

VIRGINIA DROUGHT MONITORING TASK FORCE

Drought Status Report

July 14, 2011

Statewide precipitation for the current water year, October 1, 2010 to July 14, 2011 is within the normal range (90% of normal). However, the Chowan, Northern Coastal Plain, York-James, Eastern Shore, Roanoke, Southeast Virginia and Northern Virginia drought evaluation regions are all reporting below normal precipitation. Normal precipitation is defined as the mean precipitation for a thirty year period of record. Precipitation greater than 85% and less than 115% of normal is considered to be in the normal range. Statewide precipitation is in the normal range (95%) for the calendar year. Appendix A contains precipitation tables for periods dating from May 1, 2010 through July 14, 2011 provided by the Climatology Office of the University of Virginia.

As of July 13, 2011 the National Weather Service Climate Prediction Center 6-10 day climatologic outlooks call for above normal precipitation and above normal temperatures for the entire Commonwealth. The 8-14 day outlooks call for above normal precipitation and above normal temperatures for the entire Commonwealth. The one month outlook calls for equal chances of below normal, normal and above normal precipitation and temperatures statewide. The three month outlook calls for above normal precipitation in southeast Virginia with equal chances of below normal, normal and above normal precipitation in the rest of the Commonwealth, and equal chances of below normal, normal and above normal temperatures statewide.

The July 12, 2011 NOAA U.S. Drought Monitor indicates “moderate drought” conditions exist in approximately 4% of the state, comprised of the south eastern portion of the Commonwealth, Northumberland County and the northern end of the Eastern Shore. “Abnormally dry” conditions exist in approximately 18% of the Commonwealth, comprised primarily of the Northern Neck and Middle Peninsula, and including Northern Virginia and the southern end of the Eastern Shore. The remainder of Virginia is reported as having no drought conditions (Appendix C). The Seasonal Drought Outlook for the United States from now through September 2011 forecasts “improvement” for the central and south eastern portion of the Commonwealth and the Eastern Shore and “no drought posted or predicted” for the remainder of the state. (Appendix D).

The Virginia Department of Health (VDH) reports that 2 systems are under voluntary water conservation requirements and 2 systems are under mandatory water conservation requirements. Of the 39 systems listed in the VDH report, 1 is rated as having a “Better” overall water supply situation (Suffolk), 1 is rated as having a “Worse” overall water supply situation (Portsmouth) and all other systems are rated as being in a “Stable” situation (Appendix F).

Reports from the Climatology Office of the University of Virginia, NOAA’s National Weather Service, the United States Geological Survey, the Virginia Department of Agriculture and Consumer Services, and the Virginia Department of Environmental Quality follow.

Report of the Climatology Office of the University of Virginia

July 14, 2011

Over the last four weeks, thunderstorm activity has continued to provide scattered rainfall across the Commonwealth. Significant increases have occurred throughout most of Tidewater Virginia during this period. This has been enough to push the average for all five tidewater Drought Regions above normal for the period of June 1 through July 14. These Regions have not all seen normal (or above) monthly totals since September of last year.

Despite what the regional averages indicate, because of the scattered nature of the thunderstorms, there are many locations throughout each of these that have received only small amounts of moisture this summer. Even within a given county, monthly rainfall totals may vary by a factor of five or more.

Scattered thunderstorms are expected to continue as the primary sources of rainfall for the summer, and these large variations will mean serious moisture shortages are likely in some locations. At this time of year even somewhat above normal rainfall will fail to keep up with moisture losses.

Hurricane season has begun and decaying tropical systems can quickly provide large moisture inputs. Although forecasts for this season are for above normal activity in the Atlantic, this does not translate directly into expectations of increased rainfall in Virginia.

NOAA's National Weather Service

July 20, 2011

Significant rainfall across a large part of Virginia, especially central and eastern sections, in late June and early July significantly improved the short-term moisture conditions in those areas. However, generally dry weather has been the rule since July 10th, and is expected to persist into the upcoming weekend. Of greater short-term concern is the excessive heat and humidity anticipated from July 21st through the 23rd or 24th. Temperatures across the eastern 2/3rds of Virginia will be above 95 degrees, with some areas reaching or exceeding 100 degrees, especially Thursday through Saturday. A stronger cold front looks to drop southward into the area next Monday and Tuesday, accompanied by scattered showers and thunderstorms. However, no widespread significant rainfall is currently anticipated through the end of July.

United States Geological Survey Streamflow and Ground Water Levels

July 14, 2011

Statewide precipitation over the past several weeks has been spotty with some areas getting much greater than normal precipitation and nearby areas receiving much less than normal precipitation. As a result, streamflow in some areas that had consistent below normal streamflow, such as southeast Virginia, have improved to normal or near normal flows (Appendix G). In areas where precipitation

has been minimal, such as south central Virginia, and the Roanoke, New, and upper James River Basins, streamflow conditions mostly have remained below normal. Groundwater levels (Appendix H) have remained steady or improved across the State. The greatest improvement has been in eastern and southeastern portions of the State. Drought conditions based on streamflow has shifted from the southeast portion of the State to central and southern portions of the State. These changes follow recent precipitation patterns (Appendix I).

Virginia Department of Agriculture and Consumer Services Status of Agricultural Drought

July 2011

According to the USDA Crop Weather Report released on July 18, 2011, 60% of topsoil moisture ranged from adequate to surplus. Severe thunderstorms brought heavy rains, scattered hail, and windy conditions throughout different areas of Virginia during the first few weeks of July. The storms brought much needed relief for those areas that have been experiencing drought-like conditions around the state, although a few areas of the states reported crop damage from the storms.

South Central Virginia reports adequate moisture conditions for Amelia County and points west of Amelia County. Nottaway and Charlotte counties are dry with corn growth short and starting to tassel out with well below average yields expected. Some areas of Charlotte County have had only two tenths of an inch of rain since the May 28, 2011.

Eastern Virginia reports that recent rainfalls have helped to alleviate dry conditions experienced earlier. At this time, producers are reporting that soil moisture conditions are good overall and that this crop year has been better than last year.

Central eastern Virginia is experiencing a moderate drought, with precipitation levels for this time of year being below normal. Soil moisture conditions are good, due to continued, timely rains. Area lake levels are normal, but fields are still dry and could use more rainfall.

Northwestern and Northern Virginia producers report dryer than normal conditions, but sporadic rainfall has helped to maintain adequate moisture. Some northern-area producers reported that strong storms during the early part of July caused damage to some crops and fields. Overall, the prospects for a normal crop year are good.

The Shenandoah Valley area reports they are in good shape overall with rain storms providing adequate moisture. Corn is starting to tassel and yield is expected to be above average.

Southwest Virginia reports that after a prolonged dry spell that facilitated good hay harvest, recent hard rains curbed concerns of early drought. Many late plantings have benefited from this moisture and yields look promising if summer moisture continues. Pastures were replenished and grazing is abundant. Other than yearlings, cattle are staying on pasture. Nevertheless, the peak dry season is coming and it will not take many weeks without rain before pastures begin to brown with lack of moisture. Some areas of the region (such as Lee County) have received considerably less rain and would welcome more.

