

DROUGHT MONITORING TASK FORCE

Drought Status Report

July 8, 2002

The Department of Environmental Quality compiled the following drought status report from information provided by the State Climatologist, the Virginia Departments of Agriculture and Consumer Services, Health, Forestry, Emergency Management, Game and Inland Fisheries; the Virginia Cooperative Extension Service, Farm Service Agency-USDA, the National Weather Service, and the U. S. Geological Survey.

OVERVIEW

Drought conditions have deteriorated significantly since the report of June 7, 2002. Statewide rainfall for the month of June was 63% of long term average June rainfall. The occurrence of a period of virtually no rainfall during the two weeks around the first day of summer (the period of maximum solar radiation and associated evaporation) has resulted in a rapid increase in drought severity throughout most of central Virginia. Typical summertime weather is predicted for the next two weeks with temperatures generally near 90 and the potential for a couple of rounds of scattered showers and thunderstorms. Streamflows over the majority of the Commonwealth are well below levels that are expected in June and several areas have set new record low streamflows for June. Streamflows have declined quickly since the last statewide storm system in mid-May with many stream gaging stations east of the Blue Ridge recording new minimum flows for the month of June. Near normal precipitation from March through May slowed the decline in ground-water levels but it is unlikely that any significant ground water recharge will occur through the summer. Levels of large reservoirs such as Smith Mountain Lake, Kerr Reservoir, and Philpott Reservoir continue to decline despite variances to required minimum discharges. Lake Moomaw is currently operating under their normal summer water quality release which is supplying about one third of the flow measured in the James River near Richmond. Low rainfall in June has adversely impacted agricultural concerns across the Commonwealth. Cattle producers are reducing herd sizes in some areas because of lack of water and lack of pasture and feed. Corn crops are reported to be dying in the field due to lack of sufficient moisture. There is a significant concern that pasture and haylands will die off due to lack of moisture and will have to be re-established in the fall. Wildfire threats have significantly increased as forest fuel moisture declined with lack of June precipitation. Reservoir and stream levels that support public water supplies have declined since the last report. Ground water based public water supplies in Augusta, Botetourt, Caroline, Clarke, Fluvanna, Fauquier, Loudoun, Nottoway, Shenandoah, and Warren Counties have reported dropping ground water levels or reduced yields. While little is known on private ground water based supplies, it is anticipated that individual domestic users, especially those that utilize water table aquifers, have been or will be impacted by low ground water levels. The Department of Game and Inland Fisheries continue operations at all nine aquaculture facilities. Lowered stream flows since the last statewide precipitation event in mid-May have reduced recreational opportunities in many areas.

CLIMATOLOGICAL CONDITIONS

National Weather Service

No significant widespread precipitation events are expected for the next 5 to 7 days. Typical summer weather is expected through July 20 with temperatures generally in the upper 80s to low 90s although a couple of days in the mid 90s are expected. Scattered showers and thunderstorms are expected July 9 and 10 and July 12 or 13. Although no prolonged hot periods are expected during the next 2 weeks, the potential exists for a period of hotter weather as we get toward the last week in July.

The 30-day outlook through the month of July 2002 calls for normal precipitation and temperatures.

The 90-day outlook through the month of September 2002 calls for normal precipitation and temperatures.

The latest NOAA drought monitor indicates an increase in drought severity over the majority of the state. An area of D-3 (extreme drought) conditions has expanded significantly in the Piedmont and a small area of D-4 (exceptional drought) conditions has developed along the North Carolina border near Danville. The

drought monitor is included as Appendix A. The NOAA seasonal drought outlook calls for continuation of drought conditions with some improvement through September 2002 and is included as Appendix B.

Report of the State Climatologist

While statewide precipitation was 63% of normal for June, a band from Augusta County southward through much of the western Piedmont received less than 25% of normal June rainfall. This has resulted in a very rapid increase in drought severity in this region. Agricultural impacts are particularly severe. This very rapid increase in drought severity, known as “flash drought,” develops when several weeks with virtually no rain occur around the first day of summer. The longest days of the year occur in this period, resulting in the greatest solar radiation and associated evaporation rates. The accumulated precipitation deficits for the last three years have exacerbated this occurrence of “flash drought” in the Piedmont of Virginia. Maps depicting rainfall patterns in June and May-June are included in Appendix C.

It is highly unlikely that this region will receive area-wide rainfall sufficient to prevent major damage to agricultural interests. We are now in the time of year in which rainfall is generally generated by scattered afternoon thunderstorms. The likelihood of a more widespread rainfall event is low because we are between the period when frontal passages produce area-wide rains and the time of the year when tropical cyclones produce area-wide rains. This latter period is not likely to begin until at least late July. It is likely that drought conditions will continue to intensify in this region with the potential for significant impact to the agricultural community. It is worth noting that scattered thunderstorms have created some regions north of Augusta County where conditions are not as difficult, even though spotty regions are still extremely dry.

The map depicting June rainfall in Appendix C also shows that the majority of the state, except for relatively small areas in southeast, southwest and northern Virginia, received less than 50% of normal June rainfall. While conditions are more severe in the “core” of this area described above, drought impacts are likely to persist throughout this area. Because of the spotty nature of summertime precipitation events it is likely that there will be localized areas with severe impacts.

The map contained in Appendix C depicting combined May-June precipitation is most noteworthy for the low totals from the central Shenandoah Valley, southward through the Western Piedmont, to the North Carolina border. Two-month totals, in general, are more normal elsewhere in the state. Again, the propensity for the Valley and the Western Piedmont to be far below normal predisposed those regions to the flash drought that has developed in recent weeks.

Precipitation departures from normal for various periods ranging from one month to three years are presented in the Appendix D. Long-term precipitation deficits exist over most of the state with the exception of Tidewater. These deficits indicate the lack of significant ground water recharge during the last several years. This lack of recharge has resulted in significant ground water levels declines that are likely to impact users of shallow domestic wells for several months into the future. The areas most prone to this problem are likely to be in the Shenandoah Valley and the Piedmont.

In conclusion, drought conditions are likely to continue over the majority of the state. The likelihood that there will be sufficiently widespread rain in time to ameliorate major agricultural problems, particularly in the zone from the Central Shenandoah Valley throughout the Western Piedmont is exceedingly low.

PROVISIONAL ASSESSMENT OF HYDROLOGIC CONDITIONS IN VIRGINIA

United States Geological Survey

Streamflow levels across the State generally are well below the normal range of flow expected during June except where scattered thunderstorms brought significant precipitation into the basin. Streamgages in the Shenandoah, York, James, Chowan, and Roanoke River Basins are recording streamflow levels below normal with many of the gages setting new record minimums for June.

Streamgages in the Potomac, Rappahannock, and Kanawha River Basins are recording streamflow levels below the normal range of flow but above the minimum for the month. Streamgages in the Big Sandy and Tennessee River Basins are in or above the normal range of flow from recent thunderstorms. However, streamflow levels will decline rapidly if periodic precipitation does not continue because of low ground-water storage levels.

A frontal passage during the night of June 27 brought about one-half inch of precipitation across much of the State. Streamflows increased slightly but are expected to quickly decline back to near record low levels experienced prior to the precipitation event.

Near normal precipitation from March through May slowed the decline in ground-water levels, and there may have been minimal recharge to ground-water storage. With summer type precipitation events (scattered thunder storms) combined with normal summertime evaporation and transpiration ground-water levels will continue to decline.

