

VIRGINIA DROUGHT MONITORING TASK FORCE

Drought Status Report

September 7, 2010

Statewide precipitation for the current water year, October 1, 2009 August 31, 2010 was in the normal range (109% of normal) with all drought evaluation regions greater than 100% normal except the Big Sandy Region (99%). 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 now within the normal range (90%) for the calendar year, due to a greater than normal statewide precipitation during the month of August. Statewide precipitation is 79% of normal since June 1st with all drought evaluation regions except the Roanoke, New River, and Big Sandy Region having less than 85% of normal. The York-James is now the only region with a particularly pronounced deficit since June 1st (<50%). Appendix A contains precipitation tables for periods dating from July 1, 2009 through August 31, 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 below normal precipitation and temperatures for the entire Commonwealth. Below normal precipitation and below normal temperatures are also anticipated over the 8-14 day period. The one month outlook calls for equal chances of below normal, normal and above normal precipitation for the entire Commonwealth with the above normal temperatures. The three month outlook calls for equal chances of below normal, normal and above normal temperatures and precipitation for the entire Commonwealth.

The latest NOAA U.S. National Drought Monitor indicates “abnormally dry” to “moderate drought” conditions exist in approximately 65% of the Commonwealth. Southwest Virginia and some portions of the Blue Ridge are the only areas that are not in an “abnormally dry” or “moderate drought” condition. Approximately 30% of Virginia is experiencing “severe drought” conditions, as designated in the U.S. National Drought Monitor. The Seasonal Drought Outlook for the United States from now through November 2010 forecasts “some improvement” in the drought conditions in those portions of the state that are classified as “severe drought”, including portions of Northern Virginia, the Piedmont and the Coastal Plain (Appendix D).

The number of public water supply systems under some sort of drought related restriction has been increasing. 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, 18 systems are under voluntary water conservation requirements and 2 systems are under mandatory water conservation requirements. Of the 41 systems listed in the VDH report, one is rated as having a “Better” overall water supply situation, four 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 (VDOT) continues to report an above normal rate of wildfire occurrence, with 122 fires reported in the month of July alone. The DOT is becoming increasingly concerned about the potential for a significant fall fire season.

The Department of Game and Inland Fisheries reports that trout hatcheries are not experiencing problems with fish production (at this time) as a result of lower water supply flows. Currently, spring flows are normal for this time of year, and while some faculties are having to recirculate water, this is normal for late August/early September. Stream levels are dropping and there are reports of a few boat ramps not being accessible due to low lake/river levels.

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.

Virginia Department of Forestry Wildfire Conditions

Summertime wildfire activity has remained at more elevated levels than what would be considered normal for Virginia. For the month of July 2010, the VDOF responded to 122 wildfires which burned 543 acres. The leading cause of wildfire continues to be human carelessness.

Observed fire behavior over the last few weeks indicates that wildfire occurrence, rates of spread and fire intensity is much greater than would normally be expected during this time of the year. The low fuel moisture conditions overall make suppression operations more difficult and lead to increased long term monitoring which can place a drain on firefighter resources. This has not been a significant problem up to this point, however it can have significant problem if the drought conditions persist moving in to our normal fall wildfire season

At least 26 counties across the Commonwealth have enacted local burning bans due to the increased risk of wildfire. The Department of Forestry's Cumulative Severity Index (CSI), which is a detailed measure of soil moisture conditions taken at six location across the Commonwealth indicate the driest conditions that we have seen within the last ten years.

The DOF is becoming increasingly concerned about the potential for a significant fall fire season. The official fall wildfire season runs from October 15 – November 30. Current predictions of warmer and drier than normal conditions through December indicate that little relief is expected through the end of the year and that the fall wildfire season could more troublesome than any we have faced in the last ten years. The agency has begun early contingency planning to be better prepared for higher than normal levels of wildfire activity headed into October.

Report of the Climatology Office of the University of Virginia

As in July, the predominant source of rainfall throughout the Commonwealth in August was thunderstorm activity. Most of the thunderstorms were widely scattered, but some outbreaks covered larger areas. In either case, rainfall totals for August were highly variable, with one location becoming inundated while a nearby spot remained virtually untouched.

Average total accumulations for the three southwesternmost Drought Regions (Big Sandy, New River and Roanoke) were well above normal for August and five other Regions ended at normal or above. Statewide, the average was above normal. Again, these averages belie the fact that many individual locations received scant moisture.

Nonetheless, two Regions in Tidewater were especially dry, Southeast Virginia and York-James, with less than two-thirds and less than one-half normal, respectively. Taken together, rainfall for the entire summer [climatological summer = June through August] averaged well below normal across Virginia (79% statewide). Only three Regions reached near normal values, and the York-James Region was below 50%.

In addition, the unusually high temperatures for August (and the entire summer) led to higher rates of evapotranspiration, with even more moisture loss than the already high rates of a typical summer. In many portions of the state, this summer was the hottest on record. Although, based only on preliminary data at this time, averaged across the state, the summer temperature is the highest seen in Virginia in at least 116 years.

With the high point of the hurricane season upon us, the likelihood of receiving significant moisture across a large portion of the Commonwealth from tropical systems and their remnants is increasing. Activity in the tropics increased markedly during August and numerous opportunities for tropical moisture are presenting themselves. This is in keeping with forecasts of an active hurricane season.

United States Geological Survey Streamflow and Ground Water Levels

Precipitation has been varied but substantial across most of the State with the exception of southeast Virginia. The majority of stream gages across the State are recording flows in the normal to below normal based on August flow statistics. The driest portions of the State analyzed by hydrologic units are the southeast and east Coastal Plain locations.

Groundwater levels mimic surface-water levels with most wells recording levels in the normal to below normal range. The exception is the far southeast well which is well below normal. Groundwater levels will continue to decline until leaf-off in late September to October where evapotranspiration is reduced substantially.

