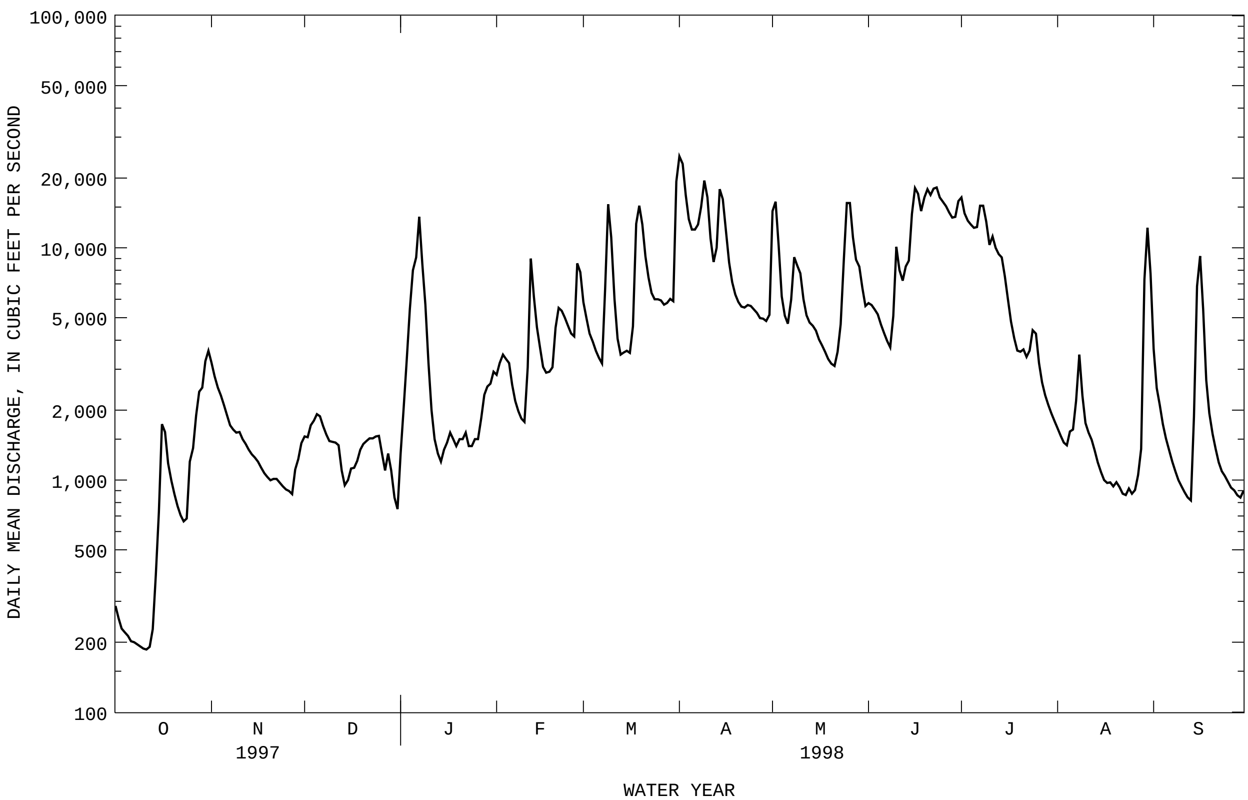
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1915 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1338	1547	1293	1329	2365	4370	4148	4060	4316	2875	1708	1647
MAX	11560	10020	8387	8090	7306	16560	18770	16780	19800	26860	18550	15460
(WY)	1987	1962	1983	1946	1984	1979	1973	1996	1947	1993	1993	1926
MIN	15.5	20.5	21.2	21.3	56.5	191	104	92.5	130	122	25.8	71.4
(WY)	1957	1957	1957	1940	1940	1957	1956	1934	1977	1988	1934	1953

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1915 - 1998	
ANNUAL TOTAL	753474		1790723			
ANNUAL MEAN	2064		4906		2581	
HIGHEST ANNUAL MEAN					10200	1993
LOWEST ANNUAL MEAN					152	1934
HIGHEST DAILY MEAN	14900	Feb 22	24800	Apr 1	62600	Apr 23 1973
LOWEST DAILY MEAN	186	Oct 11	186	Oct 11	7.0	Aug 27 1934a
ANNUAL SEVEN-DAY MINIMUM	194	Oct 6	194	Oct 6	7.4	Aug 26 1934
INSTANTANEOUS PEAK FLOW			25400	Apr 1	66800	Apr 23 1973
INSTANTANEOUS PEAK STAGE			17.47	Apr 1	27.05	Apr 23 1973
INSTANTANEOUS LOW FLOW			179	Oct 11		
ANNUAL RUNOFF (AC-FT)	1495000		3552000		1870000	
ANNUAL RUNOFF (CFSM)	.48		1.14		.60	
ANNUAL RUNOFF (INCHES)	6.50		15.45		8.13	
10 PERCENT EXCEEDS	4680		13400		6780	
50 PERCENT EXCEEDS	1470		3170		1080	
90 PERCENT EXCEEDS	420		915		147	

a Also Aug 28 to Sep 1, 1934
e Estimated



05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER QUALITY RECORDS

LOCATION.--Samples collected at bridge on State Highway 394, 300 ft downstream from gage.

PERIOD OF RECORD.--October 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to current year.
WATER TEMPERATURES: October 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1975 to current year.

REMARKS.--During periods of ice effect, sediment samples are collected in open water channel. Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens Dec. 20, 1979, Feb. 12, 1980; minimum daily, 149 microsiemens Mar. 6, 1993.
WATER TEMPERATURES: Maximum daily, 34.0°C July 20, 1980, Aug. 15-17, 1988, July 10-13, 1989, and July 15, 1995; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,550 mg/L June 25, 1981; minimum daily mean, 1 mg/L Mar. 8, 9,12, 1978, Jan. 5, 6, 1984.
SEDIMENT LOADS: Maximum daily, 499,000 tons Mar. 21, 1978; minimum daily, 1.4 tons Dec. 11, 1989.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 652 microsiemens Jan. 24; minimum daily, 219 microsiemens Aug. 30.
WATER TEMPERATURES: Maximum daily, 31.0°C Aug. 23, 26; minimum daily, 0.5°C Dec. 7 and Jan. 24.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,670 mg/L May 25; minimum daily mean, 9 mg/L Jan. 24.
SEDIMENT LOADS: Maximum daily, 197,000 tons May 25; minimum daily, 33 tons Jan. 24.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
OCT							
02...	1020	--	248	106	71	--	--
NOV							
07...	1440	6.6	1710	56	259	--	--
APR							
03...	1215	8.7	16400	676	29900	44	48
28...	1210	13.3	4950	202	2700	--	--
JUN							
09...	1050	16.6	4220	328	3740	--	--
JUL							
21...	1030	28.7	3660	252	2490	--	--
SEP							
01...	1030	23.4	3880	1240	13000	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
02...	--	--	--	--	--	100
NOV						
07...	--	--	--	--	--	98
APR						
03...	52	65	89	92	97	--
28...	--	--	--	--	--	94
JUN						
09...	--	--	--	--	--	94
JUL						
21...	--	--	--	--	--	95
SEP						
01...	--	--	--	--	--	99

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	NUMBER OF SAM- PLING POINTS (COUNT) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
NOV											
07...	1525	3	--	0	3	50	92	100	--	--	--
APR											
28...	1250	2	1	5	35	63	88	97	99	100	--
JUN											
09...	1135	3	4	7	16	37	64	80	89	94	100
JUL											
21...	1100	2	1	2	12	68	87	95	98	100	--
SEP											
01...	1100	3	1	3	31	78	94	98	99	100	--

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	489	494	552	---	435	492	272	370	521	345	502	265
2	477	508	558	608	424	516	308	---	493	375	502	357
3	468	485	575	---	393	543	---	365	507	374	567	422
4	471	504	560	430	405	553	398	463	539	370	572	468
5	465	---	522	407	442	---	431	517	533	385	537	505
6	483	540	538	440	514	564	449	---	---	406	---	---
7	505	570	545	---	484	585	482	529	560	---	527	496
8	532	556	---	---	527	498	458	421	---	376	400	452
9	552	550	---	---	---	---	342	425	506	362	465	399
10	568	558	---	---	561	362	361	406	375	406	378	405
11	---	559	---	---	---	---	450	454	393	335	434	409
12	590	565	---	---	358	---	495	494	425	383	497	438
13	583	575	583	---	393	---	---	519	399	397	508	429
14	603	577	582	---	450	560	332	528	421	412	556	400
15	604	575	588	---	491	564	356	520	329	450	522	306
16	573	578	---	---	---	541	419	---	260	467	494	272
17	426	580	593	---	517	---	481	531	309	486	450	292
18	390	580	614	---	525	336	503	538	367	495	466	315
19	407	579	609	---	528	336	523	537	323	505	450	400
20	462	582	606	---	528	360	531	548	---	507	447	447
21	518	586	594	---	453	409	543	552	316	540	465	481
22	515	592	611	---	474	450	554	504	342	520	440	509
23	511	590	589	---	504	488	533	434	337	---	452	522
24	---	585	---	652	540	508	512	390	341	479	---	503
25	613	---	---	---	558	518	---	295	339	393	---	497
26	---	589	---	---	560	---	551	---	349	410	408	452
27	512	585	---	---	---	538	563	340	---	489	---	488
28	455	532	---	---	464	544	460	397	371	---	---	448
29	421	---	---	---	---	519	543	454	394	517	308	472
30	468	552	---	---	---	517	534	487	392	489	219	492
31	---	---	---	443	---	318	---	511	---	---	225	---

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.5	9.0	6.0	---	5.0	6.0	12.0	15.0	20.0	22.0	29.0	23.0
2	21.5	6.5	6.0	4.0	3.0	6.0	11.0	---	24.0	27.0	28.0	26.0
3	26.0	6.5	5.0	---	3.0	5.0	---	15.0	21.0	27.0	26.0	29.0
4	26.0	7.0	4.0	5.0	2.0	5.0	10.0	17.0	21.0	28.0	28.0	27.0
5	23.0	---	.5	5.0	3.0	---	11.0	21.0	20.0	26.0	26.0	30.0
6	23.5	6.5	1.0	3.5	4.0	5.0	13.0	---	---	27.0	---	---
7	23.5	6.5	.5	---	4.5	6.0	13.0	18.0	21.0	---	29.0	28.0
8	24.0	7.0	---	---	4.0	8.0	13.0	20.0	---	27.0	27.0	25.0
9	22.0	7.0	---	---	---	---	12.0	19.0	20.0	28.0	28.0	25.0
10	21.5	6.5	---	---	5.0	1.0	12.0	19.0	20.0	28.0	30.0	25.0
11	---	5.0	---	---	---	---	13.0	21.0	20.0	28.0	29.0	25.0
12	22.0	4.5	---	---	4.0	---	15.0	21.0	20.0	28.0	28.0	28.0
13	16.0	3.5	1.0	---	5.0	---	---	23.0	22.0	28.0	29.0	21.0
14	14.0	5.0	3.0	---	5.0	4.0	14.0	24.0	21.0	29.0	30.0	24.0
15	14.0	3.0	2.5	---	6.0	3.0	15.0	25.0	22.0	29.0	30.0	23.0
16	14.5	2.0	---	---	---	4.0	13.0	---	22.0	30.0	29.0	24.0
17	16.0	3.0	1.5	---	6.0	---	14.0	24.0	22.0	29.0	28.0	25.0
18	14.0	4.0	5.0	---	6.0	4.0	15.0	28.0	23.0	30.0	30.0	25.0
19	13.0	4.5	5.0	---	6.0	4.0	15.0	26.0	24.0	30.0	30.0	26.0
20	13.5	5.0	2.0	---	7.0	5.0	14.0	25.0	---	30.0	30.0	25.0
21	11.5	3.5	2.0	---	7.0	1.0	14.0	24.0	25.0	32.0	30.0	22.0
22	9.0	3.0	2.0	---	8.0	7.0	16.0	21.0	25.0	29.0	30.0	24.0
23	9.0	3.0	4.0	---	7.0	7.0	16.0	21.0	21.0	---	31.0	22.0
24	---	3.0	---	.5	8.0	7.0	15.0	21.0	21.0	28.0	---	22.0
25	10.0	---	---	---	10.0	10.0	---	19.0	27.0	28.0	---	24.0
26	---	6.5	---	---	10.0	---	17.0	---	29.0	27.0	31.0	27.0
27	6.5	5.0	---	---	---	12.0	16.0	20.0	---	28.0	---	26.0
28	7.0	10.0	---	---	7.0	12.0	15.0	21.0	29.0	---	---	27.0
29	7.0	---	---	---	---	15.0	15.0	23.0	30.0	29.0	21.0	25.0
30	8.0	7.0	---	---	---	18.0	14.0	24.0	28.0	28.0	25.0	25.0
31	---	---	---	3.0	---	15.0	---	26.0	---	---	25.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	140	108	423	3650	110	457	339	1190	565	4320	1260	19900
2	132	91	516	3900	66	273	388	2150	432	3710	816	11000
3	142	89	369	2490	77	358	684	6100	455	4260	535	6200
4	122	73	180	1120	139	680	1360	20000	392	3510	417	4440
5	105	60	150	851	135	697	2210	47800	338	2910	325	3160
6	92	51	119	610	79	402	722	18000	465	3220	259	2350
7	83	45	60	280	58	269	1230	45500	288	1720	327	2810
8	80	42	88	390	57	241	786	18700	136	731	887	18800
9	77	40	123	530	58	229	427	6600	93	463	1670	69600
10	74	38	59	255	58	230	335	2900	82	396	1070	32500
11	71	36	74	298	59	233	281	1520	442	4700	923	15000
12	118	61	109	419	60	229	235	953	2360	58400	836	9180
13	279	174	162	590	61	181	194	680	2420	41000	757	7090
14	447	482	170	593	62	159	147	476	1020	12700	683	6530
15	657	1330	125	423	61	166	110	402	700	7050	594	5780
16	872	4130	116	376	50	152	83	324	621	5140	572	5450
17	569	2510	119	365	42	128	62	268	529	4140	1060	14000
18	315	1020	123	355	61	199	47	188	367	2910	2100	74300
19	172	463	126	349	60	218	35	132	545	4540	2780	115000
20	155	363	124	333	69	268	26	106	866	10800	1980	68200
21	134	280	116	315	85	335	20	80	1140	16900	2060	51000
22	131	249	77	211	106	431	15	64	1530	22100	1910	38600
23	129	230	49	129	131	534	11	42	1070	14500	985	17100
24	196	365	43	108	149	617	9	33	1080	13600	783	12700
25	324	1070	40	99	165	687	13	53	711	8240	627	10200
26	462	1700	44	107	183	641	23	92	790	8920	727	11700
27	660	3380	129	304	202	601	39	197	1020	24000	896	13700
28	1140	7380	283	866	225	788	68	430	1310	27500	997	15600
29	810	5470	235	777	249	739	119	811	---	---	1080	17500
30	618	5420	151	584	276	626	205	1450	---	---	1170	18600
31	485	4710	---	---	306	619	356	2830	---	---	2590	140000
TOTAL	---	41460	---	21677	---	12387	---	180071	---	312380	---	837990

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	2750	184000	1970	79700	857	13400	983	43700	241	1090	677	6840
2	2230	140000	1840	78600	755	11600	778	29700	190	796	444	3010
3	1040	48100	1310	36700	735	10800	628	22200	154	604	269	1530
4	841	30300	974	16300	724	10100	510	17400	171	653	211	994
5	790	25500	755	10400	708	8930	416	13700	291	1270	165	672
6	870	28300	924	11700	599	6940	407	13500	270	1210	159	572
7	1090	37100	1250	20300	486	5210	433	17700	418	2600	154	500
8	1230	50400	1130	27800	435	4420	455	18700	1100	10400	101	296
9	1880	99400	1370	30900	551	7980	459	16000	616	3910	69	187
10	1350	60500	1690	35600	1900	53000	461	12900	413	1970	55	140
11	1020	30400	975	16100	1870	40900	462	14000	398	1710	58	138
12	785	18400	487	6770	1130	21900	464	12500	330	1330	75	170
13	1330	37700	468	6030	1360	30600	466	11800	209	761	128	282
14	2390	117000	505	6290	1570	38100	467	11500	157	504	562	3350
15	2500	111000	479	5700	3570	138000	469	9550	145	424	1110	21200
16	1230	39600	472	5130	3470	170000	471	7630	143	387	1180	29400
17	907	21200	468	4800	3700	172000	473	6130	142	373	800	12000
18	689	13300	427	4100	1320	51400	501	5510	148	390	536	3930
19	526	8960	366	3290	895	39900	422	4120	147	373	363	1910
20	408	6440	306	2630	816	39500	362	3480	156	411	230	989
21	323	4880	288	2410	743	33900	296	2920	141	354	143	528
22	335	5000	714	7110	676	32800	263	2410	166	392	102	330
23	478	7330	2160	27800	604	29800	338	3340	168	391	101	296
24	507	7680	3340	81800	538	23900	655	7900	159	394	107	301
25	496	7280	4670	197000	479	20400	1070	12300	150	353	93	246
26	475	6720	3200	135000	431	17600	906	7860	144	352	117	294
27	379	5100	2000	60300	411	15800	552	3940	158	450	110	266
28	314	4190	2410	57700	397	14400	416	2610	384	1560	111	258
29	482	6280	1490	33500	436	16200	337	1930	1860	43000	155	350
30	589	8540	1060	19300	1050	45100	309	1620	2490	81900	167	402
31	---	---	884	13400	---	---	275	1340	1460	32100	---	---
TOTAL	---	1170600	---	1044160	---	1124580	---	339890	---	192412	---	91381

YEAR 5368988

05474500 MISSISSIPPI RIVER AT KEOKUK, IA

LOCATION.--Lat 40°23'37", long 91°22'27", in SE$^1/_4$ SW$^1/_4$ sec.30, T.65 N., R.4 W., Lee County, Hydrologic Unit 07080104, near right bank in tailwater of dam and powerplant of Union Electric Co. at Keokuk, 0.2 mi upstream from bridge on U.S. Highway 136, 2.7 mi upstream from Des Moines River, and at mile 364.2 upstream from Ohio River.

DRAINAGE AREA.--119,000 mi^2, approximately.

PERIOD OF RECORD.--January 1878 to current year.

GAGE.--Water-stage recorder. Datum of gage is 477.41 ft above sea level (levels by U.S. Army Corps of Engineers). Jan. 1, 1878 to May 1913, nonrecording gage at Galland (formerly Nashville), 8 mi upstream; zero of gage was set to low-water mark of 1864, or 496.52 ft above sea level.

REMARKS.--Discharge computed from records of operation of turbines in powerplant and spillway gates in dam. Minor flow regulation caused by powerplant since 1913 and navigation dams. Records for May 1913 to September 1937 adjusted for change in contents in Keokuk Reservoir, those after September 1937 unadjusted.

COOPERATION.--Records provided by Union Electric Co.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 6, 1851, reached a stage of 21.0 ft, present site and datum, estimated as 13.5 ft at Galland, discharge, 360,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42400	53800	50000	22600	48800	155400	157400	154900	87700	161900	48300	61900
2	35800	51200	48100	30000	51900	118100	173000	157100	89100	170400	47600	51700
3	42200	53800	45400	45300	58900	119900	184700	145700	82100	171700	48000	50400
4	37300	55600	48100	55700	59900	119700	196300	128000	77500	174000	48700	45400
5	36600	53400	43500	60200	57300	121600	201200	115400	78600	175500	55900	44900
6	36500	52900	45200	61500	57100	118500	199300	116800	78700	182400	55100	41200
7	37500	51000	47900	86900	55500	121600	198500	109200	78100	194300	56300	40800
8	30600	51500	47500	86300	53100	131200	206300	108600	75800	198000	70000	37600
9	33100	51500	47900	77300	49100	150500	220100	118900	74700	198700	73600	38500
10	38100	51600	49100	63700	50600	155500	228800	114400	77800	195700	71800	38400
11	38800	49500	49200	47400	49700	148900	232800	113200	88000	189900	69400	37600
12	39200	49300	47300	37800	69100	139400	234300	109000	88900	179200	61900	37300
13	32700	49400	48400	34600	69000	128300	241200	109500	109200	168800	63000	35500
14	36700	49500	43900	33600	67200	122600	252900	103700	114200	155700	70800	37200
15	49600	47500	43300	30500	66300	109100	253400	93900	133800	141100	57400	53700
16	55600	47000	39600	30800	66000	100600	249100	82600	140100	122200	46300	58100
17	63300	44700	43500	32500	62300	101400	237400	76200	134000	106900	35500	59400
18	61100	47600	42400	33500	66800	115600	224400	81600	135500	98600	61100	50500
19	67500	48400	45900	34000	65500	117700	216100	84800	142900	92000	55900	41500
20	65000	47800	46500	34400	65700	115400	210000	83700	148700	82500	52900	38600
21	69300	44200	46700	36100	69300	108300	206200	85900	155500	79100	52500	38600
22	68400	44600	45000	40700	83400	107100	200800	87800	159800	80300	49000	37400
23	64300	41900	43800	43200	85900	102500	185300	79100	163000	82900	55200	34400
24	64800	38600	41300	47800	82700	98400	189100	90700	151800	83800	57400	32200
25	62000	35600	41900	48900	92100	98700	183900	97400	147200	81100	57700	33400
26	61900	30200	43900	48300	89500	96100	178600	103400	144500	72300	48100	37900
27	59800	37700	40700	46900	103700	91700	173300	97600	144000	66600	53400	33200
28	49800	48600	39800	47100	115700	88400	164200	95700	143900	65500	71000	32400
29	56300	55900	38200	49300	---	85500	159200	88600	146800	67900	74700	32400
30	51000	48000	30000	53100	---	94600	151700	80800	162800	59500	75600	33900
31	54700	---	28000	50000	---	131600	---	86700	---	54200	66700	---
TOTAL	1541900	1432300	1362000	1450000	1912100	3613900	6109500	3200900	3554700	3952700	1810800	1246000
MEAN	49740	47740	43940	46770	68290	116600	203700	103300	118500	127500	58410	41530
MAX	69300	55900	50000	86900	116000	156000	253000	157000	163000	199000	75600	61900
MIN	30600	30200	28000	22600	48800	85500	152000	76200	74700	54200	35500	32200
MED	49800	49000	45000	46900	65900	118000	201000	97600	134000	122000	56300	38500
AC-FT	3058000	2841000	2702000	2876000	3793000	7168000	12120000	6349000	7051000	7840000	3592000	2471000
CFSM	.42	.40	.37	.39	.57	.98	1.71	.87	1.00	1.07	.49	.35
IN.	.48	.45	.43	.45	.60	1.13	1.91	1.00	1.11	1.24	.57	.39

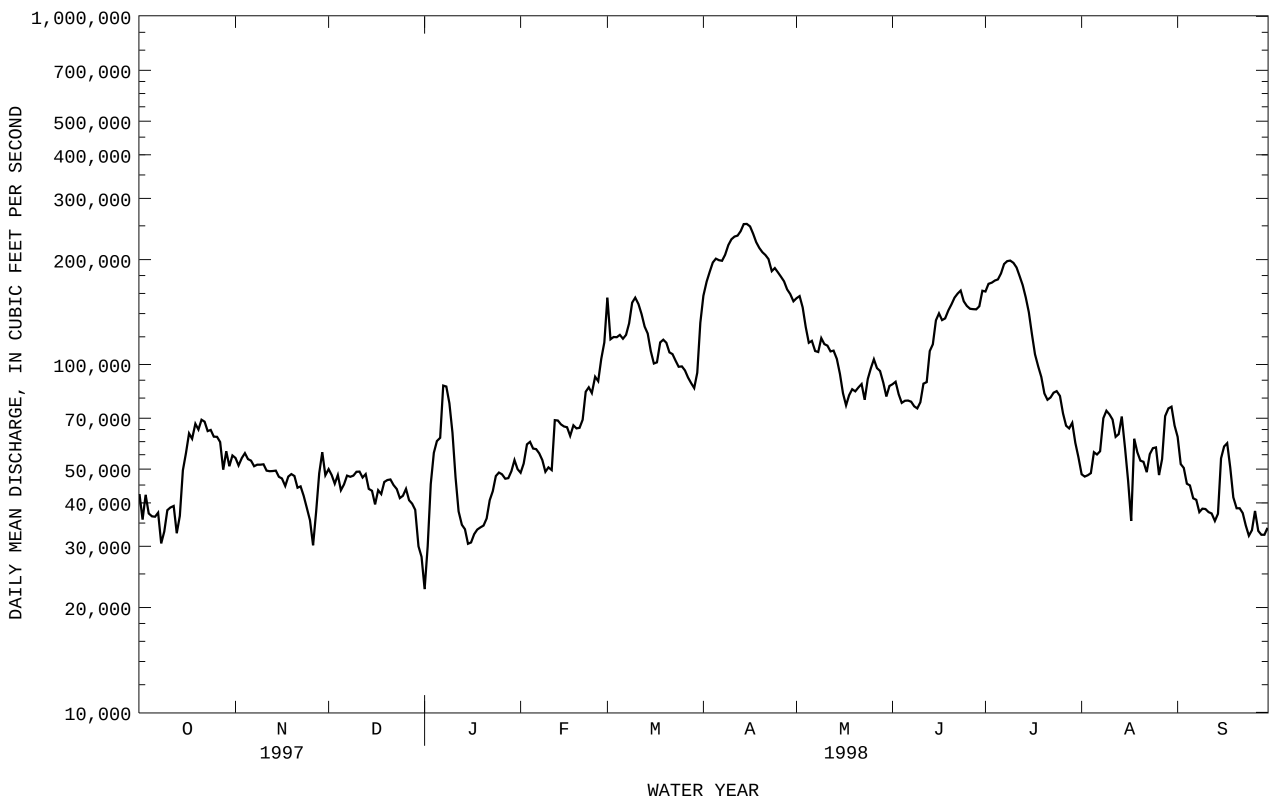
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1879 - 1998, BY WATER YEAR (WY)

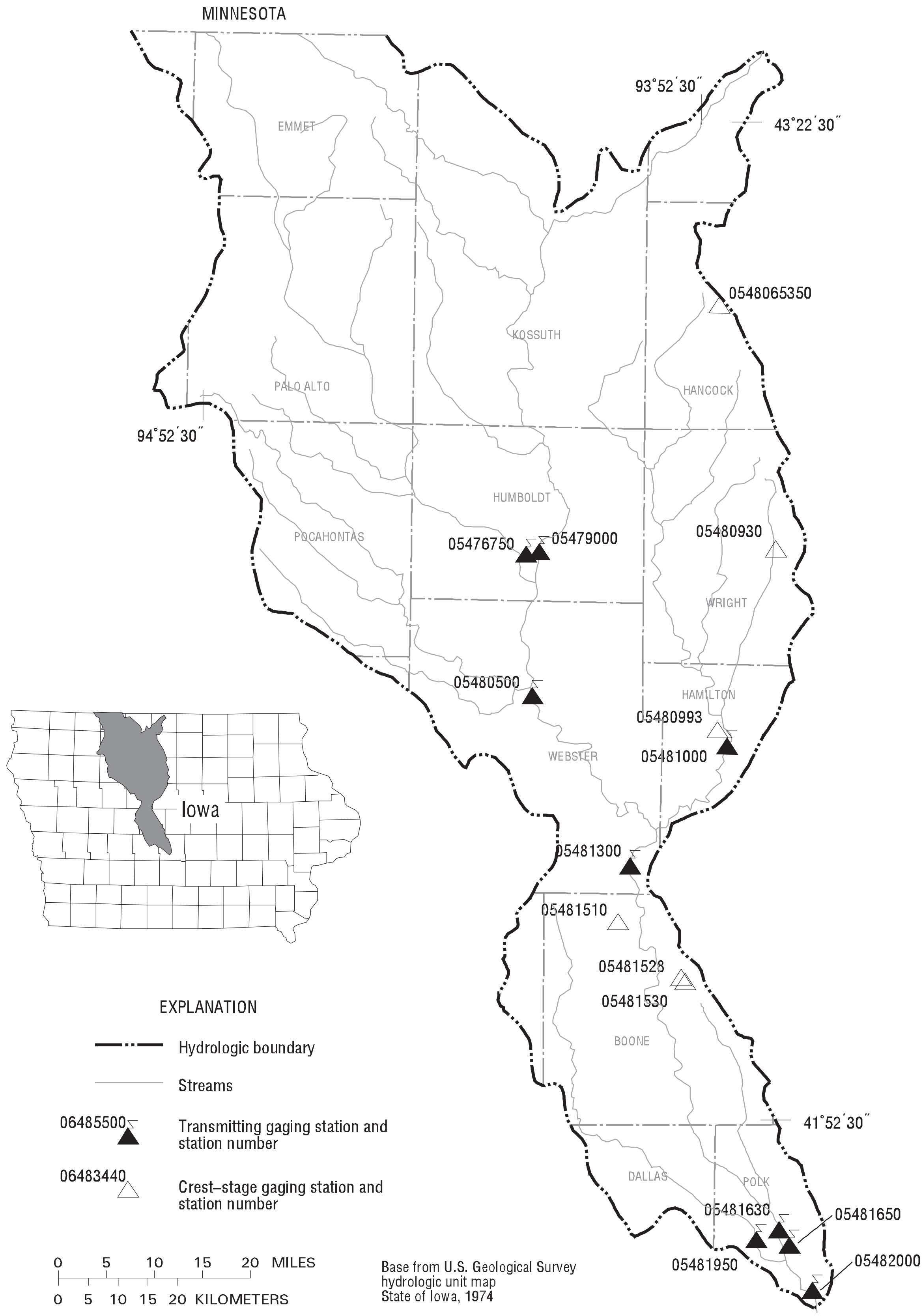
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	50900	51050	38510	35960	42320	80700	119900	107600	92680	74140	49420	47380
MAX	221100	211300	125600	101600	95660	185400	250100	260700	227300	385800	223000	163300
(WY)	1882	1882	1983	1973	1984	1973	1993	1888	1892	1993	1993	1993
MIN	16060	16020	13450	14650	15790	21780	32930	27600	17400	16280	13030	15530
(WY)	1934	1934	1934	1940	1899	1934	1895	1934	1934	1988	1936	1976

05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1879 - 1998	
ANNUAL TOTAL	31194500		31186800			
ANNUAL MEAN	85460		85440		65930	
HIGHEST ANNUAL MEAN					162500	1993
LOWEST ANNUAL MEAN					21540	1934
HIGHEST DAILY MEAN	251000	Apr 22	253000	Apr 15	434000	Jul 10 1993
LOWEST DAILY MEAN	28000	Dec 31	22600	Jan 1	5000	Dec 27 1933
ANNUAL SEVEN-DAY MINIMUM	35600	Oct 8	32800	Dec 27	8270	Dec 25 1933
INSTANTANEOUS PEAK FLOW					446000	Jul 10 1993
INSTANTANEOUS PEAK STAGE					27.58	Jul 10 1993a
ANNUAL RUNOFF (AC-FT)	61870000		61860000		47760000	
ANNUAL RUNOFF (CFSM)	.72		.72		.55	
ANNUAL RUNOFF (INCHES)	9.75		9.75		7.53	
10 PERCENT EXCEEDS	164000		171000		132000	
50 PERCENT EXCEEDS	65000		65000		50300	
90 PERCENT EXCEEDS	43900		37600		23000	

a From floodmark

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43°22´30˝
EMMET
KOSSUTH
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PALO ALTO
HANCOCK
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HUMBOLDT
POCAHONTAS
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05479000
05480930
WRIGHT
05480500
HAMILTON
05480993
05481000
WEBSTER
Iowa
05481300
05481510
05481528
05481530
BOONE
EXPLANATION
Hydrologic boundary
Streams
06485500
Transmitting gaging station and station number
06483440
Crest–stage gaging station and station number
41°52´30˝
DALLAS
POLK
05481630
05481650
05481950
05482000
0 5 10 15 20 MILES
0 5 10 15 20 KILOMETERS
Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05476750 DES MOINES RIVER AT HUMBOLDT, IA

LOCATION.--Lat 42°43'12", long 94°13'06", in SE$^1/_4$ SW$^1/_4$ sec.1, T.91 N., R.29 W., Humboldt County, Hydrologic Unit 07100002 on left bank 5 ft downstream from First Avenue in city of Humboldt, .84 mi downstream of Reasoner Dam, about 700 ft downstream from City of Humboldt water plant, 3.2 mi upstream from Indian Creek, 3.9 mi upstream from East Fork Des Moines River, and at mile 334.3 upstream from mouth of Des Moines River.

DRAINAGE AREA.--2,256 mi^2.

PERIOD OF RECORD.--October 1964 to current year. Prior to October 1970, published as "West Fork Des Moines River at Humboldt."

GAGE.--Water stage recorder. Datum of gage is 1,053.54 ft above sea level. Prior to Oct. 3, 1966, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Daily nonrecording gage readings made from Mar. 7, 1940 to Sept. 30, 1964, but discharge not published for this period because of extreme regulation at dam 700 ft upstream from gage. Power generation and streamflow regulation discontinued August 1964. Low-flow discharges occasionally affected by minor regulation at Reasoner Dam. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23, 1947, reached a stage of 12.2 ft, discharge, 11,000 ft^3/s at present site and datum.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

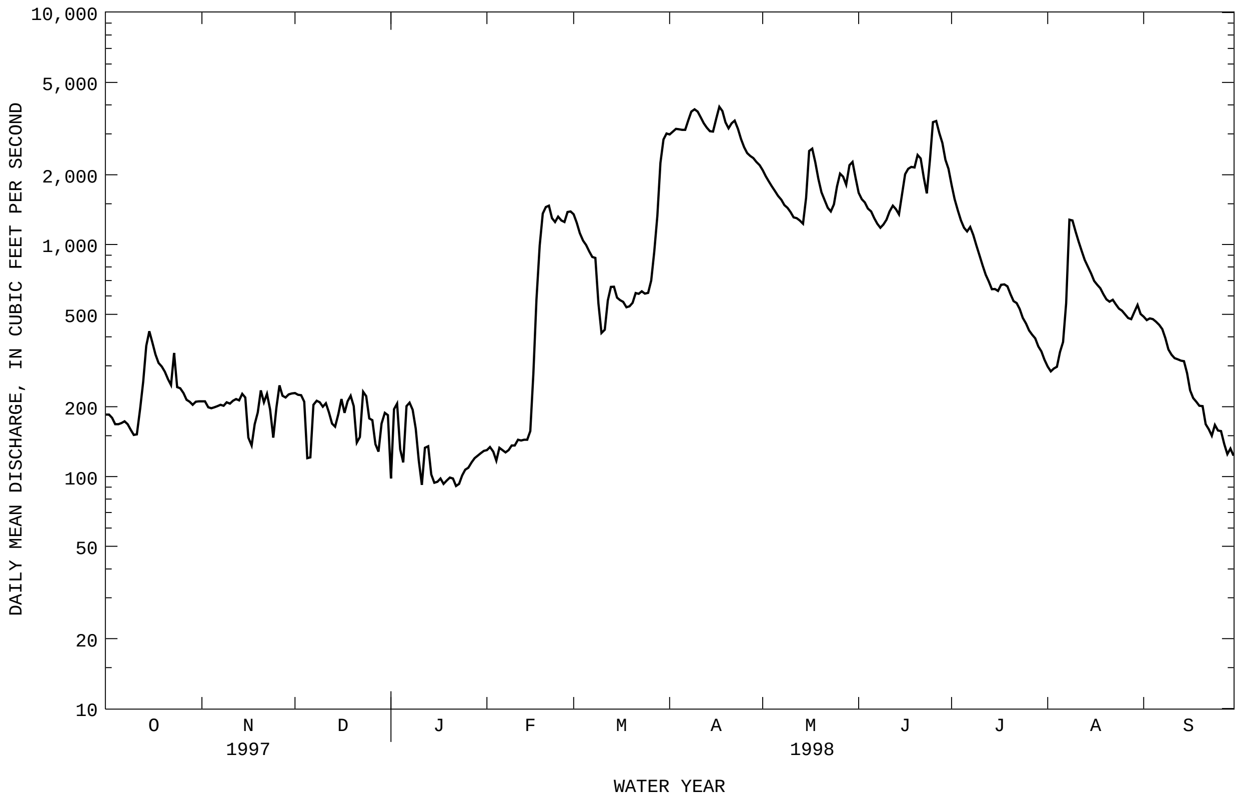
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	185	211	229	98	130	1350	2980	2090	1670	1810	298	489
2	185	211	225	195	134	1240	3070	1970	1570	1570	284	472
3	179	199	224	206	128	1120	3150	1870	1520	1400	292	480
4	168	197	210	131	117	1040	3140	1780	1430	1270	297	477
5	168	199	120	115	133	995	3120	1700	1390	1180	344	465
6	170	201	121	201	130	934	3120	1620	1300	1140	380	450
7	173	204	204	208	127	884	3430	1560	1230	1190	558	432
8	168	202	212	194	130	876	3740	1480	1180	1100	1280	395
9	159	209	209	161	136	557	3830	1440	1220	993	1270	353
10	151	206	200	117	136	416	3740	1380	1280	896	1140	335
11	152	212	207	92	144	429	3530	1310	1390	811	1030	324
12	196	216	189	133	143	575	3330	1300	1470	741	938	320
13	256	213	169	135	144	657	3190	1270	1420	693	858	316
14	366	227	164	102	144	658	3080	1230	1350	642	803	314
15	423	219	186	94	157	590	3070	1590	1650	643	750	279
16	378	147	216	95	277	576	3490	2530	2010	631	697	235
17	336	136	188	98	578	566	3920	2590	2120	671	671	218
18	309	168	211	93	992	537	3760	2260	2160	673	648	210
19	298	189	223	96	1360	542	3360	1920	2150	660	611	202
20	283	235	201	99	1450	561	3170	1680	2430	611	580	201
21	263	209	140	98	1470	618	3330	1550	2350	570	567	168
22	248	227	148	91	1300	613	3420	1440	1950	560	578	160
23	341	195	232	93	1250	629	3150	1390	1660	527	552	150
24	243	147	222	101	1320	614	2850	1490	2300	483	529	167
25	240	198	178	107	1270	619	2630	1780	3370	456	519	158
26	229	247	175	109	1250	700	2480	2020	3410	426	500	157
27	214	223	138	115	1380	932	2410	1960	3030	409	482	138
28	210	219	128	120	1390	1330	2360	1810	2740	394	477	125
29	204	226	169	123	---	2250	2270	2200	2320	364	514	132
30	210	228	188	126	---	2840	2200	2270	2120	346	549	123
31	211	---	184	129	---	3010	---	1940	---	319	502	---
TOTAL	7316	6120	5810	3875	17320	29258	94320	54420	57190	24179	19498	8445
MEAN	236	204	187	125	619	944	3144	1755	1906	780	629	282
MAX	423	247	232	208	1470	3010	3920	2590	3410	1810	1280	489
MIN	151	136	120	91	117	416	2200	1230	1180	319	284	123
AC-FT	14510	12140	11520	7690	34350	58030	187100	107900	113400	47960	38670	16750
CFSM	.10	.09	.08	.06	.27	.42	1.39	.78	.85	.35	.28	.12
IN.	.12	.10	.10	.06	.29	.48	1.56	.90	.94	.40	.32	.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	660	662	418	238	335	1329	2731	1913	1941	1604	727	549
MAX	3768	2656	1675	1078	1571	5110	8454	6261	9126	11540	4477	3097
(WY)	1987	1980	1983	1983	1983	1983	1969	1993	1993	1993	1993	1979
MIN	20.4	28.8	19.9	13.5	19.8	78.9	94.4	77.6	72.3	81.0	42.4	30.1
(WY)	1977	1977	1977	1977	1977	1968	1968	1968	1977	1976	1976	1976

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1965 - 1998	
ANNUAL TOTAL	549084		327751			
ANNUAL MEAN	1504		898		1094	
HIGHEST ANNUAL MEAN					4136	1993
LOWEST ANNUAL MEAN					74.3	1977
HIGHEST DAILY MEAN	7300	Apr 7	3920	Apr 17	17800	Apr 14 1969
LOWEST DAILY MEAN	120	Dec 5	91	Jan 22	13	Nov 12 1976
ANNUAL SEVEN-DAY MINIMUM	163	Oct 5	95	Jan 17	13	Jan 12 1977
INSTANTANEOUS PEAK FLOW			3960	Apr 17	19000	Jul 13 1993
INSTANTANEOUS PEAK STAGE			7.51	Apr 17	15.40	Apr 14 1969
INSTANTANEOUS LOW FLOW			56	Dec 5		
ANNUAL RUNOFF (AC-FT)	1089000		650100		792400	
ANNUAL RUNOFF (CFSM)	.67		.40		.48	
ANNUAL RUNOFF (INCHES)	9.05		5.40		6.59	
10 PERCENT EXCEEDS	3980		2380		2860	
50 PERCENT EXCEEDS	574		477		468	
90 PERCENT EXCEEDS	198		133		67	

05476750 DES MOINES RIVER AT HUMBOLDT, IA--Continued



05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IA

LOCATION.--Lat 42°43'26", long 94°11'30", in NW$^1/_4$ SE$^1/_4$ sec.6, T.91 N., R.28 W., Humboldt County, Hydrologic Unit 07100003, on right bank 50 ft upstream from old mill dam, in city park at east edge of Dakota City, 500 ft upstream from bridge on county highway P56, 0.6 mi downstream from bridge on State Highway 3, 3.4 mi upstream from confluence with Des Moines River, and at mile 333.8 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,308 mi^2.

PERIOD OF RECORD.--March 1940 to current year. Prior to October 1954, published as "near Hardy".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1944, 1945-47 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,038.71 ft above sea level. Prior to Oct. 1, 1954, nonrecording gage at site 8 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Dec. 7-11, 14, 15, 17-20, 22-28, Jan. 5 to Feb. 18, Mar. 12-16, and June 9. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of September 1938 reached a stage of 17.4 ft, discharge, about 22,000 ft^3/s, site and datum in use during the period 1940-54.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	117	116	87	e60	1100	2190	1170	1900	2520	144	253
2	59	118	121	91	e60	986	2290	1100	1620	2110	135	210
3	58	119	126	83	e59	897	2320	1020	1420	1690	133	184
4	54	113	119	80	e59	831	2290	950	1290	1320	145	167
5	53	111	67	e75	e59	794	2220	899	1240	1110	142	154
6	54	107	97	e78	e59	753	2140	851	1180	983	132	142
7	52	105	e105	e78	e59	706	2620	810	1110	990	152	127
8	48	106	e110	e75	e59	677	2910	763	1030	953	184	118
9	48	104	e115	e70	e59	567	2790	741	e1000	827	333	108
10	46	107	e105	e75	e59	345	2520	710	964	729	324	103
11	46	109	e100	e70	e58	372	2300	685	994	640	279	96
12	61	105	101	e68	e59	e380	2180	681	1140	570	243	94
13	98	104	96	e60	e59	e420	2070	656	1160	512	223	88
14	128	104	e90	e58	e60	e440	1920	618	1150	460	204	82
15	283	101	e90	e55	e60	e440	1870	830	1230	422	191	78
16	315	76	104	e55	e65	e440	2240	2630	1650	399	178	74
17	256	96	e85	e60	e380	473	2510	2970	1910	437	165	70
18	220	105	e80	e65	e1350	454	2440	2610	1890	415	155	70
19	197	101	e70	e65	1320	438	2340	2360	2040	394	142	70
20	184	108	e70	e66	1340	422	2420	2390	2170	364	139	79
21	175	99	68	e70	1420	448	2690	2410	3090	331	124	73
22	162	103	e75	e70	1410	519	2840	2310	2730	309	121	70
23	155	92	e80	e70	1540	590	2670	2100	2300	291	138	65
24	148	78	e80	e68	1610	618	2390	1920	2480	262	138	70
25	143	109	e78	e66	1550	625	2140	1740	3200	236	129	72
26	139	96	e75	e64	1460	700	1920	1710	3950	222	132	75
27	134	95	e60	e62	1350	873	1670	1790	3730	207	128	62
28	128	104	e90	e62	1210	1090	1480	1940	3720	192	134	58
29	123	106	88	e60	---	1520	1340	2420	3360	177	135	63
30	121	109	88	e60	---	1830	1250	2520	2930	169	297	59
31	120	---	71	e60	---	2040	---	2270	---	154	317	---
TOTAL	3870	3107	2820	2126	16893	22788	66970	48574	59578	20395	5536	3034
MEAN	125	104	91.0	68.6	603	735	2232	1567	1986	658	179	101
MAX	315	119	126	91	1610	2040	2910	2970	3950	2520	333	253
MIN	46	76	60	55	58	345	1250	618	964	154	121	58
AC-FT	7680	6160	5590	4220	33510	45200	132800	96350	118200	40450	10980	6020
CFSM	.10	.08	.07	.05	.46	.56	1.71	1.20	1.52	.50	.14	.08
IN.	.11	.09	.08	.06	.48	.65	1.90	1.38	1.69	.58	.16	.09

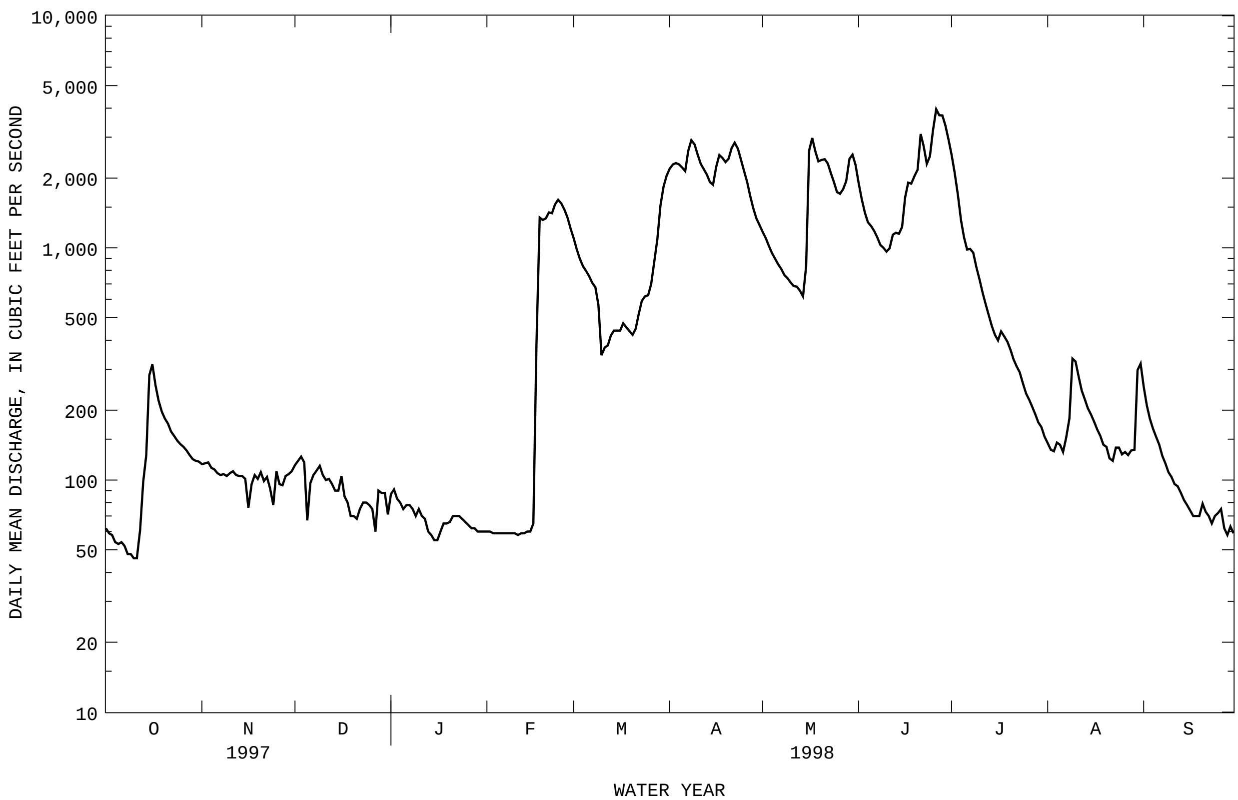
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	320	316	224	128	238	921	1399	1028	1260	848	392	333
MAX	1713	2042	1340	836	1602	4033	7004	5031	5908	6777	4114	2666
(WY)	1983	1942	1992	1992	1984	1983	1993	1991	1993	1993	1979	1979
MIN	12.0	14.2	8.45	5.12	10.4	39.4	58.8	75.7	36.3	13.7	15.5	7.40
(WY)	1959	1959	1977	1977	1959	1968	1977	1977	1977	1977	1976	1976

05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	252099		255691			
ANNUAL MEAN	691		701		618	
HIGHEST ANNUAL MEAN					2744	1993
LOWEST ANNUAL MEAN					29.7	1977
HIGHEST DAILY MEAN	3940	Mar 19	3950	Jun 26	17800	Jun 21 1954
LOWEST DAILY MEAN	46	Oct 10	46	Oct 10	4.8	Jan 11 1977a
ANNUAL SEVEN-DAY MINIMUM	50	Oct 5	50	Oct 5	4.8	Jan 8 1977
INSTANTANEOUS PEAK FLOW			4050	Jun 26	18800	Jun 21 1954
INSTANTANEOUS PEAK STAGE			13.94	Jun 26	24.02	Jun 21 1954
INSTANTANEOUS LOW FLOW			31	Nov 24		
ANNUAL RUNOFF (AC-FT)	500000		507200		447600	
ANNUAL RUNOFF (CFSM)	.53		.54		.47	
ANNUAL RUNOFF (INCHES)	7.17		7.27		6.42	
10 PERCENT EXCEEDS	1820		2280		1680	
50 PERCENT EXCEEDS	220		177		214	
90 PERCENT EXCEEDS	72		61		23	

a Also Jan 12-14, 1977
e Estimated



05480500 DES MOINES RIVER AT FORT DODGE, IA

LOCATION.--Lat 42°30'22", long 94°12'04", in NW$^1/_4$ SW$^1/_4$ sec.19, T.89 N., R.28 W., Webster County, Hydrologic Unit 07100004, on right bank 400 ft upstream from Soldier Creek, 1,800 ft downstream from Illinois Central Railroad bridge in Fort Dodge, 2,000 ft downstream from Lizard Creek, and at mile 314.6.

DRAINAGE AREA.--4,190 mi^2.

PERIOD OF RECORD.--April 1905 to July 1906 (no winter records), October 1913 to September 1927 (published as "at Kalo"), October 1946 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1924, 1925 (M).

GAGE.--Water-stage recorder. Datum of gage is 969.38 ft above sea level. See WSP 1728 for history of changes prior to Dec. 8, 1949.

REMARKS.--Estimated daily discharges: Dec. 5-12, Dec. 25 to Jan. 3, Jan. 9 to Feb. 19, and Mar. 13, 14. Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam 0.8 mi upstream from gage. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform, U.S. National Weather Service Limited Automatic Remote Collector (LARC) and City of Fort Dodge gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	277	366	353	e190	e250	2870	6470	4170	5590	7420	575	813
2	265	362	360	e220	e240	2620	6520	3870	4740	6190	548	736
3	258	359	378	e300	e250	2340	6550	3580	4160	5320	543	704
4	247	345	370	242	e220	2160	6430	3350	3790	4260	544	694
5	241	345	e180	334	e200	2050	6320	3170	3630	3590	606	666
6	237	338	e200	337	e200	1960	6280	3020	3390	3220	639	632
7	240	339	e250	394	e210	1820	8370	2890	3180	3950	725	593
8	237	339	e290	413	e240	1790	9450	2740	3030	3730	1440	556
9	238	338	e340	e360	e260	1340	9100	2640	3340	3030	1840	507
10	222	336	e320	e340	e260	1060	8200	2660	3450	2770	1760	473
11	221	337	e340	e300	e260	770	7470	2780	4000	2390	1560	447
12	280	343	e320	e320	e250	1160	7000	2650	5190	2130	1380	426
13	416	342	314	e180	e240	e1300	6660	2510	4550	1930	1300	410
14	464	355	305	e160	e240	e1310	6330	2370	4120	1760	1180	399
15	672	358	314	e190	e350	1340	6670	2920	4830	1690	1090	384
16	760	265	376	e220	e700	1250	8410	7880	6080	1610	997	345
17	662	237	363	e230	e1300	1200	8740	8560	6130	1810	933	324
18	591	286	353	e180	e5000	1150	8110	7360	6290	1800	893	312
19	545	302	357	e200	e4200	1110	7340	6420	6430	1760	837	298
20	509	360	376	e230	3860	1080	7240	5910	6390	1620	835	330
21	484	343	255	e220	3960	1210	8030	5660	7470	1450	974	296
22	455	341	278	e210	3640	1310	8110	5380	6710	1360	865	275
23	489	320	366	e200	3720	1430	7420	4890	5880	1280	803	261
24	473	261	361	e190	3840	1460	6820	5610	7360	1160	775	273
25	425	289	e300	e210	3650	1470	6300	5290	9190	1080	726	272
26	411	348	e240	e220	3390	1790	5930	5310	9730	1030	719	273
27	394	323	e210	e240	3300	2500	5630	5180	8550	956	698	255
28	385	328	e240	e230	3120	3060	5260	5020	9000	785	680	231
29	376	337	e260	e235	---	4780	4780	6110	9130	717	673	220
30	367	349	e290	e240	---	5960	4460	6540	9340	664	827	231
31	365	---	e200	e250	---	6390	---	6380	---	617	894	---
TOTAL	12206	9891	9459	7785	47350	63040	210400	142820	174670	73079	28859	12636
MEAN	394	330	305	251	1691	2034	7013	4607	5822	2357	931	421
MAX	760	366	378	413	5000	6390	9450	8560	9730	7420	1840	813
MIN	221	237	180	160	200	770	4460	2370	3030	617	543	220
AC-FT	24210	19620	18760	15440	93920	125000	417300	283300	346500	145000	57240	25060
CFSM	.09	.08	.07	.06	.40	.49	1.67	1.10	1.39	.56	.22	.10
IN.	.11	.09	.08	.07	.42	.56	1.87	1.27	1.55	.65	.26	.11

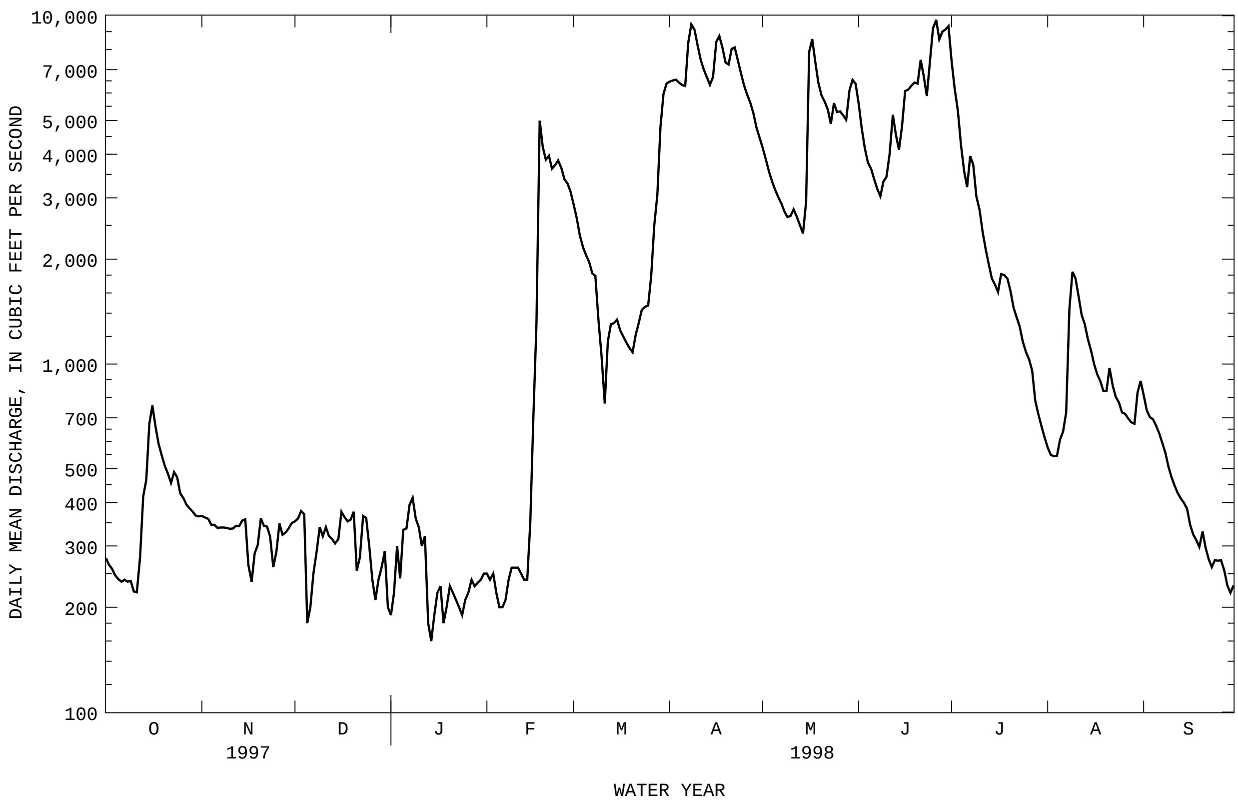
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	940	866	605	391	761	2617	4102	2926	3391	2374	1106	921
MAX	6120	4447	3698	2257	4352	11070	17530	10540	16150	21530	9264	6206
(WY)	1987	1983	1983	1983	1984	1983	1993	1991	1993	1993	1993	1979
MIN	32.8	54.5	34.7	24.0	35.5	141	238	149	138	75.2	69.0	49.9
(WY)	1957	1959	1977	1977	1959	1968	1968	1926	1977	1926	1976	1976

05480500 DES MOINES RIVER AT FORT DODGE, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1914 - 1998	
ANNUAL TOTAL	929770		792195			
ANNUAL MEAN	2547		2170		1764	
HIGHEST ANNUAL MEAN					7882	1993
LOWEST ANNUAL MEAN					143	1977
HIGHEST DAILY MEAN	10200	Apr 7	9730	Jun 26	35100	Apr 8 1965
LOWEST DAILY MEAN	180	Dec 5	160	Jan 14a	14	Nov 3 1955
ANNUAL SEVEN-DAY MINIMUM	234	Oct 5	194	Jan 13	23	Jan 13 1977
INSTANTANEOUS PEAK FLOW			10900	Jun 26	35600	Apr 8 1965
INSTANTANEOUS PEAK STAGE			8.37	Jun 26	19.62	Jun 23 1947
INSTANTANEOUS LOW FLOW			148	Nov 17		
ANNUAL RUNOFF (AC-FT)	1844000		1571000		1278000	
ANNUAL RUNOFF (CFSM)	.61		.52		.42	
ANNUAL RUNOFF (INCHES)	8.25		7.03		5.72	
10 PERCENT EXCEEDS	7230		6420		4640	
50 PERCENT EXCEEDS	1000		760		650	
90 PERCENT EXCEEDS	304		240		102	

a Ice affected
e Estimated



05481000 BOONE RIVER NEAR WEBSTER CITY, IA

LOCATION.--Lat 42°26'01", long 93°48'12", in $NW^1/_4$ $SE^1/_4$ sec. 18, T.88 N., R.25 W., Hamilton County, Hydrologic Unit 07100005, on right bank 100 ft upstream from bridge on State Highway 17, 2.5 mi south of Webster City, and 3.2 mi downstream from Brewers Creek.

DRAINAGE AREA.--844 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1940 (M), WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 989.57 ft above sea level. Prior to June 26, 1940, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 16-19, Dec. 5-21, Dec. 25 to Jan. 5, Jan. 9 to Feb. 19, Mar. 11-14, May 4, June 4, 5, and July 11, 12. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1896, 19.1 ft about June 10, 1918, from floodmarks, from information by local resident, discharge, 21,500 ft^3/s. Flood of June 18, 1932, reached a stage of 16.0 ft, discharge, 15,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	37	35	e21	e90	901	1940	897	1090	3300	114	98
2	18	38	36	e30	e80	754	1770	831	952	2350	106	89
3	18	39	36	e38	e40	666	1520	758	854	1860	102	80
4	17	37	36	e44	e35	648	1300	e689	e775	1540	112	70
5	17	37	e17	e54	e45	592	1120	639	e721	1310	167	63
6	16	37	e18	66	e49	539	1030	594	672	1160	286	59
7	16	37	e27	71	e46	504	2760	570	602	1100	277	55
8	17	38	e31	77	e47	499	4230	535	575	1080	222	51
9	26	39	e35	e90	e49	328	4150	505	711	988	195	48
10	24	38	e34	e54	e68	115	3700	619	831	882	171	48
11	23	38	e37	e44	e66	e180	3050	617	1030	e785	138	46
12	32	36	e30	e48	e62	e240	2320	593	1920	e681	115	43
13	62	36	e25	e19	e70	e260	1860	544	1780	587	152	41
14	90	38	e23	e16	e60	e300	1590	496	1650	517	276	40
15	69	40	e26	e23	e100	329	1810	488	2250	511	214	40
16	63	e33	e32	e27	e350	315	3540	490	1990	480	152	39
17	53	e25	e45	e28	e1200	275	3780	607	1820	866	116	37
18	48	e45	e41	e21	e1500	290	3100	880	2830	782	108	36
19	44	e36	e40	e23	e1700	330	2540	934	4230	637	98	35
20	41	38	e36	e28	1960	331	2070	797	3740	515	825	43
21	40	35	e33	e30	1950	421	2440	619	3990	434	1600	41
22	38	37	42	e36	1600	520	2820	548	4110	372	793	46
23	37	33	41	e34	1410	600	2590	527	4090	325	499	45
24	37	31	42	e33	1280	608	2160	685	6280	280	339	43
25	38	36	e32	e34	1210	594	1720	773	4730	247	263	42
26	38	36	e28	e37	1160	823	1500	909	3720	219	232	42
27	37	35	e25	e45	1190	1060	1320	876	3510	196	190	44
28	36	35	e26	e43	1090	1120	1160	954	4670	175	172	45
29	36	35	e27	e60	---	1520	1040	1650	6730	155	139	42
30	36	35	e27	e55	---	1560	965	1510	5800	138	115	42
31	36	---	e22	e56	---	1780	---	1290	---	126	104	---
TOTAL	1123	1090	985	1285	18507	19002	66895	23424	78653	24598	8392	1493
MEAN	36.2	36.3	31.8	41.5	661	613	2230	756	2622	793	271	49.8
MAX	90	45	45	90	1960	1780	4230	1650	6730	3300	1600	98
MIN	16	25	17	16	35	115	965	488	575	126	98	35
AC-FT	2230	2160	1950	2550	36710	37690	132700	46460	156000	48790	16650	2960
CFSM	.04	.04	.04	.05	.78	.73	2.64	.90	3.11	.94	.32	.06
IN.	.05	.05	.04	.06	.82	.84	2.95	1.03	3.47	1.08	.37	.07

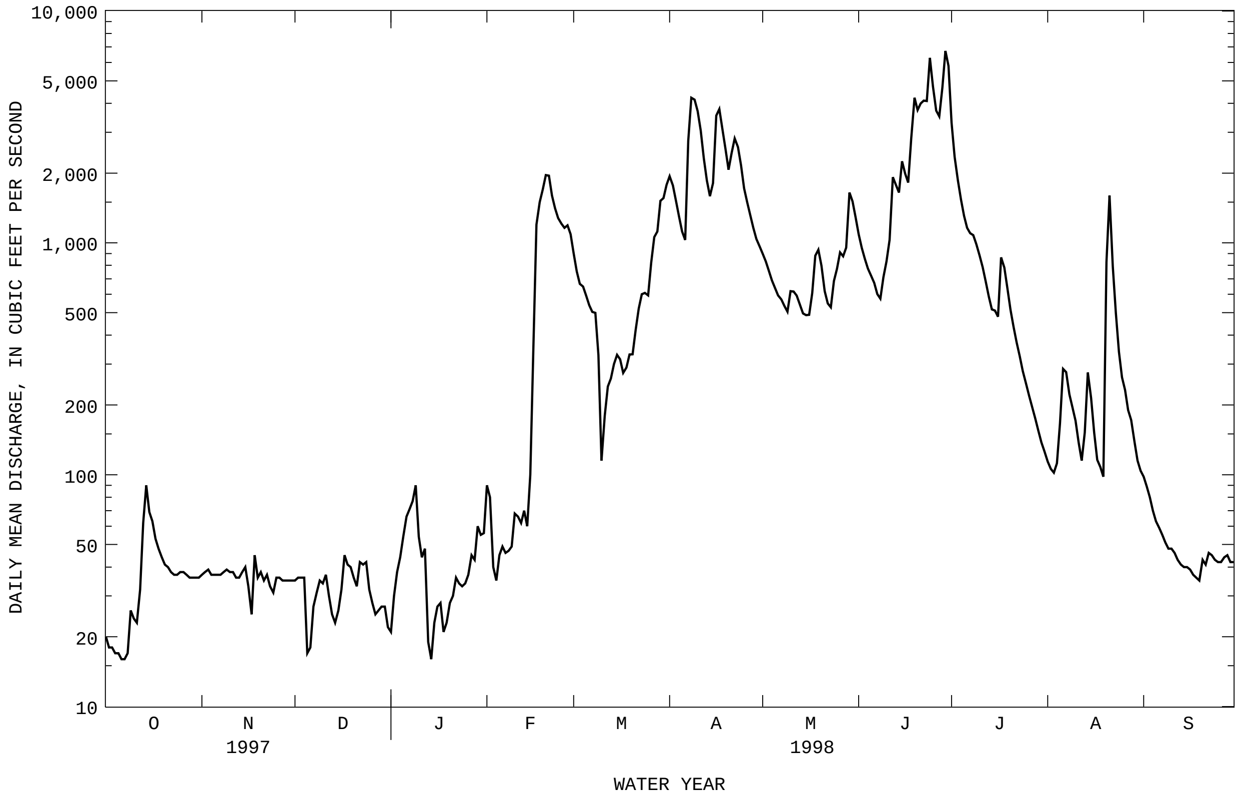
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	243	222	147	100	254	816	915	780	1055	578	254	220
MAX	1771	1395	1181	568	1847	2826	4307	4315	4239	4715	2942	2501
(WY)	1987	1993	1983	1983	1984	1973	1965	1991	1984	1993	1993	1965
MIN	6.66	11.0	4.62	.32	3.60	32.5	33.7	46.0	14.1	8.66	9.79	6.48
(WY)	1950	1950	1977	1977	1950	1968	1957	1968	1977	1977	1949	1976

05481000 BOONE RIVER NEAR WEBSTER CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	198099		245447			
ANNUAL MEAN	543		672		465	
HIGHEST ANNUAL MEAN					1861	1993
LOWEST ANNUAL MEAN					36.1	1956
HIGHEST DAILY MEAN	5510	Jun 22	6730	Jun 29	19500	Jun 22 1954
LOWEST DAILY MEAN	16	Oct 6	16	Oct 6,7a	.00	Feb 7 1977
ANNUAL SEVEN-DAY MINIMUM	17	Oct 2	17	Oct 2	.01	Feb 1 1977
INSTANTANEOUS PEAK FLOW			8270	Jun 29	20300	Jun 22 1954
INSTANTANEOUS PEAK STAGE			11.41	Jun 29	18.55	Jun 22 1954
ANNUAL RUNOFF (AC-FT)	392900		486800		337100	
ANNUAL RUNOFF (CFSM)	.64		.80		.55	
ANNUAL RUNOFF (INCHES)	8.73		10.82		7.49	
10 PERCENT EXCEEDS	1710		1880		1200	
50 PERCENT EXCEEDS	150		139		140	
90 PERCENT EXCEEDS	26		31		16	

a Also Jan 14
e Estimated



05481300 DES MOINES RIVER NEAR STRATFORD, IA

LOCATION.--Lat 42°15'04", long 93°59'52", in $NW^1/_4$ $NE^1/_4$ sec.21, T.86 N., R.27 W., Webster County, Hydrologic Unit 07100004, on right bank 6 ft downstream from bridge on State Highway 175, 0.1 mi downstream from Skillet Creek, 4.0 mi southwest of Stratford, 7.3 mi downstream from Boone River, and at mile 276.7.

