

DROUGHT MONITORING TASK FORCE

Drought Status Report

April 12, 2002

The Virginia Drought Monitoring Task Force met on April 9, 2002 to discuss the current moisture conditions in the Commonwealth. The Department of Environmental Quality compiled the following 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 improved somewhat since the report of March 14, 2002. Statewide rainfall for the month of March was 107% of long term average March rainfall. While this period of above average rainfall had positive impacts on streamflows, they are expected to be short lived. It is unlikely that March rainfall produced any appreciable ground water recharge. The existing variances to reduce discharges from large reservoirs such as Smith Mountain Lake, Kerr Reservoir, and Lake Moomaw have been successful in increasing reservoir storage for future water demands. While recent rainfall has not brought river and reservoir levels to normal seasonal elevations almost all public boat ramps are currently open and normal stream trout stockings have resumed. Winter small grain crops have reacted favorably to precipitation received in March. Early spring plantings of corn are proceeding at a rate greater than last year. Many farm ponds used for livestock watering and irrigation are at very low levels or dry, especially in the Shenandoah Valley. Public water supplies, both ground water based and surface water based, are in relatively good condition. Several additional public water supplies moved to voluntary conservation during the month and two systems moved from voluntary to mandatory water conservation measures. Ground water based public water supplies in Loudoun County, Clarke County, Shenandoah County, and Fauquier County have reported dropping 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. Forest fuel moisture conditions improved due to the March rainfall. As the state returns to warmer daytime temperatures over the next month, forest fuels will dry out quickly resulting in the potential for significant forest fire threats if periodic rainfall is not received.

CLIMATOLOGICAL CONDITIONS

National Weather Service

March rainfall for Virginia was generally near average with only the southeast region observing precipitation slightly below normal. The recent rains have helped to improve the short-term deficit; however the long-term affects continue to be a concern.

As the current high-pressure center continues to move farther out to sea, the next chance for rain will be on Tuesday evening (April 9) into Wednesday (April 10) with a cold frontal passage. Widespread precipitation with this front is not likely as the main energy and moisture surge is expected to clip the western part of the state. Average rainfall amounts could amount to six to seven tenths of an inch (.60-.70) in some areas. The front is expected to stall south of the state with some models indicating weak disturbances moving along the front.

Significant rainfall is not expected over the next several days; however some light rain could be possible with the interaction of the ocean environment with the atmospheric disturbances.

The latest NOAA drought monitor indicates improved conditions from the last report with D-3 (extreme drought) conditions still present in the Shenandoah Valley, northern Piedmont, and the Eastern Shore. The drought monitor is included as Appendix A. The NOAA seasonal drought outlook remains very similar to earlier reports and is included as Appendix B.

Report of the State Climatologist

March rainfall averaged 7% above the long-term mean on a statewide basis, ranging from 6% below average in the Eastern Piedmont to 47% above average in Southwestern Virginia. This has temporarily stabilized drought conditions statewide. However, with the exception of a portion of Southwestern Virginia, mainly west of Wytheville, most of Virginia remains in drought conditions that worsen sequentially as one moves north and west from the Tidewater region. Appendix C contains tables of regional precipitation departures from average for periods ranging from one month to three years. Additional rain, of 0.50–0.75 inch, on April 9 increased surface moisture and was beneficial to some agricultural interests in western Virginia, mainly in the southern portion of the Shenandoah Valley.

Appendix D contains updated six-month running departures for a number of representative stations in Virginia. Note that “Dale Enterprise” is a central Shenandoah Valley station that contains one of the longest-running continuous rainfall records in the Mid-Atlantic region. The six-month deficits have currently stabilized at a very low level that is slightly less severe than the major droughts of 1930 (the modern Virginia drought of record) or the mid-1960s.

The March DMTF report also included 43-month departures, which are representative of the longer, more intermittent drought that has affected much of the state, particularly Northern and Western regions. These values will change very little over a one-month period unless there is near-record rain in that month. We direct your attention to the previous report of the Drought Task Force for those records.

The pattern of regional drought will continue to focus a great deal of public attention, as the driest region extends roughly from New York City to Washington DC. A southwestward extension of this zone, through the western suburbs of Washington DC to the southern end of the Shenandoah Valley, represents the most severely dry area in Virginia.

Because of the March rains, Palmer Drought Index values indicate “Moderate Drought” for Tidewater, the eastern and western piedmont, and Northern Virginia, and “Severe Drought” for the Shenandoah Valley and surrounding mountains. This Index is an imperfect measure that appears to be underestimating drought severity in the counties in Northern Virginia that border on the Blue Ridge.

PROVISIONAL ASSESSMENT OF HYDROLOGIC CONDITIONS IN VIRGINIA

United States Geological Survey

Normal to above-normal precipitation amounts during March and early April have increased streamflow at streamgaging stations throughout the State. Since the peak flows in late March and early April, streamflows at many gages have declined to levels below the normal range of flow for April; however, some gages remain in or near the normal range of flow. In some instances, adjacent basins have shown great variation in response to the precipitation (flow values in one basin remain near the top of the normal range of flow and flow values in an adjacent basin have declined to record minimums for the month.) Streamflow responses of this nature generally are characteristic of nonuniform precipitation amounts. Streamgages in the Shenandoah, Potomac, Rappahannock, York, James, Roanoke, and Kanawha River Basins are still recording flows that are well below normal based on historic April flows. Streamgages in the Chowan, Big Sandy, and Tennessee River Basins are recording flows that are in the normal range of flow and even above the median flow for April.

Ground-water levels measured in late March have not shown significant response to March precipitation. Ground-water response time to precipitation events varies from weeks to months for wells that monitor water-table aquifers.

Appendix E contains charts giving 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 now only 0.5 feet below full and slowly rising. Minimum releases are 300 cfs. Normal releases would be 650 cfs. The minimum release has been under a variance since September 3, 2001. The current variance expires April 15th. DEQ will extend the variance for 45 days. Current plans are to increase releases for the Striped Bass spawning run but at a lower rate and for a shorter time period than in a normal year.

Lake Moomaw in western Virginia has refilled nicely and is now 75% full. The lake level is increasing with a minimum release of 100 cfs and inflow approximately the same. The minimum releases would normally be 194 cfs. The current variance expires April 30th.

Kerr Reservoir in Southside is at 299 feet above mean sea level and stable. The Wilmington District has been operating the Lake under reduced releases since December. The lake is about 3 feet below the guide curve. Inflows and outflows to the lake are much below normal, on the order of 3000 cfs.

Philpott Reservoir near Martinsville is 8 feet below normal and rising slowly. Minimum releases have been reduced to one fourth of their normal amount.

FISHERIES AND RECREATIONAL IMPACTS

Virginia Department of Game and Inland Fisheries

While recent rainfall has not brought river and reservoir levels to normal seasonal elevations (except in the case of far Southwest Virginia) almost all of the public boat ramps are currently open. River flows remain extremely low in many areas of the state and boaters should check to determine if shallow riffles and rapids are passable before starting down river.

The DGIF trout stocking program is back on schedule with spring stockings (information available at <http://www.dgif.state.va.us> or (434) 525-3475) occurring daily.

The agency remains concerned over the predictions of continuing drought as related to fire danger, operation of state and private fish hatcheries, recreational boating and fishing and negative impacts on some wildlife populations.

Department staff continues to coordinate with DEQ and reservoir managers on FERC variances and discharges in order to limit future impacts of a continued drought situation.

