

## VIRGINIA DROUGHT MONITORING TASK FORCE

### Drought Status Report

July 14, 2010

Overall, water supply and availability conditions in Virginia are normal for the time of year and are more stable than during the drought events of 2002 and 2007. Short-term, 60-day precipitation deficits are significant in much of the Commonwealth and stream flows are below normal at a majority Virginia's stream gages. Agricultural impacts and fire danger are emerging throughout the Commonwealth. However, impacts to public water supplies, energy production, fishery resources or recreational resources have been limited.

Statewide precipitation for the current water year, October 1, 2009 July 12, 2010 was in the normal range (111% of normal) with all drought evaluation regions greater than 100% normal except the Big Sandy Region. 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 below the normal range (81%) for the calendar year, with deficits generally increasing throughout the calendar year. Statewide precipitation is 53% of normal since June 1<sup>st</sup> with all drought evaluation regions except the Big Sandy Region having less than 65% of normal. Drought evaluation regions with particularly pronounced deficits since June 1<sup>st</sup> (<50%) include the Middle James, Northern Virginia, Northern Coastal Plain, York-James and Eastern Shore. Appendix A contains precipitation tables for periods dating from July 1, 2009 through July 12, 2010 provided by the Climatology Office of the University of Virginia.

The National Weather Service Climate Prediction Center 6-10 day climatologic outlooks call for above normal precipitation for the entire Commonwealth and above normal temperatures for the western third of the Commonwealth. Normal precipitation and normal to above normal temperatures are anticipated over the 8-14 day period. The three month outlook calls for equal chances of below normal, normal and above normal precipitation for the entire Commonwealth with the exception of above normal precipitation for a portion of extreme southeast Virginia. The three month outlook calls for above normal temperatures for the entire Commonwealth.

The latest NOAA U.S. National Drought Monitor indicates "abnormally dry" to "moderate drought" conditions exist in approximately 86% of the Commonwealth. Only southwest Virginia is not in an "abnormally dry" or "moderate drought" condition. "Moderate drought" conditions are found in portions of Northern Virginia, the Shenandoah Valley, northern Coastal Plain and south central Virginia. Approximately 35% of Virginia experiencing "moderate drought" conditions, as designated in the U.S. National Drought Monitor. The Seasonal Drought Outlook for the United States from now through September 2010 forecasts an improvement in the drought conditions in portions of Northern Virginia (Appendix D).

Generally, water supply systems across the Commonwealth are stable. While the Virginia Department of Health (VDH) has not reported any impacts to public water supplies that have compromised their ability to provide the needs of their customers, 13 systems are under voluntary water conservation requirements and 1 system is under mandatory water conservation requirements. The number of systems under restrictions has not changed since August 2009. Of the 41 systems listed in the VDH report, one is rated as having a "Better" overall water supply situation, two are rated as having a "Worse" overall water supply situation and all other systems are rated as being in a "Stable" situation (Appendix F).

The Virginia Department of Forestry (VDOF) reports greater than normal wildfire activity for the summer months resulting from hot, dry conditions in June and early July. As of July 12<sup>th</sup>, twenty Virginia counties had declared open burning bans. Since the beginning of the calendar year, the VDOF responded to 591 wild land fires that burned 3,932 acres.

The Department of Game and Inland Fisheries reports that trout hatcheries' water supplies are still good in Southwest Virginia but spring flows at trout facilities in Nelson, Craig and Bath Counties are declining. Currently, all boat access sites across the state are open.

Reports from the Climatology Office of the University of Virginia, the Virginia Department of Environmental Quality, the United States Geological Survey, the Virginia Department of Forestry and the Virginia Department of Agriculture and Consumer Services, follow.

### **Report of the Climatology Office of the University of Virginia**

Precipitation throughout the Commonwealth was significantly above normal during the November 2009 through March 2010 period. Moisture during these colder months of the year is critical to the recharge of groundwater and deep soil moisture. Normally high evapotranspiration rates during the growing season remove much of the rainfall received before it can penetrate into the deeper soil layers.

Since March 2010, the precipitation levels have dropped significantly for most of Virginia. In April, most areas received less than about 50% of normal and May rainfall was quite variable between locations. A persistent ridge of high pressure has suppressed rainfall from June through the present. Only one of the Drought Evaluation Regions (Big Sandy) has seen rainfall over two-thirds of normal. Temperatures have also been running above normal statewide; many days have seen high temperatures 10° to 20°F above normal and a number of high temperature records have been set. The shortage of rain contributes to this because less of the solar energy is used to evaporate surface moisture and more is available to raise air temperatures. In turn, the higher temperatures increase the loss of moisture.

With the high point of the hurricane season upon us, the likelihood of receiving significant moisture across a substantial portion of the Commonwealth from tropical systems and their remnants is increasing. This hurricane season is forecast to be an active one; but, so far, only one named storm has formed and there is no significant activity in the tropics.

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

There has been very little precipitation across Virginia since late May with the exception of the far southwest portion of the State. Streamflow has dropped quickly from above normal and normal ranges of flow to current levels. The majority of streamgages across the State are recording flows below normal to well below normal ranges based on July flow statistics (Appendices G and H). These ranges correspond to the 5<sup>th</sup> to 25<sup>th</sup> percentiles. The driest portions of the State analyzed by hydrologic units are the southeast and central locations with increased dryness migrating from north to south and from east to west.

Because of the wet winter and spring, groundwater levels are recording water levels mostly in the normal to above normal range with the exception of three wells along the Atlantic Coast and one well located in the mountains near Roanoke, Va (Appendix I). Release of the groundwater storage is the primary source for maintaining streamflow. Releases of groundwater to streams will continue to decline through August and into September.

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

Levels of large reservoirs statewide are within normal ranges but have generally been declining since June. 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 at levels above any defined drought status. Below is a summary of large reservoir conditions:

- Lake Moomaw on the Jackson River has declined at a rate of 0.2 ft per day throughout July. Approximately 80% of conservation storage remains. Lake Moomaw is 12 ft above the Drought Watch level.
- Kerr Reservoir is currently approximately 0.3 ft below the Guide Curve and is anticipated to drop an additional 0.3 ft by July 19<sup>th</sup>. Drought Watch status is reached at greater than 3 ft below the Guide Curve.
- Smith Mountain Lake is currently at elevation 794 ft which is 1 ft below full pond. The Drought Watch stage for Smith Mountain Lake is elevation 793 feet and below.
- As of July 7<sup>th</sup>, Lake Anna was at elevation 249.7 feet (0.3 feet below full) and dropped approximately 0.3 feet since June 26<sup>th</sup>. The Drought Watch stage for Lake Anna Lake is elevation 248 feet and below.