DRAINAGE AREA.--5,452 mi^2.

PERIOD OF RECORD.--October 1967 (revised) to current year in reports of U.S. Geological Survey. Replacement station for 05481500 "near Boone", which operated April 1920 to September 1968. Records not necessarily equivalent.

GAGE.--Water-stage recorder. Datum of gage is 894.00 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 16, 17, 23-25, Dec. 5-12, Dec. 24 to Jan. 4, Jan. 10 to Feb. 17, and Mar. 12-14, 28, 29. Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam at Fort Dodge. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1903, reached a stage of 25.4 ft, from high-water mark, site and datum then in use, discharge, 43,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

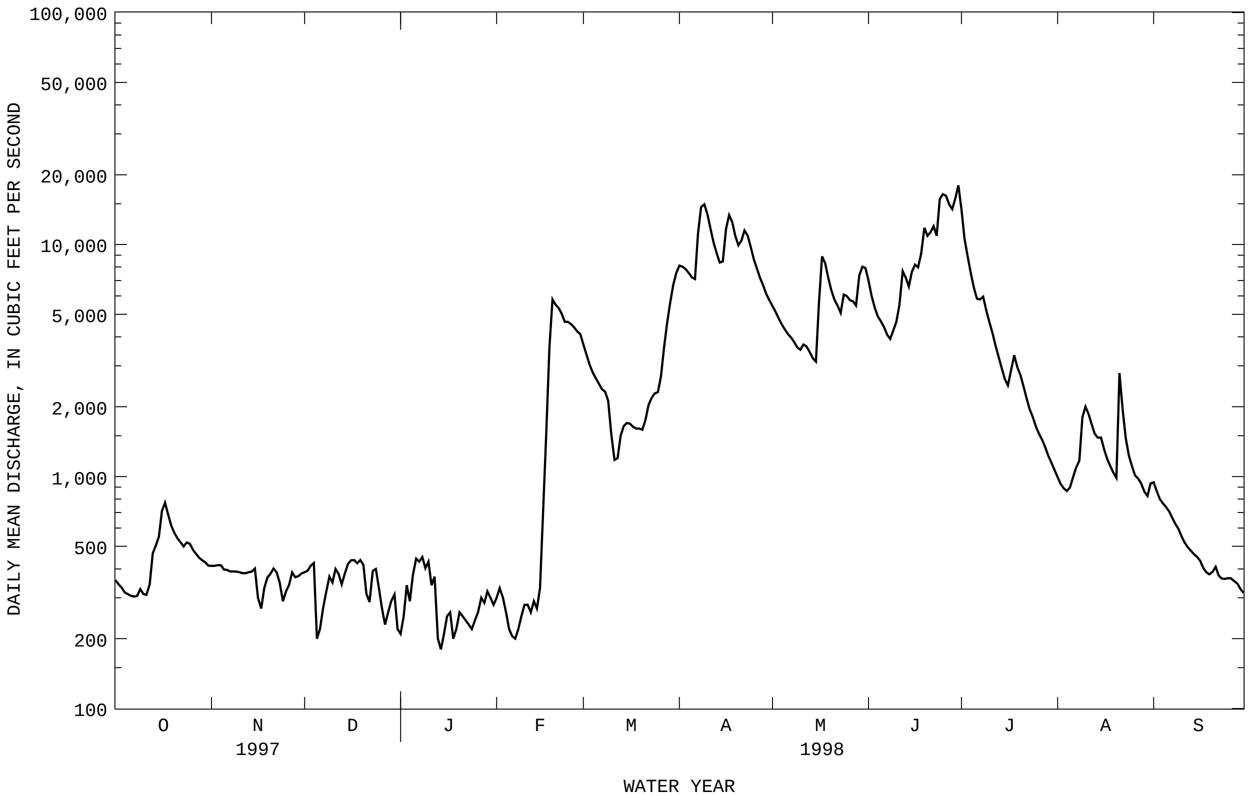
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	358	412	387	e210	e300	3710	8110	5430	7000	14200	994	944
2	343	412	393	e250	e330	3350	8020	5130	6010	10600	928	867
3	332	415	413	e340	e300	3040	7820	4800	5360	8830	889	800
4	317	414	424	e290	e260	2800	7530	4530	4910	7510	866	767
5	311	397	e200	377	e220	2650	7220	4310	4660	6510	896	739
6	306	396	e220	443	e205	2510	7100	4120	4400	5830	991	706
7	304	390	e270	430	e200	2380	11200	3970	4090	5800	1090	664
8	306	390	e320	450	e220	2320	14500	3790	3920	5960	1170	625
9	327	389	e370	403	e250	2120	14900	3600	4260	5210	1800	595
10	312	387	e350	e430	e280	1530	13500	3520	4640	4620	2000	554
11	309	383	e400	e340	e280	1180	11700	3710	5500	4140	1860	520
12	343	383	e380	e370	e260	e1200	10200	3640	7680	3650	1680	497
13	466	387	343	e200	e290	e1500	9190	3450	7190	3270	1530	479
14	504	389	381	e180	e270	e1650	8370	3230	6590	2930	1470	463
15	550	401	420	e210	e330	1700	8450	3130	7630	2630	1470	451
16	710	e300	435	e250	e700	1690	11700	5640	8190	2470	1310	434
17	771	e270	436	e260	e1500	1640	13400	8890	7980	2860	1190	404
18	687	331	423	e200	3600	1610	12500	8310	9110	3330	1110	387
19	612	367	436	e220	5800	1610	10900	7210	11800	2960	1040	379
20	571	381	417	e260	5510	1590	9930	6360	10900	2740	988	388
21	541	401	312	e250	5330	1750	10400	5770	11300	2450	2790	408
22	521	387	288	e240	5030	2030	11500	5450	12000	2180	1930	374
23	499	e350	392	e230	4640	2180	10900	5080	10900	1950	1460	363
24	520	e290	e400	e220	4640	2280	9730	6080	15700	1810	1230	362
25	513	e320	e330	e240	4540	2310	8610	5990	16500	1640	1110	365
26	483	341	e270	e260	4390	2700	7870	5760	16200	1530	1010	364
27	464	386	e230	e300	4220	3590	7180	5690	14900	1440	980	354
28	446	368	e260	e285	4110	e4600	6670	5460	14200	1340	933	346
29	435	372	e290	e320	---	e5620	6130	7370	15800	1230	859	328
30	426	382	e310	e300	---	6700	5750	8020	18000	1150	824	315
31	413	---	e220	e280	---	7550	---	7910	---	1070	933	---
TOTAL	14000	11191	10720	9038	58005	83090	290980	165350	277320	123840	39331	15242
MEAN	452	373	346	292	2072	2680	9699	5334	9244	3995	1269	508
MAX	771	415	436	450	5800	7550	14900	8890	18000	14200	2790	944
MIN	304	270	200	180	200	1180	5750	3130	3920	1070	824	315
AC-FT	27770	22200	21260	17930	115100	164800	577200	328000	550100	245600	78010	30230
CFSM	.08	.07	.06	.05	.38	.49	1.78	.98	1.70	.73	.23	.09
IN.	.10	.08	.07	.06	.40	.57	1.99	1.13	1.89	.84	.27	.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1730	1753	1285	778	1315	4460	6516	5361	5952	4433	2055	1413
MAX	8763	5745	5267	3267	7061	13920	22020	16010	21310	27250	13500	7546
(WY)	1987	1993	1983	1992	1984	1983	1993	1991	1993	1993	1993	1993
MIN	69.4	96.3	44.4	18.7	57.7	204	355	296	177	156	122	69.5
(WY)	1977	1977	1977	1977	1977	1968	1968	1968	1977	1977	1976	1976

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1968 - 1998	
ANNUAL TOTAL	1204567		1098107			
ANNUAL MEAN	3300		3009		3092	
HIGHEST ANNUAL MEAN					10400	1993
LOWEST ANNUAL MEAN					254	1977
HIGHEST DAILY MEAN	14600	Mar 14	18000	Jun 30	41400	Apr 2 1993
LOWEST DAILY MEAN	200	Dec 5	180	Jan 14	13	Jan 23 1977a
ANNUAL SEVEN-DAY MINIMUM	273	Dec 25	217	Jan 13	14	Jan 22 1977
INSTANTANEOUS PEAK FLOW			18700	Jun 30	423000	Apr 2 1993
INSTANTANEOUS PEAK STAGE			17.44	Jun 30	25.68	Apr 2 1993
ANNUAL RUNOFF (AC-FT)	2389000		2178000		2240000	
ANNUAL RUNOFF (CFSM)	.61		.55		.57	
ANNUAL RUNOFF (INCHES)	8.22		7.49		7.71	
10 PERCENT EXCEEDS	9480		8330		8310	
50 PERCENT EXCEEDS	1120		1040		1400	
90 PERCENT EXCEEDS	350		287		186	

a Jan 24, 1977
e Estimated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05481630 SAYLORVILLE LAKE NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°42'13", long 93°41'21", in SE $^{1}/_{4}$ SW $^{1}/_{4}$ sec.30, T.80 N., R.24 W., Polk County, Hydrologic Unit 07100004, in control tower of Saylorville Dam, 3.2 mi northwest of Saylorville, 4.2 mi upstream from Beaver Creek, and at mile 213.7.

DRAINAGE AREA.--5,823 mi^2.

PERIOD OF RECORD.--April 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Dec. 1. Reservoir is formed by earthfill dam completed in 1976. Storage began in April 1977. Release controlled at intake structure to forechamber of 22 ft diameter concrete conduit through dam. Ungated chute spillway 430 ft in length at right end of dam at elevation 884 ft, contents, 570,000 acre-ft. Conservation pool at elevation 836 ft, contents, 90,000 acre-ft, surface area, 5,950 acres. Flood pool elevation at 890 ft, contents, 586,000 acre-ft, surface area, 16,700 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents,717,000 acre-ft July 13, 1993; maximum elevation, 892.00 ft July 14, 1993; minimum daily contents, 45,000 acre-ft May 15, 1985; minimum elevation, 832.61 ft Jan. 19, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 386,000 acre-ft July 2; maximum elevation, 870.18 July 2; minimum daily contents, 81,600 acre-ft Sept. 17; minimum elevation, 836.09 ft Sept. 17.

Capacity table (elevation in feet, contents in acre-feet)

800	0	820	18,500	840	112,000	860	274,000	880	507,000
805	260	825	34,300	845	147,000	865	324,000	885	582,000
810	2,140	830	55,600	850	186,000	870	380,000	890	672,000
815	7,460	835	80,500	855	229,000	875	440,000		

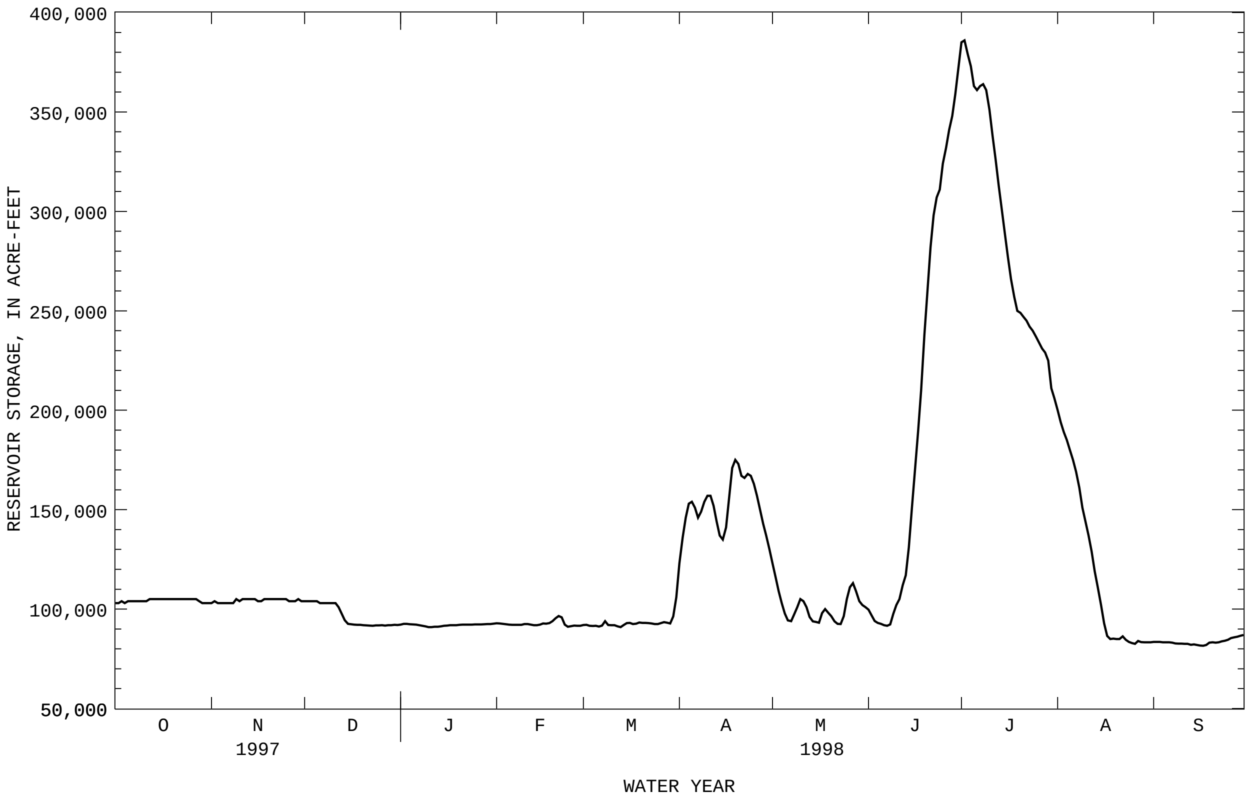
RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103000	103000	e104000	92200	92900	92000	123000	123000	99700	385000	200000	83500
2	103000	104000	104000	92600	92800	92100	136000	116000	96800	386000	194000	83500
3	104000	103000	104000	92600	92600	91600	146000	109000	94000	379000	189000	83500
4	103000	103000	104000	92400	92400	91500	153000	103000	93100	373000	185000	83300
5	104000	103000	104000	92300	92200	91600	154000	97800	92600	363000	180000	83300
6	104000	103000	103000	92200	92100	91200	151000	94300	91900	361000	175000	83300
7	104000	103000	103000	91900	92100	91700	146000	93900	91600	363000	169000	83100
8	104000	103000	103000	91600	92100	93900	149000	97400	92300	364000	161000	82700
9	104000	105000	103000	91300	92100	92000	154000	101000	97600	361000	151000	82600
10	104000	104000	103000	90900	92500	91900	157000	105000	102000	351000	144000	82600
11	104000	105000	103000	90900	92500	91900	157000	104000	105000	338000	137000	82500
12	105000	105000	101000	91100	92200	91300	152000	101000	112000	326000	129000	82500
13	105000	105000	97700	91100	91900	90900	144000	96100	117000	313000	119000	82100
14	105000	105000	94400	91300	91900	92000	137000	93800	131000	301000	111000	82200
15	105000	105000	92600	91600	92200	93000	135000	93500	151000	289000	102000	82000
16	105000	104000	92400	91700	92800	93100	141000	93200	170000	277000	92900	81700
17	105000	104000	92200	91900	92700	92500	156000	98000	189000	266000	86500	81600
18	105000	105000	92100	91900	93000	92700	171000	100000	210000	257000	85000	82000
19	105000	105000	92100	91900	93900	93300	175000	98200	238000	250000	85100	83100
20	105000	105000	91900	92100	95400	93100	173000	96400	260000	249000	85000	83300
21	105000	105000	91800	92200	96500	93100	167000	93800	282000	247000	85000	83100
22	105000	105000	91700	92200	95900	93000	166000	92600	298000	245000	86300	83300
23	105000	105000	91600	92200	92200	92800	168000	92500	307000	242000	84600	83800
24	105000	105000	91800	92200	91100	92500	167000	96400	311000	240000	83500	84100
25	105000	105000	91800	92300	91400	92500	163000	105000	324000	237000	82900	84600
26	105000	104000	91900	92300	91700	93000	157000	111000	332000	234000	82500	85400
27	105000	104000	91700	92300	91600	93400	150000	113000	341000	231000	84000	85800
28	104000	104000	91900	92400	91600	93200	143000	109000	348000	229000	83400	86100
29	103000	105000	91900	92500	---	92800	137000	104000	359000	225000	83300	86600
30	103000	104000	92100	92500	---	96300	130000	102000	372000	211000	83300	87000
31	103000	---	92000	92700	---	106000	---	101000	---	206000	83300	---
MEAN	104000	104000	96600	92000	92700	93000	152000	101000	197000	294000	119000	83500
MAX	105000	105000	104000	92700	96500	106000	175000	123000	372000	386000	200000	87000
MIN	103000	103000	91600	90900	91100	90900	123000	92500	91600	206000	82500	81600

CAL YR 1997 MEAN 99700 MAX 166000 MIN 90100
WTR YR 1998 MEAN 128000 MAX 386000 MIN 81600

e Estimated

05481630 SAYLORVILLE LAKE NEAR SAYLORVILLE, IA--Continued



05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°40'50", long 93°40'05", SW1/4 NE1/4 NE1/4 sec.5, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, on left bank 5 ft upstream of Fisher Bridge on county highway R6F, 2.0 mi west of Saylorville, 2.1 mi downstream from Rock Creek, 2.3 mi downstream from Saylorville Dam, 2.3 mi upstream from Beaver Creek, and at mile 211.4.

DRAINAGE AREA.--5,841 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 787.42 ft above NGVD (levels by U. S. Army Corps of Engineers). Prior to Aug. 6, 1970, nonrecording gage at same site and datum.

REMARKS.-- Estimated daily discharges: Jan. 10-12, 27, 28, and June 15-21. Records good except those for estimated daily discharges, which are poor. Flow regulated by Saylorville Lake (Station 05481630) 2.3 mi upstream since Apr. 12, 1977. U.S. Army Corps of Engineers satellite data collection platform and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,400 ft^3/s Apr. 10, 1965, gage height, 24.02 ft; minimum daily discharge, 13 ft^3/s Jan. 25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, 24.5 ft June 24, 1954, from floodmarks, discharge, 60,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	270	555	606	288	438	4390	2510	9070	9090	11600	3870	1060
2	270	555	604	306	534	4170	2850	8800	8550	11700	3870	1060
3	275	557	608	534	571	3870	3660	8280	7600	11400	3760	1050
4	277	484	606	684	574	3370	4920	7660	6070	11200	3720	1070
5	280	417	601	689	576	3150	7060	6980	5280	11100	3740	962
6	283	412	489	687	504	3130	8660	6250	5110	10900	3760	892
7	283	350	357	689	452	2860	10900	4850	4620	8450	4240	887
8	285	306	316	689	454	2640	12800	2610	4390	7250	5390	887
9	307	304	318	549	461	2610	14000	2110	3700	8340	5940	739
10	312	301	447	e476	475	1930	14700	2100	3600	10700	5900	643
11	288	302	563	e496	620	1420	14800	3540	5800	11300	5780	638
12	311	349	1340	e340	726	1310	14700	5510	6120	10600	5840	641
13	463	386	1810	300	731	1230	14600	5600	6900	10200	6410	638
14	593	386	1800	293	667	1190	13300	4670	6790	9410	6060	635
15	653	489	1280	293	640	1620	10600	3660	e4750	9280	5840	642
16	656	552	617	291	1160	2090	8020	3330	e3070	8870	5740	658
17	657	414	549	291	2160	2490	6730	4910	e3400	8230	4580	500
18	659	299	541	292	3240	2490	8080	7860	e2280	8180	2130	315
19	663	301	541	294	4560	2200	10600	9250	e2720	6840	1290	226
20	663	388	545	302	5580	2330	12800	8420	e2740	4540	1370	331
21	665	443	498	316	6250	2430	13600	7620	e2610	3650	1800	404
22	608	444	470	318	6880	2700	12500	6800	4450	3740	2540	304
23	571	444	470	319	7210	3050	11800	5960	6710	3660	2860	236
24	634	444	467	321	5940	3150	11700	4410	10000	3340	2270	227
25	666	449	471	324	5060	3140	11700	3280	10800	3080	1620	225
26	740	493	474	328	5100	3260	11600	3620	10800	2960	1440	221
27	799	522	471	e298	4930	3890	11400	5420	10800	2870	1220	187
28	805	520	379	e334	4710	4660	10700	7350	10400	2890	1250	163
29	806	523	299	319	---	5010	10100	8610	10200	2990	1210	152
30	655	573	298	322	---	5690	9550	9140	11300	3480	1070	201
31	556	---	285	331	---	4620	---	9120	---	3870	1070	---
TOTAL	15953	12962	19120	12313	71203	92090	310940	186790	190650	226620	107580	16794
MEAN	515	432	617	397	2543	2971	10360	6025	6355	7310	3470	560
MAX	806	573	1810	689	7210	5690	14800	9250	11300	11700	6410	1070
MIN	270	299	285	288	438	1190	2510	2100	2280	2870	1070	152
AC-FT	31640	25710	37920	24420	141200	182700	616700	370500	378200	449500	213400	33310
CFSM	.09	.07	.11	.07	.44	.51	1.77	1.03	1.09	1.25	.59	.10
IN.	.10	.08	.12	.08	.45	.59	1.98	1.19	1.21	1.44	.69	.11

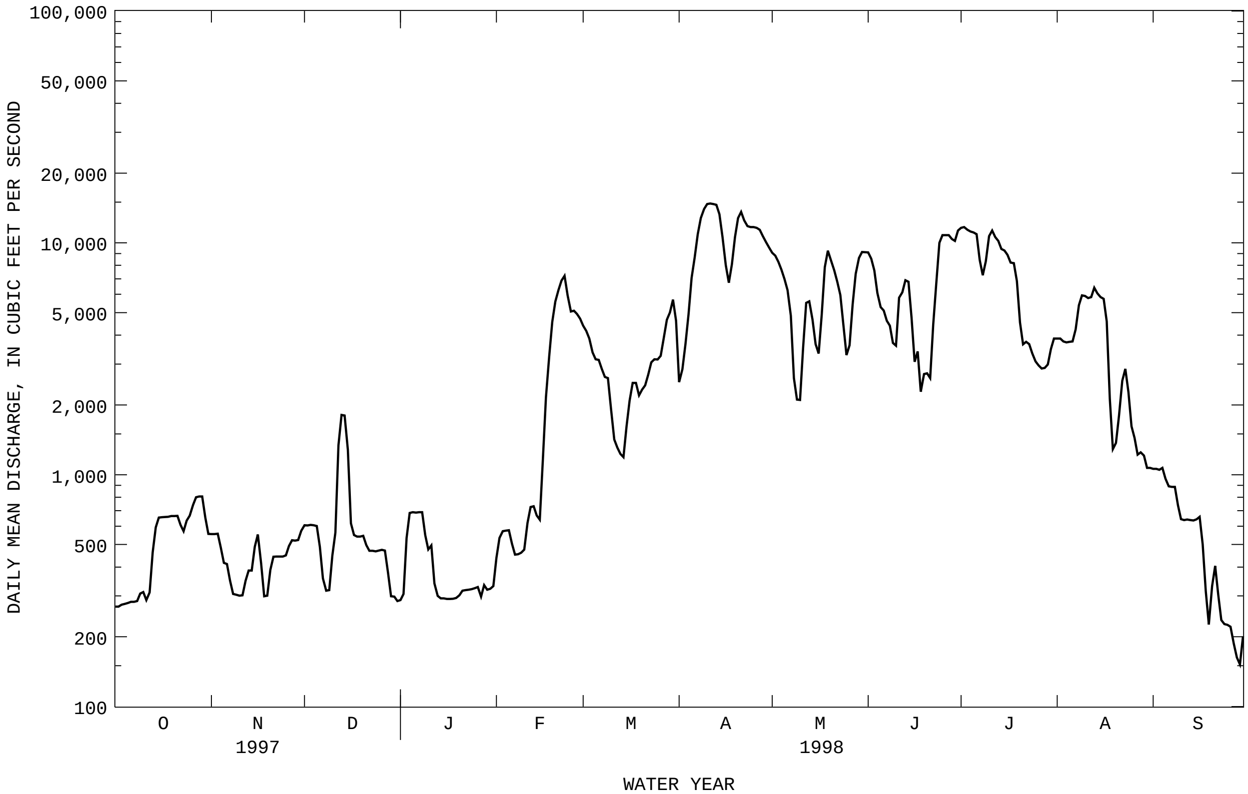
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1973	2214	1800	1010	1654	4680	6961	6389	7094	6610	3330	2295
MAX	7161	6210	5345	3605	6591	13800	17790	18170	19540	32820	15440	13450
(WY)	1987	1987	1983	1983	1984	1983	1993	1993	1991	1993	1993	1993
MIN	194	190	205	190	209	362	623	1305	877	254	212	225
(WY)	1990	1990	1990	1991	1978	1981	1989	1989	1988	1988	1989	1988

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1978 - 1998a	
ANNUAL TOTAL	1233268		1263015			
ANNUAL MEAN	3379		3460		3842	
HIGHEST ANNUAL MEAN					11320	1993
LOWEST ANNUAL MEAN					487	1989
HIGHEST DAILY MEAN	13600	Mar 15	14800	Apr 11	44300	Jul 21 1993
LOWEST DAILY MEAN	190	Sep 16	152	Sep 29	144	Nov 29 1977
ANNUAL SEVEN-DAY MINIMUM	216	Sep 16	197	Sep 24	165	Mar 5 1978
INSTANTANEOUS PEAK FLOW			14900	Apr 11	45700	Jul 21 1993
INSTANTANEOUS PEAK STAGE			13.95	Apr 11	24.22	Jul 21 1993
ANNUAL RUNOFF (AC-FT)	2446000		2505000		2783000	
ANNUAL RUNOFF (CFSM)	.58		.59		.66	
ANNUAL RUNOFF (INCHES)	7.85		8.04		8.94	
10 PERCENT EXCEEDS	8990		10000		10800	
50 PERCENT EXCEEDS	1350		1800		2050	
90 PERCENT EXCEEDS	299		304		270	

a Post regulation
e Estimated



05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD: October 1961 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1967 to current year.
WATER TEMPERATURES: October 1961 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1961 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis. During periods of partial ice cover, sediment samples are collected in open water channel.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,400 microsiemens Feb. 18, 1977; minimum daily, 90 microsiemens Feb. 19, 1971.
WATER TEMPERATURES: Maximum daily, 36.0℃ June 29, 1971; minimum daily, 0.0℃ on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 5,400 mg/L May 14, 1970; minimum daily mean, 1 mg/L Jan. 8, 1965, Sept. 1, 1988, Feb. 9, July 8, 1990.
SEDIMENT LOADS: Maximum daily, 148,000 tons June 12, 1966; minimum daily, 0.56 tons Sept. 1, 1988.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 779 microsiemens Jan. 23; minimum daily, 446 microsiemens Aug. 3.
WATER TEMPERATURES: Maximum daily, 29.5℃ Aug. 23, 28; minimum daily, 1.5℃ Dec. 28, and Jan. 3.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 167 mg/L June 12; minimum daily mean, 3 mg/L Dec. 2-6.
SEDIMENT LOADS: Maximum daily, 2,930 tons June 13; minimum daily, 4.4 tons Dec. 6.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
31...	1100	9.4	546	14	21	92
DEC						
17...	1345	1.6	550	10	15	96
JAN						
28...	1200	2.3	319	16	14	82
MAR						
19...	0930	1.4	2310	9	56	94
APR						
20...	1545	11.1	14200	33	1270	75
JUL						
06...	1330	23.0	11600	14	438	91
AUG						
25...	1310	26.9	1700	34	156	94
SEP						
29...	1215	21.5	155	20	8.4	97

DATE	TIME	NUMBER OF SAM-PLING POINTS (COUNT) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)
SEP										
29...	1130	3	0	1	22	58	79	89	98	100

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	607	592	629	---	606	---	664	---	528	583	---	563
2	615	---	635	648	617	---	620	---	561	572	451	558
3	622	---	---	625	---	554	547	513	632	567	446	561
4	---	575	---	---	---	563	589	528	535	---	458	557
5	631	597	---	671	---	---	621	532	---	548	536	558
6	629	579	---	---	610	---	565	652	535	546	447	---
7	638	---	660	---	608	---	630	542	580	542	469	562
8	634	---	650	607	---	---	662	---	577	562	---	564
9	632	---	---	---	---	---	662	---	547	---	---	564
10	632	---	---	---	696	---	604	---	518	577	---	567
11	---	---	---	---	---	---	637	536	---	---	---	563
12	---	625	---	---	---	---	640	553	538	574	---	---
13	632	620	625	---	617	622	653	539	580	573	---	---
14	632	---	646	---	---	---	645	524	537	582	---	568
15	---	---	---	641	599	---	647	534	508	490	492	572
16	---	---	---	601	612	626	674	---	518	537	548	572
17	---	617	595	618	---	---	---	---	529	---	569	567
18	---	622	621	---	607	647	---	544	609	---	587	572
19	---	628	579	---	620	655	663	545	586	491	538	581
20	---	---	581	---	585	692	655	602	583	585	570	576
21	---	---	582	---	647	663	566	610	544	596	574	591
22	---	---	624	680	582	650	537	599	606	583	---	595
23	636	---	669	779	553	655	541	---	535	594	572	584
24	640	636	---	647	527	654	526	---	602	595	572	580
25	---	628	---	616	---	671	---	569	609	---	569	590
26	---	628	---	630	---	691	547	572	595	547	549	604
27	---	---	---	641	---	679	524	651	594	592	561	594
28	---	---	623	608	---	671	565	581	593	508	546	598
29	597	---	587	626	---	693	516	541	587	526	---	594
30	601	644	611	---	---	655	513	---	578	600	---	594
31	656	---	---	---	---	572	---	---	---	576	564	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.0	10.5	5.0	---	3.5	---	9.0	---	22.0	25.5	---	27.0
2	20.0	---	5.0	6.0	3.5	---	10.5	---	23.5	25.5	26.0	27.0
3	24.0	---	---	1.5	---	4.0	10.5	15.5	20.0	25.5	26.5	27.0
4	---	8.0	---	---	---	4.5	10.5	15.0	20.0	---	27.0	27.5
5	23.0	9.5	---	3.5	---	---	10.0	16.5	---	24.5	26.0	26.0
6	22.0	8.0	---	---	5.0	---	10.0	17.0	19.0	25.0	25.5	---
7	23.5	---	3.0	---	5.0	---	10.0	18.0	20.0	26.5	26.0	28.0
8	21.0	---	2.0	5.5	---	---	11.5	---	23.0	27.0	---	27.0
9	20.0	---	---	---	---	---	10.0	---	19.0	---	---	24.0
10	19.0	---	---	---	4.5	---	10.5	---	20.0	27.0	---	24.5
11	---	---	---	---	---	---	10.5	20.0	---	---	---	25.0
12	---	7.0	---	---	---	---	13.5	20.0	20.5	26.5	---	---
13	19.0	7.0	3.0	---	4.5	4.5	13.0	20.0	21.5	27.0	---	---
14	16.5	---	3.0	---	---	---	12.5	21.5	20.0	27.0	---	24.5
15	---	---	---	2.0	6.0	---	12.0	22.5	22.0	27.0	27.0	24.5
16	---	---	---	2.0	5.0	4.0	---	---	22.0	28.0	27.0	25.5
17	---	7.0	3.0	5.0	---	---	---	---	20.5	---	---	25.0
18	---	6.5	3.0	---	4.5	3.0	---	24.0	22.0	---	---	23.5
19	---	4.0	4.5	---	4.5	4.0	13.5	23.5	24.0	28.0	26.5	23.0
20	---	---	4.0	---	5.0	4.0	13.0	22.5	25.0	27.0	29.0	25.0
21	---	---	2.0	---	4.5	4.5	13.0	23.0	24.0	27.5	28.0	23.0
22	---	---	3.0	2.5	4.5	3.5	14.0	21.0	22.0	26.0	---	23.0
23	14.5	---	4.0	3.0	4.5	4.5	15.0	---	23.0	27.0	29.5	21.0
24	14.0	5.5	---	4.0	4.5	4.5	14.0	---	23.0	27.5	28.0	21.5
25	---	8.0	---	4.5	---	5.0	---	22.0	24.5	---	27.0	24.0
26	---	5.0	---	5.0	---	8.0	15.0	22.5	25.0	26.0	28.5	23.0
27	---	---	---	5.0	---	9.5	13.5	22.0	25.0	26.0	26.0	25.0
28	---	---	1.5	5.0	---	8.0	13.0	22.0	27.0	28.0	29.5	23.0
29	13.5	---	2.0	4.5	---	8.0	14.0	21.0	26.0	27.0	---	23.0
30	11.0	5.0	3.0	---	---	10.5	14.5	---	25.0	26.5	---	23.0
31	9.5	---	---	---	---	11.0	---	---	---	27.5	28.0	---

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	OCTOBER MEAN CONCEN-TRATION (MG/L)	OCTOBER LOAD (TONS/DAY)	NOVEMBER MEAN CONCEN-TRATION (MG/L)	NOVEMBER LOAD (TONS/DAY)	DECEMBER MEAN CONCEN-TRATION (MG/L)	DECEMBER LOAD (TONS/DAY)	JANUARY MEAN CONCEN-TRATION (MG/L)	JANUARY LOAD (TONS/DAY)	FEBRUARY MEAN CONCEN-TRATION (MG/L)	FEBRUARY LOAD (TONS/DAY)	MARCH MEAN CONCEN-TRATION (MG/L)	MARCH LOAD (TONS/DAY)
1	24	18	28	43	4	6.0	20	16	41	49	33	390
2	26	19	34	52	3	4.9	23	19	87	127	31	354
3	24	18	41	61	3	4.9	18	26	90	138	30	313
4	23	17	45	59	3	4.9	14	26	83	129	27	243
5	21	16	36	41	3	4.9	12	23	77	120	26	218
6	21	16	38	42	3	4.4	20	37	68	94	25	214
7	21	16	31	30	6	5.3	35	65	44	53	25	192
8	24	18	23	19	8	6.7	55	103	36	45	25	175
9	24	20	17	14	8	7.2	53	78	33	41	24	170
10	24	20	13	10	9	11	46	59	31	39	21	110
11	25	19	9	7.6	9	14	40	54	33	56	18	67
12	25	21	7	6.5	10	35	35	32	36	71	17	60
13	32	41	5	5.4	10	47	31	25	40	79	16	53
14	31	49	5	5.5	7	36	27	22	43	78	15	47
15	28	50	5	7.3	8	27	25	20	48	84	13	58
16	27	48	6	8.5	9	15	31	24	38	98	12	67
17	26	46	6	6.7	10	15	28	22	15	88	10	65
18	24	43	7	5.6	10	15	28	22	16	146	9	60
19	23	42	8	6.3	12	17	28	22	38	488	14	81
20	22	39	7	7.6	12	18	29	24	39	582	16	102
21	21	38	7	8.0	15	20	30	25	29	483	20	134
22	19	32	6	7.3	12	15	30	26	43	802	17	125
23	16	25	6	6.7	8	9.7	32	27	49	945	14	119
24	21	35	5	6.0	8	9.9	35	31	41	668	17	143
25	22	39	4	5.2	9	11	23	20	39	534	26	218
26	23	46	5	6.7	10	13	21	19	37	515	15	135
27	24	51	6	8.2	11	14	56	45	36	477	23	243
28	25	54	7	9.5	12	12	41	37	34	436	33	416
29	26	57	8	11	8	6.7	31	27	---	---	27	363
30	26	46	8	12	13	10	32	28	---	---	51	787
31	18	27	---	---	17	13	33	29	---	---	64	801
TOTAL	---	1026	---	518.6	---	433.5	---	1033	---	7465	---	6523

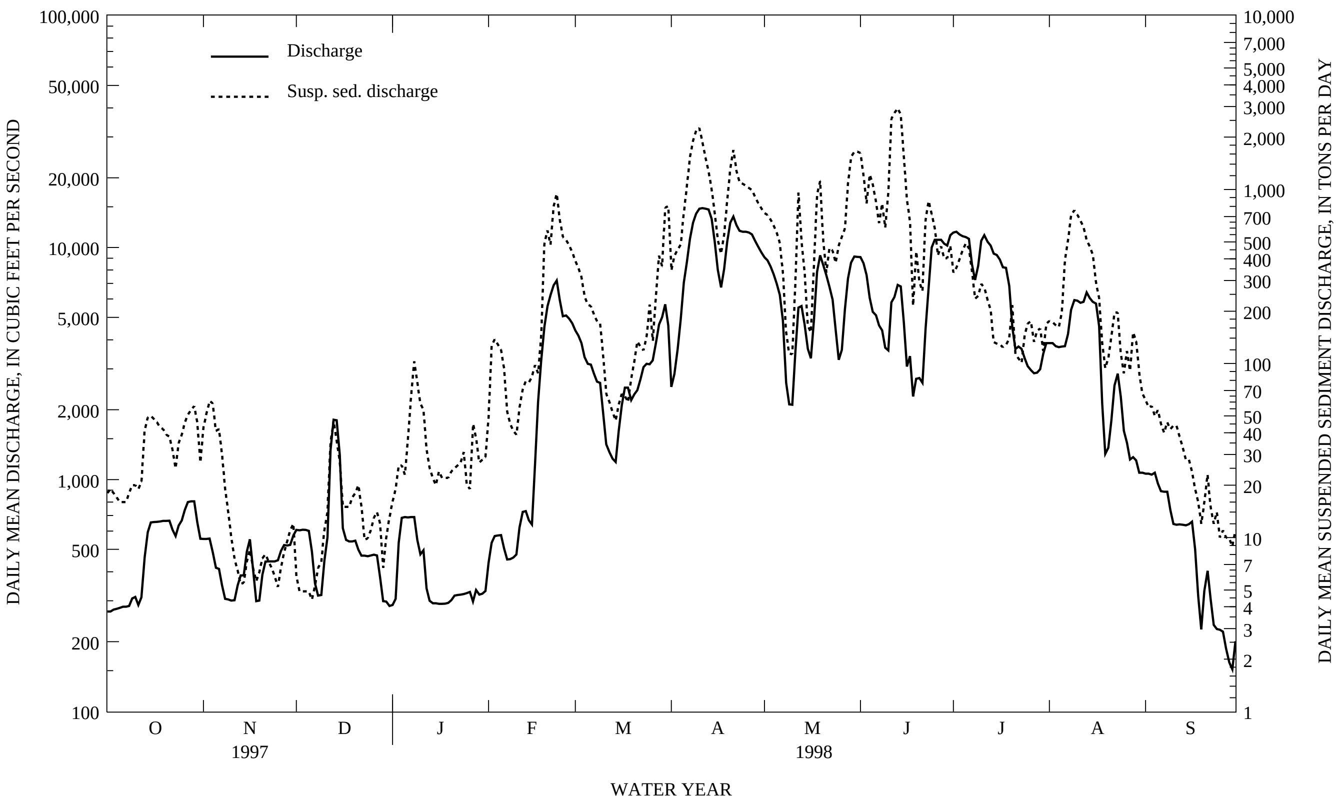
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	APRIL MEA CON TRA (MG	APRIL LOAD (TONS/ DAY)	MAY MEAN CONCE TRATI (MG/L	MAY LOAD (TONS DAY)	JUNE MEAN CONCE TRATI (MG/L	JUNE LOAD (TONS DAY)	JULY MEAN CONCE TRATI (MG/L	JULY LOAD (TON DAY)	AUGUST MEAN CONCE TRATI (MG/L	AUGUST LOAD (TON DAY)	SEPTEMBER MEAN CONCE TRATI (MG/L	SEPTEMBER LOAD (TONS DAY)
1	51	343	30	734	66	1620	11	333	17	176	21	62
2	54	417	30	713	52	1200	11	356	17	173	20	56
3	46	451	30	671	41	834	13	398	16	166	20	57
4	37	484	30	621	75	1220	15	449	16	162	17	50
5	38	730	30	565	75	1070	16	491	20	198	21	54
6	45	1050	29	490	62	851	16	460	39	394	19	45
7	52	1540	25	330	52	642	15	338	45	512	17	40
8	55	1910	22	152	70	831	12	236	49	714	19	46
9	58	2190	20	114	58	604	11	245	47	760	21	42
10	57	2260	20	113	84	960	10	287	45	716	25	44
11	47	1880	28	290	161	2550	9	272	43	664	25	44
12	38	1520	64	959	167	2760	8	232	39	608	22	38
13	32	1270	33	507	157	2930	7	204	30	513	19	33
14	28	1000	26	335	148	2710	5	133	29	471	17	28
15	26	731	17	165	121	1550	5	130	27	420	16	28
16	24	511	17	151	106	879	5	129	19	294	14	24
17	23	427	27	371	71	652	6	124	20	239	14	19
18	25	548	43	934	35	215	6	128	23	132	19	16
19	30	861	45	1120	60	441	8	139	27	94	19	12
20	38	1320	22	508	40	296	18	216	29	107	18	16
21	46	1690	16	334	37	261	12	114	30	144	21	23
22	38	1280	25	461	55	666	11	107	28	196	18	15
23	35	1100	28	446	48	859	10	101	26	197	19	12
24	34	1080	33	379	27	721	16	146	19	114	22	14
25	33	1050	54	476	21	601	20	170	20	88	17	10
26	33	1020	56	536	14	418	22	175	30	118	18	11
27	32	991	39	597	16	472	17	133	28	91	20	10
28	31	909	55	1090	14	402	20	154	44	151	22	9.9
29	31	838	66	1540	15	403	20	159	40	134	22	8.9
30	30	781	67	1650	16	476	13	118	30	88	21	11
31	---	---	67	1650	---	---	16	169	23	67	---	---
TOTAL	---	32182	---	19002	---	30094	---	6846	---	8901	---	878.8

YEAR 114902.9

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

SUSPENDED-SEDIMENT--Continued



05481950 BEAVER CREEK NEAR GRIMES, IA

LOCATION.--Lat 41°41'18", long 93°44'06", in $SW^1/_4$ $SW^1/_4$ sec.35, T.80 N., R.25 W., Polk County, Hydrologic Unit 07100004, on left bank 10 ft upstream from bridge on Northwest 70th Avenue, 0.5 mi downstream from Little Beaver Creek, 2.5 mi east of Grimes, and 6 mi upstream from mouth.

DRAINAGE AREA.--358 mi^2.

PERIOD OF RECORD.--April 1960 to current year.

REVISED RECORDS.--WDR IA-77-1: 1974 (P), WDR IA-95-1:location.

GAGE.--Water stage recorder. Datum of gage is 806.98 ft above sea level. Prior to Aug. 31, 1966, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 17, Dec. 4-7, 13-15, Dec. 26 to Jan. 2, 11-26, Feb. 3-7, June 15, and Sept. 10-14. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

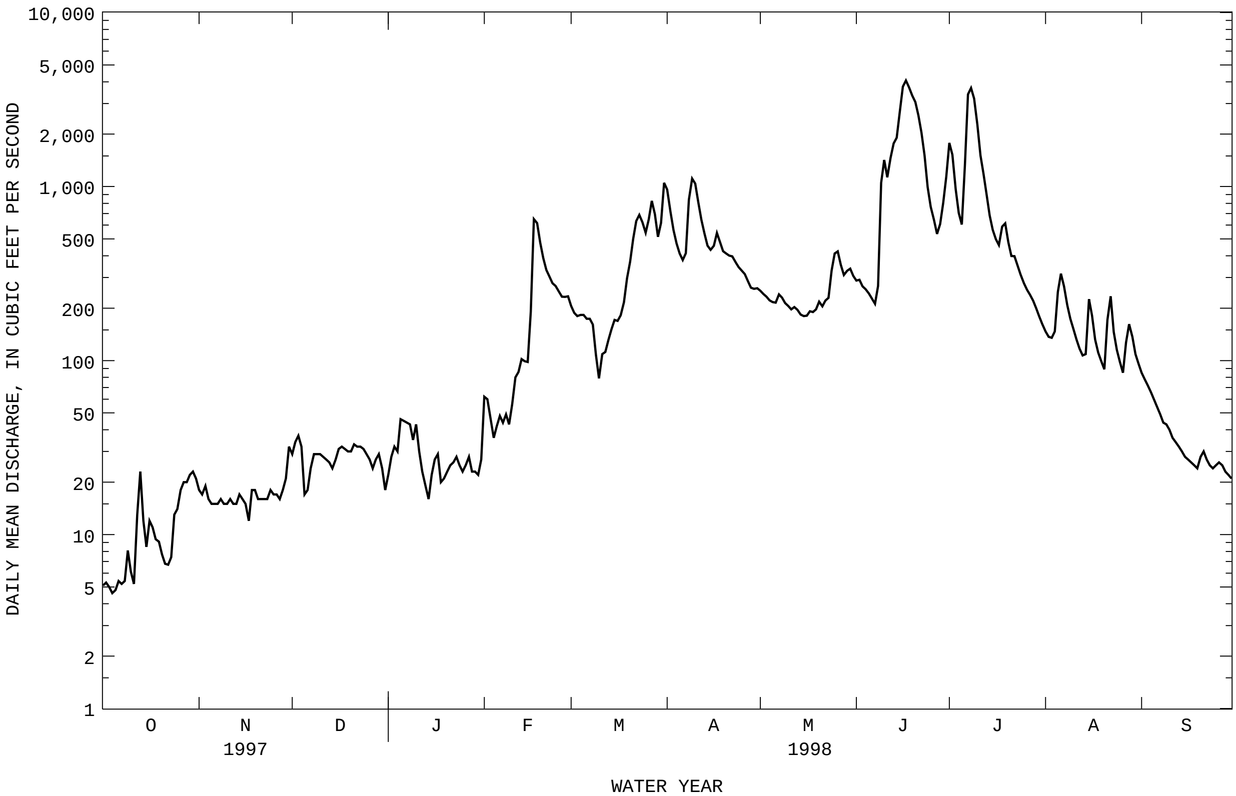
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	18	29	e22	62	206	960	252	288	1780	147	85
2	5.3	17	34	e28	60	188	718	241	291	1520	137	78
3	5.0	19	37	32	e46	180	562	233	267	965	135	72
4	4.6	16	e32	30	e36	183	471	222	257	704	147	66
5	4.8	15	e17	46	e42	183	412	217	243	605	248	60
6	5.4	15	e18	45	e48	174	378	215	227	1320	316	54
7	5.2	15	e24	44	e44	174	413	240	212	3390	267	49
8	5.4	16	29	43	49	161	839	230	268	3680	208	44
9	8.1	15	29	35	43	108	1110	214	1050	3200	174	43
10	6.1	15	29	43	56	79	1040	206	1420	2270	152	e40
11	5.2	16	28	e30	80	109	812	197	1130	1510	132	e36
12	13	15	27	e23	86	112	644	203	1460	1180	117	e34
13	23	15	e26	e19	102	131	538	196	1770	899	107	e32
14	12	17	e24	e16	99	151	457	184	1910	681	109	e30
15	8.5	16	e27	e22	98	171	433	180	e2690	563	225	28
16	12	15	31	e27	191	169	456	181	3750	499	181	27
17	11	e12	32	e29	649	182	541	192	4070	461	132	26
18	9.4	18	31	e20	616	216	480	190	3720	588	111	25
19	9.1	18	30	e21	477	297	425	197	3330	615	99	24
20	7.7	16	30	e23	388	370	412	218	3060	479	89	28
21	6.8	16	33	e25	331	500	401	205	2560	399	171	30
22	6.7	16	32	e26	304	634	397	221	2040	398	234	27
23	7.4	16	32	e28	278	687	368	229	1510	352	146	25
24	13	18	31	e25	268	624	344	329	993	312	115	24
25	14	17	29	e23	249	542	329	412	765	279	98	25
26	18	17	e27	e25	233	647	314	424	643	256	85	26
27	20	16	e24	28	232	827	287	355	534	239	127	25
28	20	18	e27	23	234	694	262	310	608	221	162	23
29	22	21	e29	23	---	514	258	328	804	200	137	22
30	23	32	e24	22	---	618	260	337	1140	179	109	21
31	21	---	e18	27	---	1050	---	306	---	162	96	---
TOTAL	337.8	506	870	873	5401	10881	15321	7664	43010	29906	4713	1129
MEAN	10.9	16.9	28.1	28.2	193	351	511	247	1434	965	152	37.6
MAX	23	32	37	46	649	1050	1110	424	4070	3680	316	85
MIN	4.6	12	17	16	36	79	258	180	212	162	85	21
AC-FT	670	1000	1730	1730	10710	21580	30390	15200	85310	59320	9350	2240
CFSM	.03	.05	.08	.08	.54	.98	1.43	.69	4.00	2.69	.42	.11
IN.	.04	.05	.09	.09	.56	1.13	1.59	.80	4.47	3.11	.49	.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	104	124	104	64.1	127	360	383	418	466	291	112	76.1
MAX	724	655	486	305	526	1171	1275	1419	1434	2160	695	654
(WY)	1974	1973	1983	1974	1973	1979	1965	1974	1998	1993	1993	1993
MIN	.058	.63	.77	.002	.35	3.98	3.26	1.11	1.41	.24	.73	.26
(WY)	1989	1967	1977	1977	1977	1981	1981	1981	1977	1977	1988	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1961 - 1998	
ANNUAL TOTAL	59282.9		120611.8			
ANNUAL MEAN	162		330		219	
HIGHEST ANNUAL MEAN					575	1993
LOWEST ANNUAL MEAN					17.3	1981
HIGHEST DAILY MEAN	1090	May 3	4070	Jun 17	11500	Jul 10 1993
LOWEST DAILY MEAN	3.9	Sep 20	4.6	Oct 4	.00	Sep 8 1970a
ANNUAL SEVEN-DAY MINIMUM	4.4	Sep 16	5.1	Oct 1	.00	Oct 7 1971
INSTANTANEOUS PEAK FLOW			4280	Jun 17	14300	Jul 10 1993
INSTANTANEOUS PEAK STAGE			13.20	Jun 17	16.58	Jul 10 1993
INSTANTANEOUS LOW FLOW			4.0	Oct 4		
ANNUAL RUNOFF (AC-FT)	117600		239200		158900	
ANNUAL RUNOFF (CFSM)	.45		.92		.61	
ANNUAL RUNOFF (INCHES)	6.16		12.53		8.32	
10 PERCENT EXCEEDS	366		781		560	
50 PERCENT EXCEEDS	100		117		76	
90 PERCENT EXCEEDS	6.8		16		2.1	

a Also Sep 11-13, 1970, Sep 17, 18, Oct 7-17, 1971; many days during 1977
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05482000 DES MOINES RIVER AT SECOND AVENUE AT DES MOINES, IA

LOCATION.--Lat 41°36'45", long 93°37'15", in NE$^1/_4$ NE$^1/_4$ sec.34, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, on right bank 5 ft upstream from 2nd Avenue or State Highway 60 bridge in Des Moines, 1.8 miles upstream from Des Moines Electric Company dam, 2.8 miles upstream from Raccoon River, and 4.5 miles downstream from Beaver Creek.

DRAINAGE AREA.--6,245 mi^2.

PERIOD OF RECORD.--October 1902 to August 1903, October 1914 to February 1915 (gage heights and discharge measurements only); March 1915 to September 1961, October 1996 to current year.

REVISED RECORDS-- WSP 1308: 1915-19, 1921, 1923, 1933, 1943(M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 773.68 ft above sea level and at city datum. Prior to August 21, 1941, staff, chain, or recording gages at several sites within 3 mi of present site at various datums.

REMARKS.--Estimated daily discharges: Oct. 1-12, 22-29, Nov. 6-8, Dec. 29 to Jan. 2, Jan. 12-25, 29, 30, Mar. 30, 31, May 29, 30, June 12-15, and Sept. 2-4, 19, 23-30. Records good except those for estimated daily discharges, which are poor. Flow regulated by Saylorville Dam 6.8 mi. upstream, since Apr. 12, 1977. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform and U.S. Weather Service Limited Automated Remote Collector (LARC) at station.

EXTREMES FOR PERIOD OF RECORD--Maximum discharge 60,200 ft^3/sec on June 24, 1954, gage height 30.16; minimum unregulated daily discharge 24 ft^3/sec Jan. 29, 30, 1940.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e300	571	601	e300	538	4820	3520	9400	9750	13600	3860	1130
2	e300	567	609	e340	635	4670	4020	9070	9060	13600	3870	e1130
3	e300	573	657	512	660	4290	4510	8430	8130	13000	3710	e1150
4	e300	530	660	692	660	3750	5830	7810	6390	12600	3830	e1200
5	e310	476	634	719	660	3570	7850	7170	5850	12500	3730	1060
6	e310	e460	514	719	569	3530	9350	6620	5650	12700	3760	989
7	e310	e380	412	719	518	3140	12000	4940	5160	11000	4420	977
8	e340	e340	379	719	522	2920	13900	2800	5230	10200	5420	982
9	e365	341	378	534	522	2870	15500	2410	4680	11000	5770	898
10	e340	339	473	417	565	1970	16000	2390	5350	12800	5780	761
11	e310	339	554	374	751	1570	16000	4340	7580	12600	5620	739
12	e360	374	1480	e340	870	1480	15700	6060	e8000	11800	5730	714
13	557	405	1830	e300	890	1380	15400	5930	e8900	11100	6110	700
14	621	411	1840	e310	829	1360	13600	5060	e9000	10300	5810	703
15	660	486	1230	e320	779	1890	10700	3940	e7500	10100	5760	679
16	664	541	637	e320	1400	2390	7980	3850	11600	9510	5630	705
17	679	438	565	e320	2850	2980	7070	5720	7280	8920	4330	608
18	679	341	565	e320	3960	2890	8790	8830	7780	8820	2150	412
19	679	339	558	e330	5040	2670	11400	9900	5550	6930	1330	e280
20	679	402	554	e340	5880	2890	13600	9050	4920	4860	1420	369
21	658	446	533	e350	6390	3120	14100	8100	4760	4360	1940	436
22	e630	451	519	e350	7050	3620	12800	7290	6370	4360	2700	391
23	e600	451	512	e350	7310	4030	12200	6550	8670	4160	3030	e270
24	e650	444	502	e350	6000	4110	12200	4780	12000	3710	2530	e260
25	e750	452	501	e360	5490	4050	12200	4010	12400	3460	1750	e260
26	e800	486	501	370	5500	4290	12100	4480	12500	3290	1500	e260
27	e850	520	501	370	5300	5060	11900	6390	12600	3190	1570	e230
28	e850	522	419	370	5200	5550	11000	8190	11800	3150	1370	e200
29	e850	591	e340	e360	---	5800	10400	e9500	12400	3190	1420	e180
30	695	572	e320	e360	---	e6660	9810	e9800	13100	3600	1200	e220
31	595	---	e300	374	---	e5500	---	9780	---	3880	1150	---
TOTAL	16991	13588	20078	12909	77338	108820	331430	202590	249960	258290	108200	18893
MEAN	548	453	648	416	2762	3510	11050	6535	8332	8332	3490	630
MAX	850	591	1840	719	7310	6660	16000	9900	13100	13600	6110	1200
MIN	300	339	300	300	518	1360	3520	2390	4680	3150	1150	180
AC-FT	33700	26950	39820	25610	153400	215800	657400	401800	495800	512300	214600	37470
CFSM	.09	.07	.10	.07	.44	.56	1.77	1.05	1.33	1.33	.56	.10
IN.	.10	.08	.12	.08	.46	.65	1.97	1.21	1.49	1.54	.64	.11

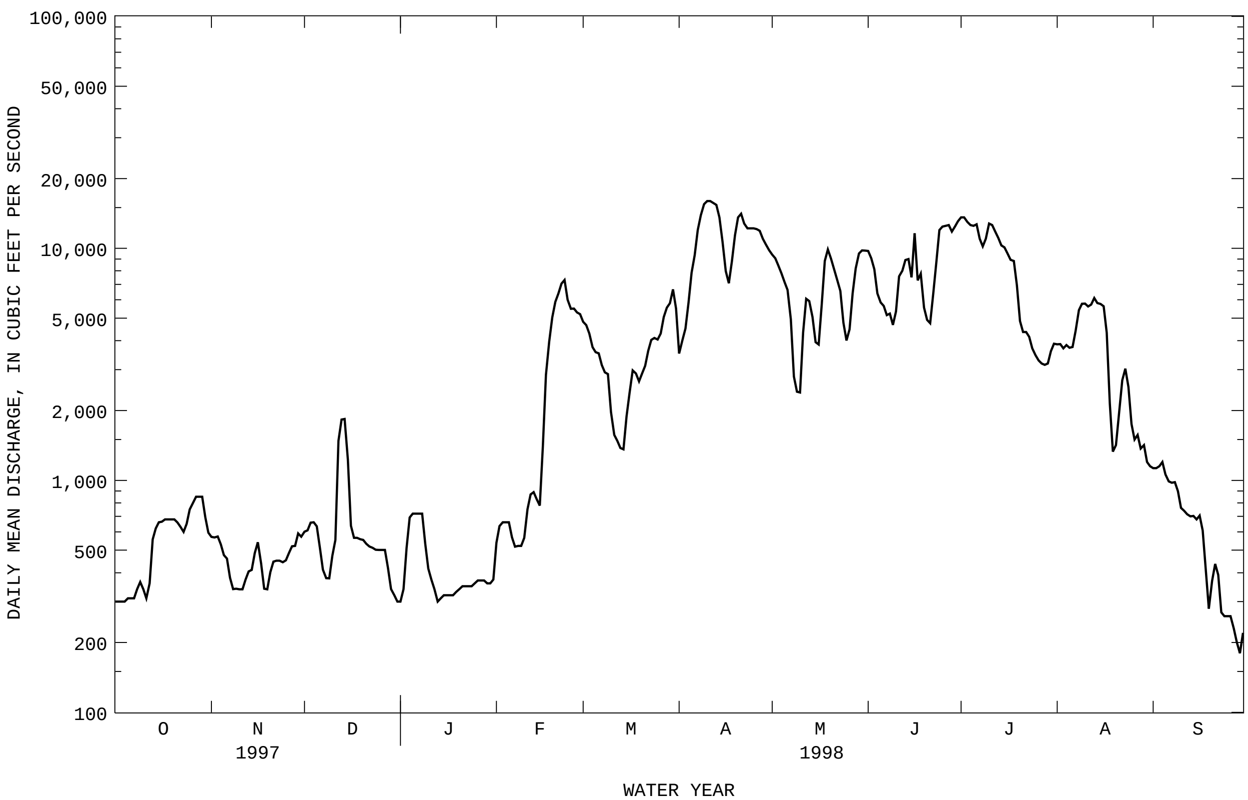
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1998, BY WATER YEAR (WY)

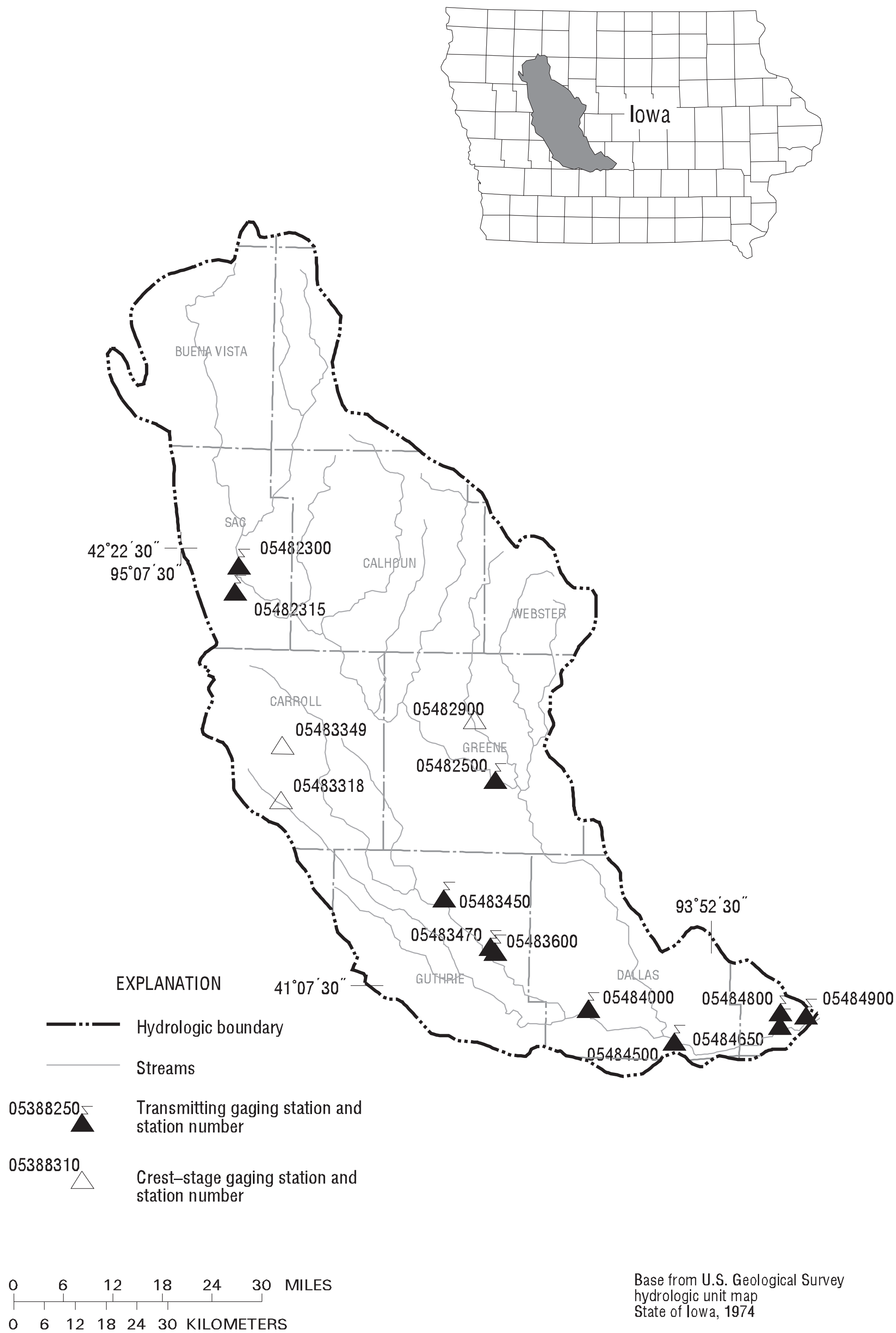
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	663	1662	1672	823	2768	6448	10050	7037	6642	6622	2559	469
MAX	778	2871	2696	1231	2775	9385	11050	7539	8332	8332	3490	630
(WY)	1997	1997	1997	1997	1997	1997	1998	1997	1998	1998	1998	1998
MIN	548	453	648	416	2762	3510	9045	6535	4952	4913	1627	308
(WY)	1998	1998	1998	1998	1998	1998	1997	1998	1997	1997	1997	1997

05482000 DES MOINES RIVER AT SECOND AVENUE AT DES MOINES, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1997 - 1998	
ANNUAL TOTAL	1322993		1419087			
ANNUAL MEAN	3625		3888		3952	
HIGHEST ANNUAL MEAN					4017	1997
LOWEST ANNUAL MEAN					3888	1998
HIGHEST DAILY MEAN	13700	Mar 15	16000	Apr 10	16000	Apr 10 1998
LOWEST DAILY MEAN	210	Sep 17	180	Sep 29	180	Sep 29 1998
ANNUAL SEVEN-DAY MINIMUM	229	Sep 16	230	Sep 24	229	Sep 16 1997
INSTANTANEOUS PEAK FLOW			16000	Apr 10,11		
INSTANTANEOUS PEAK STAGE			19.59	Apr 10,11		
ANNUAL RUNOFF (AC-FT)	2624000		2815000		2863000	
ANNUAL RUNOFF (CFSM)	.58		.62		.63	
ANNUAL RUNOFF (INCHES)	7.88		8.45		8.60	
10 PERCENT EXCEEDS	9520		11000		10100	
50 PERCENT EXCEEDS	1480		1890		2620	
90 PERCENT EXCEEDS	339		340		365	

e Estimated





Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA

LOCATION.--Lat 42°21'16", long 94°59'26", in NW$^1/_4$ NW$^1/_4$ sec.13, T.87 N., R.36 W., Sac County, Hydrologic Unit 07100006, on right bank 5 ft downstream from bridge on county highway, 2.1 mi upstream from Indian Creek, 0.3 mi upstream from Drainage Ditch 73, 4.6 mi south of Sac City, 167.1 miles upstream of mouth of Raccoon River, and at mile 367.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--700 mi^2.

PERIOD OF RECORD.--June 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,146.03 ft above sea level. Prior to Oct. 1, 1987 at site 1.7 miles downstream at datum 1.43 ft lower.