Virginia Department of Environmental Quality
Conditions of Major Reservoirs

Levels of large reservoirs statewide are at or above normal levels. Four large multi-purpose reservoirs are identified as drought indicators in the *Virginia Drought Assessment and Response Plan* (Plan); Smith Mountain Lake, Lake Moomaw, Lake Anna and Kerr Reservoir. All four of these reservoirs are currently at levels above their Drought Watch stages. Below is a summary of large reservoir conditions:

- On July 14, Lake Moomaw on the Jackson River was at 1578.06 feet, and was dropping at a rate of approximately 0.2 ft per day. Approximately 84% of conservation storage remains. Lake Moomaw is 13.06 ft above its Drought Watch level (1565 feet MSL).
- On July 14, Kerr Reservoir was at 299.66 feet, approximately 0.17 ft above the Guide Curve, and was anticipated to drop to 299.00 ft by July 21, 2011. Drought Watch status is reached at greater than 3 ft below the Guide Curve.
- On July 14, Smith Mountain Lake was at elevation 794.23 ft. The Drought Watch stage for Smith Mountain Lake is elevation 793 feet and below.
- On July 14, Lake Anna was at elevation 249.9 ft (1.99 ft above drought watch). The Drought Watch stage for Lake Anna Lake is elevation 248 feet and below.

APPENDIX A

Precipitation Departures by Drought Evaluation Region

PRELIMINARY PRECIPITATION SUMMARY

Prepared:

7/14/11

| DROUGHT REGION | OBSERVED | Jul 1, 2011 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|---------------------------|----------|-----------------------|-----------------------------|------------|
| 1 Big Sandy | 2.18 | 2.02 | 0.15 | 108% |
| 2 New River | 2.19 | 1.71 | 0.48 | 128% |
| 3 Roanoke | 1.84 | 1.98 | -0.14 | 93% |
| 4 Upper James | 1.46 | 1.82 | -0.36 | 80% |
| 5 Middle James | 3.08 | 1.99 | 1.08 | 154% |
| 6 Shenandoah | 1.81 | 1.70 | 0.12 | 107% |
| 7 Northern Virginia | 2.27 | 1.70 | 0.56 | 133% |
| 8 Northern Piedmont | 1.89 | 1.99 | -0.09 | 95% |
| 9 Chowan | 4.14 | 2.04 | 2.10 | 203% |
| 10 Northern Coastal Plain | 3.04 | 2.01 | 1.03 | 151% |
| 11 York-James | 7.18 | 2.30 | 4.88 | 312% |
| 12 Southeast Virginia | 4.75 | 2.29 | 2.46 | 207% |
| 13 Eastern Shore | 3.29 | 1.81 | 1.48 | 182% |
| Statewide | 2.62 | 1.96 | 0.66 | 134% |

| DROUGHT REGION | OBSERVED | Jun 1, 2011 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|---------------------------|----------|-----------------------|-----------------------------|------------|
| 1 Big Sandy | 5.31 | 6.16 | -0.86 | 86% |
| 2 New River | 4.39 | 5.56 | -1.17 | 79% |
| 3 Roanoke | 4.51 | 5.87 | -1.36 | 77% |
| 4 Upper James | 3.86 | 5.53 | -1.67 | 70% |
| 5 Middle James | 6.51 | 5.50 | 1.01 | 118% |
| 6 Shenandoah | 5.10 | 5.41 | -0.31 | 94% |
| 7 Northern Virginia | 4.23 | 5.56 | -1.33 | 76% |
| 8 Northern Piedmont | 4.62 | 6.00 | -1.37 | 77% |
| 9 Chowan | 7.31 | 5.69 | 1.62 | 129% |
| 10 Northern Coastal Plain | 6.98 | 5.57 | 1.41 | 125% |
| 11 York-James | 12.88 | 5.71 | 7.17 | 225% |
| 12 Southeast Virginia | 8.66 | 5.90 | 2.76 | 147% |
| 13 Eastern Shore | 9.56 | 4.79 | 4.77 | 200% |
| Statewide | 5.72 | 5.75 | -0.03 | 99% |

| DROUGHT REGION | OBSERVED | May 1, 2011 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|----------------|----------|-----------------------|-----------------------------|------------|
| 1 Big Sandy | 10.64 | 10.98 | -0.34 | 97% |
| 2 New River | 10.23 | 9.77 | 0.46 | 105% |
| 3 Roanoke | 9.20 | 10.20 | -1.00 | 90% |
| 4 Upper James | 8.95 | 9.81 | -0.87 | 91% |
| 5 Middle James | 10.94 | 9.74 | 1.20 | 112% |
| 6 Shenandoah | 10.53 | 9.25 | 1.29 | 114% |

| | | | | | |
|----|------------------------|-------|-------|-------|------|
| 7 | Northern Virginia | 8.23 | 9.90 | -1.67 | 83% |
| 8 | Northern Piedmont | 9.71 | 10.22 | -0.51 | 95% |
| 9 | Chowan | 10.04 | 9.78 | 0.26 | 103% |
| 10 | Northern Coastal Plain | 9.38 | 9.73 | -0.35 | 96% |
| 11 | York-James | 14.78 | 9.98 | 4.79 | 148% |
| 12 | Southeast Virginia | 11.10 | 9.76 | 1.34 | 114% |
| 13 | Eastern Shore | 10.66 | 8.31 | 2.35 | 128% |
| | Statewide | 10.09 | 10.01 | 0.08 | 101% |

| DROUGHT REGION | | OBSERVED | Apr 1, 2011 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|----------------|------------------------|----------|-----------------------|-----------------------------|------------|
| 1 | Big Sandy | 16.68 | 14.74 | 1.94 | 113% |
| 2 | New River | 15.92 | 13.32 | 2.60 | 120% |
| 3 | Roanoke | 13.70 | 14.00 | -0.30 | 98% |
| 4 | Upper James | 16.37 | 13.21 | 3.16 | 124% |
| 5 | Middle James | 14.93 | 13.08 | 1.84 | 114% |
| 6 | Shenandoah | 17.79 | 12.17 | 5.62 | 146% |
| 7 | Northern Virginia | 13.08 | 13.20 | -0.12 | 99% |
| 8 | Northern Piedmont | 15.21 | 13.51 | 1.70 | 113% |
| 9 | Chowan | 11.98 | 13.21 | -1.23 | 91% |
| 10 | Northern Coastal Plain | 12.00 | 12.82 | -0.82 | 94% |
| 11 | York-James | 16.02 | 13.28 | 2.74 | 121% |
| 12 | Southeast Virginia | 12.73 | 13.01 | -0.28 | 98% |
| 13 | Eastern Shore | 12.18 | 11.23 | 0.95 | 108% |
| | Statewide | 14.74 | 13.43 | 1.31 | 110% |

| DROUGHT REGION | | OBSERVED | Mar 1, 2011 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|----------------|------------------------|----------|-----------------------|-----------------------------|------------|
| 1 | Big Sandy | 23.35 | 18.99 | 4.36 | 123% |
| 2 | New River | 22.34 | 16.99 | 5.35 | 131% |
| 3 | Roanoke | 19.02 | 18.27 | 0.74 | 104% |
| 4 | Upper James | 22.09 | 17.00 | 5.08 | 130% |
| 5 | Middle James | 20.33 | 17.14 | 3.19 | 119% |
| 6 | Shenandoah | 22.12 | 15.37 | 6.75 | 144% |
| 7 | Northern Virginia | 17.97 | 16.86 | 1.10 | 107% |
| 8 | Northern Piedmont | 20.72 | 17.32 | 3.40 | 120% |
| 9 | Chowan | 16.10 | 17.58 | -1.48 | 92% |
| 10 | Northern Coastal Plain | 16.00 | 17.10 | -1.10 | 94% |
| 11 | York-James | 19.02 | 17.97 | 1.04 | 106% |
| 12 | Southeast Virginia | 16.13 | 17.21 | -1.08 | 94% |
| 13 | Eastern Shore | 15.42 | 15.54 | -0.11 | 99% |
| | Statewide | 19.89 | 17.47 | 2.42 | 114% |

