

## **VIRGINIA DROUGHT MONITORING TASK FORCE**

### **Drought Status Report**

**September 1, 2011**

Statewide precipitation for the current water year, October 1, 2010 to August 31, 2011 is within the normal range (93% of normal). However, the Roanoke and Northern Virginia drought evaluation regions are reporting below normal precipitation for the current water year. 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 (98%) for the calendar year. Appendix A contains precipitation tables for periods dating from June 1, 2010 through August 31, 2011 provided by the Climatology Office of the University of Virginia.

As of August 31, 2011 the National Weather Service Climate Prediction Center 6-10 day climatologic outlooks call for above normal precipitation and below normal temperatures for the entire Commonwealth. The 8-14 day outlooks call for above normal precipitation and below normal temperatures for the entire Commonwealth. The one month outlook calls for above normal precipitation for southeast Virginia and equal chances of below normal, normal and above normal precipitation for the rest of the Commonwealth, and equal chances of below normal, normal and above normal temperatures for the entire Commonwealth. The three month outlook calls for equal chances of below normal, normal and above normal precipitation and temperatures statewide.

The September 1, 2011 NOAA U.S. Drought Monitor indicates “moderate drought” conditions exist in approximately 17% of the state, concentrated in Frederick and Clarke Counties and central Southwest Virginia. “Abnormally dry” conditions exist in approximately 20% of the Commonwealth. The remainder of Virginia is reported as having no drought conditions (Appendix C). The Seasonal Drought Outlook for the United States from now through November 2011 forecasts “improvement” for the Northern Virginia region and “drought to persist or intensify” in southwest Virginia, and “no drought posted or predicted” for the remainder of the state. (Appendix D).

The Virginia Department of Health (VDH) reports that 8 systems are under voluntary water conservation requirements and 3 systems are under mandatory water conservation requirements. Of the 45 systems listed in the VDH report, 3 are rated as having a “Better” overall water supply situation, 8 are rated as having a “Worse” overall water supply situation and all other systems are rated as being in a “Stable” situation (Appendix F).

Reports from the Climatology Office of the University of Virginia, 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**

September 4, 2011

In late August Hurricane Irene brought significant rainfall to much of the Virginia Tidewater. Some locations received in excess of one foot of water from this event. As a result, monthly total precipitation for all but four Drought Regions (more southwestern regions) was well in excess of normal. Precipitation totals running back to the around the beginning of the growing season (April) are in the normal range or above (>90%) for all Regions.

West of the Tidewater, the primary source of rainfall for the month of August was thunderstorm activity. Because of the scattered nature of these storms, there are many locations throughout these regions that have received only small amounts of moisture this summer. These variations can even be seen at the county level.

Averaged overall, the Big Sandy Region received less than two-thirds of normal overall for August. Otherwise, only the New River and Roanoke Regions were below 75% for the month, with the Upper James at almost 85%.

Scattered thunderstorms are expected to continue as important sources of rainfall for September, but we will begin to transition to a more winter like pattern toward the end of the month, with an increasing likelihood of rainfall associated with frontal passages.

In addition, we are in the most active period of hurricane season and, as shown by Hurricane Irene, tropical systems can quickly provide large moisture inputs. Even weak and decaying remnants of these can be sufficient to bring heavy rains over large areas.

### **United States Geological Survey Streamflow and Ground Water Levels**

**September 1, 2011**

Hurricane Irene brought extensive precipitation to most of Virginia east of Interstate 95 which corresponds with the Coastal Plain Physiographic Province. Average precipitation was 3 to 6 inches with some areas in southeast Virginia receiving totals of 14 inches. Stream gages in the Coastal Plain are recording rises to reflect the increased runoff from the hurricane and are in the normal to above normal range of flows. There has been very little precipitation across the rest of the State and stream gages in the southern Piedmont, Valley and Ridge, and Appalachian Plateaus Physiographic Provinces have continued to decline. These areas include streams in the Upper James, Roanoke, Kanawha, and Tennessee River Basins and flows are below normal to well below normal ranges (Appendix G & Appendix H).

Groundwater levels (Appendix I) have responded in a similar manner with water levels in wells in the Coastal Plain east of Interstate 95 in the normal and above normal ranges. Water levels west of Interstate 95 have continued to decline and remain well below normal. With September and October

the driest months for Virginia, groundwater levels are not expected to improve without substantial precipitation from tropical storms.

## **Virginia Department of Agriculture and Consumer Services**

August 2011

According to the USDA Crop Weather Report released on August 28, 2011, 53% of topsoil moisture ranged from adequate to surplus. Many areas of eastern Virginia received much needed rain from Hurricane Irene. Although reports are still preliminary, high winds and excessive rain from the storm caused damaged tobacco, corn and soybeans in parts of the region. Producers in the affected areas report there is too much moisture or standing water in the fields. Areas not affected by the storm continue to need rain as dry conditions persist. To date, no locality has submitted a request for disaster designation due to drought for the 2011 crop year.

Southern Virginia reports that the tobacco crop suffered wind damage as a result of the hurricane. Some tobacco crops were flattened, others left leaning, and the wind stripped many leaves off the plants. Producers are in the process of setting the crop back up for harvest. It is still too early to determine how much of the crop will rebound.

Eastern Virginia reports that Hurricane Irene brought significant rainfall. In Richmond County, it was reported that over 11 inches of rain was received as a result of the storm. Early reports indicate that the storm caused some crop damage, but producers are not yet certain to what extent. Fields have been too wet to in the region to allow for an accurate assessment of damage as of this reporting.

According to reports in Southeastern Virginia, crops were growing well prior to the hurricane. Producers now report that high winds and hard rain caused significant damage to tobacco, corn, cotton and soybean crops in this region. There is still a significant amount of standing water in the fields (some report that as much as 13 inches of rain fell. Fortunately, the water is being absorbed quickly because the soil and subsoil moisture content was low prior to the hurricane.

Although preliminary, Central Virginia producers report that crop damages from Hurricane Irene were minimal. At this time, there were only a few reports of damage to structures (trees on fences) or loss of livestock. There are reports of wind damage to tobacco crops, but the damage is minimal and the tobacco is expected to recover. The hurricane brought a good soaking rain to the region with minimal flooding. Moderate temperatures continue to add to what is shaping up to be a good crop year for the region.