REMARKS.--Estimated daily discharges: Nov. 16-19, Dec. 5 to Feb. 18, Mar. 9-13, and Sept. 28, 29. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1954, reached a stage of 15.61 ft, from floodmark, discharge, 7,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	41	53	e26	e74	367	1130	922	1510	1680	151	100
2	32	41	52	e27	e65	316	1020	857	1180	1390	139	98
3	31	39	53	e29	e34	285	871	791	1000	1210	139	93
4	30	42	45	e32	e29	275	788	738	893	1070	143	84
5	30	45	e25	e36	e34	254	743	704	839	965	143	78
6	29	43	e26	e44	e36	236	735	658	784	1030	140	74
7	28	42	e40	e46	e34	225	1640	624	733	1670	873	68
8	28	45	e46	e48	e35	207	2910	589	722	1560	1950	62
9	28	44	e53	e70	e36	e145	2540	553	1360	1130	1550	60
10	27	42	e50	e48	e50	e110	1970	556	1540	932	1140	58
11	29	38	e55	e42	e47	e180	1640	552	1350	815	827	55
12	41	39	e44	e46	e44	e240	1490	555	1520	719	614	53
13	49	40	e36	e16	e50	e265	1410	544	1300	617	510	52
14	82	44	e34	e13	e42	283	1410	509	1190	548	434	51
15	62	41	e39	e20	e50	317	1360	582	1960	551	379	50
16	52	e34	e44	e23	e70	312	2340	1410	3220	651	313	49
17	47	e29	e60	e23	e140	276	2340	1140	2890	632	262	49
18	44	e50	e50	e18	e420	239	1840	905	2540	697	232	49
19	43	e42	e49	e20	647	204	1450	768	2550	584	207	51
20	42	45	e45	e23	577	219	1430	679	2110	552	189	56
21	39	40	e42	e27	589	268	2110	609	1810	479	248	59
22	39	50	e55	e30	514	330	1860	584	1550	462	241	56
23	39	43	e48	e28	514	335	1500	565	1340	416	200	51
24	40	44	e49	e27	505	329	1280	617	5270	359	174	55
25	43	54	e39	e29	458	326	1130	626	5450	320	155	60
26	42	46	e35	e30	469	496	1200	579	4510	290	136	65
27	39	50	e30	e38	554	902	1420	545	3680	265	135	55
28	40	49	e32	e36	447	1110	1280	522	2780	244	149	e49
29	40	53	e34	e50	---	1470	1110	913	2150	213	135	e46
30	40	56	e34	e48	---	1290	1000	1550	2210	186	116	42
31	40	---	e27	e52	---	1140	---	2150	---	171	105	---
TOTAL	1227	1311	1324	1045	6564	12951	44947	23896	61941	22408	12129	1828
MEAN	39.6	43.7	42.7	33.7	234	418	1498	771	2065	723	391	60.9
MAX	82	56	60	70	647	1470	2910	2150	5450	1680	1950	100
MIN	27	29	25	13	29	110	735	509	722	171	105	42
AC-FT	2430	2600	2630	2070	13020	25690	89150	47400	122900	44450	24060	3630
CFSM	.06	.06	.06	.05	.33	.60	2.14	1.10	2.95	1.03	.56	.09
IN.	.07	.07	.07	.06	.35	.69	2.39	1.27	3.29	1.19	.64	.10

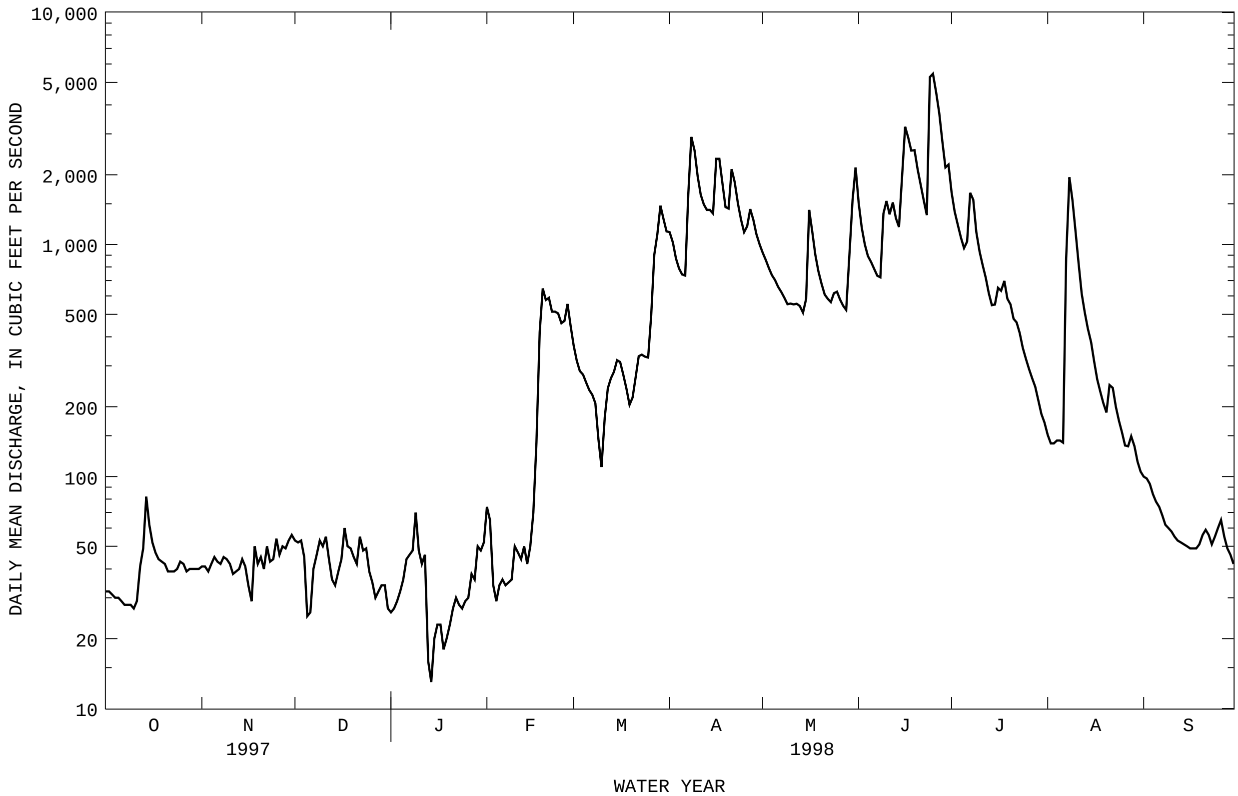
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	250	219	139	95.3	181	651	789	645	859	507	236	239
MAX	1782	1005	641	498	1038	2723	2726	2077	3344	3096	1188	1966
(WY)	1983	1984	1983	1983	1984	1983	1983	1991	1984	1993	1993	1962
MIN	6.39	9.44	4.39	.87	1.16	27.2	25.6	31.9	24.7	23.0	9.29	7.80
(WY)	1959	1959	1959	1977	1959	1968	1967	1967	1977	1977	1976	1976

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1959 - 1998	
ANNUAL TOTAL	138284		191571			
ANNUAL MEAN	379		525		401	
HIGHEST ANNUAL MEAN					1331	1983
LOWEST ANNUAL MEAN					25.3	1977
HIGHEST DAILY MEAN	2070	Jun 22	5450	Jun 25	12400	Mar 23 1979
LOWEST DAILY MEAN	25	Dec 5	13	Jan 14	.00	Jan 30 1977a
ANNUAL SEVEN-DAY MINIMUM	28	Oct 5	19	Jan 13	.01	Jan 29 1977
INSTANTANEOUS PEAK FLOW			6180	Jun 24	13100	Mar 23 1979
INSTANTANEOUS PEAK STAGE			17.27	Jun 24	20.14	Jun 17 1990
ANNUAL RUNOFF (AC-FT)	274300		380000		290700	
ANNUAL RUNOFF (CFSM)	.54		.75		.57	
ANNUAL RUNOFF (INCHES)	7.35		10.18		7.79	
10 PERCENT EXCEEDS	1000		1490		1030	
50 PERCENT EXCEEDS	150		149		138	
90 PERCENT EXCEEDS	37		33		16	

a Also Jan 31 to Feb 4, 1977
e Estimated

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA--Continued



05482315 BLACK HAWK LAKE AT LAKE VIEW, IA

LOCATION.--Lat 42°18'15", long 95°02'30", in NW$^1/_4$ SE$^1/_4$ sec.33, T.87 N., R.36 W., Sac County, Hydrologic Unit 07100006, on south shore across from swimming beach at Lake View and 2 mi. upstream from lake outlet.

DRAINAGE AREA.--23.3 mi^2.

PERIOD OF RECORD.--April 1970 to September 1975; April 1978 to September 1992, October 1994 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,218.50 ft above sea level and 2.00 ft below crest of spillway of dam at outlet. Prior to June 25, 1970, nonrecording gage at lake outlet.

REMARKS.--Gage height was considered reliable for the year, except Feb. 26 to Mar. 3. Lake is formed by concrete dam with ungated overflow spillway at elevation 1,220.50 ft. above sea level. Lake is used for conservation and recreation. Area of lake is approximately 957 acres. U.S. Geological Survey satellite data collection platform at station.

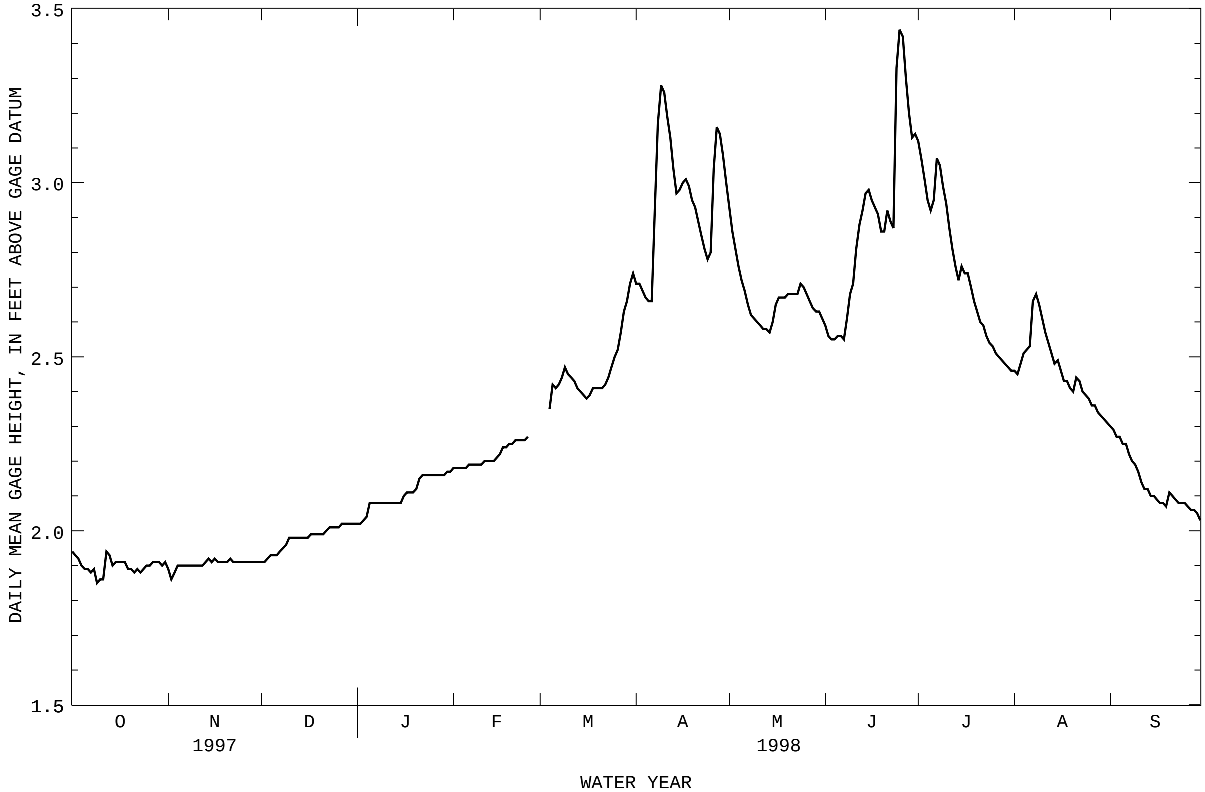
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 4.34 ft June 22, 1996; minimum, 0.02 ft Sept. 26, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 3.44 ft June 25; minimum, 1.85 ft Oct 9.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.94	1.89	1.91	2.02	2.18	---	2.71	2.93	2.59	3.12	2.46	2.30
2	1.93	1.86	1.91	2.02	2.18	---	2.71	2.86	2.56	3.07	2.45	2.29
3	1.92	1.88	1.92	2.03	2.18	---	2.69	2.81	2.55	3.01	2.48	2.27
4	1.90	1.90	1.93	2.04	2.18	2.35	2.67	2.76	2.55	2.95	2.51	2.27
5	1.89	1.90	1.93	2.08	2.18	2.42	2.66	2.72	2.56	2.92	2.52	2.25
6	1.89	1.90	1.93	2.08	2.19	2.41	2.66	2.69	2.56	2.95	2.53	2.25
7	1.88	1.90	1.94	2.08	2.19	2.42	2.92	2.65	2.55	3.07	2.66	2.22
8	1.89	1.90	1.95	2.08	2.19	2.44	3.17	2.62	2.61	3.05	2.68	2.20
9	1.85	1.90	1.96	2.08	2.19	2.47	3.28	2.61	2.68	2.99	2.65	2.19
10	1.86	1.90	1.98	2.08	2.19	2.45	3.26	2.60	2.71	2.94	2.61	2.17
11	1.86	1.90	1.98	2.08	2.20	2.44	3.19	2.59	2.81	2.87	2.57	2.14
12	1.94	1.90	1.98	2.08	2.20	2.43	3.13	2.58	2.88	2.81	2.54	2.12
13	1.93	1.91	1.98	2.08	2.20	2.41	3.04	2.58	2.92	2.76	2.51	2.12
14	1.90	1.92	1.98	2.08	2.20	2.40	2.97	2.57	2.97	2.72	2.48	2.10
15	1.91	1.91	1.98	2.08	2.21	2.39	2.98	2.60	2.98	2.76	2.49	2.10
16	1.91	1.92	1.98	2.10	2.22	2.38	3.00	2.65	2.95	2.74	2.46	2.09
17	1.91	1.91	1.99	2.11	2.24	2.39	3.01	2.67	2.93	2.74	2.43	2.08
18	1.91	1.91	1.99	2.11	2.24	2.41	2.99	2.67	2.91	2.70	2.43	2.08
19	1.89	1.91	1.99	2.11	2.25	2.41	2.95	2.67	2.86	2.66	2.41	2.07
20	1.89	1.91	1.99	2.12	2.25	2.41	2.93	2.68	2.86	2.63	2.40	2.11
21	1.88	1.92	1.99	2.15	2.26	2.41	2.89	2.68	2.92	2.60	2.44	2.10
22	1.89	1.91	2.00	2.16	2.26	2.42	2.85	2.68	2.89	2.59	2.43	2.09
23	1.88	1.91	2.01	2.16	2.26	2.44	2.81	2.68	2.87	2.56	2.40	2.08
24	1.89	1.91	2.01	2.16	2.26	2.47	2.78	2.71	3.33	2.54	2.39	2.08
25	1.90	1.91	2.01	2.16	2.27	2.50	2.80	2.70	3.44	2.53	2.38	2.08
26	1.90	1.91	2.01	2.16	---	2.52	3.04	2.68	3.42	2.51	2.36	2.07
27	1.91	1.91	2.02	2.16	---	2.57	3.16	2.66	3.30	2.50	2.36	2.06
28	1.91	1.91	2.02	2.16	---	2.63	3.14	2.64	3.20	2.49	2.34	2.06
29	1.91	1.91	2.02	2.16	---	2.66	3.08	2.63	3.13	2.48	2.33	2.05
30	1.90	1.91	2.02	2.17	---	2.71	3.00	2.63	3.14	2.47	2.32	2.03
31	1.91	---	2.02	2.17	---	2.74	---	2.61	---	2.46	2.31	---
MEAN	1.90	1.90	1.98	2.11	---	---	2.95	2.67	2.89	2.75	2.46	2.14
MAX	1.94	1.92	2.02	2.17	---	---	3.28	2.93	3.44	3.12	2.68	2.30
MIN	1.85	1.86	1.91	2.02	---	---	2.66	2.57	2.55	2.46	2.31	2.03

05482315 BLACK HAWK LAKE AT LAKE VIEW, IA--Continued



05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IA

LOCATION.--Lat 41°59'17", long 94°22'36", in $SW^1/_4$ $NW^1/_4$ sec.20, T.83 N., R.30 W., Greene County, Hydrologic Unit 07100006, on right bank 20 ft downstream from bridge on State Highway 4, 0.1 mi downstream from Drainage Ditch 33 and 40, 1.9 mi south of Jefferson, 4.7 mi upstream from Hardin Creek, 92.0 miles upstream of mouth of Raccoon River, and at mile 292.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,619 mi^2.

PERIOD OF RECORD.--March 1940 to current year. Prior to April 1940, monthly discharge only, published in WSP 1308. Prior to October 1955, published as "Raccoon River near Jefferson".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1950-51.

GAGE.--Water-stage recorder. Datum of gage is 967.09 ft above sea level. Prior to Apr. 22, 1946, nonrecording gage at site 4 mi upstream at different datum. Apr. 22 to June 25, 1946, nonrecording gage, June 26, 1946 to Sept. 30, 1955, water-stage recorder, Oct. 1, 1955 to Apr. 30, 1958, nonrecording gage, at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 17-23, and Nov. 28 to Feb. 16. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	169	e140	e80	e140	1040	2540	2320	3980	7940	587	327
2	75	164	e140	e110	e170	919	2450	2150	3160	5490	547	305
3	76	163	e145	e90	e150	844	2340	1990	2440	3740	522	284
4	71	161	e160	e105	e80	778	2080	1850	2130	3030	506	268
5	66	161	e120	e110	e90	745	1910	1750	1940	2760	498	256
6	64	161	e105	e115	e90	740	1810	1650	1820	2660	506	240
7	64	166	e110	e150	e85	716	4680	1580	1760	4160	527	221
8	76	170	e115	e170	e90	713	6920	1510	1740	6820	779	203
9	70	179	e120	e150	e100	517	7870	1440	2200	5490	2420	190
10	61	168	e130	e120	e130	576	7550	1390	3630	3890	2140	181
11	67	167	e140	e90	e120	471	5430	1370	5330	2910	1670	175
12	118	165	e125	e105	e115	432	3880	1370	5470	2390	1330	162
13	167	168	e110	e55	e130	510	3280	1360	5130	2070	1110	157
14	182	169	e100	e55	e120	588	2970	1340	4920	1840	951	145
15	183	167	e120	e60	e200	647	3030	1380	5070	1710	865	137
16	204	158	e130	e65	e460	642	4640	3700	4650	1600	802	135
17	221	e75	e150	e60	1010	679	5920	5270	5530	1630	694	130
18	192	e80	e140	e55	1040	687	5910	4760	5620	1880	609	133
19	174	e95	e140	e60	1290	705	4390	3350	5550	1770	546	130
20	159	e100	e125	e65	1620	699	3570	2580	4970	1550	499	167
21	155	e100	e140	e70	1490	830	3750	2240	4300	1450	488	181
22	153	e110	e160	e75	1420	990	4760	2030	3660	1320	709	159
23	155	e130	e155	e70	1330	1160	4220	2010	3120	1200	685	143
24	165	142	e160	e75	1250	1260	3390	2740	3600	1120	574	149
25	166	144	e190	e80	1210	1290	2930	2290	7320	1020	493	145
26	175	144	e160	e85	1130	1400	2770	2070	10300	947	449	138
27	177	152	e90	e95	1030	1810	3280	1890	11200	876	439	133
28	178	e145	e90	e95	1060	2330	3150	1740	9420	810	416	137
29	180	e140	e100	e100	---	2420	2900	1630	7230	755	383	135
30	178	e140	e100	e105	---	2790	2600	1800	7380	694	372	127
31	174	---	e110	e110	---	2670	---	2840	---	640	355	---
TOTAL	4224	4353	4020	2830	17150	32598	116920	67390	144570	76162	23471	5393
MEAN	136	145	130	91.3	613	1052	3897	2174	4819	2457	757	180
MAX	221	179	190	170	1620	2790	7870	5270	11200	7940	2420	327
MIN	61	75	90	55	80	432	1810	1340	1740	640	355	127
AC-FT	8380	8630	7970	5610	34020	64660	231900	133700	286800	151100	46550	10700
CFSM	.08	.09	.08	.06	.38	.65	2.41	1.34	2.98	1.52	.47	.11
IN.	.10	.10	.09	.07	.39	.75	2.69	1.55	3.32	1.75	.54	.12

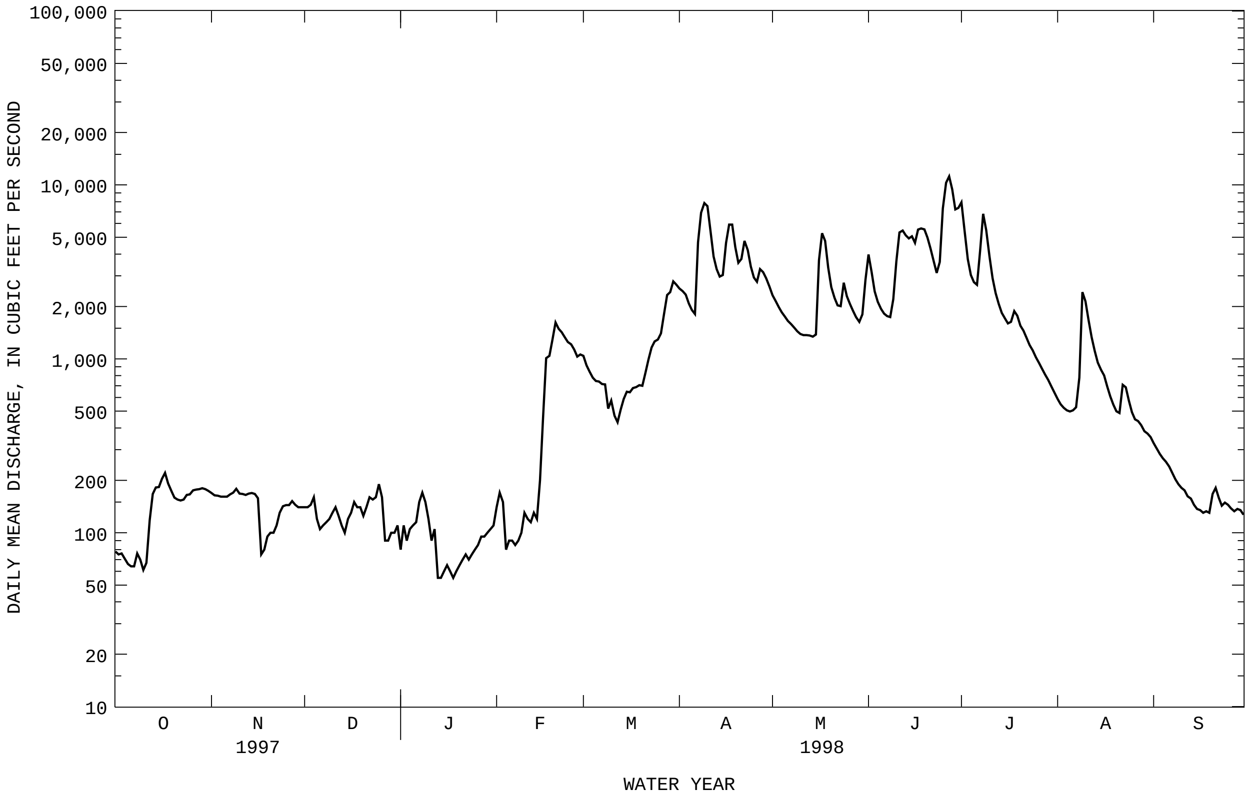
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	440	390	273	205	413	1287	1499	1395	1867	1054	502	402
MAX	3654	2011	1228	1045	2407	4990	5650	4702	6831	7584	3007	2823
(WY)	1974	1974	1974	1973	1984	1983	1983	1984	1984	1993	1993	1962
MIN	5.04	19.8	13.4	3.58	6.89	68.5	46.3	54.7	61.9	18.1	12.1	16.6
(WY)	1957	1956	1977	1977	1977	1956	1956	1967	1977	1956	1956	1955

05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	293523		499081			
ANNUAL MEAN	804		1367		811	
HIGHEST ANNUAL MEAN					2615	1993
LOWEST ANNUAL MEAN					32.8	1956
HIGHEST DAILY MEAN	3700	Jun 23	11200	Jun 27	23200	Jun 24 1947
LOWEST DAILY MEAN	61	Oct 10	55	Jan 13,14,18	.60	Oct 5 1956
ANNUAL SEVEN-DAY MINIMUM	67	Oct 5	59	Jan 13	.91	Oct 4 1956
INSTANTANEOUS PEAK FLOW			11600	Jun 27	29100	Jun 23 1947
INSTANTANEOUS PEAK STAGE			15.68	Jun 27	22.30	Jun 23 1947
INSTANTANEOUS LOW FLOW			34	Oct 10		
ANNUAL RUNOFF (AC-FT)	582200		989900		587500	
ANNUAL RUNOFF (CFSM)	.50		.84		.50	
ANNUAL RUNOFF (INCHES)	6.74		11.47		6.81	
10 PERCENT EXCEEDS	1920		3930		2040	
50 PERCENT EXCEEDS	380		506		292	
90 PERCENT EXCEEDS	114		90		42	

e Estimated



05483450 MIDDLE RACCOON RIVER NEAR BAYARD, IA

LOCATION.--Lat 41°46'43", long 94°29'33", in $SW^1/_4$ $SW^1/_4$ sec. 32, T.81 N., R.31 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft downstream from bridge on State Highway 25, 0.2 mi downstream from Battle Run Creek, 1.8 mi upstream from Springbrook Creek, 5.8 mi southeast of Bayard, 10.3 mi upstream from dam at Lake Panorama, at mile 78.0 mi. upstream from mouth of Raccoon River, and at mile 279.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--375 mi^2.

PERIOD OF RECORD.--March 1979 to current year. Occasional low-flow measurements, water years 1976, 1977.

GAGE.--Water-stage recorder. Datum of gage is 1,040.00 ft above sea level. Prior to June 23, 1979, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 30 to Dec. 24, Jan. 9 to Feb. 2, and Mar. 8-13. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform with telephone modem and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 3, 1973 reached a stage of 21.63 ft, from contracted-opening measurement, discharge, 14,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	66	e70	145	e300	233	506	406	606	943	161	114
2	43	63	e65	88	e270	223	423	399	607	721	155	93
3	43	64	e70	110	224	217	380	378	594	614	160	87
4	41	61	e60	95	186	208	348	363	575	556	282	82
5	39	62	e50	92	159	198	325	353	515	745	216	80
6	39	61	e55	112	140	194	321	343	487	1050	321	79
7	39	59	e60	95	131	191	1850	360	465	2860	278	78
8	44	60	e65	87	129	e180	2290	336	594	1980	244	73
9	59	61	e70	e90	132	e160	1700	321	1890	1420	215	70
10	40	63	e65	e85	205	e140	1340	315	1280	1170	182	70
11	34	59	e75	e75	214	e180	1080	307	3090	890	164	67
12	51	58	e70	e80	173	e220	894	309	4590	720	152	67
13	107	59	e60	e70	165	e250	786	297	2170	623	146	66
14	88	60	e55	e55	147	269	671	284	3560	547	144	65
15	61	59	e60	e46	255	283	630	351	5960	586	150	65
16	53	51	e65	e65	1270	294	1450	1710	3390	576	131	64
17	48	65	e75	e70	786	285	1120	920	2100	476	125	63
18	45	58	e70	e60	672	218	855	677	1810	432	119	63
19	43	59	e70	e65	568	234	728	575	1540	397	115	63
20	43	59	e65	e70	487	245	742	534	1200	362	112	81
21	45	58	e60	e75	435	342	837	555	1030	328	140	86
22	45	55	e80	e80	399	433	737	534	889	321	130	74
23	49	54	e75	e75	384	444	650	671	793	298	106	68
24	69	49	e80	e70	351	419	587	2350	734	274	97	70
25	65	56	86	e80	318	402	544	1580	714	259	94	71
26	80	56	82	e95	307	690	517	1080	631	251	89	70
27	79	54	77	e110	274	923	479	808	576	239	101	67
28	78	53	84	e100	250	656	443	686	630	225	121	62
29	77	63	78	e110	---	542	428	1520	707	204	98	62
30	76	e75	79	e95	---	518	420	957	1610	181	89	63
31	72	---	114	e100	---	510	---	718	---	170	100	---
TOTAL	1738	1780	2190	2645	9331	10301	24081	20997	45337	20418	4737	2183
MEAN	56.1	59.3	70.6	85.3	333	332	803	677	1511	659	153	72.8
MAX	107	75	114	145	1270	923	2290	2350	5960	2860	321	114
MIN	34	49	50	46	129	140	321	284	465	170	89	62
AC-FT	3450	3530	4340	5250	18510	20430	47760	41650	89930	40500	9400	4330
CFSM	.15	.16	.19	.23	.89	.89	2.14	1.81	4.03	1.76	.41	.19
IN.	.17	.18	.22	.26	.93	1.02	2.39	2.08	4.50	2.03	.47	.22

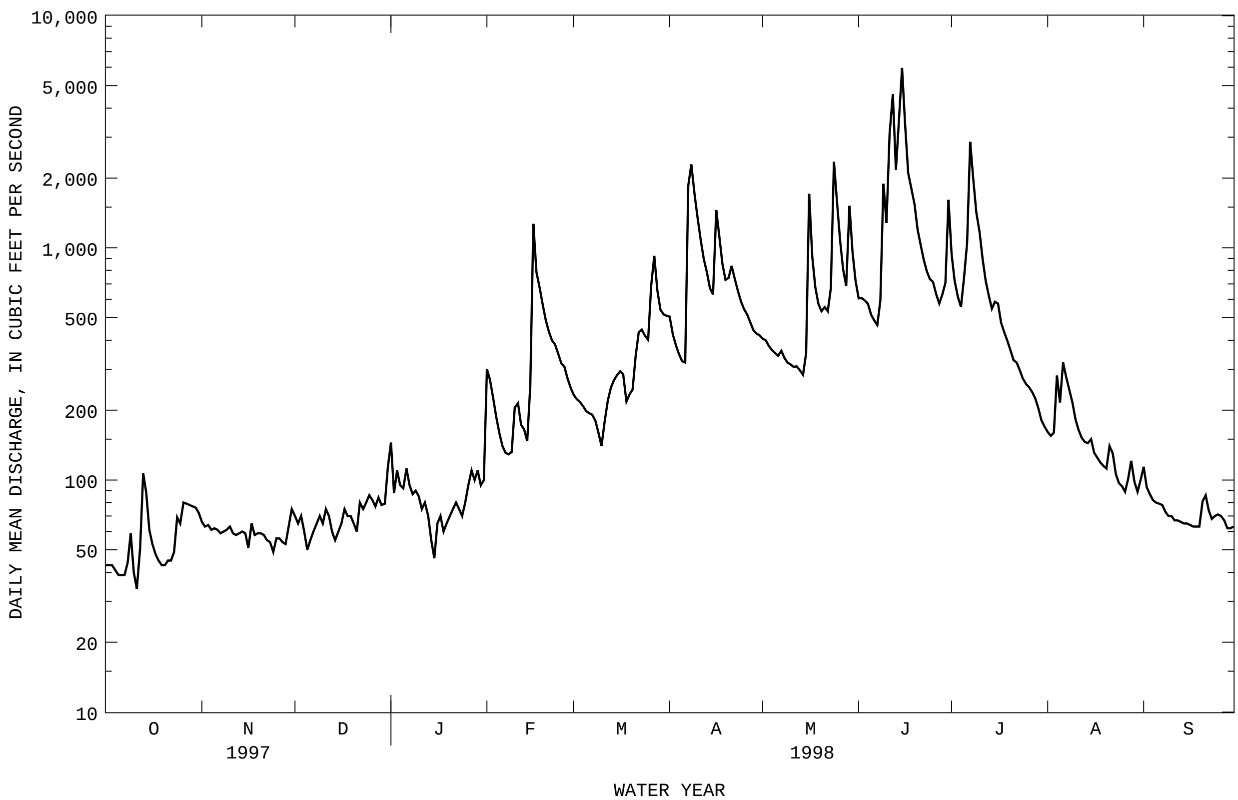
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	120	127	128	94.6	205	302	391	461	549	440	193	118
MAX	587	376	347	175	645	907	1035	993	1667	2653	673	466
(WY)	1987	1993	1993	1993	1983	1993	1991	1984	1990	1993	1993	1993
MIN	20.1	18.3	12.5	13.8	27.4	23.3	22.9	51.6	106	40.2	35.6	18.8
(WY)	1981	1981	1981	1981	1990	1981	1981	1981	1981	1980	1985	1980

05483450 MIDDLE RACCOON RIVER NEAR BAYARD, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1980 - 1998	
ANNUAL TOTAL	80479		145738			
ANNUAL MEAN	220		399		261	
HIGHEST ANNUAL MEAN					677	1993
LOWEST ANNUAL MEAN					54.1	1981
HIGHEST DAILY MEAN	2700	Feb 19	5960	Jun 15	18100	Jul 9 1993
LOWEST DAILY MEAN	34	Oct 11	34	Oct 11	5.5	Jun 13 1981a
ANNUAL SEVEN-DAY MINIMUM	41	Oct 1	41	Oct 1	7.3	Jun 8 1981
INSTANTANEOUS PEAK FLOW			7200	Jun 15	27500	Jul 9 1993
INSTANTANEOUS PEAK STAGE			22.37	Jun 15	29.02	Jul 9 1993
INSTANTANEOUS LOW FLOW			30	Oct 11		
ANNUAL RUNOFF (AC-FT)	159600		289100		188900	
ANNUAL RUNOFF (CFSM)	.59		1.06		.70	
ANNUAL RUNOFF (INCHES)	7.98		14.46		9.45	
10 PERCENT EXCEEDS	433		904		573	
50 PERCENT EXCEEDS	110		160		121	
90 PERCENT EXCEEDS	49		59		33	

a Also June 14, 1981
e Estimated



05483470 LAKE PANORAMA AT PANORA, IA

LOCATION.--Lat 41°41'44", long 94°22'53", in $SW^1/_4$ $NE^1/_4$ sec.31, T.80 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, in gate control building of dam on Middle Raccoon River, 0.5 mi upstream from State Highway 44, 1.0 mi west of Panora, 4.4 mi upstream from Bay Branch, 67.7 mi. upstream from mouth of Raccoon River, and at mile 268.8 upstream from mouth of Des Moines River.

DRAINAGE AREA.--433 mi^2.

PERIOD OF RECORD.--May 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above sea level.

REMARKS.--Missing gage height record Jan. 3-5. Lake is formed by earthfill dam with 100 ft bascule gate and concrete chute spillway, and 300 ft earthen emergency spillway. Low-flow outlet is 30-inch conduit and gate valve through dam. Dam was completed in August, 1970 and began filling April 27, 1971. Total storage, 60,000 acre-ft, surface area, 2,900 acres, at top of dam, elevation 1,068 ft. Storage unknown at top of spillway, elevation 1,048 ft. Normal storage, 19,700 acre-ft, surface area, 1,270 acres with bascule gate closed, elevation 1,045 ft. Dead storage unknown with bascule gate open, elevation 1,036 ft. Present lake classification is utility (industrial) but is also used for recreation. U.S. Geological Survey data collection platform with telephone modem at station.

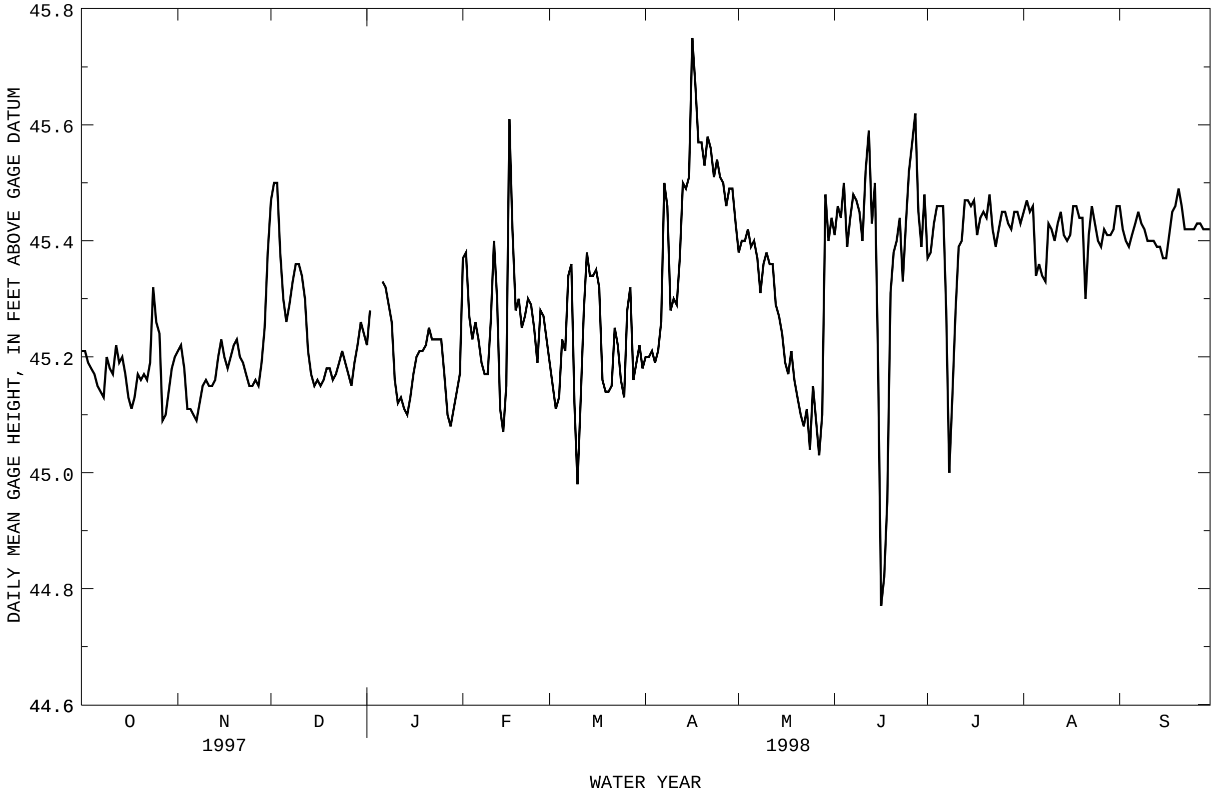
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height,50.68 ft July 9, 1993; minimum, 41.56 ft Oct. 15, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 46.20 ft July 6; minimum recorded, 44.63 ft June 15 and 18.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45.21	45.21	45.47	45.22	45.37	45.19	45.20	45.38	45.41	45.37	45.45	45.46
2	45.21	45.22	45.50	45.28	45.38	45.15	45.20	45.40	45.46	45.38	45.47	45.42
3	45.19	45.18	45.50	---	45.27	45.11	45.21	45.40	45.44	45.43	45.45	45.40
4	45.18	45.11	45.38	---	45.23	45.13	45.19	45.42	45.50	45.46	45.46	45.39
5	45.17	45.11	45.30	---	45.26	45.23	45.21	45.39	45.39	45.46	45.34	45.41
6	45.15	45.10	45.26	45.33	45.23	45.21	45.26	45.40	45.44	45.46	45.36	45.43
7	45.14	45.09	45.29	45.32	45.19	45.34	45.50	45.37	45.48	45.28	45.34	45.45
8	45.13	45.12	45.33	45.29	45.17	45.36	45.46	45.31	45.47	45.00	45.33	45.43
9	45.20	45.15	45.36	45.26	45.17	45.12	45.28	45.36	45.45	45.13	45.43	45.42
10	45.18	45.16	45.36	45.16	45.26	44.98	45.30	45.38	45.40	45.28	45.42	45.40
11	45.17	45.15	45.34	45.12	45.40	45.13	45.29	45.36	45.52	45.39	45.40	45.40
12	45.22	45.15	45.30	45.13	45.30	45.28	45.37	45.36	45.59	45.40	45.43	45.40
13	45.19	45.16	45.21	45.11	45.11	45.38	45.50	45.29	45.43	45.47	45.45	45.39
14	45.20	45.20	45.17	45.10	45.07	45.34	45.49	45.27	45.50	45.47	45.41	45.39
15	45.17	45.23	45.15	45.13	45.15	45.34	45.51	45.24	45.19	45.46	45.40	45.37
16	45.13	45.20	45.16	45.17	45.61	45.35	45.75	45.19	44.77	45.47	45.41	45.37
17	45.11	45.18	45.15	45.20	45.42	45.32	45.67	45.17	44.82	45.41	45.46	45.41
18	45.13	45.20	45.16	45.21	45.28	45.16	45.57	45.21	44.95	45.44	45.46	45.45
19	45.17	45.22	45.18	45.21	45.30	45.14	45.57	45.16	45.31	45.45	45.44	45.46
20	45.16	45.23	45.18	45.22	45.25	45.14	45.53	45.13	45.38	45.44	45.44	45.49
21	45.17	45.20	45.16	45.25	45.27	45.15	45.58	45.10	45.40	45.48	45.30	45.46
22	45.16	45.19	45.17	45.23	45.30	45.25	45.56	45.08	45.44	45.42	45.41	45.42
23	45.19	45.17	45.19	45.23	45.29	45.22	45.51	45.11	45.33	45.39	45.46	45.42
24	45.32	45.15	45.21	45.23	45.25	45.16	45.54	45.04	45.43	45.42	45.43	45.42
25	45.26	45.15	45.19	45.23	45.19	45.13	45.51	45.15	45.52	45.45	45.40	45.42
26	45.24	45.16	45.17	45.17	45.28	45.28	45.50	45.09	45.57	45.45	45.39	45.43
27	45.09	45.15	45.15	45.10	45.27	45.32	45.46	45.03	45.62	45.43	45.42	45.43
28	45.10	45.19	45.19	45.08	45.23	45.16	45.49	45.10	45.45	45.42	45.41	45.42
29	45.14	45.25	45.22	45.11	---	45.19	45.49	45.48	45.39	45.45	45.41	45.42
30	45.18	45.38	45.26	45.14	---	45.22	45.43	45.40	45.48	45.45	45.42	45.42
31	45.20	---	45.24	45.17	---	45.18	---	45.44	---	45.43	45.46	---
MEAN	45.18	45.18	45.25	---	45.27	45.21	45.44	45.26	45.38	45.40	45.41	45.42
MAX	45.32	45.38	45.50	---	45.61	45.38	45.75	45.48	45.62	45.48	45.47	45.49
MIN	45.09	45.09	45.15	---	45.07	44.98	45.19	45.03	44.77	45.00	45.30	45.37

05483470 LAKE PANORAMA AT PANORA, IOWA--Continued



05483600 MIDDLE RACCOON RIVER AT PANORA, IA

LOCATION.--Lat 41°41'14", long 94°22'15", in NE$^{1}/_{4}$ NW$^{1}/_{4}$ sec.5, T.79 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft downstream from bridge on Soldier Trail, 0.2 mi southwest of Panora, 1.5 mi upstream from Andy's Branch, 1.6 mi downstream from Lake Panorama, 18.1 mi upstream from mouth, 66.1 mi. upstream from mouth of Raccoon River, and at mile 267.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--440 mi^2.

PERIOD OF RECORD.--June 1958 to current year.

REVISED RECORDS.--WDR IA-74-1: 1973 (P).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 991.20 ft above sea level.

REMARKS.--Estimated daily discharges: Feb. 1, 2, and 16. Records good except those for estimated daily discharges, which are poor. City of Panora diverts approximately 100 acre-ft/yr upstream of station. Flow regulated by dam on Lake Panorama since August 1970. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and data collection platform at station. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1953, reached a stage of 14.3 ft, from floodmark, discharge, about 14,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	86	80	70	e102	243	527	383	483	996	175	155
2	43	88	80	76	e112	226	426	335	489	702	191	127
3	43	87	80	86	186	215	380	322	439	555	205	103
4	43	88	79	99	198	133	333	295	490	557	426	88
5	43	74	87	107	164	107	290	321	459	1050	321	77
6	42	74	79	107	156	89	279	282	336	2750	366	74
7	41	72	79	109	147	104	1470	370	366	3410	360	79
8	41	67	84	108	138	118	2710	287	502	2210	228	77
9	43	68	90	106	133	118	1760	249	2550	1070	212	75
10	42	70	95	89	140	97	1190	274	1240	779	212	75
11	42	71	93	80	173	50	845	284	2930	522	171	73
12	87	72	101	80	171	67	675	315	4840	386	143	72
13	143	70	109	80	171	117	647	300	2520	336	174	72
14	80	69	101	72	166	162	563	274	6090	300	171	75
15	79	74	97	59	153	158	539	325	6760	456	177	76
16	75	73	95	60	e845	158	1060	1780	3880	378	117	58
17	57	69	93	63	872	253	1080	920	2530	342	134	48
18	43	66	92	64	626	264	759	732	2000	327	140	52
19	44	70	94	66	545	251	658	559	1490	320	136	68
20	44	84	94	67	483	264	630	534	1040	303	223	97
21	45	85	94	74	392	326	661	489	861	284	263	103
22	46	83	93	73	371	424	669	479	782	503	117	75
23	47	78	93	72	371	493	554	603	716	290	139	63
24	107	75	96	72	359	462	491	2540	561	261	143	65
25	131	74	97	80	304	423	484	1780	621	250	129	66
26	149	74	95	97	265	592	480	1290	565	253	108	74
27	138	67	80	97	269	907	389	764	471	257	150	77
28	66	58	63	81	262	700	375	433	748	235	154	74
29	69	61	66	70	---	506	411	1600	756	213	118	73
30	75	78	71	72	---	654	375	932	1720	215	108	76
31	80	---	72	76	---	526	---	613	---	201	145	---
TOTAL	2073	2225	2722	2512	8274	9207	21710	20664	49235	20711	5856	2367
MEAN	66.9	74.2	87.8	81.0	296	297	724	667	1641	668	189	78.9
MAX	149	88	109	109	872	907	2710	2540	6760	3410	426	155
MIN	41	58	63	59	102	50	279	249	336	201	108	48
AC-FT	4110	4410	5400	4980	16410	18260	43060	40990	97660	41080	11620	4690
CFSM	.15	.17	.20	.18	.67	.68	1.64	1.51	3.73	1.52	.43	.18
IN.	.18	.19	.23	.21	.70	.78	1.84	1.75	4.16	1.75	.50	.20

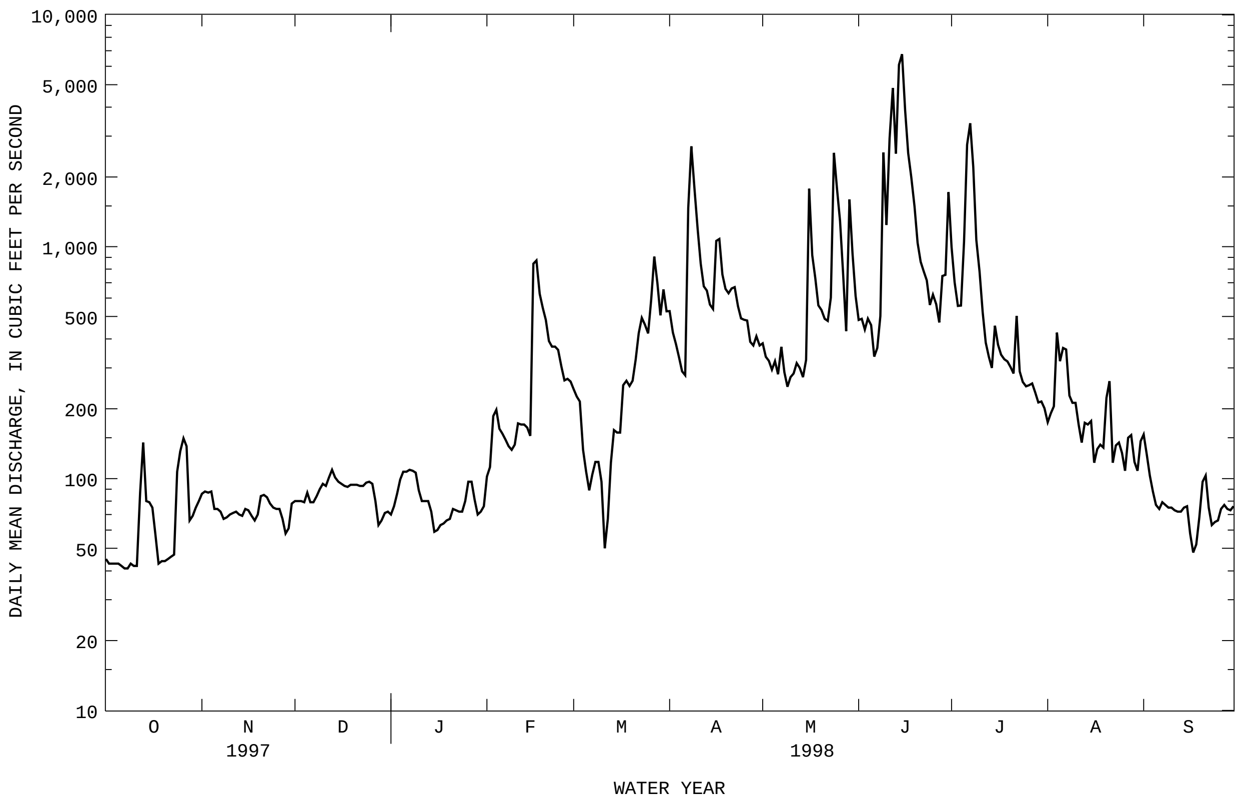
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	131	151	129	105	232	386	389	495	492	400	172	145
MAX	670	588	356	439	838	1479	1222	1458	1646	2731	668	528
(WY)	1987	1973	1993	1973	1971	1979	1984	1974	1990	1993	1996	1973
MIN	19.5	12.8	7.60	6.95	27.8	20.2	26.4	20.0	9.40	5.56	22.2	19.3
(WY)	1981	1971	1971	1971	1972	1981	1977	1977	1977	1977	1971	1980

05483600 MIDDLE RACCOON RIVER AT PANORA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1971 - 1998a	
ANNUAL TOTAL	88624		147556			
ANNUAL MEAN	243		404		269	
HIGHEST ANNUAL MEAN					701	1973
LOWEST ANNUAL MEAN					38.6	1977
HIGHEST DAILY MEAN	4050	Feb 19	6760	Jun 15	17500	Jul 10 1993
LOWEST DAILY MEAN	41	Oct 7	41	Oct 7	.00	Jun 9 1977b
ANNUAL SEVEN-DAY MINIMUM	42	Oct 5	42	Oct 5	3.1	Jul 8 1977
INSTANTANEOUS PEAK FLOW			11400	Jun 14	22400	Jul 9 1993
INSTANTANEOUS PEAK STAGE			13.51	Jun 14	20.04	Jul 9 1993
INSTANTANEOUS LOW FLOW			40	Oct 8		
ANNUAL RUNOFF (AC-FT)	175800		292700		194700	
ANNUAL RUNOFF (CFSM)	.55		.92		.61	
ANNUAL RUNOFF (INCHES)	7.49		12.48		8.30	
10 PERCENT EXCEEDS	470		845		589	
50 PERCENT EXCEEDS	143		153		113	
90 PERCENT EXCEEDS	57		67		31	

a Post regulation
b Also June 10, 1977, result of gate operation at Lake Panorama
e Estimated



05484000 SOUTH RACCOON RIVER AT REDFIELD, IA

LOCATION.--Lat 41°35'22", long 94°09'04", in $SW^1/_4$ $NE^1/_4$ sec. 2, T.78 N., R.29 W., Dallas County, Hydrologic Unit 07100007, on right bank 20 ft upstream from bridge on H Avenue, 3.4 mi.(revised) downstream from bridge on U.S. Highway 6, 3.4 mi. downstream from Middle Raccoon River, 14.3 mi. upstream from mouth, 44.6 miles upstream of mouth of Raccoon River, and at mile 245.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--994 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940, WDR IA-87-1:datum.

GAGE.--Water-stage recorder. Datum of gage is 888.88 ft above sea level. Prior to June 12, 1946, nonrecording gage, June 12, 1946 to Sept. 30, 1986, water-stage recorder at site 2.4 mi upstream at datum 7.55 ft higher.

REMARKS.--Estimated daily discharges: Nov. 2, 3, 5, 15, 16, Nov. 30 to Dec. 5, Dec. 7-14, Jan. 12 to Feb. 3, Feb. 10-13, and Mar. 4-11. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	158	197	e175	200	e400	490	1720	711	952	1940	422	628
2	160	e180	e175	206	e440	470	1220	650	844	1460	441	456
3	160	e160	e170	231	e420	462	1030	641	839	1320	500	350
4	146	159	e185	213	381	e350	904	587	868	1280	726	290
5	127	e160	e170	248	339	e250	793	600	830	2010	2050	270
6	106	176	174	251	335	e280	751	555	685	8690	1420	256
7	102	155	e190	243	313	e290	1660	643	682	12500	1040	253
8	103	146	e175	222	295	e285	4400	632	5400	6240	733	242
9	112	146	e180	205	296	e270	3350	525	7850	3460	613	235
10	120	151	e190	155	e320	e230	2270	529	3010	2680	560	232
11	112	149	e200	222	e350	e170	1590	530	4960	1890	510	227
12	130	147	e205	e175	e360	242	1260	545	7120	1530	442	227
13	272	149	e210	e165	e360	352	1150	527	4010	1300	580	225
14	186	149	e225	e150	367	445	1070	466	8530	1200	568	225
15	164	e140	239	e145	372	452	1100	483	26000	1210	511	225
16	156	e140	242	e150	1450	422	1320	1880	10900	1170	479	213
17	149	145	246	e155	1430	459	1560	1280	5730	1060	393	195
18	127	153	221	e160	1200	602	1230	873	5400	966	393	189
19	124	151	229	e165	964	672	1070	746	4200	914	375	197
20	124	159	228	e165	823	651	1050	746	2850	859	421	244
21	122	164	238	e165	694	862	1080	691	2350	777	850	277
22	119	155	218	e170	645	1090	1050	735	2020	1620	735	248
23	134	150	231	e185	640	1110	956	838	1880	955	536	203
24	220	148	230	e210	611	1020	855	2850	1650	727	541	203
25	271	149	221	e220	574	1010	829	2220	1620	646	526	203
26	256	157	234	e215	565	2030	814	1540	1550	613	345	212
27	291	155	223	e195	550	2730	751	1060	1390	584	500	209
28	210	143	203	e170	518	1770	685	874	1690	547	541	198
29	205	152	217	e200	---	1210	689	2500	1570	494	410	197
30	209	e170	215	e250	---	2780	716	1980	2230	473	354	198
31	201	---	215	e290	---	2600	---	1220	---	458	430	---
TOTAL	5076	4655	6474	6096	16012	26056	38923	30657	119610	61573	18945	7527
MEAN	164	155	209	197	572	841	1297	989	3987	1986	611	251
MAX	291	197	246	290	1450	2780	4400	2850	26000	12500	2050	628
MIN	102	140	170	145	295	170	685	466	682	458	345	189
AC-FT	10070	9230	12840	12090	31760	51680	77200	60810	237200	122100	37580	14930
CFSM	.16	.16	.21	.20	.58	.85	1.31	.99	4.01	2.00	.61	.25
IN.	.19	.17	.24	.23	.60	.98	1.46	1.15	4.48	2.30	.71	.28

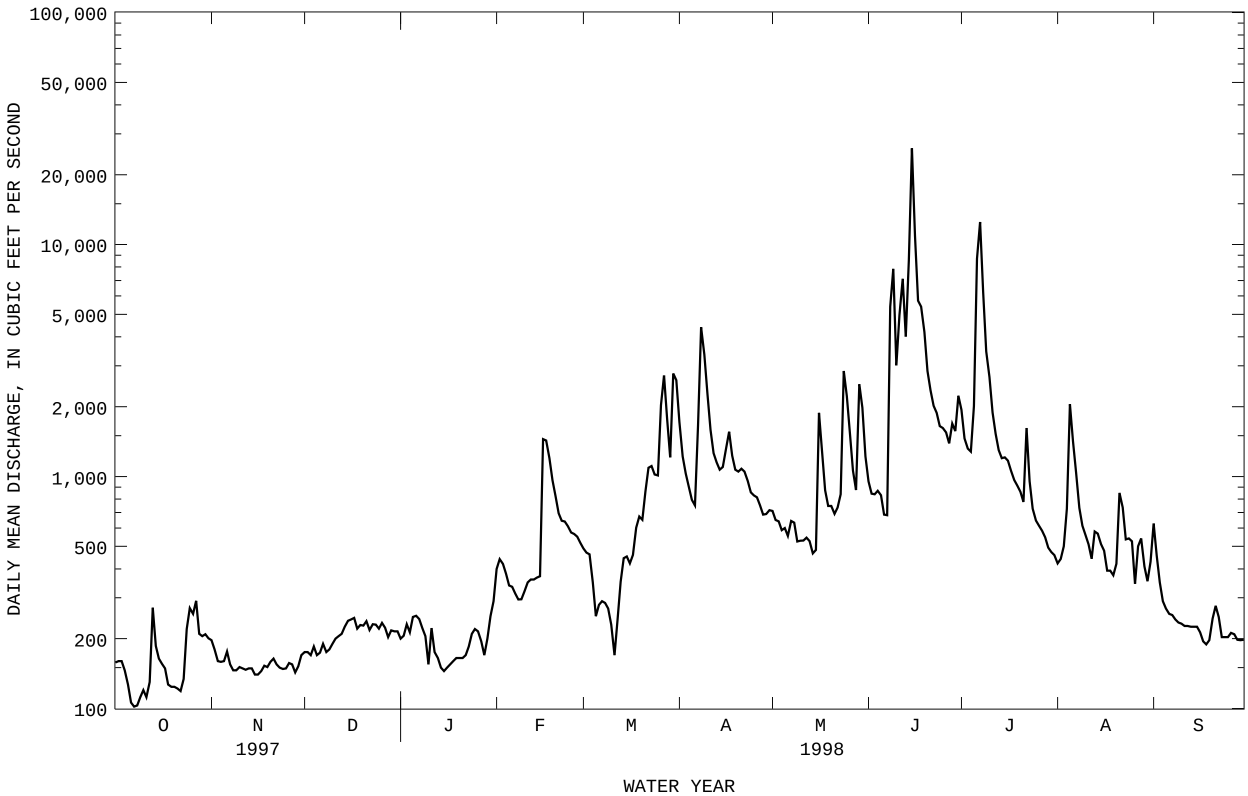
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	236	238	196	178	404	842	750	866	1034	646	376	291
MAX	1501	1162	826	565	1785	3112	2474	3005	5017	5494	2745	1385
(WY)	1987	1973	1993	1983	1971	1979	1984	1974	1947	1993	1993	1993
MIN	28.6	36.2	32.4	30.4	35.5	74.2	50.0	62.9	43.2	57.4	37.8	36.0
(WY)	1941	1956	1956	1950	1956	1981	1956	1967	1977	1954	1955	1955

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	199531		341604			
ANNUAL MEAN	547		936		505	
HIGHEST ANNUAL MEAN					1632	1993
LOWEST ANNUAL MEAN					91.4	1968
HIGHEST DAILY MEAN	7000	Feb 19	26000	Jun 15	33600	Jul 10 1993
LOWEST DAILY MEAN	102	Oct 7	102	Oct 7	17	Aug 4 1977
ANNUAL SEVEN-DAY MINIMUM	112	Oct 5	112	Oct 5	20	Jan 24 1954
INSTANTANEOUS PEAK FLOW			35100	Jun 15	44000	Jul 10 1993
INSTANTANEOUS PEAK STAGE			24.67	Jun 15	29.04	Jul 2 1958
INSTANTANEOUS LOW FLOW			93	Oct 8		
ANNUAL RUNOFF (AC-FT)	395800		677600		365600	
ANNUAL RUNOFF (CFSM)	.55		.94		.51	
ANNUAL RUNOFF (INCHES)	7.47		12.78		6.90	
10 PERCENT EXCEEDS	1040		1880		1110	
50 PERCENT EXCEEDS	340		422		207	
90 PERCENT EXCEEDS	150		154		59	

e Estimated

05484000 SOUTH RACCOON RIVER AT REDFIELD, IA--Continued



05484500 RACCOON RIVER AT VAN METER, IA

LOCATION.--Lat 41°32'02", long 93°56'59", in SW$^1/_4$ SW$^1/_4$ sec.22, T.78 N., R.27 W., Dallas County, Hydrologic Unit 07100006, on right bank 10 ft downstream from bridge on county highway R16, 0.3 mi northeast of Van Meter, 0.7 mi upstream from small left bank tributary, 1.1 mi downstream from confluence of North and South Raccoon Rivers, 29.1 mi upstream from mouth, and at mile 230.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--3,441 mi^2.

PERIOD OF RECORD.--April 1915 to current year. Prior to October 1934, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1927 (M), WSP 1438: Drainage area, WSP 1508: 1915 (M), 1925 (M), 1926, 1933 (M), 1939 (M), 1947 (M), 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 841.16 ft above sea level. See WSP 1308 for history of changes prior to Aug. 8, 1934.

REMARKS.--Estimated daily discharges: Nov. 16-17, Dec. 4-9, 12-15, 17, 20-23, 25, Dec. 27 to Jan. 1, Jan. 3-5, 9-27, Feb. 2-12, Mar. 8-12, and June 8-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	209	390	670	e300	877	1760	5870	4050	5710	10400	1380	1280
2	216	351	687	443	e1100	1710	5100	3650	6560	9710	1300	1020
3	222	329	652	e480	e500	1560	4520	3430	5460	8680	1370	857
4	200	317	e620	e440	e550	1450	4070	3140	4610	6260	1340	766
5	197	321	e500	e500	e600	1270	3540	2950	4150	5780	3730	715
6	198	300	e400	545	e550	1320	3230	2750	3620	12300	3150	684
7	195	298	e360	547	e650	1170	3550	2730	3280	20100	2520	635
8	193	295	e420	525	e700	e1100	9720	2740	e3600	15100	1800	578
9	198	286	e460	e380	e600	e750	10900	2440	e10000	12200	1640	548
10	214	284	483	e280	e650	e650	11200	2330	9160	11400	2960	538
11	225	283	489	e300	e700	e550	11100	2270	10400	9920	2890	526
12	239	276	e440	e250	e850	e1200	9510	2250	15200	7690	2320	512
13	391	281	e340	e220	953	1850	7250	2260	13600	6080	2040	497
14	406	283	e360	e270	845	1140	6190	2160	14900	5190	2010	476
15	350	286	e480	e300	819	1100	5650	2090	35700	4620	1840	481
16	333	e260	479	e360	1990	1100	6100	3460	29000	4410	1670	457
17	308	e240	e440	e340	3930	1200	8510	6330	16600	3940	1600	443
18	301	380	449	e300	3760	1600	8790	6960	15300	4230	1440	428
19	277	448	459	e340	3270	1920	8540	6560	14600	4320	1290	428
20	245	466	e420	e360	3030	2000	7190	5160	11500	3770	1170	467
21	224	485	e400	e380	3100	2430	6360	4380	9900	3200	1820	505
22	209	475	e420	e400	2810	3020	6650	4000	8350	4400	1730	487
23	243	464	e440	e380	2660	3350	7230	3860	7180	3590	1420	446
24	405	448	483	e360	2530	3280	6490	6030	6280	2720	1370	422
25	477	467	e460	e380	2330	3280	5500	8320	6480	2380	1210	433
26	459	466	492	e400	2200	4580	4900	6980	8180	2170	1050	452
27	480	486	e420	e440	2070	5550	4660	5400	9300	2010	1370	440
28	426	441	e380	431	1880	5240	4850	4590	11200	1860	1470	413
29	377	432	e420	369	---	4870	4700	6050	12100	1690	1170	409
30	404	628	e400	358	---	6620	4490	6410	11200	1570	994	390
31	411	---	e280	413	---	7260	---	4800	---	1480	985	---
TOTAL	9232	11166	14203	11791	46504	75880	196360	130530	323120	193170	54049	16733
MEAN	298	372	458	380	1661	2448	6545	4211	10770	6231	1744	558
MAX	480	628	687	547	3930	7260	11200	8320	35700	20100	3730	1280
MIN	193	240	280	220	500	550	3230	2090	3280	1480	985	390
AC-FT	18310	22150	28170	23390	92240	150500	389500	258900	640900	383200	107200	33190
CFSM	.09	.11	.13	.11	.48	.71	1.90	1.22	3.13	1.81	.51	.16
IN.	.10	.12	.15	.13	.50	.82	2.12	1.41	3.49	2.09	.58	.18

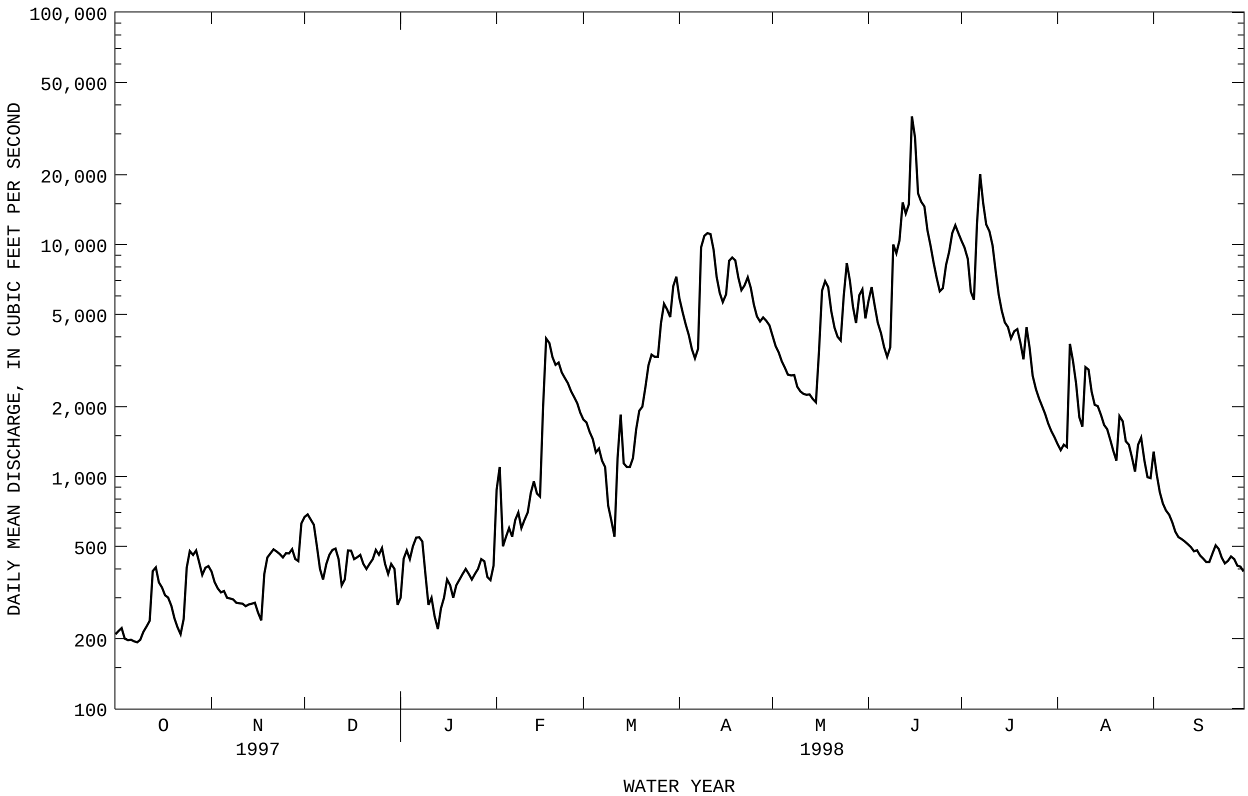
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1916 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	835	778	575	495	1004	2634	2605	2583	3288	1890	999	874
MAX	6840	4774	3085	3461	5438	10480	10630	9257	13970	17260	7414	6692
(WY)	1974	1973	1983	1932	1984	1979	1983	1984	1947	1993	1993	1926
MIN	48.6	51.5	31.0	17.2	31.5	146	125	121	112	68.1	28.1	43.1
(WY)	1940	1938	1938	1940	1940	1931	1956	1934	1977	1936	1936	1939

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1916 - 1998	
ANNUAL TOTAL	658332		1082738			
ANNUAL MEAN	1804		2966		1547	
HIGHEST ANNUAL MEAN					5717	1993
LOWEST ANNUAL MEAN					166	1956
HIGHEST DAILY MEAN	8500	Feb 20	35700	Jun 15	57500	Jul 10 1993
LOWEST DAILY MEAN	193	Oct 8	193	Oct 8	10	Jan 22 1940a
ANNUAL SEVEN-DAY MINIMUM	199	Oct 4	199	Oct 4	10	Jan 22 1940
INSTANTANEOUS PEAK FLOW			47400	Jun 15	70100	Jul 10 1993
INSTANTANEOUS PEAK STAGE			23.29	Jun 15	26.34	Jul 10 1993
INSTANTANEOUS LOW FLOW			180	Oct 4,5b		
ANNUAL RUNOFF (AC-FT)	1306000		2148000		1121000	
ANNUAL RUNOFF (CFSM)	.52		.86		.45	
ANNUAL RUNOFF (INCHES)	7.12		11.71		6.11	
10 PERCENT EXCEEDS	4430		8240		3880	
50 PERCENT EXCEEDS	950		1210		603	
90 PERCENT EXCEEDS	282		300		114	

a Also Jan 23-31, 1940
b Also Oct 6, 8-10
e Estimated

05484500 RACCOON RIVER AT VAN METER, IA--Continued



05484650 RACCOON RIVER AT 63RD STREET, DES MOINES, IA

LOCATION.--Lat 41°33'49", long 93°42'13", in SW$^1/_4$ NE$^1/_4$ sec.14, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, at upstream side of bridge on State Highway 28, 2.9 mi. upstream from Walnut Creek, 8.6 mi. upstream from mouth of Raccoon River, and at mile 210.0 upstream from mouth of Des Moines River.

DRAINAGE AREA.-- 3529 mi^2.