Appendix E contains flow duration and current flow conditions for selected U.S. Geological Survey and Virginia Department of Environmental Quality surface-water gaging stations. Data are provisional and subject to revision. The normal range of flows is defined as flows in the middle two quartiles (between those flows equaled or exceeded 75 percent of the time and those flows equaled or exceeded 25 percent of the time).

Department of Environmental Quality, Status of Major Reservoirs

Smith Mountain Lake is 2.3 feet below full and falling. Inflow is approximately 230 cfs and outflow is 400 cfs. The lake is operating under a temporary variance from the FERC minimum release requirement of 650 cfs. Assuming the drought continues, the Lake will fall approximately one foot in July.

Kerr Reservoir is at 299 feet above mean sea level and falling. The lake is about a foot below the guide curve. Inflows are much below normal, on the order of 800 cfs; outflows are 3800 cfs. The Lake will probably fall about ten feet in the next two and a half months. Releases are being made to make hydropower, maintain water quality, protect juvenile anadromous fish, and to keep salt water from encroaching into the lower Roanoke River so a major paper plant can stay in operation. The Wilmington District of the U.S. Army Corps of Engineers has worked hard since last October to get the lake in good condition for this critical time of the year. Recreational users of the lake will begin to notice adverse impacts, but the most severe adverse impacts will occur toward the end of the summer recreational season.

Philpott Reservoir near Martinsville is 7.0 feet below normal and slowly falling. Minimum releases have been cut back to one fourth of their normal amounts and even at this low level the Lake is falling. Swimming beaches are closed due to low water and probably will not open this season.

Lake Moomaw in western Virginia is 86% full and operating under their normal summer water quality release. Inflow is 62 cfs and outflow is 307 cfs. At this rate the lake loses 3% of its conservation pool every 5 days. These flow augmentation releases from Lake Moomaw contribute almost one third of the flow currently measured in the James River near Richmond. This flow augmentation release will probably continue through the summer but this rate of release will completely utilize the conservation pool in 3 to 4 months.

Lake Anna is currently at 247 feet above sea level and falling at about .1 foot per week. This level is three feet below full pool elevation. There is approximately three feet of additional elevation available in the lake before NRC licensing requirements will impact power production from the facility.

VIRGINIA AGRICULTURAL SITUATION

Virginia Department of Agriculture and Consumer Services

Local Disaster Designation Requests

Nineteen Virginia localities have submitted requests to the Governor for federal drought disaster designation. The U.S. Secretary of Agriculture has approved disaster designations for Goochland and Prince Edward Counties. Damage assessment reports have been completed and the Governor has asked the Secretary of Agriculture for disaster designation for Augusta, Bedford, Bland, Brunswick, Buckingham, Cumberland, Fluvanna, Louisa, Nelson, Orange, Page, Rockbridge, Rockingham and Wythe Counties. Damage assessment reports are pending from USDA for Campbell, Franklin and Pittsylvania Counties.

Soil/Crop Conditions

Some areas of the state experienced much needed scattered rainfall while other areas received no precipitation. Pasture growth has slowed and crops are showing stress from the continued dry and hot weather. Soil moisture did not see much improvement with the scattered rains and water reserves are still low. Beef producers continued to feed hay due to a lack of pasture growth. Some farmers continued culling cattle due to lack of pasture growth and low water reserves. There were several reports of the tomato spotted wilt virus severely attacking the tomato crop. Hay yields remained well below average.

The Shenandoah Valley is currently the driest area of the state from an agricultural perspective. Farmers in this area report that corn is drying up in the field and dying and that some springs are drying up for the first time in 25 years.

In Southside Virginia the prolonged lack of rainfall has drastically reduced the amount of grazing available in pastures and many cattlemen will probably begin feeding hay in the next week or two. Producers have begun selling off their cattle due to reduced water supplies. This trend will increase over the next few weeks if significant rainfall does not occur.

In the Roanoke Valley agricultural drought conditions are critical. Pasture and hayland have ceased active growth and are completely brown. Agricultural conditions in the New River Valley and most of Southwest Virginia are not quite as bad but are still near critical. Ponds and streams are beginning to become a concern. The area has received some spotty thunderstorms that have provided localized temporary relief.

In Central Virginia ponds and streams are extremely low. Quite a few people are drilling new wells for agricultural water supplies. Corn is highly stressed and there has been no growth of hay to allow a second cutting. Pastures are showing signs of stress. It is anticipated that grass and hay will be killed as a result of the dry weather. Cattle producers are likely to experience monetary losses on three fronts: (1) selling cattle early on a depressed market due to inadequate water supplies, (2) no second cutting of hay resulting in inadequate feed supplies during the winter of 2002-2003, and (3) the added expense of having to reseed pastures and haylands this fall.

Northern Virginia ponds are in fair to good condition. However, two weeks of hot dry weather could dramatically increase agricultural drought impacts.

Tables describing topsoil moisture, crop condition, and crop progress are contained in Appendix F.

Virginia Cooperative Extension Service

A June 24, 2002 survey of Virginia Cooperative Extension Agriculture and Natural Resource Agents indicates that agricultural conditions are deteriorating rapidly across the state. Sporadic scattered thundershowers have not provided enough moisture to remedy the dry conditions. Agricultural conditions are not quite as critical in the southeastern area of the state and the Northern Neck region; however those areas are also in need of rainfall soon.

Livestock producers in numerous counties are feeding hay as a result of pasture growth being severely limited by lack of moisture. Some producers are hauling water to livestock. Producers in some counties are selling cattle and calves to reduce stocking rates.

Row crops are drought stressed over most of the state. Corn growth is stunted and plants are beginning to tassel at much shorter heights than in a normal year. Hot dry days significantly reduce the ability of corn to pollinate thus reducing yield potential. As a result of minimal shallow topsoil moisture some producers have stopped planting soybeans. Soybeans that have been planted are showing little growth in most areas of the state.

Pond levels remain low over much of the state. This poses a major problem for crops that require irrigation and livestock producers who rely on ponds for livestock water.

Without significant sustained rainfall soon, the agricultural situation in Virginia will continue to deteriorate creating major problems for farmers over most of the state.

FOREST SITUATION IN VIRGINIA

Virginia Department of Forestry

Wildfire Conditions

Wildfire activity has returned over the last two weeks as drought like conditions return with high daily temperatures and the lack of periodic precipitation. The threat of lightning caused wildfire continues due to the long-term drought, dry forest conditions, and summertime thunderstorms. The largest cause of wildfires in the state continues to be human activities. Amherst, Bedford, Campbell and Pittsylvania Counties and the City of Lynchburg have enacted local open burning bans.

Observed fire behavior over the last two weeks indicates that wildfire occurrence, rate of spread and intensity is much greater than would normally be expected at this time of year. The low forest fuel moistures resulting from long term precipitation deficits are definitely making fire operations more difficult and dangerous, regardless of the season.

The agency is particularly concerned about the potential for a severe fall fire season. Current long-term predictions indicate that the fall wildfire season in Virginia has the potential be even more severe than what was experienced last fall. The agency has continued its focus on the training of new fire resources for the state, exploration of new fire suppression technologies, and in maintaining the continued close working relationships with other cooperating agencies, to ensure adequate fire readiness when faced with another severe wildfire season.

Through June 28, theVDOP has responded to 1252 wildfires for over 10,717 acres this calendar year. This activity is above the normal five and ten year averages.

PUBLIC WATER SUPPLY SYSTEMS

Virginia Department of Health

Decreased rainfall and higher evaporation rates associated with the summer time have decreased reservoir and stream levels across the majority of the state.