| DROUGHT REGION | | OBSERVED | Feb 1, 2011 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|----------------|--------------|----------|-----------------------|-----------------------------|------------|
| 1 | Big Sandy | 25.65 | 22.57 | 3.07 | 114% |
| 2 | New River | 24.14 | 19.92 | 4.22 | 121% |
| 3 | Roanoke | 20.48 | 21.58 | -1.11 | 95% |
| 4 | Upper James | 23.58 | 19.85 | 3.72 | 119% |
| 5 | Middle James | 21.72 | 20.26 | 1.46 | 107% |
| 6 | Shenandoah | 23.78 | 17.78 | 6.00 | 134% |

| | | | | | |
|----|------------------------|-------|-------|-------|------|
| 7 | Northern Virginia | 19.85 | 19.53 | 0.32 | 102% |
| 8 | Northern Piedmont | 22.04 | 20.29 | 1.76 | 109% |
| 9 | Chowan | 17.28 | 20.75 | -3.47 | 83% |
| 10 | Northern Coastal Plain | 17.16 | 20.24 | -3.08 | 85% |
| 11 | York-James | 20.29 | 21.50 | -1.21 | 94% |
| 12 | Southeast Virginia | 17.74 | 20.71 | -2.97 | 86% |
| 13 | Eastern Shore | 16.87 | 18.73 | -1.85 | 90% |
| | Statewide | 21.44 | 20.60 | 0.84 | 104% |

| DROUGHT | | | Jan 1, 2011 | - Jul 14, 2011 | |
|---------|------------------------|--------|-------------|----------------|------|
| REGION | OBSERVED | NORMAL | DEPARTURE | % OF NORM. | |
| 1 | Big Sandy | 27.43 | 26.30 | 1.13 | 104% |
| 2 | New River | 25.06 | 23.13 | 1.93 | 108% |
| 3 | Roanoke | 21.65 | 25.50 | -3.85 | 85% |
| 4 | Upper James | 24.49 | 23.13 | 1.35 | 106% |
| 5 | Middle James | 23.26 | 23.92 | -0.66 | 97% |
| 6 | Shenandoah | 24.79 | 20.63 | 4.17 | 120% |
| 7 | Northern Virginia | 21.62 | 22.81 | -1.19 | 95% |
| 8 | Northern Piedmont | 23.52 | 23.81 | -0.28 | 99% |
| 9 | Chowan | 18.88 | 24.86 | -5.98 | 76% |
| 10 | Northern Coastal Plain | 18.72 | 23.99 | -5.27 | 78% |
| 11 | York-James | 22.75 | 25.64 | -2.89 | 89% |
| 12 | Southeast Virginia | 20.83 | 24.87 | -4.04 | 84% |
| 13 | Eastern Shore | 19.74 | 22.29 | -2.55 | 89% |
| | Statewide | 22.92 | 24.24 | -1.32 | 95% |

| DROUGHT | | | Dec 1, 2010 | - Jul 14, 2011 | |
|---------|------------------------|--------|-------------|----------------|------|
| REGION | OBSERVED | NORMAL | DEPARTURE | % OF NORM. | |
| 1 | Big Sandy | 31.98 | 29.94 | 2.04 | 107% |
| 2 | New River | 28.83 | 25.84 | 2.99 | 112% |
| 3 | Roanoke | 24.84 | 28.75 | -3.91 | 86% |
| 4 | Upper James | 27.45 | 26.08 | 1.36 | 105% |
| 5 | Middle James | 25.95 | 27.09 | -1.14 | 96% |
| 6 | Shenandoah | 27.28 | 23.22 | 4.06 | 117% |
| 7 | Northern Virginia | 23.41 | 25.91 | -2.50 | 90% |
| 8 | Northern Piedmont | 26.05 | 27.09 | -1.04 | 96% |
| 9 | Chowan | 22.13 | 27.88 | -5.75 | 79% |
| 10 | Northern Coastal Plain | 20.44 | 27.27 | -6.83 | 75% |
| 11 | York-James | 24.74 | 29.03 | -4.30 | 85% |
| 12 | Southeast Virginia | 23.67 | 28.05 | -4.38 | 84% |
| 13 | Eastern Shore | 22.87 | 25.53 | -2.66 | 90% |
| | Statewide | 25.89 | 27.36 | -1.47 | 95% |

| DROUGHT | | | Nov 1, 2010 | - Jul 14, 2011 | |
|---------|-------------|--------|-------------|----------------|------|
| REGION | OBSERVED | NORMAL | DEPARTURE | % OF NORM. | |
| 1 | Big Sandy | 35.31 | 33.22 | 2.09 | 106% |
| 2 | New River | 31.88 | 28.87 | 3.01 | 110% |
| 3 | Roanoke | 27.19 | 32.11 | -4.92 | 85% |
| 4 | Upper James | 29.95 | 29.44 | 0.51 | 102% |

| | | | | | |
|----|------------------------|-------|-------|-------|------|
| 5 | Middle James | 28.28 | 30.60 | -2.32 | 92% |
| 6 | Shenandoah | 29.30 | 26.27 | 3.03 | 112% |
| 7 | Northern Virginia | 25.12 | 29.32 | -4.20 | 86% |
| 8 | Northern Piedmont | 28.33 | 30.89 | -2.56 | 92% |
| 9 | Chowan | 23.99 | 30.99 | -7.00 | 77% |
| 10 | Northern Coastal Plain | 22.46 | 30.41 | -7.95 | 74% |
| 11 | York-James | 26.31 | 32.40 | -6.09 | 81% |
| 12 | Southeast Virginia | 25.39 | 31.12 | -5.73 | 82% |
| 13 | Eastern Shore | 24.07 | 28.47 | -4.39 | 85% |
| | Statewide | 28.22 | 30.59 | -2.37 | 92% |

| DROUGHT | | | Oct 1, 2010 | - Jul 14, 2011 | |
|---------|------------------------|--------|-------------|----------------|------|
| REGION | OBSERVED | NORMAL | DEPARTURE | % OF NORM. | |
| 1 | Big Sandy | 37.73 | 36.10 | 1.62 | 104% |
| 2 | New River | 33.80 | 32.04 | 1.76 | 105% |
| 3 | Roanoke | 30.01 | 35.82 | -5.81 | 84% |
| 4 | Upper James | 32.18 | 32.69 | -0.52 | 98% |
| 5 | Middle James | 31.02 | 34.44 | -3.42 | 90% |
| 6 | Shenandoah | 30.55 | 29.46 | 1.09 | 104% |
| 7 | Northern Virginia | 27.77 | 32.80 | -5.04 | 85% |
| 8 | Northern Piedmont | 30.62 | 34.88 | -4.25 | 88% |
| 9 | Chowan | 26.53 | 34.57 | -8.04 | 77% |
| 10 | Northern Coastal Plain | 25.16 | 33.92 | -8.76 | 74% |
| 11 | York-James | 29.86 | 35.93 | -6.07 | 83% |
| 12 | Southeast Virginia | 28.43 | 34.78 | -6.35 | 82% |
| 13 | Eastern Shore | 26.72 | 31.68 | -4.95 | 84% |
| | Statewide | 30.67 | 34.09 | -3.42 | 90% |

| DROUGHT | | | Sep 1, 2010 | - Jul 14, 2011 | |
|---------|------------------------|--------|-------------|----------------|------|
| REGION | OBSERVED | NORMAL | DEPARTURE | % OF NORM. | |
| 1 | Big Sandy | 40.04 | 39.56 | 0.48 | 101% |
| 2 | New River | 37.75 | 35.45 | 2.30 | 106% |
| 3 | Roanoke | 36.27 | 40.05 | -3.79 | 91% |
| 4 | Upper James | 37.69 | 36.19 | 1.50 | 104% |
| 5 | Middle James | 37.13 | 38.57 | -1.44 | 96% |
| 6 | Shenandoah | 35.55 | 33.13 | 2.42 | 107% |
| 7 | Northern Virginia | 34.18 | 36.87 | -2.69 | 93% |
| 8 | Northern Piedmont | 36.91 | 39.16 | -2.24 | 94% |
| 9 | Chowan | 34.83 | 39.00 | -4.17 | 89% |
| 10 | Northern Coastal Plain | 32.84 | 38.01 | -5.17 | 86% |
| 11 | York-James | 39.13 | 40.83 | -1.71 | 96% |
| 12 | Southeast Virginia | 41.72 | 39.21 | 2.51 | 106% |
| 13 | Eastern Shore | 31.29 | 35.29 | -4.00 | 89% |
| | Statewide | 36.71 | 38.09 | -1.38 | 96% |