PERIOD OF RECORD.-- October 1991 to current year. October 1991 to September 1996 gage height record only.

GAGE.--Water-stage recorder. Datum of gage is 774.91 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 17, 18, Dec. 12-14, 31, Jan. 1, 4, Jan. 9 to Feb. 9, Mar. 15, 16, Apr. 13-15, and Apr. 28 to May 13. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. National Weather Service Limited Automatic Remote Collector (LARC) and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	263	400	644	e320	e700	2090	6520	e4800	5320	13000	1980	1430
2	256	380	676	452	e950	2030	5640	e4400	6310	11400	1860	1340
3	254	365	668	495	e700	1910	4990	e4100	5890	10600	1860	1120
4	248	353	666	e480	e550	1790	4620	e3800	4990	7450	1800	998
5	244	344	608	517	e650	1630	4150	e3600	4640	6350	3630	919
6	238	341	424	539	e600	1550	3780	e3400	4250	11600	3610	869
7	234	327	390	578	e650	1500	3700	e3500	3910	23400	3490	815
8	238	324	444	556	e750	1520	8210	e3550	3900	23400	2600	765
9	255	323	476	e420	e650	1380	10900	e3300	9660	15600	2200	719
10	240	324	487	e320	681	1250	12000	e3050	10300	13700	2890	689
11	259	324	506	e340	831	777	13000	e2950	9450	11100	3470	673
12	313	324	e460	e280	1080	662	12900	e2900	18800	8750	3040	645
13	327	324	e360	e250	1050	1030	e9500	e2900	18000	6740	2730	620
14	406	327	e380	e300	869	1290	e7300	2810	16900	5880	2770	612
15	356	326	479	e340	782	e1200	e6000	2730	27600	5260	2610	593
16	342	317	556	e400	1170	e1200	5630	3160	36300	5080	2300	579
17	325	e280	508	e360	3360	1380	7560	5650	25100	4700	2150	562
18	317	e270	505	e320	3710	1660	8370	6530	21100	4620	1930	525
19	304	458	517	e360	3430	2020	8270	6510	20700	4940	1740	510
20	288	479	472	e380	3240	2150	7390	5490	15400	4500	1560	530
21	278	485	425	e400	3320	2410	6330	4740	12500	4040	1930	591
22	269	481	414	e420	3130	3010	6350	4380	10100	4740	2450	625
23	315	459	428	e400	2910	3400	6900	4190	8380	4740	1840	586
24	390	434	490	e380	2830	3390	6660	5070	7180	3720	1750	530
25	451	437	465	e400	2700	3360	5960	7910	6670	3330	1580	519
26	523	427	499	e420	2580	4030	5560	7090	8530	3090	1400	513
27	486	435	440	e460	2480	5220	5340	5780	9970	2890	1640	512
28	491	431	410	e440	2280	4990	e5250	4850	12700	2740	1980	492
29	405	449	388	e400	---	4710	e5200	5150	15300	2540	1550	467
30	407	581	422	e380	---	5580	e5100	7000	14100	2310	1290	457
31	412	---	e300	e550	---	8300	---	5010	---	2140	1200	---
TOTAL	10134	11529	14907	12657	48633	78419	209080	140300	373950	234350	68830	20805
MEAN	327	384	481	408	1737	2530	6969	4526	12470	7560	2220	694
MAX	523	581	676	578	3710	8300	13000	7910	36300	23400	3630	1430
MIN	234	270	300	250	550	662	3700	2730	3900	2140	1200	457
AC-FT	20100	22870	29570	25110	96460	155500	414700	278300	741700	464800	136500	41270
CFSM	.09	.11	.14	.12	.49	.72	1.97	1.28	3.53	2.14	.63	.20
IN.	.11	.12	.16	.13	.51	.83	2.20	1.48	3.94	2.47	.73	.22

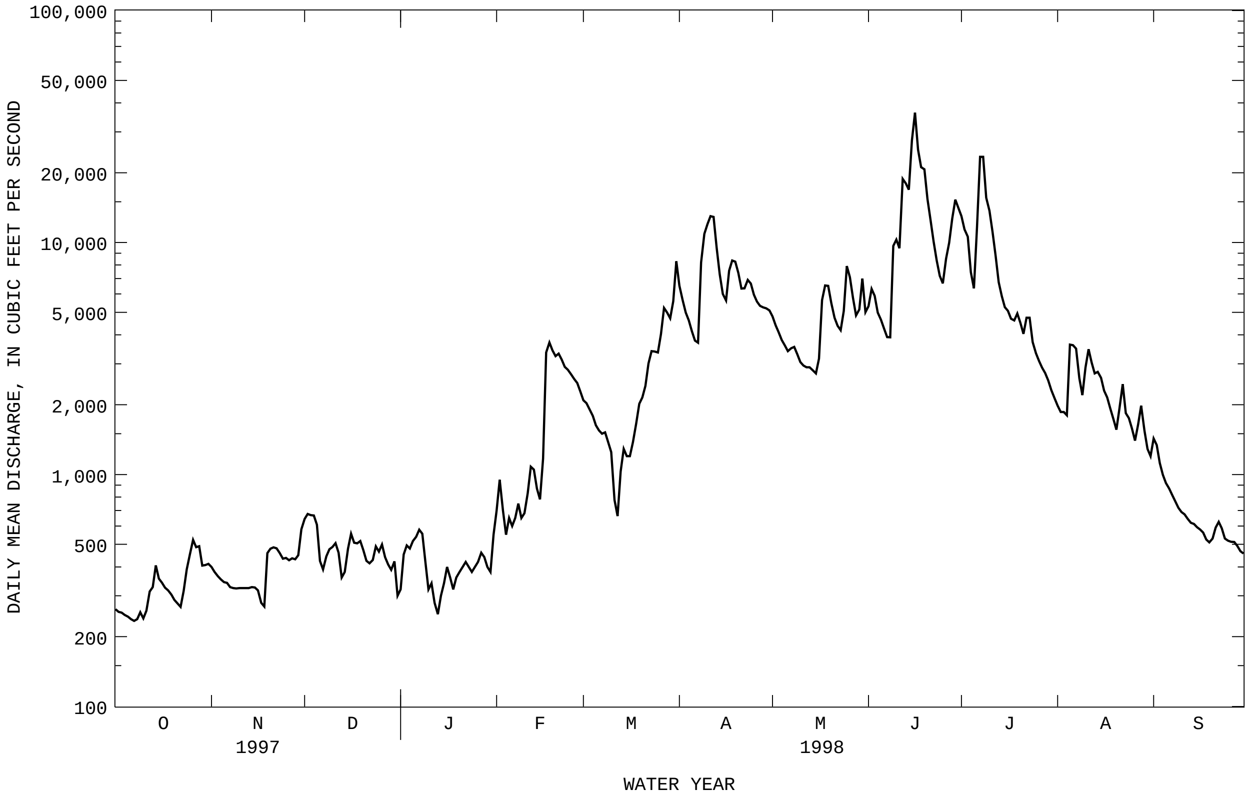
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	734	1434	1177	822	2471	3029	5315	4292	7629	4503	1415	512
MAX	1142	2484	1873	1236	3205	3528	6969	4526	12470	7560	2220	694
(WY)	1997	1997	1997	1997	1997	1997	1998	1998	1998	1998	1998	1998
MIN	327	384	481	408	1737	2530	3660	4057	2792	1447	609	331
(WY)	1998	1998	1998	1998	1998	1998	1997	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1997 - 1998	
ANNUAL TOTAL	667032		1223594			
ANNUAL MEAN	1827		3352		2770	
HIGHEST ANNUAL MEAN					3352	1998
LOWEST ANNUAL MEAN					2188	1997
HIGHEST DAILY MEAN	9200	Feb 20	36300	Jun 16	36300	Jun 16 1998
LOWEST DAILY MEAN	234	Oct 7	234	Oct 7	234	Oct 7 1997
ANNUAL SEVEN-DAY MINIMUM	242	Oct 4	242	Oct 4	242	Oct 4 1997
INSTANTANEOUS PEAK FLOW			40300	Jun 16	40300	Jun 16 1998
INSTANTANEOUS PEAK STAGE			39.46	Jun 16	40.77	Jul 11 1993
INSTANTANEOUS LOW FLOW			226	Oct 8		
ANNUAL RUNOFF (AC-FT)	1323000		2427000		2007000	
ANNUAL RUNOFF (CFSM)	.52		.95		.78	
ANNUAL RUNOFF (INCHES)	7.03		12.90		10.66	
10 PERCENT EXCEEDS	4200		8330		5910	
50 PERCENT EXCEEDS	1030		1520		1800	
90 PERCENT EXCEEDS	324		327		360	

e Estimated

05484650 RACCOON RIVER AT 63RD STREET, DES MOINES, IA--Continued



05484800 WALNUT CREEK AT DES MOINES, IA

LOCATION.--Lat 41°35'14", long 93°42'11", in SW1/4 SE1/4 sec.2, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, 25 ft downstream from bridge on 63rd Street in Des Moines, and 2.2 mi upstream from Raccoon River.

DRAINAGE AREA.--78.4 mi^2.

PERIOD OF RECORD.--October 1971 to current year.

REVISED RECORDS.--WDR IA-73-1: 1972. WDR IA-75-1: 1973-74.

GAGE.--Water-stage recorder. Datum of gage is 801.04 ft above sea level (levels by Iowa Natural Resources Council).

REMARKS.--Estimated daily discharges: Oct. 1-11, Nov. 17, 18, Dec. 5, 6, 12-14, 21, 22, Dec. 26 to Jan 1, Jan. 9-27, Feb. 3-6, Mar. 9-15, and Apr. 2-10. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance published in this report as miscellaneous water quality data. U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.40	30	37	e14	137	41	222	57	78	159	38	44
2	e.55	26	25	19	87	39	e190	53	76	123	86	36
3	e.44	26	54	23	e46	40	e160	48	104	116	55	33
4	e.35	18	30	56	e36	38	e140	45	78	101	115	28
5	e.40	15	e13	40	e48	36	e120	43	70	161	152	26
6	e.30	14	e15	30	e46	36	e110	70	62	447	197	24
7	e.50	14	17	27	39	37	e110	163	58	1120	106	21
8	e1.0	13	19	27	32	36	e120	57	188	309	69	19
9	e.50	18	20	e18	23	e21	e140	49	465	203	51	17
10	e.40	15	20	e12	62	e12	e130	48	203	167	87	16
11	e.35	11	16	e13	67	e11	116	43	643	139	48	14
12	215	9.7	e13	e7.5	47	e5.0	110	81	452	116	38	13
13	81	8.8	e12	e6.5	43	e18	104	42	192	102	35	13
14	15	11	e17	e5.0	41	e17	93	38	719	91	33	18
15	6.4	9.9	27	e6.5	41	e25	100	37	898	97	275	14
16	3.9	8.0	23	e9.0	60	42	95	38	535	76	81	21
17	2.8	e6.5	27	e8.0	79	87	86	31	704	117	48	16
18	1.9	e8.0	23	e7.0	77	130	81	32	1720	75	37	13
19	1.5	8.1	22	e7.5	74	129	83	84	859	60	32	11
20	1.5	7.8	23	e9.0	65	121	107	168	331	54	30	37
21	1.6	7.2	e19	e12	58	150	85	92	244	61	263	16
22	.76	6.5	e20	e18	62	166	78	170	193	563	56	11
23	137	5.8	23	e15	56	161	72	131	169	155	38	9.3
24	134	7.7	21	e14	50	138	69	182	157	97	30	9.0
25	43	5.9	19	e18	52	139	77	122	133	77	28	9.1
26	95	5.8	e15	e17	62	210	72	102	119	70	24	22
27	57	5.1	e13	e30	44	171	58	91	108	62	345	11
28	47	5.3	e18	52	45	125	53	82	184	59	152	9.1
29	49	88	e16	48	---	100	55	212	420	53	81	8.5
30	45	84	e15	36	---	340	61	114	330	45	55	7.6
31	37	---	e10	39	---	272	---	93	---	42	58	---
TOTAL	980.55	499.1	642	644.0	1579	2893.0	3097	2618	10492	5117	2743	546.6
MEAN	31.6	16.6	20.7	20.8	56.4	93.3	103	84.5	350	165	88.5	18.2
MAX	215	88	54	56	137	340	222	212	1720	1120	345	44
MIN	.30	5.1	10	5.0	23	5.0	53	31	58	42	24	7.6
AC-FT	1940	990	1270	1280	3130	5740	6140	5190	20810	10150	5440	1080
CFSM	.40	.21	.26	.26	.72	1.19	1.32	1.08	4.46	2.11	1.13	.23
IN.	.47	.24	.30	.31	.75	1.37	1.47	1.24	4.98	2.43	1.30	.26

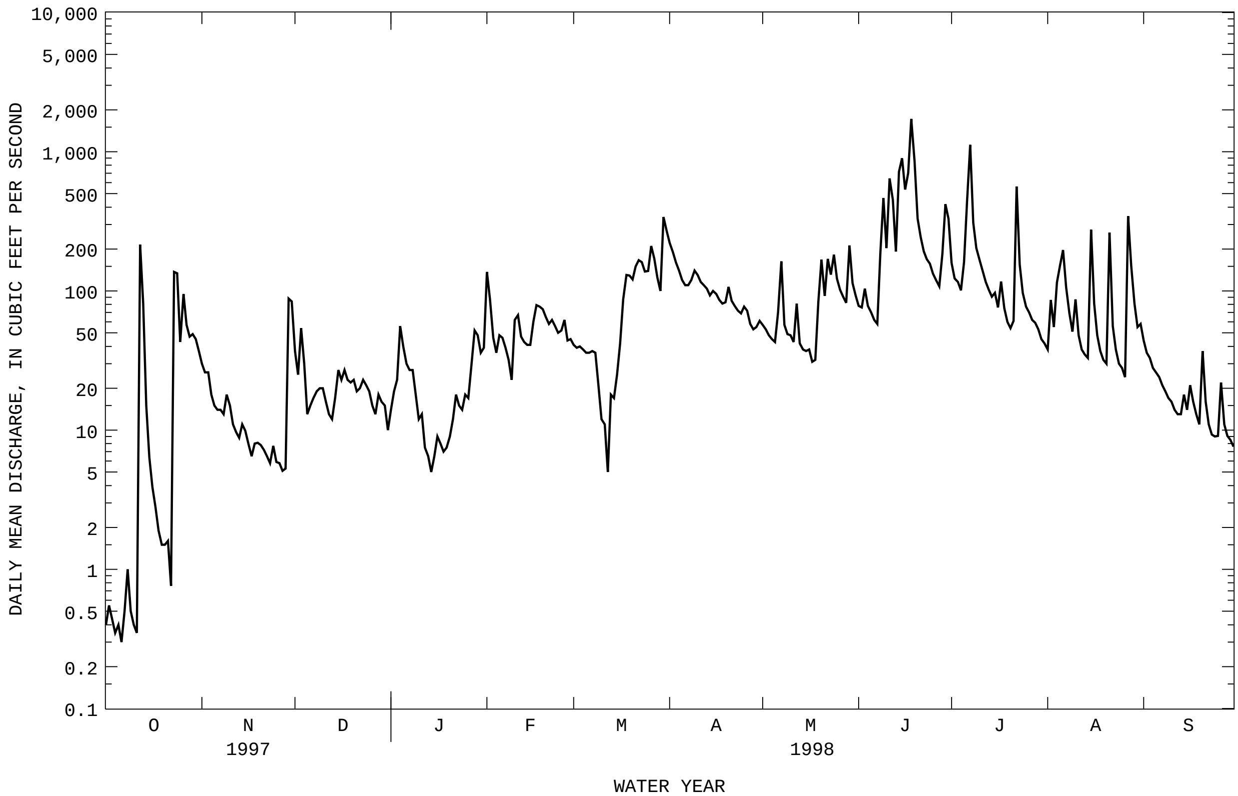
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	32.6	38.7	32.8	23.6	46.1	75.9	100	122	125	86.5	49.2	31.8
MAX	166	147	119	123	172	214	310	390	385	427	329	214
(WY)	1974	1973	1983	1974	1973	1990	1973	1996	1990	1993	1993	1993
MIN	1.33	.88	.17	.001	.48	3.17	2.71	6.36	7.63	2.96	4.37	.57
(WY)	1972	1977	1977	1977	1977	1981	1981	1977	1977	1985	1976	1976

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1972 - 1998	
ANNUAL TOTAL	19023.75		31851.25			
ANNUAL MEAN	52.1		87.3		63.8	
HIGHEST ANNUAL MEAN					158	1993
LOWEST ANNUAL MEAN					10.3	1989
HIGHEST DAILY MEAN	1170	Feb 18	1720	Jun 18	4280	Jul 1 1973
LOWEST DAILY MEAN	.27	Sep 20	.30	Oct 6	.00	Jan 3 1977a
ANNUAL SEVEN-DAY MINIMUM	.42	Oct 1	.42	Oct 1	.00	Jan 3 1977a
INSTANTANEOUS PEAK FLOW			4910	Jun 18	12500	May 10 1986
INSTANTANEOUS PEAK STAGE			15.85	Jun 18	18.32	May 10 1986
ANNUAL RUNOFF (AC-FT)	37730		63180		46190	
ANNUAL RUNOFF (CFSM)	.66		1.11		.81	
ANNUAL RUNOFF (INCHES)	9.03		15.11		11.05	
10 PERCENT EXCEEDS	108		170		150	
50 PERCENT EXCEEDS	27		45		25	
90 PERCENT EXCEEDS	3.1		7.8		2.5	

a Many days 1977, Aug 21, 1994
e Estimated

05484800 WALNUT CREEK AT DES MOINES, IA--Continued



05484900 RACCOON RIVER AT FLEUR DRIVE, DES MOINES, IA

LOCATION.--Lat 41°34'54", long 93°38'34", in NW$^1/_4$ NE$^1/_4$ sec.8, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100006, on downstream side of Fleur Drive bridge(SW 18th St.) attached to handrail 465 ft. from right edge of bridge, 3.0 miles downstream from Walnut Creek, 2.6 miles upstream from mouth, and at mile 204.1 above mouth of Des Moines River.

DRAINAGE AREA.--3,625 mi^2.

PERIOD OF RECORD.--June 1984 to current year; June 1984 to September 1996 gage-height record only.

GAGE.--Water-stage recorder. Datum of gage is 780.70 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 1-7, Jan. 10-30, Feb. 3-7, 12-15, Mar. 8-16, and Aug. 11-12. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in the report as miscellaneous water quality data. Discharges are affected by withdrawal by Des Moines Water Works. U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e200	386	603	333	617	2170	6860	4660	5160	12900	1960	1450
2	e190	366	618	457	883	2110	5800	4390	6030	11500	1930	1440
3	e180	349	643	466	e600	2010	5190	4130	5790	10900	1940	1100
4	e170	322	625	451	e500	1890	4820	3930	4960	7490	1990	942
5	e160	300	601	427	e600	1760	4400	3700	4620	6110	3450	850
6	e150	307	459	475	e550	1680	4060	3620	4240	10600	3760	797
7	e140	297	383	583	e600	1680	3950	3700	3890	21000	3640	755
8	186	288	398	571	635	e1600	8440	3560	3950	22400	2760	712
9	200	288	490	604	622	e1500	12400	3330	9140	14900	2310	673
10	160	292	509	e280	712	e1200	13100	3150	10900	13200	2910	628
11	189	288	509	e300	817	e700	13200	3060	10000	11100	e3450	582
12	359	281	430	e250	e1100	e650	11700	3080	17400	8730	e3100	569
13	369	281	329	e220	e1000	e1000	8500	3030	17200	6290	2760	552
14	359	292	347	e270	e850	e1300	6860	2930	16400	5420	2640	570
15	327	285	425	e320	e800	e1200	5990	2840	24500	4920	2740	539
16	308	272	496	e360	1450	e1200	5820	3120	40100	4730	2200	532
17	291	260	438	e340	3270	1500	7870	5410	29000	4480	2030	523
18	278	292	458	e300	3860	1780	8960	6370	22800	4350	1820	484
19	267	425	472	e320	3600	2120	8950	6500	21900	4650	1620	463
20	249	443	447	e340	3300	2250	8050	5620	15500	4230	1440	517
21	227	446	369	e380	3310	2470	6680	4830	12300	3840	2020	508
22	218	455	396	e400	3200	3050	6540	4560	10100	4760	2510	536
23	336	440	423	e360	2960	3510	7160	4320	8220	4580	1850	556
24	467	444	455	e340	2840	3490	6900	4980	7080	3610	1700	536
25	414	437	428	e360	2670	3430	5940	8070	6340	3220	1520	527
26	498	416	417	e380	2550	4020	5490	7130	8420	3010	1340	532
27	470	427	351	e420	2460	5120	5120	5730	10100	2830	1930	529
28	459	431	370	e380	2330	4990	5150	4860	12300	2660	2240	512
29	407	479	339	e360	---	4630	5090	5080	14700	2470	1670	504
30	402	608	379	e340	---	5580	4970	7070	14100	2270	1340	494
31	399	---	280	450	---	9070	---	5030	---	2100	1250	---
TOTAL	9029	10897	13887	11837	48686	80660	213960	141790	377140	225250	69820	19912
MEAN	291	363	448	382	1739	2602	7132	4574	12570	7266	2252	664
MAX	498	608	643	604	3860	9070	13200	8070	40100	22400	3760	1450
MIN	140	260	280	220	500	650	3950	2840	3890	2100	1250	463
AC-FT	17910	21610	27540	23480	96570	160000	424400	281200	748100	446800	138500	39500
CFSM	.08	.10	.12	.11	.48	.72	1.97	1.26	3.47	2.00	.62	.18
IN.	.09	.11	.14	.12	.50	.83	2.20	1.46	3.87	2.31	.72	.20

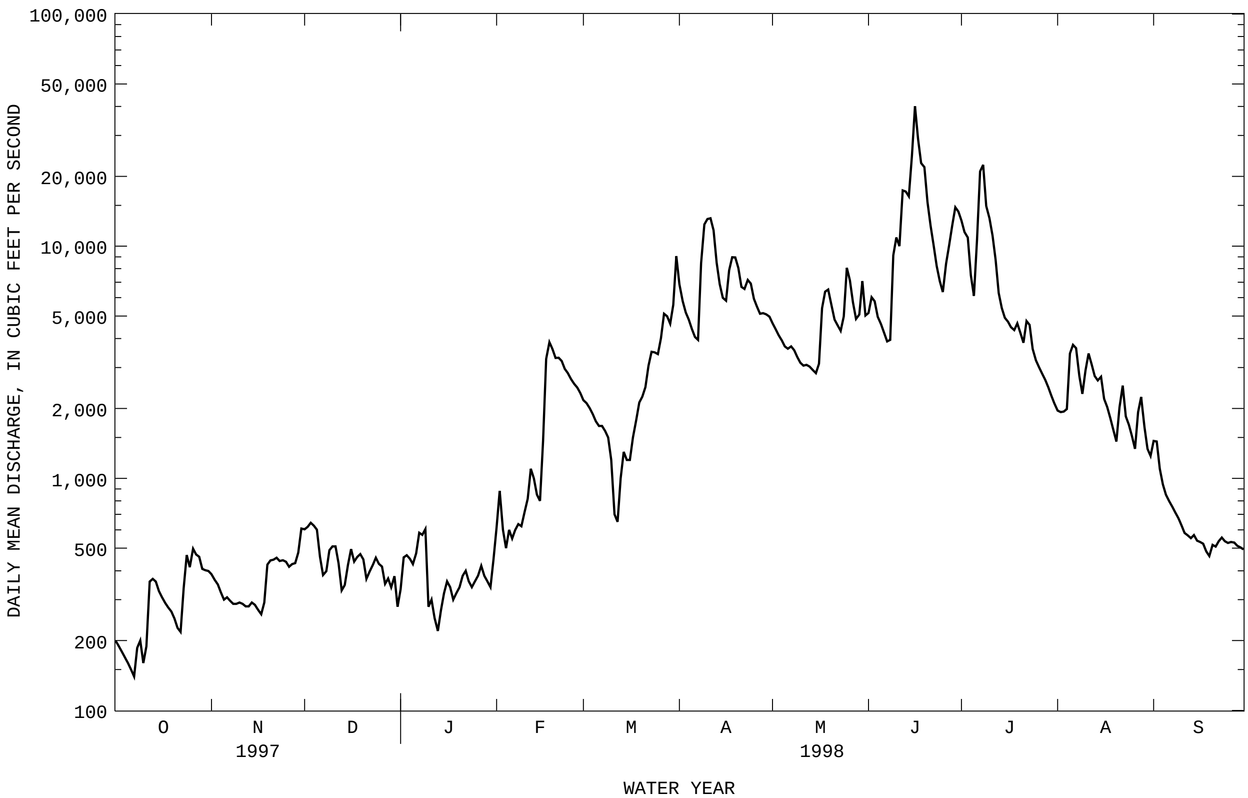
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1998, BY WATER YEAR (WY)

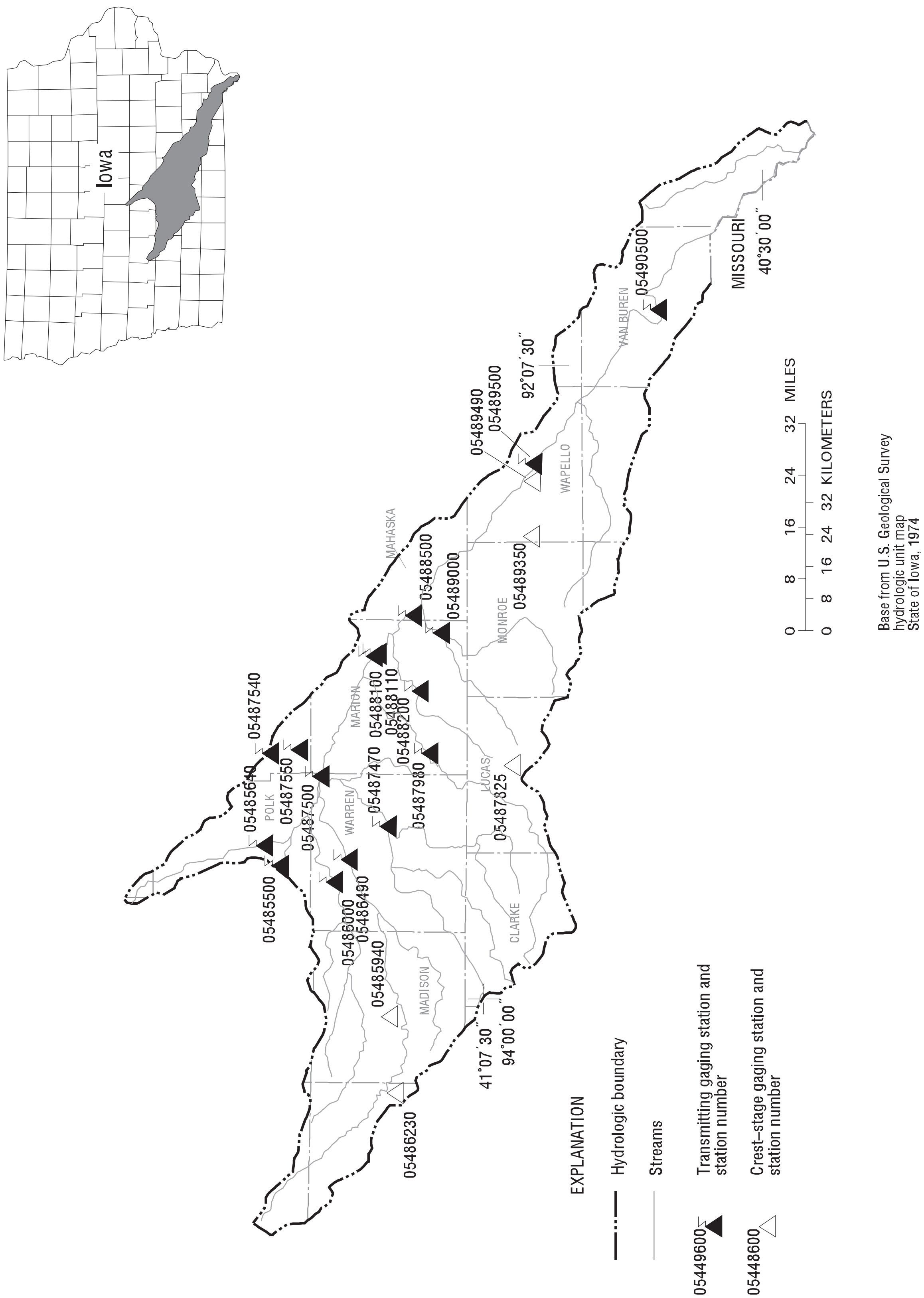
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	715	1445	1160	808	2509	3063	5410	4362	7722	4378	1396	464
MAX	1139	2527	1873	1235	3280	3525	7132	4574	12570	7266	2252	664
(WY)	1997	1997	1997	1997	1997	1997	1998	1998	1998	1998	1998	1998
MIN	291	363	448	382	1739	2602	3688	4151	2872	1489	540	263
(WY)	1998	1998	1998	1998	1998	1998	1997	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1997 - 1998	
ANNUAL TOTAL	669495		1222868			
ANNUAL MEAN	1834		3350		2778	
HIGHEST ANNUAL MEAN					3350	1998
LOWEST ANNUAL MEAN					2205	1997
HIGHEST DAILY MEAN	9630	Feb 20	40100	Jun 16	40100	Jun 16 1998
LOWEST DAILY MEAN	140	Oct 7	140	Oct 7	140	Oct 7 1997
ANNUAL SEVEN-DAY MINIMUM	167	Oct 4	167	Oct 4	167	Oct 4 1997
INSTANTANEOUS PEAK FLOW			45000	Jun 16		
INSTANTANEOUS PEAK STAGE			20.45	Jun 16	26.80	Jul 11 1993
ANNUAL RUNOFF (AC-FT)	1328000		2426000		2012000	
ANNUAL RUNOFF (CFSM)	.51		.92		.77	
ANNUAL RUNOFF (INCHES)	6.87		12.55		10.41	
10 PERCENT EXCEEDS	4290		8460		5840	
50 PERCENT EXCEEDS	1050		1520		1840	
90 PERCENT EXCEEDS	271		300		320	

e Estimated

05484900 RACCOON RIVER AT FLEUR DRIVE, DES MOINES, IA--Continued

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0 8 16 24 32 MILES
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Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974
EXPLANATION
Hydrologic boundary
Streams
05449600 Transmitting gaging station and station number
05448600 Crest–stage gaging station and station number

Gaging Stations

Crest Stage Gaging Stations

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA

LOCATION.--Lat 41°34'40", long 93°36'19", in SW 1/4 NE 1/4 sec. 10, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100008, on left bank 40 ft downstream from bridge on Southeast 6th Street at Des Moines, 0.5 mi downstream from Raccoon River and Scott Street Dam, and at mile 201.0 (revised).

DRAINAGE AREA.--9,879 mi^2.

PERIOD OF RECORD.--April 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1943 (P).

GAGE.--Water-stage recorder. Datum of gage is 762.52 ft above sea level. Prior to Oct. 1, 1951, and Oct. 1, 1953 to Sept. 30, 1959, water-stage recorder upstream of Scott Street Dam, 0.8 mi upstream at datum 11.16 ft higher. Oct. 1, 1951 to Sept. 30, 1953, Oct. 1, 1959 to April 24, 1997 water-stage recorder .3 mi downstream at current datum, and Oct. 1, 1959 to Sept. 30, 1961, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Jan. 4-6, 12-21, 24, Feb. 3-7, and Sept. 24-29. Records good except those for estimated daily discharges, which are poor. Des Moines municipal water supply is taken from infiltration galleries on Raccoon River, 3.5 mi upstream from station. Average daily pumpage was about 44 ft^3/s. At times, water is pumped from Raccoon River into recharge basins, or into Waterworks Reservoir, capacity 4,800 acre-ft. Effluent from sewage treatment plant enters the river 2.3 mi downstream from station. Net effect diversions not know. Flow regulated by Saylorville Lake (station 05481630) 12.7 mi upstream, since Apr. 12, 1977. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and data collection platform, U.S. National Weather Service Limited Automatic Remote Collector (LARC), and U.S. Geological Survey data logger at station.

COOPERATION.--Average monthly pumpage from galleries provided by Des Moines Water Works.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 116,000 ft^3/s July 11,1993, gage height, 34.29; minimum daily discharge, 26 ft^3/s Jan. 16-29, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, that of June 26, 1947, site and datum then in use. Flood of May 31, 1903, reached a stage of 20.9 ft, from flood profile, at Scott Street site and datum, by office of Des Moines City Engineer.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	498	1040	1280	731	1150	7210	11400	15000	15300	26300	5840	2660
2	487	986	1290	882	1660	6840	9780	14400	16000	25000	5810	2900
3	481	954	1370	1020	e1400	6490	9860	13600	14900	23900	5620	2080
4	471	894	1320	e1200	e1250	5830	10300	12600	12300	20600	5800	2200
5	466	762	1190	e1250	e1300	5360	12000	11600	10700	19000	7200	2110
6	451	1300	1030	e1300	e1200	5130	13600	10800	10000	22700	7720	1960
7	450	743	861	1370	e1200	4950	15400	9890	9020	32400	8040	1910
8	508	610	827	1350	1280	4700	21500	6960	8880	34100	8080	1860
9	568	746	893	1160	1260	4460	26600	5980	13900	26100	8290	1740
10	506	742	981	778	1450	3620	28200	5750	16100	25500	8930	1570
11	496	562	1170	657	1740	2570	27800	6740	17300	24400	9470	1530
12	972	750	1640	e620	1970	2290	26500	9150	23500	21300	8940	1490
13	1060	791	2250	e550	2000	2500	23800	9400	24800	18500	9100	1460
14	1060	799	2270	e620	1940	2800	21400	8290	24600	16600	8850	1470
15	1090	834	2050	e680	1760	3330	17900	7160	30300	15800	8850	1430
16	1040	905	1280	e700	2230	3980	15100	6770	45000	15200	8220	1440
17	1010	837	1060	e680	5690	4510	15300	11000	39300	14200	7140	1330
18	992	720	1090	e650	7840	5110	17300	15400	32800	13900	4550	1000
19	968	720	1140	e680	8940	5130	19900	17300	30600	13300	3190	846
20	942	790	1110	e700	9610	5400	21600	15700	22700	10300	3120	977
21	919	879	987	e750	10400	5800	21700	13700	18700	8630	4050	1120
22	873	894	968	748	11000	6720	20800	12600	18100	10100	5240	1070
23	1080	879	994	758	11200	7700	20300	11100	18400	9540	4960	907
24	1400	879	1030	e720	9900	7830	20200	10600	19200	7850	4350	e840
25	1250	875	991	742	8440	7600	19200	12500	19100	6930	3470	e780
26	1520	885	980	735	8320	8350	18400	12100	20800	6470	3030	e800
27	1470	945	923	737	8110	10400	17800	12200	22500	6110	3560	e760
28	1450	952	889	757	7680	11300	17300	13200	24700	5880	3710	e720
29	1360	1070	783	749	---	11000	16500	14700	26300	5650	3270	e650
30	1230	1290	814	752	---	12900	16000	17400	27200	5810	2730	692
31	1090	---	722	775	---	15900	---	15300	---	6020	2610	---
TOTAL	28158	26033	36183	25801	131920	197710	553440	358890	633000	498090	183740	42302
MEAN	908	868	1167	832	4711	6378	18450	11580	21100	16070	5927	1410
MAX	1520	1300	2270	1370	11200	15900	28200	17400	45000	34100	9470	2900
MIN	450	562	722	550	1150	2290	9780	5750	8880	5650	2610	650
AC-FT	55850	51640	71770	51180	261700	392200	1098000	711900	1256000	988000	364400	83910
CFSM	.09	.09	.12	.08	.48	.65	1.87	1.17	2.14	1.63	.60	.14
IN.	.11	.10	.14	.10	.50	.74	2.08	1.35	2.38	1.88	.69	.16

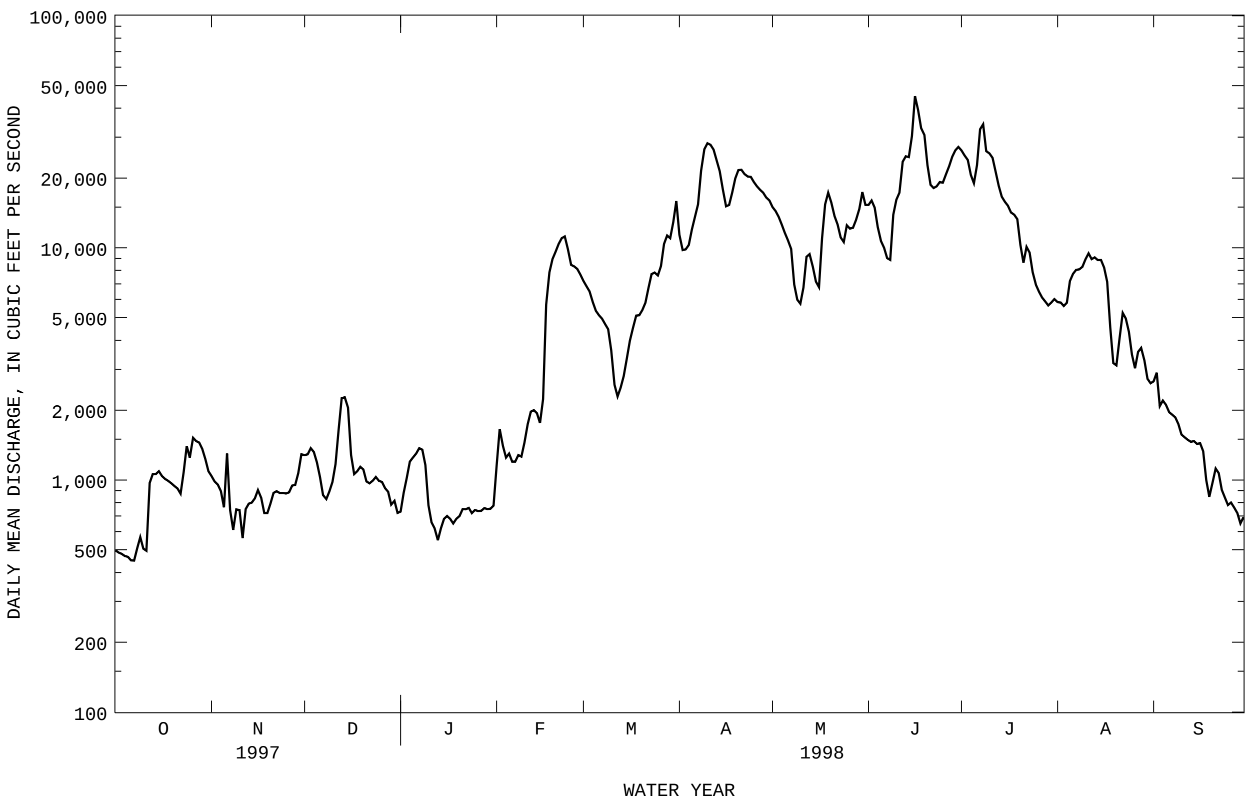
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3360	3689	3167	1931	3405	8589	11730	11680	13100	11370	5485	3824
MAX	15060	10610	9045	6439	12400	23530	27620	28190	35250	55960	26050	21430
(WY)	1987	1993	1983	1983	1984	1983	1993	1993	1984	1993	1993	1993
MIN	474	363	342	310	343	560	1082	1794	1716	739	441	434
(WY)	1990	1990	1990	1981	1978	1981	1981	1981	1988	1988	1988	1988

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1978 - 1998a	
ANNUAL TOTAL	2174863		2715267			
ANNUAL MEAN	5959		7439		6790	
HIGHEST ANNUAL MEAN					19180	1993
LOWEST ANNUAL MEAN					1036	1989
HIGHEST DAILY MEAN	20200	Mar 15	45000	Jun 16	113000	Jul 11 1993
LOWEST DAILY MEAN	450	Oct 7	450	Oct 7	200	Mar 12 1978b
ANNUAL SEVEN-DAY MINIMUM	472	Oct 1	472	Oct 1	236	Mar 7 1978
INSTANTANEOUS PEAK FLOW			49600	Jun 16	116000	Jul 11 1993
INSTANTANEOUS PEAK STAGE			28.65	Jun 16	34.29	Jul 11 1993
ANNUAL RUNOFF (AC-FT)	4314000		5386000		4919000	
ANNUAL RUNOFF (CFSM)	.60		.75		.69	
ANNUAL RUNOFF (INCHES)	8.19		10.22		9.34	
10 PERCENT EXCEEDS	16000		20200		18200	
50 PERCENT EXCEEDS	3200		3620		3590	
90 PERCENT EXCEEDS	627		745		642	

a Post regulation
b Also Mar 13, 1978
e Estimated



05485640 FOURMILE CREEK AT DES MOINES, IA

LOCATION.--Lat 41°36'50", long 93°32'43", in $NE^1/_4$ $NE^1/_4$ sec.32, T.79 N., R.23 W., Polk County, Hydrologic Unit 07100008, on right bank 20 ft downstream from bridge on Easton Blvd., 4.4 mi downstream from Muchikinock Creek, and 5.0 mi upstream from Des Moines River.

DRAINAGE AREA.--92.7 mi^2.

PERIOD OF RECORD.--October 1971 to current year.

REVISED RECORDS.--WDR IA-75-1: 1974 (P).

GAGE.--Water-stage recorder. Datum of gage is 795.87 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 17, 18, Dec. 4-11, 13, 14, 21, 22, Dec. 26 to Jan. 1, Jan. 9-29, Feb. 4, 12, Mar. 8-14, Apr. 25, 26, and Aug. 30 to Sept. 4. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	19	17	e16	67	59	419	67	127	297	25	e21
2	4.8	17	15	21	47	56	266	66	118	200	29	e18
3	4.4	17	22	22	31	59	196	66	119	163	31	e16
4	4.0	15	e15	29	e24	58	156	66	104	136	75	e15
5	4.5	13	e12	40	26	54	138	68	96	161	82	14
6	3.7	13	e15	33	25	53	126	80	88	695	67	13
7	4.2	12	e18	33	24	53	121	184	82	2600	48	11
8	9.3	11	e17	39	24	e29	129	123	125	750	36	10
9	9.4	11	e20	e23	25	e16	145	108	697	489	28	10
10	4.3	13	e18	e16	36	e14	136	100	411	351	48	9.6
11	3.9	11	e19	e18	89	e7.5	124	95	819	268	36	8.0
12	45	10	15	e12	e48	e23	117	99	737	226	31	7.8
13	68	10	e12	e10	47	e21	108	70	363	194	31	8.3
14	16	11	e15	e8.0	46	e28	98	63	819	170	32	9.3
15	9.7	10	22	e11	46	50	99	62	1140	151	83	9.1
16	7.7	10	18	e15	73	47	92	58	643	127	75	9.8
17	6.8	e8.0	17	e14	94	66	84	52	583	231	46	9.3
18	6.4	e9.3	19	e11	102	125	80	53	2170	167	36	8.1
19	6.7	9.7	18	e12	114	163	79	226	1970	132	31	8.5
20	5.2	10	18	e14	115	154	98	476	592	112	26	15
21	5.1	9.6	e17	e16	103	188	101	249	445	96	152	8.8
22	5.6	9.2	e17	e19	94	233	92	329	341	196	50	8.3
23	13	8.9	20	e17	88	222	87	233	271	103	36	7.9
24	14	9.7	19	e16	82	176	84	629	220	83	32	7.2
25	12	9.1	17	e19	78	183	e80	269	168	75	28	7.0
26	22	8.7	e16	e19	77	288	e70	186	142	68	25	8.5
27	24	8.7	e13	e23	69	233	66	147	123	60	166	9.5
28	19	7.8	e17	e28	65	153	63	126	403	50	88	8.0
29	23	15	e15	e21	---	122	65	272	612	45	45	7.0
30	21	32	e15	20	---	502	68	233	636	35	e30	6.8
31	21	---	e12	19	---	694	---	157	---	30	e24	---
TOTAL	408.0	358.7	520	614.0	1759	4129.5	3587	5012	15164	8461	1572	309.8
MEAN	13.2	12.0	16.8	19.8	62.8	133	120	162	505	273	50.7	10.3
MAX	68	32	22	40	115	694	419	629	2170	2600	166	21
MIN	3.7	7.8	12	8.0	24	7.5	63	52	82	30	24	6.8
AC-FT	809	711	1030	1220	3490	8190	7110	9940	30080	16780	3120	614
CFSM	.14	.13	.18	.21	.68	1.44	1.29	1.74	5.45	2.94	.55	.11
IN.	.16	.14	.21	.25	.71	1.66	1.44	2.01	6.09	3.40	.63	.12

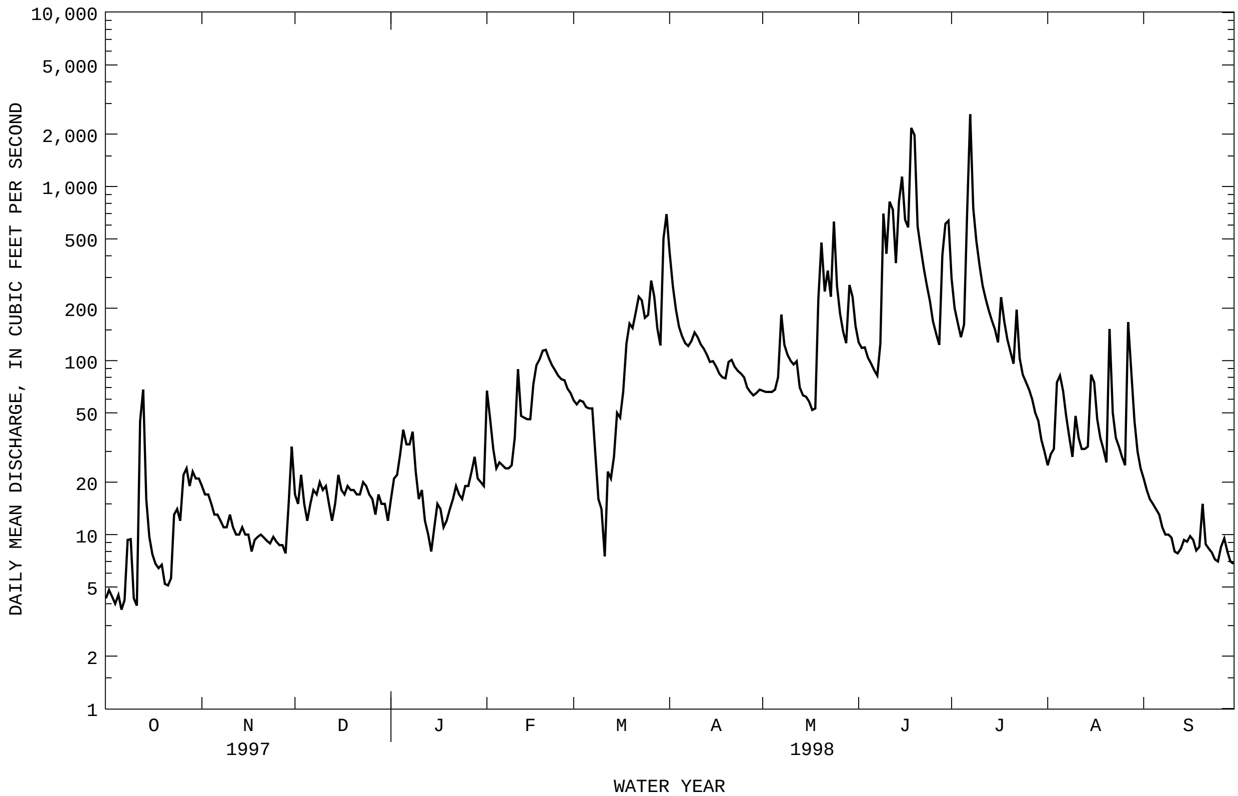
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	42.0	47.0	36.5	24.9	50.9	102	125	145	161	108	50.0	38.5
MAX	258	317	124	118	206	292	354	462	505	607	363	270
(WY)	1987	1984	1983	1974	1973	1979	1973	1974	1998	1993	1993	1993
MIN	1.36	1.57	.25	.001	.55	4.04	3.67	6.67	.73	.074	1.66	1.37
(WY)	1989	1977	1977	1977	1977	1981	1981	1977	1977	1977	1988	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1972 - 1998	
ANNUAL TOTAL	18160.7		41895.0			
ANNUAL MEAN	49.8		115		77.6	
HIGHEST ANNUAL MEAN					204	1993
LOWEST ANNUAL MEAN					7.97	1981
HIGHEST DAILY MEAN	900	Feb 18	2600	Jul 7	3570	Jun 9 1974
LOWEST DAILY MEAN	3.4	Aug 24	3.7	Oct 6	.00	Jan 2 1977a
ANNUAL SEVEN-DAY MINIMUM	3.5	Sep 1	4.3	Oct 1	.00	Jan 2 1977a
INSTANTANEOUS PEAK FLOW			5600	Jun 18	5600	Jun 18 1998
INSTANTANEOUS PEAK STAGE			15.00	Jun 18	15.00	Jun 18 1998
INSTANTANEOUS LOW FLOW			2.7	Oct 4		
ANNUAL RUNOFF (AC-FT)	36020		83100		56190	
ANNUAL RUNOFF (CFSM)	.54		1.24		.84	
ANNUAL RUNOFF (INCHES)	7.29		16.81		11.37	
10 PERCENT EXCEEDS	106		239		183	
50 PERCENT EXCEEDS	23		36		28	
90 PERCENT EXCEEDS	5.5		8.9		2.8	

a No flow many days in 1977
e Estimated

05485640 FOURMILE CREEK AT DES MOINES, IA--Continued



05486000 NORTH RIVER NEAR NORWALK, IA

LOCATION.--Lat 41°27'25", long 93°39'10", in NW1/4 SW1/4 sec.20, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on county highway R57, 1.7 mi southeast of Norwalk, 5.2 mi upstream from Middle Creek, and 6.2 mi downstream from Badger Creek.

DRAINAGE AREA.--349 mi^2.

PERIOD OF RECORD.--February 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1946. WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 788.45 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to June 12, 1946, nonrecording gage at same site and datum. Jan. 7 to Oct. 11, 1960, nonrecording gage at site 2.1 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 1-5, Dec. 5-8, 13, 14, 21, 22, 25-28, Dec. 31 to Jan. 1, Jan. 3, 9-26, 28, and Mar. 9-14. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e5.5	67	59	e32	102	139	2030	165	275	220	89	312
2	e4.0	87	90	39	210	131	1510	160	222	191	83	370
3	e3.4	70	95	e50	456	128	738	151	199	177	87	200
4	e3.0	50	78	56	239	124	591	144	183	170	103	141
5	e2.2	38	e14	88	154	119	503	138	175	170	103	113
6	1.8	31	e18	105	136	113	449	137	161	318	121	97
7	1.7	24	e34	93	120	109	418	284	152	1680	168	86
8	2.4	23	e36	79	108	105	426	205	154	1810	270	77
9	4.3	21	40	e55	99	e80	512	162	394	1780	158	67
10	3.9	19	42	e40	100	e36	474	143	1050	605	124	61
11	3.7	20	44	e42	137	e32	404	135	827	400	105	56
12	22	22	40	e26	155	e26	363	134	1690	336	92	53
13	42	19	e28	e15	136	e75	344	131	1660	292	83	49
14	47	19	e29	e17	133	e70	321	124	985	259	80	47
15	17	18	37	e19	128	128	306	112	1740	229	252	47
16	10	17	41	e20	137	160	310	103	1880	221	277	46
17	9.8	14	51	e19	177	166	314	97	1880	223	168	42
18	7.0	14	57	e17	215	366	278	92	1590	189	120	41
19	5.2	17	60	e20	276	616	255	88	2740	171	98	39
20	4.3	17	64	e24	249	647	272	94	2970	156	84	39
21	4.0	16	e50	e29	199	756	271	98	1590	143	86	38
22	3.7	14	e65	e30	176	823	248	168	600	180	129	41
23	3.8	13	70	e29	169	852	225	562	474	291	139	41
24	6.8	12	67	e28	161	729	209	439	425	288	108	36
25	8.4	12	e55	e29	151	651	201	343	377	182	83	34
26	23	13	e50	e31	144	935	202	288	329	148	70	34
27	64	14	e38	35	146	1380	191	233	290	135	93	33
28	79	12	e42	e34	146	905	169	201	264	126	354	32
29	76	12	42	44	---	556	159	272	251	116	312	29
30	74	45	39	54	---	936	162	493	246	114	179	28
31	70	---	e27	63	---	1880	---	389	---	105	132	---
TOTAL	612.9	770	1502	1262	4759	13773	12855	6285	25773	11425	4350	2329
MEAN	19.8	25.7	48.5	40.7	170	444	429	203	859	369	140	77.6
MAX	79	87	95	105	456	1880	2030	562	2970	1810	354	370
MIN	1.7	12	14	15	99	26	159	88	152	105	70	28
AC-FT	1220	1530	2980	2500	9440	27320	25500	12470	51120	22660	8630	4620
CFSM	.06	.07	.14	.12	.49	1.27	1.23	.58	2.46	1.06	.40	.22
IN.	.07	.08	.16	.13	.51	1.47	1.37	.67	2.75	1.22	.46	.25

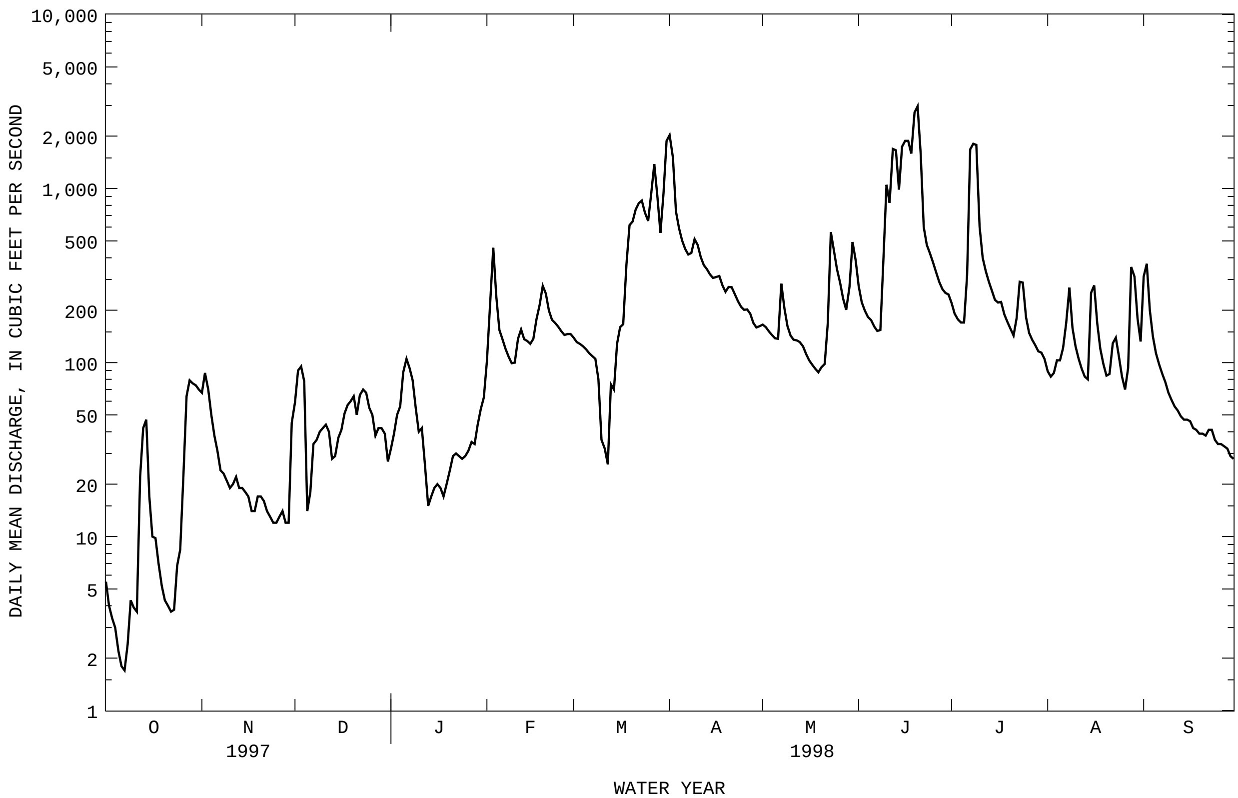
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	79.2	102	76.5	79.8	164	340	349	356	383	198	117	95.2
MAX	593	747	567	739	911	1041	1401	1699	3260	1722	1185	1007
(WY)	1987	1973	1993	1973	1973	1965	1973	1996	1947	1993	1993	1993
MIN	.20	.37	.36	.38	3.21	3.90	1.22	3.71	1.58	1.10	.21	.26
(WY)	1950	1956	1956	1954	1956	1954	1956	1967	1977	1977	1968	1957

05486000 NORTH RIVER NEAR NORWALK, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	47789.2		85695.9			
ANNUAL MEAN	131		235		195	
HIGHEST ANNUAL MEAN					709	1993
LOWEST ANNUAL MEAN					8.08	1968
HIGHEST DAILY MEAN	2300	Feb 20	2970	Jun 20	21600	Jun 13 1947
LOWEST DAILY MEAN	1.7	Oct 7	1.7	Oct 7	.00	Jul 20 1954a
ANNUAL SEVEN-DAY MINIMUM	2.6	Oct 2	2.6	Oct 2	.00	Jul 25 1954a
INSTANTANEOUS PEAK FLOW			3220	Jun 20	32000	Jun 13 1947b
INSTANTANEOUS PEAK STAGE			21.21	Jun 20	25.30	Jun 13 1947c
INSTANTANEOUS LOW FLOW			1.5	Oct 6	.00	Jul 20 1954a
ANNUAL RUNOFF (AC-FT)	94790		170000		141100	
ANNUAL RUNOFF (CFSM)	.38		.67		.56	
ANNUAL RUNOFF (INCHES)	5.09		9.13		7.58	
10 PERCENT EXCEEDS	278		507		445	
50 PERCENT EXCEEDS	60		109		45	
90 PERCENT EXCEEDS	6.9		17		2.3	

a Many days 1954-58
b From rating curve extended above 9,100 ft^3/s on basis of velocity-area studies
c From floodmark
e Estimated



05486490 MIDDLE RIVER NEAR INDIANOLA, IA

LOCATION.--Lat 41°25'27", long 93°35'09", in SW 1/4 SE 1/4 sec.35, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on right bank 10 ft downstream from bridge on county highway, 0.4 mi upstream from Cavitt Creek, 1.5 mi upstream from bridge on U.S. Highway 69, and 4.6 mi northwest of Indianola.

DRAINAGE AREA.--503 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1941, 1944, 1946, 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 776.15 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to June 11, 1946, June 9, 1947 to Nov. 23, 1948, and Sept. 8, 1951 to Oct. 30, 1952, nonrecording gage; and June 11, 1946 to June 8, 1947 (destroyed by flood), Nov. 24, 1948 to Sept. 7, 1951, Oct. 31, 1952 to Sept. 30, 1962, water-stage recorder at site 1.6 mi downstream at datum 2.81 ft lower.

REMARKS.--Estimated daily discharges: Nov. 16-18, Dec. 5-10, 13-15, Dec. 20 to Jan. 4, Jan. 9-31, Feb. 2-15, Mar. 9-16, and June 8, 9. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	48	35	e46	233	203	2070	216	314	256	54	115
2	9.2	50	47	e65	e220	185	1260	204	246	217	50	194
3	8.9	54	94	e85	e120	179	925	191	218	189	52	174
4	8.5	47	73	e100	e85	175	753	176	213	177	55	115
5	8.0	38	e15	123	e95	167	653	168	204	210	86	89
6	8.1	34	e19	147	e120	153	584	188	191	5170	85	77
7	7.9	30	e36	136	e100	149	544	511	174	9990	99	70
8	9.3	29	e40	121	e100	159	668	271	e200	2780	401	65
9	15	27	e42	e70	e110	e75	1160	212	e400	1270	175	61
10	15	26	e40	e42	e150	e42	800	177	1560	883	121	58
11	12	25	45	e46	e160	e36	609	159	1070	724	72	55
12	17	25	42	e32	e130	e23	523	166	2960	637	56	54
13	63	24	e29	e25	e140	e110	483	152	1270	537	47	52
14	39	25	e30	e32	e130	e100	462	141	2050	478	41	52
15	28	24	e38	e36	e150	e140	465	137	3780	407	63	50
16	33	e21	60	e38	192	e190	468	124	4470	359	97	48
17	33	e19	52	e36	328	289	442	118	2120	353	198	47
18	25	e25	60	e30	409	777	380	177	3010	277	125	47
19	20	27	62	e34	437	1240	340	135	5930	223	97	46
20	16	23	e50	e38	395	1020	456	132	1580	185	85	47
21	14	23	e44	e42	318	1280	417	127	943	150	88	48
22	13	24	e50	e44	274	1430	353	1580	811	172	92	49
23	13	23	e55	e38	255	1310	306	1590	1090	223	169	50
24	16	23	e55	e36	239	1030	276	914	689	531	144	50
25	16	24	e48	e42	224	909	264	592	606	286	101	44
26	30	23	e46	e46	209	1620	256	510	508	172	83	43
27	50	22	e38	e50	207	1880	238	375	431	130	84	41
28	58	22	e46	e46	228	1340	224	305	360	109	82	41
29	78	24	e48	e65	---	882	220	318	313	91	114	40
30	69	39	e48	e60	---	2910	220	414	319	77	131	39
31	56	---	e30	e120	---	5040	---	551	---	63	100	---
TOTAL	798.9	868	1417	1871	5758	25043	16819	11031	38030	27326	3247	1961
MEAN	25.8	28.9	45.7	60.4	206	808	561	356	1268	881	105	65.4
MAX	78	54	94	147	437	5040	2070	1590	5930	9990	401	194
MIN	7.9	19	15	25	85	23	220	118	174	63	41	39
AC-FT	1580	1720	2810	3710	11420	49670	33360	21880	75430	54200	6440	3890
CFSM	.05	.06	.09	.12	.41	1.61	1.11	.71	2.52	1.75	.21	.13
IN.	.06	.06	.10	.14	.43	1.85	1.24	.82	2.81	2.02	.24	.15

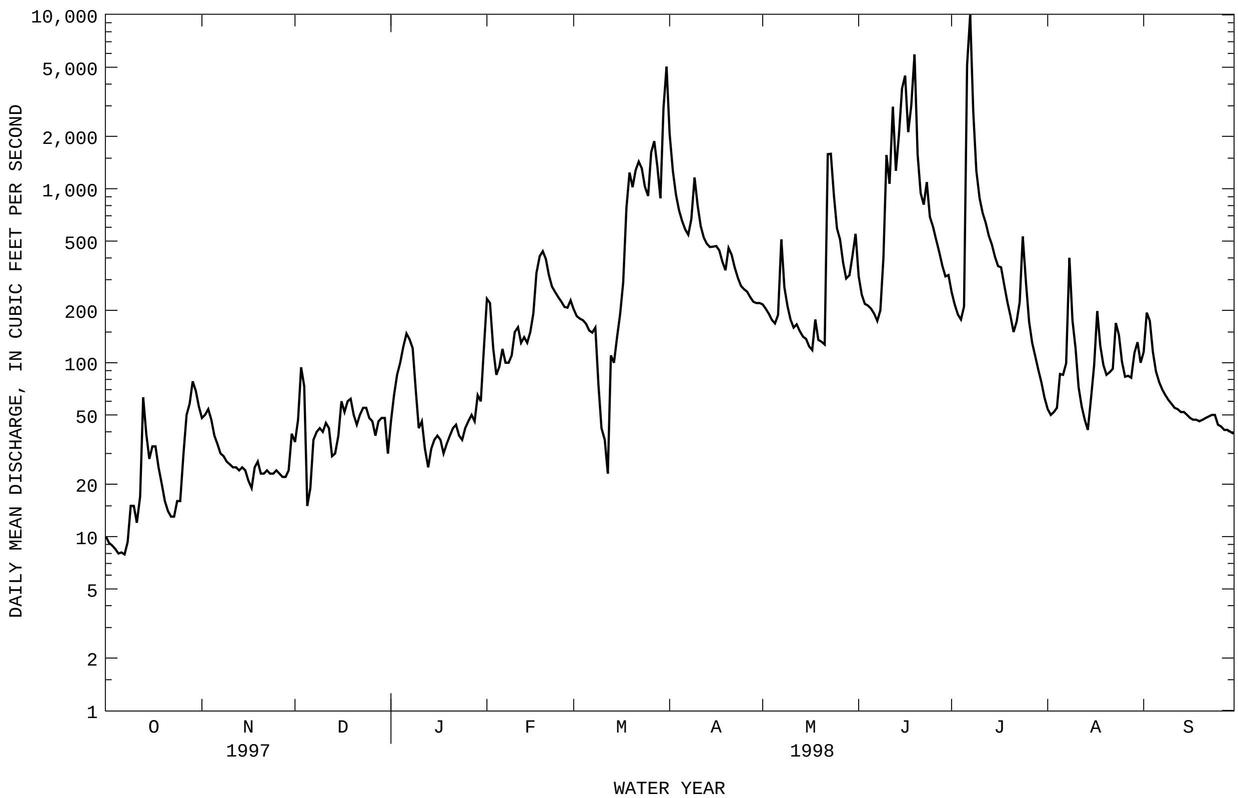
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	116	136	119	108	236	476	488	510	515	278	172	180
MAX	928	961	1070	646	1415	1417	1983	2053	4094	3121	1419	1460
(WY)	1974	1973	1983	1973	1973	1962	1973	1996	1947	1993	1993	1992
MIN	4.28	2.80	1.62	1.02	4.68	7.35	4.81	10.1	3.81	5.20	4.47	3.92
(WY)	1969	1956	1956	1977	1977	1954	1956	1956	1977	1977	1968	1968

05486490 MIDDLE RIVER NEAR INDIANOLA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	76676.2		134169.9			
ANNUAL MEAN	210		368		278	
HIGHEST ANNUAL MEAN					1006	1993
LOWEST ANNUAL MEAN					17.8	1968
HIGHEST DAILY MEAN	6110	May 8	9990	Jul 7	21400	Jun 13 1947
LOWEST DAILY MEAN	7.9	Oct 7	7.9	Oct 7	.11	Jul 2 1977
ANNUAL SEVEN-DAY MINIMUM	8.6	Oct 2	8.6	Oct 2	.51	Jun 29 1977
INSTANTANEOUS PEAK FLOW			11500	Jul 7	34000	Jun 13 1947
INSTANTANEOUS PEAK STAGE			22.27	Jul 7	28.27	Jun 13 1947a
INSTANTANEOUS LOW FLOW			7.1	Oct 4b		
ANNUAL RUNOFF (AC-FT)	152100		266100		201100	
ANNUAL RUNOFF (CFSM)	.42		.73		.55	
ANNUAL RUNOFF (INCHES)	5.67		9.92		7.50	
10 PERCENT EXCEEDS	468		893		615	
50 PERCENT EXCEEDS	69		115		72	
90 PERCENT EXCEEDS	16		25		8.6	

a From floodmark
b Also Oct. 5-8
e Estimated



05487470 SOUTH RIVER NEAR ACKWORTH, IA

LOCATION.--Lat 41°20'14", long 93°29'10", in $SE^1/_4$ $SE^1/_4$ sec.34, T.76 N., R.23 W., Warren County, Hydrologic Unit 07100008, on right bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Otter Creek, and 2.2 mi southwest of Ackworth.

DRAINAGE AREA.--460 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1941, 1945 (M), 1946.