Virginia Department of Environmental Quality Conditions of Major Reservoirs

Levels of large reservoirs statewide are within normal ranges but have generally been declining throughout the summer. 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, however, they have all dropped closer to drought watch status since the July DMTF report. Below is a summary of large reservoir conditions :

- Lake Moomaw on the Jackson River is at 1566.99 feet ASL, and is dropping at a rate of ~2 ft per day. Approximately 42.6% of conservation storage remains. Lake Moomaw is 2 ft above the Drought Watch level.
- Kerr Reservoir is currently approximately 1.6 ft below the Guide Curve and is anticipated to drop an additional 0.8 ft by September 14th. Drought Watch status is reached at greater than 3 ft below the Guide Curve.
- Smith Mountain Lake is currently at elevation 793.8 ft which is 1.2 ft below full pond. The Drought Watch stage for Smith Mountain Lake is elevation 793 feet and below.
- As of September 7th, Lake Anna was at elevation 248.7 feet (1.3 feet below full) and dropped approximately 1.0 feet since July 10th. 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 August 29, 2010, 60% of topsoil moisture ranged from short to very short. Some areas of the state saw scattered showers, but many areas continue to suffer from dry conditions. Many areas of the state saw some rain in early August, it was not significant enough to reverse the effects the lack of rain have already had on the agricultural this summer community. As of August 31, 2010, forty-one localities have requested the Governor's assistance in obtaining federal disaster designation due to drought conditions. Those localities include: Albemarle, Amelia, Amherst, Appomattox,

Bedford, Brunswick, Campbell, Caroline, Charlotte, Clarke, Culpeper, Cumberland, Dinwiddie, Essex, Franklin, Frederick, Goochland, Hanover, Isle of Wight, King and Queen, King George, Lancaster, Louisa, Lunenburg, Mecklenburg, Middlesex, Nelson, Northampton, Northumberland, Nottoway, Patrick, Pittsylvania, Powhatan, Prince Edward, Pulaski, Richmond (County), Rockbridge, Southampton, Suffolk, Surry, and Westmoreland.

USDA/Farm Service Agency (FSA) has completed 38 of the 41 requested Loss Assessment Reports (LARs) which indicate that these localities have experienced at least a 30% loss in a major commodity due to drought. VDACS is in the process of working with the Governor's Office to obtain federal disaster designations due to drought conditions on behalf of these localities. VDACS has requested that the USDA/FSA prepare official loss assessment reports (LARs) for the remaining three localities (Amelia, Northampton, and Suffolk).

Impact on Dairies/Livestock/Poultry

Shenandoah Valley Area: The hot and dry summer has financially squeezed the Valley's livestock owners causing unplanned cattle sales to climb. Recent rains have made pastures and hayfields green, however, many producers had to graze hayfields early and re-growth will be slow and may not be enough before cooler fall temperatures arrive. Fall pastures will be less than normal and this along with decreased stored feeds may well lead to less cattle being wintered this year.

Producers in the Valley are reporting that severe heat stress and high humidity is jeopardizing the appetite and milk production in dairy herds. Continued heat and humidity continues to have impact on dairy milk production and cow reproduction. Cow comfort continues to be challenging.

Southwest Virginia: Southwest Virginia has not experienced the dryness that most of the state has. Producer will have plenty of feed this year unlike many dairymen located in other portions of the state.

Southern Virginia: Southern Virginia producers report that most dairymen will have a serious feed shortage this year. Although some areas in Amelia have received rain, for the most part Franklin and Pittsylvania counties have been very dry. Most dairymen had already cut their corn for silage by mid-July. Some dairymen in Franklin County replanted their corn after cutting what corn crop they did have, so with the recent rains in early August, they may be able to produce another silage crop. In the dry areas such as the counties of Nottoway, Dinwiddie, Goochland and surrounding counties, there is likely to be no last cutting of hay. Cattle at the livestock markets are up dramatically since there is very little pasture and farmers are already short on feed.

Impact on Nurseries/Christmas Trees:

Scattered rain across the state has provided some relief; however, in many areas, the nursery industry continues to experience an increase in irrigation requirements due to inadequate rainfall and extreme high temperatures. Nursery and Christmas tree growers have lost seedlings that were planted both this year and last year due to drought conditions.

Impact on Crops

Shenandoah Valley: The Shenandoah Valley area reports that the early corn crop suffered from the lack of rain in May and June but the Valley received adequate rain in July and most of the late corn yields appear to be good compared to other areas of the state. With the exception of the Dayton area where the corn crop has suffered significantly from the lack of rain, corn is 60 -65% of the normal yield. Most dairymen will have enough corn to make silage to feed but none to pick for shelled corn. Due to the rain in July and August the fall hay is also expected to be good but there was no second cutting of hay for most of the area. Many dairymen have been feeding the hay they had cut due to lack of pasture. The soybean crop seems to have suffered the least of the feed crops.

South Central Area: Significant rainfall covered the south-central region during the August 17–19 period. Dry weather and high temperatures experienced over the summer will have some negative effects on yield and quality of tobacco, but the recent rainfall coupled with the high percentage of the crop that was exposed to irrigation will mitigate the impact. Extensive irrigation has made this an expensive crop for the farmers to produce. A source of concern now is that the crop is maturing later due to the drought. Harvesting the crop prior to frost will be a challenge.

Recent rainfall will have a positive impact on soybean yields, but overall yields will still be significantly lower than average.

Northeast: The rains that came during the first half of August have potentially salvaged the soybean crop. The full season beans are growing nicely, developing pods, and beginning to fill them with beans. The double crop beans are growing now, but in some cases they are still just coming out of the stubble. The bean crop needs to continue getting timely rainfalls throughout the remainder of August and into September. In addition, the beans will need a late frost in order to have enough time to develop. The immediate concern is the infestations of corn ear worms and army worms. Due to the corn dying early, the worms moved into the soybean fields two to three weeks ahead of normal. Producers will most likely have to spray multiple times to control the worms, which will cost approximately \$10 per acre. This will dramatically increase the cost of production and make it even more economically challenging to make this crop profitable.

Eastern Shore: The Eastern Shore has been hard hit by not only the drought, but also the heat. The corn harvest will be off by more than 40–50%, and potatoes were whipsawed by early wet weather that delayed planting, and then severe heat, which gave many growers quality issues. Weather factors have reduced the marketable crops by 40–50%.

Southeast: Many areas in Southeast Virginia have received rainfall during the month of August. In some places, it has rained up to three inches this month. However, other areas received only one or two tenths of an inch. Some areas have had a total of only one inch of rain since May 24, 2010. While the rainfall is much welcomed by everyone, for most crops it is too late. The plants look healthier, but any fruit that will appear on the plant at this late date will likely not mature due to our frost dates. Crops receiving rainfall have perked up and some new growth is forming. How much the rain helps the crop will depend on the stage of the crop.

Some cotton is already blooming, but this may be the only cotton crop that can be harvested this year. Growers can wait and hope for any second crop to mature, but it might be better to pick early what is there rather than hope for more only to have a hurricane take it all.

Earworms are a problem now and they are eating any healthy soybean plants they can find.

Southwest: This region of the state have experienced both high temperatures and at time excessive rain at time. The heat may have as much influence or more on apple sizing as the drought. Several vegetable growers that were unable to irrigate their crops experienced losses this summer. Currently, cabbage growers are concerned that they are getting too much rain. The sale of cabbage has slowed somewhat, and the cabbage heads are getting too large for the market.