| DROUGHT | | | Aug 1, 2010 | - Jul 14, 2011 | |
|---------|-----------|--------|-------------|----------------|------|
| REGION | OBSERVED | NORMAL | DEPARTURE | % OF NORM. | |
| 1 | Big Sandy | 45.17 | 43.39 | 1.78 | 104% |
| 2 | New River | 42.99 | 38.76 | 4.23 | 111% |

| | | | | | |
|----|------------------------|-------|-------|-------|------|
| 3 | Roanoke | 42.70 | 43.77 | -1.07 | 98% |
| 4 | Upper James | 40.67 | 39.52 | 1.14 | 103% |
| 5 | Middle James | 41.32 | 42.39 | -1.07 | 97% |
| 6 | Shenandoah | 38.24 | 36.46 | 1.79 | 105% |
| 7 | Northern Virginia | 38.45 | 40.72 | -2.28 | 94% |
| 8 | Northern Piedmont | 40.32 | 42.98 | -2.65 | 94% |
| 9 | Chowan | 39.10 | 43.31 | -4.21 | 90% |
| 10 | Northern Coastal Plain | 37.18 | 41.87 | -4.69 | 89% |
| 11 | York-James | 40.83 | 45.70 | -4.88 | 89% |
| 12 | Southeast Virginia | 44.91 | 44.33 | 0.58 | 101% |
| 13 | Eastern Shore | 36.06 | 39.16 | -3.09 | 92% |
| | Statewide | 41.07 | 41.92 | -0.85 | 98% |

| DROUGHT REGION | | OBSERVED | Jul 1, 2010 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|----------------|------------------------|----------|-----------------------|-----------------------------|------------|
| 1 | Big Sandy | 48.91 | 47.87 | 1.03 | 102% |
| 2 | New River | 45.84 | 42.55 | 3.29 | 108% |
| 3 | Roanoke | 45.96 | 48.16 | -2.21 | 95% |
| 4 | Upper James | 44.32 | 43.56 | 0.76 | 102% |
| 5 | Middle James | 43.18 | 46.80 | -3.62 | 92% |
| 6 | Shenandoah | 41.62 | 40.22 | 1.41 | 103% |
| 7 | Northern Virginia | 41.91 | 44.49 | -2.58 | 94% |
| 8 | Northern Piedmont | 42.65 | 47.38 | -4.73 | 90% |
| 9 | Chowan | 40.79 | 47.82 | -7.03 | 85% |
| 10 | Northern Coastal Plain | 38.65 | 46.32 | -7.67 | 83% |
| 11 | York-James | 44.19 | 50.80 | -6.61 | 87% |
| 12 | Southeast Virginia | 48.64 | 49.40 | -0.76 | 98% |
| 13 | Eastern Shore | 38.15 | 43.16 | -5.01 | 88% |
| | Statewide | 43.85 | 46.26 | -2.41 | 95% |

| DROUGHT REGION | | OBSERVED | Jun 1, 2010 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|----------------|------------------------|----------|-----------------------|-----------------------------|------------|
| 1 | Big Sandy | 53.69 | 52.01 | 1.67 | 103% |
| 2 | New River | 48.41 | 46.40 | 2.00 | 104% |
| 3 | Roanoke | 48.04 | 52.05 | -4.01 | 92% |
| 4 | Upper James | 46.17 | 47.27 | -1.10 | 98% |
| 5 | Middle James | 45.05 | 50.31 | -5.26 | 90% |
| 6 | Shenandoah | 43.45 | 43.93 | -0.48 | 99% |
| 7 | Northern Virginia | 43.25 | 48.35 | -5.10 | 89% |
| 8 | Northern Piedmont | 45.06 | 51.39 | -6.33 | 88% |
| 9 | Chowan | 43.31 | 51.47 | -8.16 | 84% |
| 10 | Northern Coastal Plain | 40.66 | 49.88 | -9.22 | 82% |
| 11 | York-James | 45.12 | 54.21 | -9.09 | 83% |
| 12 | Southeast Virginia | 51.87 | 53.01 | -1.14 | 98% |
| 13 | Eastern Shore | 39.68 | 46.14 | -6.46 | 86% |
| | Statewide | 46.21 | 50.05 | -3.84 | 92% |

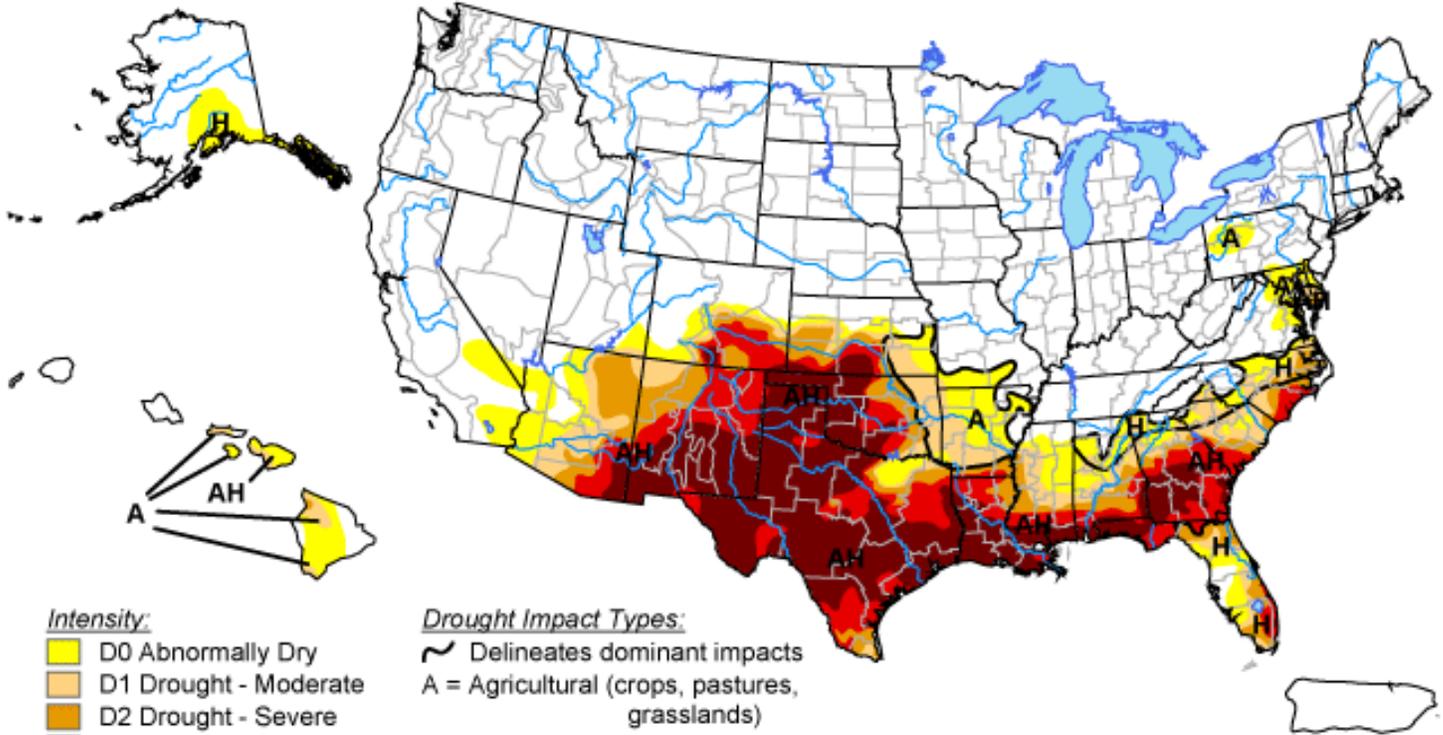
| DROUGHT REGION | | OBSERVED | May 1, 2010 NORMAL | - Jul 14, 2011 DEPARTURE | % OF NORM. |
|----------------|--|----------|-----------------------|-----------------------------|------------|
|----------------|--|----------|-----------------------|-----------------------------|------------|