PUBLIC WATER SUPPLY SYSTEMS

Virginia Department of Health

Public water supply conditions have remained relatively stable since the last report with some improvement in the central and southeast portions of the Commonwealth. Conditions have continued to deteriorate in the Shenandoah Valley.

The large municipalities in the greater Richmond area (Richmond, Henrico, Hanover, and Chesterfield) held meetings to discuss water conservation. Voluntary conservation on a regional basis was urged by press release on April 1, 2002. In addition, Clarke County Sanitary Authority (Boyce-Millwood), Stoney Creek Sanitary District, Town of Front Royal, Williamsburg, Portsmouth, Chesapeake, Suffolk, Leesburg, Town of Hamilton, Town of Lovettsville, Lake Caroline, Waterloo Estates, and Stafford have initiated voluntary water conservation. The City of Roanoke, Craigsville, Spotsylvania County, and the City of Fredericksburg have initiated mandatory water conservation requirements.

Ground water based public water supplies in Loudoun County, Clarke County, Shenandoah County, and Fauquier County have reported dropping levels or reduced yields. Reports of reduced flows from springs have not been verified. Other public water supplies have reported few or no adverse impacts due to ground water level declines. Appendix F contains detailed reports of public water supply conditions in the six field offices.

VIRGINIA AGRICULTURAL SITUATION

Virginia Department of Agriculture and Consumer Services

Local Disaster Designation Requests

With the addition of Bedford and Nelson Counties, the number of Virginia localities that have submitted requests to the Governor for federal drought disaster designation increased to fourteen. The U.S. Department of Agriculture has completed damage assessment reports on seven of these localities. Requests for Goochland and Prince Edward Counties have been submitted to the Secretary of Agriculture. The Secretary of Agriculture in early March approved the Governor's request for disaster designation for Goochland County and all contiguous localities.

Soil/Crop Conditions

The Virginia Agricultural Statistics Service reports that February's dry conditions continued into early March in the Commonwealth. Moisture conditions improved through March due to the above average precipitation. Topsoil moisture ratings increased, but surface water levels remained generally low. Subsoil moisture remained low due to the earlier extended periods of dryness. Damage to fruits and small grains was reported in some areas of Virginia as a result of dry weather conditions.

For the week that ended April 5, 2002, some areas experienced much needed rainfall while other parts of the state saw no precipitation. Corn planting was initiated in most of the Commonwealth, with some areas showing significant progress. Cold weather injured small grains and fruit trees in some areas. Cool weather and windy conditions slowed pasture growth in some areas, causing farmers to continue feeding hay. Other activities for the week included continued land preparation for planting, fertilization of small grains, and herbicide applications.

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

Virginia Cooperative Extension Service

The Virginia Cooperative Extension Service compiled the following brief reports of local conditions across the Commonwealth.

Buckingham – Livestock feed is adequate until pasture begin spring growth. Pastures need overseeding due to past dry weather. Water supplies are critically low, but no emergency situations have developed yet.

Giles - Cumulative precipitation is 30 inches below normal. 1-2 inches of rainfall were received March 23 and 24. Water supplies are at critical levels for livestock. Hundreds of springs are reported dry. Other springs are flowing at 50% or less of normal flows. Over 50 farmers have dug new wells. Pasture remains poor. Livestock feed is adequate at this time.

Westmoreland - Vegetable growers who irrigate from the Rappahannock River and its tributaries are very concerned about increases in salinity due to saltwater intrusion. Normal salinity is 300-400 ppm this time of year, and right now it is 2200-2400 ppm. Early season irrigation may not be possible if significant precipitation does not occur. Current low soil moisture levels may result in significant crop damage if precipitation does not improve.

Augusta - Over 100 farming operations are either drilling new wells or having to find some alternative source of water due to failed wells, dry springs or creeks. Livestock feed and hay supplies are depleted.

Clarke - Ground water supplies are critically low with wells failing in the NW part of the county. Livestock feed supplies are being depleted. Livestock condition is pretty good because of the mild winter.

Fluvanna – Well failures have been reported by seven livestock producers. The Natural Resource and Conservation Service has appropriated \$18,000 for the county for well or spring development. Over 80 new wells have been constructed in the county to replace failed wells since September 2001. Cumulative precipitation is 16 inches below normal.

Chesterfield – Chesterfield’s reservoir is 3 feet below normal. Ponds are at record lows. Pasture is adequate.

Culpeper - Water supplies are currently in good condition. Pasture growth is behind normal. There are adequate hay supplies available due to the mild winter. Livestock is in good condition due to mild winter.

Page – Small grain crops and pastures are greening up but overall crop conditions are poor. Several reports of well failure have been received. FSA has received only a couple of applications for assistance with well failures. Most ponds are dry.

Craig – Hay supplies were adequate through the winter but all hay reserves have been utilized. Subsoil moisture is very low. Some farmers have postponed stocker cattle purchases because of lack of rain. Spring grass growth is about normal.

Lancaster/Northumberland - One farmer is using a supplemental water supply since his pond is very low.

Russell - Conditions have been extremely dry. Received 6 inches of rain on March 16 and 17.

Chesapeake – Received 2 ½ inches of rain on March 23 and 24. Topsoil moisture is adequate. Conditions are not serious at this time. Pasture and small grain are making adequate progress. Livestock is not impacted. Farm pond levels are below normal.

Smyth – Livestock feed is adequate due to mild winter. Received 5.3 inches of rain March 23 and 24. Ponds are full. Ground water levels are still below normal.

Amherst – Ground water levels are very low. Streamflows are also low. Some springs have ceased flowing and some wells have failed. Livestock condition is good with feed supplies dwindling.

Albemarle - Some producers have been hauling water for over 3 months. There is currently a two-month waiting list to drill new wells. Some producers have sold livestock due to lack of water and feed. Many pastures will have to be re-established. Hay is available. Silage supplies are depleted.

Pulaski - Received 3 inches of rain March 23 and 24 resulting in some flash flooding. Cumulative precipitation is 25 inches below normal for the past two years. Subsoil moisture is extremely low. Many springs have ceased flowing. Streamflows are below normal. Livestock feed supplies are adequate. Livestock is in fair condition. Pasture and forage condition is very poor with poor root growth.

Nottoway - Received 1.7 inches of rain the week of March 25. Ponds are extremely low and may result in inadequate water supplies for tobacco irrigation this summer. Many springs are dry. Some shallow wells have reported reduction in yields. Many calves were weaned early and sold light. Pasture conditions should significantly improve with recent rainfall. Some producers are buying hay because they have exhausted existing supplies.

Madison - 60 gravity flow spring developments for cattle have failed. 14 replacement well permits for failed domestic supply wells were issued in January. Stream flows are very low. Rainfall in March has improved soil moisture but additional rainfall is needed for soil moisture to remain in acceptable ranges. Livestock producers are hauling water both purchased and pumped. No herd reductions have been reported.

Essex – Hay supplies are currently low but adequate. Received 2 inches of rain in March. It is anticipated that some shallow wells will experience decreased yields.

FOREST FIRE SITUATION IN VIRGINIA

Virginia Department of Forestry

The Department of Forestry (DOF) has experienced the most active spring wildfire season in the last 10 years. The spring wildfire season began earlier this year due to extended drought conditions, with heavy activity occurring by mid-February. Periodic rainfall during the last two weeks has given a slight, short-lived break in wildfire activity. Rainfall amounts have been too light to provide any long-term relief. Traditionally, there should be another several weeks of wildfire activity during the spring season. Current drought conditions may extend this period longer than would normally be expected. If conditions persist as predicted, the spring season could turn into a summer wildfire season; an event that does not normally occur in Virginia.