Shenandoah Valley Area: Recent moisture will help late planted corn in the Valley and late planted soybeans, but many late soybeans did not have enough moisture to germinate so stands are much less than normal. Corn harvest for silage is three weeks earlier than normal where there is some corn. Most of the shelled corn yields are from zero to 20 bushels in the Northern Valley.

Northern Virginia and Winchester: Northern Virginia and Winchester areas report extremely dry conditions and until mid August the area had received virtually no rain. Corn is short in height and much of it has

already been chopped. Early corn seems to have fared well but late corn has suffered and is in very poor condition. Many dairymen in the Northern Virginia area will have to purchase feed to make it through the winter.

Tidewater: The Tidewater area has suffered severely from the drought conditions. Corn crops are waist to head high with yields estimated at less than two bushels per acre, unless the corn had been irrigated. Most of the farmers in Tidewater with crop insurance have had their corn crops looked at by adjusters. Many cut their corn crops mid June to be able to salvage some feed value for silage.

Impact on Creeks, Rivers, and Wells

In the northern and central parts of the state, low to non-existing surface water flow is occurring. Farm ponds are drying up. In the Southwest, ground water appears very close to normal. Streams that had slowed or stopped are picking up again.

APPENDIX A

Precipitation Departures by Drought Evaluation Region

PRELIMINARY PRECIPITATION SUMMARY

Prepared:
08/31/10

DROUGHT REGION	OBSERVED	Aug 1, 2010 NORMAL	- Aug 31, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	5.13	3.83	1.30	134%
2 New River	5.24	3.31	1.93	158%
3 Roanoke	6.43	3.72	2.71	173%
4 Upper James	2.97	3.33	-0.36	89%
5 Middle James	4.19	3.82	0.37	110%
6 Shenandoah	2.70	3.33	-0.63	81%
7 Northern Virginia	4.27	3.85	0.42	111%
8 Northern Piedmont	3.41	3.82	-0.41	89%
9 Chowan	4.27	4.31	-0.04	99%
10 Northern Coastal Plain	4.34	3.86	0.48	112%
11 York-James	1.70	4.87	-3.17	35%
12 Southeast Virginia	3.19	5.12	-1.93	62%
13 Eastern Shore	4.78	3.87	0.91	123%
Statewide	4.36	3.83	0.53	114%

DROUGHT REGION	OBSERVED	Jul 1, 2010 NORMAL	- Aug 31, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	8.87	8.31	0.56	107%
2 New River	8.08	7.10	0.98	114%
3 Roanoke	9.69	8.11	1.58	119%
4 Upper James	6.63	7.37	-0.74	90%
5 Middle James	6.05	8.23	-2.18	74%
6 Shenandoah	6.08	7.09	-1.01	86%
7 Northern Virginia	7.73	7.62	0.11	101%
8 Northern Piedmont	5.73	8.22	-2.49	70%
9 Chowan	5.96	8.82	-2.86	68%
10 Northern Coastal Plain	5.80	8.31	-2.51	70%
11 York-James	5.07	9.97	-4.90	51%
12 Southeast Virginia	6.92	10.19	-3.27	68%
13 Eastern Shore	6.86	7.87	-1.01	87%
Statewide	7.14	8.17	-1.03	87%

DROUGHT		Jun 1, 2010 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	13.64	12.45	1.19	110%
2	New River	10.65	10.95	-0.30	97%
3	Roanoke	11.78	12.00	-0.22	98%
4	Upper James	8.48	11.08	-2.60	77%
5	Middle James	7.92	11.74	-3.82	67%
6	Shenandoah	7.91	10.80	-2.89	73%
7	Northern Virginia	9.07	11.48	-2.41	79%
8	Northern Piedmont	8.14	12.23	-4.09	67%
9	Chowan	8.48	12.47	-3.99	68%
10	Northern Coastal Plain	7.81	11.87	-4.06	66%
11	York-James	6.00	13.38	-7.38	45%
12	Southeast Virginia	10.16	13.80	-3.64	74%
13	Eastern Shore	8.39	10.85	-2.46	77%
	Statewide	9.50	11.96	-2.46	79%

DROUGHT		May 1, 2010 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	19.09	17.27	1.82	111%
2	New River	14.46	15.16	-0.70	95%
3	Roanoke	16.42	16.33	0.09	101%
4	Upper James	12.29	15.36	-3.07	80%
5	Middle James	11.97	15.98	-4.01	75%
6	Shenandoah	10.96	14.64	-3.68	75%
7	Northern Virginia	13.71	15.82	-2.11	87%
8	Northern Piedmont	11.81	16.45	-4.64	72%
9	Chowan	13.89	16.56	-2.67	84%
10	Northern Coastal Plain	10.21	16.03	-5.82	64%
11	York-James	10.89	17.65	-6.76	62%
12	Southeast Virginia	14.36	17.66	-3.30	81%
13	Eastern Shore	10.50	14.37	-3.87	73%
	Statewide	13.67	16.22	-2.55	84%

DROUGHT		Apr 1, 2010 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	21.78	21.03	0.75	104%
2	New River	16.31	18.71	-2.40	87%
3	Roanoke	18.18	20.13	-1.95	90%
4	Upper James	13.99	18.76	-4.77	75%
5	Middle James	13.73	19.32	-5.59	71%
6	Shenandoah	12.32	17.56	-5.24	70%
7	Northern Virginia	15.31	19.12	-3.82	80%
8	Northern Piedmont	13.35	19.74	-6.39	68%
9	Chowan	15.33	19.99	-4.66	77%
10	Northern Coastal Plain	11.80	19.12	-7.32	62%
11	York-James	11.84	20.95	-9.11	57%
12	Southeast Virginia	15.55	20.91	-5.36	74%
13	Eastern Shore	11.69	17.29	-5.60	68%
	Statewide	15.38	19.64	-4.26	78%
DROUGHT		Mar 1, 2010 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	24.65	25.28	-0.63	98%
2	New River	20.38	22.38	-2.00	91%
3	Roanoke	23.31	24.40	-1.09	96%
4	Upper James	18.09	22.55	-4.46	80%
5	Middle James	18.86	23.38	-4.52	81%
6	Shenandoah	17.03	20.76	-3.73	82%
7	Northern Virginia	19.05	22.78	-3.73	84%
8	Northern Piedmont	18.27	23.55	-5.28	78%
9	Chowan	19.92	24.36	-4.44	82%
10	Northern Coastal Plain	17.95	23.40	-5.45	77%
11	York-James	17.46	25.64	-8.18	68%
12	Southeast Virginia	21.85	25.11	-3.26	87%
13	Eastern Shore	17.92	21.60	-3.68	83%
	Statewide	20.08	23.68	-3.60	85%