| | | | | | |
|----|------------------------|-------|-------|--------|------|
| 1 | Big Sandy | 59.14 | 56.83 | 2.30 | 104% |
| 2 | New River | 52.22 | 50.61 | 1.61 | 103% |
| 3 | Roanoke | 52.69 | 56.38 | -3.69 | 93% |
| 4 | Upper James | 49.98 | 51.55 | -1.57 | 97% |
| 5 | Middle James | 49.10 | 54.55 | -5.45 | 90% |
| 6 | Shenandoah | 46.51 | 47.77 | -1.26 | 97% |
| 7 | Northern Virginia | 47.89 | 52.69 | -4.80 | 91% |
| 8 | Northern Piedmont | 48.73 | 55.61 | -6.88 | 88% |
| 9 | Chowan | 48.72 | 55.56 | -6.83 | 88% |
| 10 | Northern Coastal Plain | 43.05 | 54.04 | -10.99 | 80% |
| 11 | York-James | 50.02 | 58.48 | -8.47 | 86% |
| 12 | Southeast Virginia | 56.07 | 56.87 | -0.80 | 99% |
| 13 | Eastern Shore | 41.79 | 49.66 | -7.87 | 84% |
| | Statewide | 50.38 | 54.31 | -3.93 | 93% |

APPENDIX B

U.S. Drought Monitor

July 12, 2011
Valid 8 a.m. EDT



Intensity:

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

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

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 Thursday, July 14, 2011
Author: David Miskus, NOAA/NWS/NCEP/CPC

APPENDIX C

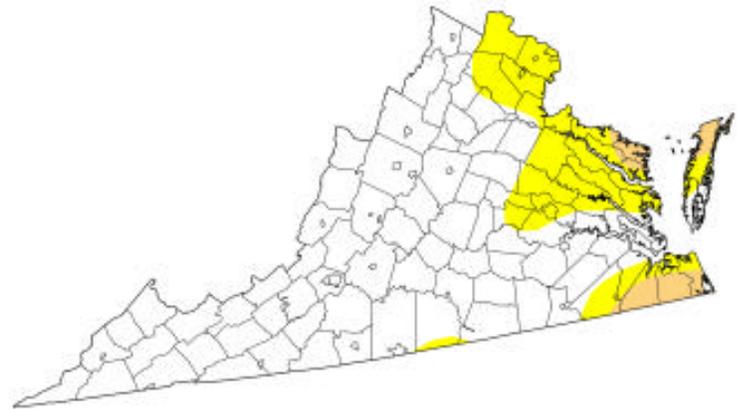
U.S. Drought Monitor Virginia

July 12, 2011

Valid 7 a.m. EST

Drought Conditions (Percent Area)

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|-------|-------|-------|-------|-------|------|
| Current | 78.50 | 21.50 | 3.55 | 0.00 | 0.00 | 0.00 |
| Last Week (07/05/2011 map) | 60.98 | 39.02 | 19.26 | 0.82 | 0.00 | 0.00 |
| 3 Months Ago (04/12/2011 map) | 50.52 | 49.48 | 26.72 | 0.00 | 0.00 | 0.00 |
| Start of Calendar Year (12/28/2010 map) | 81.67 | 18.33 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start of Water Year (09/28/2010 map) | 13.71 | 86.29 | 49.67 | 28.15 | 0.79 | 0.00 |
| One Year Ago (07/06/2010 map) | 14.06 | 85.94 | 34.66 | 0.00 | 0.00 | 0.00 |



Intensity:

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

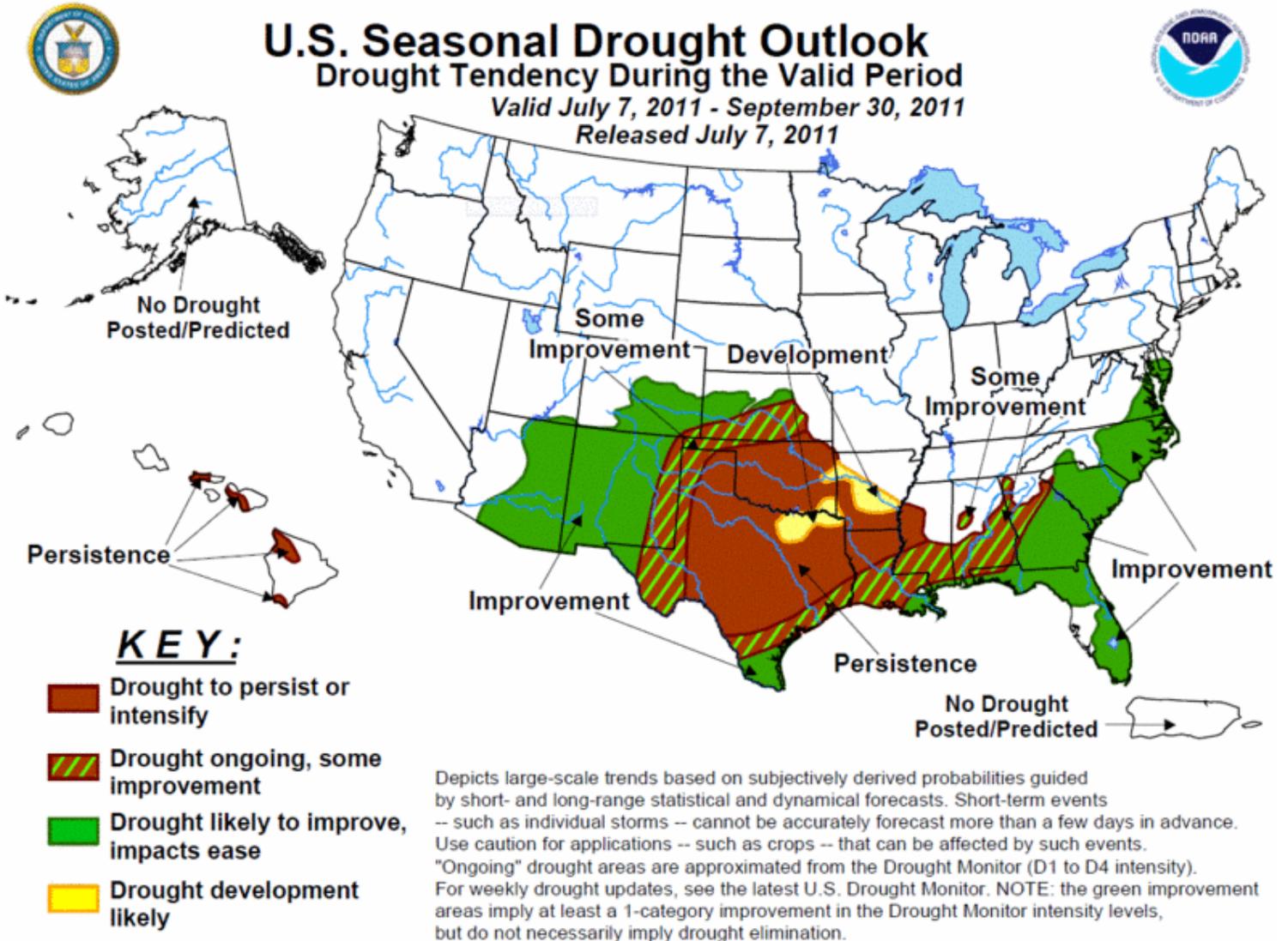
<http://drought.unl.edu/dm>



Released Thursday, July 14, 2011

David Miskus, NOAA/NWS/NCEP/Climate Prediction Center

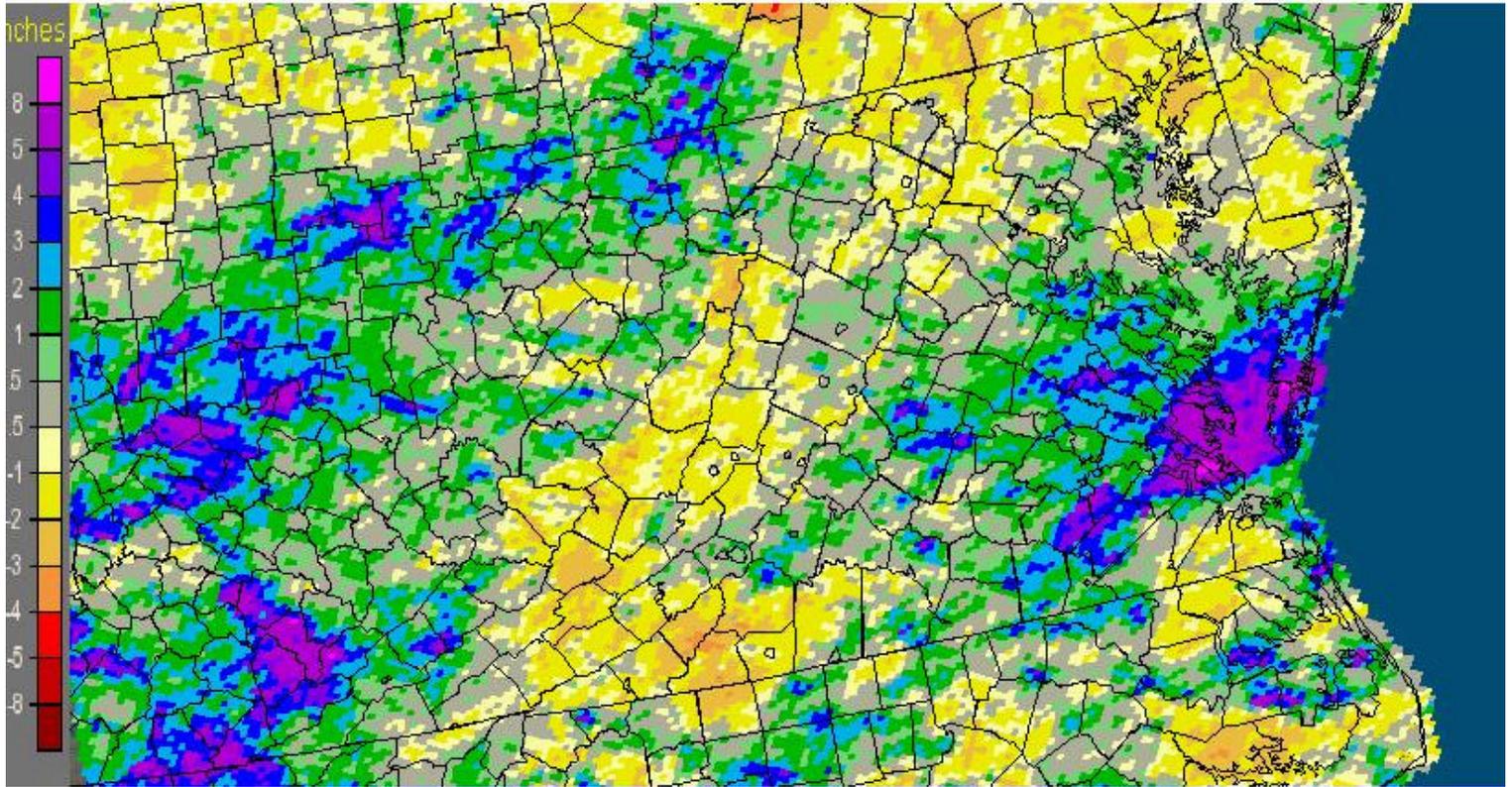
APPENDIX D



APPENDIX E

30-Day Departure from Normal Precipitation Valid July 14, 2011

Virginia: Current 30-Day Departure from Normal Precipitation
Valid at 7/14/2011 1200 UTC- Created 7/14/11 16:07 UTC



APPENDIX F

Condition of Public Water Supplies

July 13, 2011

ODW Drought Situation Report

Date: **7/13/11**

| | Restriction totals | Population Totals |
|--------------|--------------------|-------------------|
| Mandatory | 2 | 2,134 |
| Voluntary | 2 | 9,456 |
| Total | 4 | 11,590 |

N-None
M-Mandatory
V-Voluntary
B-Better
S-Stable/Same
W-Worse

| PWSID | Waterworks | Source Name | Restrictions | Situation | Population Served |
|-------------|-----------------|--|--------------|---|-------------------|
| 308155 0 | GCWSA - Jarratt | Nottoway River | N | S - 07/11/2011 - River level sufficient to allow plant operation at 1.9 mgd. Gage at Stony Creek indicates 6.01 feet. | 7,190 |
| 355005 1 | Chesapeake | Northwest River, City of Norfolk Raw Water (Lake Gaston) | N | S -07/11/2011 Total rainfall for July 3.35 inches. There are no water restrictions in Chesapeake. Chlorides are used as an indicator of drought, the higher the levels the more concentrated the contaminant in a lesser amount of surface water. The average for the month was 333 mg/L. The river level is back to normal. Continuing to purchase raw water from | 109,411 |

| | | | | | |
|-------------|--|---|---|---|--|
| | | | | Norfolk (7.2 MGD average). | |
| 359525 0 | Emporia | Meherrin River | N | S - 07/11/2011 - Reservoir level sufficient for normal operation. | 5,600 |
| 367080 0 | Virginia-American Water Company (Hopewell) | Appomattox & James Rivers | N | S - 07/11/2011 - Level at intakes sufficient to supply plant. MIB (taste & odor) detected in raw water and finished water (less than 10 ng/l). | 28000 - Primary / 45463 Total including Consecutive System (Ft. Lee) |
| 370050 0 | Newport News | Chickahomony River, Skiffs Creek, Diascand, Little Creek, Harwoods Mill, Lee Hall | N | S - 7/7/11 * Reservoir Status: 93.81 % Full (down 0.09% from prior report) * 39.35 Million Gallons Delivered | 414,000 |
| 371010 0 | 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 07/11/11, reservoirs at 93.0% (from 92.2% on 06/13/11). Historic reservoir capacity is 88.6% at this time of year. Avg. pumping from Lake Gaston = 49.4 MGD (from 49.7 MGD). Total Reservoir Storage = 14,147 MG (from 14,023 MG). | 261,250 - Primary / 755,617 - Total including consecutive systems (Va Beach + military bases). |