### **Virginia Department of Agriculture and Consumer Services Status of Agricultural Drought**

**Overview:** According to the USDA Crop Weather Report released on June 27, 2010, 75% of topsoil moisture ranged from short to very short. All regions of the state are reporting serious drought-like conditions. A shortage of rainfall compounded with daytime temperatures reaching over 100 degrees has tremendously stressed all summer vegetation. Moisture conditions are past critical in many areas and the soil is drying out quickly. Pastures and hay crops have browned out leading some counties to consider seeking drought declarations from the Governor. Many corn fields are showing severe signs of drought stress and yields will be greatly depressed without substantial rainfall within the next few weeks.

Although most areas of the state are reporting drought-like conditions, as of July 9, 2010, no locality has submitted a request for disaster designation due to drought-like conditions. Frederick County has requested the Governor's assistance in obtaining federal agricultural disaster designation due to agricultural loss as a result of a hail event on April 5, 2010 and a freeze event on May 10, 2010. Other localities are expected to seek disaster designation due to drought conditions if significant, soaking rain is not received soon around the state.

**Impact on Dairies/Livestock/Poultry:** The lack of rain is forcing producers to sell calves, as well as cull cows. Producers are culling the herd to save forage, as well as weaning calves from cows to reduce their maintenance requirements. Cattle sales are expected to be high until some appreciable amount of moisture arrives. Some poultry farmers have also reported heat stress on animals during the hottest days. In the northern, southern and central parts of the state, pastures are severely stressed by the drought. Hay supplementation to grazing animals has begun. In the southwestern part of the state, pastures are adequate as of now but rain will be needed to sustain them.

**Impact on Nurseries/Christmas Trees:** The nursery industry has seen an increase in irrigation requirements as high temperatures and lack of rainfall across the state have impacted both containerized and in-ground nursery stock. Christmas tree growers report that they are beginning to see the effects of the heat on Christmas trees. The trees are starting to have a wilted look.

**Impact on Crops:** Broadly speaking, the majority of the state is experiencing drought conditions and experiencing record heat. Most crops are suffering from a shortage of moisture compounded with extreme

heat. Corn, soybeans, and pastures all show signs of severe drought due to water shortage and extreme temperatures.

*Corn:* The 2010 corn crop was in very good condition and was ahead of schedule until the hot, dry weather conditions set in. Because the crop is somewhat ahead of schedule, a lot of the crop is in the tasseling stage at the same time that temperatures are exceeding 100 degrees during the day and nighttime temperatures are remaining elevated. Producers need to see some cooler temperatures coupled with some rainfall to prevent a crop disaster. Even if it rains soon, corn in the tassel stage will make an ear, but will not grow to needed height for silage production. Several farms are reported to be cutting their late corn for feeding now as it has no chance of recovering. Farms with the ability to irrigate have begun to do so. In general, silage yield for corn will be reduced and late corn is in very poor condition at this time.

*Hay:* In central and northern Virginia, the first-cutting of hay was marginal in amount and poor in quality. In the southwestern part of the state, hay is abundant. Rain during early days of June pushed harvest later into month and some quality has been sacrificed.

*Potatoes:* Reports from the Eastern Shore indicate that many of the potatoes being graded are being impacted by heat damage. Two localities (Accomack and Northampton) are considering requesting disaster designation if significant rainfall is not received.

*Peanut and Cotton:* No significant rainfall has occurred in southeast Virginia in more than a month. Peanuts and cotton are holding up but the cotton is going to need some rain soon. The one advantage of this dry spell is that it is making the cotton roots go down more in search of moisture. This may be a benefit when rains do occur in July/August, as the root system will be in place.

*Tobacco:* Southside Virginia has experienced only widely scattered thunderstorms in the past month. Irrigation of tobacco started in late June and has been steadily increasing. The tobacco still looks reasonably well and has excellent prospects assuming rain falls soon.

*Soybeans:* Planting of double-crop soybeans has pretty much come to a halt due to dry conditions.

*Wheat:* Producers experienced difficult conditions when planting the winter wheat crop during the fall of 2009. In spring 2010, the significant rainfall hampered planting which caused producers to decrease their planted acres and to decrease their seeding rates. Then producers experienced extremely dry conditions during the spring growing season causing wheat fields and the 2010 crop to not reach full potential. Yields this year ran in the 55-60 bushel per acre range compared to the 60-70 bushel range over the last few years. This coupled with lower prices will lead to a wheat crop that will have an overall significantly reduced value to the Commonwealth for the 2010 wheat crop. The silver lining regarding the wheat crop is that the dry conditions produced a crop with good quality.

*Barley:* Barley has pretty much mirrored the wheat crop. Yields were reduced to the 55-60 bushel range compared to 70-85 bushel range over the last few years. The same weather conditions that plagued the wheat crop also had the same effect on the barley crop.

*Peach, grape and apple:* Crops seem to be fairing well at this time. The lack of rain is producing smaller, sweeter, quality crops.

**Impact on Creeks, Rivers, and Wells:** Low to non-existing surface water flow is occurring in northern and parts of central Virginia. In central and southern Virginia, water levels are becoming low. In the southwestern part of the state, no reports of any problems with wells or streams have been reported; however, annual and monthly rainfall for the region is below normal.

# APPENDIX A

## Precipitation Departures by Drought Evaluation Region

### PRELIMINARY PRECIPITATION SUMMARY

Prepared:  
07/12/10

DROUGHT REGION	OBSERVED	Jul 1, 2010 NORMAL	- Jul 12, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	0.34	1.73	-1.40	19%
2 New River	0.34	1.47	-1.13	23%
3 Roanoke	0.99	1.70	-0.71	58%
4 Upper James	0.97	1.56	-0.59	62%
5 Middle James	0.21	1.71	-1.50	12%
6 Shenandoah	1.16	1.46	-0.30	80%
7 Northern Virginia	0.70	1.46	-0.76	48%
8 Northern Piedmont	0.53	1.70	-1.18	31%
9 Chowan	0.23	1.75	-1.51	13%
10 Northern Coastal Plain	0.04	1.72	-1.68	2%
11 York-James	0.06	1.97	-1.91	3%
12 Southeast Virginia	0.25	1.96	-1.71	13%
13 Eastern Shore	0.35	1.55	-1.20	23%
Statewide	0.52	1.68	-1.16	31%