DROUGHT		Feb 1, 2010 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	27.42	28.86	-1.44	95%
2	New River	22.80	25.31	-2.51	90%
3	Roanoke	25.97	27.71	-1.74	94%
4	Upper James	20.41	25.40	-4.99	80%
5	Middle James	22.09	26.50	-4.41	83%
6	Shenandoah	19.91	23.17	-3.26	86%
7	Northern Virginia	23.09	25.45	-2.36	91%
8	Northern Piedmont	20.80	26.52	-5.72	78%
9	Chowan	23.17	27.53	-4.36	84%
10	Northern Coastal Plain	21.25	26.54	-5.29	80%
11	York-James	21.15	29.17	-8.02	72%
12	Southeast Virginia	25.60	28.61	-3.01	89%
13	Eastern Shore	21.80	24.79	-2.99	88%
	Statewide	23.05	26.81	-3.76	86%

DROUGHT		Jan 1, 2010 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	31.66	32.59	-0.93	97%
2	New River	27.30	28.52	-1.22	96%
3	Roanoke	31.04	31.63	-0.59	98%
4	Upper James	24.73	28.68	-3.95	86%
5	Middle James	26.47	30.16	-3.69	88%
6	Shenandoah	23.72	26.02	-2.30	91%
7	Northern Virginia	25.79	28.73	-2.94	90%
8	Northern Piedmont	24.72	30.04	-5.32	82%
9	Chowan	27.19	31.64	-4.45	86%
10	Northern Coastal Plain	24.95	30.29	-5.34	82%
11	York-James	25.58	33.31	-7.73	77%
12	Southeast Virginia	29.92	32.77	-2.85	91%
13	Eastern Shore	24.82	28.35	-3.53	88%
	Statewide	27.25	30.45	-3.20	90%

DROUGHT		Dec 1, 2009 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	37.35	36.23	1.12	103%
2	New River	34.59	31.23	3.36	111%
3	Roanoke	38.60	34.88	3.72	111%
4	Upper James	32.12	31.63	0.49	102%
5	Middle James	34.63	33.33	1.30	104%
6	Shenandoah	28.97	28.61	0.36	101%
7	Northern Virginia	32.04	31.83	0.21	101%
8	Northern Piedmont	31.22	33.32	-2.10	94%
9	Chowan	35.13	34.66	0.47	101%
10	Northern Coastal Plain	32.86	33.57	-0.71	98%
11	York-James	32.53	36.70	-4.17	89%
12	Southeast Virginia	37.73	35.95	1.78	105%
13	Eastern Shore	33.34	31.59	1.75	106%
	Statewide	34.40	33.57	0.83	102%

DROUGHT		Nov 1, 2009 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	39.60	39.51	0.09	100%
2	New River	39.59	34.26	5.33	116%
3	Roanoke	46.78	38.24	8.54	122%
4	Upper James	37.01	34.99	2.02	106%
5	Middle James	43.20	36.84	6.36	117%
6	Shenandoah	32.82	31.66	1.16	104%
7	Northern Virginia	35.97	35.24	0.73	102%
8	Northern Piedmont	37.28	37.12	0.16	100%
9	Chowan	44.77	37.77	7.00	119%
10	Northern Coastal Plain	41.61	36.71	4.90	113%
11	York-James	41.78	40.07	1.71	104%
12	Southeast Virginia	48.12	39.02	9.10	123%
13	Eastern Shore	40.90	34.53	6.37	118%
	Statewide	41.03	36.80	4.23	112%

DROUGHT		Oct 1, 2009 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	42.64	42.39	0.25	101%
2	New River	42.28	37.43	4.85	113%
3	Roanoke	49.34	41.95	7.39	118%
4	Upper James	39.80	38.24	1.56	104%
5	Middle James	46.25	40.68	5.57	114%
6	Shenandoah	35.57	34.85	0.72	102%
7	Northern Virginia	40.79	38.72	2.07	105%
8	Northern Piedmont	40.70	41.11	-0.41	99%
9	Chowan	46.82	41.35	5.47	113%
10	Northern Coastal Plain	45.82	40.22	5.60	114%
11	York-James	44.87	43.60	1.27	103%
12	Southeast Virginia	50.43	42.68	7.75	118%
13	Eastern Shore	45.27	37.74	7.53	120%
	Statewide	44.04	40.30	3.74	109%
DROUGHT		Sep 1, 2009 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	47.82	45.85	1.97	104%
2	New River	46.30	40.84	5.46	113%
3	Roanoke	52.40	46.18	6.22	113%
4	Upper James	43.07	41.74	1.33	103%
5	Middle James	49.42	44.81	4.61	110%
6	Shenandoah	37.79	38.52	-0.73	98%
7	Northern Virginia	43.03	42.79	0.24	101%
8	Northern Piedmont	43.58	45.39	-1.81	96%
9	Chowan	51.13	45.78	5.35	112%
10	Northern Coastal Plain	48.90	44.31	4.59	110%
11	York-James	50.79	48.50	2.29	105%
12	Southeast Virginia	57.73	47.11	10.62	123%
13	Eastern Shore	51.74	41.35	10.39	125%
	Statewide	47.68	44.30	3.38	108%

DROUGHT		Aug 1, 2009 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	52.31	49.68	2.63	105%
2	New River	50.81	44.15	6.66	115%
3	Roanoke	56.75	49.90	6.85	114%
4	Upper James	46.45	45.07	1.38	103%
5	Middle James	52.95	48.63	4.32	109%
6	Shenandoah	40.83	41.85	-1.02	98%
7	Northern Virginia	47.00	46.64	0.36	101%
8	Northern Piedmont	46.73	49.21	-2.48	95%
9	Chowan	54.98	50.09	4.89	110%
10	Northern Coastal Plain	54.16	48.17	5.99	112%
11	York-James	56.26	53.37	2.89	105%
12	Southeast Virginia	67.18	52.23	14.95	129%
13	Eastern Shore	56.34	45.22	11.12	125%
	Statewide	51.85	48.13	3.72	108%