The Northern region reports very dry conditions and is in need of significant rainfall. Pastures are drying up and some producers have resorted to feed early. Fauquier and Prince William counties are especially dry. Corn in Fauquier County is reported to be in poor condition with many fields only knee high. The drought in this area may cause aflatoxin residues in silage harvested from stunted plants. Winchester is reported to be faring better due to increased rainfall throughout the month of August. Many farms are chopping corn for silage early. The numbers of calves sold at feeder calf sales have increased in Winchester, Marshall, and Front Royal.

Southwest Virginia reports expectations are for a better than average year overall. Recent cool weather has benefited livestock production. Rain in the region is still scattered, leaving most counties with varying conditions ranging from adequate to dry. The counties of Floyd, Wythe, Carroll and Bland seem to be experiencing excessively dry conditions with brown pastures and creeks, ponds, and streams going dry. The counties of Russell, Washington, Scott, Smyth, and Grayson are experiencing relatively drought-free conditions.

### **Virginia Department of Environmental Quality Conditions of Major Reservoirs**

Two large reservoirs statewide are at drought watch 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. Lake Moomaw and Lake Anna are currently at levels above their Drought Watch stages. Kerr Reservoir is 0.01 foot below its Drought Watch stage and Smith Mountain Lake is 1.14 feet below Drought Watch stage. Below is a summary of large reservoir conditions:

- On September 1, Lake Moomaw on the Jackson River was at 1569.47 feet, and was dropping at a rate of approximately 0.2 ft per day. Approximately 51% of conservation storage remains. Lake Moomaw is 4.47 ft above its Drought Watch level (1565 feet MSL).
- On August 4, Kerr Reservoir was at 296.49 feet, approximately 3.01 ft below the Guide Curve, and was anticipated to drop to 295.50 ft by September 8, 2011. Drought Watch status is reached at greater than 3 ft below the Guide Curve.
- On August 4, Smith Mountain Lake was at elevation 791.86 ft. The Drought Watch stage for Smith Mountain Lake is elevation 793 feet and below.
- On August 4, Lake Anna was at elevation 249.8 ft (1.80 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:  
9/5/11

DROUGHT REGION	OBSERVED	Aug 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1 Big Sandy	2.54	3.83	-1.29	66%
2 New River	2.34	3.31	-0.97	71%
3 Roanoke	2.76	3.72	-0.96	74%
4 Upper James	2.77	3.33	-0.56	83%
5 Middle James	5.57	3.82	1.75	146%
6 Shenandoah	3.79	3.33	0.46	114%
7 Northern Virginia	4.69	3.85	0.84	122%
8 Northern Piedmont	4.97	3.82	1.15	130%
9 Chowan	8.90	4.31	4.59	207%
10 Northern Coastal Plain	9.09	3.86	5.23	235%
11 York-James	10.78	4.87	5.91	221%
12 Southeast Virginia	12.12	5.12	7.00	237%
13 Eastern Shore	9.59	3.87	5.72	248%
Statewide	5.08	3.83	1.25	133%

DROUGHT REGION	OBSERVED	Jul 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1 Big Sandy	7.97	8.31	-0.34	96%
2 New River	6.17	7.10	-0.93	87%
3 Roanoke	6.54	8.11	-1.57	81%
4 Upper James	5.33	7.37	-2.05	72%
5 Middle James	10.61	8.23	2.38	129%
6 Shenandoah	6.50	7.09	-0.59	92%
7 Northern Virginia	7.00	7.62	-0.62	92%
8 Northern Piedmont	7.05	8.22	-1.17	86%
9 Chowan	15.26	8.82	6.44	173%
10 Northern Coastal Plain	13.49	8.31	5.18	162%
11 York-James	19.42	9.97	9.45	195%
12 Southeast Virginia	20.46	10.19	10.27	201%
13 Eastern Shore	13.30	7.87	5.43	169%
Statewide	9.40	8.17	1.23	115%

DROUGHT REGION	OBSERVED	Jun 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1 Big Sandy	11.10	12.45	-1.35	89%
2 New River	8.37	10.95	-2.58	76%
3 Roanoke	9.21	12.00	-2.79	77%
4 Upper James	7.73	11.08	-3.35	70%
5 Middle James	14.05	11.74	2.31	120%
6 Shenandoah	9.79	10.80	-1.01	91%
7 Northern Virginia	8.96	11.48	-2.52	78%

8	Northern Piedmont	9.78	12.23	-2.45	80%
9	Chowan	18.43	12.47	5.96	148%
10	Northern Coastal Plain	17.43	11.87	5.56	147%
11	York-James	25.12	13.38	11.74	188%
12	Southeast Virginia	24.37	13.80	10.57	177%
13	Eastern Shore	19.58	10.85	8.73	180%
	Statewide	12.50	11.96	0.54	105%

DROUGHT REGION		OBSERVED	May 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	16.43	17.27	-0.84	95%
2	New River	14.21	15.16	-0.95	94%
3	Roanoke	13.91	16.33	-2.42	85%
4	Upper James	12.81	15.36	-2.55	83%
5	Middle James	18.48	15.98	2.50	116%
6	Shenandoah	15.22	14.64	0.58	104%
7	Northern Virginia	12.96	15.82	-2.86	82%
8	Northern Piedmont	14.86	16.45	-1.59	90%
9	Chowan	21.16	16.56	4.60	128%
10	Northern Coastal Plain	19.82	16.03	3.79	124%
11	York-James	27.02	17.65	9.37	153%
12	Southeast Virginia	26.82	17.66	9.16	152%
13	Eastern Shore	20.68	14.37	6.31	144%
	Statewide	16.87	16.22	0.65	104%

DROUGHT REGION		OBSERVED	Apr 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	22.47	21.03	1.44	107%
2	New River	19.90	18.71	1.19	106%
3	Roanoke	18.40	20.13	-1.73	91%
4	Upper James	20.24	18.76	1.48	108%
5	Middle James	22.46	19.32	3.14	116%
6	Shenandoah	22.48	17.56	4.92	128%
7	Northern Virginia	17.81	19.12	-1.31	93%
8	Northern Piedmont	20.37	19.74	0.63	103%
9	Chowan	23.10	19.99	3.11	116%
10	Northern Coastal Plain	22.45	19.12	3.33	117%
11	York-James	28.26	20.95	7.31	135%
12	Southeast Virginia	28.45	20.91	7.54	136%
13	Eastern Shore	22.20	17.29	4.91	128%
	Statewide	21.52	19.64	1.88	110%