GAGE.--Water-stage recorder. Datum of gage is 769.97 ft above sea level. Prior to June 12, 1946, nonrecording gage, June 13, 1946 to Apr. 13, 1960, water-stage recorder, and Apr. 14, 1960 to Sept. 30, 1961, nonrecording gage, all at site 4.0 mi downstream at datum 8.06 ft lower.

REMARKS.--Estimated daily discharges: Nov. 16-21, Dec. 4-10, Dec. 13 to Jan. 3, Jan. 10 to Feb. 15, Mar. 9-15, Aug. 5-10, 13-18, Aug. 28 to Sept. 2, and Sept. 11-15. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 24.5 ft, from information by local residents, discharge, about 30,000 ft^3/s, at site 4.0 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	154	106	e100	e270	205	2040	174	165	90	28	e46
2	5.9	109	89	e140	e250	200	963	149	148	79	30	e70
3	6.3	95	94	e220	e130	204	663	138	141	74	36	27
4	4.7	84	e55	317	e100	200	532	113	151	73	27	19
5	5.1	79	e30	397	e110	187	441	97	130	100	e30	17
6	4.6	73	e34	445	e140	181	380	952	119	4240	e29	16
7	4.2	70	e70	306	e120	179	359	5720	113	5830	e44	14
8	8.7	67	e75	226	e120	200	2430	1420	148	888	e70	9.5
9	23	65	e80	176	e130	e145	3510	607	420	372	e50	8.4
10	13	70	e78	e75	e170	e85	972	401	312	235	e36	7.8
11	10	78	95	e80	e180	e75	565	301	636	180	26	e7.0
12	42	74	91	e60	e150	e48	421	299	1100	141	22	e7.5
13	463	70	e60	e46	e160	e230	632	261	359	116	e20	e7.0
14	122	65	e65	e50	e150	e210	840	186	3670	99	e19	e26
15	56	66	e95	e65	e170	e290	1660	155	2720	87	e34	e18
16	41	e40	e120	e70	287	368	917	133	739	79	e55	14
17	34	e20	e100	e65	359	612	498	116	885	79	e40	13
18	30	e25	e115	e55	547	2600	365	105	1430	77	e29	13
19	27	e27	e120	e60	423	2310	309	102	2860	68	19	13
20	24	e36	e110	e65	333	1500	574	213	591	60	17	14
21	23	e48	e85	e75	283	1950	482	170	331	54	33	13
22	21	51	e100	e80	267	1850	335	3030	384	60	39	15
23	22	47	e105	e70	297	1360	275	1190	338	55	29	17
24	39	48	e110	e65	283	846	240	1190	224	49	19	16
25	50	50	e95	e70	254	766	229	572	179	44	14	15
26	124	50	e90	e80	240	1410	311	390	144	43	11	13
27	248	49	e75	e90	228	764	244	283	119	40	26	12
28	221	48	e85	e85	214	520	204	224	105	38	e42	12
29	384	52	e95	e120	---	407	210	389	102	36	e65	13
30	466	107	e95	e110	---	7620	195	413	106	32	e48	12
31	264	---	e65	e160	---	11200	---	218	---	30	e32	---
TOTAL	2792.0	1917	2682	4023	6365	38722	21796	19711	18869	13448	1019	505.2
MEAN	90.1	63.9	86.5	130	227	1249	727	636	629	434	32.9	16.8
MAX	466	154	120	445	547	11200	3510	5720	3670	5830	70	70
MIN	4.2	20	30	46	100	48	195	97	102	30	11	7.0
AC-FT	5540	3800	5320	7980	12620	76810	43230	39100	37430	26670	2020	1000
CFSM	.20	.14	.19	.28	.49	2.72	1.58	1.38	1.37	.94	.07	.04
IN.	.23	.16	.22	.33	.51	3.13	1.76	1.59	1.53	1.09	.08	.04

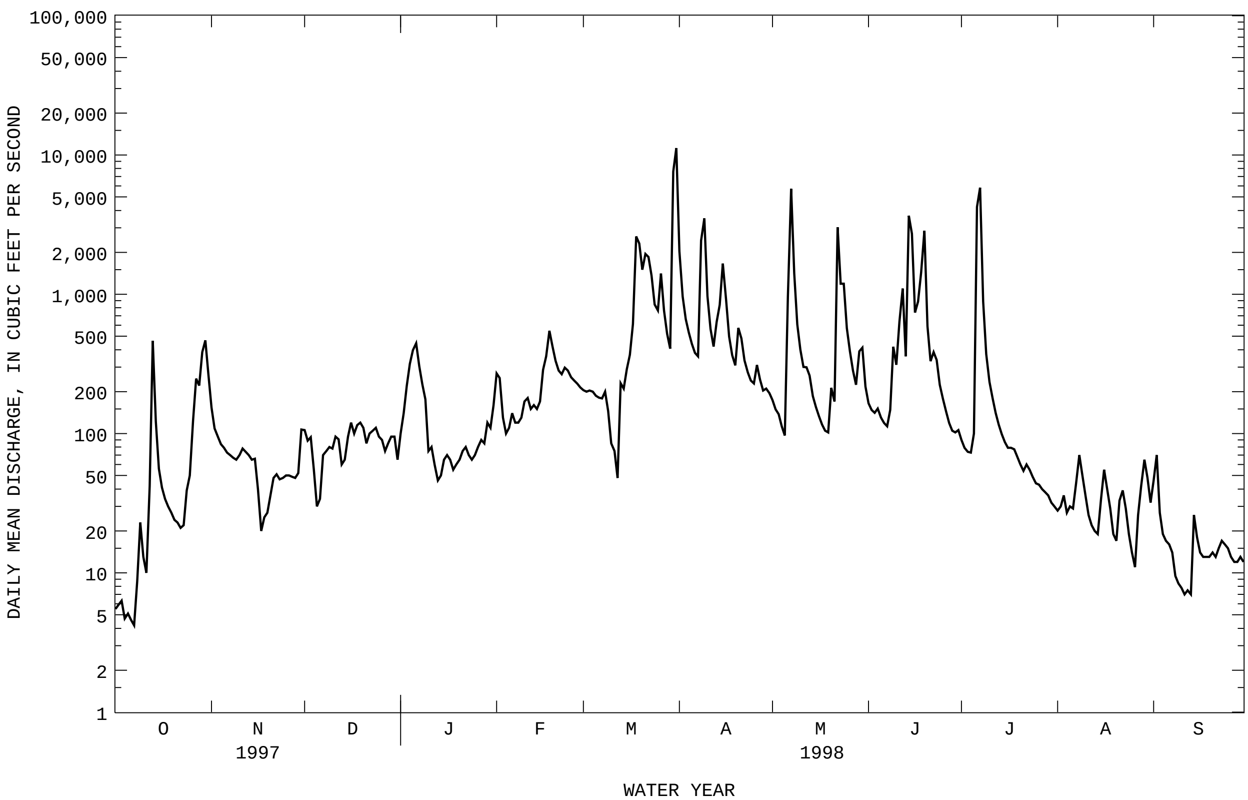
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	113	128	114	106	222	456	455	470	483	266	132	158
MAX	1283	906	1022	901	1209	1568	1937	1962	4305	3870	1546	1332
(WY)	1974	1962	1983	1974	1973	1960	1973	1959	1947	1993	1993	1993
MIN	.35	1.05	.88	1.05	3.70	3.61	1.70	7.14	1.79	1.48	2.02	1.05
(WY)	1957	1957	1956	1956	1989	1957	1956	1980	1977	1977	1957	1957

05487470 SOUTH RIVER NEAR ACKWORTH, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	62343.7		131849.2			
ANNUAL MEAN	171		361		258	
HIGHEST ANNUAL MEAN					966	1993
LOWEST ANNUAL MEAN					16.1	1989
HIGHEST DAILY MEAN	6810	May 8	11200	Mar 31	31400	Jun 17 1990
LOWEST DAILY MEAN	4.2	Oct 7	4.2	Oct 7	.00	Sep 19 1956a
ANNUAL SEVEN-DAY MINIMUM	5.2	Oct 1	5.2	Oct 1	.00	Sep 19 1956a
INSTANTANEOUS PEAK FLOW			21700	Mar 30	38100	Jun 17 1990
INSTANTANEOUS PEAK STAGE			25.91	Mar 30	32.85	Jul 5 1981
INSTANTANEOUS LOW FLOW			3.6	Oct 6,7	.00	Sep 19 1956a
ANNUAL RUNOFF (AC-FT)	123700		261500		187200	
ANNUAL RUNOFF (CFSM)	.37		.79		.56	
ANNUAL RUNOFF (INCHES)	5.04		10.66		7.63	
10 PERCENT EXCEEDS	337		693		493	
50 PERCENT EXCEEDS	63		100		42	
90 PERCENT EXCEEDS	10		17		3.1	

a Also Sept 30 to Oct 13, 1956
e Estimated



05487500 DES MOINES RIVER NEAR RUNNELLS, IA

LOCATION.--Lat 41°29'19", long 93°20'17", in SE$^1/_4$ NW$^1/_4$ sec.12, T.77 N., R.22 W., Polk County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on State Highway 316, 0.2 mi downstream from South River River, 0.5 mi upstream from Camp Creek, 2.2 mi southeast of Runnells, 37.2 mi upstream from Red Rock Dam, and at mi 179.5.

DRAINAGE AREA.--11,655 mi^2.

PERIOD OF RECORD.--October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above sea level (U.S. Army Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Oct. 1 to Dec. 15, Dec. 20-23, 27, 29, 31, Jan. 1, 3-28, 30, 31, Feb. 1, 3-7, Mar. 10-14, 31, May 4-6, June 18 to Aug. 20, and Aug. 27. Records good except those for estimated daily discharge, which are poor. Flow regulated by Saylorville Lake (station 05481630) 34.2 mi upstream. Stage-discharge relation is affected at times by backwater from Lake Red Rock (05488100). U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on May 31, 1903; June 14, 1947; June 26, 1947; and June 24, 1954. No gage height or discharge was determined. Gage height and discharge information is available for these floods at other sites on the Des Moines River.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e530	e1400	e1550	e1100	e2100	8250	28000	16100	16700	e27000	e6300	2890
2	e510	e1300	e1600	1450	2870	7630	18600	15500	17100	e26000	e6200	3520
3	e500	e1200	e1800	e2000	e2700	7420	16600	15000	16700	e25000	e6000	3370
4	e500	e1100	e1600	e1800	e2100	6790	15300	e14000	15100	e22000	e6500	2280
5	e490	e950	e1300	e2100	e2000	6130	15600	e13000	12600	e20000	e7500	2400
6	e490	e1400	e1150	e2200	e1900	5780	16300	e13000	11900	e34000	e8000	2150
7	e480	e950	e1000	e2100	e1800	5760	16900	19700	11000	e50000	e8500	2010
8	e550	e750	e1000	e2000	1770	5390	20600	13700	10400	e46000	e9000	1920
9	e650	e850	e1100	e1700	1710	4990	30500	10000	13400	e36000	e9000	1860
10	e570	e850	e1200	e1200	1790	e4000	33600	8730	19000	e30000	e9500	1630
11	e550	e700	e1500	e1000	2200	e3000	34200	8050	19300	e28000	e10000	1510
12	e1100	e850	e1900	e900	2680	e2500	33600	10000	27700	e26000	e9500	1460
13	e1700	e900	e2400	e700	2970	e2900	30800	10900	31600	e22000	e9500	1470
14	e1400	e950	e2600	e800	3140	e3400	26800	10100	35700	e20000	e9300	1490
15	e1300	e1000	e2500	e900	2830	3900	23200	8940	50100	e19000	e9500	1490
16	e1200	e1050	1980	e950	2700	4600	20500	7580	54700	e17500	e9000	1480
17	e1150	e950	1630	e900	4940	5360	19000	9500	68500	e16000	e8000	1460
18	e1100	e850	1650	e850	9000	9270	20000	14000	e48000	e15000	e5500	1220
19	e1050	e850	1820	e900	10300	11000	21500	17000	e42000	e14500	e3800	1100
20	e1020	e900	e1700	e950	11200	9900	23300	17600	e44000	e11000	e3600	1010
21	e1000	e1000	e1400	e1000	11900	10700	23800	16100	e30000	e9000	4560	1140
22	e950	e1000	e1400	e1000	12200	11900	22800	16900	e23000	e11000	5650	1160
23	e1100	e1000	e1500	e1000	12700	12500	21600	17100	e21000	e10700	6170	1010
24	e1500	e980	1570	e950	12300	12100	21200	16500	e21000	e9500	5770	946
25	e1400	e980	1490	e1000	9830	11400	20500	15000	e21000	e8000	4500	907
26	e1700	e1000	1380	e1000	9230	12800	19600	15200	e21000	e7500	3560	903
27	e1900	e1050	e1250	e1100	9070	14600	18900	14200	e23000	e7000	e3700	848
28	e1900	e1100	1260	e1300	8580	15400	18300	14600	e26000	e6500	5070	863
29	e2000	e1200	e1150	1290	---	14200	17500	15700	e27000	e6200	4570	838
30	e1900	e1500	1150	e1400	---	18800	16900	18300	e28000	e6200	3530	817
31	e1600	---	e1000	e1600	---	e45100	---	18100	---	e6500	2990	---
TOTAL	33790	30560	47530	39140	158510	297470	666000	430100	806500	593100	204270	47152
MEAN	1090	1019	1533	1263	5661	9596	22200	13870	26880	19130	6589	1572
MAX	2000	1500	2600	2200	12700	45100	34200	19700	68500	50000	10000	3520
MIN	480	700	1000	700	1710	2500	15300	7580	10400	6200	2990	817
AC-FT	67020	60620	94280	77630	314400	590000	1321000	853100	1600000	1176000	405200	93530
CFSM	.09	.09	.13	.11	.49	.82	1.90	1.19	2.31	1.64	.57	.13
IN.	.11	.10	.15	.12	.51	.95	2.13	1.37	2.57	1.89	.65	.15

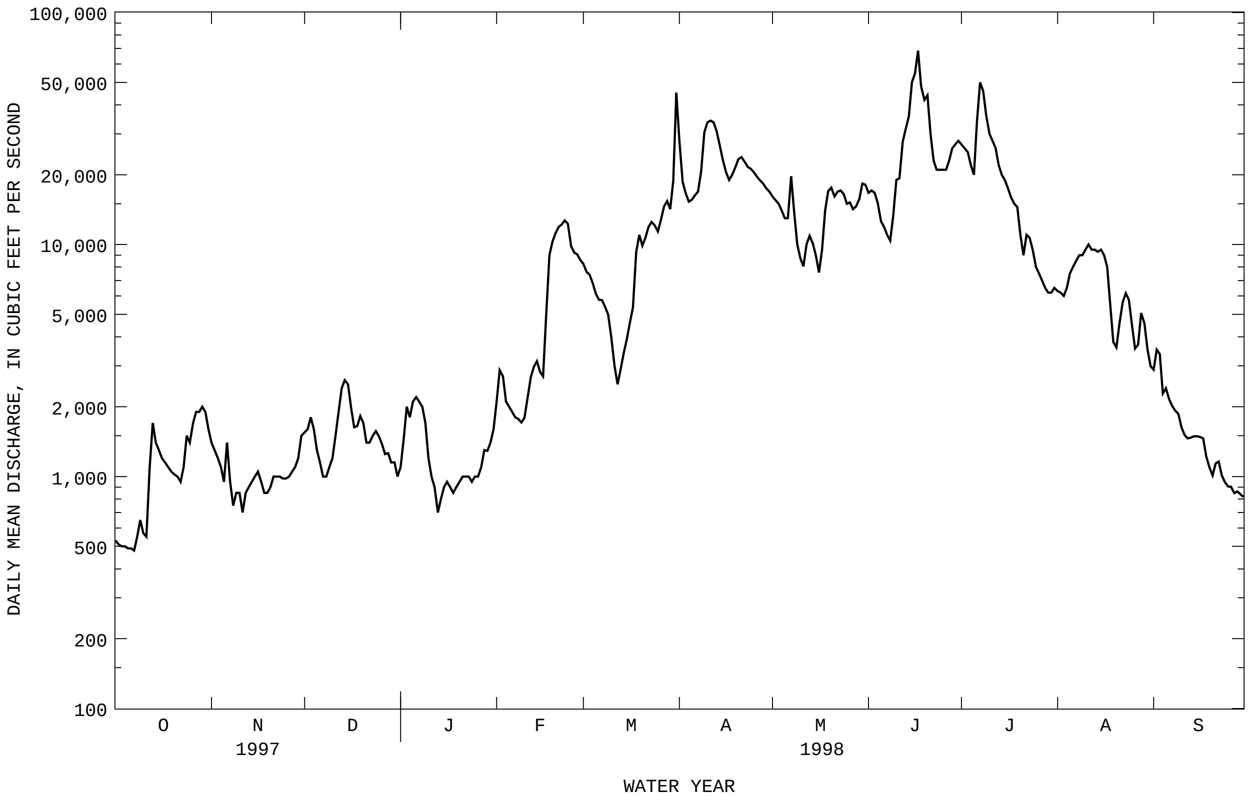
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4205	4238	3929	2201	3735	9977	13390	14620	16410	15240	7541	4655
MAX	18040	12660	10000	6237	8557	18390	30380	32740	40530	68140	32990	26320
(WY)	1987	1993	1992	1992	1997	1993	1993	1993	1991	1993	1993	1993
MIN	621	524	473	450	500	1805	1151	2372	1777	840	534	506
(WY)	1990	1990	1990	1990	1990	1989	1989	1989	1988	1988	1988	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1986 - 1998	
ANNUAL TOTAL	2503974		3354122			
ANNUAL MEAN	6860		9189		8365	
HIGHEST ANNUAL MEAN					22980	1993
LOWEST ANNUAL MEAN					1200	1989
HIGHEST DAILY MEAN	34900	May 8	68500	Jun 17	133000	Jul 11 1993
LOWEST DAILY MEAN	480	Oct 7	480	Oct 7	390	Jan 10 1990
ANNUAL SEVEN-DAY MINIMUM	500	Oct 1	500	Oct 1	407	Jan 6 1990
INSTANTANEOUS PEAK FLOW			71700	Jun 17	134000	Jul 11 1993
INSTANTANEOUS PEAK STAGE			68.56	Jul 12	82.88	Jul 11 1993
ANNUAL RUNOFF (AC-FT)	4967000		6653000		6060000	
ANNUAL RUNOFF (CFSM)	.59		.79		.72	
ANNUAL RUNOFF (INCHES)	7.99		10.71		9.75	
10 PERCENT EXCEEDS	17800		22900		21000	
50 PERCENT EXCEEDS	3600		4560		4390	
90 PERCENT EXCEEDS	750		950		712	

e Estimated

05487500 DES MOINES RIVER NEAR RUNNELLS, IA--Continued



05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA

LOCATION.--Lat 41°36'05", long 93°16'14", in NE$^1/_4$ NE$^1/_4$ sec. 5, T.78 N., R.21 W., Jasper County, Hydrologic Unit 07100008, on left bank downstream side of bridge on Highway 163.

DRAINAGE AREA.--6.78 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1995 to current year.

GAGE.--Water-stage recorder. Concrete control. Datum of gage is 828.33 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 4, 5, 27, 31, Jan. 9-19, Mar. 9-15, and June 18, 19. Records good except those for estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in report as miscellaneous water quality data. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

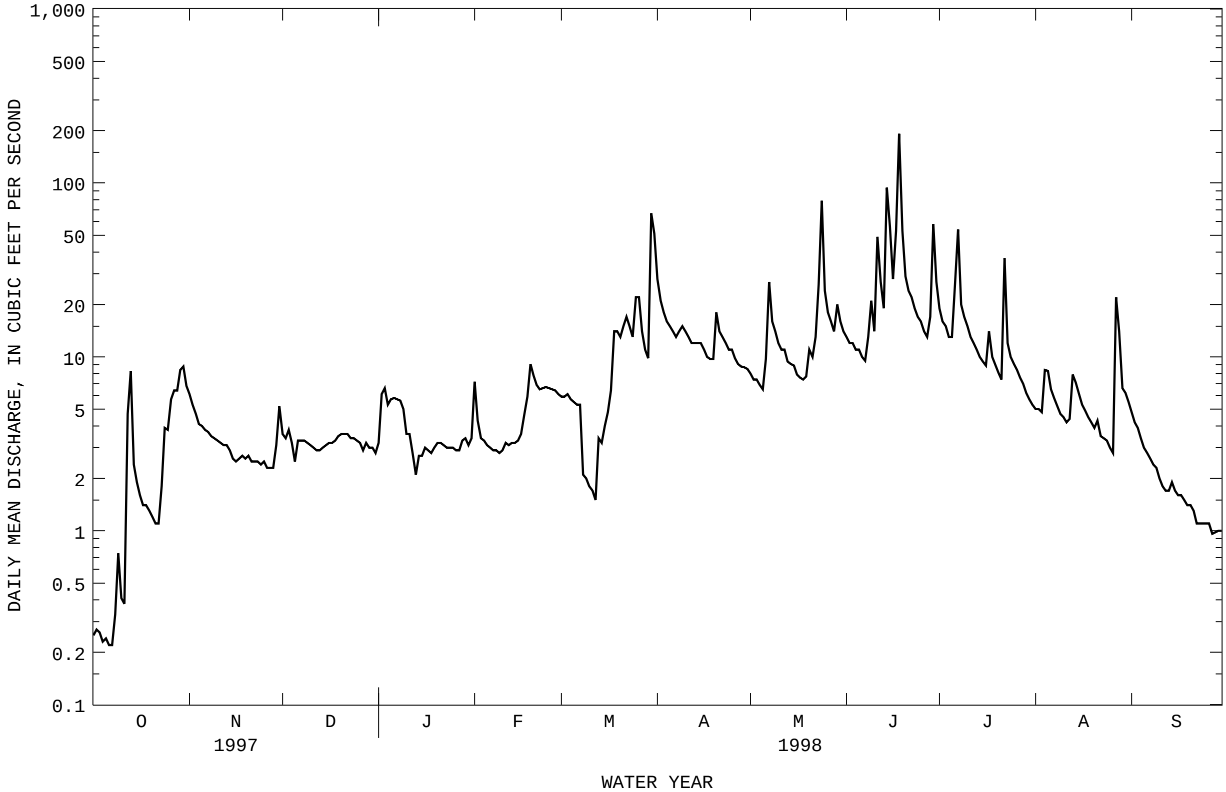
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	6.1	3.6	3.2	7.2	5.9	28	8.0	13	19	5.0	4.8
2	.27	5.3	3.4	6.1	4.3	5.9	21	7.4	12	16	5.0	4.2
3	.26	4.7	3.8	6.6	3.4	6.1	18	7.4	12	15	4.8	3.9
4	.23	4.1	e3.2	5.3	3.3	5.7	16	6.9	11	13	8.4	3.4
5	.24	4.0	e2.5	5.7	3.1	5.5	15	6.5	11	13	8.3	3.0
6	.22	3.8	3.3	5.8	3.0	5.3	14	9.7	10	26	6.5	2.8
7	.22	3.7	3.3	5.7	2.9	5.3	13	27	9.5	54	5.8	2.6
8	.33	3.5	3.3	5.6	2.9	2.1	14	16	13	20	5.2	2.4
9	.74	3.4	3.2	e5.0	2.8	e2.0	15	14	21	17	4.7	2.3
10	.41	3.3	3.1	e3.6	2.9	e1.8	14	12	14	15	4.5	2.0
11	.38	3.2	3.0	e3.6	3.2	e1.7	13	11	49	13	4.2	1.8
12	4.7	3.1	2.9	e2.8	3.1	e1.5	12	11	27	12	4.4	1.7
13	8.3	3.1	2.9	e2.1	3.2	e3.4	12	9.4	19	11	7.9	1.7
14	2.4	2.9	3.0	e2.7	3.2	e3.2	12	9.1	94	10	7.1	1.9
15	1.9	2.6	3.1	e2.7	3.3	e4.0	12	8.9	56	9.4	6.1	1.7
16	1.6	2.5	3.2	e3.0	3.6	4.8	11	7.9	28	8.9	5.3	1.6
17	1.4	2.6	3.2	e2.9	4.6	6.4	10	7.6	53	14	4.9	1.6
18	1.4	2.7	3.3	e2.8	5.9	14	9.7	7.4	e192	10	4.5	1.5
19	1.3	2.6	3.5	e3.0	9.1	14	9.7	7.7	e53	9.0	4.2	1.4
20	1.2	2.7	3.6	3.2	7.8	13	18	11	29	8.1	3.9	1.4
21	1.1	2.5	3.6	3.2	6.9	15	14	10	24	7.4	4.3	1.3
22	1.1	2.5	3.6	3.1	6.5	17	13	13	22	37	3.5	1.1
23	1.8	2.5	3.4	3.0	6.6	15	12	26	19	12	3.4	1.1
24	3.9	2.4	3.4	3.0	6.7	13	11	79	17	10	3.3	1.1
25	3.8	2.5	3.3	3.0	6.6	22	11	24	16	9.1	3.0	1.1
26	5.7	2.3	3.2	2.9	6.5	22	9.8	18	14	8.4	2.8	1.1
27	6.4	2.3	e2.9	2.9	6.4	14	9.1	16	13	7.6	22	.96
28	6.4	2.3	3.2	3.3	6.1	11	8.8	14	17	7.0	14	.98
29	8.4	3.1	3.0	3.4	---	9.8	8.7	20	58	6.2	6.6	1.0
30	8.8	5.2	3.0	3.1	---	67	8.5	16	27	5.7	6.2	1.0
31	6.8	---	e2.8	3.4	---	51	---	14	---	5.3	5.5	---
TOTAL	81.95	97.5	99.8	115.7	135.1	368.4	393.3	455.9	953.5	429.1	185.3	58.44
MEAN	2.64	3.25	3.22	3.73	4.83	11.9	13.1	14.7	31.8	13.8	5.98	1.95
MAX	8.8	6.1	3.8	6.6	9.1	67	28	79	192	54	22	4.8
MIN	.22	2.3	2.5	2.1	2.8	1.5	8.5	6.5	9.5	5.3	2.8	.96
AC-FT	163	193	198	229	268	731	780	904	1890	851	368	116
CFSM	.39	.48	.47	.55	.71	1.75	1.93	2.17	4.69	2.04	.88	.29
IN.	.45	.53	.55	.63	.74	2.02	2.16	2.50	5.23	2.35	1.02	.32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1.12	1.48	1.55	1.93	10.7	5.58	6.14	17.8	16.9	7.34	2.96	.94
MAX	2.64	3.25	3.22	3.73	19.8	11.9	13.1	25.0	31.8	13.8	5.98	1.95
(WY)	1998	1998	1998	1998	1996	1998	1998	1996	1998	1998	1998	1998
MIN	.20	.40	.54	.68	4.82	1.59	1.41	13.6	6.61	3.79	1.26	.43
(WY)	1996	1996	1996	1997	1998	1996	1996	1997	1997	1997	1997	1996

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1996 - 1998	
ANNUAL TOTAL	1510.93		3373.99			
ANNUAL MEAN	4.14		9.24		6.17	
HIGHEST ANNUAL MEAN					9.24	1998
LOWEST ANNUAL MEAN					3.56	1997
HIGHEST DAILY MEAN	118	Feb 18	192	Jun 18	210	May 24 1996
LOWEST DAILY MEAN	.22	Oct 6	.22	Oct 6	.04	Jan 7 1996
ANNUAL SEVEN-DAY MINIMUM	.24	Oct 1	.24	Oct 1	.16	Oct 20 1995
INSTANTANEOUS PEAK FLOW			1350	Jun 18	1350	Jun 18 1998
INSTANTANEOUS PEAK STAGE			9.66	Jun 18	9.66	Jun 18 1998
INSTANTANEOUS LOW FLOW			.20	Oct 7	.00	Nov 10 1995a
ANNUAL RUNOFF (AC-FT)	3000		6690		4470	
ANNUAL RUNOFF (CFSM)	.61		1.36		.91	
ANNUAL RUNOFF (INCHES)	8.29		18.51		12.37	
10 PERCENT EXCEEDS	8.4		17		14	
50 PERCENT EXCEEDS	2.8		5.3		2.6	
90 PERCENT EXCEEDS	.40		1.7		.32	

a Also Nov 11, 27, and Nov 29
e Estimated


1,000
500
200
100
50
20
10
5
2
1
0.5
0.2
0.1
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
O
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1997
1998
WATER YEAR

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1995 to current year.
WATER TEMPERATURES: April 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: May 1995 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 801 microsiemens Feb. 17, 1997; minimum daily, 159 microsiemens May 24, 1996.
WATER TEMPERATURES: Maximum daily, 30.0°C Aug. 28 and 30, 1995; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L July 22, 1998; minimum daily mean, 7 mg/L Apr. 24, 1996.
SEDIMENT LOADS: Maximum daily, 1,080 tons May 24, 1996; minimum daily, 0.003 tons Nov. 28, 1995.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 626 microsiemens Oct. 10; minimum daily, 318 microsiemens Mar 30.
WATER TEMPERATURES: Maximum daily, 19.0°C Aug. 11; minimum daily, 1.0°C Dec. 4.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L July 22; minimum daily mean, 12 mg/L Feb. 9, 10.
SEDIMENT LOADS: Maximum daily, 654 tons Mar. 30; minimum daily, 0.03 tons Oct. 1.

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	561	---	---	534	497	---	556	538	---	---
2	---	---	544	---	533	---	---	---	541	---	---	---
3	---	---	---	---	---	532	550	---	---	---	---	482
4	597	---	555	---	---	---	---	---	536	---	---	---
5	---	---	---	---	518	---	---	---	---	---	---	---
6	---	383	---	558	---	534	---	509	---	534	---	---
7	562	---	---	550	---	---	540	---	---	521	---	---
8	568	---	---	553	---	---	546	541	548	542	---	---
9	596	---	---	---	---	---	537	544	548	508	---	---
10	626	441	---	---	---	---	---	---	---	---	529	---
11	---	554	510	---	612	---	---	---	381	514	500	---
12	---	512	---	---	561	---	---	---	---	---	503	---
13	572	---	---	---	---	523	541	---	---	---	445	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	595	---	---	---	551	---	---	551	---	521	---	548
16	---	---	---	---	549	---	---	---	---	541	---	---
17	---	---	---	---	---	596	540	---	---	---	558	554
18	---	---	530	467	601	546	492	---	---	---	---	---
19	---	509	---	447	---	552	507	501	---	---	514	541
20	617	517	564	---	554	530	---	495	511	542	---	520
21	---	556	---	466	---	541	---	---	---	543	---	512
22	603	505	530	---	---	520	534	493	529	514	---	541
23	---	---	505	---	493	---	---	---	528	---	---	490
24	553	---	---	---	---	---	---	---	---	---	537	---
25	592	451	---	---	---	358	536	---	---	---	553	512
26	---	503	---	---	543	382	537	---	---	---	---	---
27	612	---	---	---	540	510	543	---	---	---	466	---
28	---	---	---	563	539	527	---	---	---	538	---	---
29	544	---	493	---	---	---	---	544	---	---	---	451
30	542	---	---	---	---	318	---	---	---	---	475	---
31	---	---	---	548	---	489	---	---	---	523	---	---

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

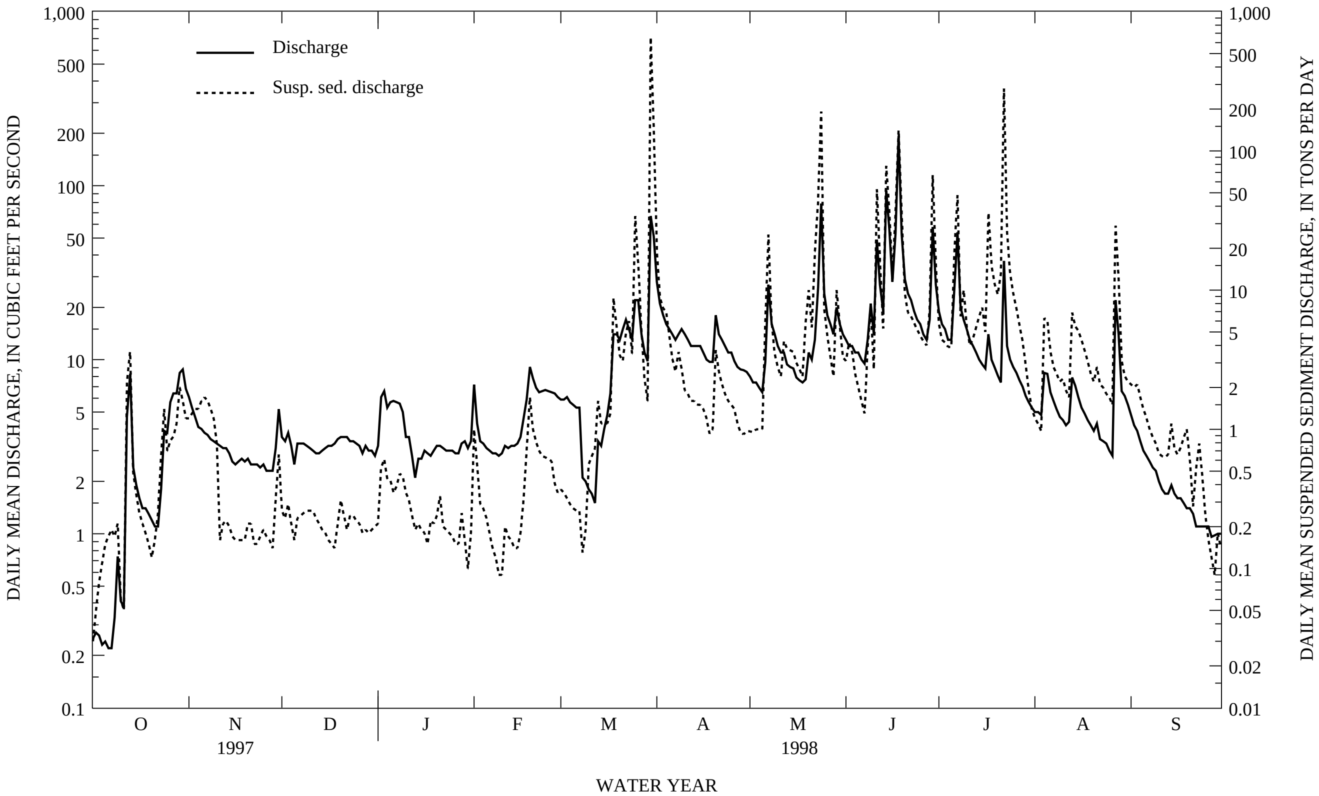
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	18.0	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	1.0	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	3.0	---	---	---	---	---	---	---	---
8	---	---	---	2.0	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	19.0	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	4.5	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	12.5	---	---	---	---
20	---	---	---	---	4.0	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	17.0
22	---	---	---	---	---	---	---	---	---	---	---	13.0
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	8.0	---	---	---	---	---	---

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	39	.03	76	1.2	26	.26	24	.21	47	1.0	23	.37
2	66	.05	91	1.3	25	.23	30	.53	46	.55	22	.35
3	110	.08	108	1.4	28	.29	34	.61	31	.29	20	.32
4	181	.11	128	1.4	24	.21	31	.44	30	.27	19	.29
5	239	.15	152	1.6	24	.16	28	.43	28	.23	18	.27
6	291	.17	170	1.7	26	.23	23	.35	23	.18	18	.26
7	317	.19	158	1.6	27	.24	25	.39	19	.14	18	.26
8	195	.17	146	1.4	29	.25	32	.48	15	.12	24	.13
9	103	.21	134	1.2	30	.26	34	.46	12	.09	36	.19
10	57	.06	88	.79	32	.26	36	.35	12	.09	115	.56
11	45	.05	19	.16	32	.26	32	.31	22	.20	139	.64
12	107	2.2	25	.21	29	.23	32	.24	20	.17	180	.73
13	126	3.6	26	.22	26	.21	34	.19	18	.16	169	1.6
14	74	.49	25	.20	23	.19	29	.21	17	.14	131	1.1
15	66	.34	25	.17	21	.18	26	.19	16	.14	103	1.1
16	59	.25	24	.16	19	.16	22	.18	19	.18	81	1.1
17	53	.21	23	.16	17	.15	19	.15	25	.32	76	1.3
18	47	.18	23	.16	16	.14	29	.22	42	.72	219	8.8
19	42	.15	24	.16	23	.21	26	.21	68	1.7	142	5.4
20	39	.12	29	.21	31	.31	28	.24	49	1.0	98	3.4
21	53	.16	30	.21	25	.24	38	.33	44	.81	75	3.1
22	85	.25	22	.15	20	.19	24	.20	40	.70	105	4.9
23	138	.64	23	.15	26	.24	23	.19	36	.64	146	6.0
24	135	1.4	26	.17	26	.24	22	.18	35	.63	98	3.5
25	67	.70	29	.19	25	.22	21	.17	34	.61	456	34
26	54	.83	27	.17	24	.21	20	.15	33	.59	243	15
27	52	.89	25	.16	23	.18	19	.15	24	.41	134	5.2
28	65	1.1	23	.14	23	.19	27	.25	21	.35	73	2.3
29	87	2.0	35	.32	22	.18	17	.16	---	---	62	1.6
30	65	1.6	46	.66	24	.19	12	.10	---	---	2090	654
31	64	1.2	---	---	26	.20	19	.18	---	---	868	141
TOTAL	---	19.58	---	17.72	---	6.71	---	8.45	---	12.43	---	898.77

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	243	19	45	.97	88	3.1	113	5.7	88	1.2	165	2.1
2	153	8.8	48	.95	127	4.2	103	4.4	81	1.1	180	2.0
3	151	7.4	51	1.0	111	3.6	105	4.2	74	.97	196	2.1
4	162	7.0	54	1.0	81	2.5	107	3.9	205	6.3	189	1.7
5	118	4.7	58	1.0	67	2.0	110	3.9	265	6.0	174	1.4
6	87	3.2	162	6.0	58	1.6	219	19	203	3.6	161	1.2
7	73	2.6	326	25	50	1.3	239	48	178	2.8	148	1.0
8	94	3.6	137	6.0	85	3.8	123	6.5	175	2.5	136	.88
9	64	2.7	93	3.5	125	7.7	220	10	172	2.2	125	.79
10	52	1.9	86	2.8	72	2.7	133	5.4	191	2.3	123	.67
11	51	1.8	82	2.4	276	53	112	4.0	172	1.9	130	.64
12	50	1.6	147	4.3	213	16	136	4.5	146	1.7	138	.63
13	48	1.6	151	3.8	106	5.3	178	5.4	276	6.9	146	.66
14	47	1.5	151	3.7	238	78	234	6.5	290	5.5	208	1.1
15	47	1.5	151	3.6	226	37	295	7.5	311	5.1	160	.73
16	46	1.4	143	3.0	158	12	206	5.0	307	4.4	151	.66
17	45	1.2	131	2.7	211	36	852	36	284	3.7	170	.74
18	35	.93	121	2.4	272	141	544	15	254	3.1	218	.87
19	39	1.0	271	5.9	243	35	460	11	224	2.5	281	1.0
20	77	3.7	357	10	121	9.5	425	9.3	213	2.2	162	.60
21	68	2.6	199	5.4	109	6.9	640	13	242	2.8	81	.28
22	60	2.1	516	19	111	6.5	2130	281	228	2.1	176	.52
23	57	1.8	378	43	112	5.8	766	26	213	2.0	263	.79
24	55	1.6	558	192	112	5.2	462	13	200	1.8	150	.46
25	53	1.5	113	7.3	111	4.7	387	9.5	211	1.7	80	.24
26	52	1.4	93	4.7	111	4.3	324	7.4	195	1.5	56	.16
27	44	1.1	77	3.3	111	4.0	272	5.6	389	29	45	.12
28	40	.95	64	2.4	157	7.1	227	4.3	278	12	36	.09
29	39	.92	189	10	279	67	172	2.9	176	3.1	66	.18
30	42	.97	129	5.7	212	16	125	1.9	145	2.4	52	.14
31	---	---	85	3.3	---	---	97	1.4	152	2.2	---	---
TOTAL	---	92.07	---	386.12	---	582.8	---	581.2	---	126.57	---	24.45
YEAR		2756.87										


Discharge
Susp. sed. discharge
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
DAILY MEAN SUSPENDED SEDIMENT DISCHARGE, IN TONS PER DAY
1,000
500
200
100
50
20
10
5
2
1
0.5
0.2
0.1
0.05
0.02
0.01
O
N
D
J
F
M
A
M
J
J
A
S
1997
1998
WATER YEAR

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--July 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

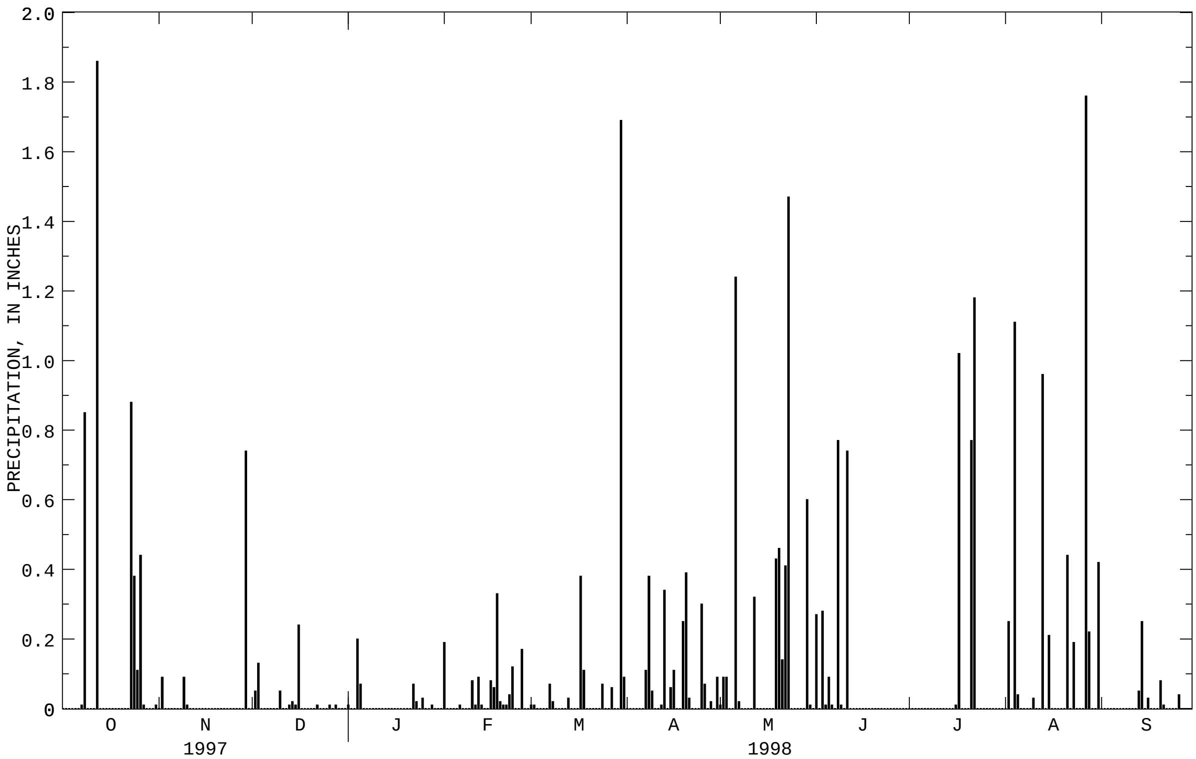
REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.53 in., July 17, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 1.86 in., Oct. 12.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.01	.19	.01	.00	.01	.27	.00	.00	.00
2	.00	.09	.05	.00	.00	.01	.00	.09	.00	.00	.25	.00
3	.00	.00	.13	.00	.00	.00	.00	.09	.28	.00	.00	.00
4	.00	.00	.00	.20	.00	.00	.00	.00	.01	.00	1.11	.00
5	.00	.00	.00	.07	.00	.00	.00	.00	.09	.00	.04	.00
6	.00	.00	.00	.00	.01	.00	.00	1.24	.01	.00	.00	.00
7	.01	.00	.00	.00	.00	.07	.11	.02	.00	.00	.00	.00
8	.85	.00	.00	.00	.00	.02	.38	.00	.77	.00	.00	.00
9	.00	.09	.00	.00	.00	.00	.05	.00	.01	.00	.00	.00
10	.00	.01	.05	.00	.08	.00	.00	.00	.00	.00	.03	.00
11	.00	.00	.00	.00	.01	.00	.00	.00	.74	.00	.00	.00
12	1.86	.00	.00	.00	.09	.00	.01	.32	.00	.00	.00	.00
13	.00	.00	.01	.00	.01	.03	.34	.00	.00	.00	.96	.05
14	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.25
15	.00	.00	.01	.00	.00	.00	.06	.00	.00	.00	.21	.00
16	.00	.00	.24	.00	.08	.00	.11	.00	.00	.01	.00	.03
17	.00	.00	.00	.00	.06	.38	.00	.00	.00	1.02	.00	.00
18	.00	.00	.00	.00	.33	.11	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.02	.00	.25	.43	.00	.00	.00	.00
20	.00	.00	.00	.00	.01	.00	.39	.46	.00	.00	.00	.08
21	.00	.00	.00	.00	.01	.00	.03	.14	.00	.77	.44	.01
22	.00	.00	.01	.07	.04	.00	.00	.41	.00	1.18	.00	.00
23	.88	.00	.00	.02	.12	.00	.00	1.47	.00	.00	.19	.00
24	.38	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00	.00
25	.11	.00	.00	.03	.00	.00	.30	.00	.00	.00	.00	.00
26	.44	.00	.01	.00	.17	.00	.07	.00	.00	.00	.00	.04
27	.01	.00	.00	.00	.00	.06	.00	.00	.00	.00	1.76	.00
28	.00	.00	.01	.01	.00	.00	.02	.00	.00	.00	.22	.00
29	.00	.74	.00	.00	---	.00	.00	.60	.00	.00	.00	.00
30	.00	.00	.00	.00	---	1.69	.09	.01	.00	.00	.00	.00
31	.01	---	.00	.00	---	.09	---	.00	---	.00	.42	---
TOTAL	4.55	0.93	0.54	0.41	1.23	2.54	2.21	5.29	2.18	2.98	5.63	0.46
MEAN	.15	.03	.02	.01	.04	.08	.07	.17	.07	.10	.18	.02
MAX	1.86	.74	.24	.20	.33	1.69	.39	1.47	.77	1.18	1.76	.25
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00


PRECIPITATION, IN INCHES
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
O
N
D
J
F
M
A
M
J
J
A
S
1997
1998

05487550 WALNUT CREEK NEAR VANDALIA, IA

LOCATION.--Lat 41°32'13", long 93°15'32", in $NW^1/_4$ $NE^1/_4$ Sec. 27, T.78 N., R.21 W., Jasper County, Hydrologic Unit 07100008, on right bank downstream side of bridge.

DRAINAGE AREA.--20.3 mi^2.

WATER DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Concrete control. Datum of gage is 785.15 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 4-6, 13, 14, 27, Jan. 10-19, Mar. 9-15, and Sept. 15-22, 24-29. Records good except those for estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in report as miscellaneous water quality data. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.43	13	10	8.4	17	15	81	23	37	47	12	7.5
2	.37	11	9.3	14	11	15	54	20	35	32	12	6.8
3	.51	10	11	17	8.0	16	52	22	34	31	12	6.2
4	.59	9.1	e9.0	15	7.5	15	46	19	31	25	13	5.6
5	.45	8.7	e7.0	21	7.5	14	41	18	30	24	14	5.2
6	.43	8.3	e8.0	16	7.5	13	38	74	27	92	12	5.0
7	.30	8.2	8.6	15	7.2	13	38	167	25	336	12	4.3
8	1.1	7.9	8.6	14	7.0	9.3	45	64	40	55	11	4.1
9	3.6	7.5	8.5	12	6.7	e6.0	53	45	78	46	9.6	3.9
10	1.4	7.5	8.1	e10	7.0	e5.5	41	37	41	41	9.1	3.9
11	1.1	7.0	7.6	e10	7.7	e5.0	38	33	100	32	8.8	3.8
12	11	6.8	7.4	e8.0	7.3	e4.4	34	36	71	26	8.5	3.7
13	29	6.8	e7.0	e6.0	7.8	e8.0	53	29	50	23	19	3.5
14	5.4	6.7	e7.5	e7.0	7.9	e7.5	44	26	447	21	12	4.0
15	4.1	6.3	7.6	e7.0	8.1	e8.0	40	25	286	20	11	e3.8
16	3.6	6.0	8.3	e8.0	9.3	9.2	39	22	80	19	9.0	e3.2
17	3.3	6.1	8.6	e7.5	12	15	33	21	159	40	8.3	e3.2
18	3.2	6.2	8.7	e7.5	16	47	30	20	526	23	7.8	e3.0
19	3.2	6.0	8.9	e8.0	29	54	30	26	229	19	7.4	e2.8
20	3.0	6.2	9.3	9.2	21	47	77	43	77	19	7.1	e2.8
21	3.6	6.1	9.0	8.8	18	55	48	30	69	16	7.3	e2.7
22	3.8	6.0	9.3	8.8	17	59	38	58	49	156	6.8	e2.6
23	5.9	5.7	8.7	8.7	17	49	33	49	41	32	6.5	2.5
24	20	5.4	9.0	8.4	17	37	31	266	36	24	6.5	e2.5
25	12	5.6	8.6	8.5	16	60	32	71	34	20	6.3	e2.4
26	17	5.5	8.4	8.3	18	66	30	56	31	19	6.2	e2.4
27	16	5.2	e7.5	8.3	18	41	25	46	25	18	37	e2.3
28	15	5.3	8.6	9.8	16	32	23	40	32	17	29	e2.2
29	21	6.8	7.9	10	---	27	23	67	134	15	12	e2.1
30	22	18	7.7	9.1	---	284	23	49	80	14	9.2	2.1
31	17	---	6.9	8.8	---	142	---	41	---	13	8.1	---
TOTAL	229.38	224.9	260.6	318.1	349.5	1178.9	1213	1543	2934	1315	350.5	110.1
MEAN	7.40	7.50	8.41	10.3	12.5	38.0	40.4	49.8	97.8	42.4	11.3	3.67
MAX	29	18	11	21	29	284	81	266	526	336	37	7.5
MIN	.30	5.2	6.9	6.0	6.7	4.4	23	18	25	13	6.2	2.1
MED	3.6	6.8	8.6	8.8	10	15	38	37	45	24	9.2	3.3
AC-FT	455	446	517	631	693	2340	2410	3060	5820	2610	695	218
CFSM	.36	.37	.41	.51	.61	1.87	1.99	2.45	4.82	2.09	.56	.18
IN.	.42	.41	.48	.58	.64	2.16	2.22	2.83	5.38	2.41	.64	.20

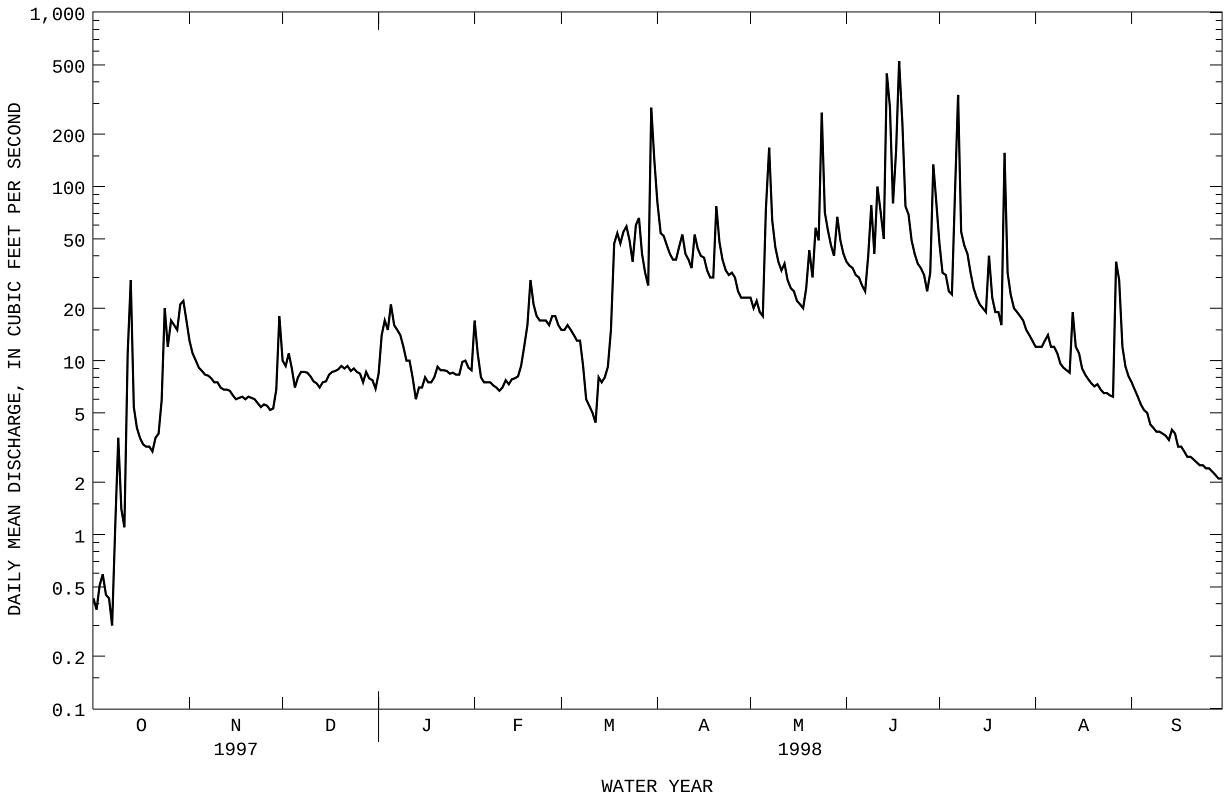
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2.39	3.54	3.85	4.69	28.3	16.0	26.5	61.6	40.1	18.0	5.36	1.63
MAX	7.40	7.50	8.41	10.3	58.8	38.0	47.4	86.1	97.8	42.4	11.3	3.67
(WY)	1998	1998	1998	1998	1996	1998	1995	1996	1998	1998	1998	1998
MIN	.21	.49	1.02	1.47	4.67	6.22	5.62	49.8	15.2	7.12	2.44	.89
(WY)	1995	1995	1995	1995	1995	1996	1996	1998	1995	1997	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1995 - 1998	
ANNUAL TOTAL	4929.99		10026.98			
ANNUAL MEAN	13.5		27.5		17.6	
HIGHEST ANNUAL MEAN					27.5	1998
LOWEST ANNUAL MEAN					12.3	1997
HIGHEST DAILY MEAN	426	Feb 18	526	Jun 18	573	May 24 1996
LOWEST DAILY MEAN	.30	Oct 7	.30	Oct 7	.10	Dec 7 1994
ANNUAL SEVEN-DAY MINIMUM	.44	Oct 1	.44	Oct 1	.14	Oct 9 1994
INSTANTANEOUS PEAK FLOW			1380	Jun 14	1380	Jun 14 1998
INSTANTANEOUS PEAK STAGE			10.85	Jun 14	10.85	Jun 14 1998
INSTANTANEOUS LOW FLOW			.19	Oct 7	.01	Jan 8 1996a
ANNUAL RUNOFF (AC-FT)	9780		19890		12730	
ANNUAL RUNOFF (CFSM)	.67		1.35		.87	
ANNUAL RUNOFF (INCHES)	9.03		18.37		11.76	
10 PERCENT EXCEEDS	24		53		40	
50 PERCENT EXCEEDS	6.7		12		5.9	
90 PERCENT EXCEEDS	1.0		3.8		.55	

a Result of freeze up
e Estimated

05487550 WALNUT CREEK NEAR VANDALIA, IA--Continued



05487550 WALNUT CREEK AT VANDALIA, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1995 to current year.
WATER TEMPERATURES: March 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: March 1995 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 771 microsiemens Oct. 10, 1995; minimum daily, 137 microsiemens Feb. 18, 1997.
WATER TEMPERATURES: Maximum daily, 32.0°C Aug. 13, 1995; minimum daily, 0.0°C many days in winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,120 mg/L Mar. 30, 1998; minimum daily mean, 6.0 mg/L Feb. 9, 1997.
SEDIMENT LOADS: Maximum daily, 4,600 tons Mar. 30, 1998; minimum daily, 0.01 tons Feb. 2-3, 1996.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 556 microsiemens Oct. 4; minimum daily, 210 microsiemens Mar. 30.
WATER TEMPERATURES: Maximum daily, 25.0°C Aug. 11; minimum daily, 1.5°C Jan. 8.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,120 mg/L Mar. 30; minimum daily mean, 8.0 mg/L Dec. 31 to Jan. 1.
SEDIMENT LOADS: Maximum daily, 4,600 tons Mar. 30; minimum daily, 0.05 tons Oct. 1, 2, and Oct. 7.

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	512	---	---	485	---	---	---	489	---	---
2	---	---	509	---	468	482	---	---	495	---	---	---
3	---	---	484	---	503	---	483	---	---	496	---	507
4	556	515	524	---	---	---	---	---	498	---	---	---
5	---	---	---	487	493	485	---	---	---	---	---	---
6	530	---	---	499	---	480	---	444	---	455	---	---
7	---	---	---	---	---	---	485	430	499	428	---	---
8	531	---	---	508	---	---	464	458	448	471	---	---
9	449	---	---	502	---	---	470	471	476	464	---	---
10	---	---	---	---	---	475	---	---	---	---	464	---
11	---	523	478	---	480	476	---	---	264	477	430	---
12	---	496	---	---	509	---	---	---	---	---	480	---
13	---	497	---	470	---	457	419	---	481	---	342	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	539	---	---	482	486	---	---	486	---	487	---	497
16	---	---	---	426	483	---	---	---	---	492	---	---
17	---	471	502	---	---	468	474	---	---	422	502	503
18	---	---	---	455	---	409	478	---	---	---	---	517
19	---	520	---	406	---	445	478	378	---	---	512	425
20	529	466	482	---	---	454	343	416	466	496	---	428
21	527	504	---	400	---	469	---	---	---	501	---	401
22	543	444	457	---	---	---	458	341	477	354	---	422
23	---	---	490	458	490	---	---	---	482	---	---	434
24	462	---	---	---	---	---	---	---	---	---	505	---
25	484	502	---	---	489	423	460	---	---	---	509	504
26	---	511	---	---	460	389	476	483	---	---	---	---
27	506	---	---	454	485	452	---	---	499	495	266	---
28	---	---	---	---	477	472	---	---	---	483	---	---
29	483	---	471	509	---	477	---	466	---	---	499	524
30	477	---	485	---	---	210	---	---	---	---	493	---
31	---	---	---	471	---	385	---	---	---	492	---	---

05487550 WALNUT CREEK AT VANDALIA, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	17.5	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	6.0	---	---	---	---	---
4	12.0	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	4.0	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	12.5	---	---	---	---
8	---	---	---	1.5	---	---	---	---	---	22.5	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	19.0	---	25.0	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	4.0	---	---	---	---	---	---	---
19	---	2.5	---	---	---	---	---	18.0	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	17.5
23	---	---	---	---	---	---	---	---	---	---	---	17.5
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	23.5
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	24.0
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---

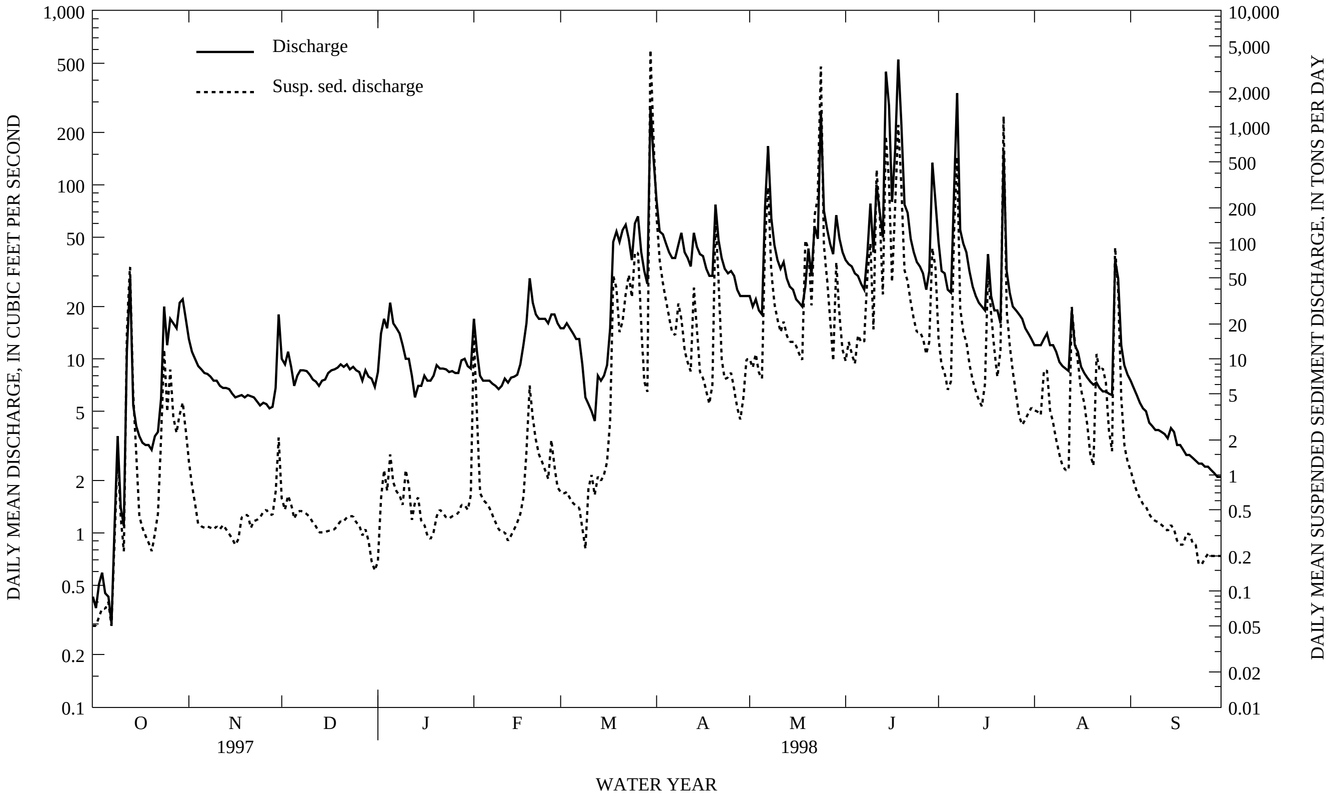
05487550 WALNUT CREEK AT VANDALIA, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	47	.05	39	1.3	22	.62	8	.18	298	16	17	.71
2	46	.05	28	.82	20	.50	14	.62	93	3.2	17	.69
3	45	.06	20	.56	23	.66	23	1.1	32	.70	16	.71
4	45	.07	16	.38	23	.56	18	.73	30	.61	16	.63
5	57	.07	15	.36	22	.42	27	1.5	28	.57	15	.57
6	67	.08	16	.35	22	.48	19	.86	26	.52	15	.54
7	60	.05	16	.36	21	.49	18	.72	23	.45	14	.52
8	76	.27	17	.35	21	.48	18	.67	21	.39	14	.35
9	160	1.6	17	.34	20	.46	16	.55	19	.34	14	.23
10	114	.43	17	.36	19	.43	42	1.1	17	.32	52	.77
11	73	.22	18	.34	19	.39	30	.81	15	.32	74	1.0
12	287	18	20	.37	18	.36	19	.41	14	.27	56	.67
13	694	62	18	.34	17	.32	36	.58	14	.30	45	.97
14	340	5.1	17	.31	16	.32	34	.64	16	.34	44	.89
15	136	1.5	16	.28	16	.32	21	.40	18	.39	47	1.0
16	45	.44	16	.25	15	.33	17	.37	18	.46	50	1.3
17	40	.35	17	.28	14	.33	15	.30	19	.65	69	3.0
18	35	.30	26	.43	15	.34	14	.28	32	1.6	359	52
19	30	.26	28	.45	15	.37	15	.32	75	5.9	274	41
20	27	.22	27	.45	16	.40	18	.44	53	3.1	132	17
21	31	.31	21	.35	17	.40	21	.50	40	2.0	135	21
22	45	.46	25	.40	17	.43	20	.47	33	1.5	223	36
23	92	2.0	27	.41	19	.44	18	.43	27	1.3	394	53
24	204	12	29	.43	18	.44	19	.42	23	1.1	337	34
25	98	3.5	32	.48	17	.39	19	.44	21	.92	474	83
26	158	8.1	34	.50	16	.37	20	.45	40	2.0	460	82
27	66	3.1	32	.46	15	.30	21	.47	26	1.2	174	20
28	56	2.3	31	.45	15	.34	21	.55	18	.78	74	6.4
29	59	3.3	35	.71	13	.27	20	.55	---	---	71	5.2
30	69	4.2	41	2.1	9	.18	20	.50	---	---	3120	4600
31	53	2.4	---	---	8	.15	27	.67	---	---	1730	780
TOTAL	---	132.79	---	14.97	---	12.29	---	18.03	---	47.23	---	5845.15

DAY	MEA CON TRA (MG	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	748	165	170	10	96	9.6	120	15	110	3.6	53	1.1
2	478	70	159	8.4	140	14	100	8.8	107	3.5	48	.87
3	323	45	174	11	122	11	89	7.5	103	3.3	43	.72
4	258	32	150	7.6	110	9.1	81	5.4	183	7.8	41	.63
5	208	23	144	6.8	206	16	97	6.4	211	8.0	41	.56
6	167	17	305	107	199	14	273	127	109	3.6	40	.53
7	161	16	663	301	205	14	485	551	88	2.8	39	.46
8	246	30	332	58	425	52	176	27	71	2.0	38	.42
9	154	22	245	30	421	99	138	17	58	1.5	37	.40
10	106	12	216	22	160	18	125	14	48	1.2	37	.39
11	91	9.3	194	17	944	427	104	8.9	48	1.1	36	.37
12	84	7.8	220	21	887	180	93	6.6	47	1.1	35	.35
13	265	41	204	16	265	36	85	5.3	364	28	35	.33
14	148	18	203	14	551	830	78	4.4	408	14	34	.37
15	71	7.7	217	14	334	334	73	3.9	321	9.3	33	.34
16	65	6.8	210	13	213	46	118	6.1	224	5.4	31	.27
17	59	5.3	195	11	427	216	522	60	190	4.2	29	.25
18	51	4.1	182	9.8	570	1040	383	24	127	2.7	31	.25
19	69	6.0	1040	105	416	303	228	12	78	1.5	41	.31
20	776	178	827	89	275	58	140	7.0	61	1.2	41	.31
21	340	46	358	29	246	47	275	12	513	11	36	.26
22	100	10	982	172	236	31	1530	1230	425	7.9	35	.25
23	75	6.7	876	245	198	22	298	26	471	8.3	25	.17
24	83	6.9	2700	3310	180	17	204	13	360	6.3	25	.17
25	88	7.6	486	94	181	17	140	7.7	142	2.4	30	.19
26	68	5.5	321	49	183	15	96	5.0	94	1.6	33	.21
27	56	3.8	176	22	165	11	67	3.2	585	91	33	.20
28	48	3.0	87	9.6	155	14	60	2.7	427	38	34	.20
29	75	4.6	342	68	178	90	72	3.0	142	4.5	35	.20
30	156	9.9	177	24	269	61	93	3.4	71	1.8	36	.20
31	---	---	109	12	---	---	112	3.8	59	1.3	---	---
TOTAL	---	820.0	---	4906.2	---	4051.7	---	2227.1	---	279.9	---	11.28
YEAR		18366.64										

05487550 WALNUT CREEK AT VANDALIA, IA--Continued



05487550 WALNUT CREEK AT VANDALIA, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--April 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

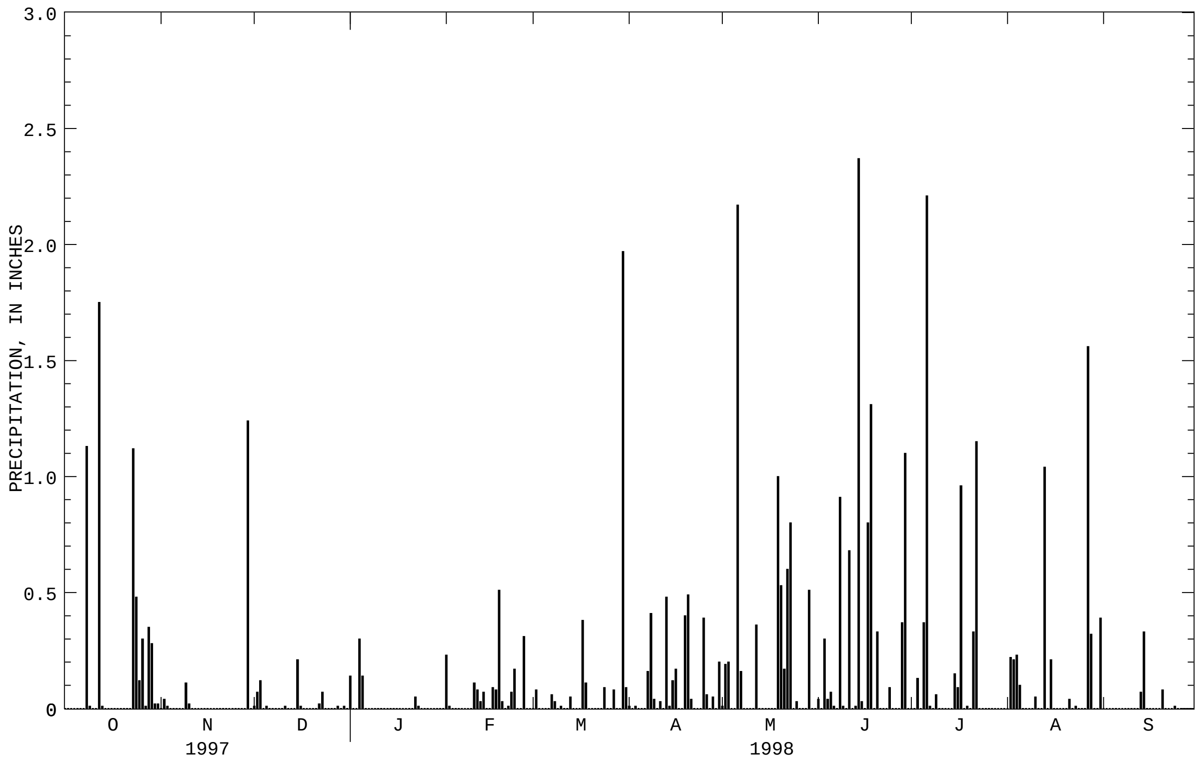
REMARKS.--Records good except for the winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 4.72 in., May 9, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.37 in., June 14.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.01	.14	.23	.00	.01	.01	.04	.00	.00	.00
2	.00	.04	.07	.00	.01	.08	.00	.19	.00	.00	.22	.00
3	.00	.01	.12	.00	.00	.00	.01	.20	.30	.13	.21	.00
4	.00	.00	.00	.30	.00	.00	.00	.00	.04	.00	.23	.00
5	.00	.00	.01	.14	.00	.00	.00	.00	.07	.37	.10	.00
6	.00	.00	.00	.00	.00	.00	.00	2.17	.01	2.21	.00	.00
7	.00	.00	.00	.00	.00	.06	.16	.16	.00	.01	.00	.00
8	1.13	.00	.00	.00	.00	.03	.41	.00	.91	.00	.00	.00
9	.01	.11	.00	.00	.00	.00	.04	.00	.01	.06	.00	.00
10	.00	.02	.00	.00	.11	.01	.00	.00	.00	.00	.05	.00
11	.00	.00	.01	.00	.08	.00	.03	.00	.68	.00	.00	.00
12	1.75	.00	.00	.00	.03	.00	.00	.36	.00	.00	.00	.00
13	.01	.00	.00	.00	.07	.05	.48	.00	.01	.00	1.04	.07
14	.00	.00	.00	.00	.00	.00	.01	.00	2.37	.00	.00	.33
15	.00	.00	.21	.00	.00	.00	.12	.00	.03	.15	.21	.00
16	.00	.00	.01	.00	.09	.00	.17	.00	.00	.09	.00	.00
17	.00	.00	.00	.00	.08	.38	.00	.00	.80	.96	.00	.00
18	.00	.00	.00	.00	.51	.11	.00	.00	1.31	.00	.00	.00
19	.00	.00	.00	.00	.03	.00	.40	1.00	.00	.01	.00	.00
20	.00	.00	.00	.00	.00	.00	.49	.53	.33	.00	.00	.08
21	.00	.00	.00	.00	.01	.00	.04	.17	.00	.33	.04	.00
22	.00	.00	.02	.05	.07	.00	.00	.60	.00	1.15	.00	.00
23	1.12	.00	.07	.01	.17	.00	.00	.80	.00	.00	.01	.00
24	.48	.00	.00	.00	.00	.09	.00	.00	.09	.00	.00	.01
25	.12	.00	.00	.00	.00	.00	.39	.03	.00	.00	.00	.00
26	.30	.00	.00	.00	.31	.00	.06	.00	.00	.00	.00	.00
27	.01	.00	.00	.00	.00	.08	.00	.00	.00	.00	1.56	.00
28	.35	.00	.01	.00	.00	.00	.05	.00	.37	.00	.32	.00
29	.28	1.24	.00	.00	---	.00	.00	.51	1.10	.00	.00	.00
30	.02	.00	.01	.00	---	1.97	.20	.00	.00	.00	.00	.00
31	.02	---	.00	.00	---	.09	---	.00	---	.00	.39	---
TOTAL	5.60	1.42	0.55	0.64	1.80	2.95	3.07	6.73	8.47	5.47	4.38	0.49
MEAN	.18	.05	.02	.02	.06	.10	.10	.22	.28	.18	.14	.02
MAX	1.75	1.24	.21	.30	.51	1.97	.49	2.17	2.37	2.21	1.56	.33
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00


3.0
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PRECIPITATION, IN INCHES
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1997
1998

05487980 WHITE BREAST CREEK NEAR DALLAS, IA

LOCATION.--Lat 41°14'41", long 93°16'08", in NW1/4 NW1/4 sec.3, T.74 N., R.21 W., Marion County, Hydrologic Unit 07100008, on left bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Kirk Branch, and 1.7 mi northwest of Dallas.