Through April 8, the DOF has responded to 1068 wildfires that burned over 8300 acres. Activity this spring represents 16 % more wildfires when compared to the next closest period in the last ten years with 40% more acreage burned. Compared to the five-year average, this spring represents slightly less than double the average number of wildfires, and slightly more than double the average acreage burned. The extended drought is causing more wildfires that are much more difficult and dangerous to control, and therefore burn more acreage.

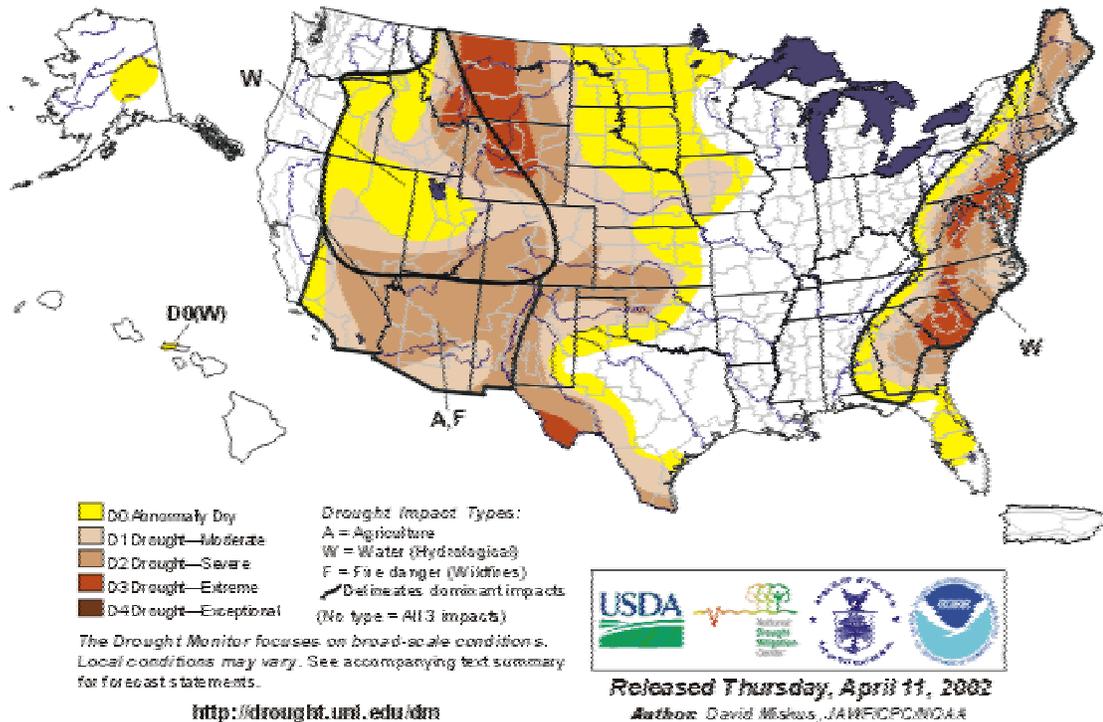
One of the biggest drought related problems affecting wildfire control is the fact that larger sized dead fuel classes have dried to record-setting levels. Normally, these larger fuels have higher moisture levels and only have a minor impact on a fire's intensity and spread. These fuels are now dry enough to have significant impact on a wildfire by adding significant amounts of burnable fuel to that fire. These larger amounts of burnable fuel result in extreme levels of fire behavior that make control more dangerous and difficult for suppression personnel. Only repeated significant rainfall can reverse this trend.

The statewide nature of the drought and wildfire conditions has lead to some difficulty in moving agency resources around the state to respond to wildfire emergencies, as activity has been occurring in all regions of the state. This problem could potentially lead to a serious shortage of resources to control wildfires if spring conditions become more severe, or if multiple large fires develop in several different geographical areas of the state. The DOF is making preparations to deal with this potential problem by establishing contract resources, maintaining cooperative agreements with in-state resources such as the National Guard and other agencies, and by keeping in close communications with federal cooperators, and other eastern states.

APPENDIX A

U.S. Drought Monitor April 9, 2002

10:18 a.m. EDT



National Drought Summary – April 9, 2002

The East: Although weekly precipitation markedly decreased, there was little change in the drought areas due to several consecutive wet weeks in March. However, based upon the latest March statistics and indices, some slight adjustment of D3 was made into west-central Virginia.

Little or no rain fell on most of the mid-Atlantic, southern Atlantic Coast States, and Appalachians. The region's long-term (hydrological) drought generally remained entrenched—even after favorable short-term weather (near to above normal March precipitation, plus seasonable March and cool early April temperatures) as current stream flows have quickly dropped to very low levels. On Tuesday morning, 20% or more of the reporting USGS river gauges hit instantaneous record low flows in the states of NJ (36%), SC (27%), VA (24%), MD (23%), NC (21%), and DE (20%), while at least one-third of the weekly (April 2-8) average stream flows were in the lower tenth percentile in DE (84%), NJ (64%), SC (51%), VA (40%), MD (38%), NC and GA (33%). Since August 1, 2001, 8-month precipitation percentiles were less than 2% from New Jersey southward into central South Carolina, corresponding to 9-15 inch deficits and Standardized Precipitation Index (SPI) values less than -2 (extremely dry). In Maryland and Delaware, record low March groundwater levels were set at 8 of the 17 monitoring well sites, and the Potomac River's average flow into the Chesapeake Bay set a record low March value (4.38 billion gallons per day), breaking the old 1931 mark. In New Jersey, combined storage in the 13 major water supply reservoirs on March 31 was close to record low levels at 35.8 billion gallons (bg), or 44.6% of capacity; however, storage was 7.6 bg more than one month ago, but 42.4 bg less than one year ago. Farther north, overall moisture conditions have somewhat improved, but are still below normal and need to be closely monitored as the growing season commences. In contrast, unseasonably heavy thundershowers dumped 1.5-2.5" of rain from Cross City to Jacksonville, FL, alleviating short-term dryness.