DROUGHT REGION		OBSERVED	Mar 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	29.14	25.28	3.86	115%
2	New River	26.32	22.38	3.94	118%
3	Roanoke	23.72	24.40	-0.68	97%
4	Upper James	25.95	22.55	3.40	115%
5	Middle James	27.87	23.38	4.49	119%
6	Shenandoah	26.81	20.76	6.05	129%
7	Northern Virginia	22.70	22.78	-0.08	100%
8	Northern Piedmont	25.88	23.55	2.33	110%

9	Chowan	27.22	24.36	2.86	112%
10	Northern Coastal Plain	26.45	23.40	3.05	113%
11	York-James	31.26	25.64	5.62	122%
12	Southeast Virginia	31.85	25.11	6.74	127%
13	Eastern Shore	25.44	21.60	3.84	118%
	Statewide	26.67	23.68	2.99	113%

	DROUGHT REGION	OBSERVED	Feb 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	31.44	28.86	2.58	109%
2	New River	28.12	25.31	2.81	111%
3	Roanoke	25.18	27.71	-2.53	91%
4	Upper James	27.44	25.40	2.04	108%
5	Middle James	29.26	26.50	2.76	110%
6	Shenandoah	28.46	23.17	5.29	123%
7	Northern Virginia	24.59	25.45	-0.86	97%
8	Northern Piedmont	27.20	26.52	0.68	103%
9	Chowan	28.40	27.53	0.87	103%
10	Northern Coastal Plain	27.61	26.54	1.07	104%
11	York-James	32.53	29.17	3.36	112%
12	Southeast Virginia	33.46	28.61	4.85	117%
13	Eastern Shore	26.89	24.79	2.10	108%
	Statewide	28.22	26.81	1.41	105%

	DROUGHT REGION	OBSERVED	Jan 1, 2011 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	33.22	32.59	0.63	102%
2	New River	29.04	28.52	0.52	102%
3	Roanoke	26.35	31.63	-5.28	83%
4	Upper James	28.35	28.68	-0.33	99%
5	Middle James	30.80	30.16	0.64	102%
6	Shenandoah	29.48	26.02	3.46	113%
7	Northern Virginia	26.36	28.73	-2.37	92%
8	Northern Piedmont	28.68	30.04	-1.36	95%
9	Chowan	30.00	31.64	-1.64	95%
10	Northern Coastal Plain	29.17	30.29	-1.12	96%
11	York-James	34.99	33.31	1.68	105%
12	Southeast Virginia	36.54	32.77	3.77	112%
13	Eastern Shore	29.75	28.35	1.40	105%
	Statewide	29.69	30.45	-0.76	98%

	DROUGHT REGION	OBSERVED	Dec 1, 2010 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	37.77	36.23	1.54	104%
2	New River	32.80	31.23	1.57	105%
3	Roanoke	29.55	34.88	-5.33	85%
4	Upper James	31.31	31.63	-0.32	99%
5	Middle James	33.49	33.33	0.16	100%
6	Shenandoah	31.96	28.61	3.35	112%
7	Northern Virginia	28.15	31.83	-3.68	88%
8	Northern Piedmont	31.21	33.32	-2.11	94%
9	Chowan	33.25	34.66	-1.41	96%

10	Northern Coastal Plain	30.89	33.57	-2.68	92%
11	York-James	36.98	36.70	0.28	101%
12	Southeast Virginia	39.39	35.95	3.44	110%
13	Eastern Shore	32.88	31.59	1.29	104%
	Statewide	32.67	33.57	-0.90	97%

	DROUGHT REGION	OBSERVED	Nov 1, 2010 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	41.10	39.51	1.59	104%
2	New River	35.85	34.26	1.59	105%
3	Roanoke	31.89	38.24	-6.35	83%
4	Upper James	33.82	34.99	-1.17	97%
5	Middle James	35.82	36.84	-1.02	97%
6	Shenandoah	33.99	31.66	2.33	107%
7	Northern Virginia	29.85	35.24	-5.39	85%
8	Northern Piedmont	33.49	37.12	-3.63	90%
9	Chowan	35.10	37.77	-2.67	93%
10	Northern Coastal Plain	32.91	36.71	-3.80	90%
11	York-James	38.55	40.07	-1.52	96%
12	Southeast Virginia	41.11	39.02	2.09	105%
13	Eastern Shore	34.09	34.53	-0.44	99%
	Statewide	35.00	36.80	-1.80	95%

	DROUGHT REGION	OBSERVED	Oct 1, 2010 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	43.52	42.39	1.13	103%
2	New River	37.77	37.43	0.34	101%
3	Roanoke	34.71	41.95	-7.24	83%
4	Upper James	36.04	38.24	-2.20	94%
5	Middle James	38.56	40.68	-2.12	95%
6	Shenandoah	35.23	34.85	0.38	101%
7	Northern Virginia	32.50	38.72	-6.22	84%
8	Northern Piedmont	35.78	41.11	-5.33	87%
9	Chowan	37.65	41.35	-3.70	91%
10	Northern Coastal Plain	35.61	40.22	-4.61	89%
11	York-James	42.10	43.60	-1.50	97%
12	Southeast Virginia	44.15	42.68	1.47	103%
13	Eastern Shore	36.74	37.74	-1.00	97%
	Statewide	37.45	40.30	-2.85	93%

	DROUGHT REGION	OBSERVED	Sep 1, 2010 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	45.83	45.85	-0.02	100%
2	New River	41.73	40.84	0.89	102%
3	Roanoke	40.97	46.18	-5.21	89%
4	Upper James	41.56	41.74	-0.18	100%
5	Middle James	44.67	44.81	-0.14	100%
6	Shenandoah	40.23	38.52	1.71	104%
7	Northern Virginia	38.91	42.79	-3.88	91%
8	Northern Piedmont	42.07	45.39	-3.32	93%
9	Chowan	45.95	45.78	0.17	100%

10	Northern Coastal Plain	43.29	44.31	-1.02	98%
11	York-James	51.37	48.50	2.87	106%
12	Southeast Virginia	57.43	47.11	10.32	122%
13	Eastern Shore	41.30	41.35	-0.05	100%
	Statewide	43.49	44.30	-0.81	98%