Mandatory water restrictions remain in place in the City of Roanoke, Craigsville, Spotsylvania County, and the City of Fredericksburg. In Caroline County, Lake Caroline and Campbell's Creek Subdivision recently initiated mandatory water restrictions.

Voluntary water restrictions remain in place in the City of Richmond, Chesterfield, Hanover, Henrico, Botetourt County (Dal-Nita Hills), Clarke County Sanitary Authority (Boyce-Millwood), Williamsburg, Portsmouth, Chesapeake, Suffolk, Leesburg, Town of Hamilton, Town of Lovettsville, and Stafford. Systems serving parts of Albemarle, Amherst, Fluvanna, James City, and Henry Counties; the City of Charlottesville; and the Town of Burkeville have recently initiated voluntary water conservation measures.

Ground water based public water supplies in parts of Augusta, Botetourt, Caroline, Clarke, Fluvanna, Fauquier, Loudoun, Nottoway, Shenandoah, and Warren County have reported dropping levels or reduced yields from wells and springs. Efforts to drill new wells and repair leaking water lines have been initiated.

Appendix G contains detailed reports of public water supply conditions in the six field offices. The Abingdon Field Office has no reported problems or issues with either ground water or surface water sources.

FISHERIES AND RECREATIONAL IMPACTS

Virginia Department of Game and Inland Fisheries

Streamflows across the state have declined to near record low flows since the last statewide rainfall event in mid-May. Many portions of major recreational rivers, such as the James, Shenandoah, and Roanoke are only accessible utilizing non-powered watercraft, and in many areas, the low flows have limited accessibility even for these craft. Reservoir levels improved with the spring rainfall events, and are providing summer-time recreation with no closure of Department ramps on lakes and reservoirs. Groundwater supplies continue to decrease, however at this time there are no problems in the operation of the Department's nine (9) fish hatcheries. A flow variance was granted to American Electric Power in order to reserve water in the lake to support stream flows as the drought continues, protect the summer recreational pool in Smith Mountain Lake, and allow boating opportunities downstream during peak weekend recreational periods.

LOCAL EMERGENCY DECLARATIONS/REQUESTS FOR ASSISTANCE

Virginia Department of Emergency Management

Amherst County declared a local emergency on June 26 banning private use of fireworks and open burning. The declaration also requires voluntary water conservation and anticipates requiring mandatory water conservation if reservoir levels continue to decline. Amherst is not seeking state assistance at this time.

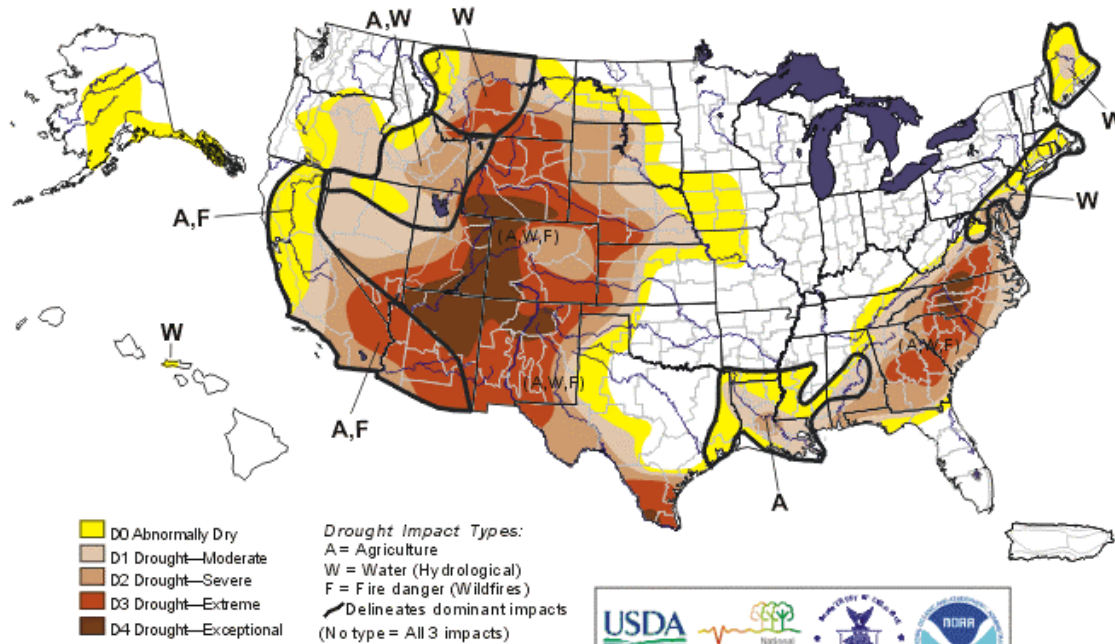
Campbell County has initiated actions under the VDEM potable water supply shortage procedures. Campbell is experiencing private well failures county wide. In one area existing geologic conditions are not favorable for well development and the county has planned a water line extension to serve the impacted area. On June 20 representatives from VDEQ, VDH, and Campbell County met to assess the water shortage and to develop plans to address the shortage. Campbell County intends to make treated public water available to residents in the impacted area by providing temporary water distribution sites at three locations. Campbell is not seeking additional state assistance at this time.

VDEM has requested that all local emergency managers review their plans for summer heat related emergencies. As part of this request the local emergency managers have been asked to identify if they have a local plan in place to deal with these emergencies, including any plans for establishing local emergency cooling centers.

APPENDIX A

U.S. Drought Monitor July 2, 2002

Valid 8 a.m. EDT



- D0 Abnormally Dry
- D1 Drought—Moderate
- D2 Drought—Severe
- D3 Drought—Extreme
- D4 Drought—Exceptional

Drought Impact Types:
 A = Agriculture
 W = Water (Hydrological)
 F = Fire danger (Wildfires)
 — Delineates dominant impacts
 (No type = All 3 impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Wednesday, July 3, 2002