DRAINAGE AREA.--342 mi^2.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 759.21 ft above sea level.

REMARKS.--Estimated daily discharges: Dec.26 to Jan. 6, Jan. 10 to Feb. 2, and July 10-19. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 11, 1962 reached a stage of 28.87 ft, from floodmark, discharge, about 12,000 ft^3/s. Flood of June 6, 1947 may have been slightly higher.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

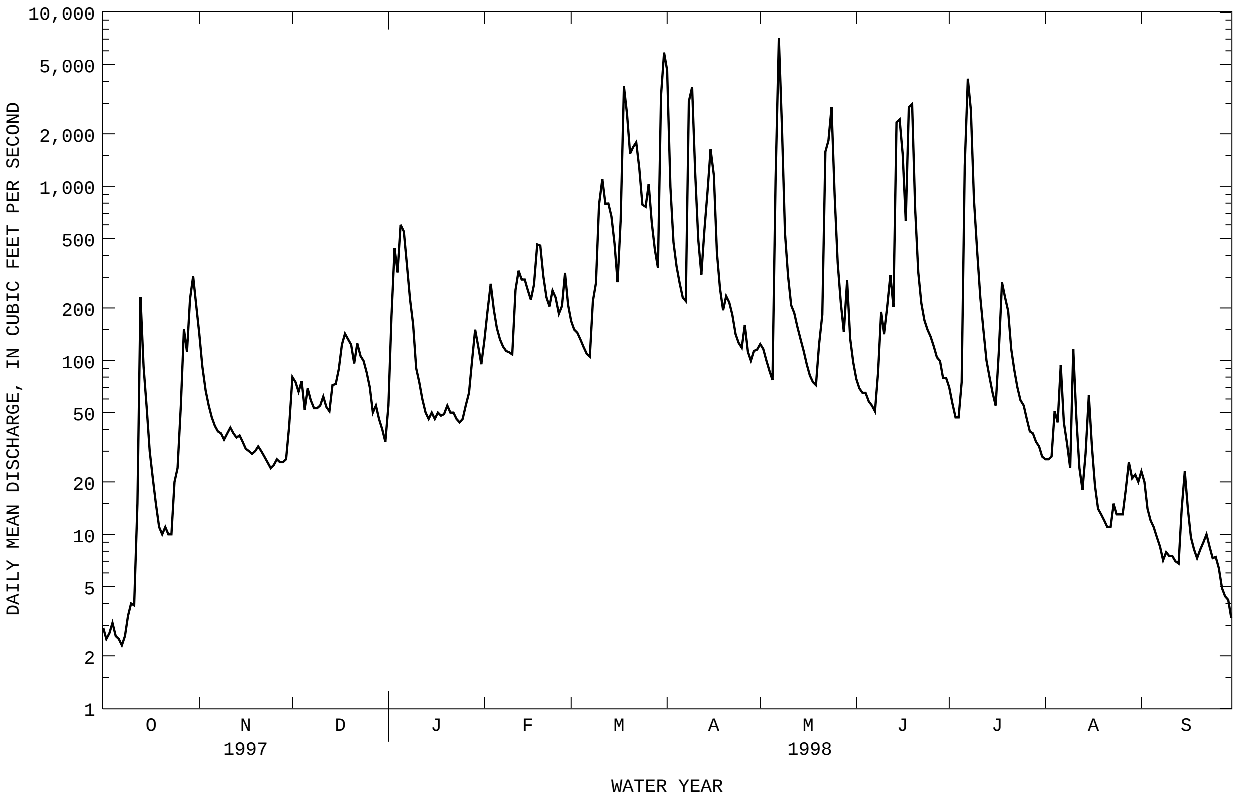
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	142	80	e55	e130	168	4640	124	78	70	27	23
2	2.5	92	75	e180	e190	150	988	116	69	57	27	20
3	2.7	67	66	e440	275	144	477	100	65	47	28	14
4	3.1	55	76	e320	196	131	347	87	65	47	51	12
5	2.6	47	52	e600	153	119	278	77	58	75	44	11
6	2.5	42	69	e550	132	109	230	1090	55	1310	94	9.6
7	2.3	39	59	354	120	105	219	7090	51	4150	44	8.5
8	2.6	38	53	224	113	219	3080	2210	85	2740	33	7.1
9	3.4	35	53	161	111	278	3710	538	190	838	24	7.9
10	4.0	38	55	e90	108	785	1190	305	141	e420	116	7.5
11	3.9	41	62	e75	254	1100	493	207	201	e230	47	7.5
12	15	38	54	e60	327	794	311	187	309	e150	24	7.0
13	231	36	51	e50	291	797	560	156	203	e100	18	6.8
14	92	37	72	e46	291	672	928	132	2330	e80	29	14
15	54	34	73	e50	253	469	1630	113	2420	e65	63	23
16	30	31	89	e46	223	281	1160	95	1530	e55	32	14
17	21	30	123	e50	272	638	414	82	630	e110	19	9.6
18	15	29	142	e48	463	3750	258	75	2840	e280	14	8.2
19	11	30	132	e49	456	2610	194	72	2970	e230	13	7.3
20	10	32	123	e55	303	1540	234	123	736	192	12	8.2
21	11	30	96	e50	230	1680	215	183	321	116	11	9.0
22	10	28	125	e50	204	1790	183	1580	213	88	11	10
23	10	26	106	e46	252	1270	141	1830	170	70	15	8.5
24	20	24	99	e44	230	784	126	2850	150	59	13	7.3
25	24	25	85	e46	185	763	118	895	137	55	13	7.4
26	55	27	e70	e55	205	1030	160	363	120	46	13	6.4
27	151	26	e50	e65	318	618	112	215	104	39	18	4.9
28	112	26	e55	e100	208	433	99	145	99	38	26	4.4
29	226	27	e46	e150	---	340	113	288	79	34	21	4.2
30	304	42	e40	e120	---	3310	115	133	79	32	22	3.3
31	207	---	e34	e95	---	5870	---	97	---	28	20	---
TOTAL	1641.5	1214	2365	4324	6493	32747	22723	21558	16498	11851	942	291.6
MEAN	53.0	40.5	76.3	139	232	1056	757	695	550	382	30.4	9.72
MAX	304	142	142	600	463	5870	4640	7090	2970	4150	116	23
MIN	2.3	24	34	44	108	105	99	72	51	28	11	3.3
AC-FT	3260	2410	4690	8580	12880	64950	45070	42760	32720	23510	1870	578
CFSM	.15	.12	.22	.41	.68	3.09	2.21	2.03	1.61	1.12	.09	.03
IN.	.18	.13	.26	.47	.71	3.56	2.47	2.34	1.79	1.29	.10	.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	123	115	114	67.0	174	348	454	401	274	300	123	195
MAX	1153	757	718	601	718	1056	1592	1823	1146	3641	1202	1903
(WY)	1974	1984	1983	1974	1973	1998	1991	1996	1967	1993	1993	1992
MIN	1.16	1.35	.80	.49	1.82	4.05	3.85	6.44	5.13	1.47	2.09	1.11
(WY)	1990	1977	1964	1977	1964	1964	1989	1980	1977	1988	1971	1968

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1963 - 1998	
ANNUAL TOTAL	57594.0		122648.1			
ANNUAL MEAN	158		336		224	
HIGHEST ANNUAL MEAN					816	1993
LOWEST ANNUAL MEAN					17.1	1989
HIGHEST DAILY MEAN	3980	May 8	7090	May 7	24700	Sep 16 1992
LOWEST DAILY MEAN	2.3	Oct 7	2.3	Oct 7	.02	Oct 14 1989
ANNUAL SEVEN-DAY MINIMUM	2.6	Oct 2	2.6	Oct 2	.05	Aug 9 1989
INSTANTANEOUS PEAK FLOW			9640	Mar 31	37300	Jul 16 1982
INSTANTANEOUS PEAK STAGE			22.19	Mar 31	33.45	Jul 16 1982
ANNUAL RUNOFF (AC-FT)	114200		243300		162300	
ANNUAL RUNOFF (CFSM)	.46		.98		.65	
ANNUAL RUNOFF (INCHES)	6.26		13.34		8.90	
10 PERCENT EXCEEDS	302		789		446	
50 PERCENT EXCEEDS	36		87		36	
90 PERCENT EXCEEDS	5.8		11		2.5	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
10,000
5,000
2,000
1,000
500
200
100
50
20
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1997
1998
WATER YEAR

05488100 LAKE RED ROCK NEAR PELLA, IA

LOCATION.--Lat 41°22'11", long 92°58'48", in NE$^1/_4$ NW$^1/_4$ sec.19, T.76 N., R.18 W., Marion County, Hydrologic Unit 07100008, at outlet works near right end of Red Rock Dam on Des Moines River, 1.4 mi upstream from Lake Creek, 4.5 mi southwest of Pella, and at mile 142.3.

DRAINAGE AREA.--12,323 mi^2.

PERIOD OF RECORD.--March 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Nov. 10, 20. Reservoir is formed by earthfill dam completed in 1969. Storage began in March 1969. Releases controlled through 14 concrete conduits extending through the concrete ogee spillway section into the stilling basin. Inlet invert elevation at 690 ft above sea level. Maximum design discharge through the conduits is 37,500 ft^3/s but normal flood control operation limits maximum outflow to 30,000 ft^3/s. Spillway section consists of 5 tainter gates, 41 ft wide and 45 ft high, on concrete ogee crest at elevation 736 ft. The storage capacity of the reservoir at full flood-control pool level, 780 ft, is 1,489,900 acre-ft, surface area, 65,440 acres. Conservation pool level, 742 feet, is 265,500 acre-feet, surface area, 19,100 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will maintain an elevation of 742 ft with minimum release of 300 ft^3/s and maximum release of 30,000 ft^3/s during the non-growing season, providing discharges at Ottumwa and Keosauqua do not exceed 30,000 ft^3/s and 35,000 ft^3/s respectively. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 1,933,000 acre-ft July 12, 13, 1993; maximum elevation, 782.67 ft July 13, 1993; minimum daily contents, 43,900 acre-ft May 24, 1985, minimum elevation, 719.68 ft Feb. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 1,080,000 acre-ft July 10-13; maximum elevation, 768.57 ft July 12,13; minimum daily contents, 249,000 acre-ft Jan. 10; minimum elevation, 742.10 ft Jan 10.

Capacity table (elevation in feet, contents in acre-feet)

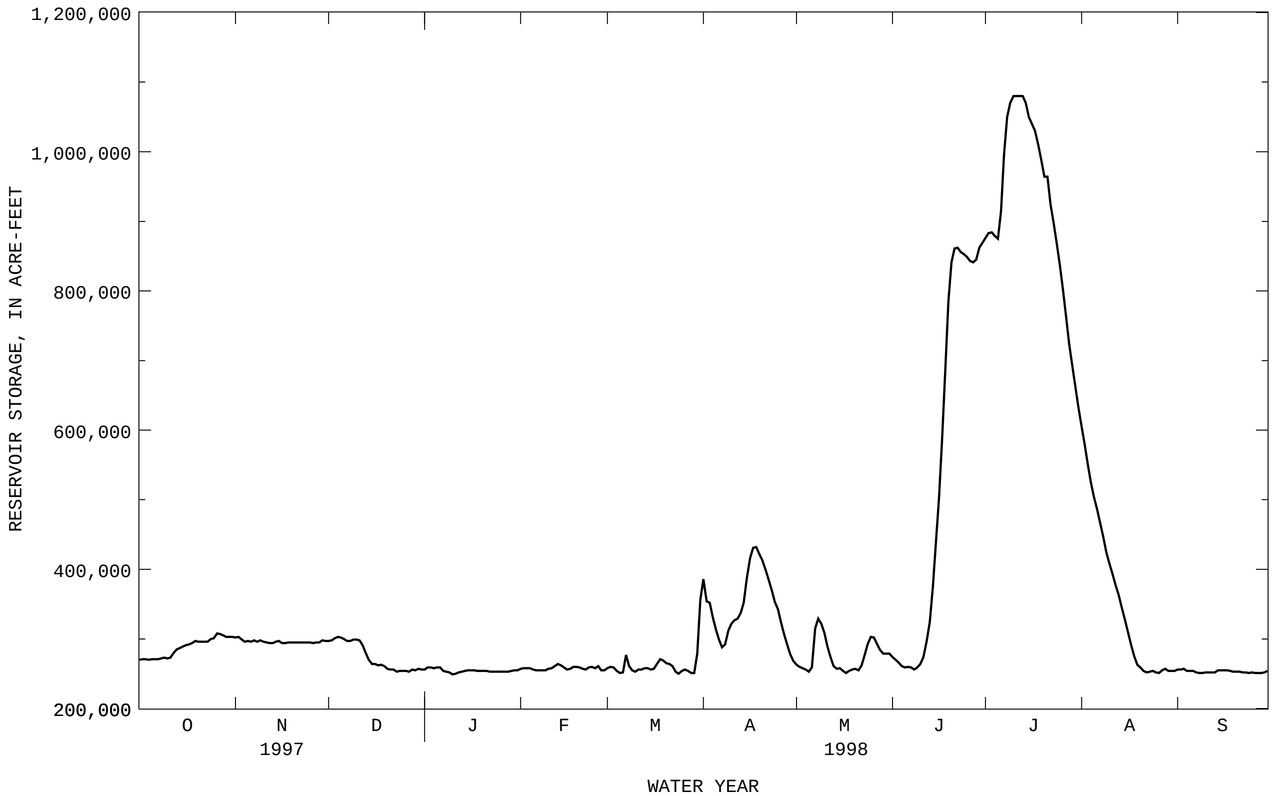
700	300	720	27,700	740	226,000	760	754,000	780	1,751,000
705	1,200	725	50,700	745	324,000	765	948,000	785	2,109,000
710	3,940	730	89,200	750	445,000	770	1,178,000		
715	11,900	735	149,000	755	589,000	775	1,444,000		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	270000	302000	297000	256000	257000	258000	386000	263000	274000	876000	605000	256000
2	271000	303000	298000	259000	258000	260000	354000	260000	270000	883000	579000	256000
3	271000	299000	301000	259000	258000	259000	352000	258000	266000	884000	551000	257000
4	270000	296000	303000	258000	258000	254000	331000	256000	261000	879000	525000	254000
5	271000	297000	302000	259000	256000	251000	314000	253000	259000	875000	504000	254000
6	271000	296000	300000	259000	255000	252000	299000	259000	260000	914000	487000	254000
7	271000	298000	297000	254000	255000	277000	288000	315000	259000	997000	467000	252000
8	272000	296000	297000	253000	255000	261000	292000	329000	256000	1050000	446000	251000
9	273000	298000	299000	252000	255000	255000	312000	322000	259000	1070000	424000	251000
10	272000	e296000	299000	249000	257000	253000	322000	309000	264000	1080000	408000	252000
11	273000	295000	298000	250000	258000	256000	327000	289000	274000	1080000	393000	252000
12	280000	294000	291000	252000	261000	256000	329000	274000	297000	1080000	377000	252000
13	285000	294000	280000	253000	264000	258000	337000	261000	324000	1080000	363000	252000
14	287000	296000	270000	254000	262000	258000	352000	257000	374000	1070000	345000	255000
15	289000	297000	264000	255000	259000	256000	387000	258000	439000	1050000	327000	255000
16	291000	294000	264000	255000	256000	257000	416000	254000	502000	1040000	309000	255000
17	292000	294000	262000	255000	257000	264000	431000	251000	586000	1030000	291000	255000
18	294000	295000	263000	254000	260000	271000	432000	254000	681000	1010000	275000	254000
19	297000	295000	261000	254000	260000	269000	422000	256000	785000	988000	263000	253000
20	296000	e295000	257000	254000	259000	265000	413000	257000	841000	964000	259000	253000
21	296000	295000	256000	254000	257000	264000	400000	255000	861000	964000	254000	253000
22	296000	295000	256000	253000	256000	261000	386000	262000	862000	924000	252000	252000
23	296000	295000	253000	253000	259000	253000	370000	277000	856000	898000	253000	252000
24	300000	295000	254000	253000	260000	250000	353000	293000	853000	869000	254000	251000
25	301000	295000	254000	253000	258000	254000	343000	303000	849000	836000	252000	252000
26	308000	294000	254000	253000	261000	256000	324000	302000	843000	801000	251000	251000
27	307000	295000	253000	253000	255000	254000	307000	293000	841000	763000	255000	251000
28	305000	295000	256000	253000	255000	251000	292000	284000	845000	724000	257000	251000
29	303000	298000	255000	254000	---	251000	278000	279000	862000	693000	254000	252000
30	303000	297000	257000	255000	---	279000	268000	279000	869000	663000	254000	254000
31	303000	---	256000	255000	---	356000	---	279000	---	633000	254000	---
MEAN	288000	296000	274000	254000	258000	262000	347000	276000	542000	925000	354000	253000
MAX	308000	303000	303000	259000	264000	356000	432000	329000	869000	1080000	605000	257000
MIN	270000	294000	253000	249000	255000	250000	268000	251000	256000	633000	251000	251000

CAL YR 1997 MEAN 274000 MAX 425000 MIN 228000
WTR YR 1998 MEAN 362000 MAX 1080000 MIN 249000

e Estimated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WATER YEAR

05488110 DES MOINES RIVER NEAR PELLA, IA

LOCATION.--Lat 41°21'38", long 92°58'23", in SW$^1/_4$ SW$^1/_4$ SE$^1/_4$ sec.19, T.76 N., R.18 W., Marion County, Hydrologic Unit 07100009, on right bank, 0.4 mile downstream of outlet of Red Rock Reservoir, and 0.75 mile upstream of Lake Creek.

DRAINAGE AREA.--12,330 mi^2.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 600.00 ft above sea level.

REMARKS.--Estimated daily discharges: Sept. 11-20. Records good except those for estimated daily discharges, which are fair. Flow regulated by Lake Red Rock (station 05488100) 0.4 mi upstream. Periodic observations of water temperature and specific conductance are published as in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	421	2300	1860	1020	1450	7360	17300	18300	18300	23800	20300	2270
2	419	2270	1280	1160	2090	7350	23200	16000	18300	23800	19700	3200
3	421	2260	1590	2600	2830	7750	23900	14600	18200	23900	19600	3240
4	410	1800	1860	3770	3160	8140	21800	13500	16900	23800	19500	3270
5	408	1270	1820	2970	3430	7650	20400	13200	13200	24000	18500	2930
6	409	1100	1850	3870	2780	5520	20300	11700	10600	18900	17000	2580
7	404	841	1890	4810	2000	3660	20200	9420	10700	12600	17200	2550
8	409	1190	1420	3680	1770	6310	20300	9860	10700	20300	18200	2590
9	386	1170	1060	3030	1780	6810	21300	12100	12400	22600	18500	1950
10	395	1160	1490	1670	1770	4750	24200	13600	15800	23100	18700	1650
11	396	1180	1880	678	2650	3260	26000	15000	17000	23200	18600	e1400
12	416	918	4440	616	1960	3180	26700	15900	16400	23200	18500	e1400
13	367	749	7130	906	1760	2940	25500	14600	17200	23100	18600	e1400
14	369	750	7110	726	4240	3630	19600	11700	15500	23100	18600	e1500
15	375	985	5910	871	4250	4760	9430	8990	11300	23100	18300	e1400
16	370	1190	2280	1420	4240	4750	5710	8060	15000	23000	18200	e1400
17	371	962	2800	1290	4830	4990	9340	9160	16300	22500	16700	e1400
18	374	756	1880	1270	7690	8680	16400	11200	11600	22900	13000	e1400
19	353	761	2920	1200	9950	13900	22200	15300	7130	22800	9530	e1300
20	580	766	3310	1210	10800	13400	26700	18100	11200	22800	6640	e1200
21	734	899	2270	1190	11300	12300	29000	17200	18000	22700	6170	1060
22	741	973	2210	1160	11300	14100	28900	14800	21200	22700	5970	1060
23	633	982	2670	1160	10600	15700	28700	15300	23000	22500	5850	965
24	768	1000	2020	1170	10600	13200	27700	12900	22400	22600	5400	872
25	915	1010	1640	1170	10200	11000	25900	11800	23200	22600	5190	900
26	903	1010	1620	1160	9530	12200	26100	15100	23700	22600	4250	943
27	2490	1030	1680	1170	11100	14600	25700	17500	23700	22600	3690	831
28	3440	1030	1200	1190	8940	15900	24600	18000	23700	22500	5040	687
29	3440	1040	1010	1090	---	14100	23100	17900	23800	22300	5900	504
30	3450	2040	1030	1210	---	13100	20900	17900	23800	22200	5280	413
31	2800	---	1130	1380	---	11900	---	18100	---	21600	1890	---
TOTAL	28367	35392	74260	51817	159000	276890	661080	436790	510230	693400	398500	48265
MEAN	915	1180	2395	1672	5679	8932	22040	14090	17010	22370	12850	1609
MAX	3450	2300	7130	4810	11300	15900	29000	18300	23800	24000	20300	3270
MIN	353	749	1010	616	1450	2940	5710	8060	7130	12600	1890	413
AC-FT	56270	70200	147300	102800	315400	549200	1311000	866400	1012000	1375000	790400	95730
CFSM	.07	.10	.19	.14	.46	.72	1.79	1.14	1.38	1.81	1.04	.13
IN.	.09	.11	.22	.16	.48	.84	1.99	1.32	1.54	2.09	1.20	.15

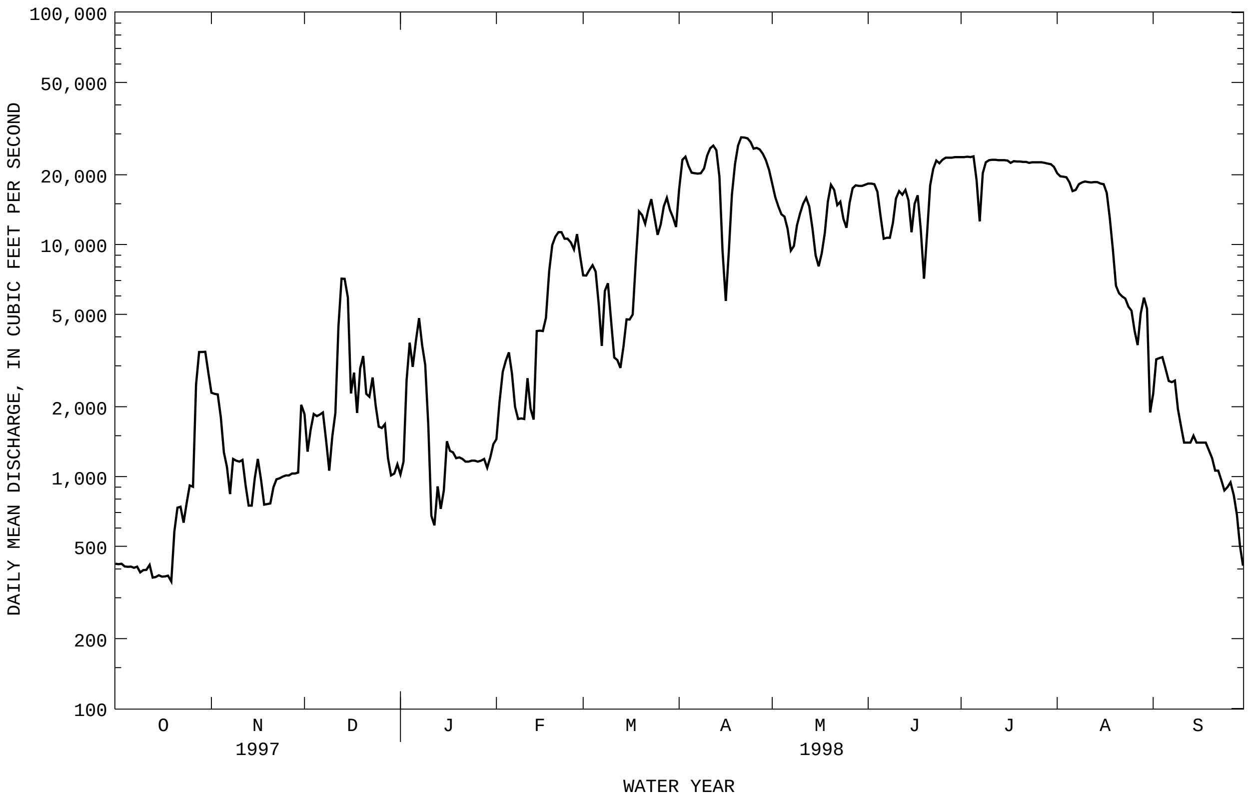
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4370	4706	5069	2412	4989	10490	14190	15310	17390	25500	12470	6781
MAX	11150	11990	12380	3997	8246	17480	22040	28520	27950	79340	44600	33490
(WY)	1994	1993	1993	1993	1997	1993	1998	1993	1993	1993	1993	1993
MIN	915	1180	2395	1410	2310	2892	5051	6361	9395	7039	2412	491
(WY)	1998	1998	1998	1996	1995	1996	1996	1994	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1993 - 1998	
ANNUAL TOTAL	2452233		3373991			
ANNUAL MEAN	6718		9244		10340	
HIGHEST ANNUAL MEAN					24360	1993
LOWEST ANNUAL MEAN					6168	1994
HIGHEST DAILY MEAN	24200	Feb 25	29000	Apr 21	104000	Jul 12 1993
LOWEST DAILY MEAN	344	Sep 6	353	Oct 19	344	Sep 6 1997
ANNUAL SEVEN-DAY MINIMUM	368	Oct 13	368	Oct 13	368	Oct 13 1997
INSTANTANEOUS PEAK FLOW			29200	Apr 20,21	105000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			96.92	Apr 20,21	109.71	Jul 12 1993
ANNUAL RUNOFF (AC-FT)	4864000		6692000		7493000	
ANNUAL RUNOFF (CFSM)	.54		.75		.84	
ANNUAL RUNOFF (INCHES)	7.40		10.18		11.40	
10 PERCENT EXCEEDS	18400		22800		22600	
50 PERCENT EXCEEDS	4080		5400		5430	
90 PERCENT EXCEEDS	429		837		1300	

e Estimated

05488110 DES MOINES RIVER NEAR PELLA, IA--Continued



05488200 ENGLISH CREEK NEAR KNOXVILLE, IA

LOCATION.--Lat 41°18'02" (revised), long 93°02'43" (revised), in NE$^1/_4$ SE$^1/_4$ sec.16, T.75 N., R.19 W., Marion County, Hydrologic Unit 07100009, on left bank 30 ft from left upstream abutment of bridge on State Highway 92, 3 mi east of Knoxville, and 11.4 mi upstream from mouth at Des Moines River.

DRAINAGE AREA.--90.1 mi^2.

PERIOD OF RECORD.--July 1985 to current year.

REVISED RECORDS.--WDR IA-97:(M)

GAGE.--Water-stage recorder. Datum of gage is 721.79 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 17-27, Dec. 12-14, Dec. 25 to Jan. 3, Jan. 10 to Feb. 2, Aug. 19-23, and Sept. 11-30. Records fair except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 16, 1982 reached a stage of 30.28 ft, gage datum, discharge 28,000 ft^3/s, from contracted-opening indirect computations.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	51	25	e13	e32	71	672	73	35	38	21	4.2
2	.49	30	15	e50	e55	59	207	71	32	31	20	3.3
3	.39	20	16	e230	76	59	150	58	32	28	20	2.7
4	.31	16	25	135	42	57	128	50	32	27	77	2.3
5	.25	12	22	229	33	47	108	44	31	31	206	2.8
6	.23	10	16	335	25	42	95	47	29	854	172	2.8
7	.25	9.7	13	130	20	38	141	1110	27	1360	49	2.9
8	.28	8.9	12	73	19	111	913	605	37	418	31	2.1
9	.45	8.6	13	53	18	288	1110	133	85	113	24	1.7
10	.33	9.7	14	e30	27	256	348	83	67	80	68	1.8
11	.30	13	16	e19	115	186	168	63	129	66	68	e2.1
12	16	10	e14	e16	297	134	127	55	214	57	21	e2.1
13	75	9.4	e12	e14	130	102	211	54	74	50	14	e2.0
14	35	8.5	e15	e11	93	115	644	41	447	45	11	e11
15	9.9	7.7	17	e12	76	114	726	37	1090	40	10	e9.0
16	3.3	6.1	26	e11	69	79	340	34	366	36	7.7	e6.5
17	e2.6	5.0	45	e13	87	200	160	29	520	66	5.9	e4.6
18	e1.8	4.6	53	e12	132	1210	121	26	986	79	4.6	e4.0
19	e1.4	4.4	44	e12	181	974	105	28	2470	49	e4.2	e3.6
20	e1.2	5.5	40	e13	124	463	114	63	427	39	e3.9	e4.2
21	e1.3	5.4	39	e14	83	401	127	50	120	35	e3.7	e4.6
22	e1.2	5.6	36	e13	66	508	92	181	87	37	e3.5	e5.5
23	e1.1	5.0	33	e12	77	328	79	180	72	33	e3.4	e5.0
24	e3.0	4.0	34	e12	78	179	71	592	64	30	3.3	e4.6
25	e8.0	4.1	e29	e13	58	173	71	185	57	29	2.8	e4.0
26	e30	4.0	e21	e15	82	285	78	114	49	27	2.5	e4.6
27	e75	4.3	e15	e16	249	135	65	72	41	27	5.5	e5.0
28	58	4.5	e16	e19	112	100	58	53	39	26	8.2	e4.5
29	80	5.7	e13	e32	---	82	58	55	45	24	7.0	e4.2
30	164	17	e11	e27	---	592	59	62	47	23	5.5	e3.9
31	177	---	e8.5	e23	---	2220	---	43	---	22	4.0	---
TOTAL	748.56	309.7	708.5	1607	2456	9608	7346	4291	7751	3820	887.7	121.6
MEAN	24.1	10.3	22.9	51.8	87.7	310	245	138	258	123	28.6	4.05
MAX	177	51	53	335	297	2220	1110	1110	2470	1360	206	11
MIN	.23	4.0	8.5	11	18	38	58	26	27	22	2.5	1.7
AC-FT	1480	614	1410	3190	4870	19060	14570	8510	15370	7580	1760	241
CFSM	.27	.11	.25	.58	.97	3.44	2.72	1.54	2.87	1.37	.32	.04
IN.	.31	.13	.29	.66	1.01	3.97	3.03	1.77	3.20	1.58	.37	.05

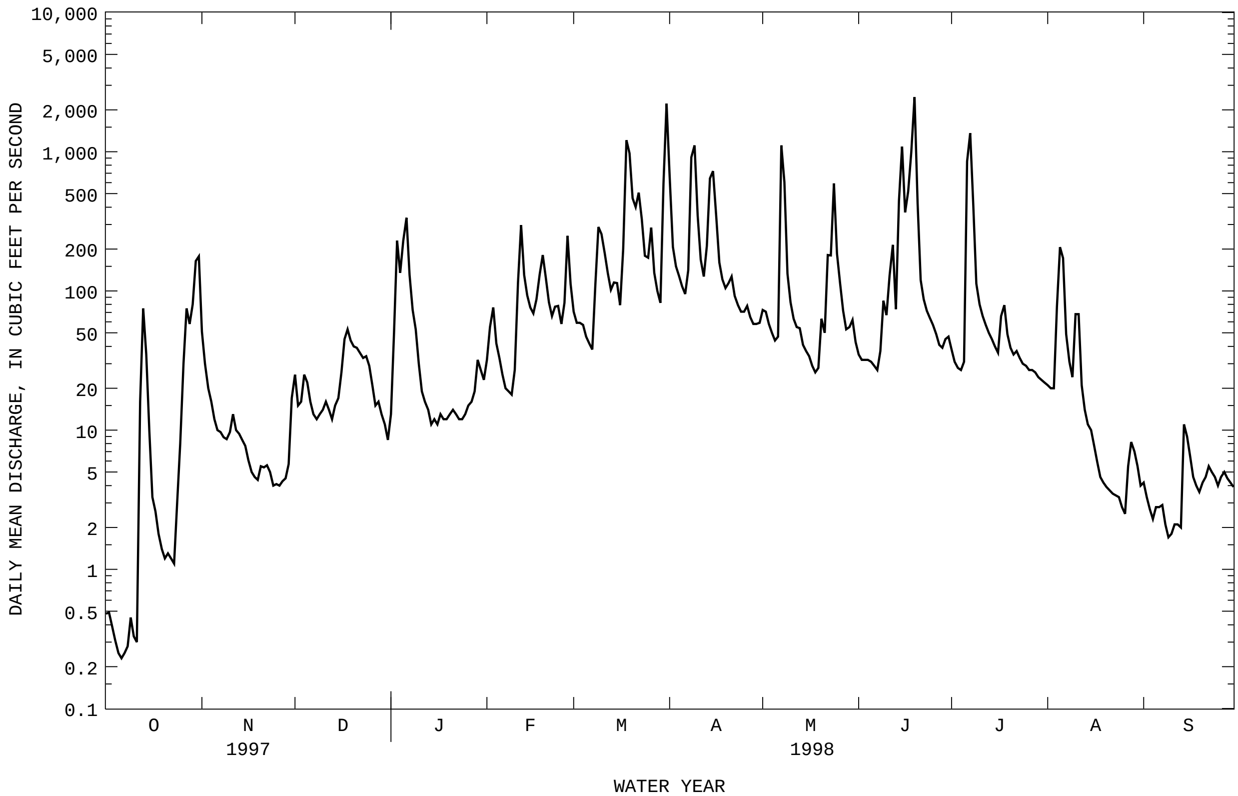
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	24.5	23.5	28.1	15.7	43.1	102	122	153	82.1	101	35.7	40.7
MAX	161	100	112	51.8	134	335	476	514	258	1039	285	159
(WY)	1987	1993	1993	1998	1997	1993	1991	1996	1998	1993	1993	1992
MIN	.48	.76	.31	.66	.50	2.05	1.03	2.27	2.27	.18	.17	.026
(WY)	1995	1989	1989	1989	1989	1989	1989	1989	1992	1988	1988	1991

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1985 - 1998	
ANNUAL TOTAL	16630.70		39655.06			
ANNUAL MEAN	45.6		109		65.4	
HIGHEST ANNUAL MEAN					214	1993
LOWEST ANNUAL MEAN					6.71	1989
HIGHEST DAILY MEAN	2240	May 8	2470	Jun 19	8610	Jul 5 1993
LOWEST DAILY MEAN	.10	Sep 4	.23	Oct 6	.00	Sep 12 1988a
ANNUAL SEVEN-DAY MINIMUM	.13	Sep 1	.30	Oct 5	.00	Sep 25 1991
INSTANTANEOUS PEAK FLOW			2830	Jun 19	18900	Jul 5 1993
INSTANTANEOUS PEAK STAGE			22.46	Jun 19	27.88	Jul 5 1993
ANNUAL RUNOFF (AC-FT)	32990		78660		47370	
ANNUAL RUNOFF (CFSM)	.51		1.21		.73	
ANNUAL RUNOFF (INCHES)	6.87		16.37		9.86	
10 PERCENT EXCEEDS	77		220		105	
50 PERCENT EXCEEDS	9.4		33		10	
90 PERCENT EXCEEDS	.31		3.5		.34	

a Also Sep 13-17, 1988, Aug 8-13, 1989, Sep 6-10, 21, and Sep 25 to Oct 3, 1991
e Estimated

05488200 ENGLISH CREEK NEAR KNOXVILLE, IA--Continued



05488500 DES MOINES RIVER NEAR TRACY, IA

LOCATION.--Lat 41°16'53", long 92°51'34", in NW$^{1}/_{4}$ SE$^{1}/_{4}$ sec.19, T.75 N., R.17 W., Mahaska County, Hydrologic Unit 07100009, on right bank 250 ft upstream from abandoned Bellefountaine Bridge, 0.8 mi east of Tracy, 3.1 mi upstream from Cedar Creek, 3.8 mi downstream from bridge on newly located State Highway 92, 6.4 mi downstream from English Creek, and at mile 130.4.

DRAINAGE AREA.--12,479 mi^2.

PERIOD OF RECORD.--March 1920 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1920 (M), 1922 (M), 1933.

GAGE.--Water-stage recorder. Datum of gage is 670.91 ft above sea level. Prior to June 26, l940 and June 30, 1952 to Nov. 4, 1960 nonrecording gage, and June 27, 1940 to June 29, 1952 water-stage recorder, at site 250 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Jan. 10-25. Records good except those for periods of estimated daily discharges, which are poor. Flow regulated by Lake Red Rock (station 05488100) 11.9 mi upstream, since March 12, 1969. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers gage-height telemeter and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 155,000 ft^3/s, June 14, 1947, gage height, 26.5 ft; minimum daily discharge, 40 ft^3/s Jan. 29 to Feb. 2, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1851, that of June 14, 1947. Flood of May 31, 1903, reached a stage of about 25 ft, discharge, about 130,000 ft^3/s. Minimum daily discharge since at least 1910, that of Jan. 29 to Feb. 1, 1940.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	397	2600	2210	1460	1520	7210	19200	19700	18500	24800	20900	2030
2	396	2540	1410	1260	1920	7180	25800	17000	18400	24700	20000	3120
3	397	2480	1600	2370	2730	7480	26700	16000	18400	24700	19900	3140
4	398	2130	1960	3740	2980	8010	24800	14800	17700	24700	19800	3130
5	398	1520	1980	3350	3260	7620	22700	14200	14400	24900	19000	2900
6	396	1330	1960	3600	2900	5960	22500	13000	10900	24400	18000	2490
7	396	977	1960	4650	2160	3170	22500	11900	10900	16900	17700	2340
8	409	1310	1670	3880	1830	5980	25300	11000	10900	20600	18100	2350
9	413	1320	1190	3050	1820	6920	26800	12700	12500	23300	18200	1990
10	396	1330	1410	e1900	1830	5410	27800	14600	15800	24100	18700	1500
11	397	1330	1940	e850	2360	3360	29200	15600	17600	24100	18700	1490
12	513	1190	3360	e750	2570	3340	30000	16700	17100	24100	18200	1490
13	654	919	6660	e1000	1360	3170	29200	15800	17400	24000	18200	1490
14	494	914	6710	e850	3940	3380	24700	12800	17300	24000	18300	1680
15	456	1050	6120	e1000	3970	4540	12600	9620	14000	23900	18200	1430
16	435	1320	2500	e1500	3970	4520	6470	7890	15500	23800	18000	1530
17	425	1200	2720	e1450	4240	4750	8790	9010	18000	23400	17200	1530
18	417	916	1990	e1400	6870	9100	16700	11100	15100	23900	13700	1530
19	418	914	2720	e1350	9970	15900	23300	14900	11400	23700	10400	1430
20	539	914	3200	e1300	10900	15400	28000	18400	12800	23600	6360	1280
21	857	988	2580	e1300	11500	13200	30900	17800	17600	23500	6080	1260
22	860	1130	2070	e1250	11500	14900	30800	15900	21500	23600	5500	1250
23	806	1130	2670	e1250	11300	17100	30600	15900	23800	23300	5600	1190
24	826	1130	2320	e1250	10200	15100	29700	15400	23100	23300	5110	1070
25	1110	1130	1740	e1250	10900	11500	27700	12500	23700	23300	4980	1070
26	1210	1130	1760	1240	9140	12700	27500	15300	24500	23300	4140	1070
27	2150	1140	1800	1240	11400	15100	27500	17800	24500	23300	3560	996
28	3420	1150	1490	1260	9670	17400	26100	18300	24600	23200	4610	819
29	3470	1170	1160	1180	---	15400	24800	18200	24800	23000	5730	641
30	3560	1840	1180	1280	---	14400	22300	18100	25000	22900	5550	393
31	3290	---	1550	1360	---	17000	---	18300	---	22300	2370	---
TOTAL	30303	40142	75590	54570	158710	296200	730960	460220	537700	726600	400790	49629
MEAN	978	1338	2438	1760	5668	9555	24370	14850	17920	23440	12930	1654
MAX	3560	2600	6710	4650	11500	17400	30900	19700	25000	24900	20900	3140
MIN	396	914	1160	750	1360	3170	6470	7890	10900	16900	2370	393
AC-FT	60110	79620	149900	108200	314800	587500	1450000	912800	1067000	1441000	795000	98440
CFSM	.08	.11	.20	.14	.45	.77	1.95	1.19	1.44	1.88	1.04	.13
IN.	.09	.12	.23	.16	.47	.88	2.18	1.37	1.60	2.17	1.19	.15

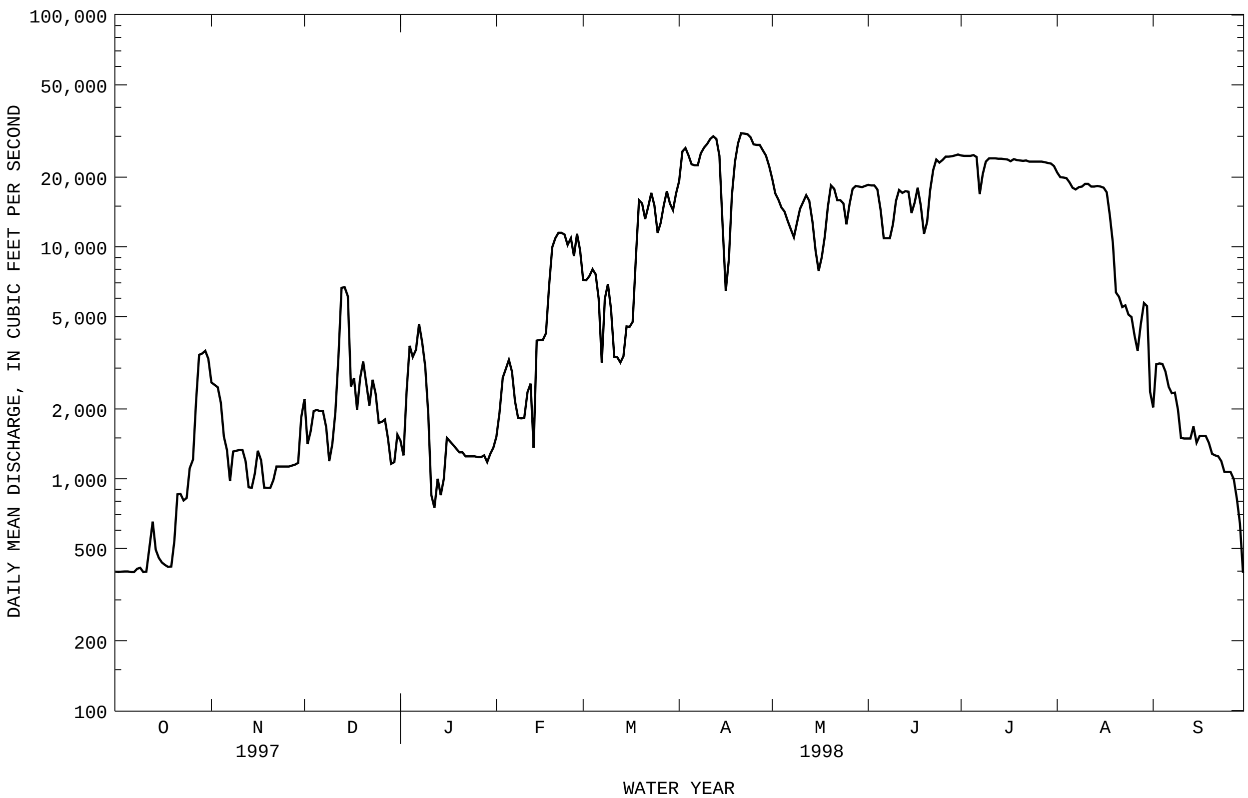
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3804	4793	4018	2675	4586	9510	11950	11890	13100	13810	8250	4512
MAX	17190	19160	12540	11510	15560	21520	24370	28280	30260	80800	45240	33670
(WY)	1974	1987	1983	1973	1973	1983	1998	1993	1984	1993	1993	1993
MIN	318	341	344	305	276	746	866	425	277	220	591	342
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1989	1976

05488500 DES MOINES RIVER NEAR TRACY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1970 - 1998a	
ANNUAL TOTAL	2587291		3561414			
ANNUAL MEAN	7088		9757		7757	
HIGHEST ANNUAL MEAN					24450	1993
LOWEST ANNUAL MEAN					898	1977
HIGHEST DAILY MEAN	26600	Feb 25	30900	Apr 21	107000	Jul 12 1993
LOWEST DAILY MEAN	391	Sep 6	393	Sep 30	165	Feb 20 1977
ANNUAL SEVEN-DAY MINIMUM	397	Oct 1	397	Oct 1	210	Oct 9 1980
INSTANTANEOUS PEAK FLOW			31000	Apr 21	109000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			13.57	Apr 21	24.16	Jul 12 1993
ANNUAL RUNOFF (AC-FT)	5132000		7064000		5620000	
ANNUAL RUNOFF (CFSM)	.57		.78		.62	
ANNUAL RUNOFF (INCHES)	7.71		10.62		8.45	
10 PERCENT EXCEEDS	19500		23900		19100	
50 PERCENT EXCEEDS	4160		5500		4100	
90 PERCENT EXCEEDS	448		984		582	

a Post regulation
e Estimated



05489000 CEDAR CREEK NEAR BUSSEY, IA

LOCATION.--Lat 41°13'09", long 92°54'38", at SW corner sec.11, T.74 N., R.18 W., Marion County, Hydrologic Unit 07100009, on left bank 10 ft downstream from bridge on State Highway 156, 0.8 mi downstream from North Cedar Creek, 1.6 mi northwest of Bussey, 3.0 mi upstream from Honey Creek, and 8.9 mi upstream from mouth.

DRAINAGE AREA.--374 mi^2.

PERIOD OF RECORD.--October 1947 to current year.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water stage recorder. Datum of gage is 682.15 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Feb. 21, 1949, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 12-14, Dec. 25 to Jan. 3, Jan. 10 to Feb. 2, and Sept. 1-8. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1946 reached a stage of 28.45 ft on upstream side and 28.05 ft on downstream side of bridge, levels to floodmarks by U.S. Army Corps of Engineers, discharge, 31,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

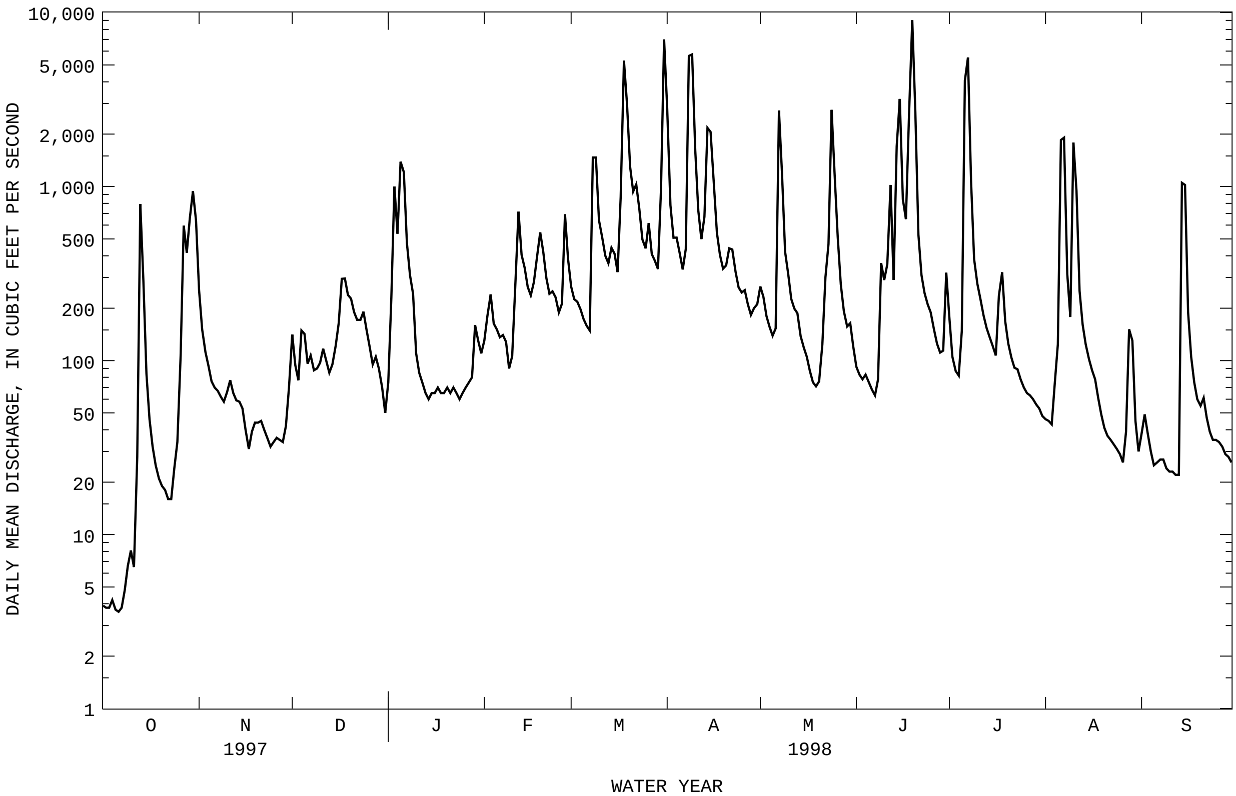
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	253	141	e75	e130	266	2850	266	92	178	46	e38
2	3.8	151	94	e230	e180	225	781	232	83	105	45	e49
3	3.8	112	77	e1000	240	218	508	180	78	87	43	e38
4	4.2	93	149	536	163	197	509	156	83	82	74	e30
5	3.7	76	142	1390	151	173	415	139	75	148	124	e25
6	3.6	70	96	1210	136	158	334	153	68	4070	1850	e26
7	3.8	67	107	474	140	149	438	2740	63	5520	1910	e27
8	4.8	62	88	309	128	1470	5630	1180	78	1080	314	e27
9	6.6	58	90	242	90	1470	5740	422	363	383	178	24
10	8.1	66	97	e110	106	640	1630	316	290	276	1790	23
11	6.5	77	117	e85	280	508	728	226	358	225	944	23
12	28	65	e100	e75	717	400	499	199	1020	182	251	22
13	793	59	e85	e65	405	362	669	187	290	154	161	22
14	288	58	e95	e60	342	445	2170	138	1700	136	124	1050
15	84	53	121	e65	265	411	2060	119	3190	121	102	1020
16	46	40	164	e65	237	322	1040	105	843	107	88	190
17	32	31	295	e70	282	872	543	87	649	236	78	105
18	25	39	296	e65	399	5280	404	75	2540	321	61	75
19	21	44	238	e65	545	2970	337	71	9030	168	49	60
20	19	44	227	e70	421	1300	352	76	2690	125	41	55
21	18	45	190	e65	298	937	441	124	530	104	37	61
22	16	40	171	e70	242	1030	435	301	310	91	35	47
23	16	36	171	e65	250	745	324	467	244	89	33	39
24	24	32	191	e60	231	496	263	2760	211	78	31	35
25	34	34	e150	e65	189	441	246	1160	189	70	29	35
26	107	36	e120	e70	212	616	254	511	151	65	26	34
27	596	35	e95	e75	692	409	211	274	125	63	39	32
28	416	34	e105	e80	383	374	183	192	111	60	151	29
29	659	42	e90	e160	---	336	200	157	114	56	130	28
30	940	70	e70	e130	---	973	211	164	320	53	45	26
31	638	---	e50	e110	---	7000	---	120	---	48	30	---
TOTAL	4852.8	1922	4222	7211	7854	31193	30405	13297	25888	14481	8859	3295
MEAN	157	64.1	136	233	281	1006	1014	429	863	467	286	110
MAX	940	253	296	1390	717	7000	5740	2760	9030	5520	1910	1050
MIN	3.6	31	50	60	90	149	183	71	63	48	26	22
AC-FT	9630	3810	8370	14300	15580	61870	60310	26370	51350	28720	17570	6540
CFSM	.42	.17	.36	.62	.75	2.69	2.71	1.15	2.31	1.25	.76	.29
IN.	.48	.19	.42	.72	.78	3.10	3.02	1.32	2.57	1.44	.88	.33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	97.5	127	93.4	88.9	231	415	418	420	300	292	112	158
MAX	950	1331	844	894	952	1371	1553	1797	1258	3846	1070	1384
(WY)	1974	1962	1983	1974	1949	1960	1973	1996	1967	1982	1993	1992
MIN	.18	.33	.39	.20	2.29	3.78	.79	7.19	2.74	2.26	2.51	.60
(WY)	1957	1956	1956	1956	1954	1954	1956	1956	1977	1988	1953	1953

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1948 - 1998	
ANNUAL TOTAL	66908.5		153479.8			
ANNUAL MEAN	183		420		229	
HIGHEST ANNUAL MEAN					768	1993
LOWEST ANNUAL MEAN					29.4	1989
HIGHEST DAILY MEAN	3370	May 8	9030	Jun 19	42000	Jul 3 1982
LOWEST DAILY MEAN	3.6	Oct 6	3.6	Oct 6	.00	Sep 6 1955a
ANNUAL SEVEN-DAY MINIMUM	3.8	Oct 1	3.8	Oct 1	.00	Sep 6 1955
INSTANTANEOUS PEAK FLOW			10900	Jun 19	96000	Jul 3 1982
INSTANTANEOUS PEAK STAGE			23.57	Jun 19	34.61	Jul 3 1982
ANNUAL RUNOFF (AC-FT)	132700		304400		166000	
ANNUAL RUNOFF (CFSM)	.49		1.12		.61	
ANNUAL RUNOFF (INCHES)	6.66		15.27		8.32	
10 PERCENT EXCEEDS	357		956		410	
50 PERCENT EXCEEDS	59		136		37	
90 PERCENT EXCEEDS	6.9		31		2.5	

a Also Sep 7-20, 1955, Oct 11, 12, 1956, Aug 12, 13, 1989
e Estimated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05489500 DES MOINES RIVER AT OTTUMWA, IA

LOCATION.--Lat 41°00'39", long 92°24'40", in SE$^1/_4$ NE$^1/_4$ sec.25, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, on right bank 15 ft downstream from Colorado and Eastern Railroad Bridge at Ottumwa, 0.4 mi downstream from Ottumwa powerplant, 6.5 mi upstream from Village Creek, 9.5 mi downstream from South Avery Creek, and at mile 94.1.

DRAINAGE AREA.--13,374 mi^2.

PERIOD OF RECORD.--March 1917 to current year (published as "at Eldon" October 1930 to March 1935). Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1917-20. WSP 1308: 1917-23 (M), 1925-27 (M), 1931. WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 622.00 ft above sea level. Prior to Sept. 30, 1930, nonrecording gage at Market Street Bridge 1,700 ft upstream at datum 0.83 ft higher. Oct. 1, 1930 to Mar. 31, 1935, nonrecording gage at Eldon 15 mi downstream at different datum. Apr. 1, 1935 to Oct. 25, 1963, water-stage recorder at site 1,100 ft downstream at Vine Street Bridge at datum 0.77 ft higher.

REMARKS.--No estimated daily discharge. Records good. Prior to Dec. 12, 1958 and since Nov. 30, 1960, diurnal fluctuation at low and medium stages are caused by powerplant upstream of station about $^1/_2$ mile. Flow regulated by Lake Red Rock (station 05488100) 48.2 mi upstream since March 12, 1969. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 135,000 ft^3/s June 7, 1947, gage height, 20.2 ft, site and datum then in use; minimum daily discharge, 26 ft^3/s Oct. 25, 1990, when gates at dam in Ottumwa were closed.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1850, that of June 7, 1947. Flood of May 31, 1903, reached a stage of 19.4 ft, former site and datum at Vine Street Bridge or about 22 ft at Market Street Bridge, from information by U.S. Army Corps of Engineers and U.S. National Weather Service, discharge, about 140,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	617	3790	2430	1390	1780	8360	21900	22200	18800	25500	21700	2320
2	564	2770	2160	2320	2270	7710	24400	18300	18600	24800	20400	3170
3	518	2780	1550	3940	2950	7640	25900	17000	18600	24600	20300	3480
4	483	2710	2180	5310	3080	8340	25600	15500	18500	24500	20700	3480
5	415	1900	2230	6200	3360	8380	22900	14600	16200	25600	20800	3410
6	384	1710	2150	5330	3480	7440	22200	14300	12000	40400	21400	3070
7	446	1470	1870	5730	2810	4670	22300	16100	10900	35000	20800	2610
8	439	1150	2080	5190	2070	7230	28400	14300	11000	21800	19100	2610
9	485	1650	1640	3710	2110	10200	31100	13000	12300	23400	18600	2650
10	446	1570	1260	2760	2110	8170	28600	14700	15100	24700	20300	2160
11	449	1410	1840	1890	2490	4980	27800	15400	18500	25200	21000	1800
12	561	1530	1820	741	4310	3890	28700	16900	19300	24900	19100	1860
13	1460	1430	5300	1400	2960	4180	30300	16900	18300	24900	18600	1770
14	1830	993	6470	1010	3240	3900	30500	14600	21600	24800	18800	7650
15	880	1080	6480	951	4620	4980	20700	11200	26400	24700	18700	4780
16	644	1100	4640	1320	4590	5350	10800	8140	17000	24600	18600	2620
17	523	1370	2540	1390	4670	6880	7870	8420	19300	24400	18400	2430
18	313	1190	2970	2230	6100	14400	14100	9870	22100	24700	15400	2060
19	432	1050	2460	1510	10700	19400	20900	12800	25000	24400	12800	1780
20	535	981	3310	1670	11600	19100	25600	18300	18900	24100	7430	1790
21	646	968	3310	1520	12100	15400	29100	18900	17700	23800	6610	1670
22	831	1010	2120	1540	12100	15300	30100	17700	21500	23800	5660	1780
23	979	1170	2740	1550	12100	17900	30000	16300	24100	23600	5880	1340
24	1010	1150	2880	1560	10300	18100	29800	21100	24000	23400	5220	1640
25	1030	1140	2150	1470	12300	13000	28400	16800	23700	23400	5180	1320
26	1740	1120	2030	1550	9460	12800	26800	15600	24900	23300	4830	1570
27	2300	1140	1810	1450	11800	14800	27600	18100	24900	23400	4020	1340
28	4160	1130	2010	1530	12200	17700	26100	18700	24900	23300	7220	913
29	4600	1170	1540	1850	---	17100	25600	18700	25100	23100	6820	1020
30	4990	1630	1310	1830	---	15300	23300	18600	27400	22900	5990	970
31	5260	---	1270	1750	---	26200	---	18500	---	22700	4620	---
TOTAL	39970	45262	80550	73592	173660	348800	747370	491530	596600	773700	434980	71063
MEAN	1289	1509	2598	2374	6202	11250	24910	15860	19890	24960	14030	2369
MAX	5260	3790	6480	6200	12300	26200	31100	22200	27400	40400	21700	7650
MIN	313	968	1260	741	1780	3890	7870	8140	10900	21800	4020	913
AC-FT	79280	89780	159800	146000	344500	691800	1482000	974900	1183000	1535000	862800	141000
CFSM	.10	.11	.19	.18	.46	.84	1.86	1.19	1.49	1.87	1.05	.18
IN.	.11	.13	.22	.20	.48	.97	2.08	1.37	1.66	2.15	1.21	.20

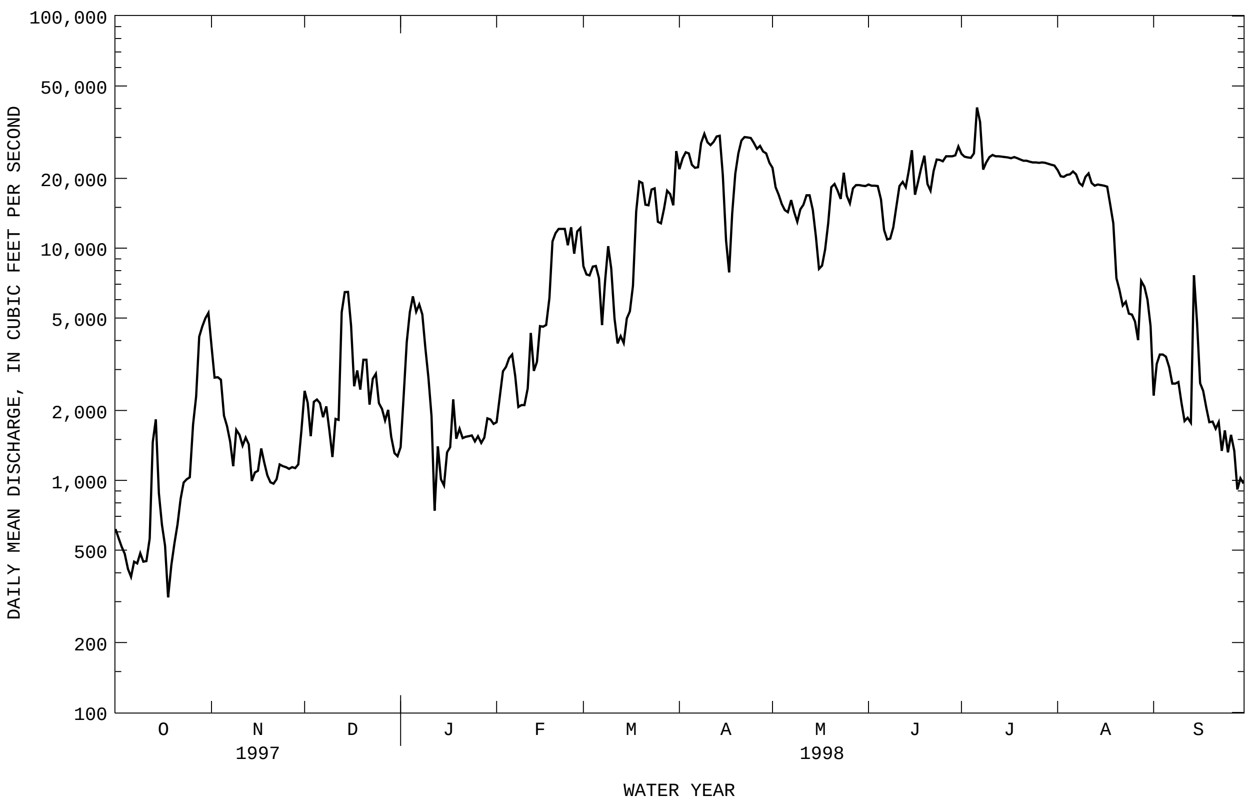
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4145	5185	4482	3050	5022	10360	12820	12880	13770	14610	8688	4955
MAX	18390	19250	13980	12380	16470	21750	25330	29770	31980	85570	47380	34790
(WY)	1974	1987	1993	1973	1973	1983	1983	1993	1984	1993	1993	1993
MIN	353	327	381	290	328	891	962	519	282	238	610	366
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1988	1976

05489500 DES MOINES RIVER AT OTTUMWA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1970 - 1998a	
ANNUAL TOTAL	2672990		3877077			
ANNUAL MEAN	7323		10620		8346	
HIGHEST ANNUAL MEAN					26350	1993
LOWEST ANNUAL MEAN					1120	1977
HIGHEST DAILY MEAN	28700	May 8	40400	Jul 6	110000	Jul 12 1993
LOWEST DAILY MEAN	161	Sep 28	313	Oct 18	26	Oct 25 1990b
ANNUAL SEVEN-DAY MINIMUM	421	Sep 24	438	Oct 5	182	Jul 7 1977
INSTANTANEOUS PEAK FLOW			46200	Jul 6	112000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			13.40	Jul 6	22.15	Jul 12 1993
ANNUAL RUNOFF (AC-FT)	5302000		7690000		6047000	
ANNUAL RUNOFF (CFSM)	.55		.79		.62	
ANNUAL RUNOFF (INCHES)	7.43		10.78		8.48	
10 PERCENT EXCEEDS	19200		24700		20100	
50 PERCENT EXCEEDS	4600		6200		4620	
90 PERCENT EXCEEDS	560		1110		689	

a Post regulation
b Gates at dam in Ottumwa closed



05490500 DES MOINES RIVER AT KEOSAUQUA, IA

LOCATION.--Lat 40°43'40", long 91°57'34", in $SE^{1}/_{4}$ $SW^{1}/_{4}$ sec.36, T.69 N., R.10 W., Van Buren County, Hydrologic Unit 07100009, on right bank 10 ft upstream from bridge on State Highway 1 at Keosauqua, 4.0 mi downstream from Chequest Creek, and at mile 51.3.