	DROUGHT REGION	OBSERVED	Aug 1, 2010 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	50.96	49.68	1.28	103%
2	New River	46.97	44.15	2.82	106%
3	Roanoke	47.40	49.90	-2.50	95%
4	Upper James	44.53	45.07	-0.54	99%
5	Middle James	48.86	48.63	0.23	100%
6	Shenandoah	42.93	41.85	1.08	103%
7	Northern Virginia	43.18	46.64	-3.46	93%
8	Northern Piedmont	45.48	49.21	-3.73	92%
9	Chowan	50.22	50.09	0.13	100%
10	Northern Coastal Plain	47.63	48.17	-0.54	99%
11	York-James	53.07	53.37	-0.30	99%
12	Southeast Virginia	60.62	52.23	8.39	116%
13	Eastern Shore	46.08	45.22	0.86	102%
	Statewide	47.85	48.13	-0.28	99%

	DROUGHT REGION	OBSERVED	Jul 1, 2010 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	54.70	54.16	0.54	101%
2	New River	49.81	47.94	1.87	104%
3	Roanoke	50.66	54.29	-3.63	93%
4	Upper James	48.19	49.11	-0.92	98%
5	Middle James	50.72	53.04	-2.32	96%
6	Shenandoah	46.31	45.61	0.70	102%
7	Northern Virginia	46.64	50.41	-3.77	93%
8	Northern Piedmont	47.80	53.61	-5.81	89%
9	Chowan	51.91	54.60	-2.69	95%
10	Northern Coastal Plain	49.09	52.62	-3.53	93%
11	York-James	56.43	58.47	-2.04	97%
12	Southeast Virginia	64.35	57.30	7.05	112%
13	Eastern Shore	48.17	49.22	-1.06	98%
	Statewide	50.63	52.47	-1.84	96%

	DROUGHT REGION	OBSERVED	Jun 1, 2010 NORMAL	- Aug 31, 2011 DEPARTURE	% OF NORM.
1	Big Sandy	59.48	58.30	1.18	102%
2	New River	52.38	51.79	0.59	101%
3	Roanoke	52.75	58.18	-5.43	91%
4	Upper James	50.04	52.82	-2.78	95%
5	Middle James	52.59	56.55	-3.96	93%
6	Shenandoah	48.14	49.32	-1.18	98%
7	Northern Virginia	47.98	54.27	-6.29	88%
8	Northern Piedmont	50.21	57.62	-7.41	87%
9	Chowan	54.43	58.25	-3.82	93%
10	Northern Coastal Plain	51.10	56.18	-5.08	91%

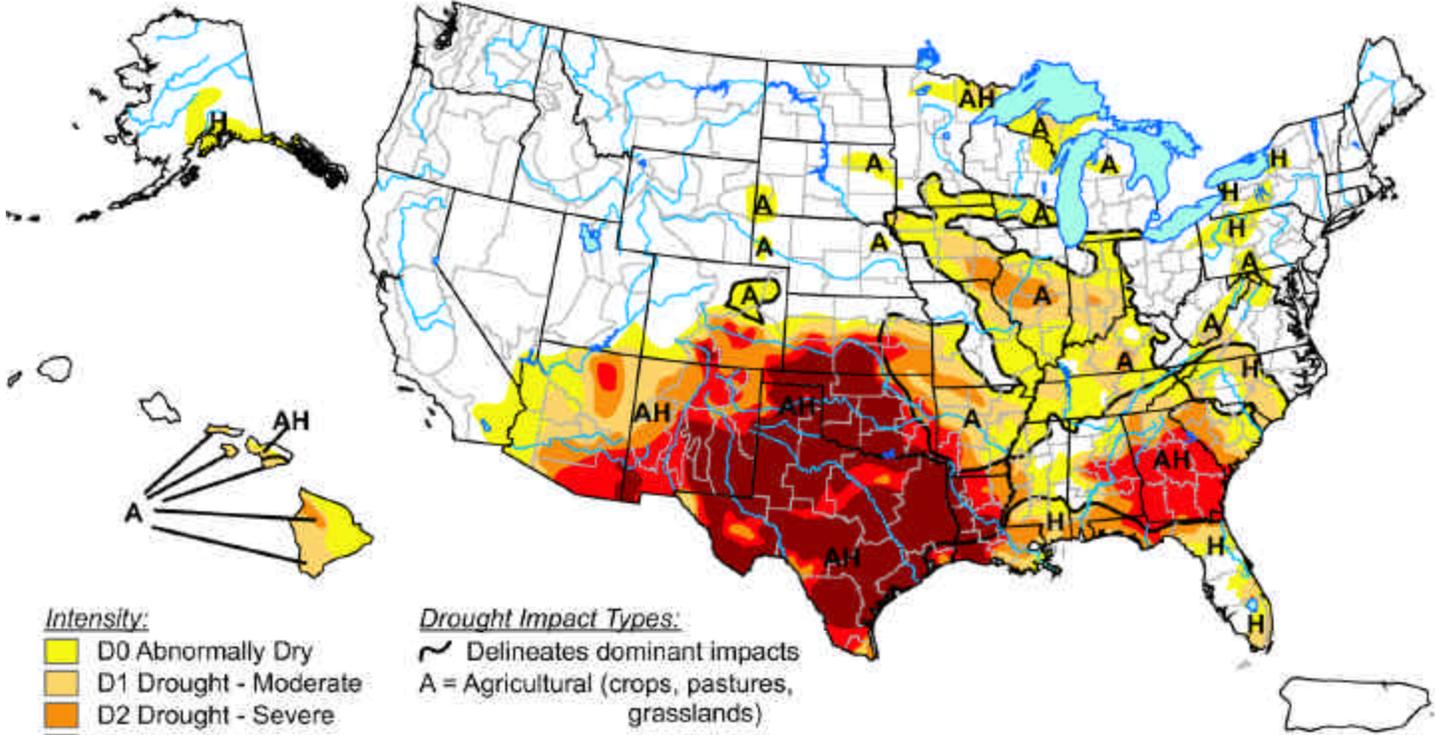
11	York-James	57.36	61.88	-4.52	93%
12	Southeast Virginia	67.59	60.91	6.68	111%
13	Eastern Shore	49.69	52.20	-2.51	95%
	Statewide	52.99	56.26	-3.27	94%