DROUGHT REGION	OBSERVED	Jun 1, 2010 NORMAL	- Jul 12, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	5.12	5.87	-0.76	87%
2 New River	2.90	5.32	-2.41	55%
3 Roanoke	3.08	5.59	-2.51	55%
4 Upper James	2.83	5.27	-2.45	54%
5 Middle James	2.08	5.22	-3.14	40%
6 Shenandoah	2.99	5.17	-2.18	58%
7 Northern Virginia	2.04	5.32	-3.28	38%
8 Northern Piedmont	2.94	5.71	-2.78	51%
9 Chowan	2.75	5.40	-2.64	51%
10 Northern Coastal Plain	2.05	5.28	-3.23	39%
11 York-James	0.99	5.38	-4.39	18%
12 Southeast Virginia	3.49	5.57	-2.09	63%
13 Eastern Shore	1.88	4.53	-2.65	41%
Statewide	2.89	5.47	-2.58	53%

DROUGHT REGION	OBSERVED	May 1, 2010 NORMAL	- Jul 12, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	10.57	10.69	-0.13	99%
2 New River	6.72	9.53	-2.81	71%
3 Roanoke	7.72	9.92	-2.19	78%
4 Upper James	6.63	9.55	-2.92	69%
5 Middle James	6.13	9.46	-3.33	65%
6 Shenandoah	6.04	9.01	-2.96	67%
7 Northern Virginia	6.68	9.66	-2.98	69%
8 Northern Piedmont	6.61	9.93	-3.33	67%
9 Chowan	8.17	9.49	-1.31	86%
10 Northern Coastal Plain	4.44	9.44	-5.00	47%
11 York-James	5.89	9.65	-3.77	61%
12 Southeast Virginia	7.69	9.43	-1.74	82%
13 Eastern Shore	3.99	8.05	-4.06	50%
Statewide	7.05	9.73	-2.68	73%

DROUGHT		Apr 1, 2010 - Jul 12, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1 Big Sandy	13.25	14.45	-1.21	92%	
2 New River	8.56	13.08	-4.51	65%	
3 Roanoke	9.49	13.72	-4.23	69%	
4 Upper James	8.33	12.95	-4.62	64%	
5 Middle James	7.88	12.80	-4.91	62%	
6 Shenandoah	7.40	11.93	-4.53	62%	
7 Northern Virginia	8.28	12.96	-4.68	64%	
8 Northern Piedmont	8.14	13.22	-5.08	62%	
9 Chowan	9.61	12.92	-3.30	74%	
10 Northern Coastal Plain	6.04	12.53	-6.49	48%	
11 York-James	6.84	12.95	-6.12	53%	
12 Southeast Virginia	8.88	12.68	-3.80	70%	
13 Eastern Shore	5.17	10.97	-5.80	47%	
Statewide	8.77	13.15	-4.38	67%	

DROUGHT		Mar 1, 2010 - Jul 12, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1 Big Sandy	16.12	18.70	-2.58	86%	
2 New River	12.63	16.75	-4.12	75%	
3 Roanoke	14.62	17.99	-3.37	81%	
4 Upper James	12.43	16.74	-4.31	74%	
5 Middle James	13.02	16.86	-3.84	77%	
6 Shenandoah	12.11	15.13	-3.01	80%	
7 Northern Virginia	12.02	16.62	-4.60	72%	
8 Northern Piedmont	13.06	17.03	-3.97	77%	
9 Chowan	14.20	17.29	-3.09	82%	
10 Northern Coastal Plain	12.19	16.81	-4.62	72%	
11 York-James	12.45	17.64	-5.19	71%	
12 Southeast Virginia	15.19	16.88	-1.70	90%	
13 Eastern Shore	11.40	15.28	-3.88	75%	
Statewide	13.47	17.19	-3.72	78%	

DROUGHT		Feb 1, 2010 - Jul 12, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1 Big Sandy	18.89	22.28	-3.39	85%	
2 New River	15.05	19.68	-4.63	76%	
3 Roanoke	17.27	21.30	-4.03	81%	
4 Upper James	14.76	19.59	-4.84	75%	
5 Middle James	16.24	19.98	-3.73	81%	
6 Shenandoah	14.99	17.54	-2.54	85%	
7 Northern Virginia	16.06	19.29	-3.23	83%	
8 Northern Piedmont	15.59	20.00	-4.41	78%	
9 Chowan	17.45	20.46	-3.01	85%	
10 Northern Coastal Plain	15.48	19.95	-4.47	78%	
11 York-James	16.14	21.17	-5.03	76%	
12 Southeast Virginia	18.94	20.38	-1.45	93%	
13 Eastern Shore	15.28	18.47	-3.19	83%	
Statewide	16.44	20.32	-3.88	81%	

DROUGHT REGION	OBSERVED	Jan 1, 2010 NORMAL	- Jul 12, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	23.13	26.01	-2.89	89%
2 New River	19.55	22.89	-3.33	85%
3 Roanoke	22.34	25.22	-2.88	89%
4 Upper James	19.08	22.87	-3.80	83%
5 Middle James	20.63	23.64	-3.01	87%
6 Shenandoah	18.80	20.39	-1.58	92%
7 Northern Virginia	18.76	22.57	-3.81	83%
8 Northern Piedmont	19.52	23.52	-4.01	83%
9 Chowan	21.47	24.57	-3.10	87%
10 Northern Coastal Plain	19.19	23.70	-4.51	81%
11 York-James	20.57	25.31	-4.74	81%
12 Southeast Virginia	23.26	24.54	-1.29	95%
13 Eastern Shore	18.30	22.03	-3.73	83%
Statewide	20.64	23.96	-3.32	86%

DROUGHT REGION	OBSERVED	Dec 1, 2009 NORMAL	- Jul 12, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	28.82	29.65	-0.84	97%
2 New River	26.85	25.60	1.25	105%
3 Roanoke	29.91	28.47	1.44	105%
4 Upper James	26.46	25.82	0.64	102%
5 Middle James	28.78	26.81	1.98	107%
6 Shenandoah	24.05	22.98	1.07	105%
7 Northern Virginia	25.01	25.67	-0.66	97%
8 Northern Piedmont	26.01	26.80	-0.80	97%
9 Chowan	29.41	27.59	1.82	107%
10 Northern Coastal Plain	27.10	26.98	0.11	100%
11 York-James	27.52	28.70	-1.18	96%
12 Southeast Virginia	31.07	27.72	3.34	112%
13 Eastern Shore	26.83	25.27	1.56	106%
Statewide	27.78	27.08	0.70	103%