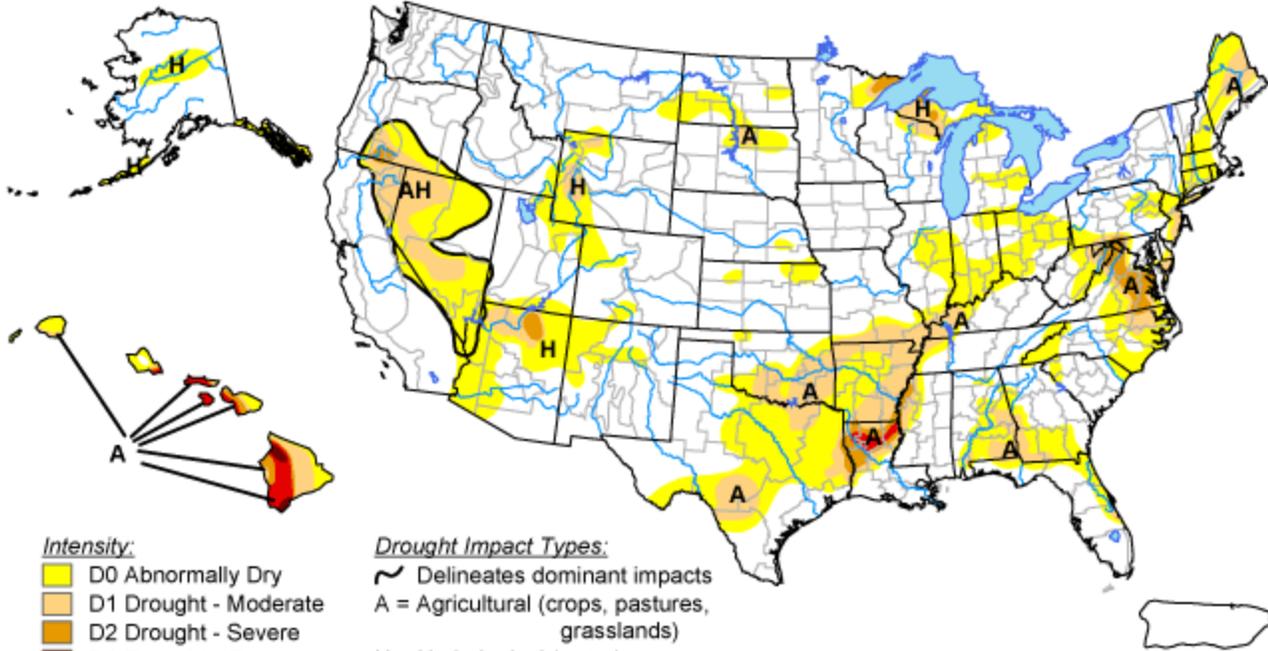
DROUGHT		Jul 1, 2009 - Aug 31, 2010			
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	57.91	54.16	3.75	107%
2	New River	54.87	47.94	6.93	114%
3	Roanoke	61.10	54.29	6.81	113%
4	Upper James	51.34	49.11	2.23	105%
5	Middle James	56.43	53.04	3.39	106%
6	Shenandoah	43.77	45.61	-1.84	96%
7	Northern Virginia	48.65	50.41	-1.76	97%
8	Northern Piedmont	49.65	53.61	-3.96	93%
9	Chowan	58.99	54.60	4.39	108%
10	Northern Coastal Plain	59.02	52.62	6.40	112%
11	York-James	62.24	58.47	3.77	106%
12	Southeast Virginia	71.17	57.30	13.87	124%
13	Eastern Shore	62.12	49.22	12.90	126%
	Statewide	55.91	52.47	3.44	107%

APPENDIX B

U.S. Drought Monitor

August 31, 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, September 2, 2010
Author: Brad Rippey, U.S. Department of Agriculture

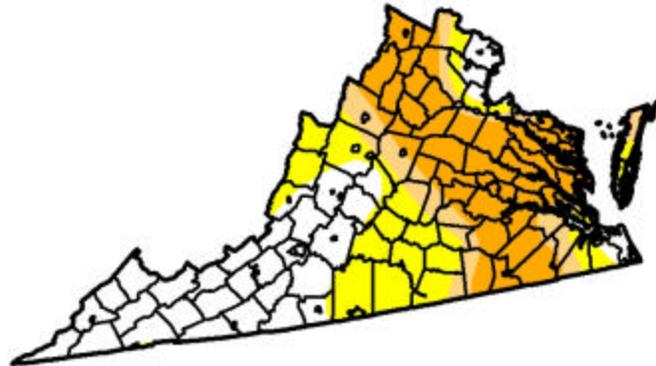
APPENDIX C

U.S. Drought Monitor Virginia

August 31, 2010
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	35.3	64.7	41.8	30.6	0.0	0.0
Last Week (08/24/2010 map)	26.1	73.9	41.8	30.4	0.0	0.0
3 Months Ago (06/08/2010 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 (09/01/2009 map)	93.2	6.8	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>



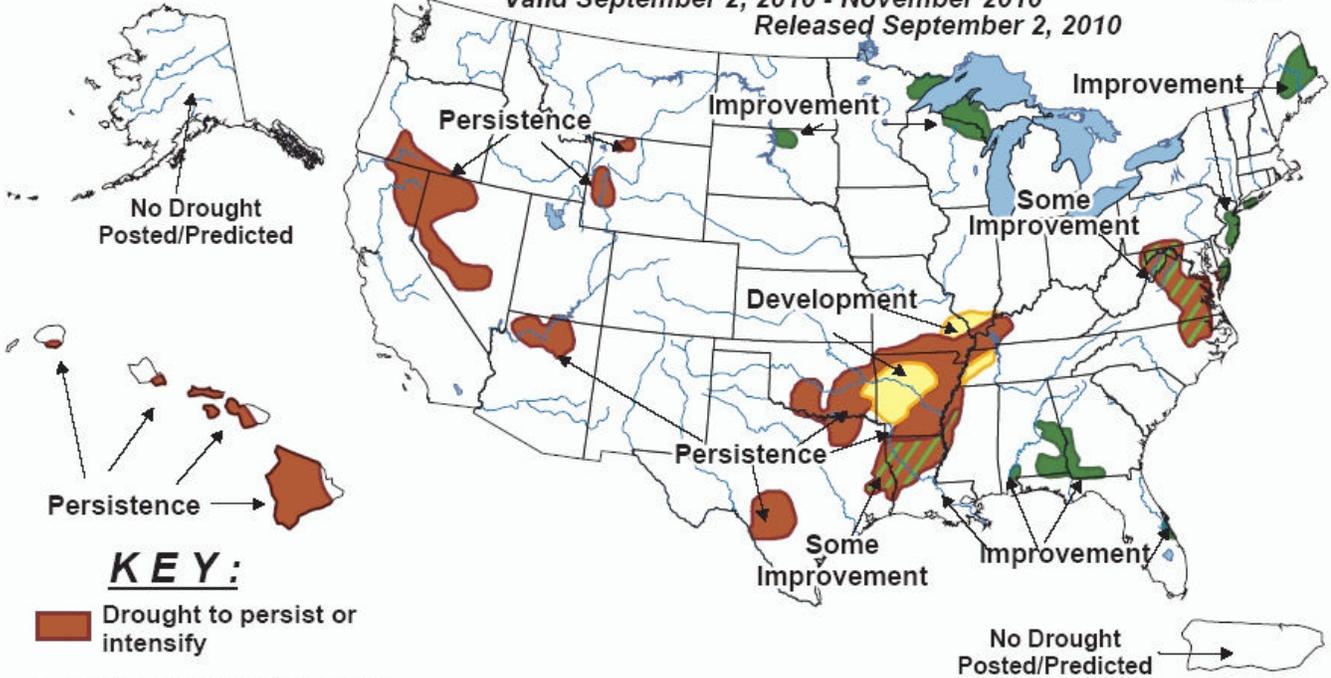
Released Thursday, September 2, 2010
Author: Brad Rippey, U.S. Department of Agriculture