DROUGHT			May 1, 2010	- Jul 31, 2011	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	62.38	59.29	3.09	105%
2	New River	53.85	52.69	1.16	102%
3	Roanoke	54.63	58.79	-4.16	93%
4	Upper James	51.07	53.77	-2.70	95%
5	Middle James	51.07	56.97	-5.90	90%
6	Shenandoah	47.41	49.83	-2.42	95%
7	Northern Virginia	47.94	54.76	-6.82	88%
8	Northern Piedmont	48.91	58.02	-9.11	84%
9	Chowan	50.94	58.03	-7.09	88%
10	Northern Coastal Plain	44.41	56.48	-12.07	79%
11	York-James	51.48	61.28	-9.80	84%
12	Southeast Virginia	59.67	59.65	0.02	100%
13	Eastern Shore	42.22	51.85	-9.64	81%
	Statewide	52.08	56.69	-4.61	92%

# APPENDIX B

## U.S. Drought Monitor

August 30, 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, September 1, 2011

Authors: Eric Luebehusen, U.S. Department of Agriculture

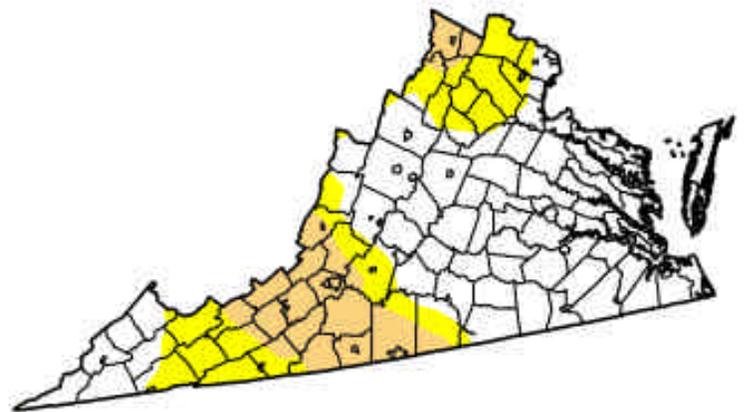
# APPENDIX C

## U.S. Drought Monitor Virginia

August 30, 2011  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	63.08	36.92	16.53	0.00	0.00	0.00
Last Week (08/23/2011 map)	58.44	41.56	12.61	0.00	0.00	0.00
3 Months Ago (05/31/2011 map)	74.30	25.70	12.88	0.09	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 (08/24/2010 map)	26.15	73.85	41.75	30.39	0.00	0.00



Intensity:

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

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

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

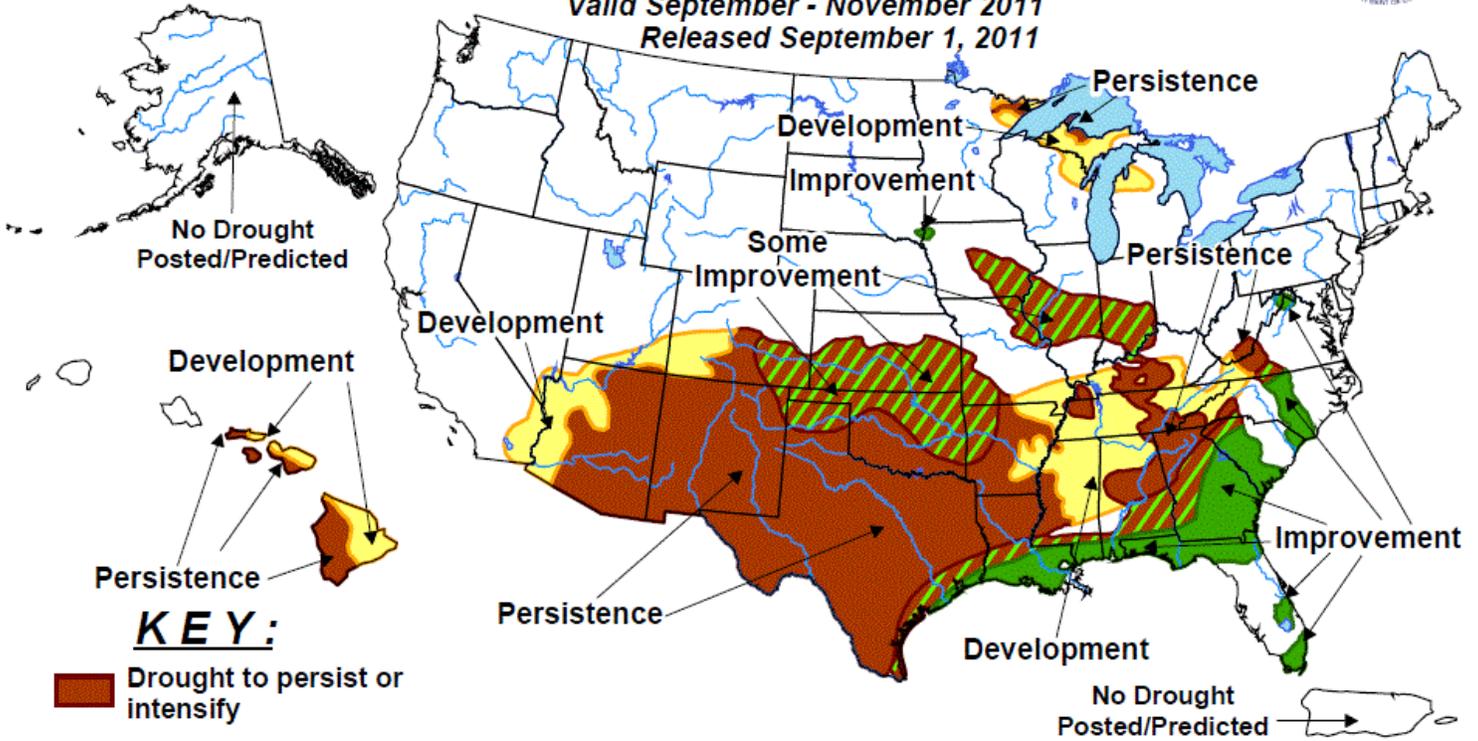


Released Thursday, September 1, 2011  
Eric Luebehusen, USDA

# APPENDIX D



## U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period Valid September - November 2011 Released September 1, 2011