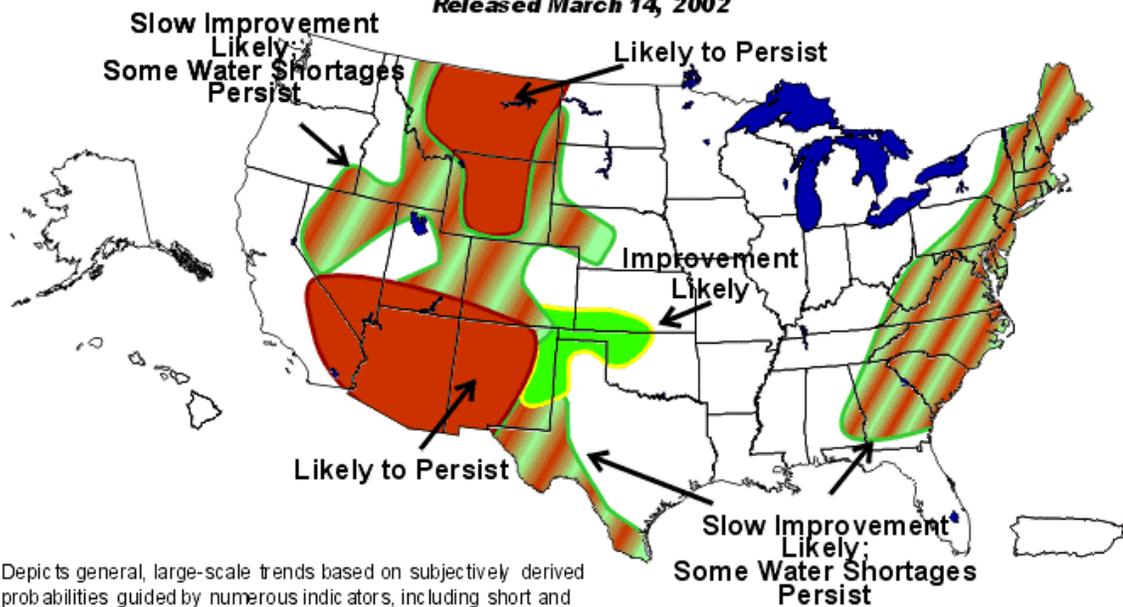
APPENDIX B



Seasonal U. S. Drought Outlook

Through June 2002

Released March 14, 2002



Depicts general, large-scale trends based on subjectively derived probabilities guided by numerous indicators, including short and long-range statistical and dynamical forecasts. Short-term events—such as individual storms—cannot be accurately forecast more than a few days in advance, so use caution if using this outlook for applications—such as crops—that can be affected by such events. Initial drought areas—shown schematically—are approximated from the Drought Monitor. For weekly updates on drought, see the latest Drought Monitor map and text.

Latest Seasonal Assessment - In mid-March, severe to extreme drought extended from Georgia to Maine, but several bouts of rain or snow since the start of the month boosted topsoil moisture and caused at least temporary rises in river levels, especially in the Southeast and northern New England. The overall outlook for the East Coast continues to call for slow improvement, with the likelihood that some water shortages will persist into June. Accumulating enough rain to bring reservoirs and groundwater levels up to normal following the severe precipitation deficits incurred since September is unlikely. Precipitation departures from normal during September 1, 2001 to March 13, 2002 exceed 12 inches from northeastern Virginia through Delaware, southern New Jersey, and into Connecticut. This is about one-half of normal. Deficits are in the 8-to-12-inch range from eastern Alabama to North Carolina, but the deficits have been building for longer periods in this region. For June 1, 2001 through March 12, 2002, Columbia, South Carolina measured 19.73 inches of precipitation, which is 19.62 inches below normal. Departures across the Southeast are considerably greater going back to the spring of 1998, when persistent dryness began affecting this region.

APPENDIX C

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

One Month Precipitation Departures

Climatological Division	MAR 2002	MAR NORMAL	MAR DEPARTURE	MAR % DEPART.
Tidewater	3.90	3.89	0.01	100%
Eastern Piedmont	3.50	3.74	-0.24	94%
Western Piedmont	4.20	3.86	0.34	109%
Northern	3.10	3.21	-0.11	97%
Central Mountain	3.50	3.23	0.27	108%
Southwestern	5.50	3.75	1.75	147%
Statewide	4.00	3.74	0.26	107%

Two Month Precipitation Departures

Climatological Division	FEB-MAR 2002	FEB-MAR NORMAL	FEB-MAR DEPARTURE	FEB-MAR % DEPART.
Tidewater	5.20	7.25	-2.05	72%
Eastern Piedmont	4.50	7.00	-2.50	64%
Western Piedmont	5.20	7.16	-1.96	73%
Northern	3.60	5.90	-2.30	61%
Central Mountain	4.10	5.92	-1.82	69%
Southwestern	6.40	7.05	-0.65	91%
Statewide	4.90	6.74	-1.84	73%

Three Month Precipitation Departures

Climatological Division	JAN-MAR 2002	JAN-MAR NORMAL	JAN-MAR DEPARTURE	JAN-MAR % DEPART.
Tidewater	9.90	10.87	-0.97	91%
Eastern Piedmont	7.40	10.36	-2.96	71%
Western Piedmont	8.10	10.38	-2.28	78%
Northern	4.80	8.60	-3.80	56%
Central Mountain	5.30	8.48	-3.18	63%
Southwestern	9.90	10.10	-0.20	98%
Statewide	7.80	9.95	-2.15	78%

Six Month Precipitation Departures

Climatological Division	OCT 2001 - MAR 2002	OCT-MAR NORMAL	OCT-MAR DEPARTURE	OCT-MAR % DEPART.
Tidewater	13.06	20.42	-7.36	64%
Eastern Piedmont	10.54	20.80	-10.26	51%
Western Piedmont	12.33	21.01	-8.68	59%
Northern	8.37	18.61	-10.24	45%
Central Mountain	9.07	18.15	-9.08	50%
Southwestern	14.34	19.98	-5.64	72%
Statewide	11.52	19.03	-7.51	61%

Twelve Month Precipitation Departures

Climatological Division	APR 2001 - MAR 2002	1 - YEAR NORMAL	1 - YEAR DEPARTURE	1 - YEAR % DEPART.
Tidewater	35.56	43.65	-8.09	81%
Eastern Piedmont	31.37	43.27	-11.90	72%
Western Piedmont	33.10	44.76	-11.66	74%
Northern	31.87	40.75	-8.88	78%
Central Mountain	29.20	39.38	-10.18	74%
Southwestern	40.31	43.30	-2.99	93%
Statewide	33.80	42.21	-8.41	80%

Twenty Four Month Precipitation Departures

Climatological Division	APR 2000 - MAR 2002	2 - YEAR NORMAL	2 - YEAR DEPARTURE	2 - YEAR % DEPART.
Tidewater	81.80	87.30	-5.50	94%
Eastern Piedmont	72.03	86.54	-14.51	83%
Western Piedmont	71.73	89.52	-17.79	80%
Northern	69.55	81.50	-11.95	85%
Central Mountain	69.48	78.76	-9.28	88%
Southwestern	78.54	86.60	-8.06	91%
Statewide	74.09	84.42	-10.33	88%

Thirty Six Month Precipitation Departures

Climatological Division	APR 1999 - MAR 2002	3 - YEAR NORMAL	3 - YEAR DEPARTURE	3 - YEAR % DEPART.
Tidewater	134.05	130.95	3.10	102%
Eastern Piedmont	114.22	129.81	-15.59	88%
Western Piedmont	112.79	134.28	-21.49	84%
Northern	106.79	122.25	-15.46	87%
Central Mountain	103.34	118.14	-14.80	87%
Southwestern	113.31	129.90	-16.59	87%
Statewide	114.32	126.63	-12.32	90%