APPENDIX D



U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid September 2, 2010 - November 2010
Released September 2, 2010



KEY:

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

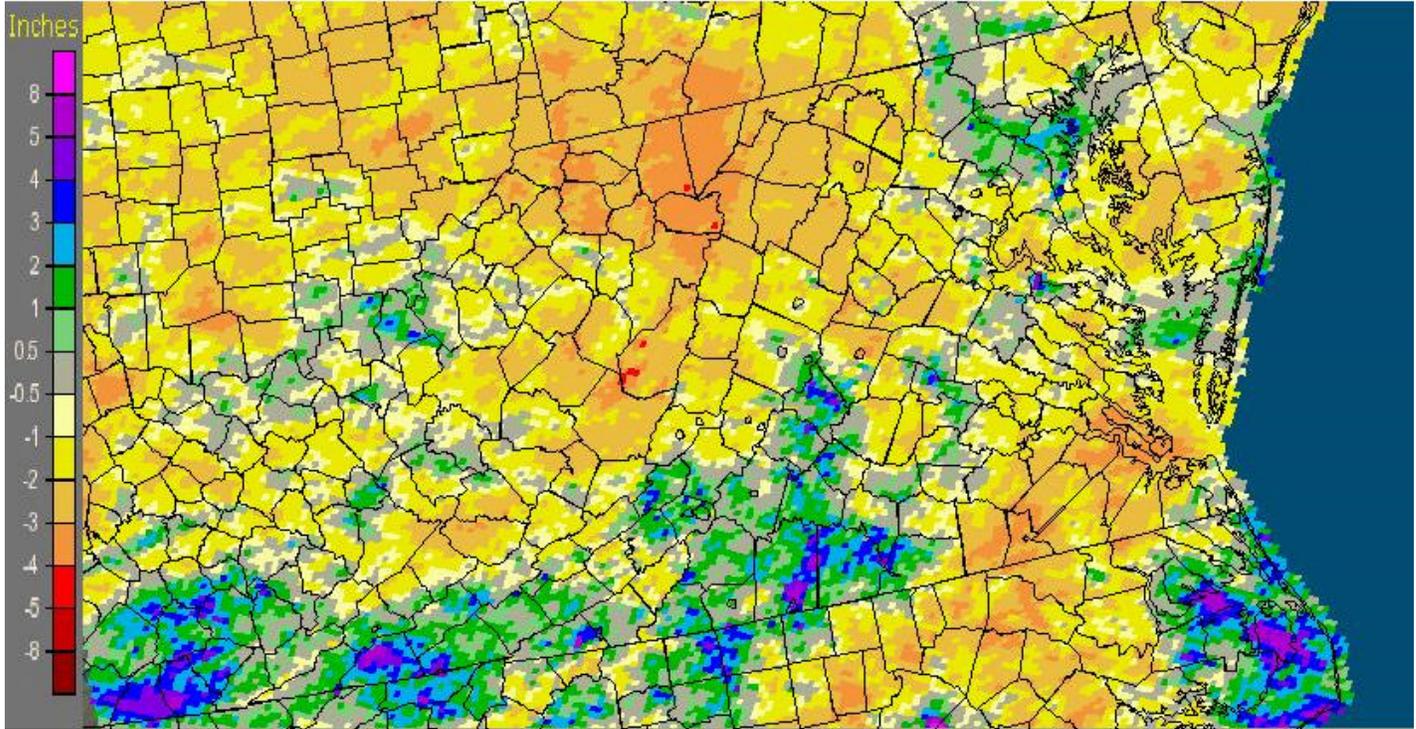
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- 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

Virginia: Current 30-Day Departure from Normal Precipitation

Valid at 9/7/2010 1200 UTC- Created 9/7/10 18:17 UTC



APPENDIX F

Condition of Public Water Supplies

August 24, 2010

ODW Drought Situation Report

Date: **8/24/10**

	Restriction totals
Mandatory	2
Voluntary	18
Total	20

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	S tending towards W - 08/19/2010 - Voluntary restrictions as of 7/12/2010 (but.....DCWA expects ARWA to announce mandatory restrictions in the next couple weeks, if rainfall doesn't increase lake levels quickly)	6,800
3081550	GCWSA - Jarratt	Nottoway River	N	S - 08/19/10 - 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	W - 08/20/10 - Obtains water from Suffolk. Follows Suffolk's lead on conservation.	1,284
3149700	Puddledock Road	ARWA	V	S - 08/19/2010 - Voluntary restrictions as of 7/12/2010.	9,723
3550050	Chesapeake - Western Branch system	City of Portsmouth	V	S -08/20/2010 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	36,642

				conservation.	
3550051	Chesapeake	Northwest River, City of Norfolk Raw Water (Lake Gaston)	N	S -08/20/2010 Through the first 7 months surplus rainfall for 2010 is 13.24 inches. There are no water restrictions in Chesapeake. Chlorides are slightly elevated 69 ppm. the normal range between 30-50 mg/l. Continuing to purchase raw water from Norfolk (7.5 MGD average). NWR averages 4.3 MGD. The Intown Lakes remain full and there are no irregularities in the tidal patterns in NWR.	103,504
3550052	Chesapeake - South Norfolk system	City of Norfolk	V	S -08/20/2010-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 - 08/19/10 - Voluntary restrictions currently in place. Generally follow ARWA recommendations on water restrictions.	17,286
3595250	Emporia	Meherrin River	N	S - 08/19/10 - Reservoir level sufficient for normal operation. Power plant & ILLUKA also withdrawing from river.	5,600
3670800	Virginia-American Water Company (Hopewell)	Appomattox & James Rivers	N	S - 08/19/2010 - Level at intakes normal and sufficient to supply plant. August rainfall on track to meet monthly average and year-to-date totals slightly below average. Still experiencing taste and odor issues.	28000 - Primary / 45463 Total including Consecutive System (Ft. Lee)