### KEY:

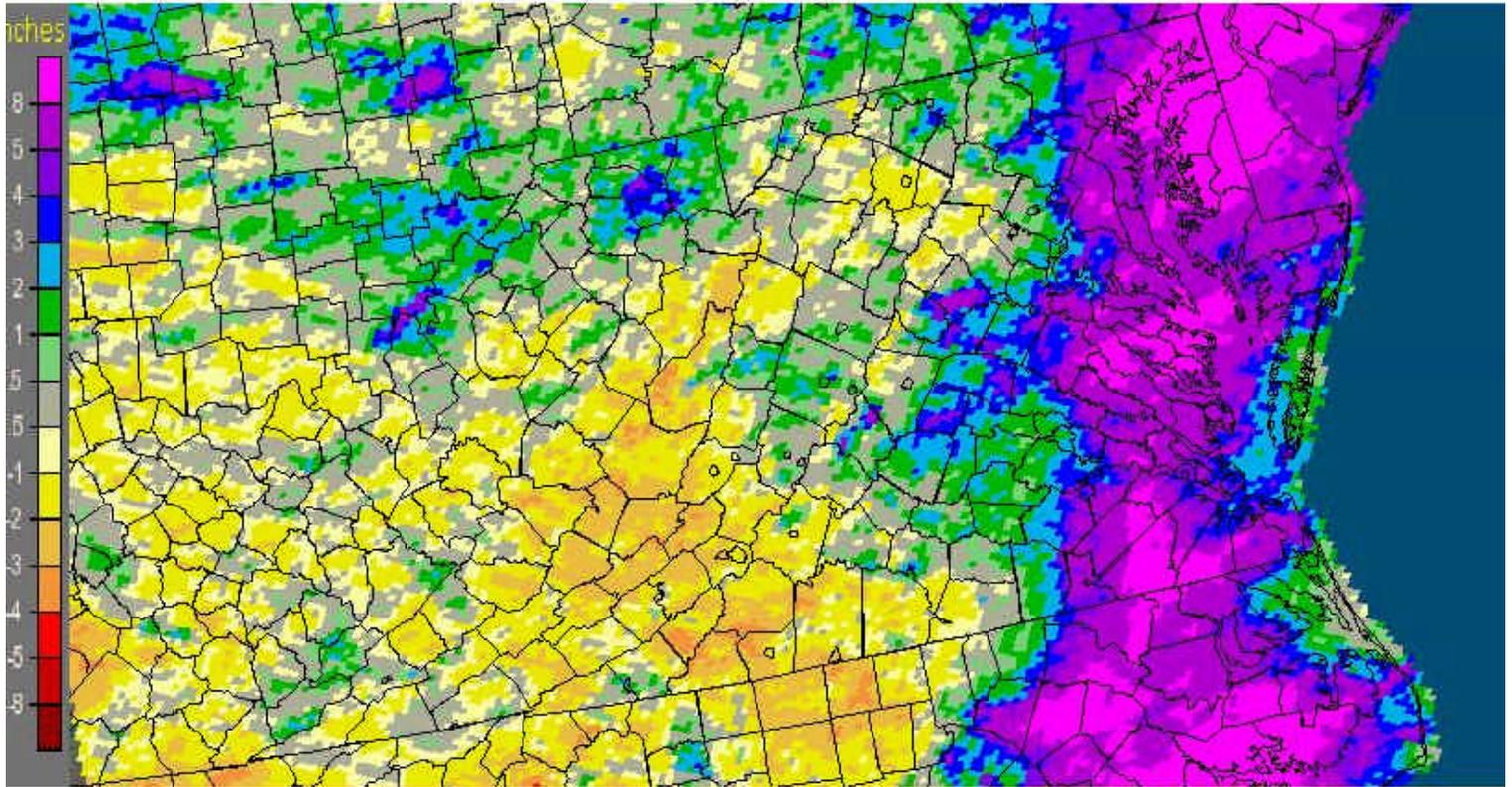
- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by 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. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

# APPENDIX E

## 30-Day Departure from Normal Precipitation Valid September 1, 2011

Virginia: Current 30-Day Departure from Normal Precipitation  
Valid at 9/1/2011 1200 UTC- Created 9/1/11 16:12 UTC



# APPENDIX F

## Condition of Public Water Supplies

### August 25, 2011

ODW Drought Situation Report

Date: **8/25/11**

	<b>Restriction totals</b>	<b>Population Totals</b>
Mandatory	3	11,339
Voluntary	8	563,005
<b>Total</b>	<b>11</b>	574,344

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

<b>PWSID</b>	<b>Waterworks</b>	<b>Source Name</b>	<b>Restrictions</b>	<b>Situation</b>	<b>Population Served</b>
3053280	DCWA Central (Dinwiddie County)	Appomattox River Water Authority (ARWA)	V	W- 8/22/2011 - Voluntary restrictions in place. ARWA called for voluntary restrictions based on lake level 8/8/2011.	6,800
3149700	Puddledock Road	ARWA	V	W- 8/22/2011 - Voluntary restrictions in place. ARWA called for voluntary restrictions based on lake level 8/8/2011.	9,723
3730750	Petersburg	ARWA	V	W- 8/22/2011 - Voluntary restrictions in place. ARWA called for voluntary restrictions based on lake level 8/8/2011.	33,740
3081550	GCWSA - Jarratt	Nottoway River	N	S - 08/22/2011 - River level sufficient to	7,190

				allow plant operation at 1.9 mgd. Gage at Stony Creek indicates 2.46 feet.	
35500 51	Chesapeake	Northwest River, City of Norfolk Raw Water (Lake Gaston)	N	S -08/22/2011 Total rainfall for August 1.25 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 329 mg/L. The river level is normal. Continuing to purchase raw water from Norfolk (7.2 MGD average).	109,411
35701 50	Colonial Heights	Purchased from Appomattox River Water Authority	V	S - 08/22/2011 - Consecutive system to ARWA - decided to go to Voluntary restriction on own. ARWA called for restrictions based on lake level 8/8/2011.	17,286
35952 50	Emporia	Meherrin River	N	S - 08/22/2011 - Reservoir level sufficient for normal operation.	5,600