DROUGHT REGION	OBSERVED	Nov 1, 2009 NORMAL	- Jul 12, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	31.07	32.93	-1.87	94%
2 New River	31.84	28.63	3.21	111%
3 Roanoke	38.09	31.83	6.26	120%
4 Upper James	31.35	29.18	2.17	107%
5 Middle James	37.36	30.32	7.04	123%
6 Shenandoah	27.90	26.03	1.88	107%
7 Northern Virginia	28.95	29.08	-0.13	100%
8 Northern Piedmont	32.07	30.60	1.47	105%
9 Chowan	39.05	30.70	8.36	127%
10 Northern Coastal Plain	35.85	30.12	5.72	119%
11 York-James	36.78	32.07	4.70	115%
12 Southeast Virginia	41.45	30.79	10.66	135%
13 Eastern Shore	34.38	28.21	6.17	122%
Statewide	34.42	30.31	4.11	114%

DROUGHT REGION	OBSERVED	Oct 1, 2009 - Jul 12, 2010		% OF NORM.
		NORMAL	DEPARTURE	
1 Big Sandy	34.11	35.81	-1.71	95%
2 New River	34.53	31.80	2.73	109%
3 Roanoke	40.65	35.54	5.11	114%
4 Upper James	34.14	32.43	1.71	105%
5 Middle James	40.41	34.16	6.25	118%
6 Shenandoah	30.65	29.22	1.44	105%
7 Northern Virginia	33.76	32.56	1.20	104%
8 Northern Piedmont	35.49	34.59	0.89	103%
9 Chowan	41.10	34.28	6.83	120%
10 Northern Coastal Plain	40.06	33.63	6.43	119%
11 York-James	39.87	35.60	4.26	112%
12 Southeast Virginia	43.76	34.45	9.31	127%
13 Eastern Shore	38.76	31.42	7.34	123%
Statewide	37.42	33.81	3.61	111%

DROUGHT REGION	OBSERVED	Sep 1, 2009 - Jul 12, 2010		% OF NORM.
		NORMAL	DEPARTURE	
1 Big Sandy	39.29	39.27	0.02	100%
2 New River	38.55	35.21	3.34	109%
3 Roanoke	43.71	39.77	3.94	110%
4 Upper James	37.41	35.93	1.48	104%
5 Middle James	43.58	38.29	5.29	114%
6 Shenandoah	32.87	32.89	-0.02	100%
7 Northern Virginia	36.00	36.63	-0.63	98%
8 Northern Piedmont	38.37	38.87	-0.50	99%
9 Chowan	45.41	38.71	6.71	117%
10 Northern Coastal Plain	43.14	37.72	5.42	114%
11 York-James	45.78	40.50	5.28	113%
12 Southeast Virginia	51.06	38.88	12.18	131%
13 Eastern Shore	45.23	35.03	10.20	129%
Statewide	41.06	37.81	3.25	109%

DROUGHT REGION	OBSERVED	Aug 1, 2009 - Jul 12, 2010		% OF NORM.
		NORMAL	DEPARTURE	
1 Big Sandy	43.78	43.10	0.68	102%
2 New River	43.06	38.52	4.54	112%
3 Roanoke	48.05	43.49	4.56	110%
4 Upper James	40.79	39.26	1.53	104%
5 Middle James	47.11	42.11	5.00	112%
6 Shenandoah	35.91	36.22	-0.30	99%
7 Northern Virginia	39.97	40.48	-0.51	99%
8 Northern Piedmont	41.52	42.69	-1.18	97%
9 Chowan	49.26	43.02	6.24	115%
10 Northern Coastal Plain	48.40	41.58	6.81	116%
11 York-James	51.25	45.37	5.88	113%
12 Southeast Virginia	60.51	44.00	16.51	138%
13 Eastern Shore	49.83	38.90	10.93	128%
Statewide	45.24	41.64	3.60	109%

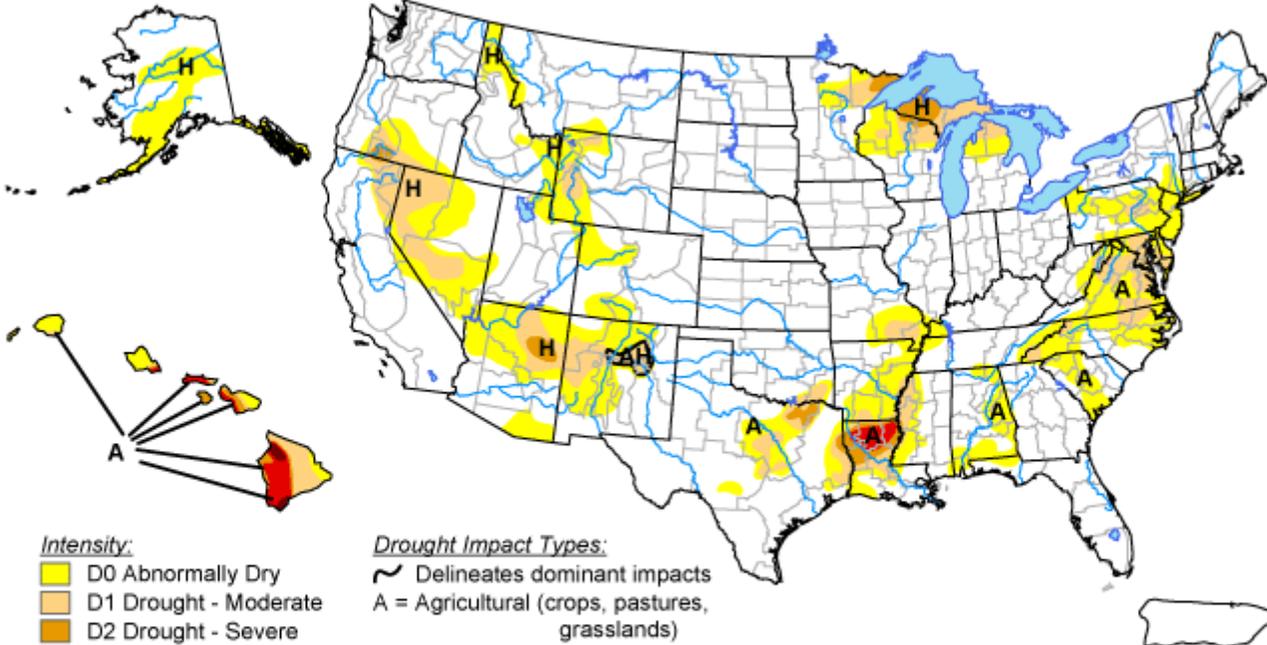
DROUGHT REGION	OBSERVED	Jul 1, 2009 - Jul 12, 2010		% OF NORM.
		NORMAL	DEPARTURE	
1 Big Sandy	49.38	47.58	1.80	104%
2 New River	47.12	42.31	4.81	111%
3 Roanoke	52.41	47.88	4.53	109%
4 Upper James	45.69	43.30	2.38	106%
5 Middle James	50.59	46.52	4.07	109%
6 Shenandoah	38.85	39.98	-1.12	97%
7 Northern Virginia	41.62	44.25	-2.63	94%
8 Northern Piedmont	44.44	47.09	-2.65	94%
9 Chowan	53.27	47.53	5.75	112%
10 Northern Coastal Plain	53.26	46.03	7.23	116%
11 York-James	57.23	50.47	6.76	113%
12 Southeast Virginia	64.50	49.07	15.42	131%
13 Eastern Shore	55.61	42.90	12.71	130%
Statewide	49.29	45.98	3.31	107%