Additional Data For April 1-7, 2002

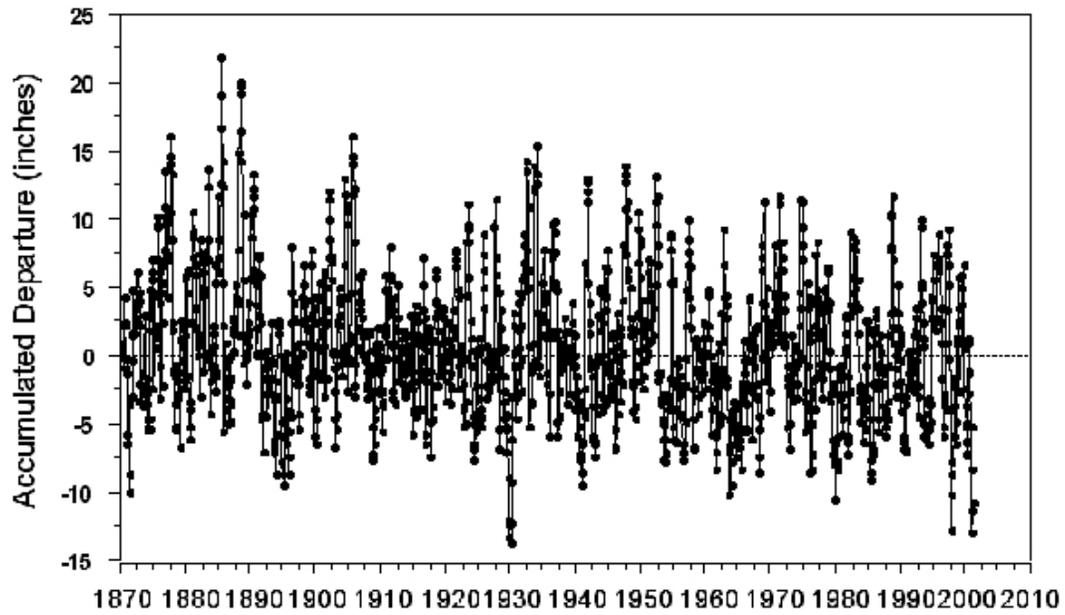
Climatological Division	APR 1-7 2002	APR 1-7 NORMAL	APR 1-7 DEPARTURE	APR 1-7 % DEPART.
Tidewater	1.80	0.70	1.10	258%
Eastern Piedmont	0.40	0.72	-0.32	56%
Western Piedmont	0.20	0.80	-0.60	25%
Northern	0.30	0.73	-0.43	41%
Central Mountain	0.30	0.71	-0.41	42%
Southwestern	0.40	0.85	-0.45	47%
Statewide	0.60	0.77	-0.17	78%

APPENDIX D

Accumulated six-month precipitation departures from the long-term average
for representative Virginia stations.

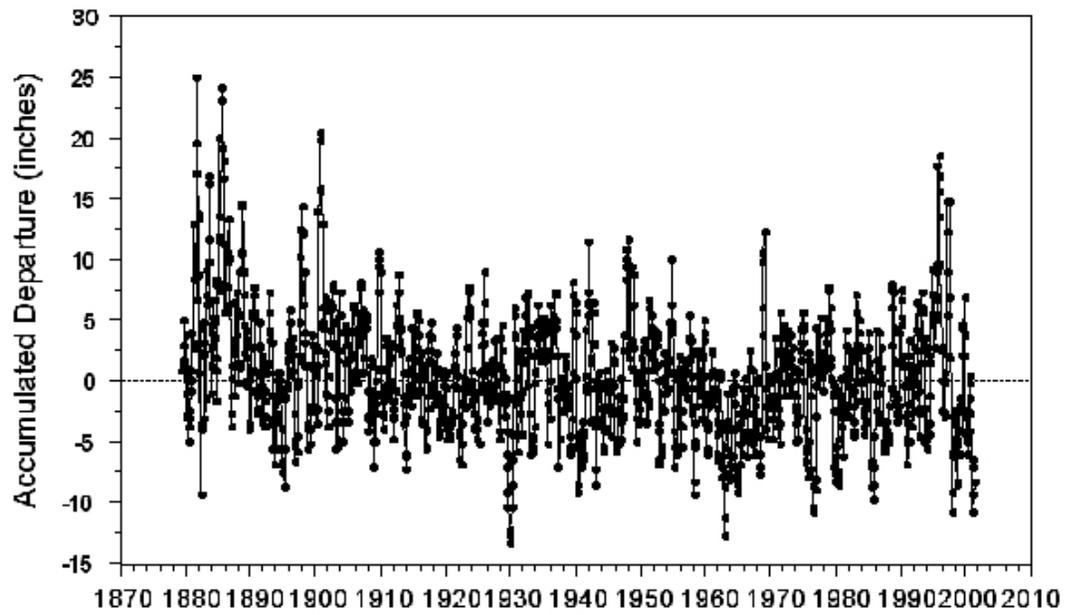
Washington, DC

6-Month Accumulated Precipitation Departure (inches)



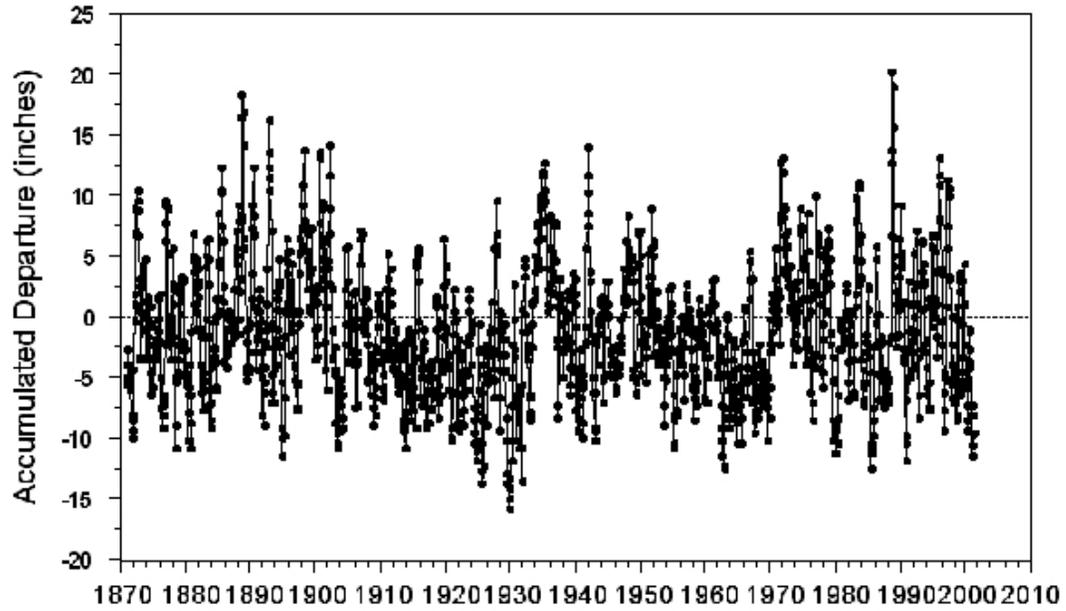
Dale Enterprise, VA

6-Month Accumulated Precipitation Departure (inches)