36708 00	Virginia-American Water Company (Hopewell)	Appomattox & James Rivers	N	S - 08/22/2011 - Level at intakes sufficient to supply plant. MIB (taste & odor) detected in raw water and finished water.	28000 - Primary / 45463 Total including Consecutive System (Ft. Lee)
37005 00	Newport News	Chickahomony River, Skiffs Creek, Diascand, Little Creek, Harwoods Mill, Lee Hall	N	W - 8/17/11 * Reservoir Status: 87.3 % Full (Down 7 % from prior report) * 41.5 Million Gallons Delivered	414,000
37101 00	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 08/22/11, reservoirs at 86.3% (from 90.5% on 08/01/11). Historic reservoir capacity is 86.7% at this time of year. Avg. pumping from Lake Gaston = 48.9 MGD (from 48.3 MGD). Total Reservoir Storage = 13,129 MG (from 13,759 MG).	261,250 - Primary / 755,617 - Total including consecutive systems (Va Beach + military bases).

37406 00	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	N	<p>W - As of 08/19/11, reservoirs at 69% (down from 77% on 07/29/11 ). Median reservoir capacity is 93% for the month and historical average capacity is 90% (period of 1969-2010). The emergency wells are pumping 3.3 MGD. Rainfall recorded at Lake Kilby WTP gauge Suffolk, VA - Monthly total to date: 0.88" 29 year Aug. average rainfall: 5.88" Current year to date: 21.75" Year to date deficit vs. 29 year avg: - 12.91" Estimated days of storage based on current pumpage and rainfall: 170 days. City council was set to vote on the purchase of raw water from Norfolk through the emergency raw water transfer pipeline, but the decision has been postponed in anticipation of rain from Hurricane Irene.</p>	100,400 - Primary / 120,400 Total including consecutive systems (military bases)
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				Mandatory conservation will be a consideration when the emergency raw water transfer occurs.	
38008 05	Suffolk	Lone Star Lakes, Cumps Mill Pond	N	S-08/22/2011 The Lake levels for the Southern Lakes in 36.25%, Lone Star Lakes, 85.88% and Crumps Mill 33.3%. Total rainfall from 8/15/2011 through 8/21/2011 is 0.06 inches.	66,631
38308 50	Williamsburg	Waller Mill Reservoir	N	W -8/17/11: 2.5" below primary spillway - about 83% of usable capacity. (down 9% from last report)	16,400
40410 35	APPOMATTOX RIVER WATER AUTHORITY	Surface water; Lake Chesdin	V	S	200,000
40418 45	CHESTERFIELD CO CENTRAL WATER SYSTEM	Surface water; Swift Creek reservoir; purchases finished water	V	S	286,000
40578 00	TAPPAHANNOCK, TOWN OF	Groundwater wells	N	S	2,100
40733 11	GLOUCESTER CO WATER TREATMENT PLT	Surface water, Beaverdam reservoir; 2 deep groundwater wells	N	S	12,000
40752 83	EASTERN GOOCHLAND CENTRAL WATER SYSTEM	Purchased surface water	N	S	2,500

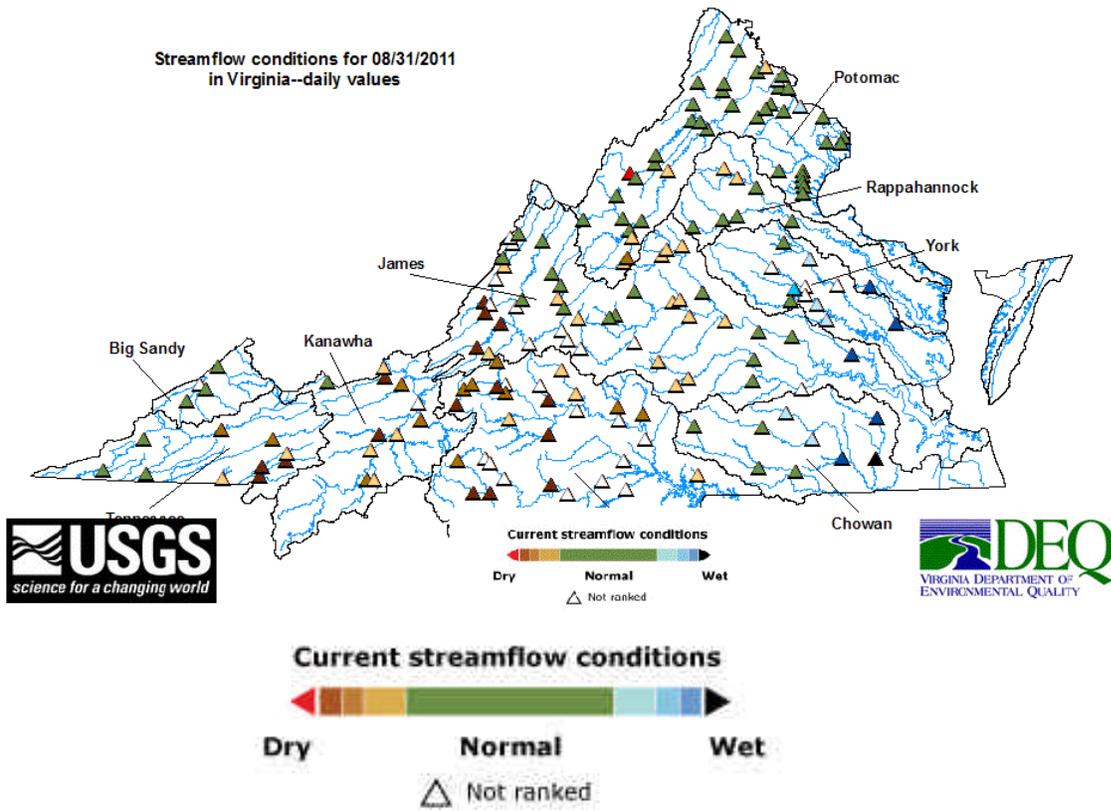
40757 35	JAMES RIVER CORRECTIONAL CTR	Surface water; James River	<b>M</b>	S	9,300
40853 98	HANOVER SUBURBAN WATER SYSTEM	Surface water; North Anna River; some groundwater wells; purchases finished water	N	S	71,000
40871 25	HENRICO COUNTY WATER SYSTEM	Surface water; James River	N	B, improved river flows	289,000
41019 00	WEST POINT, TOWN OF	Groundwater wells	N	S	3,000
41271 10	DELMARVA PROPERTIES	Groundwater wells	N	S	7,700
41456 75	POWHATAN COURTHOUSE	Groundwater wells	N	S	2,600
41932 80	COLONIAL BEACH, TOWN OF	Groundwater wells	N	S	3,300
47601 00	RICHMOND, CITY OF	Surface water; James River	N	B, improved river flows.	197,000
50090 50	Town of Amherst	Buffalo River	N	S	5,076
50092 50	Amherst County Service Authority	Graham Creek Reservoir	N	S	13,338
50110 50	Town of Appomattox	Wells	N	S- Several inches of rain in the past few weeks	1,761
56904 00	City of Martinsville	Beaver Creek Reservoir	N	W - reservoir only down ~1 foot though	16,000
51432 10	Town of Gretna	Georges Creek Reservoir	N	S	2,500
51431 14	Town of Chatham	Cherrystone Creek	N	W - having to adjust flow at Cherryston Res to maintain flow at intake	2,500
51416 40	Town of Stuart	South Mayo River	N	B - Water flowing over spillway	1,500
60330 85	Caroline Utility System	Groundwater wells	<b>M</b>	<b>S</b> - 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 Moderate-Level 3 on 6/8/11. Reduced to Low-Level 2 on 6/21/11.	3,600 Primary 6,600 Total (incl Lake Caroline)