# APPENDIX B

## U.S. Drought Monitor

July 6, 2010

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 8, 2010  
Author: Rich Tinker, NOAA/NWS/NCEP/CPC

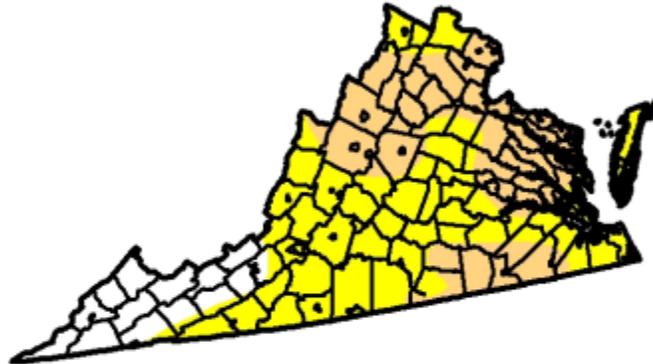
# APPENDIX C

## U.S. Drought Monitor Virginia

July 6, 2010  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	14.1	85.9	34.7	0.0	0.0	0.0
Last Week (06/29/2010 map)	21.6	78.4	0.5	0.0	0.0	0.0
3 Months Ago (04/13/2010 map)	100.0	0.0	0.0	0.0	0.0	0.0
Start of Calendar Year (01/05/2010 map)	100.0	0.0	0.0	0.0	0.0	0.0
Start of Water Year (10/06/2009 map)	86.9	13.1	0.4	0.0	0.0	0.0
One Year Ago (07/07/2009 map)	82.1	17.9	0.0	0.0	0.0	0.0



Intensity:

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

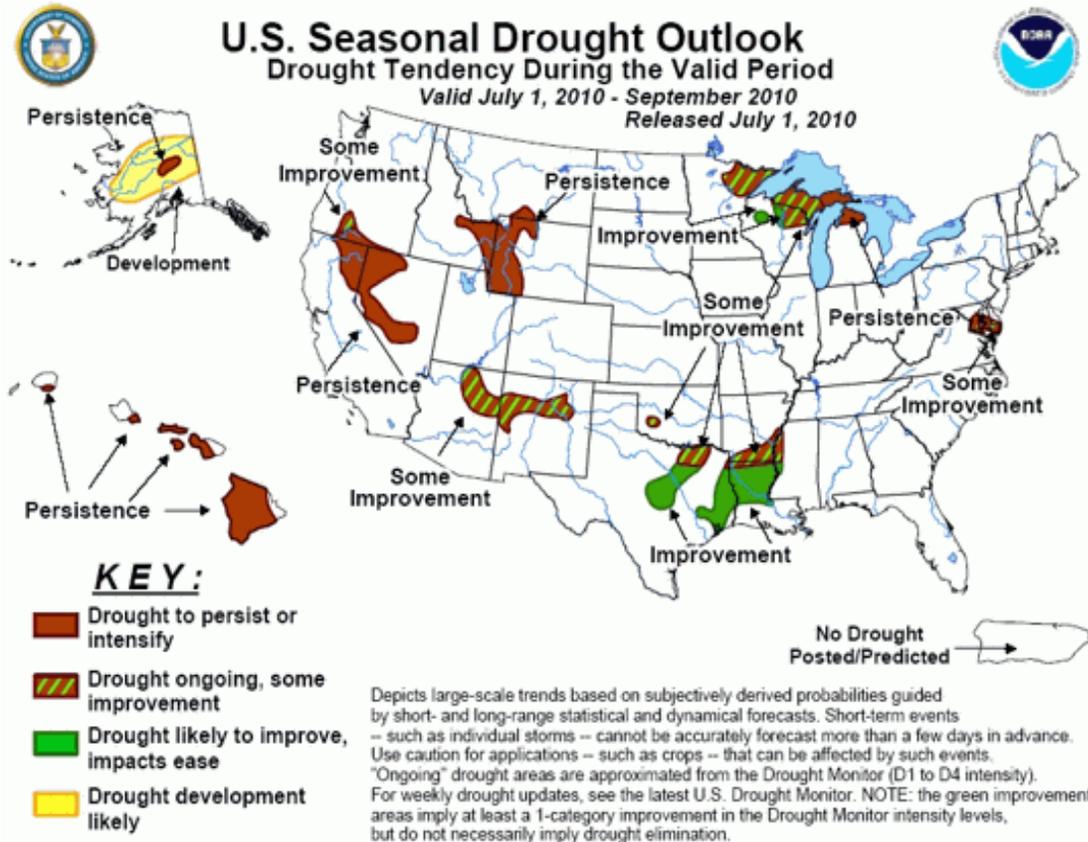
The Drought Monitor focuses on broad-scale conditions.  
Local conditions may vary. See accompanying text summary  
for forecast statements