| | | | | | |
|-------------|------------|--|---|---|--|
| 374060 0 | Portsmouth | Lakes Cohoon, Meade, Kilby, and Speights Run | N | <p>W - As of 07/08/11, reservoirs at 84% (down from 94% on 06/03/11). Median reservoir capacity is 94% for the month and historical average capacity is 92% (period of 1969-2010). The emergency wells are pumping 3.2 MGD. Rainfall recorded at Lake Kilby WTP gauge Suffolk, VA - Monthly total to date: 1.96" 29 year July average rainfall: 5.31" Current year to date: 18.82 " Year to date deficit vs. 29 year avg: - 9.96"</p> <p>Year to date deficit against the 29 year average: -10.41. Median drought year average through June: 16.10 in Estimated days of storage based on current pumpage and rainfall: 191 days</p> | 100,400 - Primary / 120,400 Total including consecutive systems (military bases) |
| 380080 5 | Suffolk | Lone Star Lakes, Cumps Mill Pond | N | <p>B -07/11/2011- Received 3.57 inches of rain from 07/04/2011 through 07/10/2011. Average reservoir levels : Southern Lakes at 53.75% capacity, for the Northern Lakes at 89.41% and Crumps Mill Pond at 95.24% .</p> | 66,631 |

| | | | | | |
|-------------|--|---|---|---|----------------|
| | | | | No conservation measures implemented at this time but will continue to monitor. | |
| 383085 0 | Williamsburg | Waller Mill Reservoir | N | S -7/5/11: 0.5" below primary spillway - about 90% of usable capacity. | 16,400 |
| 404103 5 | APPOMATTOX RIVER WATER AUTHORITY | Surface water; Lake Chesdin | N | S - Wholesaler to Chesterfield County, Prince George County, Dinwiddie County; Cities of Petersburg and Colonial Heights. All restrictions have been lifted. The reservoir is near full. | 200,000 |
| 404184 5 | CHESTERFIELD CO CENTRAL WATER SYSTEM | Surface water; Swift Creek reservoir; purchases finished water | N | S - Purchases water from the City of Richmond and the Appomattox River Water Authority. All restrictions have been lifted. The reservoir is full. | 286,000 |
| 405780 0 | TAPPAHANNOCK, TOWN OF | Groundwater wells | N | S | 2,100 |
| 407331 1 | GLOUCESTER CO WATER TREATMENT PLT | Surface water, Beaverdam reservoir; 2 deep groundwater wells | N | S -Reservoir is full. | 12,000 |
| 407528 3 | EASTERN GOOCHLAND CENTRAL WATER SYSTEM | Purchased surface water | N | S -purchases water from Henrico County | 2,500 |
| 407573 5 | JAMES RIVER CORRECTIONAL CTR | Surface water; James River | N | S - Conservation at all DOC facilities | 9,300 |
| 408539 8 | HANOVER SUBURBAN WATER SYSTEM | Surface water; North Anna River; some groundwater wells; purchases finished water | N | S (see Richmond) | 71,000 |
| 408712 5 | HENRICO COUNTY WATER SYSTEM | Surface water; James River | N | S (see Richmond) | 289,000 |
| 410190 0 | WEST POINT, TOWN OF | Groundwater wells | N | S | 3,000 |

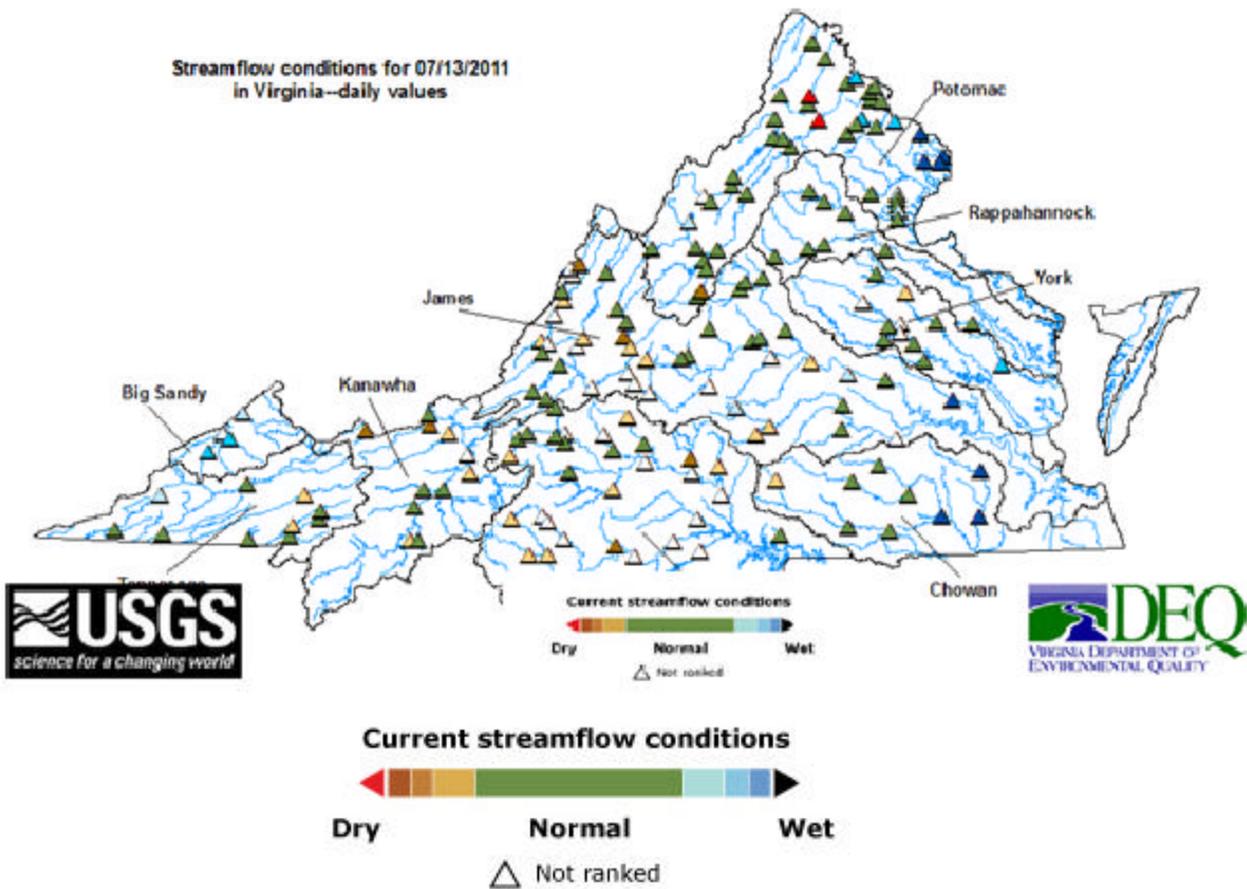
| | | | | | |
|-------------|----------------------------------|----------------------------|---|---|---------------|
| 412711 0 | DELMARVA PROPERTIES | Groundwater wells | N | S-New Kent Co. encourages conservation at all county owned waterworks. | 7,700 |
| 414567 5 | POWHATAN COURTHOUSE | Groundwater wells | N | S | 2,600 |
| 419328 0 | COLONIAL BEACH, TOWN OF | Groundwater wells | N | S | 3,300 |
| 476010 0 | RICHMOND, CITY OF | Surface water; James River | N | S- water levels do not affect intake; James River Regional Flow Management Plan set restrictions based on James River level for counties of Henrico, Chesterfield, Goochland, and Hanover counties, which purchase water from the City. | 197,000 |
| 500905 0 | Town of Amherst | Buffalo River | N | S- Water level 4 inches above dam on 7/11/11 | 5,076 |
| 500925 0 | Amherst County Service Authority | Graham Creek Reservoir | N | S- Operator indicates levels pretty good; reservoir down about 4-5 inches | 13,338 |
| 501105 0 | Town of Appomattox | Wells | N | S- Per MOR | 1,761 |
| 569040 0 | City of Martinsville | Beaver Creek Reservoir | N | S - Reservoir full but not overflowing | 16,000 |
| 514321 0 | Town of Gretna | Georges Creek Reservoir | N | S - Reservoir still full | 2,500 |
| 603308 5 | Caroline Utility System | Groundwater wells | M | S - Mandatory water use restriction of Emergency-Level 6 went into effect 5/30/2011 due to well pump failure and high water demand. Restriction reduced to | 3,600 Primary |