				Increased to High-Level 4 on 7/21/11 due to high temperatures. (Updated 8/19/11)	
60475 00	Town of Culpeper	Surface water - Lake Pelham	N	S - Lake Pelham level was 2" above overflow invert on 8/23/11.	14,200
60595 01	Fairfax Water	Surface Water - Potomac River and Occoquan Reservoir	N	S - No anticipated restrictions to water supply	823,216 primary 1.8MM total
60612 00	Marshall	Groundwater	<b>M</b>	<b>S</b> - The WSA Alert Messaging Service maintains the Water Use Restriction Notice as of 8/23/2011. The mandatory water use restriction is not directly drought related but depends on water source development.	2,039
60616 00	Town of Warrenton	Surface (Cedar Run) and groundwater	N	S-On Tuesday, Aug 23, Warrenton Reservoir surface was at 441.2 ft vs full level of 445.3 ft.	11,225
61071 50	Town of Hamilton	Groundwater	N	S - Voluntary restrictions lifted	2,000
61073 00	Town of Leesburg	Surface Water - Potomac River	N	S - Potomac River flow satisfactory	46,300
61076 00	Town of Purcellville	Surface water/groundwater	V	S - No planned change	6,300
61076 50	Town of Round Hill	Groundwater	V	W- Planning on implementing Mandatory restrictions in September.	3,156
61375 00	Town of Orange	Surface: Rapidan River	N	S - 14-day average of Rapidan River	4,500

				flow was 178 cfs on 8/23/11. (Note: Mandatory restrictions required when 14-day average flow drops to or below 44 cfs.)	
61379 99	Wilderness	Surface - Rapidan River	N	S -- Rapidan River flow measured at same location as Orange. (Note: Voluntary restrictions required when 14-day average flow reaches 53 cfs and mandatory restrictions required when 14-day average flow reaches 28 cfs.)	11,681
66001 00	City of Fairfax	Surface Water	N	S - Goose Creek flow is satisfactory	24,000

# APPENDIX G

## USGS Streamflow Conditions for August 31, 2011



Streamflow conditions in Virginia for August 31, 2011

# APPENDIX H

## Groundwater Level Conditions August 31, 2011



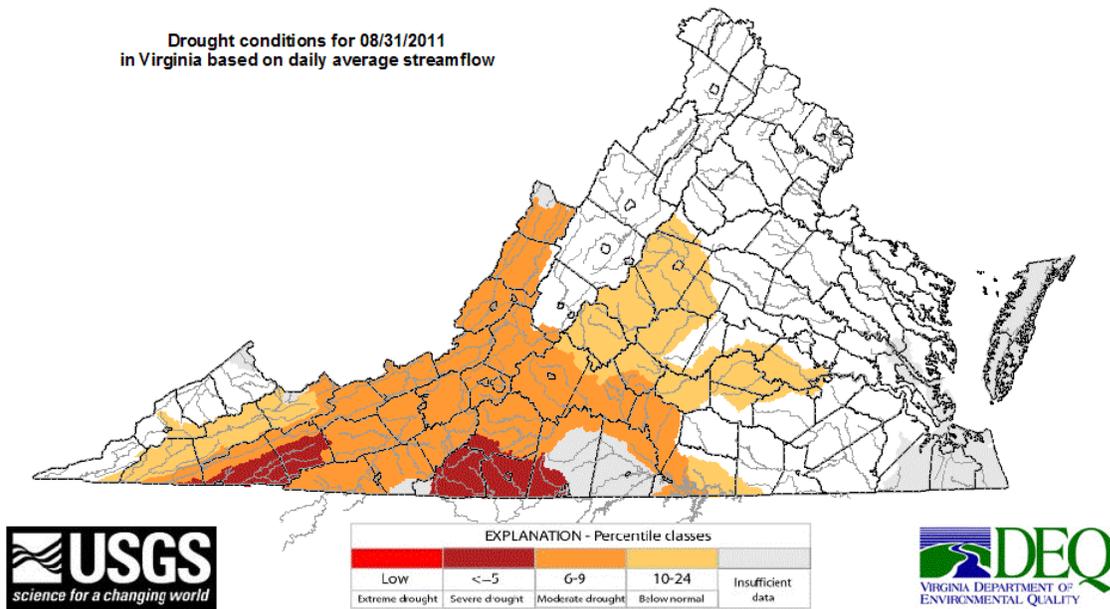
Explanation - Percentile classes (symbol color based on most recent daily value.)									
●	●	●	●	●	●	●	●	●	●
New Low	<5	5-10	10-24	25-75	76-90	90-95	>95	New High	Not Ranked
	Well Below Normal	Below Normal	Normal	Above Normal	Well Above Normal				

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 August 31, 2011

# APPENDIX I

## Drought Conditions Based on Daily Average Streamflow August 31, 2011



Drought conditions for August 31, 2011 in Virginia.