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



Released Thursday, July 8, 2010  
Author: R. Tinker, CPC/NOAA

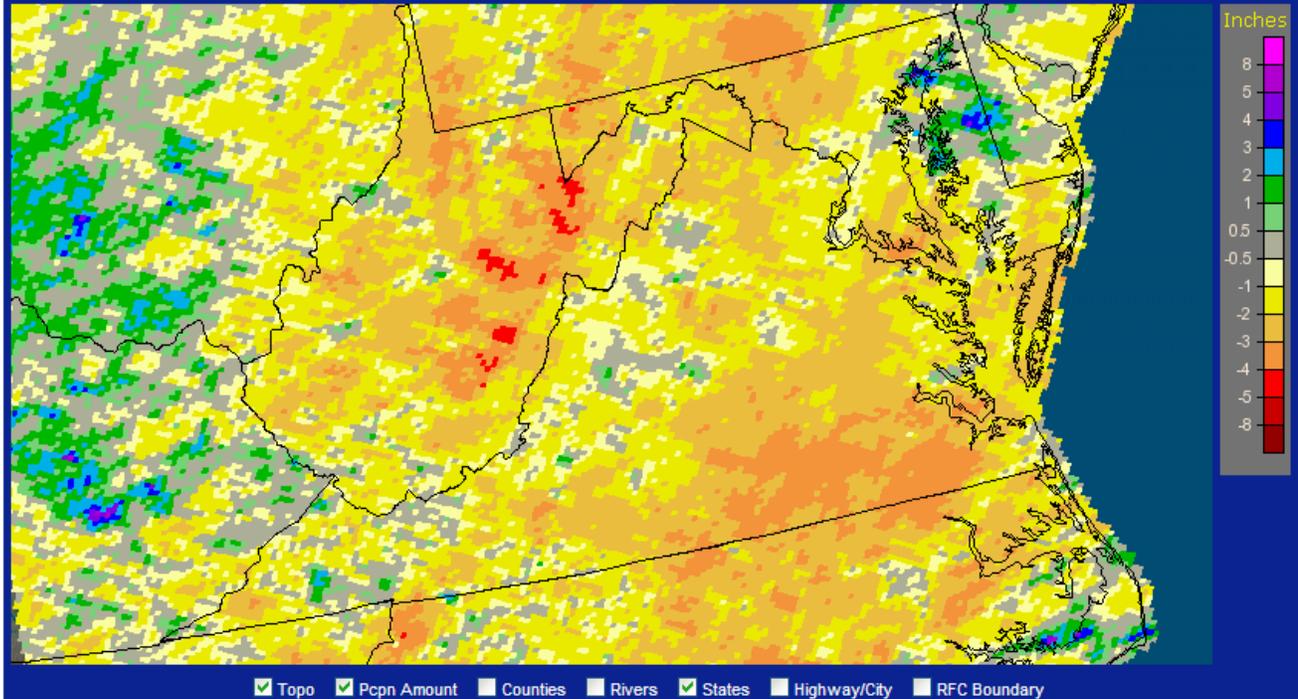
# APPENDIX D



# APPENDIX E

## 30-Day Departure from Normal Precipitation

Virginia: Current 30-Day Departure from Normal Precipitation  
Valid at 7/13/2010 1200 UTC - Created 7/13/10 16:17 UTC



# APPENDIX F

## Condition of Public Water Supplies

### July 6, 2010

**ODW Drought Situation Report**

Date: **7/6/10**

	<b>Restriction totals</b>
Mandatory	1
Voluntary	13
<b>Total</b>	<b>14</b>

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

PWSID	Waterworks	Source Name	Restrictions	Situation	Population Served
3053280	DCWA Central (Dinwiddie County)	Appomattox River Water Authority (ARWA)	V	<b>S</b> - 06/29/2010 - Voluntary restrictions began on 7/29/08. ARWA lifted voluntary restrictions September 2008. No formal action taken to rescind voluntary restrictions in Dinwiddie County to date.	6,800
3081550	GCWSA - Jarratt	Nottoway River	N	<b>S</b> - 06/28/10 - Waterworks production rate reduced due to lower demand; river level sufficient to allow plant operation at 1.9 mgd. Chief operator noted that river is getting low.	7,190
3093120	Isle of Wight County	Suffolk	V	<b>S</b> - 07/02/10 - Obtains water from Suffolk. Follows Suffolk's lead on conservation.	1,284
3550050	Chesapeake - Western Branch system	City of Portsmouth	V	<b>S</b> -07/06/2010 This portion of the city is consecutive to (receives water from) the city of Portsmouth. City Council voted to go to voluntary conservation city-wide - it took effect on 24 Oct 2007. Still following Portsmouth's lead on conservation.	36,642

3550051	Chesapeake	Northwest River, City of Norfolk Raw Water (Lake Gaston)	V	S -07/06/2010 Chesapeake is in good shape. There is no active water use restriction in place. Chlorides are used as an indicator of drought, the higher the levels the more concentrated the contaminant in a lesser amount of surface water. Current levels are in the range of 20-38 mg/l. The average for May 2010 was 29 mg/l. Continuing to purchase raw water from Norfolk (7.0 MGD average)	103,504
3550052	Chesapeake - South Norfolk system	City of Norfolk	V	S -07/06/2010-This portion of the city is consecutive to (receives water from) the city of Norfolk. City Council voted to go to voluntary conservation city-wide - it took effect on 24 Oct 2007. Still following Norfolk's lead on conservation.	38,709
3570150	Colonial Heights	ARWA	V	S - 06/28/10 - Lifted mandatory restrictions on 12/1/07. Voluntary restrictions currently in place. Generally follow ARWA recommendations on water restrictions.	17,286
3595250	Emporia	Meherrin River	N	S - 06/24/10 - Reservoir level sufficient for normal operation. Power plant & ILUKA also withdrawing from river.	5,600
3670800	Virginia-American Water Company (Hopewell)	Appomattox & James Rivers	N	S - 06/28/2010 - Level at intakes normal and sufficient to supply plant. June rainfall below monthly average, but year-to-date totals slightly above average. Water quality similar to late July/August and have had an influx of taste and odor complaints.	28000 - Primary / 45463 Total including Consecutive System (Ft. Lee)
3700500	Newport News	Chickahomony River, Skiffs Creek, Diascand, Little Creek, Harwoods Mill, Lee Hall	N	6/28/10 - Total reservoir capacity at 95.9%. Chickahominy pumps secured this date (MIF/chlorides).	406,000

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.	V	<b>S</b> - As of 06/28/10, reservoirs at 91.5% (was 91.6% on 10/05/09). Historic reservoir capacity is 90.4% at this time of year. Avg. pumping from Lake Gaston = 42.1 MGD. Called for voluntary conservation 11/1/07.	261,250 - Primary / 755,617 - Total including consecutive systems (Va Beach + military bases).
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	V	<b>W</b> - As of 07/02/10, reservoirs at 90% (down from 99% on 10/05/09). Median reservoir capacity is 94% for the month and historical average capacity is 92% (period of 1969-2008). The emergency wells are off. Called for voluntary conservation on 10/10/07.	100,400 - Primary / 120,400 Total including consecutive systems (military bases)
3800805	Suffolk	Lone Star Lakes, Cumps Mill Pond	V	<b>B</b> - 7/6/2010-Will follow Portsmouth's lead and the region as far as conservation. Average reservoir levels : Southern Lakes at 97.42% capacity, for the Northern Lakes at 73.45% and Crumps Mill Pond at 93.39% The Southern Lakes are for emergency use only. Overall they are at 94.76% capacity for the reservoirs for the period (March-May 2010). The operator states that they were in better condition last year when compared to 2009 (98.46%) for the same period. This can be attributed to the berm break at Lake I. Still purchasing water from Portsmouth per their contract, no drought measure taken to date.	62,562
3810900	Virginia Beach	Norfolk	V	<b>S</b> - 07/02/10 - Obtains water from Norfolk. Called for voluntary conservation on 9/19/07.	423,743
3830850	Williamsburg	Waller Mill Reservoir	N	6/24/2010: 8" above primary spillway - about 97% of usable capacity.	16,400