| | | | | | |
|-------------|----------------------|--|---|--|--------------------------------|
| | | | | Moderate-Level 3 on 6/8/11. Reduced to Low-Level 2 on 6/21/11. (Updated 7/11/11) | |
| 604750 0 | Town of Culpeper | Surface water - Lake Pelham | N | S - Lake Pelham level was 0.5" above overflow invert on 7/12/11. | 14,200 |
| 605950 1 | Fairfax Water | Surface Water - Potomac River and Occoquan Reservoir | N | S - 7/14/11 - Potomac River flow is satisfactory (4,000 CFS). Occoquan Reservoir is full. | 823,216 primary 1.8MM total |
| 606120 0 | Marshall | Groundwater | M | S - The WSA Alert Messaging Service maintains the Water Use Restriction Notice as of 7/12/2011. The mandatory water use restriction is not directly drought related but depends on water source development. | 2,134 |
| 606160 0 | Town of Warrenton | Surface (Cedar Run) and groundwater | N | S-On Tuesday, Jul12, Warrenton Reservoir surface was at 445.2 ft vs full level of 445.3 ft. | 11,320 |
| 610715 0 | Town of Hamilton | Groundwater | N | S - 7/13/11 Voluntary water use restrictions lifted 5/9/11. No supply problems. | 2,000 |
| 610730 0 | Town of Leesburg | Surface Water - Potomac River | N | S - 7/13/11 - Potomac River flow is satisfactory (4,000 CFS) | 46,300 |
| 610760 0 | Town of Purcellville | Surface water/groundwater | V | S - 7/13/11 - Surface water reservoir is full and is overflowing. Voluntary water conservation | 6,300 |

| | | | | | |
|-------------|--------------------|-------------------------|---|---|--------|
| | | | | initiated 7/2/10. No water supply problems. | |
| 610765 0 | Town of Round Hill | Groundwater | V | S - 7/13/11 - Voluntary water use restrictions replaced mandatory on 10/21/10. No problems. | 3,156 |
| 613750 0 | Town of Orange | Surface: Rapidan River | N | S - 14-day average of Rapidan River flow was 278 cfs on 7/12/11. | 4,500 |
| 613799 9 | Wilderness | Surface - Rapidan River | N | S | 11,681 |
| 660010 0 | City of Fairfax | Surface Water | N | S - 6/15/11 Goose Creek flow is sufficient. Beaver Dam Reservoir is full. | 24,000 |

APPENDIX G

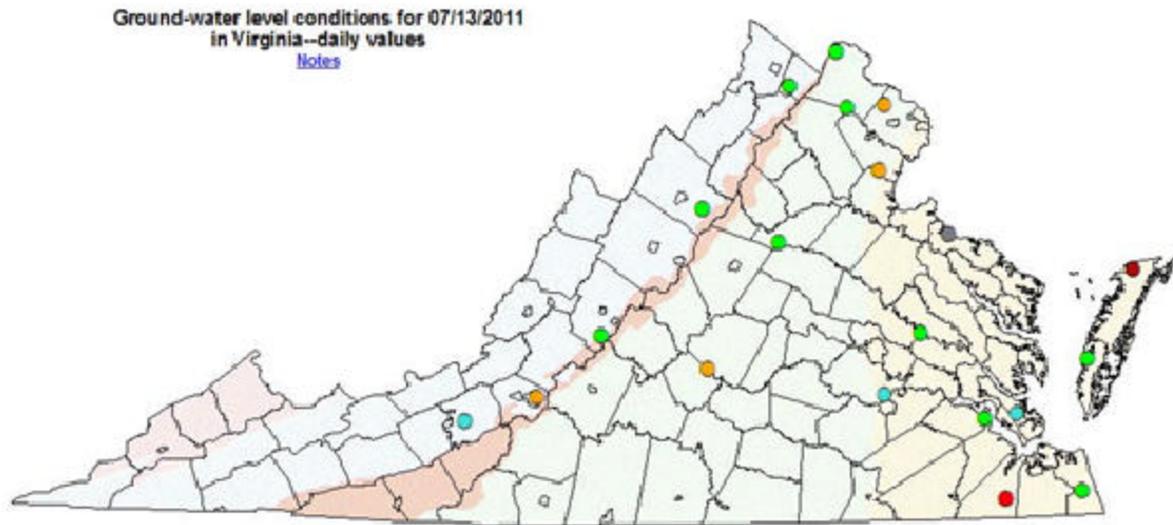
USGS Streamflow Conditions for July 14, 2011



Streamflow conditions in Virginia for July 14, 2011

APPENDIX H

Groundwater Level Conditions July 14, 2011

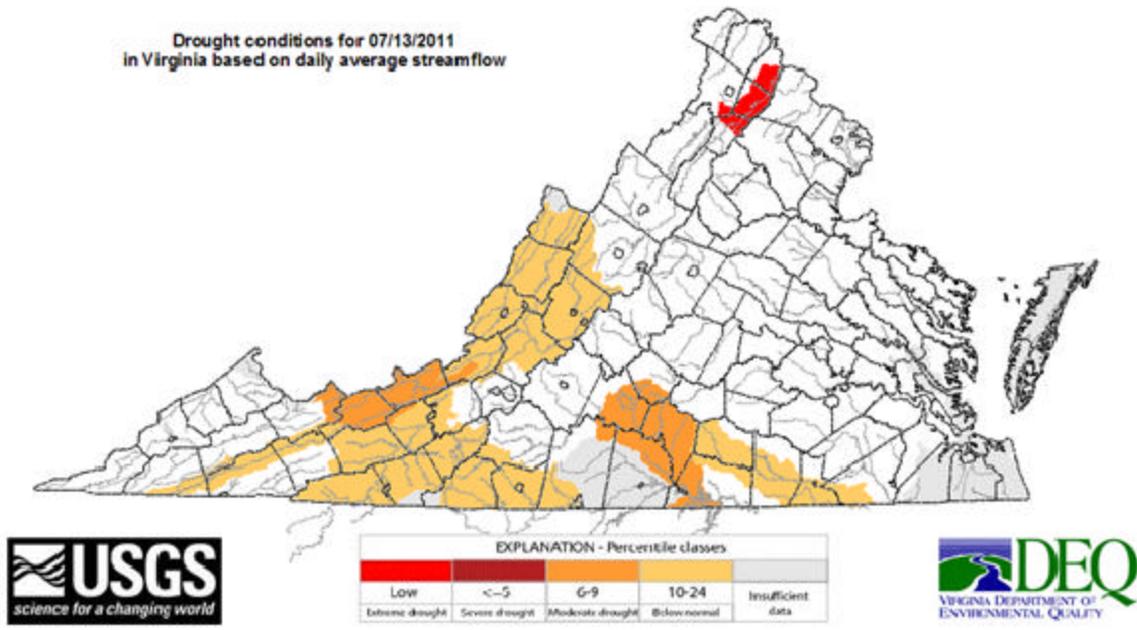


| Explanation - Percentile classes (symbol color based on most recent daily value.) | | | | | | | | | | |
|---|-------------------|------|-----------------|--------|-----------------|-------------------|-----|-------------|---------------|--|
| | | | | | | | | | | |
| New Low | <5 | 5-10 | 10-24 | 25-75 | 76-90 | 90-95 | >95 | New High | Not Ranked | |
| | Well Below Normal | | Below Normal | Normal | Above Normal | Well Above Normal | | | | |

Groundwater-level conditions in Virginia for July 14, 2011

APPENDIX I

Drought Conditions Based on Daily Average Streamflow July 14, 2011



Drought conditions for July 14, 2011 in Virginia.