3700500	Newport News	Chickahomony River, Skiffs Creek, Diascand, Little Creek, Harwoods Mill, Lee Hall	N	S - 8/23/10 - Total reservoir capacity at 76%. Chickahominy pumps operating. At current delivery rate of about 46 MGD, there is about 186 days of stored water available.	414,000
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	S - As of 08/16/10, reservoirs at 86.3% (nearly even with 85.8% on 07/19/10). Historic reservoir capacity is 86.9% at this time of year. Avg. pumping from Lake Gaston = 50.0 MGD. Total Reservoir Storage = 13,048 MG. Approx. 650 days of storage remaining under current demand with 50 MGD pumping from Lake Gaston, and approx. 190 days of storage remaining under current demand with no pumping from Lake Gaston. Current demand is approx. 70 MGD. Called for voluntary conservation 11/1/07.	261,250 - Primary / 755,617 - Total including consecutive systems (Va Beach + military bases).
3730750	Petersburg	ARWA	V	S - 08/19/10 - Voluntary restrictions requested 7/12/2010. Generally follow ARWA recommendations on water restrictions.	33,740
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	V	W - As of 08/13/10, reservoirs at 76% (down from 83% on 07/16/10). Median reservoir capacity is 93% for the month and historical average capacity is 90% (period of 1969-2008). The emergency wells are off. Estimated days of storage remaining at current pumpage and rainfall is 173 days (avg. pumpage is 16.6 MGD). Called for voluntary	100,400 - Primary / 120,400 Total including consecutive systems (military bases)

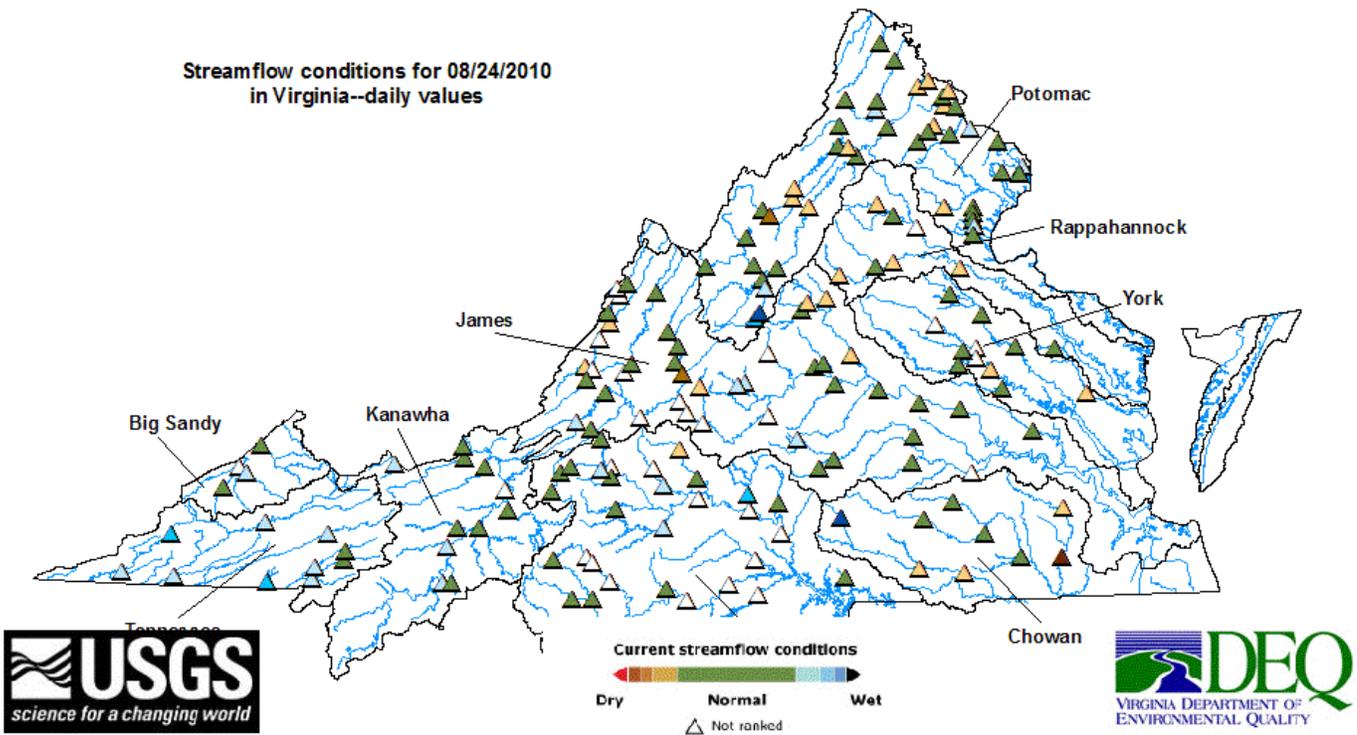
				conservation on 10/10/07.	
3800805	Suffolk	Lone Star Lakes, Cumps Mill Pond	V	<p>W 8/20/2010-Will follow Portsmouth's lead and the region as far as conservation. Average reservoir levels : Southern Lakes at 71.33% capacity, for the Northern Lakes at 73.15% and Crumps Mill Pond at 41.24%. The Southern Lakes are for emergency use only. Overall they are at 61.91% capacity as of July 30, 2010.The reservoirs for the period (May-June 2010) capacity 77.71%. The operator states that they were in better condition last year when compared to 2009 (96.66%) for the same period. No conservation measures implemented at this time but will continue to monitor.</p>	62,562
3810900	Virginia Beach	Norfolk	V	<p>S - 08/16/10 - Obtains water from Norfolk. Called for voluntary conservation on 9/19/07.</p>	423,743
3830850	Williamsburg	Waller Mill Reservoir	N	<p>8/20/2010: 5" below primary spillway - about 86% of usable capacity. 301 days of usable storage based on drawdown rate of the past week of 2.5".</p>	16,400
4041035	APPOMATTOX RIVER WATER AUTHORITY	Surface water; Lake Chesdin	V	<p>W- Wholesaler to Chesterfield County, Prince George County, Dinwiddie County; Cities of Petersburg and Colonial Heights. Reservoir is at 58" below top of dam. Voluntary restrictions continue.</p>	200,000
4041845	CHESTERFIELD CO CENTRAL WATER SYSTEM	Surface water; Swift Creek reservoir; purchases finished water	V	<p>B- Purchases water from the City of Richmond and the Appomattox River Water Authority. Swift Creek Reservoir is at 1.3 feet below top of dam.Voluntary restrictions continue.</p>	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	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. Voluntary restrictions not yet necessary, but may become necessary if no substantive rainfall events.	197,000
5011050	Town of Appomattox	Wells	V	S	1,708