4041035	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. Reservoir is at 16" below top of dam. Voluntary restrictions begin at 19" below top of dam.	200,000
4041845	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. Swift Creek Reservoir is at 0.8 feet below top of dam.	286,000
4057800	TAPPAHANNOCK, TOWN OF	Groundwater wells	N	S	2,100
4073311	GLOUCESTER CO WATER TREATMENT PLT	Surface water, Beaverdam reservoir; 2 deep groundwater wells	N	S-Reservoir is full.	8,870
4075283	EASTERN GOOCHLAND CENTRAL WATER SYSTEM	Purchased surface water	N	S-purchases water from Henrico County	2,500
4075735	JAMES RIVER CORRECTIONAL CTR	Surface water; James River	N	S- Conservation at all DOC facilities	9,300
4085398	HANOVER SUBURBAN WATER SYSTEM	Surface water; North Anna River; some groundwater wells; purchases finished water	N	S (see Richmond)	71,000
4085770	SPRING MEADOWS-MEADOW GATE	Groundwater wells	N	S- A replacement well has been drilled and other improvements are proposed in the PER.	2,300
4087125	HENRICO COUNTY WATER SYSTEM	Surface water; James River	N	S (see Richmond)	289,000
4101900	WEST POINT, TOWN OF	Groundwater wells	N	S	3,000
4127110	DELMARVA PROPERTIES	Groundwater wells	N	S-New Kent Co. encourages conservation at all county owned waterworks.	7,700
4145675	POWHATAN COURTHOUSE	Groundwater wells	N	S	2,600
4193280	COLONIAL BEACH, TOWN OF	Groundwater wells	N	S	3,300

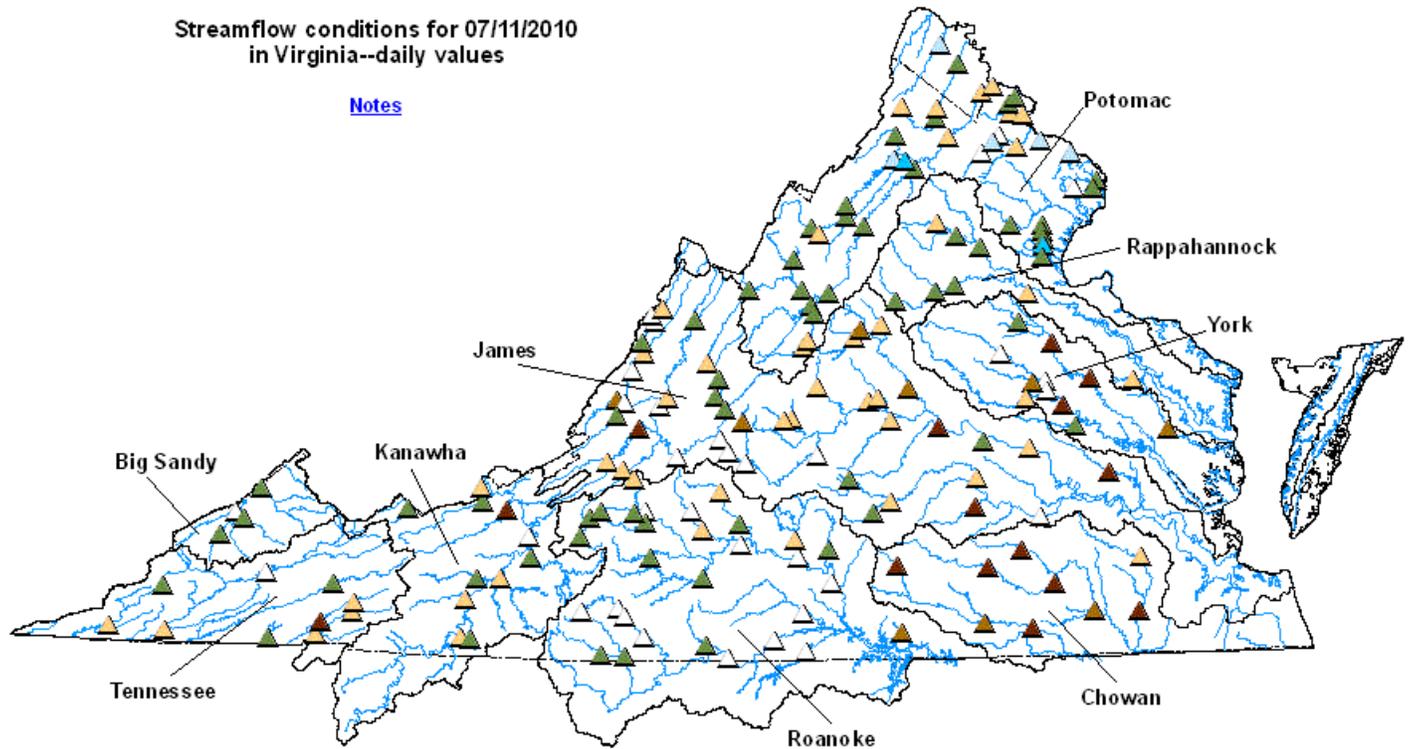
4760100	RICHMOND, CITY OF	Surface water; James River	N	S- water levels do not affect intake; James River Regional Flow Management Plan set restrictions based on James River level for counties of Henrico, Chesterfield, Goochland, and Hanover counties, which purchase water from the City.	197,000
5143210	Town of Gretna	Georges Creek Res	N	<b>S- reservoir full</b>	2,500
5029085	Buckingham County	Troublesome Creek Reservoir	N	<b>S</b>	5,751
5037300	Town of Keysville	Keysville Reservoir	N	<b>S</b>	800
5780600	HCSA-South Boston	Dan River	N	<b>S</b>	11,388
5141640	Town of Stuart	South Mayo River	N	<b>S</b>	1,500
5147170	Town of Farmville	Appomattox River	N	<b>S</b>	7,011
5011050	Town of Appomattox	Wells	V	<b>S</b>	1,708
5067265	Hales Point	Wells	N	<b>S - hauling water</b>	46
5690400	City of Martinsville	Beaver Creek Reservoir	N	<b>S</b>	16,000
6061200	Marshall	Groundwater	<b>M</b>	<b>S</b> - The WSA Alert Messaging Service maintains the Water Use Restriction Notice as of <b>7/2/2010</b> . The mandatory water use restriction is not directly drought related but depends on water source development.	2,134
6107400	Town of Lovettsville	Groundwater	V	<b>S</b> - 7/6/10 Voluntary water use restrictions remain in place; however there is no problem with water supply.	1,280
6107600	Town of Purcellville	Surface water/groundwater	N	<b>W - Hirst Farm Well #2 out of service. Production from reservoir is exceeding safe yield as of 7/6/2010</b>	6,300
6107650	Town of Round Hill	Groundwater	V	<b>S</b> - 7/6/10 - No water supply problems. Voluntary water use restrictions effective 7/6/10.	3,156