DRAINAGE AREA.--14,038 mi^2.

PERIOD OF RECORD.--May 1903 to July 1906, April to December 1910, August 1911 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1913-20. WSP 1438: Drainage area. WSP 1508: 1903, 1905-6, 1915- 18 (M), 1922 (M), 1924-26 (M), 1932-34 (M), 1937, 1942 (M).

GAGE.--Water-stage recorder. Datum of gage is 547.36 ft above sea level. Prior to Dec. 24, 1933, nonrecording gage, and Dec. 25, 1933, to Sept. 30, 1972, water-stage recorder, at same site at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Jan 9 to Feb. 1, and Mar. 10-16. Records good except those for estimated daily discharges, which are poor. Prior to Dec. 21, 1958, and since Nov. 30, 1960, some diurnal fluctuation at medium and low stages caused by power plant at Ottumwa. Flow regulated by Lake Red Rock (station 05488100) 91.0 mi upstream, since March 12, 1969. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 146,000 ft^3/s June 1, 1903, gage height, 27.85 ft, from floodmark, datum then in use; minimum daily discharge, 40 ft^3/s Jan. 30, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1851, reached a stage of 24 ft, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	300	5300	2000	1320	e2500	11000	28100	23900	18300	26100	21300	4010
2	542	3810	2780	2300	2900	8580	24400	19900	18300	24800	19800	2320
3	564	2820	2260	5420	3140	8440	27600	17100	18300	24600	19100	3460
4	535	3010	1900	6030	3820	8660	28600	15800	18300	24500	19500	3570
5	472	2870	2660	9670	3850	9090	25700	14700	17200	24700	21000	3520
6	441	2080	2400	9010	4080	8740	23500	14700	14200	40700	23800	3460
7	421	1760	2340	8460	3940	7510	23400	14900	11200	43800	23700	2990
8	397	1620	2020	6730	3230	9460	34000	16700	11300	25700	19000	2590
9	527	1260	2260	e5000	2550	14300	40300	13200	12400	22900	17900	2660
10	498	1740	1770	e3000	2620	e9500	34100	13700	14100	24000	19300	2540
11	475	1680	1400	e1900	3850	e6000	30400	14900	16600	24700	21700	2040
12	493	1570	2070	e1200	5700	e5000	30300	16000	19100	24100	18800	1780
13	721	1570	2420	e850	5680	e4600	34300	16700	18300	23800	17700	1870
14	1640	1520	6370	e1100	3610	e5000	37400	15500	19400	23700	17600	5150
15	1900	1100	6620	e1000	4800	e4800	27000	12900	29500	23500	17600	10500
16	1120	1100	6400	e1200	5530	e6000	16300	10200	20200	23400	17400	4820
17	531	1220	3980	e1600	5560	9320	9750	8440	17400	23300	17200	2900
18	740	1430	2880	e1900	6030	21200	10700	9350	20700	23300	16100	2460
19	384	1260	3220	e2200	9860	20700	18000	11300	29500	23600	13000	2280
20	422	1130	2880	e1800	12600	20800	24100	15400	21300	23200	10200	1870
21	470	1040	3820	e1900	12400	17800	28500	18500	18600	23000	6670	1860
22	599	1020	3580	e1800	12500	15700	30800	18000	19900	22900	6570	1620
23	879	1040	2280	e1800	12400	17300	30700	17000	22500	23000	5780	1810
24	1010	1200	3250	e1850	12000	18600	30400	29200	23900	22700	5900	1410
25	1110	1190	3100	e1900	11200	15900	29400	22900	23200	22600	5390	1690
26	1260	1180	2300	e1800	11800	13100	27300	17000	23900	22600	5270	1340
27	2590	1170	2370	e1900	11300	14300	27200	17000	24300	22500	4800	1580
28	3090	1290	2270	e1800	13000	16500	26700	18400	24300	22600	4990	1340
29	4800	1270	2320	e2100	---	18000	25600	18600	24600	22400	7480	1160
30	5110	1460	1820	e2300	---	16400	24100	18400	28500	22200	6490	970
31	5530	---	1880	e2200	---	34200	---	18200	---	22000	5970	---
TOTAL	39571	51710	89620	93040	192450	396500	808650	508490	599300	766900	437010	81570
MEAN	1276	1724	2891	3001	6873	12790	26960	16400	19980	24740	14100	2719
MAX	5530	5300	6620	9670	13000	34200	40300	29200	29500	43800	23800	10500
MIN	300	1020	1400	850	2500	4600	9750	8440	11200	22000	4800	970
MED	564	1360	2370	1900	5550	11000	27500	16700	19300	23400	17400	2300
AC-FT	78490	102600	177800	184500	381700	786500	1604000	1009000	1189000	1521000	866800	161800
CFSM	.09	.12	.21	.21	.49	.91	1.92	1.17	1.42	1.76	1.00	.19
IN.	.10	.14	.24	.25	.51	1.05	2.14	1.35	1.59	2.03	1.16	.22

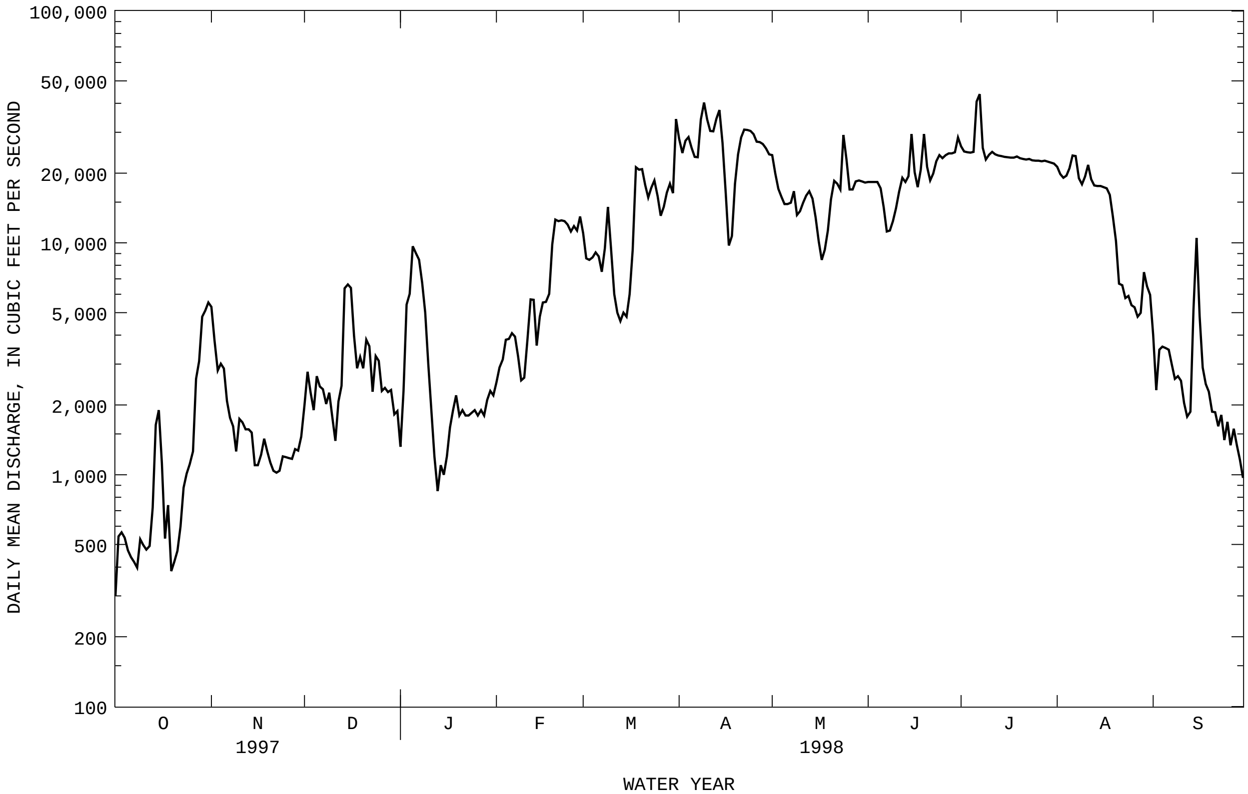
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4341	5321	4705	3225	5339	10860	13490	13730	14070	15120	8894	5362
MAX	19850	19320	14510	13120	17370	22200	30030	31260	30900	86150	47320	35210
(WY)	1974	1987	1983	1973	1973	1983	1973	1993	1984	1993	1993	1993
MIN	383	333	385	291	331	1170	1224	696	300	258	528	362
(WY)	1977	1977	1977	1977	1977	1981	1977	1977	1977	1977	1989	1976

05490500 DES MOINES RIVER AT KEOSAUQUA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1970 - 1998a	
ANNUAL TOTAL	2840533		4064811			
ANNUAL MEAN	7782		11140		8721	
HIGHEST ANNUAL MEAN					26920	1993
LOWEST ANNUAL MEAN					1303	1977
HIGHEST DAILY MEAN	28200	May 1	43800	Jul 7	108000	Jul 13 1993
LOWEST DAILY MEAN	295	Sep 30	300	Oct 1	115	Oct 27 1990
ANNUAL SEVEN-DAY MINIMUM	442	Sep 27	462	Oct 5	204	Jul 3 1977
INSTANTANEOUS PEAK FLOW			51700	Jul 6	111000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			23.54	Jul 6	32.66	Jul 13 1993
ANNUAL RUNOFF (AC-FT)	5634000		8063000		6318000	
ANNUAL RUNOFF (CFSM)	.55		.79		.62	
ANNUAL RUNOFF (INCHES)	7.53		10.77		8.44	
10 PERCENT EXCEEDS	19800		24400		21100	
50 PERCENT EXCEEDS	4840		6730		4900	
90 PERCENT EXCEEDS	603		1190		740	

a Post-regulation
e Estimated



05494300 FOX RIVER AT BLOOMFIELD, IA

LOCATION.--Lat 40°46'10", long 92°25'05", in SW1/4 SE1/4 sec.13, T.69 N., R.14 W, Davis County, Hydrologic Unit 0711000, on left bank 15 ft. downstream from bridge on county road V20, 1.3 miles north of county courthouse at Bloomfield, and 8.6 miles downstream from North Fox Creek.

DRAINAGE AREA.--87.7 mi^2

PERIOD OF RECORD.--October 1957 to September 1973, May 21 to September 30, 1997.

GAGE.--Water-stage recorder. Datum of gage is 755.57 ft above sea level.

REMARKS.--Estimated daily discharges: May 23, June 16 to July 21, and July 23 to Sept. 30. Records fair except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 9, 1905 and June 18, 1946, exceeded all other known floods at this location, stage and discharge unknown. Also flood of May 6, 1960 reached a stage of 24.02 ft., gage datum; discharge 8,600 cfs (Slope-Area Measurement).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	15	e1.6	e.75	e1.0
2	---	---	---	---	---	---	---	---	11	e1.5	e.60	e.90
3	---	---	---	---	---	---	---	---	9.6	e1.4	e.55	e.85
4	---	---	---	---	---	---	---	---	8.8	e1.9	e.50	e.80
5	---	---	---	---	---	---	---	---	8.3	e1.7	e.48	e.75
6	---	---	---	---	---	---	---	---	10	e1.6	e.46	e.70
7	---	---	---	---	---	---	---	---	7.2	e1.4	e.44	e.65
8	---	---	---	---	---	---	---	---	6.3	e1.3	e.42	e.60
9	---	---	---	---	---	---	---	---	6.1	e1.2	e.40	e.55
10	---	---	---	---	---	---	---	---	6.0	e1.1	e.38	e.50
11	---	---	---	---	---	---	---	---	6.3	e1.0	e1.0	e.46
12	---	---	---	---	---	---	---	---	25	e.90	e3.2	e.42
13	---	---	---	---	---	---	---	---	50	e.85	e1.7	e.65
14	---	---	---	---	---	---	---	---	22	e.80	e1.3	e1.0
15	---	---	---	---	---	---	---	---	12	e.75	e.95	e.80
16	---	---	---	---	---	---	---	---	e9.0	e.70	e.80	e.65
17	---	---	---	---	---	---	---	---	e7.0	e.65	e7.0	e3.0
18	---	---	---	---	---	---	---	---	e5.5	e.60	e4.4	e1.5
19	---	---	---	---	---	---	---	---	e4.2	e.55	e3.2	e1.0
20	---	---	---	---	---	---	---	---	e3.0	e40	e2.4	e.85
21	---	---	---	---	---	---	---	9.0	e2.5	e18	e2.0	e.75
22	---	---	---	---	---	---	---	9.8	e2.1	7.6	e1.7	e.70
23	---	---	---	---	---	---	---	e9.5	e1.8	e4.0	e1.3	e1.9
24	---	---	---	---	---	---	---	7.7	e1.7	e2.6	e5.0	e2.6
25	---	---	---	---	---	---	---	9.2	e4.2	e2.1	e4.0	e1.6
26	---	---	---	---	---	---	---	12	e3.6	e1.7	e2.5	e1.2
27	---	---	---	---	---	---	---	28	e2.7	e1.3	e2.0	e1.1
28	---	---	---	---	---	---	---	184	e2.1	e2.0	e1.6	e1.0
29	---	---	---	---	---	---	---	61	e1.9	e1.4	e1.3	e.90
30	---	---	---	---	---	---	---	31	e1.7	e1.1	e1.2	e.85
31	---	---	---	---	---	---	---	21	---	e.90	e1.1	---
TOTAL	---	---	---	---	---	---	---	---	256.6	104.20	54.63	30.23
MEAN	---	---	---	---	---	---	---	---	8.55	3.36	1.76	1.01
MAX	---	---	---	---	---	---	---	---	50	40	7.0	3.0
MIN	---	---	---	---	---	---	---	---	1.7	.55	.38	.42
MED	---	---	---	---	---	---	---	---	6.2	1.4	1.3	.85
AC-FT	---	---	---	---	---	---	---	---	509	207	108	60
CFSM	---	---	---	---	---	---	---	---	.10	.04	.02	.01
IN.	---	---	---	---	---	---	---	---	.11	.04	.02	.01

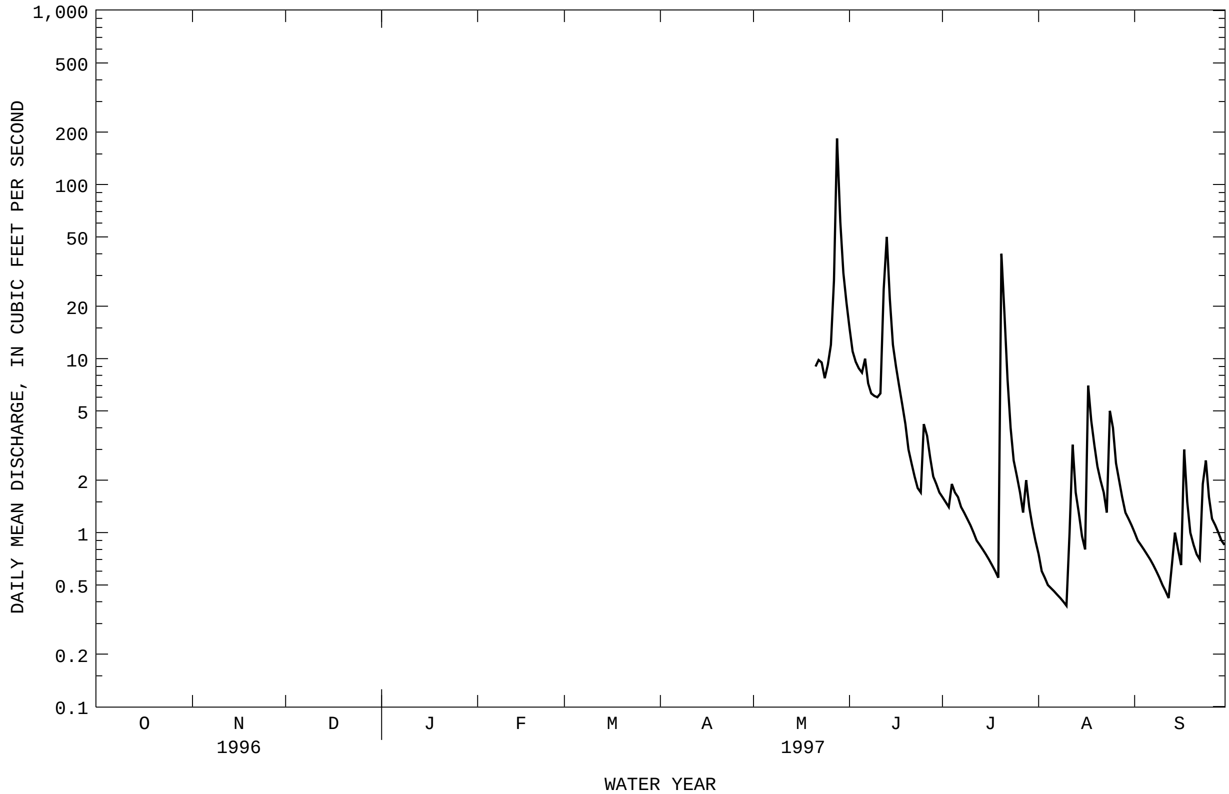
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1997, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	32.3	24.2	23.4	29.8	61.3	102	98.6	71.1	30.3	29.1	36.3	46.9
MAX	178	222	115	127	158	291	370	325	179	163	254	377
(WY)	1960	1962	1971	1973	1959	1960	1973	1973	1967	1969	1970	1970
MIN	.21	.53	.32	.59	.67	1.07	8.48	2.35	.73	1.09	.20	.78
(WY)	1964	1965	1964	1964	1964	1964	1971	1964	1963	1972	1961	1969

SUMMARY STATISTICS	WATER YEARS 1958 - 1997	
ANNUAL MEAN	49.4	
HIGHEST ANNUAL MEAN	117	1973
LOWEST ANNUAL MEAN	8.40	1964
HIGHEST DAILY MEAN	4370	May 6 1960
LOWEST DAILY MEAN	.00	Oct 1 1957
ANNUAL SEVEN-DAY MINIMUM	.00	Oct 1 1957
INSTANTANEOUS PEAK FLOW	8600	May 6 1960
INSTANTANEOUS PEAK STAGE	24.02	May 6 1960
ANNUAL RUNOFF (AC-FT)	35770	
ANNUAL RUNOFF (CFSM)	.56	
ANNUAL RUNOFF (INCHES)	7.65	
10 PERCENT EXCEEDS	73	
50 PERCENT EXCEEDS	4.4	
90 PERCENT EXCEEDS	.40	

e Estimated

05494300 FOX RIVER AT BLOOMFIELD, IA--Continued



05494300 FOX RIVER AT BLOOMFIELD, IA

LOCATION.--Lat 40°46'10", long 92°25'05", in $SW^1/_4$ $SE^1/_4$ sec.13, T.69N., R.14W, Davis County, Hydrologic Unit 0711000, on left bank 15 ft. downstream from bridge on county road V20, 1.3 miles north of county courthouse at Bloomfield, and 8.6 miles downstream from North Fox Creek.

DRAINAGE AREA.-- 87.7 mi^2 (227 km2)

PERIOD OF RECORD.--October 1957 to September 1973, May 1997 September 30, 1998.

GAGE.--Water-stage recorder. Datum of gage is 755.57 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 1-12, Oct. 14 to Nov. 30, Dec. 5 to Jan. 1, Jan. 5 to Feb. 9, June 28, 29, July 3-6, July 11 to Aug. 3, Aug. 13 to Sept. 12, and Sept. 17-30. Records fair except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 9, 1905 and June 18, 1946, exceeded all other known floods at this location, stage and discharge unknown. Also flood of May 6, 1960 reached a stage of 24.02 ft., gage datum; discharge 8600 CFS (Slope-Area Measurement).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

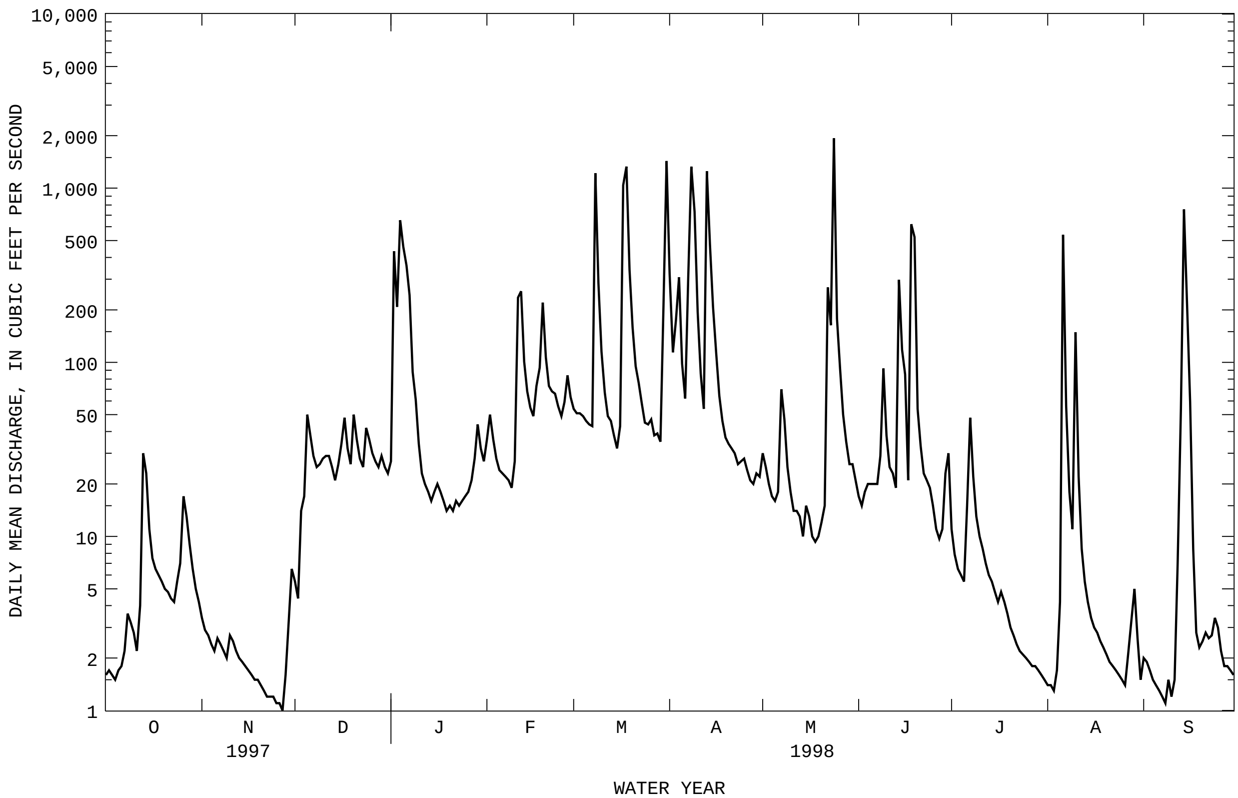
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.6	e3.4	e5.5	e27	e36	54	322	30	17	11	e1.4	e2.0
2	e1.7	e2.9	e4.4	434	e50	51	114	25	15	7.9	e1.4	e1.9
3	e1.6	e2.7	e14	208	e36	51	175	20	18	e6.5	e1.3	e1.7
4	e1.5	e2.4	e17	655	e28	49	308	17	20	e6.0	e1.7	e1.5
5	e1.7	e2.2	e50	462	e24	46	98	16	20	e5.5	e4.2	e1.4
6	e1.8	e2.6	e38	359	e23	44	62	18	20	e15	539	e1.3
7	e2.2	e2.4	e29	243	e22	43	310	70	20	48	56	e1.2
8	e3.6	e2.2	e25	88	e21	1220	1330	47	29	22	18	e1.1
9	e3.2	e2.0	e26	61	e19	285	732	25	92	13	11	e1.5
10	e2.8	e2.7	e28	e34	27	115	195	18	38	10	149	e1.2
11	e2.2	e2.5	e29	e23	235	67	86	14	25	e8.5	22	e1.5
12	e4.0	e2.2	e29	e20	256	49	54	14	23	e7.0	8.5	e7.0
13	e30	e2.0	e25	e18	101	e46	1250	13	19	e6.0	e5.5	54
14	e23	e1.9	e21	e16	68	e38	478	10	298	e5.5	e4.2	754
15	e11	e1.8	e26	e18	55	e32	208	15	118	e4.8	e3.4	214
16	e7.5	e1.7	e34	e20	49	43	111	13	85	e4.2	e3.0	59
17	e6.5	e1.6	e48	e18	73	1040	64	10	21	e4.8	e2.8	e8.5
18	e6.0	e1.5	e32	e16	93	1330	46	9.3	621	e4.2	e2.5	e2.8
19	e5.5	e1.5	e26	e14	220	340	37	10	524	e3.6	e2.3	e2.3
20	e5.0	e1.4	e50	e15	107	158	34	12	54	e3.0	e2.1	e2.5
21	e4.8	e1.3	e36	e14	73	95	32	15	33	e2.7	e1.9	e2.8
22	e4.4	e1.2	e28	e16	68	76	30	269	23	e2.4	e1.8	e2.6
23	e4.2	e1.2	e25	e15	66	58	26	163	21	e2.2	e1.7	e2.7
24	e5.5	e1.2	e42	e16	56	45	27	1930	19	e2.1	e1.6	e3.4
25	e7.0	e1.1	e36	e17	49	44	28	178	15	e2.0	e1.5	e3.0
26	e17	e1.1	e30	e18	59	47	24	92	11	e1.9	e1.4	e2.2
27	e13	e1.0	e27	e21	84	38	21	50	9.7	e1.8	e2.1	e1.8
28	e9.0	e1.6	e25	e28	63	39	20	35	11	e1.8	e3.2	e1.8
29	e6.5	e3.2	e29	e44	---	35	23	26	23	e1.7	e5.0	e1.7
30	e5.0	e6.5	e25	e32	---	212	22	26	30	e1.6	e2.6	e1.6
31	e4.2	---	e23	e27	---	1430	---	21	---	e1.5	e1.5	---
TOTAL	203.0	63.0	882.9	2997	2061	7220	6267	3211.3	2272.7	218.2	863.6	1144.0
MEAN	6.55	2.10	28.5	96.7	73.6	233	209	104	75.8	7.04	27.9	38.1
MAX	30	6.5	50	655	256	1430	1330	1930	621	48	539	754
MIN	1.5	1.0	4.4	14	19	32	20	9.3	9.7	1.5	1.3	1.1
MED	4.8	2.0	28	21	58	51	63	20	22	4.8	2.6	2.1
AC-FT	403	125	1750	5940	4090	14320	12430	6370	4510	433	1710	2270
CFSM	.07	.02	.32	1.10	.84	2.66	2.38	1.18	.86	.08	.32	.43
IN.	.09	.03	.37	1.27	.87	3.06	2.66	1.36	.96	.09	.37	.49

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	30.8	22.9	23.7	33.7	62.0	110	105	73.0	32.9	27.8	35.9	46.5
MAX	178	222	115	127	158	291	370	325	179	163	254	377
(WY)	1960	1962	1971	1973	1959	1960	1973	1973	1967	1969	1970	1970
MIN	.21	.53	.32	.59	.67	1.07	8.48	2.35	.73	1.09	.20	.78
(WY)	1964	1965	1964	1964	1964	1964	1971	1964	1963	1972	1961	1969

SUMMARY STATISTICS	FOR 1998 WATER YEAR		WATER YEARS 1958 - 1998	
ANNUAL TOTAL	27403.7			
ANNUAL MEAN	75.1		50.9	
HIGHEST ANNUAL MEAN			117	1973
LOWEST ANNUAL MEAN			8.40	1964
HIGHEST DAILY MEAN	1930	May 24	4370	May 6 1960
LOWEST DAILY MEAN	1.0	Nov 27	.00	Oct 1 1957
ANNUAL SEVEN-DAY MINIMUM	1.2	Nov 21	.00	Oct 1 1957
INSTANTANEOUS PEAK FLOW	4400	May 24	8600	May 6 1960
INSTANTANEOUS PEAK STAGE	17.32	May 24	24.02	May 6 1960
ANNUAL RUNOFF (AC-FT)	54360		36870	
ANNUAL RUNOFF (CFSM)	.86		.58	
ANNUAL RUNOFF (INCHES)	11.62		7.88	
10 PERCENT EXCEEDS	160		76	
50 PERCENT EXCEEDS	19		4.8	
90 PERCENT EXCEEDS	1.7		.44	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
10,000
5,000
2,000
1,000
500
200
100
50
20
10
5
2
1
O
N
D
J
F
M
A
M
J
J
A
S
1997
1998
WATER YEAR

CREST-STAGE PARTIAL-RECORD STATIONS

The following table contains annual maximum discharge for crest-stage stations. A crest-stage 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, but is not published herein. The years given in the period of record represent water years up to the current year for which the annual maximum has been determined.

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS

[+--Not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum: Date	Water year 1998 maximum: Gage height (ft)	Water year 1998 maximum: Discharge (ft^3/s)	Period of record maximum: Date	Period of record maximum: Gage height (ft)	Period of record maximum: Discharge (ft^3/s)
UPPER IOWA RIVER BASIN								
Dry Run Creek near Decorah, IA (05387490)	Lat 43°17'29",long 91°48'33", in SE1/4, sec.20, T.98 N., R.8 W., Winneshiek County, Hydrologic Unit 07060002, on State Highway 9, 0.5 mi west of Decorah. Drainage area is 21.0 mi^2.	1978-	06-28-98	18.81	2220	08-16-93	20.80	4,620
Waterloo Creek near Dorchester, IA (05388310)	Lat 43°27'04", long 91°30'18", in NW1/4, sec. 25, T.100 N., R.6 W., Allamakee County, Hydrologic Unit 07060002, on State Highway 76, 1.4 mi south of Dorchester Drainage area is 46.6 mi^2.	1966-	06-28-98	12.22	4160	07-01-78	14.80	9,380
MISSISSIPPI RIVER BASIN								
Mississippi River tributary at McGregor, IA (05389501)	Lat 43°01'12", long 91°11'25", in N1/4, sec.27, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001, at culvert on county road X50, at intersection with U.S. Highway 18 (Business Route), in McGregor. Drainage area is 0.72 mi^2.	1991-	03-30-98	11.58	(+)	03-31-93	13.13	(+)
TURKEY RIVER BASIN								
French Hollow Creek near Elkader, IA (05412030)	Lat 42°50'19", long 91°24'25", in SW1/4, sec.26, T.93 N., R.5 W., Clayton County, Hydrologic Unit 07060004, at culvert on State Highway 13, 1.1 mi south of Elkader. Drainage area is 3.56 mi^2.	1991-	03-31-98	12.24	769	06-15-91	16.32	d1,900
LITTLE MAQUOKETA RIVER BASIN								
Little Maquoketa River at Graf, IA (05414350)	Lat 42°30'09", long 90°51'50", in SE1/4 NW1/4, sec.20, T.89 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 300 ft downstream from Illinois Central railroad bridge, 0.5 mi northeast of Graf. Drainage area is 39.6 mi^2.	1951-	03-31-98	9.35	2,090	07-08-51	15.78	7,220
Middle Fork Little Maquoketa River near Rickardsville, IA (05414400)	Lat 42°33'38", long 90°51'35", in SE1/4, sec.32, T.90 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 2 mi southeast of Rickardsville. Drainage area is 30.2 mi^2.	1951-	03-31-98	16.56	1,270	08-02-72	27.70	23,000

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum Date	Gage height (ft)	Dis-charge (ft^3/s)	Period of record maximum Date	Gage height (ft)	Dis-charge (ft^3/s)
LITTLE MAQUOKETA RIVER BASIN--Continued								
North Fork Little Maquoketa River near Rickardsville, IA (05414450)	Lat 42°35’09”, long 90°51’20”, near NW corner, sec.28, T.90 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 1 mi northeast of Rickardsville. Drainage area is 21.6 mi^2.	1951-	03-31-98	8.55	1,590	08-02-72	14.02	7,180
Little Maquoketa River near Durango, IA (05414500) (continuous site Oct. 1934 to Jan. 1982)	Lat 42°33’18”, long 90°44’46”, in NW1/4 NE1/4, sec. 5, T.89 N., R.2 E., Dubuque County, Hydrologic Unit 07060003, on left bank 10 ft. upstream from bridge on county highway 300 ft. upstream from Cloie Branch, 1.7 mi. east of Durango, 5.6 mi. northwest of court house at Dubuque, and 6.4 mi. upstream from mouth Drainage area is 130 mi^2.	1934-1993 1996-	03-31-98	16.37	8,790	08-02-72	23.13	40,000
Little Maquoketa River tributary at Dubuque, IA (05414600)	Lat 42°32’38”, long 90°41’38”, near NW corner, sec.11, T.89 N., R.2 E, Dubuque County, Hydrologic Unit 07060003, at bridge on State Highway 386, near north city limits of Dubuque. Drainage area is 1.54 mi^2.	1951-	06-19-98	14.10	795	07-31-57	c7.98	d1,650
Bloody Run tributary near Sherrill, IA (05414605)	Lat 42°37’13”, long 90°45’44”, in SE1/4, sec.7, T.90 N., R.2 E., Dubuque County, Hydrologic Unit 07060003, at culvert on county road 1.6 mi northeast of Sherrill. Drainage area is 0.59 mi^2.	1991-	03-31-98	12.32	98.3	06-15-91	19.27	d692
LAMONT CREEK BASIN								
Lamont Creek tributary at Lamont, IA (05416200)	Lat 42°35’22”, long 91°38’52”, in SE1/4, sec.22, T.90 N., R.7 W., Buchanan County, Hydrologic Unit 07060006, at culvert on State Highway 187, 0.8 mi southwest of Lamont, Drainage area is 1.78 mi^2.	1991-	06-11-98	19.95	d610	06-11-98	19.95	d610
MAQUOKETA RIVER BASIN								
Sand Creek near Manchester, IA (05416972)	Lat 42°26’57”, long 91°28’50”, in SE1/4, sec.12, T.88 N., R.6 W., Delaware County, Hydrologic Unit 07060006, at culvert on State Highway 13, 2.7 mi southwest of Manchester. Drainage area is 11.0 mi^2.	1991-	03-31-98	12.59	1,150	07-11-93	(+)	(+)
Williams Creek near Charlotte, IA (05418645)	Lat 41°55’55”, long 90°31’44”, in SE1/4, sec.6, T.82 N., R.4 E., Clinton County, Hydrologic Unit 07060006, at culvert on county road Y70, 5 mi southwest of Charlotte, 2.1 mi north of county highway E63. Drainage area is 1.77 mi^2.	1990-	03-31-98	9.45	(+)	05-29-96	13.02	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum Date	Gage height (ft)	Dis-charge (ft^3/s)	Period of record maximum Date	Gage height (ft)	Dis-charge (ft^3/s)
	WAPSIPINICON RIVER BASIN							
Little Wapsi-pinicon River tributary near Riceville, IA (05420600)	Lat 43°21’31”, long 92°29’08”, near SW1/4 corner, sec. 27, T.99 N., R.14 W., Howard County, Hydrologic Unit 07080102, at culvert on county highway, 3.5 mi east of Riceville. Drainage area is 1.10 mi^2.	1953-	06-28-98	4.86	612	03-11-97	5.91	d3,300
Little Wapsi-pinicon River near Oran, IA (05420850)	Lat 42°42’53”, long 92°02’29”, near NW corner, sec.9, T.91 N., R.10 W., Fayette County, Hydrologic Unit 07080102, at bridge on State Highway 3, 2 mi northeast of Oran. Drainage area is 94.1 mi^2.	1966-	03-31-98	88.27	2,030	08-30-79	91.81	d5,000
Buck Creek near Oran, IA (05420875) (revised)	Lat 42°42’53”, long 92°07’33”, in NE1/4, sec.10, T.91 N., R.11 W., Bremer County, Hydrologic Unit 07080102, at bridge on State Highway 3, 2.5 mi northwest of Oran. Drain-age area is 37.9 mi^2.	1966-	03-31-98	88.14	790	06-15-91	90.18	1,720
Pine Creek tributary near Winthrop, IA (05421100)	Lat 42°29’17”, long 91°47’10”, in SW1/4, sec.27, T.89 N., R.8 W., Buchanan County, Hydrologic Unit 07080102, at culvert on county road, 2.5 mi northwest of Winthrop. Drainage area is 0.33 mi^2.	1953-	08-18-98	4.34	46.6	07-17-68	8.97	334
Wapsipinicon River tributary at Winthrop, IA (05421300) (formerly published as: “Pine Creek trib. no. 2 at Winthrop”)	Lat 42°28’06”, long 91°44’33”, at N1/4 corner sec.2, T.88 N., R.8 W., Buchanan County, Hydrologic Unit 07080102, at culvert on State Highway 939, near west city limits of Winthrop. Drainage area is 0.70 mi^2.	1953-	1998	(a)	<6.50	07-17-68	7.26	570
Silver Creek at Welton, IA (05421890)	Lat 41°54’54”, long 90°36’00”, in NW1/4, sec.15, T.82 N., R.3 E., Clinton County, Hydrologic Unit 07080103, at bridge on U.S. Highway 61, at north edge of Welton. Drainage area is 9.03 mi^2.	1966-	03-31-98	88.43	973	05-17-74	89.77	d4,820
	IOWA RIVER BASIN							
Westmain drain-age ditch 1 & 2 at Britt, IA (05448400) Low-flow site April 1958 to Sept. 1976	Lat 43°06’09”, long 93°47’04”, in SW1/4, sec.27, T.96 N., R.25 W., Hancock County, Hydrologic Unit 07080207, at bridge on U.S. Highway 18, near east city limits of Britt. Drainage area is 21.2 mi^2.	1966-	06-24-98	82.62	(+)	04-28-75	83.59	372
East Branch Iowa River above Hayfield, Ia. (05448600)	Lat 43°09’21”, long 93°41’21”, at S1/4 corner sec.4, T.96 N., R.24 W., Hancock County, Hydrologic Unit 07080207, at bridge on county highway, 1.5 mi southeast of Hayfield. Drainage area is 2.23 mi^2.	1953-	06-24-98	5.11	(+)	04-06-65	7.31	250

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record maximum Date	Gage height (ft)	Discharge (ft^3/s)
IOWA RIVER BASIN--Continued								
Honey Creek tributary near Radcliffe, IA (0545129280)	Lat 42°19’44”, long 93°25’28”, in SW1/4, sec.21, T.87 N., R.22 W., Hardin County, Hydrologic Unit 07080207, at culvert on county road highway S27, 1.1 mi northeast of Radcliffe. Drainage area is 3.29 mi^2.	1991-	06-15-98	98.08	(+)	05-10-95	100.14	(+)
Stein Creek near Clutier, IA (05451955)	Lat 42°04’46”, long 92°18’00”, in NE1/4, sec.24, T.84 N., R.13 W., Tama County, Hydrologic Unit 07080208, at bridge on county highway E36, 5 mi east of Clutier. Drainage area is 23.4 mi^2.	1971-	06-19-98	74.86	1,280	06-15-82	77.92	11,400
Price Creek at Amana, IA (05453200)	Lat 41°48’18”, long 91°52’23”, in SE1/4, sec.22, T.81 N., R.9 W., Iowa County, Hydrologic Unit 07080208, at bridge on State Highway 151, near north edge of Amana. Drainage area is 29.1 mi^2.	1966-	03-31-98	85.04	1,790	06-17-90	88.80	(+)
North Fork tributary to Mill Creek near Solon, IA (05453430)	Lat 41°50’24”, long 91°30’04” in NW1/4, sec.12, T.81 N., R.6 W., Johnson County, Hydrologic Unit 07080208, at culvert on State Highway 1, 2 mi north of Solon. Drainage area is 0.78 mi^2.	1990-1993, 1994-	1998	(+)	(+)	07-16-92	(+)	(+)
Clear Creek tributary near Williamsburg, IA (05454180)	Lat 41°41’16”, long 91°57’02”, in SE1/4, sec.36, T.80 N., R.10 W., Iowa County, Hydrologic Unit 07080209, at culvert on county road, 4 mi northeast of Williamsburg, 1 mi south of county highway F35. Drainage area is 0.37 mi^2.	1990-	08-28-98	45.13	<17.8	06-17-90	48.76	291
North English River near Montezuma, IA (05455140)	Lat 41°38’51”, long 92°34’16”, in SW1/4, sec.14, T.79 N., R.15 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on county highway, 5.0 mi northwest of Montezuma. Drainage area is 31.0 mi^2.	1972-	03-31-98	20.59	1160	07-20-78	28.18	4,640
North English River at Guernsey, IA (05455210)	Lat 41°38’42”, long 92°21’28”, at NW corner sec.22, T.79 N., R.13 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on State Highway 21, 1 mi southwest of Guernsey. Drainage area is 81.5 mi^2.	1960, 1966-	03-31-98	83.80	3,390	06-15-82	87.43	7,460
Deep River at Deep River, IA (05455230)	Lat 41°35’29”, long 92°21’18”, in SW1/4, sec.3, T.78 N., R.13 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on State Highway 21, 1 mi northeast of Deep River. Drainage area is 30.5 mi^2.	1960, 1966-	06-15-98	77.94	(+)	c05-14-70	83.85	6,200

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

			Water year 1998 maximum			Period of record maximum		
Station name and number	Location and drainage area	Period of record	Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
IOWA RIVER BASIN--Continued								
Bulgers Run near Riverside, IA (05455550)	Lat 41°29'02", long 91°37'36", in SE1/4, sec.11, T.77 N., R.7 W., Washington County, Hydrologic Unit 07080209, at bridge on State Highway 22, 2.5 mi west of Riverside. Drainage area is 6.31 mi^2.	1965-	1998	(a)	<425	09-21-65	89.04	3,080
Deer Creek near Carpenter, IA (05457440)	Lat 43°24'54", long 92°59'05", in NW1/4 sec.9, T.99 N., R.18 W., Mitchell County, Hydrologic Unit 07080201, at bridge on State Highway 105, 1.5 mi east of Carpenter. Drainage area is 91.6 mi^2.	1966-	1998	(a)	<1270	07-18-93	84.65	3,460
Gizzard Creek tributary near Bassett, IA (0545776680)	Lat 43°04'01",long 92°34'31", in SE1/4, sec.2, T.95 N., R.15 W., Floyd County, Hydrologic Unit 07080201, at culvert on U.S. Highway 18, 3.3 mi west of Bassett. Drainage area is 3.42 mi^2.	1990-	06-28-98	99.27	(+)	08-10-91	100.59	(+)
Spring Creek near Mason City, IA (05459490)	Lat 43°12'48", long 93°12'38", in SE1/4, sec.16, T.97 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, at bridge on U.S. Highway 65, 4 mi north of Mason City. Drainage area is 29.3 mi^2.	1966-	1998	(a)	<115	05-30-80	90.32	(+)
Willow Creek near Mason City, IA (05460100)	Lat 43°08'55", long 93°16'07", near center sec.12, T.96 N., R.21 W., Cerro Gordo County, Hydrologic Unit 07080203, at bridge on U.S. Highway 18, 3.5 mi west of Mason City. Drainage area is 78.6 mi^2.	1966-	06-21-98	90.96	840	07-08-69 04-01-93	91.30 91.75	d1,100 1,090
Miller Creek near Eagle Center, IA (05464025) (revised)	Lat 42°19'22", long 92°20'50", in NW1/4, sec.27, T.87 N., R.13 W., Black Hawk County, Hydrologic Unit 07080205, at culvert on State Highway 21, 1.3 mi southeast of Eagle Center. Drainage area is 9.14 mi^2.	1991-	06-11-98	47.60	(+)	06-11-98	47.60	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record maximum Date	Gage height (ft)	Discharge (ft^3/s)
IOWA RIVER BASIN--Continued								
Pratt Creek near Garrison, IA (05464310) (discontinued in 1993)	Lat 42°10’53”, long 92°11’10”, in SE 1/4, sec. 12, T.85 N,. R.12 W., Benton County, Hydrologic Unit 07080205, at bridge on U.S. Highway 218, 3.5 mi northwest of Garrison. Drainage area is 23.4 mi^2.	1966-1994	Revised Records					
			1966	89.37	1,160	07-08-93	96.86	12,300
			03-20-67	87.09	507			
			08-05-68	88.14	739			
			07-18-69	92.03	2,830			
			03-03-70	91.46	2,350			
			1971	(a)	<610			
			1972	(a)	<610			
			02-01-73	89.79	1,340			
			05-28-74	90.70	1,820			
			03-19-75	90.08	1,480			
			1976	(a)	<610			
			09-18-77	91.23	2,170			
			03-18-78	88.10	727			
			07-14-79	91.93	2,740			
			1980	(a)	<610			
			1981	(a)	<610			
			06-15-82	96.17	10,800			
			11-02-82	88.69	905			
			04-29-84	90.44	1,670			
			02-22-85	90.69	1,820			
			05-27-86	87.71	630			
			1987	(a)	<580			
			1988	(a)	<580			
			1989	(a)	<580			
			06-16-90	94.53	6,220			
			04-29-91	89.01	1,010			
			07-07-92	91.78	2,610			
			07-08-93	96.86	12,300			
			1994	(a)	<580			
Prairie Creek tributary near Van Horne, IA (05464535)	Lat 41°59’33”, long 92°05’06”, in NW1/4, sec.24, T.83 N., R.11 W., Benton County, Hydrologic Unit 07080205, at culvert on county highway V66, 1.1 mi south of Van Horne. Drainage area is 0.94 mi^2.	1991-	06-19-98	13.77	135	05-26-97	18.14	d571
Thunder Creek at Blairstown, IA (05464562)	Lat 41°54’12”, long 92°05’03”, in NE1/4, sec.23, T.82 N., R.11 W., Benton County, Hydrologic unit 07080205, at culvert on county highway V66, near city limits of Blairstown. Drainage area is 0.96 mi^2.	1991-	08-28-98	15.43	407	08-16-93	16.12	d540
North Fork Long Creek at Ainsworth, IA (05465150)	Lat 41°16’51”, long 91°32’16”, in SW1/4, sec.22, T.75 N., R.6 W., Washington County, Hydrologic Unit 07080209, at bridge on U.S. Highway 218, 1 mi southeast of Ainsworth. Drainage area is 30.2 mi^2.	1951, 1965-	06-15-98	88.93	1,300	05-10-96	93.40	(+)
			Revised Record					
			02-19-97	90.44	5,000			
Haight Creek at Kingston, IA (05469350)	Lat 40°58’14”, long 91°02’30”, in NW1/4, sec.12, T.71 N., R.2 W., Des Moines County, Hydrologic Unit 07080104, at culvert on State Highway 99, 0.5 mi south of Kingston. Drainage area is 2.67 mi^2.	1990-	07-07-98	(+)	(+)	06-16-90	15.18	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record maximum Date	Gage height (ft)	Discharge (ft^3/s)
			SKUNK RIVER BASIN					
Mud Lake drainage ditch 71, at Jewell, IA (05469860)	Lat 42°18’52”, long 93°38’23”, in SW1/4, sec.27, T.87 N., R.24 W., Hamilton County, Hydrologic Unit 07080105, at bridge on U.S. Highway 69, in Jewell. Drainage area is 65.4 mi^2.	1966-	06-15-98	89.36	1,770	07-09-93	91.32	3,700
Long Dick Creek near Ellsworth, IA (05469970)	Lat 42°18’37”, long 93°32’06”, in NW1/4, sec.33, T.87 N., R.23 W., Hamilton County, Hydrologic Unit 07080105, at culvert on State Highway 175, 2.2 mi east of Ellsworth. Drainage area is 6.08 mi^2.	1991-	06-15-98	93.74	(+)	08-17-93	94.73	(+)
Keigley Branch near Story City, IA (05469990)	Lat 42°09’01”, long 93°37’13”, in NW1/4, sec.26, T.85 N., R.24 W., Story County, Hydrologic Unit 07080105, at bridge on U.S. Highway 69, 3 mi south of Story City. Drainage area is 31.0 mi^2.	1966-	06-15-98	88.47	488	06-17-96	92.26	d3,440
Snipe Creek tributary at Melbourne, IA (0547209280)	Lat 41°56’08”, long 93°05’08”, in SE1/4, sec.5, T.82 N., R.19 W., Marshall County, Hydrologic Unit 07080106, at culvert on county highway E63, 0.5 mi east of Melbourne. Drainage area is 1.61 mi^2.	1990-	06-15-98	17.42	(+)	06-17-90	17.39	d492
North Skunk River near Baxter, IA (05472090) (discontinued in 1993)	Lat 41°49’13”, long 93°03’41”, in NE 1/4, sec. 21, T.81 N., R.19 W., Jasper County, Hydrologic Unit 07080106, at bridge on State Highway 223, 4.5 mi east of Baxter. Drainage area is 52.2 mi^2	1966-1994	Revised Records					
			06-12-66	84.42	3,800	06-12-66	84.42	3,800
			06-10-67	79.45	2,150			
			1968	(a)	<1,050			
			03-69	80.55	2,500			
			03-02-70	78.51	1,830			
			02-19-71	79.14	2,050			
			06-13-72	79.79	2,300			
			02-02-73	82.05	3,100			
			06-09-74	83.60	3,550			
			07-11-75	81.93	3,020			
			03-05-76	79.32	2,300			
			1977	(a)	1,180			
			1978	(a)	1,180			
			03-19-79	77.39	1,750			
			1980	(a)	<1,180			
			1981	(a)	<1,180			
			07-04-82	83.32	3,500			
			1983	(a)	<1,180			
			07-08-84	80.12	2,520			
			03-03-85	76.84	1,610			
			09-21-86	79.80	2,400			
			08-26-87	78.31	1,990			
			1988	(a)	<1,220			
			1989	(a)	<870			
			06-17-90	81.53	2,950			
			03-03-91	74.87	1,270			
			07-25-92	77.78	1,990			
			07-09-93	82.84	3,320			
			06-08-94	77.83	2,010			
Middle Creek near Lacey, IA (05472390)	Lat 41°25’17”, long 92°23’04”, at N1/4 corner sec.1, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080106, at bridge on U.S. Highway 63, 1.5 mi northwest of Lacey. Drainage area is 23.0 mi^2.	1966-	08-28-98	87.52	1,450	04-24-76	90.06	9,650

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record maximum Date	Gage height (ft)	Discharge (ft^3/s)
	SKUNK RIVER BASIN--Continued							
Skunk River tributary near Richland, IA (05472555)	Lat 41°15'50", long 91°57'52", in NE1/4, sec.35, T.75 N., R.10 W., Keokuk County, Hydrologic Unit 07080107, at culvert on county highway W15, 4.9 mi north of Richland, 5.1 mi south of State Highway 92. Drainage area is 0.19 mi^2.	1990-	06-15-98	15.62	(+)	06-15-98	15.62	(+)
	DES MOINES RIVER BASIN							
Drainage Ditch 97 tributary near Britt, IA (0548065350)	Lat 43°06'42", long 93°54'22", in SW1/4, sec.22, T.96 N., R.26 W., Hancock County, Hydrologic Unit 07100005, at culvert on county road, 5.4 mi northwest of Britt. Drainage area is 0.94 mi^2. (Revised)	1991-	06-24-98	93.17	(+)	07-09-93	94.53	(+)
White Fox Creek at Clarion, IA (05480930)	Lat 42°43'55", long 93°42'26", in NW1/4, sec.5, T.91 N., R.24 W., Wright County, Hydrologic Unit 07100005, at bridge on State Highway 3, 1.5 mi east of Clarion. Drainage area is 13.3 mi^2.	1966-	06-28-98	91.57	613	06-29-95	92.91	e1,700
Brewers Creek tributary near Webster City, IA (05480993)	Lat 42°26'57", long 93°51'59", in NW1/4, sec.10, T.88 N., R.26, W., Hamilton County, Hydrologic Unit 07100005, at culvert on U.S. Highway 20, 2.5 mi southwest of Webster City. Drainage area is 1.58 mi^2.	1990-	06-28-98	97.02	(+)	06-04-91	99.25	(+)
Bluff Creek at Pilot Mound, IA (05481510)	Lat 42°09'59", long 94°01'11", in NW1/4, sec.20 T.85 N., R.27 W., Boone County, Hydrologic Unit 07100004, at bridge on county road E18 at northwest edge of Pilot Mound. Drainage area is 23.5 mi^2. (Revised)	1966-	06-15-98	86.19	728	07-09-93	89.25	1,450
Peas Creek tributary at Boone, IA (05481528)	Lat 42°02'06", long 93°51'13", in SW1/4, sec.35, T.84 N., R.26 W., Boone County, Hydrologic Unit 07100004, at culvert on Corporal Rodger Snedden Drive, at intersection with U.S. Highway 30, at the south edge of Boone city limits. Drainage area is 0.30 mi^2.	1990-	06-15-98	92.66	(+)	06-17-96	94.59	(+)
Peas Creek at Boone, IA (05481530)	Lat 42°02'04", long 93°51'25", in SE1/4, sec.34, T.84 N., R.26 W., Boone County, Hydrologic Unit 07100004, at culvert on U.S. Highway 30, at the southeast side of Boone city limits. Drainage area is 1.69 mi^2.	1990-	06-15-98	103.05	(+)	06-15-98	103.05	(+)
Hardin Creek near Farlin, IA (05482900)	Lat 42°05'34, long 94°25'39", in NE1/4 NW1/4 NW1/4, sec. 14, T.84 N., R.31 W., Greene County, Hydrologic Unit 07100006, at bridge on county highway, 1.5 mi northeast of Farlin. Drainage area is 101 mi^2.	1951-	06-15-98	9.37	672	07-09-93	13.97	3,010

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
DES MOINES RIVER BASIN--Continued								
Brushy Creek near Templeton, IA (05483318)	Lat 41°56’45”, long 94°52’45”, in SW1/4 NW 1/4 NW 1/4, sec.1, T.82 N., R.35 W., Carroll County, Hydrologic Unit 07100007, at bridge on U.S. Highway 71, 4 mi northeast of Templeton. Drainage area is 45.0 mi^2.	1966-	04-16-98	79.19	(+)	07-09-93	93.48	19,000
Middle Raccoon River tributary at Carroll, Ia. (05483349)	Lat 42°02’30”, long 94°52’43”, in NW1/4 NW1/4 SW1/4, sec. 36, T. 84 N,.R.35 W., Carroll County Hydrologic Unit 07100007, at bridge on U.S. Highway 71, 1.1 mi south of Carroll. Drainage area is 6.58 mi^2.	1966-	04-16-98	24.14	1,860	06-17-96	25.88	4,600
Cedar Creek tributary No.2 near Winterset, Ia. (05485940)	Lat 41°19’49”, long 94°03’05”, in SW1/4, sec.35, T.76 N., R.28 W., Madison County, Hydrologic Unit 07100008, at culvert on State Highway 92, 0.5 mi west of U.S. Highway 169, 1 mi west of Winterset. Drainage area is 1.02 mi^2.	1990-	06-18-98	94.32	(+)	05-24-96	98.58	(e)
Bush Branch Creek near Stanzel, Ia. (05486230)	Lat 41°18’57”, long 94°16’42”, in SW1/4, sec.2, T.75 N., R.30 W., Adair County, Hydrologic Unit 07100008, at culvert on State Highway 92, 1 mi west of Stanzel. Drainage area is 3.02 mi^2.	1990-	06-15-98	94.90	(+)	09-15-92	97.06	(+)
Little White Breast Creek tributary near Chariton, Ia. (05487825)	Lat 41°03’36”, long 93°18’12”, in SW1/4, sec. 5, T.72 N., R.21 W., Lucas County, Hydrologic Unit 07100008, at culvert on State Highway 14, 2.0 mi north of Chariton. Drainage area is 0.05 mi^2.	1990-	06-18-98	18.01	33.9	08-19-93	18.93	d56.2
South Avery Creek near Blakesburg, Ia. (05489350)	Lat 41°00’59”, long 92°37’32”, in SE1/4, sec.19, T.72 N., R.15 W., Wapello County, Hydrologic Unit 07100009, at bridge on U.S. Highway 34, 3.5 mi north of Blakesburg. Drainage area is 33.1 mi^2.	1965-	06-19-98 Revised Record 09-15-92	84.45 84.71	4,960 5,300	07-03-82	90.20	(+)
Bear Creek at Ottumwa, Ia. (05489490)	Lat 41°00’52”, long 92°27’44”, in NW1/4, sec.27, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, at bridge on U.S. Highway 34, near west edge of Ottumwa. Drainage area is 22.9 mi^2.	1965-	06-18-98	87.12	1,940	09-21-65	92.80	4,000

(+)--Not determined
(a)--peak stage did not reach bottom of gage
b--ice affected
c--old gage datum
d--estimate
e--peak affected by backwater

The following water temperature and specific conductance measurements were made at the indicated sites during water year 1998.