Author: Michael Hayes, NDMC

National Drought Summary – July 2, 2002

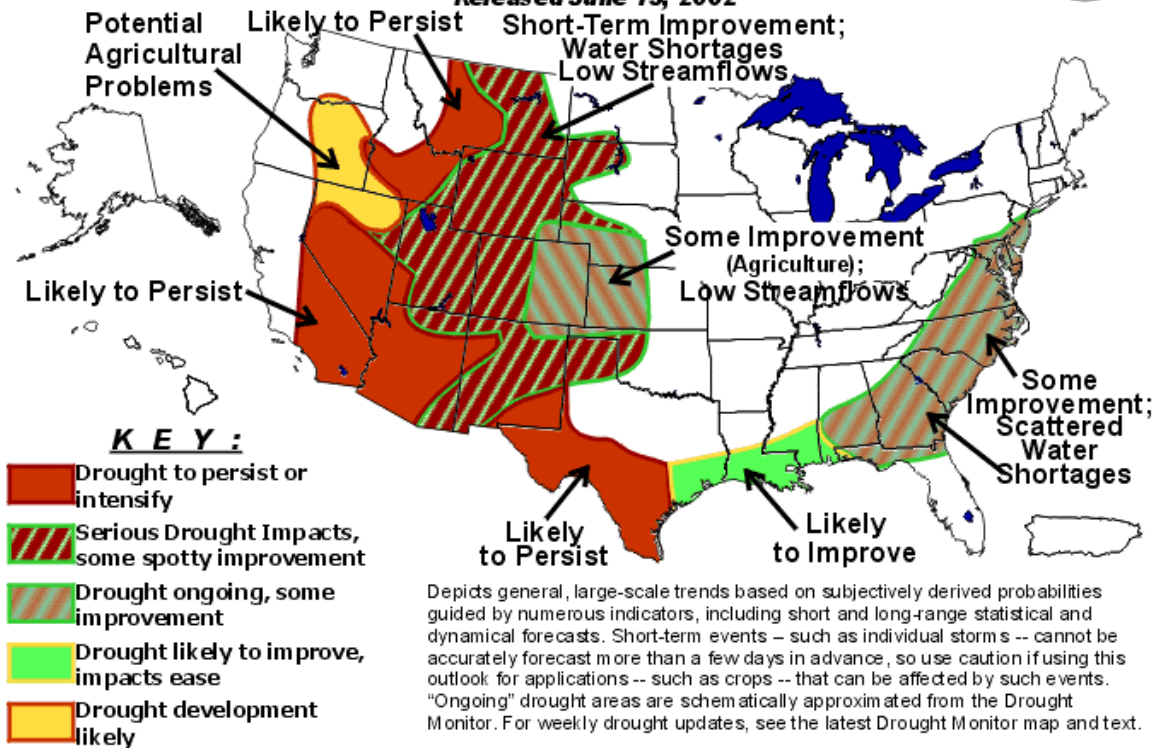
The East: Rainfall totals of 1-2 inches were common across large parts of the East during the past week, with the biggest exception being in the drought areas of Maryland and Delaware, where generally less than 1 inch fell for the week. Columbia, SC, finished with its driest June ever with 0.63 inches for the month (13% of normal). No changes to the drought classification occurred in the East for the week.

APPENDIX B



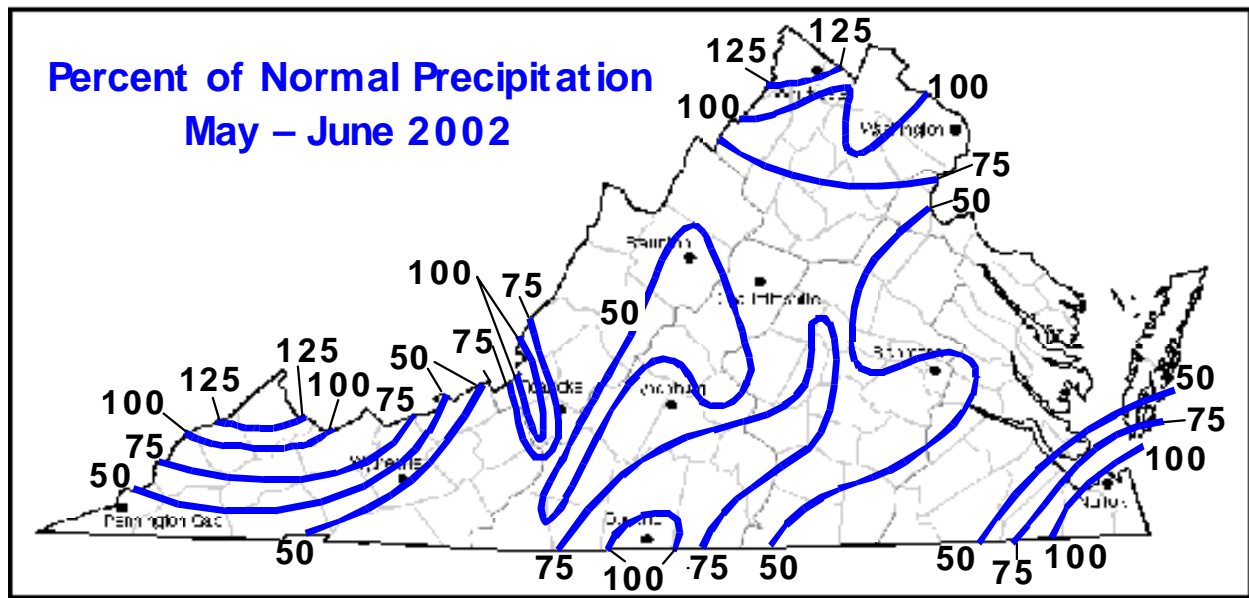
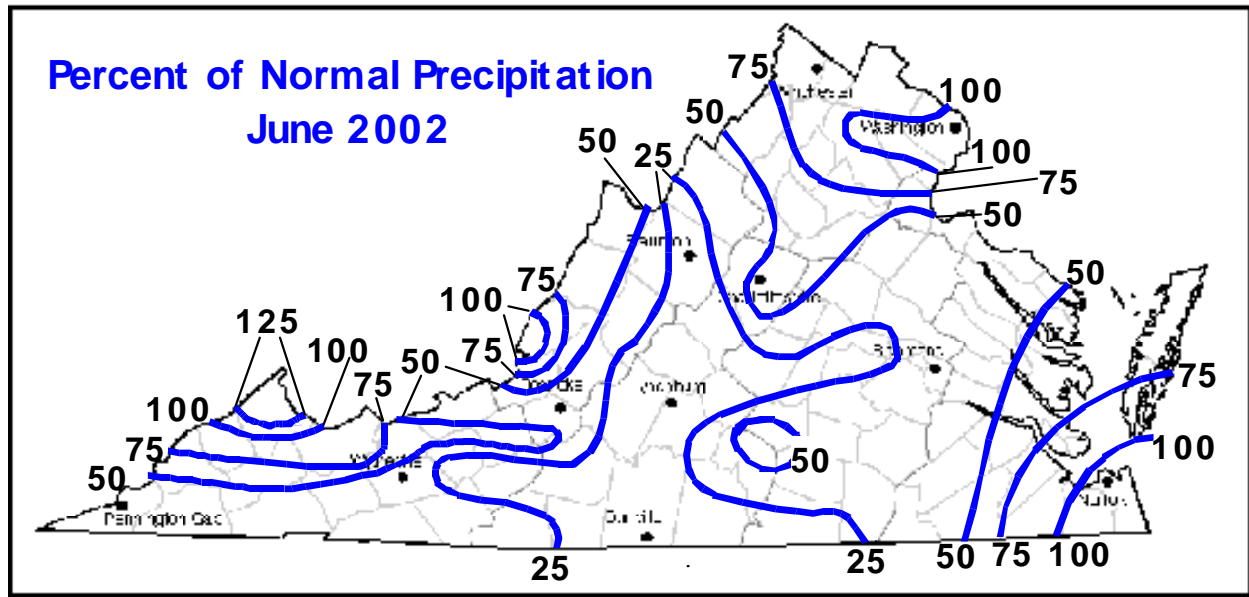
U. S. Seasonal Drought Outlook Through September 2002

Released June 13, 2002



Latest Seasonal Assessment - Several bouts of strong thunderstorms in recent weeks have helped to end drought or at least to bring significant improvement over much of the Northeast. However, precipitation deficits since September still exceed 10 inches in southern New England and the mid-Atlantic, so these areas could easily slip back into drought. The Southeast has experienced less improvement in recent months, and extreme drought extends from central Virginia southward to Georgia. Long-term forecast signals are not very strong for the East Coast for this summer, but historic data suggest that there should be some improvement in coming months across the region, especially along the Southeast coast. It should be noted, however, that summer usually sees declining levels of water supplies, so increases in well and reservoir levels will be harder to accomplish during this time of the year than during the spring. A tropical storm or hurricane could turn the drought around quickly, but the location for any such strike cannot be forecast more than a few days in advance.