6033085	Caroline Utility	Groundwater	M	S - Mandatory water use restriction of High-Level 3 went into effect 7/13/2010 and remain in effect as of 8/23/2010.	3600 primary 3000 consec
6061200	Marshall	Groundwater	M	S - The WSA Alert Messaging Service maintains the Water Use Restriction Notice as of 8/23/2010. The mandatory water use restriction is not directly drought related but depends on water source development.	2,134
6107150	Town of Hamilton	Groundwater	V	S - 8/23/10 Voluntary water use restrictions initiated 7/6/2010	2,000
6107400	Town of Lovettsville	Groundwater	V	S 8/23/10 Voluntary water use restrictions remain in place; however there is no problem with water supply.	1,280
6107600	Town of Purcellville	Surfce water/groundwater	V	S - 8/23/10 All sources returned to service. Voluntary water conservation initiated 7/2/10.	6,300
6107650	Town of Round Hill	Groundwater	V	S - 8/23/10 - No water supply problems.Voluntary water use restrictions effective 7/6/10.	3,156

APPENDIX G

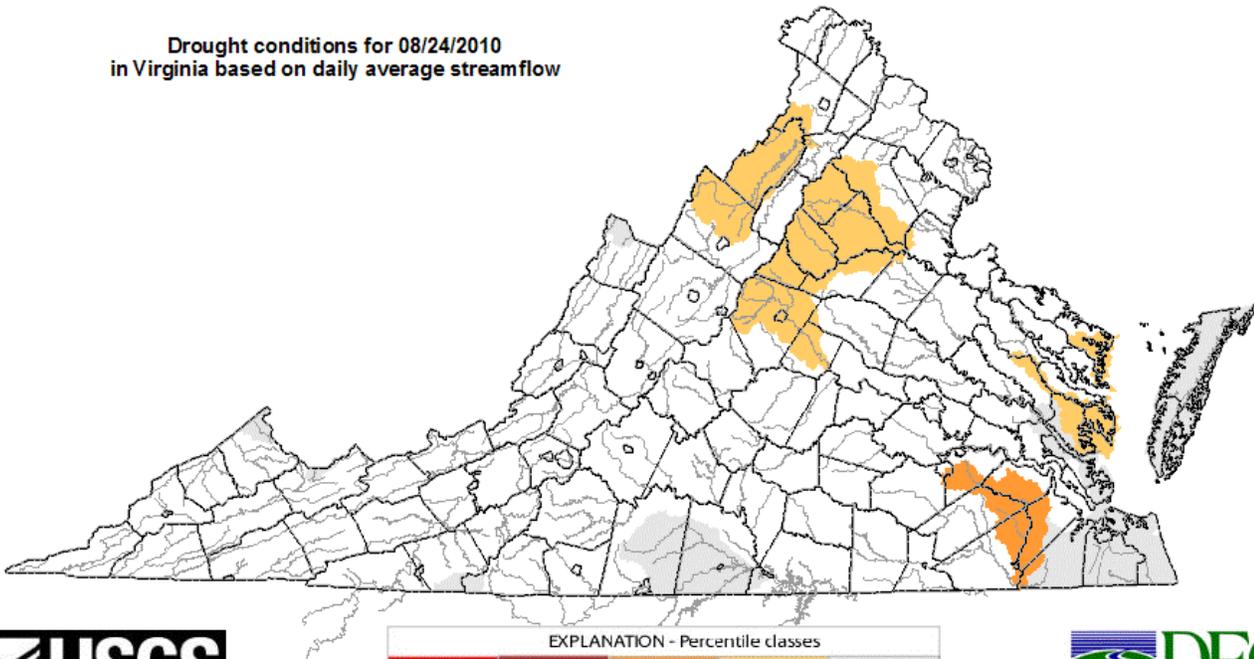
USGS Streamflow Conditions for August 24, 2010



APPENDIX H

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

Drought conditions for 08/24/2010
in Virginia based on daily average streamflow



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



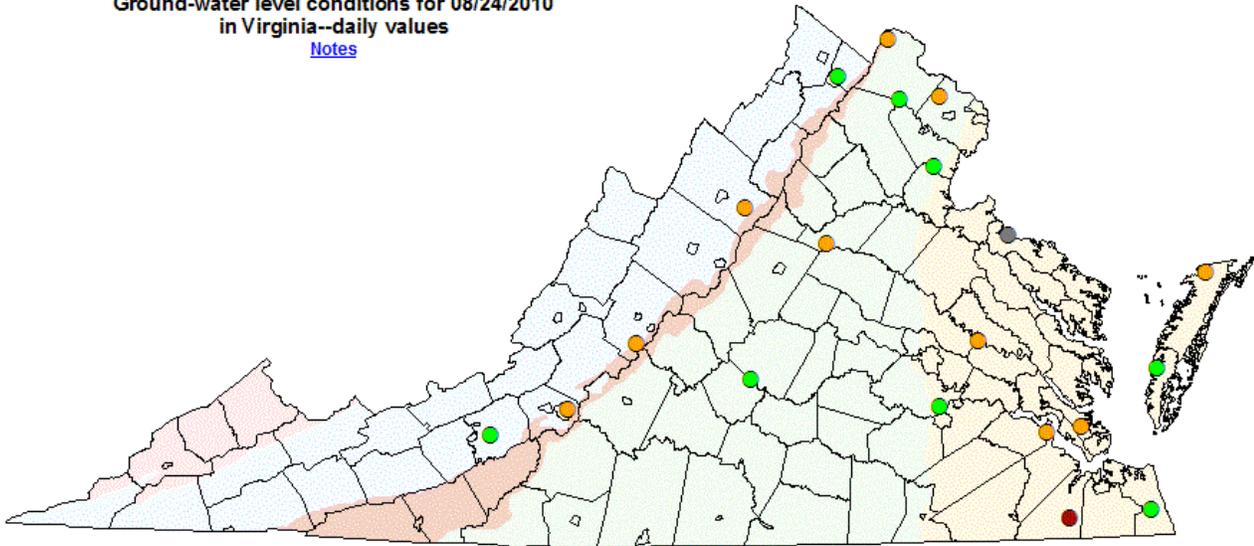
EXPLANATION - Percentile classes				
Low	<=5	6-9	10-24	Insufficient data
Extreme drought	Severe drought	Moderate drought	Below normal	

APPENDIX I

Virginia Climate Response Network

August 24, 2010

Ground-water level conditions for 08/24/2010
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			