05388250 Upper Iowa River near Dorchester, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 21...	1240	460	7.2	609
DEC 02...	0850	230	3.0	583
JAN 13...	1020	207	.1	675
FEB 24...	1035	779	4.9	482
MAR 30...	1420	1400	13.0	493
MAY 20...	0740	557	20.1	552
JUN 24...	0810	2310	19.2	508
AUG 05...	0900	546	19.4	540

05389200 Bloody Run Trib at Spook Cave near Froelich, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 22...	0920	3.1	6.1	735
DEC 02...	1020	2.3	6.1	731
JAN 13...	1210	2.8	3.5	745
FEB 24...	1305	2.8	10.1	707
MAR 18...	1520	3.7	5.7	680
APR 02...	1025	15	7.1	595
MAY 18...	0950	5.1	14.0	720
JUN 22...	1048	8.0	14.6	663
JUL 14...	0715	6.1	13.8	729
AUG 03...	1050	6.0	15.1	737
SEP 29...	1000	5.5	12.7	735

05389250 Bloody Run Site No. 2 near Giard, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 22...	1035	4.9	4.4	717
DEC 02...	1105	4.4	3.6	714
JAN 13...	1325	5.8	.0	608
FEB 24...	1240	5.7	7.3	683
MAR 18...	1620	9.0	3.8	538
APR 02...	0930	48	6.8	574
MAY 18...	1110	11	15.9	696
JUN 22...	1126	19	14.9	652
JUL 14...	0625	15	15.1	719
AUG 03...	1135	13	16.5	715
SEP 29...	1130	12	13.9	715

05389400 Bloody Run Creek near Marquette, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 22...	1145	14	7.0	625
DEC 02...	1315	13	5.8	721
JAN 13...	1415	11	1.5	641
FEB 24...	1530	14	9.7	608
MAR 31...	0730	171	9.4	396
MAY 19...	1610	19	18.6	--
JUN 23...	1530	32	18.1	640
AUG 04...	1610	33	15.8	643
SEP 29...	0820	21	13.3	657

05389500 Mississippi River at McGregor, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 23...	1245	48800	9.6	364
NOV 18...	1335	29200	.9	402
MAY 19...	1245	48000	21.3	649
JUN 23...	1230	58600	24.6	459
SEP 30...	1225	24200	20.8	417

05411200 Sny Magill Creek No. 3 Site near Clayton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 22...	1230	2.4	6.8	676
NOV 17...	1135	2.4	1.1	678
DEC 03...	0825	2.2	2.7	652
JAN 14...	1055	1.3	.0	712
FEB 23...	1305	1.6	6.2	655
MAR 18...	1215	3.5	2.4	611
MAY 18...	1300	3.5	18.9	619
JUN 22...	1400	5.1	18.1	622
JUL 13...	1107	4.0	17.0	670
AUG 03...	1320	3.5	17.6	667
SEP 29...	1320	4.1	18.5	655

05411230 West Fork Sny Magill Creek near Clayton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAR				
22...	1145	1.8	5.9	664	18...	1125	2.4	3.7	619
NOV					JUN				
17...	1115	1.8	1.2	656	22...	1457	3.1	17.3	620
DEC					JUL				
03...	0745	1.6	2.8	655	13...	1015	2.8	14.8	652
JAN					AUG				
14...	0952	1.8	-.1	640	03...	1230	3.0	16.5	645
FEB					SEP				
23...	1405	1.6	6.8	632	29...	1230	3.2	15.1	650

05411260 North Cedar Creek near Clayton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAY				
22...	1530	1.7	6.7	625	18...	1540	3.1	18.2	581
DEC					JUN				
02...	1435	1.2	4.1	621	24...	1145	7.2	17.8	450
JAN					JUL				
14...	1230	.85	.5	653	14...	0815	3.3	16.1	626
FEB					AUG				
23...	1655	1.6	6.4	598	05...	1030	5.0	15.7	560
MAR					SEP				
18...	1235	3.3	2.7	577	29...	1600	2.6	16.8	604
APR									
02...	0955	16	6.0	522					

05411290 Sny Magill Tributary near Clayton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAY				
22...	1345	.73	8.4	635	18...	1350	1.8	17.2	605
NOV					JUN				
17...	1315	.49	3.7	643	24...	1240	3.1	19.0	555
DEC					JUL				
02...	1515	.60	5.1	634	13...	1200	1.9	16.5	632
JAN					AUG				
14...	1130	.42	1.5	615	03...	1420	1.3	16.6	613
FEB					SEP				
23...	1505	.67	6.9	625	29...	1400	1.2	16.6	644
MAR									
18...	1110	1.5	3.4	586					

05411300 Sny Magill Creek No. 2 Site near Clayton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					APR				
22...	1430	10	7.6	637	02...	0910	55	6.2	556
NOV					MAY				
17...	1515	11	3.5	650	18...	1450	18	17.2	606
DEC					JUN				
03...	0910	8.4	4.5	632	27...	1520	21	17.4	597
JAN					JUL				
14...	1216	7.2	.5	644	13...	1240	14	17.0	630
FEB					AUG				
23...	1555	8.3	6.8	626	03...	1520	16	17.1	625
MAR					SEP				
18...	1030	14	3.4	604	29...	1450	13	16.4	635

05411400 Sny Magill Creek near Clayton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAY				
22...	1440	12	6.8	622	20...	1425	18	15.0	600
DEC					JUN				
03...	1105	11	3.6	611	22...	1435	29	16.9	622
JAN					AUG				
14...	1415	8.7	.1	--	03...	1310	16	16.8	--
FEB					SEP				
25...	1300	11	6.3	598	29...	1445	18	16.7	617
MAR									
31...	0810	160	8.7	437					

05412060 Silver Creek near Luana, IA (L-23S)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
21...	1525	4.2	9.5	728
DEC				
01...	1340	1.3	4.8	735
JAN				
12...	1315	1.3	.1	715
FEB				
25...	0850	3.0	3.7	705
MAR				
31...	1320	99	7.5	350
MAY				
18...	1517	2.7	20.2	537
JUN				
24...	1215	15	19.0	578
AUG				
03...	1233	1.9	16.5	747
SEP				
30...	1700	1.2	15.5	726

05412100 Roberts Creek above Saint Olaf, IA (RC-2)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
22...	0808	39	4.3	720
DEC				
01...	1145	11	1.0	633
JAN				
12...	1320	10	.0	509
FEB				
25...	1055	23	5.6	665
APR				
01...	1805	592	6.4	497
MAY				
19...	1545	23	25.8	675
JUN				
24...	1425	143	22.5	607
AUG				
04...	1600	13	23.6	615
SEP				
29...	1202	3.7	20.0	680

05412500 Turkey River at Garber, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
21...	0910	1340	8.7	616
DEC				
03...	1330	515	2.7	610
FEB				
26...	0830	1290	6.8	561
MAR				
31...	1440	14600	10.1	461
MAY				
21...	0900	1290	17.4	607
JUN				
25...	0900	6260	21.6	466
AUG				
05...	1510	1880	20.1	427
SEP				
28...	1345	562	20.2	613

05418500 Maquoketa River near Maquoketa, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	0935	404	18.7	638
FEB				
26...	1230	1000	7.8	588
MAR				
24...	1520	2220	6.5	590
APR				
22...	1430	4230	10.0	518
MAY				
26...	1630	1770	20.0	552
JUN				
30...	1545	2960	23.5	522
AUG				
24...	1340	1080	25.4	567

05420460 Beaver Slough at 3rd St at Clinton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
MAR				
24...	1030	15100	3.5	411
APR				
22...	1030	29800	11.5	465
MAY				
26...	1006	13800	20.1	465
JUN				
30...	1035	21800	26.0	441
AUG				
24...	1037	11400	27.4	404
SEP				
22...	0950	5510	20.8	431

05420500 Mississippi River at Clinton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
14...	1515	43100	15.3	380
15...	0930	50500	--	378
NOV				
20...	1315	36500	4.7	317
21...	0930	36000	1.0	349
JAN				
30...	1030	39000	.5	426
MAR				
24...	1305	61900	6.7	435
25...	1030	57500	4.5	387
APR				
07...	1230	139000	7.5	316
22...	1232	--	12.8	471
22...	1300	125000	16.4	469
MAY				
11...	1145	57700	19.0	450
26...	1045	57500	20.4	466
26...	1208	--	21.8	477
27...	0935	56500	20.5	461
JUN				
10...	1230	47500	18.5	478
27...	1231	--	--	464
30...	1240	94200	26.6	444
JUL				
01...	0920	97000	25.7	440
09...	1230	131000	26.8	363
27...	1220	45600	26.3	419
28...	0930	43500	25.5	425
AUG				
24...	1145	47200	27.4	405
25...	0925	34700	25.7	409
SEP				
22...	1200	22000	21.4	421
23...	0930	22500	20.1	442

05420680 Wapsipinicon River near Tripoli, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	1228	79	17.7	429
NOV				
06...	1249	123	4.5	448
DEC				
03...	1249	81	1.8	430
JAN				
07...	1247	85	.0	451
FEB				
19...	1351	717	.2	278
MAR				
13...	1223	275	.3	456
APR				
02...	1443	1890	6.5	329
MAY				
06...	1249	207	16.7	437
19...	0940	210	21.7	443
27...	1335	601	17.9	457
JUN				
03...	1450	334	16.1	451
20...	1030	1240	18.7	275
JUL				
08...	1315	515	22.9	431
AUG				
05...	1231	80	21.7	406
SEP				
02...	1308	153	20.5	403
28...	1519	--	--	579

05421000 Wapsipinicon River at Independence, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
20...	0950	2460	9.3	443
DEC				
01...	0905	375	2.9	489
JAN				
12...	0930	253	.4	547
MAR				
30...	0910	1870	13.2	441
APR				
02...	1340	7350	7.3	383
MAY				
18...	0920	756	21.0	484
29...	1115	--	20.5	406
JUN				
12...	1320	--	19.0	272
22...	1000	3640	20.5	408
AUG				
03...	0850	179	23.8	386

05422000 Wapsipinicon River near De Witt, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	0907	458	20.0	365
17...	0915	1960	10.7	456
20...	0950	2460	9.3	443
NOV				
06...	0915	1190	4.8	500
20...	1530	864	2.1	528
DEC				
01...	0905	375	2.9	489
04...	0900	1110	2.4	500
JAN				
08...	0843	1790	2.0	530
08...	0930	1820	2.0	530
12...	0930	260	.4	547
FEB				
19...	0955	1460	4.4	523
20...	0842	1530	4.8	509
MAR				
12...	0850	3200	.2	268
APR				
01...	1220	8180	10.9	307
02...	0900	9150	9.0	318
MAY				
06...	0925	2760	17.2	489
12...	1605	2720	20.5	450
JUN				
03...	0915	4440	20.0	440
17...	1300	6470	20.5	429
23...	1610	8690	22.4	423
JUL				
09...	0855	6490	25.0	384
AUG				
06...	0900	762	24.7	372
11...	1445	1060	27.4	318
SEP				
02...	0915	2690	22.5	379
17...	1425	1230	22.4	418

05422470 Crow Creek at Bettendorf, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
16...	1445	1.1	13.0	849
NOV				
26...	1245	2.0	5.2	799
JAN				
07...	1515	29	4.3	787
FEB				
18...	1600	18	5.0	788
APR				
02...	0735	63	6.6	645
MAY				
13...	0800	19	14.6	726
JUN				
24...	0750	35	18.2	682
AUG				
12...	0825	4.9	21.1	646
SEP				
18...	0750	8.0	18.9	768

05422560 Duck Creek at 110th Ave at Davenport, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
16...	0925	.51	1.5	707
NOV				
26...	0945	1.0	3.5	651
JAN				
07...	1010	33	4.8	639
FEB				
18...	1040	17	4.9	680
APR				
01...	1430	130	8.3	497
MAY				
12...	0920	31	11.0	634
JUN				
23...	0920	44	14.8	633
AUG				
11...	0935	3.7	19.3	611
SEP				
17...	0920	13	17.4	679

05422600 Duck Creek at DC Golf Course at Davenport, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
16...	1130	2.0	11.1	515
NOV				
26...	1115	4.5	4.0	879
JAN				
07...	1240	89	4.4	761
FEB				
18...	1410	55	5.3	799
APR				
01...	1705	332	8.2	582
MAY				
12...	1220	88	15.4	705
JUN				
23...	1215	117	18.8	661
AUG				
11...	1120	16	22.9	684
SEP				
17...	1120	32	20.2	710

05449500 Iowa River near Rowan, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	0948	35	19.4	710
20...	1134	52	8.6	687
20...	1520	51	9.7	710
NOV				
05...	0857	44	2.5	659
17...	1134	58	.2	694
24...	1520	38	.2	744
DEC				
02...	0908	45	1.6	638
JAN				
06...	0919	64	.0	664
14...	1325	25	.0	879
28...	1500	--	.0	727
FEB				
18...	0924	892	.1	316
26...	1150	373	5.4	618
MAR				
06...	1130	--	5.6	--
12...	0926	135	.1	747
30...	1520	785	9.5	676
31...	0922	906	6.9	665
MAY				
01...	1140	--	12.3	662
05...	0922	341	15.1	668
13...	1600	272	16.8	650
20...	1223	226	18.9	681
JUN				
02...	0904	272	15.1	683
13...	0928	599	16.6	688
23...	0848	2440	21.1	412
25...	0940	2570	22.3	488
JUL				
07...	0900	613	20.6	669
30...	0930	87	18.6	670
AUG				
04...	0903	118	20.8	616
SEP				
01...	0944	88	18.6	708
10...	1030	54	16.5	661

05451210 South Fork Iowa River NE of New Providence, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
07...	1054	2.8	21.0	562
NOV				
04...	1120	11	3.2	545
DEC				
01...	1128	18	2.5	575
JAN				
05...	1154	31	.0	591
28...	0830	--	1.0	659
FEB				
17...	1058	500	.3	374
MAR				
11...	0936	50	.1	691
30...	1113	312	11.5	661
APR				
01...	1033	549	5.9	682
MAY				
04...	1120	166	14.7	679
22...	0656	114	16.3	656
29...	1246	872	17.5	507
JUN				
01...	1318	510	16.1	704
12...	1155	1140	15.9	615
JUL				
06...	1213	670	19.8	604
AUG				
03...	1046	34	20.4	622
31...	1102	37	22.0	677
SEP				
14...	1000	--	21.2	533

05451500 Iowa River at Marshalltown, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1300	177	3.9	617
DEC				
16...	1035	216	.3	638
JAN				
27...	0945	172	.3	681
MAR				
12...	1105	300	.0	668
APR				
14...	1045	2620	11.3	666
MAY				
26...	1100	1590	16.8	643
JUN				
12...	1510	7050	19.2	330
22...	1140	12300	21.2	328
JUL				
08...	0755	3550	22.5	608
AUG				
26...	1545	425	25.2	635
SEP				

05451700 Timber Creek near Marshalltown, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1610	33	6.0	612
DEC				
16...	0855	30	.6	665
JAN				
27...	0800	34	.0	580
MAR				
11...	1150	96	.0	490
APR				
14...	0830	238	8.9	538
MAY				
20...	1410	196	15.0	495
JUN				
09...	0912	666	--	--
09...	1200	597	--	--
JUL				
08...	1040	178	20.3	555
AUG				
26...	1525	29	24.0	567
SEP				

05451900 Richland Creek near Haven, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
14...	1150	79	10.3	541
NOV				
24...	1140	33	.1	539
JAN				
05...	1135	38	2.8	506
FEB				
17...	1220	42	4.5	484
MAR				
30...	1335	199	11.1	386
31...	1020	509	8.0	391
MAY				
14...	1230	55	18.1	501
JUN				
22...	1400	254	15.5	486
AUG				

05452000 Salt Creek near Elberon, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
14...	1420	318	10.9	501
NOV				
24...	0950	36	.0	401
JAN				
05...	0940	103	1.6	582
FEB				
17...	1035	132	4.4	554
MAR				
30...	1145	336	12.5	538
31...	1335	1820	11.4	314
MAY				
14...	1420	158	19.4	558
JUN				
25...	0955	1030	20.3	468
AUG				

05452200 Walnut Creek near Hartwick, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
14...	1025	32	8.5	509
NOV				
24...	1305	20	.1	511
JAN				
05...	1245	56	2.6	479
FEB				
17...	1350	56	4.8	480
APR				
06...	1220	151	9.8	474
MAY				
14...	1035	61	16.5	493
JUN				
22...	1200	249	15.6	465
AUG				
10...	1105	23	24.4	509
SEP				
15...	1600	16	24.1	475

05453000 Big Bear Creek at Ladora, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
14...	0850	173	10.1	434
NOV				
24...	1445	48	.4	545
JAN				
05...	1425	218	2.7	527
FEB				
17...	1540	146	5.2	505
APR				
06...	1025	435	8.9	473
MAY				
14...	0855	224	16.1	492
JUN				
22...	0930	654	17.3	455
AUG				
10...	0830	56	22.5	534
SEP				
15...	1412	68	21.9	475

05453100 Iowa River at Marengo, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	0937	337	21.0	455
15...	1110	1470	11.4	455
NOV				
05...	0936	825	4.0	585
25...	1025	534	.9	608
DEC				
03...	0930	654	2.8	551
JAN				
06...	1045	1210	.7	567
07...	0846	1330	1.7	513
FEB				
19...	0916	2240	3.3	442
20...	1050	2620	3.3	497
MAR				
11...	0855	1490	-.2	270
31...	1720	8720	12.3	369
APR				
02...	1355	9240	7.8	402
MAY				
08...	0843	3500	15.0	544
15...	1115	2280	21.4	572
JUN				
05...	0900	3150	15.8	598
13...	0946	6280	18.3	389
25...	1345	15300	25.9	393
26...	0922	17500	25.0	382
JUL				
07...	0920	14700	24.5	500
AUG				
07...	0900	1690	22.1	508
13...	1120	1450	24.1	580
SEP				
04...	0850	975	22.6	629

05453520 Iowa River below Coralville Dam nr Coralville,

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
03...	1425	168	20.0	461
NOV				
07...	1105	708	7.4	466
MAR				
11...	1405	1650	1.5	574
JUL				
15...	1600	8190	14.7	406
AUG				
27...	1330	1140	26.4	554

05454000 Rapid Creek near Iowa City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAY				
07...	0955	.01	17.7	590	04...	1455	22	16.0	556
NOV					JUN				
17...	1125	1.0	.4	639	24...	1010	33	17.5	581
JAN					JUL				
06...	1035	18	2.7	595	30...	1430	2.9	22.2	601
MAR					SEP				
23...	1510	25	7.5	581	09...	1405	3.8	16.8	637

05454220 Clear Creek near Oxford, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)	DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT					MAY				
07...	1245	1.4	20.4	798	04...	1200	59	12.0	574
NOV					JUN				
17...	1335	19	.1	713	22...	1125	83	16.0	560
JAN					JUL				
06...	1035	95	4.6	580	30...	1155	14	22.5	604
MAR					SEP				
23...	1305	84	5.5	467	09...	1115	14	16.9	658

05454300 Clear Creek near Coralville, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)	DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT					MAR				
06...	1355	3.7	22.9	693	23...	1100	118	6.5	593
NOV					MAY				
17...	1520	21	.3	659	04...	0945	93	12.0	582
DEC					JUN				
18...	1005	19	.0	661	22...	1300	130	18.5	578
JAN					JUL				
02...	1440	23	.4	1050	30...	1015	23	21.5	658
06...	0910	132	3.8	614	SEP				
28...	1150	42	.0	618	09...	0940	26	16.3	664

05454500 Iowa River at Iowa City, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)	DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT					APR				
06...	1155	140	22.6	459	03...	1610	7900	9.3	485
NOV					MAY				
18...	1145	609	3.8	544	05...	1415	3350	16.5	604
JAN					JUN				
06...	1520	1750	2.8	608	24...	1420	6130	24.0	432
FEB					JUL				
18...	1255	2280	1.8	534	31...	0940	6770	26.9	482
MAR					SEP				
26...	1320	4820	8.0	548	10...	1110	714	23.8	517

05455100 Old Mans Creek near Iowa City, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)	DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT					APR				
07...	1350	3.2	22.2	549	30...	1050	211	10.4	493
NOV					MAY				
04...	1243	59	4.2	521	05...	1343	200	16.3	486
14...	1220	39	3.0	542	18...	0825	142	17.6	792
DEC					JUN				
02...	1223	28	4.5	528	02...	1325	169	17.6	508
18...	1535	39	.2	542	10...	0826	219	14.6	494
JAN					11...	1235	240	17.4	464
06...	1240	263	4.0	485	30...	1239	744	19.7	363
28...	0955	64	.0	511	JUL				
FEB					10...	0745	156	21.7	519
18...	1235	150	5.0	498	23...	0915	66	22.0	529
MAR					AUG				
10...	1310	249	.5	468	05...	0810	44	21.8	505
13...	1110	212	.9	504	SEP				
31...	1245	1610	12.1	269	01...	1300	104	20.9	503

05455500 English River at Kalona, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)	DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
NOV					APR				
14...	0955	150	2.5	508	30...	1335	589	11.2	437
DEC					MAY				
18...	1355	176	.4	497	18...	1430	469	22.1	436
JAN					JUN				
27...	1555	178	.0	467	11...	1115	778	17.6	412
MAR					JUL				
13...	0920	653	.0	445	23...	1125	167	24.9	460
31...	1720	4730	12.5	236	SEP				

05455700 Iowa River near Lone Tree, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
15...	1510	1730	13.7	403
NOV				
25...	1445	732	5.0	548
FEB				
20...	1445	3600	3.1	501
APR				
02...	1520	12800	10.0	406
MAY				
13...	1510	4260	20.3	509
JUN				
24...	1505	7490	23.2	439
AUG				
12...	1515	5900	26.6	543
SEP				
18...	1510	2240	24.1	491

05458000 Little Cedar River near Ionia, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
17...	0820	383	8.7	623
NOV				
21...	1130	65	.5	518
JAN				
14...	0840	39	.0	548
FEB				
25...	0910	321	4.0	456
MAR				
31...	1210	992	8.1	451
MAY				
13...	0840	255	14.9	517
JUN				
24...	0830	1110	18.8	427
JUL				
29...	0915	92	19.5	434
SEP				
09...	1430	71	20.6	479

05458500 Cedar River at Janesville, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
16...	1145	1680	10.9	524
NOV				
20...	1315	493	1.8	604
JAN				
13...	1030	256	.0	519
FEB				
24...	1150	1280	3.8	405
APR				
01...	1420	6110	6.2	522
MAY				
12...	1147	1420	19.1	482
JUN				
23...	1145	3940	21.3	499
JUL				
28...	1220	951	23.7	431
SEP				
09...	1155	715	18.7	567

05458900 West Fork Cedar River at Finchford, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
15...	1415	285	10.3	531
22...	1100	220	6.5	--
NOV				
13...	0920	190	2.0	--
20...	1530	147	3.5	587
DEC				
11...	1120	250	1.5	--
JAN				
13...	1300	138	.0	758
28...	1125	285	.5	--
FEB				
17...	0900	520	1.5	--
23...	1445	880	4.8	524
MAR				
26...	1220	1150	8.5	--
APR				
01...	0820	1890	7.4	550
09...	1045	1520	8.0	--
MAY				
11...	1335	605	18.3	573
JUN				
09...	0855	1250	15.0	--
22...	1618	5010	21.0	313
JUL				
09...	0900	1350	23.5	--
27...	1630	312	26.5	553
AUG				
11...	0850	860	22.5	--
SEP				
08...	1355	260	20.9	564
14...	1050	230	20.5	--

05459500 Winnebago River at Mason City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
14...	1340	325	10.5	702
NOV				
24...	1100	44	.1	834
JAN				
07...	1145	96	.0	721
FEB				
24...	1315	761	4.0	598
MAR				
30...	1110	868	9.9	702
MAY				
12...	1145	344	17.6	688
JUN				
24...	0900	2370	20.1	454
AUG				
03...	1145	153	21.0	720
SEP				
15...	1010	89	21.7	731

05461390 Flood Creek near Powersville, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					APR				
09...	0823	3.3	14.5	456	02...	0843	388	5.1	489
NOV					MAY				
06...	0855	4.7	4.6	491	06...	0838	74	11.4	532
DEC					18...	1004	49	14.9	519
03...	0852	2.0	2.5	452	JUN				
JAN					03...	0906	116	11.7	551
07...	0902	.07	.0	443	JUL				
FEB					08...	0848	108	15.1	540
19...	0948	60	.1	320	AUG				
MAR					05...	0837	44	15.4	468
13...	0850	8.1	.1	519	SEP				

05462000 Shell Rock River at Shell Rock, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAY				
16...	1630	881	11.9	623	12...	1620	1210	19.4	567
NOV					JUN				
21...	0830	421	.0	728	23...	1445	6090	21.1	355
JAN					JUL				
13...	1500	288	.0	734	28...	1545	844	25.2	408
FEB					SEP				
24...	1520	1850	4.5	526	08...	1555	759	22.1	513
MAR									
31...	1625	3170	10.5	607					

05463000 Beaver Creek at New Hartford, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV					MAY				
19...	1600	80	.0	694	11...	1020	276	17.7	366
JAN					JUN				
12...	1305	62	.0	706	22...	1315	6100	22.3	214
FEB					JUL				
23...	1145	409	6.0	586	27...	1355	131	24.5	587
APR					SEP				
01...	1115	1190	6.7	558	08...	1125	59	18.8	410

05464000 Cedar River at Waterloo, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAY				
16...	0845	4230	10.8	529	12...	0815	4820	17.6	524
NOV					JUN				
20...	0930	1260	.0	637	23...	0810	23300	20.9	381
JAN					JUL				
12...	1530	1000	.0	644	28...	0840	2810	21.9	504
FEB					SEP				
24...	0810	5510	2.4	484	09...	0820	1590	18.3	558
APR									
02...	0900	16000	7.3	535					

05464220 Wolf Creek near Dysart, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					MAY				
10...	0938	152	13.4	517	07...	0919	349	13.0	549
21...	0854	150	7.7	597	18...	1327	237	21.3	569
NOV					JUN				
07...	0919	103	5.8	592	04...	0933	372	12.8	566
18...	0857	188	.0	585	10...	1215	1030	15.6	458
DEC					12...	1238	5790	19.1	145
04...	0919	141	2.1	585	22...	1415	3440	21.1	284
JAN					JUL				
08...	0910	159	1.1	567	09...	0924	746	21.0	557
FEB					AUG				
20...	0941	299	3.8	557	06...	0855	334	19.9	427
MAR					SEP				
18...	0918	261	.9	523	03...	0956	88	19.7	599
APR					29...	0845	--	--	402
01...	0945	2610	7.2	388					

05464500 Cedar River at Cedar Rapids, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV					JUN				
04...	1115	2300	4.7	615	26...	0835	28100	24.2	405
JAN					JUL				
30...	1040	1950	.2	680	15...	0850	7580	18.9	501
MAR					AUG				
11...	1035	3810	.5	593	27...	1030	3430	25.0	484
APR									
20...	1110	15300	11.3	519					

05464935 Cedar River near Nichols, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	1232	1700	20.6	523
NOV				
06...	1302	3060	5.4	652
DEC				
04...	1230	2680	2.9	633
JAN				
08...	1233	4220	1.2	617
FEB				
20...	1156	5400	5.3	601
MAR				
12...	1200	5860	.1	603
APR				
03...	0851	25700	8.8	423
MAY				
07...	0827	8600	17.1	584
JUN				
04...	0900	8530	18.5	594
JUL				
06...	0847	26800	22.7	487
AUG				
04...	1300	3440	25.3	463
SEP				
03...	0840	5440	23.3	557

05465000 Cedar River near Conesville, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
17...	1340	5340	13.0	512
FEB				
19...	1420	4520	5.7	645
APR				
02...	1230	26500	10.0	394
MAY				
13...	1225	7820	20.4	523
JUN				
24...	1255	20400	22.5	468
AUG				
12...	1235	5600	26.0	503
SEP				
18...	1200	3280	21.2	542

05465500 Iowa River at Wapello, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
06...	1050	2500	20.9	475
22...	0951	5310	9.0	581
NOV				
03...	0953	5750	5.9	595
06...	1200	4900	5.6	603
19...	0935	3860	1.3	612
DEC				
01...	0928	3690	5.6	615
17...	1035	4620	.9	607
JAN				
05...	0938	6500	3.0	651
FEB				
17...	0936	6920	4.2	568
MAR				
09...	1000	15800	2.3	537
10...	1435	14600	1.8	526
30...	0905	16000	14.6	565
APR				
03...	1515	41900	--	--
04...	1020	43100	8.4	422
27...	1310	23000	13.6	565
MAY				
04...	0909	15400	14.5	583
27...	1148	13400	20.2	500
JUN				
01...	0913	16700	22.2	524
08...	1220	11100	18.7	576
19...	1002	37400	19.8	489
JUL				
02...	1049	48400	24.9	467
20...	1245	11100	29.2	449
AUG				
03...	0925	10700	25.2	470
31...	0940	12300	25.0	515
31...	1215	12300	21.6	507

05470000 South Skunk River near Ames, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
27...	1330	30	4.7	729
DEC				
15...	0955	38	.6	770
JAN				
26...	1110	32	.0	776
MAR				
12...	1515	193	.5	775
APR				
13...	1125	343	10.9	747
MAY				
27...	1245	353	17.9	749
JUL				
07...	1110	807	21.2	649
AUG				
24...	1050	244	25.4	482
SEP				
21...	1030	19	19.0	692

05470500 Squaw Creek at Ames, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
27...	1620	24	4.4	751
DEC				
15...	1220	36	.4	753
JAN				
26...	1240	30	.0	759
MAR				
12...	1315	133	.0	760
APR				
13...	1325	265	10.5	726
MAY				
27...	1500	221	19.2	728
JUL				
07...	1320	504	22.3	656
AUG				
27...	0925	26	22.7	740
SEP				
21...	1310	7.2	18.2	653

05471000 South Skunk River below Squaw Creek near Ames,

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1015	42	4.9	729
DEC				
15...	1605	101	.7	752
JAN				
26...	1435	48	.0	803
MAR				
12...	0820	166	.2	770
APR				
13...	1545	747	11.2	735
MAY				
27...	1640	596	19.9	734
JUN				
12...	1125	5010	17.4	458
JUL				
07...	1640	1570	32.1	633
AUG				
26...	1330	170	24.6	660
SEP				
21...	1550	23	19.0	605

05471040 Squaw Creek near Colfax, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
07...	1115	.63	19.5	597
NOV				
20...	1500	7.5	7.0	596
JAN				
06...	1200	16	4.5	586
FEB				
20...	1015	25	4.0	571
APR				
02...	1305	57	6.5	554
MAY				
19...	1100	21	14.0	575
JUL				
01...	1245	42	17.6	548
AUG				
11...	1430	9.5	22.0	463
SEP				
22...	1215	3.0	15.0	589

05471050 South Skunk River at Colfax, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	1035	165	6.5	698
DEC				
16...	1500	162	2.9	736
JAN				
27...	1500	142	.0	711
MAR				
11...	1215	234	.7	735
APR				
14...	1640	1060	13.7	720
MAY				
19...	0810	438	21.6	700
JUN				
12...	1225	5080	17.9	417
16...	2030	7080	18.7	474
JUL				
08...	1620	2570	24.3	543
AUG				
25...	1500	380	27.8	565
SEP				

05471200 Indian Creek near Mingo, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	0825	39	4.7	737
DEC				
16...	1330	54	2.1	720
JAN				
27...	1325	44	.0	731
MAR				
11...	1030	135	.0	770
APR				
14...	1430	293	13.1	709
MAY				
26...	1645	371	18.7	674
JUN				
15...	1120	4550	17.3	275
19...	1325	4560	19.5	328
JUL				
08...	1350	657	22.8	631
AUG				
25...	1550	28	29.2	615
SEP				

05471500 South Skunk River near Oskaloosa, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
30...	1005	956	8.1	580
DEC				
08...	1555	505	.6	668
JAN				
23...	0910	469	.0	635
MAR				
05...	1140	1500	3.1	639
APR				
01...	1635	7590	10.0	390
MAY				
21...	1250	2530	20.5	455
JUN				
15...	1230	8900	19.3	470
26...	1420	9500	26.0	441
JUL				
09...	1315	6140	19.6	452
AUG				
17...	1510	780	26.8	580
SEP				

05472500 North Skunk River near Sigourney, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
27...	1125	447	3.7	409
DEC				
08...	1030	337	.2	484
JAN				
23...	1150	348	.0	502
MAR				
02...	1035	860	2.9	462
MAY				
18...	0910	725	20.0	470
21...	1015	--	19.0	391
JUN				
10...	0915	1690	15.2	405
15...	1310	3670	18.1	331
JUL				
06...	1045	1320	21.5	438
AUG				
17...	0910	168	24.9	527
SEP				
28...	0905	116	20.7	508

05473400 Cedar Creek near Oakland Mills, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	1205	6.8	18.7	483
07...	1155	.57	23.0	--
NOV				
06...	1125	115	6.0	--
12...	1225	90	2.7	590
DEC				
01...	1145	35	6.5	--
18...	0850	91	-.2	617
JAN				
15...	1155	--	.5	--
27...	1000	113	.0	583
FEB				
05...	1140	260	.5	--
27...	1420	1810	7.3	307
MAR				
03...	1040	330	3.0	--
12...	1355	499	.0	489
31...	1230	5710	14.5	195
APR				
07...	1100	900	12.0	--
28...	1725	198	11.9	524
MAY				
05...	1300	470	16.5	--
19...	1449	164	24.1	514
JUN				
02...	1140	270	21.0	--
09...	1455	636	16.8	441
JUL				
08...	1210	4520	25.0	--
21...	1335	97	30.6	502
AUG				
04...	1205	15	26.0	--
SEP				
03...	1040	180	22.5	358

05474000 Skunk River at Augusta, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
07...	0903	194	21.4	481
NOV				
04...	0822	403	6.1	472
07...	1440	1710	6.6	--
07...	1445	1710	6.6	557
DEC				
02...	0835	1490	5.8	536
17...	1410	1130	1.4	603
JAN				
06...	0830	8100	3.3	402
FEB				
18...	0835	2930	4.6	508
MAR				
10...	0840	12200	1.2	322
11...	1200	6490	1.2	427
31...	0824	19600	14.0	297
APR				
03...	1215	16400	8.7	346
28...	1210	4950	13.3	583
MAY				
05...	0830	5180	14.4	505
26...	1200	15700	17.0	327
JUN				
02...	0820	5720	21.1	498
09...	1050	4220	16.6	561
18...	1044	14000	20.4	385
JUL				
08...	0930	15400	25.2	375
21...	1030	3660	28.7	558
AUG				
04...	0810	1370	24.9	597
SEP				
01...	0815	3960	22.8	250

05474500 Mississippi River at Keokuk, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
APR				
05...	1640	219000	11.4	421
JUN				
29...	1300	149000	27.8	413
SEP				
09...	1130	40400	25.0	486

05476750 Des Moines River at Humboldt, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
06...	1510	172	21.5	708
NOV				
17...	1550	152	1.7	774
DEC				
29...	1355	174	.0	911
FEB				
11...	1306	141	.0	886
APR				
01...	1435	3020	5.1	704
MAY				
04...	0940	1790	14.8	770
JUN				
25...	1325	3650	22.9	492
JUL				
27...	1150	417	24.4	557
SEP				
18...	1322	214	23.0	711

05479000 East Fork Des Moines River at Dakota City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
10...	1150	46	14.4	752
NOV				
17...	1120	87	.5	798
DEC				
29...	1230	82	.0	879
FEB				
11...	1035	58	.0	806
APR				
02...	1000	2290	5.0	728
MAY				
04...	1245	938	16.1	724
JUN				
24...	1525	2540	20.6	587
JUL				
27...	0920	214	23.5	606
SEP				
18...	1015	70	22.0	671

05480500 Des Moines River at Fort Dodge, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
10...	1350	211	16.4	699
NOV				
20...	1205	321	.8	756
25...	1105	264	.8	822
JAN				
02...	1100	218	.3	918
20...	1350	228	.0	999
FEB				
11...	1430	259	.0	952
APR				
03...	1005	6330	4.4	711
MAY				
07...	0820	2860	16.0	483
16...	1330	7410	17.0	437
JUN				
12...	1400	5230	18.5	711
25...	1325	8570	--	--
JUL				
30...	1600	658	26.0	493
SEP				
17...	1505	313	24.6	559

05481000 Boone River near Webster City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
07...	1200	16	23.8	721
NOV				
12...	0940	36	.0	810
18...	1110	45	3.0	764
DEC				
05...	0920	18	.0	918
08...	1040	32	.0	845
11...	1320	39	.0	868
15...	1030	25	.0	925
18...	1440	41	2.3	843
22...	1040	43	.0	871
24...	0930	41	.0	932
29...	0940	27	.0	979
JAN				
02...	0850	29	.0	1030
05...	1240	54	.0	863
08...	1355	90	1.2	577
12...	1010	48	.0	1010
16...	1025	27	.0	989
20...	1023	28	.0	1020
23...	1530	34	.0	1070
26...	1240	36	.0	982
30...	0930	55	.0	980
FEB				
02...	1120	81	.0	845
10...	1610	68	.0	866
17...	1310	1150	.3	330
20...	1550	2020	1.1	391
MAR				
13...	1340	255	1.6	542
APR				
01...	1040	1960	4.6	751
MAY				
05...	1020	638	17.3	691
JUN				
23...	1000	4080	--	--
JUL				
30...	1100	136	25.3	603
SEP				
17...	1050	37	24.0	573

05481300 Des Moines River near Stratford, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
13...	0935	393	.7	780
DEC				
15...	1330	411	.1	850
JAN				
22...	1210	241	.8	691
28...	1525	283	.0	922
MAR				
18...	1010	1600	.7	748
APR				
20...	1000	9870	9.9	719
JUN				
01...	1000	7060	18.9	683
26...	0945	16300	26.4	541
JUL				
14...	0955	2950	26.5	660
AUG				
24...	0955	1250	26.6	598
SEP				
30...	1135	314	24.0	648

05481650 Des Moines River near Saylorville, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
31...	1000	546	9.4	638
31...	1100	546	9.4	--
DEC				
17...	1000	550	1.6	627
17...	1345	550	1.6	--
JAN				
28...	1050	319	2.3	802
28...	1200	319	2.3	--
MAR				
19...	0800	2310	1.4	660
19...	0930	2310	1.4	--
APR				
20...	1405	14200	11.1	634
20...	1545	14200	11.1	--
JUN				
01...	1425	9080	22.0	656
18...	1645	2130	19.5	583
JUL				
06...	1215	11600	23.0	--
06...	1330	11600	23.0	--
AUG				
25...	1140	1700	26.9	583
25...	1310	1700	26.9	--
SEP				
29...	1125	155	21.5	614
29...	1215	155	21.5	--

05481950 Beaver Creek near Grimes, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	1315	21	9.4	714
DEC				
17...	1505	30	1.0	850
JAN				
28...	0745	26	.0	809
MAR				
11...	1420	129	.4	742
APR				
15...	1150	448	11.9	684
MAY				
27...	0845	358	18.3	711
JUN				
10...	1020	1490	15.0	531
16...	1830	3860	21.5	362
JUL				
09...	0740	3230	25.2	324
AUG				
24...	1620	107	26.9	649
SEP				

05482000 Des Moines River at 2nd Avenue, Des Moines, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	1220	364	19.0	602
NOV				
18...	1720	324	.5	616
JAN				
07...	1415	709	1.0	673
FEB				
17...	1300	2390	2.5	680
MAR				
30...	1320	6430	9.5	644
MAY				
18...	1445	8220	22.5	662
JUN				
30...	1030	13000	23.7	572
AUG				
10...	1400	5800	25.5	583
SEP				
21...	1345	430	22.0	602

05482300 North Raccoon River near Sac City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
30...	1650	41	10.5	827
DEC				
11...	1015	55	.0	946
JAN				
21...	1000	27	1.0	1030
MAR				
04...	1050	271	2.0	757
APR				
14...	1350	1380	11.0	721
MAY				
28...	1050	513	21.0	740
JUL				
10...	1000	939	22.0	695
AUG				
20...	0930	178	27.5	744
SEP				
30...	1320	42	21.0	763

05482500 North Raccoon River near Jefferson, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	1443	65	18.2	610
NOV				
19...	1100	95	.9	781
21...	1040	102	.7	809
DEC				
30...	1055	109	.0	888
FEB				
10...	1245	127	.0	781
MAR				
31...	1455	2690	9.0	703
MAY				
05...	1815	1740	19.4	601
JUN				
12...	1025	5390	17.4	582
23...	1515	3050	--	--
JUL				
29...	1400	675	26.7	640
SEP				
14...	1145	151	22.9	537

05483450 Middle Raccoon River near Bayard, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	1210	51	15.4	577
NOV				
19...	1325	63	.9	784
21...	1355	59	.5	696
DEC				
30...	1305	87	.6	728
FEB				
10...	0930	193	.9	673
MAR				
31...	1145	509	7.6	667
APR				
16...	1230	1640	6.6	535
MAY				
06...	1050	339	15.8	449
JUN				
11...	1730	4230	18.8	228
15...	1110	6410	17.2	223
JUL				
29...	1125	197	24.1	618
SEP				
14...	1350	65	23.5	609

05483600 Middle Raccoon River at Panora, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	1330	40	19.9	545
NOV				
19...	1555	66	6.0	573
DEC				
31...	1055	72	.0	651
FEB				
09...	1625	125	2.5	638
MAR				
30...	1525	798	9.3	565
MAY				
06...	1235	286	17.3	632
JUN				
11...	1835	4450	16.7	457
15...	0930	7500	17.4	258
JUL				
29...	0910	211	26.3	541
SEP				
15...	0912	74	23.0	542

05484000 South Raccoon River at Redfield, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	1000	104	16.0	476
NOV				
20...	0940	153	.6	522
DEC				
30...	1545	201	.0	581
FEB				
09...	1225	302	.8	412
MAR				
31...	0740	2920	8.3	453
MAY				
06...	1635	582	17.7	578
JUN				
15...	1222	32000	17.3	185
24...	0850	1690	--	--
JUL				
28...	1345	552	29.8	471
SEP				
15...	1140	221	23.3	498

05484500 Raccoon River at Van Meter, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
17...	1250	246	.0	624
JAN				
08...	1550	545	1.0	606
FEB				
19...	1230	3300	3.0	512
APR				
01...	1030	5970	5.9	542
MAY				
17...	0930	6690	20.5	598
JUN				
10...	1400	8800	16.0	522
15...	1600	47600	19.6	446
30...	1100	10900	23.7	524
JUL				
14...	1415	5120	26.6	586
AUG				
24...	1350	1360	27.0	519
SEP				
30...	0805	388	21.4	558

05484650 Raccoon River at 63rd Street at Des Moines, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	0945	227	21.5	515
NOV				
05...	1725	2130	7.0	668
18...	0930	267	.0	635
JAN				
07...	1145	602	1.0	642
FEB				
19...	1600	3340	2.5	500
MAR				
30...	1830	5820	12.3	524
MAY				
20...	1400	5370	--	--
JUN				
12...	1330	18600	18.5	411
16...	1030	41100	18.5	280
16...	1120	38600	18.5	280
17...	1015	26200	18.7	365
AUG				
10...	1415	3110	26.5	586
SEP				
21...	1645	602	20.0	520

05484800 Walnut Creek at Des Moines, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	1140	.96	20.0	860
NOV				
18...	1130	12	.5	861
JAN				
06...	1145	30	1.5	720
FEB				
18...	1600	75	4.5	720
MAR				
30...	1410	355	12.4	542
MAY				
18...	1530	34	25.4	670
JUN				
30...	1405	244	21.7	577
AUG				
10...	1515	71	26.0	588
SEP				
21...	1305	16	18.0	344

05484900 Raccoon River at Fleur Drive, Des Moines, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	1630	142	21.0	609
NOV				
18...	1400	243	.5	632
JAN				
07...	0930	593	.5	642
FEB				
20...	1100	3360	2.6	483
MAR				
31...	1815	8430	10.1	471
MAY				
21...	0730	4810	--	--
JUN				
12...	1615	17800	18.5	421
16...	0820	42400	17.9	272
16...	1405	44900	19.1	296
17...	1430	27400	19.6	400
19...	1015	22600	19.9	388
AUG				
12...	0830	2970	--	--
SEP				
23...	1100	548	--	--

05485500 Des Moines River blw Raccoon Riv at Des Moines,

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
31...	1310	1050	11.0	709
DEC				
17...	0805	978	.7	657
JAN				
28...	1415	753	1.7	808
MAR				
19...	1055	4800	1.8	678
APR				
21...	1335	20600	11.2	678
JUN				
02...	0850	15500	21.0	656
16...	1130	48900	19.4	368
17...	0800	38700	18.1	432
JUL				
15...	0835	15900	23.6	601
AUG				
25...	0840	3580	26.5	515
SEP				
29...	1640	616	24.8	525

05485640 Fourmile Creek at Des Moines, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
09...	0920	18	15.5	748
NOV				
18...	1625	9.3	3.0	932
JAN				
07...	1120	32	2.0	854
FEB				
17...	1530	96	5.0	774
MAR				
30...	1720	938	11.0	450
30...	1721	850	11.0	450
MAY				
18...	1640	54	25.0	735
JUL				
01...	0850	303	18.7	664
07...	1045	3280	--	--
AUG				
10...	1630	50	--	500
SEP				
04...	1240	15	24.0	605
21...	1500	8.1	18.0	774

05486000 North River near Norwalk, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
06...	1245	1.8	19.5	496
NOV				
17...	1610	16	.5	528
DEC				
17...	1115	78	.0	446
JAN				
08...	1230	78	1.0	431
20...	1025	56	.0	502
FEB				
19...	1505	300	4.0	414
APR				
01...	1330	2050	8.0	304
MAY				
19...	1430	87	24.0	449
JUN				
30...	1430	244	25.8	420
AUG				
11...	1015	105	23.0	421
SEP				
22...	0945	41	18.0	449

05486490 Middle River near Indianola, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
06...	1440	7.3	26.0	550
NOV				
20...	0950	24	4.0	525
JAN				
07...	1615	138	1.0	437
FEB				
18...	0850	379	3.5	378
MAR				
31...	1000	5160	10.5	230
MAY				
19...	0900	144	22.7	453
JUL				
01...	0915	266	24.0	487
AUG				
12...	1330	58	26.0	479
SEP				
22...	1300	48	17.0	602

05487470 South River near Ackworth, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
03...	0920	8.2	9.0	477
06...	1715	4.3	27.0	487
NOV				
06...	1330	233	8.5	336
19...	0935	26	.0	486
JAN				
08...	1000	228	.5	360
FEB				
18...	1245	576	4.0	359
MAR				
31...	1245	10300	10.5	168
31...	1305	9740	10.5	168
MAY				
19...	1200	98	22.6	444
JUL				
01...	1115	91	25.2	449
AUG				
11...	1445	25	30.0	409
SEP				

05487500 Des Moines River near Runnells, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
19...	1240	846	2.5	711
DEC				
18...	1030	1660	1.5	690
JAN				
28...	1040	1290	--	--
MAR				
18...	1420	10200	1.2	515
APR				
21...	0820	23400	10.6	646
JUN				
02...	1300	17100	21.6	648
JUL				
15...	1345	19000	30.0	387
AUG				
26...	1000	3530	25.9	576

05487540 Walnut Creek near Prairie City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
07...	1020	.22	19.5	596
NOV				
08...	1115	.83	5.5	559
20...	1350	2.6	8.0	555
JAN				
07...	0830	5.4	3.0	566
FEB				
18...	1610	6.2	5.0	617
MAR				
31...	1600	41	8.0	493
MAY				
19...	0845	7.4	12.5	559
JUL				
01...	1130	18	18.0	540
AUG				
11...	1010	4.1	19.0	476
SEP				

05487550 Walnut Creek near Vandalia, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
07...	1300	.17	21.0	585
NOV				
19...	1425	5.8	2.5	511
JAN				
06...	1415	16	4.0	509
FEB				
18...	1330	15	4.0	498
APR				
03...	0830	55	6.0	467
MAY				
07...	1120	135	12.5	382
19...	1330	19	18.0	498
JUN				
11...	2010	210	19.0	240
JUL				
01...	0925	48	17.6	459
AUG				
11...	1615	9.0	25.0	434
SEP				

05487980 White Breast Creek near Dallas, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	0845	241	3.5	352
29...	0930	241	3.5	352
DEC				
10...	1320	57	.8	537
JAN				
22...	0905	50	.0	614
MAR				
03...	1605	143	2.8	462
APR				
01...	1245	5340	9.0	209
MAY				
19...	1640	73	27.5	469
JUL				
08...	1235	3190	26.0	3190
AUG				
19...	1300	13	29.8	496
SEP				

05488110 Des Moines River near Pella, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	1515	3480	10.7	580
DEC				
11...	1025	1870	1.7	582
MAR				
04...	1125	8190	2.3	496
MAY				
20...	1300	18300	22.0	591
JUL				
09...	0915	21700	18.2	282
AUG				
18...	0910	13700	25.7	510
SEP				
29...	0920	604	21.8	558

05488200 English Creek near Knoxville, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
30...	0830	122	4.9	377
DEC				
11...	1505	16	1.3	587
JAN				
22...	1435	13	.0	635
MAR				
04...	0840	58	1.3	440
MAY				
20...	0940	53	20.6	559
JUN				
15...	1620	1350	20.1	209
JUL				
08...	1430	230	25.1	283
AUG				
18...	1600	4.4	27.1	587
SEP				
28...	1615	4.5	22.2	790

05488500 Des Moines River near Tracy, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	1250	3470	10.8	575
DEC				
11...	1300	1870	2.2	588
MAR				
04...	1420	8260	3.1	533
MAY				
20...	1600	18900	22.6	592
AUG				
18...	1245	14000	26.8	530
SEP				
29...	1625	642	24.2	571

05489000 Cedar Creek near Bussey, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
27...	1530	657	1.8	453
DEC				
10...	1530	92	.7	571
JAN				
22...	1120	72	.0	635
MAR				
05...	0830	174	2.4	506
MAY				
21...	0920	122	20.5	611
JUL				
06...	1500	5970	23.2	180
AUG				
19...	1355	50	27.7	583
SEP				
28...	1355	29	21.9	647

05489500 Des Moines River at Ottumwa, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
13...	1340	1440	3.5	658
DEC				
22...	1335	2260	.8	605
MAR				
12...	1050	3760	.6	560
APR				
29...	1035	26700	13.0	647
JUN				
10...	1025	14700	19.2	602
JUL				
06...	1600	46100	24.5	271
22...	1050	24000	26.9	464
SEP				
02...	1530	3630	26.0	623

05490500 Des Moines River at Keosauqua, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	1545	258	21.7	598
02...	0930	446	17.5	600
NOV				
12...	1720	1340	5.0	677
DEC				
19...	1200	3210	2.7	615
MAR				
23...	1248	17500	3.6	548
APR				
29...	1600	26300	13.2	650
JUN				
10...	1515	15100	19.0	593
JUL				
22...	1530	24400	27.0	466
SEP				
02...	1030	2290	24.8	563

The following surface water-quality data were measured at various locations in the Sny Magill Creek and Bloody Run Creek drainage basins during water year 1998.

05389200 Bloody Run Trib at Spook Cave near Froelich, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT					
22...	0920	6.1	3.1	735	27
NOV					
17...	1135	--	--	--	36
DEC					
02...	1020	6.1	2.3	731	40
JAN					
13...	1210	3.5	2.8	745	55
FEB					
24...	1305	10.1	2.8	707	54
MAR					
18...	1520	5.7	3.7	680	10
31...	1250	--	--	--	544
APR					
02...	1025	7.1	15	595	--
MAY					
18...	0950	14.0	5.1	720	18
JUN					
22...	1048	14.6	8.0	663	39
JUL					
14...	0715	13.8	6.1	729	43
AUG					
03...	1050	15.1	6.0	737	59
SEP					
29...	1000	12.7	5.5	735	18

05389250 Bloody Run Site No. 2 near Giard, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT					
22...	1035	4.4	4.9	717	37
NOV					
17...	1225	--	--	--	35
DEC					
02...	1105	3.6	4.4	714	11
JAN					
13...	1325	.0	5.8	608	41
FEB					
24...	1240	7.3	5.7	683	29
MAR					
18...	1620	3.8	9.0	538	10
APR					
02...	0930	6.8	48	574	--
MAY					
18...	1110	15.9	11	696	36
JUN					
09...	1200	--	--	--	128
22...	1126	14.9	19	652	48
23...	1125	--	--	--	42
30...	1250	--	--	--	89
JUL					
07...	1220	--	--	--	69
14...	0625	15.1	15	719	38
AUG					
03...	1135	16.5	13	715	15
18...	1140	--	--	--	61
SEP					
22...	1130	--	--	--	5
29...	1130	13.9	12	715	14

05411200 Sny Magill Creek No. 3 Site near Clayton, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT					
22...	1230	6.8	2.4	676	10
NOV					
17...	1135	1.1	2.4	678	60
DEC					
03...	0825	2.7	2.2	652	89
JAN					
14...	1055	.0	1.3	712	8
FEB					
23...	1305	6.2	1.6	655	20
MAR					
18...	1215	2.4	3.5	611	7
31...	1430	--	--	--	909
MAY					
18...	1300	18.9	3.5	619	24
JUN					
09...	1335	--	--	--	112
22...	1400	18.1	5.1	622	24
23...	1300	--	--	--	15
30...	1440	--	--	--	55
JUL					
13...	1107	17.0	4.0	670	18
AUG					
03...	1320	17.6	3.5	667	10
31...	1530	--	--	--	544
SEP					
29...	1320	18.5	4.1	655	4

05411230 West Fork Sny Magill Creek near Clayton, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT					
22...	1145	5.9	1.8	664	36
NOV					
17...	1115	1.2	1.8	656	8
DEC					
03...	0745	2.8	1.6	655	66
JAN					
14...	0952	-.1	1.8	640	21
FEB					
23...	1405	6.8	1.6	632	41
MAR					
18...	1125	3.7	2.4	619	16
31...	1435	--	--	--	551
31...	1440	--	--	--	545
MAY					
18...	1215	--	--	--	25
JUN					
22...	1457	17.3	3.1	620	19
23...	1310	--	--	--	43
30...	1455	--	--	--	26
JUL					
07...	1405	--	--	--	108
13...	1015	14.8	2.8	652	19
AUG					
03...	1230	16.5	3.0	645	14
18...	1320	--	--	--	27
SEP					
22...	1330	--	--	--	34
29...	1230	15.1	3.2	650	12

05411260 North Cedar Creek near Clayton, IA

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT					
22...	1510	--	--	--	23
22...	1530	6.7	1.7	625	--
NOV					
17...	1445	--	1.6	--	9
DEC					
02...	1435	4.1	1.2	621	32
JAN					
14...	1230	.5	.85	653	27
FEB					
23...	1655	6.4	1.6	598	38
MAR					
18...	1235	2.7	3.3	577	16
31...	1410	--	--	--	1690
APR					
02...	0955	6.0	16	522	58
MAY					
18...	1540	18.2	3.1	581	26
JUN					
09...	1320	--	--	--	28
23...	1245	--	--	--	102
24...	1145	17.8	7.2	450	758
30...	1415	--	--	--	28
JUL					
07...	1330	--	--	--	1120
14...	0815	16.1	3.3	626	25
AUG					
05...	1030	15.7	5.0	560	34
18...	1355	--	--	--	30
SEP					
22...	1300	--	--	--	3
29...	1600	16.8	2.6	604	7

05411290 Sny Magill Tributary near Clayton, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT					
22...	1345	8.4	.73	635	49
NOV					
17...	1315	3.7	.49	643	41
DEC					
02...	1515	5.1	.60	634	73
JAN					
14...	1130	1.5	.42	615	109
FEB					
23...	1505	6.9	.67	625	28
MAR					
18...	1110	3.4	1.5	586	13
31...	1630	--	--	--	401
APR					
18...	1350	--	--	--	14
MAY					
18...	1350	17.2	1.8	605	--
JUN					
24...	1240	19.0	3.1	555	185
JUL					
13...	1200	16.5	1.9	632	29
AUG					
03...	1420	16.6	1.3	613	55
SEP					
29...	1400	16.6	1.2	644	15

The following surface water-quality data were measured at various locations in the Fox River drainage basin during water year 1998.

05494200 Fox River near West Grove, IA

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAY 26...	1745	20.5	25.0	737	36	346	8.3	96	7.7	7.9	--	--
JUN 17...	1550	20.8	27.0	747	9.6	428	8.5	97	7.7	8.1	0	167
JUL 14...	1600	30.9	35.3	742	1.2	531	8.0	111	8.1	7.9	12	212
AUG 19...	1005	24.8	26.9	745	.18	580	4.7	58	7.5	7.8	0	257
SEP 14...	1730	20.2	22.5	733	603	152	6.8	78	7.5	6.9	0	57

DATE	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)
MAY 26...	--	.180	.050	1.4	1.64	.250	.080	9.9	49	11	8.6	4.3
JUN 17...	137	.500	<.010	1.6	1.20	.220	.120	9.4	57	13	12	6.1
JUL 14...	193	1.40	.130	3.8	.900	.420	.290	11	60	14	15	12
AUG 19...	211	2.57	.750	3.9	1.20	.360	.250	9.4	64	15	16	17
SEP 14...	46	.320	.010	3.3	.300	1.52	.230	32	31	10	3.7	12

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	BUTYL- ATE WATER WHLREC (UG/L) (30236)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)	METOLA- CHLOR WATER UNFLTRD REC (UG/L) (39356)
MAY 26...	11	37	.2	17	<10	4200	150	--	1200	--	--	--
JUN 17...	12	40	.2	14	<10	2000	100	<.100	K8100	K1000	<.100	<.10
JUL 14...	16	65	.3	10	<10	690	190	<.100	1200	K270	<.100	<.10
AUG 19...	16	56	.3	12	<10	440	890	<.100	2400	K360	<.100	<.10
SEP 14...	7.0	14	.2	23	50	40000	1300	<.100	K110000	57000	<.100	<.10

DATE	ATRA- ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO- CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA- ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN- AZINE TOTAL (UG/L) (81757)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY 26...	--	--	250	--	--	--	119	12	--	--	390	120
JUN 17...	6.00	.50	300	.190	.720	<.100	46	1.2	<.10	2.50	460	150
JUL 14...	2.30	<.10	330	<.100	.480	<.100	17	.06	<.10	.660	550	190
AUG 19...	.580	<.10	350	<.100	.150	<.100	12	.01	<.10	<.100	610	210
SEP 14...	.230	<.10	160	<.100	.130	<.100	1680	2730	<.10	<.100	170	54

05494250 Fox River near Paris, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAY 26...	1600	20.0	27.0	738	54	344	8.4	95	7.7	8.0	--	--
JUN 17...	1345	18.5	27.5	740	19	402	8.4	92	7.6	8.1	0	174
JUL 14...	1310	30.3	27.8	742	.99	490	9.8	134	8.2	8.2	11	194
AUG 19...	1200	26.0	30.7	746	.74	483	7.6	96	7.7	8.1	0	213
SEP 14...	1440	19.6	22.4	733	1340	151	6.3	72	7.1	7.2	0	52

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)
MAY 26...	--	.180	.060	1.5	1.47	.250	.090	11	47	11	8.6	4.7
JUN 17...	143	.200	.020	1.4	1.30	.240	.120	8.9	52	12	11	6.1
JUL 14...	177	<.020	.020	1.1	.400	.150	.090	7.0	60	14	14	7.0
AUG 19...	174	.120	.020	.86	.100	.140	.050	8.1	57	13	14	7.3
SEP 14...	43	.230	.020	4.9	.200	2.06	.190	30	28	11	3.0	12

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)
MAY 26...	11	38	.2	18	<10	5100	150	--	4900	--	--	--
JUN 17...	12	45	.2	15	<10	2400	90	<.100	10000	K4500	<.100	<.10
JUL 14...	14	61	.3	10	<10	990	240	<.100	K680	K67	<.100	<.10
AUG 19...	12	51	.3	14	<10	680	470	<.100	2700	500	<.100	<.10
SEP 14...	6.0	11	.2	25	50	58000	1700	<.100	96000	42000	<.100	<.10

DATE	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY 26...	--	--	250	--	--	--	148	22	--	--	390	130
JUN 17...	5.90	.62	270	.200	.770	<.100	64	3.3	<.10	2.10	440	140
JUL 14...	1.80	<.10	300	<.100	.410	<.100	33	.09	<.10	.310	510	180
AUG 19...	.480	<.10	300	<.100	.130	<.100	17	.03	<.10	<.100	520	180
SEP 14...	.160	<.10	150	<.100	.100	<.100	6250	22600	<.10	<.100	170	54

05494350 Fox River at County Road J40 near Bloomfield, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAY 26...	1320	19.0	20.0	742	109	332	8.2	91	7.5	7.9	--	--
JUN 17...	1050	19.0	21.0	742	43	349	7.9	88	7.3	8.1	0	135
JUL 14...	1030	25.3	--	742	5.8	522	8.4	106	7.6	8.1	0	229
AUG 19...	1405	30.6	32.0	747	4.7	491	10.1	138	8.1	8.3	0	217
SEP 15...	0815	20.1	23.0	742	262	179	7.0	79	7.0	7.4	0	71

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)
MAY 26...	--	.120	.050	1.6	1.34	.450	.100	10	47	10	9.3	5.4
JUN 17...	111	<.100	.020	1.6	1.60	.340	.190	13	44	9.8	11	6.8
JUL 14...	188	<.020	<.020	.61	.100	.150	.120	5.5	64	14	18	6.0
AUG 19...	178	<.020	<.010	.69	<.050	.220	.150	7.2	58	12	17	6.6
SEP 15...	58	.880	<.010	2.7	.300	.930	.200	18	26	7.9	4.9	9.9

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)
MAY 26...	11	34	.2	16	<10	6500	250	--	15000	--	--	--
JUN 17...	11	38	.2	14	<10	4300	150	<.100	32000	K6200	<.100	<.10
JUL 14...	18	63	.3	12	<10	460	310	<.100	K1100	K59	<.100	<.10
AUG 19...	16	52	.3	14	<10	330	200	<.100	920	140	<.100	<.10
SEP 15...	8.0	15	.2	19	20	26000	770	<.100	K124000	45000	<.100	<.10

DATE	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY 26...	--	--	240	--	--	--	249	73	--	--	370	110
JUN 17...	6.30	.70	250	.340	1.00	<.100	126	15	<.10	4.90	380	110
JUL 14...	1.40	<.10	320	<.100	.290	<.100	13	.20	<.10	.270	540	190
AUG 19...	.660	<.10	310	<.100	.140	<.100	8	.10	<.10	.330	520	180
SEP 15...	.630	<.10	170	<.100	.210	<.100	752	532	<.10	.130	200	58

05494450 Fox River at County Road V56 near Milton, IA

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAY 27...	0910	18.5	18.5	744	93	347	8.6	94	7.6	7.9	--	--
JUN 18...	0845	21.5	24.0	739	50	371	7.7	90	7.5	8.0	0	155
JUL 15...	0920	23.3	23.3	743	11	536	6.9	83	7.5	8.2	0	225
AUG 18...	1615	29.6	33.3	746	9.4	480	7.5	101	8.1	8.3	0	198
SEP 15...	1145	20.3	--	746	397	175	7.2	81	7.2	7.4	0	65

DATE	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)
MAY 27...	--	.020	.050	1.4	5.25	.380	.110	9.9	48	11	9.9	5.3
JUN 18...	127	<.100	<.010	1.1	1.40	.280	.160	9.5	47	11	11	6.2
JUL 15...	184	.030	<.020	.37	<.100	.110	.110	5.0	64	14	16	5.3
AUG 18...	162	<.020	<.010	.50	<.050	.180	.100	8.2	55	12	16	6.5
SEP 15...	54	.100	<.010	2.9	.300	1.22	.180	27	25	8.8	4.6	11

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	BUTYL- ATE WATER WHLREC (UG/L) (30236)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)	METOLA- CHLOR WATER UNFLTRD REC (UG/L) (39356)
MAY 27...	11	40	.2	15	20	6800	250	--	K20200	--	--	--
JUN 18...	13	45	.2	14	<10	3800	130	<.100	14400	11000	<.100	.15
JUL 15...	15	78	.3	13	<10	390	100	<.100	1500	600	<.100	<.10
AUG 18...	16	57	.3	14	<10	380	80	<.100	700	150	<.100	<.10
SEP 15...	9.0	13	.2	22	30	35000	1000	<.100	K127000	51000	<.100	<.10

DATE	ATRA- ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO- CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA- ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN- AZINE TOTAL (UG/L) (81757)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY 27...	--	--	240	--	--	--	224	56	--	--	390	120
JUN 18...	6.00	.50	270	.280	.950	<.100	100	14	<.10	3.60	410	120
JUL 15...	1.30	<.10	330	<.100	.270	<.100	9	.26	<.10	.270	550	190
AUG 18...	.620	<.10	310	<.100	.140	<.100	10	.25	<.10	.230	510	140
SEP 15...	.440	<.10	190	<.100	.190	<.100	1120	1200	<.10	.110	180	54

05494570 Valley Branch near Mount Sterling, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)
MAY										
27...	1400	18.0	22.5	745	1.1	417	8.7	94	7.6	7.9
JUN										
18...	1345	21.0	22.0	739	1.5	345	7.5	87	7.3	7.8
19...	1030	19.3	27.2	741	5.9	288	7.6	85	7.3	7.7
JUL										
15...	1315	24.2	34.5	742	.04	438	5.7	70	7.3	7.6

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
MAY										
27...	--	--	--	.030	<.010	1.4	.680	.090	.060	5.7
JUN										
18...	0	149	122	<.100	.060	1.5	2.80	.230	.070	36
19...	0	100	82	<.100	<.010	1.8	4.60	.290	.070	17
JUL										
15...	0	179	147	.030	<.020	.42	<.100	.070	.050	5.4

DATE	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
MAY										
27...	57	13	12	3.3	5.0	82	.2	16	<10	600
JUN										
18...	46	11	11	5.0	7.0	45	.2	12	<10	5200
19...	37	9.0	7.8	5.3	8.0	33	.2	14	<10	6800
JUL										
15...	52	12	12	3.5	5.0	72	.2	22	<10	620

DATE	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	PRO-PAZINE TOTAL (UG/L) (39024)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
MAY										
27...	170	--	8600	--	--	--	--	--	--	270
JUN										
18...	210	<.100	52000	40000	.140	<.100	1.60	12.0	.15	250
19...	220	<.100	41000	16000	.210	<.100	2.20	17.0	.20	250
JUL										
15...	700	<.100	3900	300	--	<.100	.13	1.40	<.10	280

DATE	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY									
27...	--	--	--	12	.03	--	--	460	130
JUN									
18...	.160	1.00	<.100	184	.72	<.10	<.100	380	110
19...	.270	1.80	<.100	250	4.0	<.10	<.100	310	84
JUL									
15...	<.100	.250	<.100	40	.00	<.10	<.100	450	150

05494600 Fox River at Mount Sterling, IA

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)
MAY										
27...	1550	20.5	26.0	743	116	336	8.2	94	7.7	7.9
JUN										
18...	1530	23.2	28.0	738	73	330	7.5	91	7.5	7.9
19...	1400	20.8	26.5	740	1750	172	6.0	69	7.1	7.3
JUL										
15...	1510	29.7	31.4	745	13	524	7.0	95	7.8	8.3
AUG										
18...	1230	26.9	32.5	748	12	466	7.8	100	8.0	8.1
SEP										
16...	0900	20.9	20.1	748	152	194	7.3	83	7.0	7.6

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
MAY										
27...	--	--	--	.020	.020	1.3	1.34	.420	.110	9.6
JUN										
18...	0	131	107	<.100	.030	1.3	1.60	.430	.110	16
19...	--	--	--	<.100	.010	5.9	1.10	2.13	.940	44
JUL										
15...	0	233	191	<.020	<.020	.41	<.100	.140	.110	6.2
AUG										
18...	0	200	164	<.020	<.010	.74	<.050	.190	.110	7.6
SEP										
16...	0	76	62	.050	<.010	1.9	.300	.790	.150	17

DATE	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
MAY										
27...	46	10	10	5.5	12	45	.2	15	<10	5500
JUN										
18...	39	9.1	9.1	5.9	14	39	.2	12	<10	5600
19...	35	8.8	4.2	7.3	7.0	11	.2	18	30	20000
JUL										
15...	67	15	16	6.0	15	70	.3	13	<10	810
AUG										
18...	55	12	14	7.1	14	52	.3	14	<10	560
SEP										
16...	25	7.0	5.4	9.1	8.0	18	.2	19	20	19000

DATE	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	PRO-PAZINE TOTAL (UG/L) (39024)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	SIMA-ZINE TOTAL (UG/L) (39055)	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)
MAY										
27...	280	--	4700	--	--	--	--	--	--	--
JUN										
18...	200	<.100	16200	7300	--	<.100	.140	.59	5.80	.47
19...	1300	<.100	--	--	.100	<.100	.110	.44	7.30	1.2
JUL										
15...	170	<.100	1100	K130	--	<.100	--	<.10	1.40	<.10
AUG										
18...	140	<.100	1700	280	--	<.100	--	<.10	.760	<.10
SEP										
16...	730	--	68000	5100	--	--	--	--	--	--

05494600 Fox River at Mount Sterling, IA

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY										
27...	230	--	--	--	232	73	--	--	370	110
JUN										
18...	230	.350	1.10	<.100	269	53	<.10	4.00	360	110
19...	220	.380	1.30	<.100	2510	11900	<.10	2.30	200	58
JUL										
15...	310	<.100	.240	<.100	21	.71	<.10	.230	540	190
AUG										
18...	290	<.100	.170	<.100	16	.53	<.10	.230	500	160
SEP										
16...	170	--	--	--	456	187	--	--	210	60

05494690 Fox River above Chambersburg, MO

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)
JUN										
19...	1520	21.0	30.0	741	1930	165	6.0	69	7.2	7.3
JUL										
16...	1100	25.7	29.5	749	15	530	7.8	98	7.4	8.1
AUG										
18...	1025	25.4	30.4	748	13	443	7.6	94	7.7	8.1
SEP										
16...	1145	21.0	23.6	751	210	181	7.7	88	7.1	7.5

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
JUN										
19...	0	69	57	<.100	.010	7.1	.900	2.48	1.08	43
JUL										
16...	0	232	190	<.020	<.020	.67	<.100	.160	.090	7.0
AUG										
18...	0	188	154	<.020	<.010	.99	<.050	.210	.070	8.4
SEP										
16...	0	68	56	.120	<.010	2.3	.300	.830	.130	19

DATE	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
JUN										
19...	37	13	4.6	12	7.0	10	.2	18	50	59000
JUL										
16...	69	15	15	5.8	13	64	.3	14	10	1900
AUG										
18...	52	11	13	7.1	16	46	.3	15	<10	1400
SEP										
16...	25	7.5	4.7	9.4	8.0	16	.2	19	20	23000

05494690 Fox River above Chambersburg, MO--continued

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	BUTYLATE WATER WHLREC (UG/L) (30236)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	PROPAZINE TOTAL (UG/L) (39024)	TRIFLURALIN TOTAL RECOVER (UG/L) (39030)	SIMAZINE TOTAL (UG/L) (39055)	METOLACHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRAZINE WATER UNFLTRD REC (UG/L) (39630)	ACETOCHLOR, WATER, UNFLTRD REC (UG/L) (49259)
JUN 19...	1800	<.100	20000	2500	.100	<.100	.150	.46	6.60	1.2
JUL 16...	330	<.100	710	240	--	<.100	--	<.10	1.30	<.10
AUG 18...	210	<.100	320	K35	--	<.100	--	<.10	.730	<.10
SEP 16...	830	<.100	36000	6100	--	<.100	--	<.10	.500	<.10

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRAZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALACHLOR TOTAL RECOVER (UG/L) (77825)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	METRIBUZIN IN WHOLE WATER (UG/L) (81408)	CYANAZINE TOTAL (UG/L) (81757)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
JUN 19...	190	.320	1.10	<.100	3720	19400	<.10	2.60	190	58
JUL 16...	320	<.100	.260	<.100	60	2.4	<.10	.230	540	190
AUG 18...	280	<.100	.160	<.100	53	1.8	<.10	.240	460	150
SEP 16...	170	<.100	.220	<.100	599	340	<.10	.120	200	60

05494700 Fox River near Chambersburg, MO

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)
MAY 28...	0945	20.0	26.0	746	126	335	8.2	92	7.7	7.9	.020	.040

DATE	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOVERABLE (MG/L AS CA) (00916)	MAGNESIUM, TOTAL RECOVERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOVERABLE (MG/L AS NA) (00929)	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K) (00937)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)
MAY 28...	1.3	1.29	.330	.080	10	46	10	9.0	5.5	11	53

DATE	FLUORIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY 28...	.2	15	<10	7000	300	9600	230	226	77	360	110

05494800 Little Fox River at Iowa-Missouri State Line

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)
MAY										
27...	1140	18.5	21.5	745	4.8	475	7.7	84	7.8	8.0
JUN										
18...	1115	20.9	27.2	741	17	307	7.8	90	7.5	7.8
19...	1030	19.1	22.5	742	175	171	7.3	81	7.0	7.5
JUL										
15...	1130	25.5	32.8	743	1.1	491	8.5	107	7.8	8.2
AUG										
18...	1420	28.9	32.1	746	.34	340	8.1	107	7.9	8.1
SEP										
15...	1415	22.3	27.9	745	24	210	7.9	93	7.4	7.5

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
MAY										
27...	--	--	--	.120	.170	1.3	3.28	.210	.120	8.3
JUN										
18...	0	114	94	<.100	.020	1.3	6.60	.290	.150	12
19...	0	59	48	<.100	<.010	5.1	2.70	1.17	.420	42
JUL										
15...	0	204	167	<.020	<.020	.63	<.100	.100	.080	5.9
AUG										
18...	0	223	183	.040	.020	.69	.080	.140	.080	8.6
SEP										
15...	0	81	67	.020	<.010	1.5	.500	.510	.260	16

DATE	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
MAY										
27...	59	15	17	6.0	19	54	.2	14	<10	1500
JUN										
18...	36	9.1	9.5	6.3	14	27	.2	13	<10	3500
19...	26	7.9	4.2	7.8	8.0	9.7	.2	16	20	21000
JUL										
15...	56	14	18	5.2	12	76	.3	11	<10	670
AUG										
18...	59	14	20	6.5	11	67	.3	10	<10	930
SEP										
15...	23	6.2	6.6	9.1	11	18	.2	11	10	6800

DATE	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	PRO-PAZINE TOTAL (UG/L) (39024)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	SIMA-ZINE TOTAL (UG/L) (39055)	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)
MAY										
27...	90	--	7000	--	--	--	--	--	--	--
JUN										
18...	110	<.100	22000	8600	.230	<.100	.230	.75	17.0	.73
19...	470	<.100	--	--	.140	<.100	.300	.78	9.80	.60
JUL										
15...	190	<.100	1500	460	--	<.100	--	<.10	1.20	<.10
AUG										
18...	410	<.100	4400	440	--	<.100	--	<.10	.370	<.10
SEP										
15...	230	<.100	81000	17000	--	<.100	--	<.10	.520	<.10

05494800 Little Fox River at Iowa-Missouri State Line

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
MAY										
27...	310	--	--	--	44	.57	--	--	530	140
JUN										
18...	240	.860	3.00	<.100	106	5.0	<.10	5.30	340	82
19...	200	1.10	2.80	<.100	1050	497	<.10	7.80	200	50
JUL										
15...	300	.150	.370	<.100	20	.06	<.10	.450	510	160
AUG										
18...	330	<.100	<.100	<.100	27	.02	<.10	.110	560	180
SEP										
15...	180	.150	.390	<.100	157	10	<.10	.480	230	70