APPENDIX C



APPENDIX D

One, two, three, six, twelve, twenty four, and thirty six month
precipitation departures by Climatological Division.

One Month Precipitation Departures

Climatological Division	JUNE 2002	JUNE NORMAL	JUNE DEPARTURE	JUNE % DEPARTURE
Tidewater	4.30	3.80	0.50	113%
Eastern Piedmont	1.20	3.91	-2.71	31%
Western Piedmont	1.40	4.14	-2.74	34%
Northern	3.40	3.95	-0.55	86%
Central Mountain	1.70	3.86	-2.16	44%
Southwestern	3.00	4.04	-1.04	74%
Statewide	2.50	3.95	-1.45	63%

Two Month Precipitation Departures

Climatological Division	MAY-JUNE 2002	MAY-JUNE NORMAL	MAY-JUNE DEPARTURE	MAY-JUNE % DEPARTURE
Tidewater	7.20	7.39	-0.19	97%
Eastern Piedmont	4.50	7.59	-3.09	59%
Western Piedmont	5.50	8.11	-2.61	68%
Northern	7.30	7.81	-0.51	93%
Central Mountain	4.40	7.59	-3.19	58%
Southwestern	7.20	8.10	-0.90	89%
Statewide	6.00	7.77	-1.77	77%

Three Month Precipitation Departures

Climatological Division	APRIL-JUNE 2002	APRIL-JUNE NORMAL	APRIL-JUNE DEPARTURE	APRIL-JUNE % DEPARTURE
Tidewater	10.30	10.48	-0.18	98%
Eastern Piedmont	6.70	10.86	-4.16	62%
Western Piedmont	7.50	11.67	-4.17	64%
Northern	11.40	11.03	0.37	103%
Central Mountain	8.40	10.64	-2.24	79%
Southwestern	9.80	11.66	-1.86	84%
Statewide	8.90	11.08	-2.18	80%

Six Month Precipitation Departures

Climatological Division	JAN 2001 - JUNE 2002	JANUARY-JUNE NORMAL	JANUARY-JUNE DEPARTURE	JANUARY-JUNE % DEPARTURE
Tidewater	18.90	20.99	-2.09	90%
Eastern Piedmont	14.74	21.30	-6.56	69%
Western Piedmont	15.54	22.30	-6.76	70%
Northern	16.81	19.91	-3.10	84%
Central Mountain	14.43	19.73	-5.30	73%
Southwestern	20.47	22.51	-2.04	91%
Statewide	16.70	21.27	-4.57	79%

Twelve Month Precipitation Departures

Climatological Division	JULY 2001 - JUNE 2002	1 - YEAR NORMAL	1 - YEAR DEPARTURE	1 - YEAR % DEPARTURE
Tidewater	33.88	43.64	-9.76	78%
Eastern Piedmont	27.54	42.97	-15.43	64%
Western Piedmont	29.20	44.44	-15.24	66%
Northern	32.23	40.53	-8.30	80%
Central Mountain	28.85	39.49	-10.64	73%
Southwestern	37.98	43.02	-5.04	88%
Statewide	31.57	42.59	-11.02	74%

Twenty Four Month Precipitation Departures

Climatological Division	JULY 2000 - JUNE 2002	2 - YEAR NORMAL	2 - YEAR DEPARTURE	2 - YEAR % DEPART.
Tidewater	76.32	87.27	-10.95	87%
Eastern Piedmont	64.55	85.93	-21.38	75%
Western Piedmont	66.04	88.87	-22.83	74%
Northern	69.73	81.06	-11.33	86%
Central Mountain	65.26	78.97	-13.71	83%
Southwestern	77.26	86.05	-8.79	90%
Statewide	69.97	85.17	-15.20	82%

Thirty Six Month Precipitation Departures

CD	JULY 1999 - JUNE 2002	3 - YEAR NORMAL	3 - YEAR DEPARTURE	3 - YEAR % DEPARTURE
Tidewater	135.23	130.90	4.33	103%
Eastern Piedmont	114.48	128.89	-14.41	89%
Western Piedmont	113.23	133.30	-20.07	85%
Northern	113.02	121.59	-8.57	93%
Central Mountain	106.30	118.45	-12.15	90%
Southwestern	114.76	129.08	-14.32	89%
Statewide	116.74	127.75	-11.01	91%

APPENDIX E

Flow duration and current flow conditions for selected U.S. Geological Survey and Virginia Department of Environmental Quality surface-water gaging stations

	MINIMUM DAILY FLOW, PERIOD OF RECORD (CFS)	MINIMUM JUNE FLOW, PERIOD OF RECORD (CFS)	7Q2 (CFS)	7Q10 (CFS)	PERCENT OF TIME FLOW EQUALED OR EXCEEDED FOR JUNE DAILY MEAN FLOWS (CUBIC FEET PER SECOND)			CURRENT FLOW (CFS)/ DURATION (PERCENT)
					75%	50%	25%	
								June 27, 2002
<u>SHENANDOAH RIVER BASIN</u>								
South River near Waynesboro, Va.	17	28	30	24	51	71	104	16.9/>95
South Fork Shenandoah River at Front Royal, Va.	107	304	344	235	659	891	1,323	368/>95
North Fork Shenandoah River at Cootes Store, Va.	0.2	2.3	3.2	0.77	23	45	101	18/85
North Fork Shenandoah River near Strasburg, Va.	35	65	-	-	204	303	473	187/80
<u>POTOMAC RIVER BASIN</u>								
Goose Creek near Leesburg, Va.	0.4	6.6	12	2.5	77	139	254	57/85
<u>RAPPAHANNOCK RIVER BASIN</u>								
Rappahannock River at Remington, Va.	2.9	33	50	11	231	382	604	92/90
Rapidan River near Culpeper, Va.	2.2	42	-	-	185	280	448	47/>95
<u>YORK RIVER BASIN</u>								
Pamunkey River near Hanover, Va.*	47	63	-	-	238	389	652	55/>95
Mattaponi River near Beulahville, Va.	.78	13	48	14	134	250	432	11/>95

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					75%	50%	25%	
								June 27, 2002
JAMES RIVER BASIN								
Jackson River near Bacova, Va.	13	22	26	20	54	80	141	49/85
Potts Creek near Covington, Va.	15	23	24	17	50	73	123	22/>95
Cowpasture River near Clifton Forge, Va.	40	63	73	54	148	208	345	80/>95
Craig Creek at Parr, Va.	25	38	43	31	88	135	250	28/>95
James River at Buchanan, Va.*	257	280	378	271	771	1,112	1,800	542/95
Maury River near Buena Vista, Va.	22	67	89	62	199	283	477	54/>95
Hardware River below Briery Run near Scottsville, Va	0.1	9.2	24	7.5	45	74	109	1.9/>95
Rivanna River at Palmyra, Va.	5.2	38	-	-	212	340	539	32/>95
James River at Cartersville, Va.	330	773	1,120	584	2,657	3,905	6,233	800/>95
Appomattox River at Farmville, Va.	6.3	13	52	21	89	133	197	17/>95
Appomattox River at Mattoax, Va.	13	59	86	30	192	291	439	62/>95
Chickahominy River near Providence Forge, Va.	0.07	2.4	16	4.0	42	87	189	.75/>95
CHOWAN RIVER BASIN								
Nottoway River near Sebrell, Va.	14	65	82	24	236	419	868	26/>95
Blackwater River near Franklin, Va.	0.07	0.20	-	-	39	158	449	4.9/>95
Meherrin River near Lawrenceville, Va.	4.2	32	52	16	126	182	297	5.1/>95