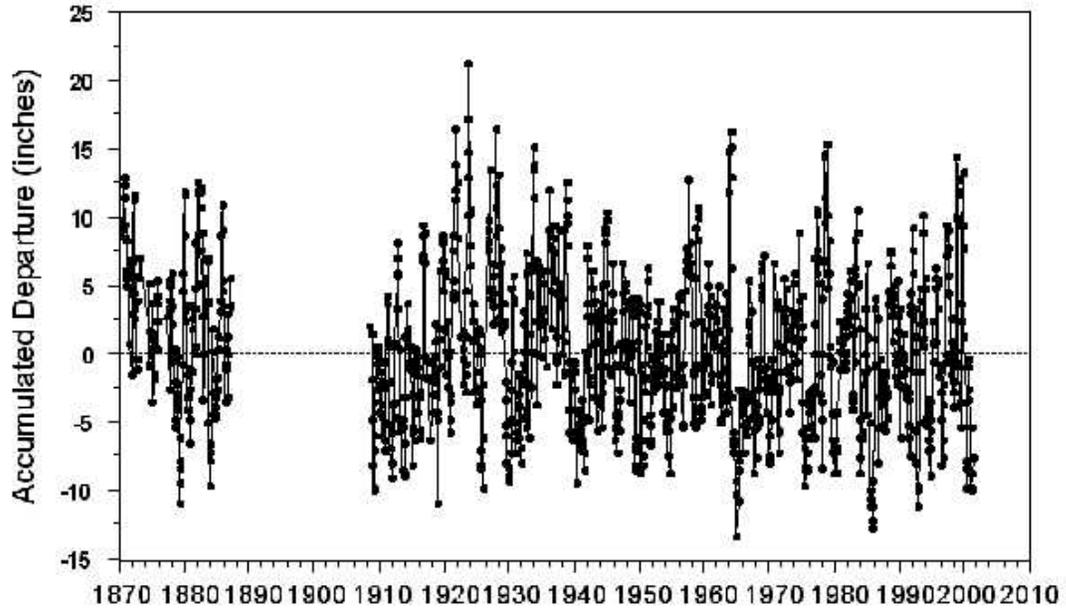
Lynchburg, VA

6-Month Accumulated Precipitation Departure (inches)



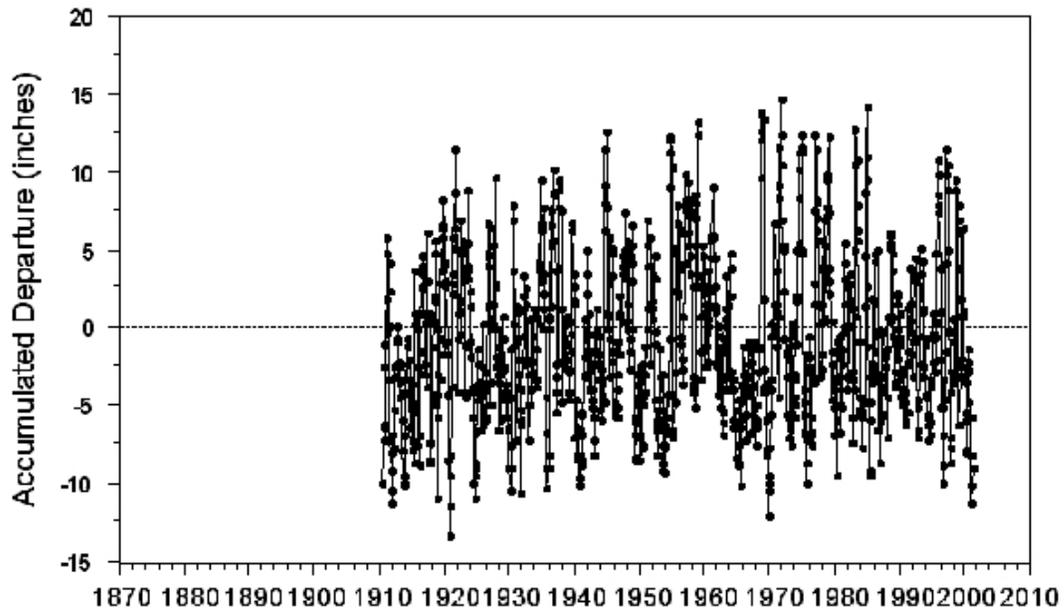
Norfolk, VA

6-Month Accumulated Precipitation Departure (inches)



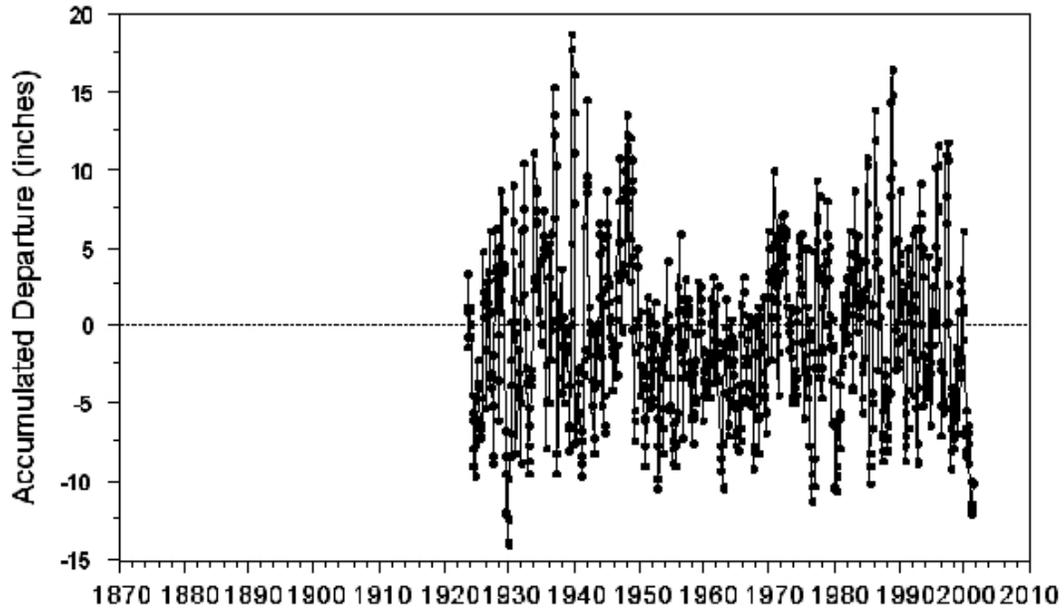
Richmond, VA

6-Month Accumulated Precipitation Departure (inches)



Roanoke, VA

6-Month Accumulated Precipitation Departure (inches)



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 APRIL FLOW, PERIOD OF RECORD (CFS)	7Q2 (CFS)	7Q10 (CFS)	PERCENT OF TIME FLOW EQUALED OR EXCEEDED FOR APRIL DAILY MEAN FLOWS (CUBIC FEET PER SECOND)			CURRENT CONDITIONS FLOW (CFS)/ DURATION (PERCENT)
					75%	50%	25%	
								April 9, 2002
<hr/>								
<u>SHENANDOAH RIVER BASIN</u>								
South River near Waynesboro, Va.	17	37	30	24	106	155	265	44/>95
South Fork Shenandoah River at Front Royal, Va.	107	442	344	235	1,154	1,665	2,785	607/>95
North Fork Shenandoah River at Cootes Store, Va.	0.2	20	3.2	0.77	88	167	348	100/70
North Fork Shenandoah River near Strasburg, Va.	35	139	-	-	394	610	1,091	254/95
<hr/>								
<u>POTOMAC RIVER BASIN</u>								
Goose Creek near Leesburg, Va.	0.4	46	12	2.5	224	347	577	75/>95
<hr/>								
<u>RAPPAHANNOCK RIVER BASIN</u>								
Rappahannock River at Remington, Va.	2.9	182	50	11	482	754	1,186	258/>95
Rapidan River near Culpeper, Va.	2.2	167	-	-	376	532	865	189/>95
<hr/>								
<u>YORK RIVER BASIN</u>								
Pamunkey River near Hanover, Va.*	47	255	-	-	674	998	1,636	174/>95
Mattaponi River near Beulahville, Va.	.78	164	48	14	447	740	1,224	105/>95