# APPENDIX G

## USGS Streamflow Conditions for July 11, 2010

Streamflow conditions for 07/11/2010  
in Virginia--daily values

[Notes](#)



Current streamflow conditions



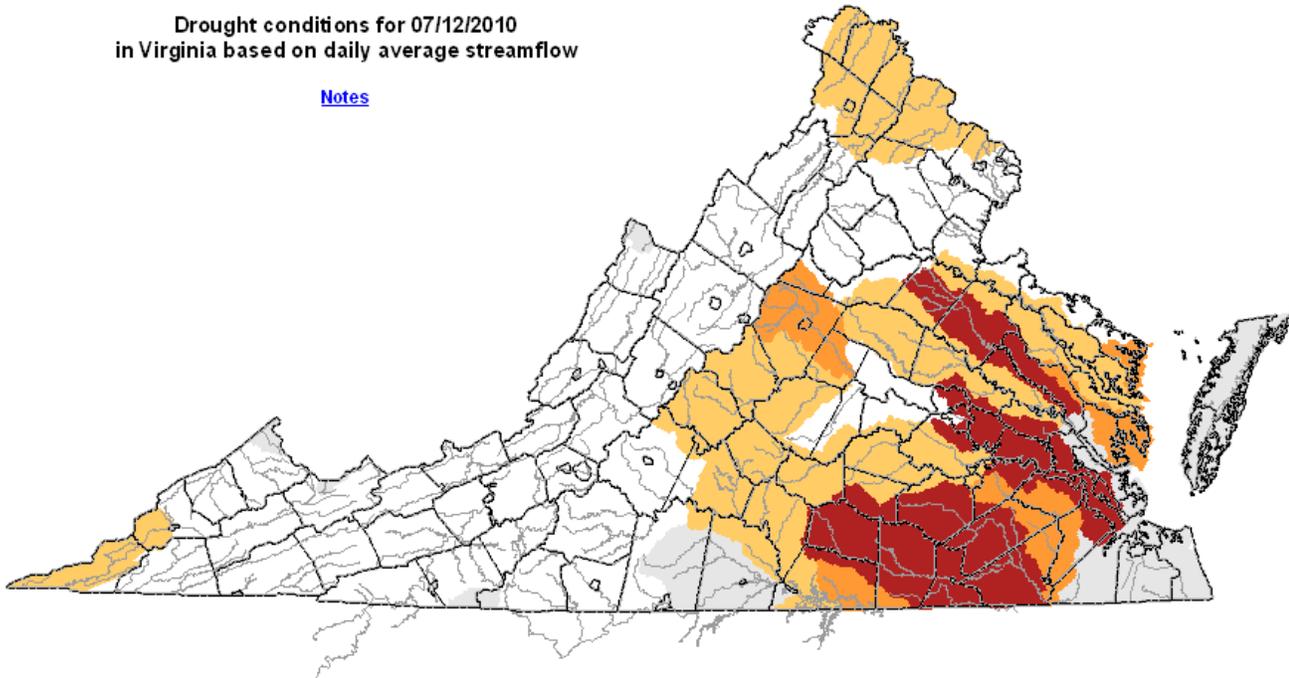
△ Not ranked

# APPENDIX H

## Drought Watch -- USGS State Information on Drought Map of below normal daily average streamflow

Drought conditions for 07/12/2010  
in Virginia based on daily average streamflow

[Notes](#)



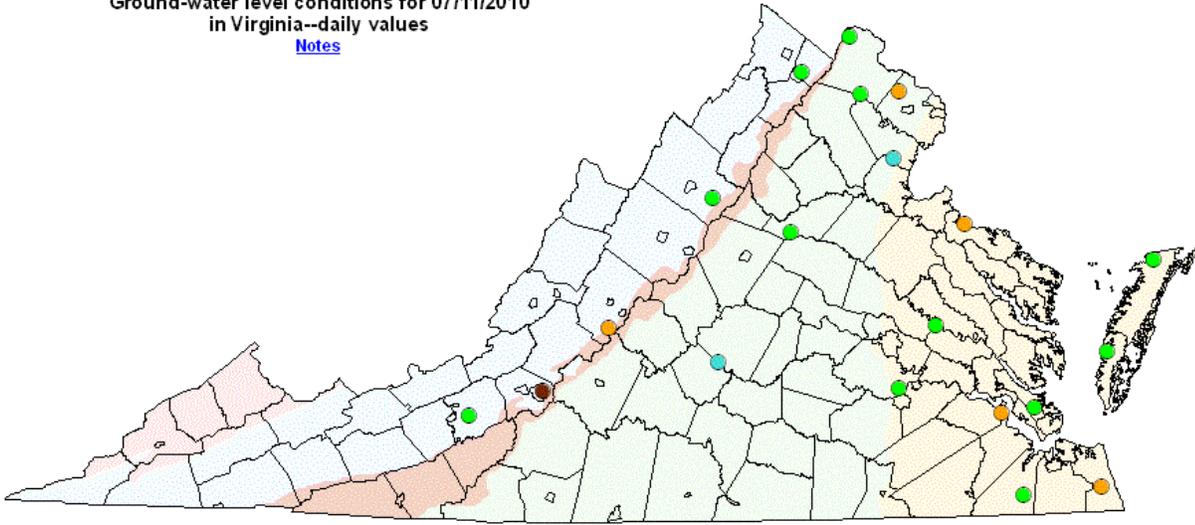
EXPLANATION - Percentile classes				
Low	<=5	6-9	10-24	Insufficient data
Extreme drought	Severe drought	Moderate drought	Below normal	

# APPENDIX I

## Virginia Climate Response Network

October 22, 2009

Ground-water level conditions for 07/11/2010  
in Virginia--daily values  
[Notes](#)



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				