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								June 27, 2002
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<u>ROANOKE RIVER BASIN</u>								
Roanoke River at Roanoke, Va.*	19	52	58	35	130	188	304	38/>95
Pigg River near Sandy Level, Va.	25	50	96	47	169	255	338	53/>95
Roanoke River at Randolph, Va.*	179	284	847	426	1,287	1,837	2,819	468/>95
Dan River at Paces, Va.	244	450	-	-	1,242	1,829	2,528	329/>95
Hyc0 River near Denniston, Va.*	2.5	10	-	-	29	47	97	7.6/>95
<hr/>								
<u>KANAWHA RIVER BASIN</u>								
New River at Allisonia, Va.	453	627	1,040	725	1,716	2,376	3,248	699/>95
Little River at Graysontown, Va.	47	76	109	69	198	276	372	135/95
Walker Creek at Bane, Va.	24	40	44	33	103	147	238	58/>95
<hr/>								
<u>BIG SANDY RIVER BASIN</u>								
Russell Fork at Haysi, Va.	0.2	0.20	8.7	1.0	47	94	197	350/15
<hr/>								
<u>TENNESSEE RIVER BASIN</u>								
South Fork Holston River near Damascus, Va.	40	83	99	73	197	274	408	200/75
North Fork Holston River near Saltville, Va.	2.0	28	34	24	83	133	234	112/60
Clinch River at Cleveland, Va.	37	59	81	54	193	298	514	126/95
Powell River near Jonesville, Va.	18	27	42	24	117	191	342	169/60
* indicates some regulation								

APPENDIX F

Virginia Agriculture Statistic Services report of topsoil moisture, crop condition and crop progress.

TOPSOIL MOISTURE PERCENT				
Week Ending	Very Short	Short	Adequate	Surplus
June 30	17	45	37	1
June 23	23	42	34	1
June 16	16	34	44	6
June 9	6	39	54	1
June 2	4	29	64	3

CROP CONDITION PERCENT					
Crop	Very Poor	Poor	Fair	Good	Excellent
Pastures	13	29	38	18	2
Livestock	1	6	23	61	9
Other Hay	7	26	42	23	2
Alfalfa Hay	2	13	36	41	8
Corn for Grain	2	15	50	31	2
Soybeans	2	10	39	45	4
Winter Wheat	3	7	38	43	9
Tobacco, Flue-Cured	0	1	37	43	9
Tobacco, Burley	0	27	26	21	26
Tobacco, Dark Fire-Cured	0	2	45	45	8
Tobacco, Sun	0	5	16	79	0
Peanuts	0	8	30	59	3
Cotton	0	7	39	47	7
Summer Potatoes	5	10	35	45	5
Apples	4	16	66	24	0
Peaches	43	14	30	13	0

CROP PROGRESS PERCENT – WITH COMPARISONS				
Crop	This Week	Last Week	Last Year	5 Year Average
Corn Silked	20	4	NA	NA
Soybeans Planted	86	78	77	72
Soybeans Emerged	74	66	75	42
Winter Wheat Harvested	81	43	55	52
Barley Harvested	96	86	91	87
Peanuts Pegged	20	1	23	19
Cotton Squaring	68	35	77	52
Summer Potatoes Harvested	35	8	17	10

APPENDIX G

Virginia Department of Health Field Office Reports for Public Water Systems

(Note: The first digit in the PWSID number indicates the field office location of the waterworks. PWSID 2770650 is located in the Lexington Field Office, etc.)

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
2023730	Dal-Nita Hills	One Drilled Well	V	W: System serves 35 connections. Well production has dropped off to approximately 5 to 7 gpm. Owner has asked customers to conserve. New well site was approved. Owner is hauling water from Greenfield system in Botetourt County to fill storage tank as needed. Owner will drill a new well.
2770650	Roanoke City - Carvins Cove	Carvins Cove Reservoir/Tinker Creek/Catawba Creek	M	W: Reservoir level 27' below spillway - situation steadily worsening (34% of supply remaining). Mandatory restrictions imposed when reservoir level is between 26 and 30 feet below spillway. (Suspension of all outdoor water uses with certain exceptions; cutting back on reservoir use by water purchases from Roanoke County (3-4MGD) and the City of Salem (1.1MGD); imposition of civil penalties and surcharge applied to base water rates). Suspension means no outside use of potable water for washing your own car, watering lawns and gardens and filling pools, etc. (Stage 4)
2015150	Craigsville		M	S: Craigsville spring production off-well production off-construction nearing completion of interconnecting water line with Augusta Springs
2015575	South River S.D. (ACSA)	Coles Run	N	S: Coles Run reservoir level down 5-6 feet-no impact on system due to multiple sources.
2017300	Millboro	Millboro Spring	N	S: Recent rains have improved spring flows. Several large leaks have also been found and repaired.
2091150	Monterey		N	S: Monterey well production off. New well was constructed. Well is in operation. Situation is improving.
2790600	Staunton		N	S: Staunton-Middle River flow reduced.

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2043250	Boyce-Millwood	Prospect Hill Spring	V	S: Spring yield is down from normal historical levels. Voluntary measures instituted to reduce water demand. Presently exploring options to eliminate spring bypassing and development of additional water sources.
2171250	Stoney Creek Sanitary District		N	S: Well yield is off. Authority has reduced pumping capacity by 40% based on lower water table levels. Process of developing new 350 gpm well and water treatment plant.
2187406	Front Royal		N	B: Lifted water use restrictions in accordance with VWPP requirements. Conservation controls implemented at 30% (voluntary), 17% (mandatory), 15% (emergency), and 13% (rationing) of mean stream flow based on 14-day running average. At present, 14-day running average stream flow is 40% of mean stream flow.
2187522	High Knob Subdivision	Springs and wells	N	W: Spring yields have dropped significantly and wells are being increasingly relied upon to meet water demand.
2003250	Albemarle County / Crozet	Beaver Creek Reservoir	N	W: Beaver Creek Reservoir is currently down 3.7 feet from normal "full". The previous all time low water level on record (Feb. 2002) was 8 feet below normal "full".
2003600	Charlottesville/Albermarle County	Sugar Hollow and Ragged Mountain Reservoirs (Observatory WTP)	N	W: The Sugar Hollow reservoir (Observatory WTP) is 0.2 feet below overflow. Ragged Mountain reservoir is 2.6 feet below normal. Overall, source water availability is at 95% of "full available capacity" (this includes both the South Rivanna system and the Sugar Hollow/Ragged Mountain system).
2003725	Charlottesville/Albermarle County	South Rivanna (South Rivanna WTP)	V	W: Their main reservoir-South Rivanna (South Rivanna WTP) is 0.3 feet below full. Overall, source water availability is at 95% of "full available capacity" (this includes both the South Rivanna system and the Sugar Hollow/Ragged Mountain system).
2065250	Fluvanna Correctional Center	Mechunk Creek	N	W: The raw water impoundment is approximately 75% full (31 MGD available, 40 MG full capacity) and dropping. The facility is using approximately 180,000 gpd of finished water and is currently unable to pump