	MINIMUM	MINIMUM	7Q2	7Q10	PERCENT OF TIME FLOW EQUALED OR			CURRENT
	DAILY	APRIL	(CFS)	(CFS)	EXCEEDED FOR APRIL DAILY MEAN			CONDITIONS
	FLOW,	FLOW,			FLOWS (CUBIC FEET PER SECOND)			FLOW (CFS)/
	PERIOD OF	PERIOD OF			75%	50%	25%	DURATION
	RECORD	RECORD						(PERCENT)
	(CFS)	(CFS)						
					75%	50%	25%	April 9, 2002
<hr/>								
JAMES RIVER BASIN								
Jackson River near Bacova, Va.	13	49	26	20	105	172	296	98/80
Potts Creek near Covington, Va.	15	50	24	17	119	172	308	112/80
Cowpasture River near Clifton Forge, Va.	40	130	73	54	324	503	935	312/78
Craig Creek at Parr, Va.	25	85	43	31	259	390	712	232/80
James River at Buchanan, Va.*	257	615	378	271	1,700	2,512	4,431	1,230/90
Maury River near Buena Vista, Va.	22	148	89	62	435	683	1,225	250/95
Hardware River below Briery Run near Scottsville, Va	0.1	28	24	7.5	89	131	203	18/>95
Rivanna River at Palmyra, Va.	5.2	162	-	-	450	659	1,098	162/>95
James River at Cartersville, Va.	330	1,760	1,120	584	5,517	7,823	12,878	2,860/>95
Appomattox River at Farmville, Va.	6.3	84	52	21	179	254	394	87/>95
Appomattox River at Mattoax, Va.	13	197	86	30	441	635	1,100	230/>95
Chickahominy River near Providence Forge, Va.	0.07	36	16	4.0	181	282	507	99/93
<hr/>								
CHOWAN RIVER BASIN								
Nottoway River near Sebrell, Va.	14	253	82	24	920	1,525	2,830	826/80
Blackwater River near Franklin, Va.	0.07	16	-	-	426	712	1,194	931/35
Meherrin River near Lawrenceville, Va.	4.2	124	52	16	310	444	720	92/>95

	MINIMUM DAILY FLOW, PERIOD OF RECORD (CFS)	MINIMUM APRIL FLOW, PERIOD OF RECORD (CFS)	7Q2 (CFS)	7Q10 (CFS)	PERCENT OF TIME FLOW EQUALED OR EXCEEDED FOR APRIL DAILY MEAN FLOWS (CUBIC FEET PER SECOND)			CURRENT CONDITIONS FLOW (CFS)/ DURATION (PERCENT)
					75%	50%	25%	
								April 9, 2002
<hr/>								
<u>ROANOKE RIVER BASIN</u>								
Roanoke River at Roanoke, Va.*	19	74	58	35	255	379	630	140/>95
Pigg River near Sandy Level, Va.	25	164	96	47	242	348	500	163/>95
Roanoke River at Randolph, Va.*	179	631	847	426	1,947	3,058	4,986	80/>95
Dan River at Paces, Va.	244	1,020	-	-	1,893	2,802	4,198	1,160/>95
Hyc0 River near Denniston, Va.*	2.5	26	-	-	102	174	400	19/>95
<hr/>								
<u>KANAWHA RIVER BASIN</u>								
New River at Allisonia, Va.	453	1,100	1,040	725	2,575	3,600	5,220	2,020/90
Little River at Graysontown, Va.	47	110	109	69	279	380	543	207/95
Walker Creek at Bane, Va.	24	76	44	33	234	360	603	234/75
<hr/>								
<u>BIG SANDY RIVER BASIN</u>								
Russell Fork at Haysi, Va.	0.2	30	8.7	1.0	202	338	606	361/45
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<u>TENNESSEE RIVER BASIN</u>								
South Fork Holston River near Damascus, Va.	40	146	99	73	395	558	844	365/80
North Fork Holston River near Saltville, Va.	2.0	70	34	24	209	301	487	213/75
Clinch River at Cleveland, Va.	37	129	81	54	465	688	1,167	611/55
Powell River near Jonesville, Va.	18	118	42	24	349	537	895	535/50
* indicates some regulation								

APPENDIX F

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
2770650	Roanoke City - Carvins Cove	Carvins Cove Reservoir/Tinker Creek/Catawba Creek	M	S: Reservoir level 23.4' below spillway - situation steadily worsening; however, recent rains have helped some. Partial Mandatory restrictions imposed when reservoir level is between 22 and 26 feet below spillway. (restricts outdoor usage between 10 am and 7 pm). (Stage 3)
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	B: Recent rains have improved spring flows. Several large leaks have also been found and repaired.
2091150	Monterey		N	B: Monterey well production off. New well construction completed and now is in operation. Situation is improving.
2790600	Staunton		N	S: Staunton-Middle River flow reduced.
2043250	Clarke County Sanitary Authority	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		V	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		V	S: Operating under voluntary water conservation per 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 25.6% of mean stream flow.
2003250	Albemarle County / Crozet	Beaver Creek Reservoir	N	B: Beaver Creek Reservoir is currently down 5.5 feet from normal "full". The previous all time low water level on record was 8 feet below normal "full".

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
2003600	Charlottesville/Albermarle County	Sugar Hollow (Observatory WTP)	N	B: The Sugar Hollow reservoir (Observatory WTP) is 4.9 feet below normal levels and remains out of service. Ragged Mountain reservoir is 6.5 feet below normal. Overall, source water availability is at 88.4% 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)	N	B: Their main reservoir-South Rivanna (South Rivanna WTP) is full and overflowing.
2065250	Fluvanna Correctional Center	Mechunk Creek	N	B: The raw water impoundment now has 120+ days of water stored and the level is increasing. The Fluvanna Correctional Center is withdrawing water from Mechunk Creek due to the recent rainfall and their new DEQ permit for increased withdrawals. The facility is using approximately 150,000 gpd of finished water while the raw water pump to the reservoir is producing 660,000 gpd.
2125650	Schulyer	Johnson's Branch	N	B: The Johnson's Branch flow is back to normal.
3700500	Newport News	Little Creek, Diascund, Skiffes Creek, Harwoods Mill and Lee Hall Reservoirs	N	B: As of 04/07/02, reservoirs were 93 % full and rising (in the previous report, the reservoirs were 87 % full). RO plant running at 2.0 mgd. No voluntary or mandatory conservation measures in effect at this time.
3830850	Williamsburg	Waller Mill Reservoir	V	B: As of 04/08/02, Waller Mill reservoir is 11 inches below the primary spillway (in the previous report it was 14 inches below the primary spillway). Voluntary conservation measures are in effect as of March 30, 2002.
3595250	Emporia	Meherrin River	N	S: The reservoir levels are still at "normal". There is a power plant located immediately across the reservoir from the water plant. When the power plant operates at full capacity, it withdraws sufficient water to cause the water level in the reservoir to drop, to the point where water stops going over the dam. This in turn has an impact on the water plant. This occurs only when power plant operates for extended hours.