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				raw water from Mechunk Creek due to withdrawal permit restrictions.
2065300	Fork Union Sanitary District	Drilled Wells	V	W: The FUSD waterworks source water is obtained from 6 drilled wells. They are currently operating at approximately 50% of normal available production. Available production is equal to or slightly below the daily demand.
2125650	Nelson County Service Authority - Schuyler	Johnson's Branch	N	W: The NCSA - Schuyler waterworks source water is obtained from Johnson's Branch. The flow is currently approximately 20 gpm (normal treatment capacity is 70 to 90 gpm). They are currently still able to meet the normal daily demand; however steps are being implemented to withdraw water from the Rockfish River in the event the Johnson's Branch flow drops to the point that the daily demand can not be met.
3700500	Newport News	Little Creek, Diascund, Skiffes Creek, Harwoods Mill and Lee Hall Reservoirs	N	W: As of 06/27/02, the reservoirs were 87 % full (in the previous report, the reservoirs were 93 % full). RO plant still at 2 MGD. No voluntary or mandatory conservation measures in effect at this time.
3830850	Williamsburg	Waller Mill Reservoir	V	W: As of 06/28/02, Waller Mill reservoir is 16.5 inches below the primary spillway (in the previous report it was 10 inches below the primary spillway). Voluntary conservation measures are in effect as of March 30, 2002.
3650150	Ft. Monroe	Big Bethel Reservoir System	N	S: The water plant was shut down in mid-December for replacement of valves, and switched to Newport News water. Plant is schedule to come back on line 7/1/02. Currently 3.75-inches below spillway.
3095490	James City Service Authority Central System		V	S: No significant impact on water levels in wells. Conservation due to high water demands.
3670800	Virginia-American, Hopewell	Appomattox River/James River	N	S: No problems with water quantity. Water quality is still fluctuating with changes in the tide. Sodium and Alkalinity have started rising again as river levels are decreasing.
3183550	Jarratt	Nottoway River	N	S: No quality or quantity problems noted, although the river level has dropped over the last two weeks.
3595250	Emporia	Meherrin River	N	S: The reservoir levels are still at "normal".

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
3710100	Norfolk	Lake Prince, Lake Burnt Mills, Western Branch reservoir, Nottoway River, Blackwater River, 4 western wells; Little Creek reservoir, Lakes Smith, Lawson, Whitehurst, and Wright. Lake Gaston.	N	W: As of 06/24, reservoirs are at 84.6% of total capacity (decrease from 90.6% on 06/04). Historic reservoir capacity at this time of year is 91.6%. Avg. pumping from Lake Gaston = 32.4 MGD; Blackwater River = 0 MGD (pump off 04/09); Nottoway River = No data (pump on 06/24). Deep wells = 16 MGD (pumps on since 06/21).
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	V	W: As of 06/24, reservoirs are at 71% of useful capacity. This is a (-) 11% change since 06/03. Median capacity for the month is 97%, average capacity is 96% (period of 1969-2001). Both emergency wells are now ON, pumping an average of 4.6 MGD. Estimated 132 days of storage remaining at current pumpage (19.0 MGD) and no rainfall. City Council voted to establish Voluntary Conservation at meeting of 11/27/01. The restrictions took effect on 11/30/01.
3550050	Chesapeake - Western Branch system	Western Branch system	V	S: This portion of the city is consecutive to (receives water from) the city of Portsmouth. Because Portsmouth decided to go on voluntary restrictions, Chesapeake has decided to follow Portsmouth's lead, for ALL residents of the city. City Council voted to establish Voluntary Conservation at the meeting on 11/27/01. The restrictions took effect on 11/30/01.
3550052	Chesapeake - South Norfolk system	South Norfolk system	V	S: This portion of the city is consecutive to (receives water from) the city of Norfolk. Because Portsmouth decided to go on voluntary restrictions, Chesapeake has decided to follow Portsmouth's lead, for ALL residents of the city. City Council voted to establish Voluntary Conservation at the meeting on 11/27/01. The restrictions took effect on 11/30/01.
3550051	Chesapeake - NW River system	NW River system	V	S: As of 6/28, chlorides levels in the Northwest River are above average (550 ppm) and well water levels have reduced to 95%. The level has not changed since the last report. Plant production has been high and the ASR facility has been in use more than usual. Because a portion of the city (a separate system from

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
				the NW River system) is served from Portsmouth, Chesapeake has decided to follow Portsmouth's lead, for ALL residents of the city. City Council voted to establish Voluntary Conservation at the meeting on 11/27/01. The restrictions took effect on 11/30/01.
3800805	City of Suffolk	Central System	V	W: As of 6/28, reservoir system is 9.5% full in Crumps Mill. This is a 52.3% decrease from the last report. Lone Star Lakes is at 92% full a 4% increase. Lone Star makes up the majority of the Northern Lakes. The Southern Lakes were at 50%. This is an 11% decrease from the last report. The surface water treatment plant and the EDR are both operational at this time. The city also purchases finished water from Portsmouth, which enters the central system in downtown Suffolk. As such, this system has followed the lead of the Portsmouth system and has adopted Voluntary Conservation. Suffolk will rescind Voluntary Conservation following Portsmouth's lead but not until the EDR is at full capacity.
3800787	City of Suffolk	Route 17 Corridor	V	S: This system is consecutive to (purchases water from) the Portsmouth system. As such, this system has followed the lead of the Portsmouth system, and has adopted Voluntary Conservation. If Portsmouth goes to Mandatory Conservation, Suffolk will probably switch the supply source to their Central System (groundwater).
4041845	Swift Creek WTP (Chesterfield County)	Swift Creek Reservoir	V	W: The reservoir level is 175.4 feet. The level is 0.4 feet lower than it was 2 weeks ago and 1.6 feet below the top of the dam. Chesterfield County continues to encourage voluntary water conservation.
4041035	Appomattox River Water Authority	Lake Chesdin	N	W: The water level is 14 inches below the top of the dam. Two weeks ago, the level was 6 inches below the top of the dam. There are no drought-related restrictions on the production of the WTP.
4075735	James River Correctional Center	Beaverdam Creek and the James River	N	W: The primary source of water (Beaverdam Creek) has temporarily gone dry, and the water level in the James River is 4 inches below the top of the bridge intake (secondary intake), rendering that intake unusable.

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				The water plant is currently using a skid-mounted pump sitting on the riverbank beside the bridge (with a flexible suction hose extending into the river beside the bridge). This pump feeds into the existing raw water line for the bridge intake. Installation of a second river intake, about 0.2 miles downstream of the bridge has just been completed, with a trailer mounted diesel powered pump, and about 7,000 feet of raw water line. The raw water line discharges into Beaverdam Creek about 100 yards upstream of the check dam on Beaverdam Creek.
4075630	Pagebrook (Goochland)	Groundwater	N	S: Sydnor continues to haul water weekly - 1 tanker load/week (2500 gallons).
4073311	Gloucester	Beaverdam Reservoir	N	W: The Beaverdam Reservoir water overflow elevation is 40.5. The reservoir is not overflowing. The water level was 40.02 on June 24, 2002 and 40.06 on June 21, 2002. The reservoir level is falling. Note that about a million gallons of water is allowed to flow through the reservoir every day.
all County owned systems	Hanover County	North Anna River , wells, and purchased water from the City of Richmond	V	S: Letters mailed to customers with conservation tips. In addition, general unidirectional flushing program has been discontinued.
4760100	City of Richmond	James River	V	W: The current flow in the James River flows is very low and dropping. Flow rates are near or at record lows; currently 850 cfs per USGS gaging station. Richmond is having no problems with water withdrawals. The draft conservation plan calls for mandatory conservation when the 14-day average is < 750cfs for 7 consecutive days.
5007030	Amelia Academy	Well No.1(bored)	N	W: Requests emergency connection of well.
5009050	Town of Amherst	Buffalo River	N	W: River has slight overflow. Town discussing release of water from upstream impoundments with County.
5009250	Amherst County Service Authority	Graham Creek Res., Harris Creek	V	W: Drawing from reservoir now and supplementing with creek. Reservoir is about 6 inches down. Started voluntary water restrictions June 26, 2002.
5019250	Eagle Eyrie	Unnamed Reservoir	N	W: Over 5 feet down. Using second intake.
5019400	High Point Subdivision	Smith Mountain Lake	N	W: Smith Mountain Lake is 3 feet below full pond.