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	S: As of 04/08, reservoirs are at 95.8% of total capacity (improvement from 87.1% on 03/21). Historic reservoir capacity at this time of year is 96.0%. Avg. pumping from Lake Gaston = 29.1 MGD; Blackwater River = 23.9 MGD; Nottoway River = 21.7 MGD. Western Branch reservoir 2.0 ft below spillway; other reservoirs flowing over spillways. Wells are OFF. Not currently considering conservation measures, but that could change with continued dry weather.
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	V	B: As of 04/08, reservoirs are at "94% of useful capacity". This is a +16% change since last report. Median capacity for this time of year is 100%, average capacity is 99% (period of 1969-2001). Both emergency wells are OFF; reservoir transfer valve between Lakes Cahoon and Meade is open. 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	B: 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	B: 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	B: As of 4/8, chlorides levels in the Northwest River are below average and well water levels have recovered almost 100%. When they inject into the aquifer, the well levels increase. Plant production has been 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
				Because a portion of the city (a separate system from 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	B: As of 4/8, reservoir system is 95% full in Crumps Mill. This is a 12% increase from the last report. Lone Star Lakes is at 89% full. A decrease of 2%. Lone Star makes up the majority of the Northern Lakes. The Southern Lakes were at 42.5%. The city can pump from this reservoir to Lone Star if needed. 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	B: 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	B: The reservoir level is 174.5 feet, which is 2.5 feet below the top of the dam. The level is about 0.5 feet higher than it was 2 weeks ago.
4041035	Appomattox River Water Authority	Lake Chesdin	N	S: The on-site hydroelectric plant is using most of the overflow, so that there is only a trickle going over the dam. Reportedly, the hydroelectric plant can use up to 7" of overflow. The situation is about the same as it was two weeks ago with the recent rainfall. There are no drought-related restrictions on the production of the WTP.
4075735	James River Correctional Center	Beaverdam Creek and the James River	N	B: The water level in Beaverdam Creek is currently 4.5 inches above the top of the dam, which

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				is 0.5 inches higher than it was two weeks ago.
4075630	Pagebrook (Goochland)	Groundwater	N	W: Sydnor has resumed the hauling of water, although the frequency is less than in previous months. The current frequency is about one tanker load (approximately 2500 gallons) every two weeks.
4073311	Gloucester	Beaverdam Reservoir	N	S: The Beaverdam Reservoir water overflow elevation is 40.5. The reservoir is full and overflowing. The water level was 40.77 on April 2, 2002. The water level is rising due to recent rainfall. 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	S: The James River was still very low for this time of year, up until the rains of the past few days. River flows are now up somewhat but could subside just as quickly. Richmond is having no problems with water withdrawals.
5019250	Eagle Eyrie	Unnamed Reservoir	N	B: Reservoir level up.
5019400	High Point Subdivision	Smith Mountain Lake	N	B: Lake level up - about 3' low now.
5067840	Town of Rocky Mount	Blackwater Creek	N	B: But far below normal flow for this time of year.
5089376	Fieldcrest Cannon WTP	Smith River	N	S: Flow subject to release from Philpott Dam.
5089852	Upper Smith River WTP	Smith River	N	S: Flow subject to release from Philpott Dam.
5117310	Town of Clarksville	Kerr Lake	N	B: Level up, 1.5 feet below normal pond.
5515050	City of Bedford	Stoney Creek Reservoir	N	B: Reservoir overflow of 1.5".
5590100	City of Danville	Dan River, Schofield Dam	N	S: Still far below normal for this time off year.
5680200	City of Lynchburg	Pedlar Reservoir	N	B: Pedlar Reservoir is about 48" down. City drawing entirely from reservoir.
5690400	City of Martinsville	Beaver Creek Reservoir	N	S: Reservoir level has increased as a result of area rainfall received. Was down 4.4' as of 3/28/02---was down 4.8' on 3/19/02.
6059500	FCWA-Lorton/Occoquan WTPs	Occoquan Reservoir	N	S: Reservoir 96% full, 7.72billion gallons usable storage. All of FCWA service area is on "watch" status.

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6059501	FCWA-Corbalis WTP	Potomac River	N	S: Jennings Randolph and Little Seneca reservoirs on the Potomac River are both 100% full. Flow In Potomac River at Little Falls (downstream of the Wash DC intake) is currently 6400 MGD.
6600100	City of Fairfax	Goose Creek/Beaver Dam	N	S: Water Level Status: Flowing over the dam at Goose Creek and full at Beaver Dam reservoirs.
6107600	Purcellville	Hirst Reservoirs	N	S: Water Level 3.1 feet below full. Town Council established "watch" status 2 weeks ago. Expected to move to "warning" status in early April if drought continues.
6685100	City of Manassas	Lake Manassas (Broad Run)	N	S: Water Level 286.90 feet; Max is 290 feet.
6153675	Quantico- Mainside	Lunga Reservoir/ Breckenridge reservoir	N	S: Water Level Lunga 14 inches below overflow and Breckenridge 2 inches above overflow.
6107300	Leesburg	Potomac River	V	S: Current river levels at normal (187.50 feet). Leesburg intake is located upstream of the FCWA and Wash DC Intakes. Signs requesting voluntary conservation have been placed around town and on town web-site.
6107150	Hamilton	GW	V	S: Groundwater levels have been dropping and demand increasing. In process of adding additional well.
6107400	Lovettsville	GW	V	S: Groundwater levels have been dropping and demands increasing. 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: Some improvement from last week, but still very low stream flows observed. No impact on water treatment plant to this point. Considering implementing conservation measures.
6137500	Town of Orange	Rapidan River	N	S: Some improvement from last week, but still very low stream flows observed. No impact on water treatment plant to this point. Considering implementing conservation measures.
6137500	Wilderness WTP	Rapidan River	N	S: Some improvement from last week, but still very low stream flows observed. No impact on water treatment plant to this point. Considering implementing conservation measures.
6061665	Waterloo Estates (Fauquier County)	Groundwater (5 wells)	V	S: Decrease in well production led to a request for residents to voluntarily conserve water beginning 3/26/02.

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6033425	Lake Caroline	Lake Caroline	V	S: Lake Caroline is 10" below normal. 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 over 6 feet below normal. Motts Run Reservoir is 7.2 feet below normal. Increased flow in Rappahannock River has allowed county to pump 30 million gallons into Motts Run Reservoir.
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	S: Stafford County has asked residents to voluntarily conserve water. Smith Lake is 7 feet 7 inches below normal and Abel Lake is 4 feet 3 inches below normal.

APPENDIX G

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

TOPSOIL MOISTURE PERCENT

Week Ending	Very Short	Short	Adequate	Surplus
April 7	4%	25%	68%	3%
March 31	4 %	23 %	69%	4%

CROP CONDITION PERCENT

Crop	Very Poor	Poor	Fair	Good	Excellent
Pastures	9%	26%	44%	20%	1%
Livestock	0%	5%	23%	65%	7%
Winter Wheat	1%	9%	33%	51%	6%
Barley	3%	12%	39%	42%	4%
Other Hay	6%	16%	49%	28%	1%
Alfalfa Hay	0%	9%	37%	53%	1%
Tobacco Greenhouse	0%	0%	6%	63%	31%
Tobacco Plantbeds	0%	0%	23%	60%	17%
Apples	0%	7%	81%	12%	0%
Peaches	14%	19%	44%	22%	1%
Summer Potatoes	0%	0%	20%	80%	0%

CROP PROGRSS PERCENT - WITH COMPARISONS

Crop	This Week	Last Week	Last Year	5 Year Average
Summer Potatoes Planted	92%	90%	97%	90%
Corn for Grain Planted	13%	2%	3%	8%
Winter Wheat Headed	2%	1%	NA	NA