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5025450	Town of Lawrenceville	Great Creek	N	W: Great Creek Reservoir is about 10 inches below normal.
5029085	Buckingham County Waterworks	Troublesome Creek Reservoir	N	W: Reservoir is 4 inches below spillway.
5031050	Town of Altavista	Staunton River, Reed Creek	N	W: River is low, but OK. Creek is too low to draw from right now.
5031150	CCUSA	Otter River	N	W: River is 28 inches down.
5031175	Town of Brookneal	Phelps Creek Reservoir	N	W: Reservoir still has overflow, but less than it did at last report.
5031200	Dan River, Inc. - Brookneal Plant	Falling River	N	W: River has slight overflow, but less than at last report.
5067840	Town of Rocky Mount	Blackwater Creek	N	W: Flow in the river continues to drop, still an overflow over the check dam but only by putting flow restricting plate in the dam bypass.
5089376	Fieldcrest Cannon WTP	Smith River	N	S: Flow subject to release from Philpott Dam.
5089487	Marrowbone Cr. WTP	Marrowbone Creek	V	W: 5/8 inch flowing over check dam on 6/27/02, but this is only a temporary improvement after rain on 6/26/02. The WTP has reduced its production rate; there are voluntary conservation measures in place & using interconnections with City of Martinsville to supplement system. This situation has potential to get much worse in short time period: 1 inch on 6/11/02; was 1.75 inches over check dam on 5/24/02.
5089852	Upper Smith River WTP	Smith River	N	S: Flow subject to release from Philpott Dam.
5117310	Town of Clarksville	Kerr Lake	N	S: Kerr Lake is 0.5 ft below normal pool.
5117800	Town of South Hill	Meherrin River	N	W: Stream flow is low but sufficient.
5135110	Town of Burkeville	7 wells	V	W: One well has lost production. Others are showing signs of stress.
5135160	Town of Crewe	Lazeretto Creek/Crystal Lake	N	W: Reservoir is 6 inches below spillway.
5141640	Town of Stuart	South Mayo River	N	S: But flow is noticeably less than normal.
5515050	City of Bedford	Stoney Creek Reservoir	N	W: Reservoir is 3 inches down. City is drawing from wells and river (about 0.5 mgd of 1.6 mgd total) to try to maintain reservoir level.
5590100	City of Danville	Dan River, Schofield Dam	N	W: There has been a significant drop in the river level during this monitoring period; however, the City is having no problems meeting demand of 7.0 mgd avg.
5680200	City of Lynchburg	Pedlar Reservoir	N	W: Pedlar Reservoir is down 76 inches. City may supplement with river water soon.
5690400	City of Martinsville	Beaver Creek	N	W: Reservoir at approx. 5.4 feet

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		Reservoir		below spillway. In order to help reduce loss in reservoir (approx. 0.1 inches every two days), the City has initiated use of Leatherwood source along with reservoir.
6059500	FCWA-Lorton/Occoquan WTPs	Occoquan Reservoir	N	S: Reservoir 97% full, 7.77 billion gallons usable storage. All of FCWA service area is on "watch" status.
6059501	FCWA-Corbais WTP	Potomac River	N	W: Jennings Randolph and Little Seneca reservoirs on the Potomac River are both 100% full. Flow In Potomac River at Little Falls (downstream of the Washington DC intakes) is currently 1,034 MGD. Flow at Point of Rocks recently dropped below threshold of 2,000 cfs which requiring heightened monitoring. Probability of summer/fall releases from Jennings Randolph and Little Seneca has increased from 20% to 40%.
6600100	City of Fairfax	Goose Creek/Beaver Dam	N	S: Water Level Status: Flowing over the dam at Goose Creek Reservoir and 2 inches below overflow level at Beaver Dam reservoir.
6107600	Purcellville	Hirst Reservoirs	N	S: Front reservoir full; back reservoir 0.15 feet below normal. Drought "watch" status still in effect.
6685100	City of Manassas	Lake Manassas (Broad Run)	N	S: Current Water Level Status: 289.77 feet; Max is 290 feet.
6153675	Quantico- Mainside	Lunga Reservoir/ Breckenridge reservoir	N	S: Water Level Status: Lunga 2 inches below overflow; Breckenridge 6 inches below overflow.
6107300	Leesburg	Potomac River	V	S: Current river level at 184.9 feet. Normal level is 187.50 feet. Leesburg intake is located upstream of the FCWA and Washington DC intakes. Signs requesting voluntary conservation have been placed around town and on town website.
6107150	Hamilton	GW	V	S: Groundwater levels and system demands currently stable. In process to add additional well.
6107400	Lovettsville	GW	V	S: Groundwater levels and system demands currently stable. Voluntary conservation in effect.
6047500	Town of Culpeper	Lake Pelham	N	S: No problems at this time. Reservoir is overflowing.
6061600	Town of Warrenton	Warrenton Reservoir	N	S: No problems at this time. Reservoir is near overflow.
6113200	Town of Madison	White Oak Run	N	S: Stream flow is near normal, and no impact on water treatment plant to this point.
6137500	Town of Orange	Rapidan River	N	W: Stream flow is below normal, but no impact on water treatment

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				plant to this point.
6137500	Wilderness WTP	Rapidan River	N	W: Stream flow is below normal and continues to drop. Level being monitored daily. No impact on water treatment plant to this point.
6061665	Waterloo Estates	Groundwater (5 wells)	N	B: Decrease in well production led to a request for residents to voluntarily conserve water beginning 3/26/02. Well pump has been throttled back to allow pump to run longer thereby increasing production and lifting of voluntary restrictions on 6/15/2002.
6033425	Lake Caroline	Lake Caroline	M	S: Lake Caroline is 8 inches below normal level. Conservation measures in place.
6177280, 6177300	Spotsylvania County	Ni River Reservoir and Motts Run/Rappahannock River	M	S: Spotsylvania County declared a water emergency in mid November and instituted mandatory conservation (vehicle washing at homes not allowed). Ni River Reservoir is 2.8 feet below normal. Motts Run Reservoir is at normal level. Increased flow in Rappahannock River is at 30% mean annual flow.
6630050	City of Fredericksburg	Motts Run/Rappahannock River	M	S: City of Fredericksburg (consecutive system to Spotsylvania County) has asked for mandatory conservation based on Spotsylvania County's action.
6179100, 6179775	Stafford County	Smith Lake and Abel Lake	V	W: Stafford County has asked residents to voluntarily conserve water. Smith Lake is 0.45 feet below normal and Abel Lake is 0.95 feet below normal.
6033100	Campbell's Creek Subd.	Groundwater (3 wells)	M	W: Hauling water (approx. 10,000 gpd) from Caroline County system. New well sites approved in Mar 2002. Considering waterline extension from county system.