

VIRGINIA DROUGHT MONITORING TASK FORCE

Drought Status Report

October 27, 2009

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. Although precipitation deficits since 2007 remain in much of the Commonwealth and stream flows are below normal at approximately one-third of Virginia's stream gages, impacts to public water supplies, agricultural production, energy production, fishery resources or recreational resources have been limited. One notable exception is the Kerr Reservoir on the Roanoke River which is close to a water level where the power generation capacity could be affected.

Statewide precipitation for the period from October 1, 2007 through October 21, 2009 was in the normal range (92% of normal). Normal precipitation is defined as the mean precipitation for a thirty year period of record. Precipitation greater than 85% of normal is considered to be in the normal range. No drought evaluation regions were below the normal range for this time period although precipitation deficits still persist in eleven of the thirteen drought evaluation regions. Only the Southeast Virginia and Eastern Shore drought evaluation regions have received precipitation above 100% of normal for this time period. Statewide precipitation for the period from October 1, 2008 through October 21, 2009 is within the normal range (92%). Precipitation is now within the normal range for all drought evaluation areas for the current water year with the exception of the Middle James (83%) and the Northern Coastal Plain (81%). Statewide precipitation from August 1st through October 21, 2009 was below the normal range (82%), with four drought evaluation regions receiving precipitation greater than 100% of normal and nine drought evaluation regions receiving below 100% of normal. Appendix A contains precipitation tables for periods dating from October 1, 2007 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 and below normal temperatures for the Commonwealth. Above normal precipitation and normal to below 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 through the middle of January. The three month outlook calls for below normal temperatures for southeastern Virginia and equal chances of below normal, normal and above normal temperatures for the remainder of the Commonwealth.

The latest NOAA U.S. National Drought Monitor indicates "abnormally dry" conditions exist in portions of south central Virginia along the North Carolina border and areas in northeastern Virginia along the West Virginia border. The total area in Virginia experiencing "abnormally dry" conditions, as designated in the U.S. National Drought Monitor, has decreased over a three month period from 16.9% to approximately 9.7% of the Commonwealth's land area (Appendices B and C). The Seasonal Drought Outlook for the United States from now through December 2009 forecasts an improvement in the drought conditions in northeastern Virginia (Appendix D).

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, 22 systems are under voluntary water conservation requirements and 2 systems are under mandatory water conservation requirements. The number of systems under restrictions has not changed since August 2009. Of the 46 systems listed in the VDH report, 8 are rated as having a "Better" overall water supply situation, 2 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 official fall wildfire season in Virginia runs from October 15th through November 30th. Currently the entire Commonwealth is rated as having low fire danger (Class 1). From January 1st through October 26th, 2009, the Virginia Department of Forestry (VDOF) responded to 877 wild land fires that burned 6,970 acres. Since the September 22, 2009 Drought Status Report, VDOF received reports of 21 wild land fires that burned 23 acres.

The Department of Game and Inland Fisheries reports that trout hatcheries' water supplies are still good and there have been no drought related problems at any of the facilities. However, flow in some streams and rivers in the northwestern portion of the state are lower than normal which may affect Fall trout stocking schedule in that area. Currently, all boat access sites across the state are open.

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

Report of the Climatology Office of the University of Virginia

For most of the Commonwealth, substantial widespread rainfall at the end of September made the major contribution to that month's totals, and kept it from being one of the driest on record at many observing stations. October rainfall to date has been below normal with the exception of the Eastern Shore. The driest areas have been Northern Tidewater and Central and Southside Virginia. One component of the overall drier than normal conditions for September and October has been the lack of tropical cyclone activity. These systems, on average, supply a very significant amount of moisture to much of Virginia during the latter part of the growing season.

The close of the growing season, in concert with shortening days and lower sun angles, brings a sharp drop in the evapotranspiration rates. This gives available precipitation a better opportunity to soak into the soil. In addition, the majority of the precipitation Virginia receives from now into early spring is associated with mid-latitude storm systems and frontal passages. This usually means more consistent and widespread precipitation than spotty summer thunderstorms. In general, the colder months present the greatest opportunity for deep soil and groundwater recharge. The number, intensity and track of winter storms will likely have a profound effect on the long-term moisture situation at the start of the growing season next year.

Report of the National Weather Service

Over the last 30 days, much of the interior of the Commonwealth has been below normal with regard to precipitation, even with several rainfall events during that time (Appendix E). Unfortunately, much of the precipitation from these events has concentrated itself across eastern and far southwest Virginia. The forecast for the next 5 days indicates that the areas hardest hit by dry weather could be getting an inch or more of rainfall by the end of the weekend as another frontal system moves through the eastern U.S. Looking out a little longer, the 6 to 10 day and 8 to 14 day outlooks call for average to below average temperatures and above average precipitation across the Commonwealth. The NOAA winter outlook calls for December through February temperatures to be below average, with no tendency (below, above or average) indicated for precipitation. Precipitation over the 2009-10 winter will likely be determined by an atmospheric phenomena called the North Atlantic Oscillation (NAO). How the NAO sets up will determine whether storminess across the Deep South will translate northward as increased coastal lows and more precipitation across the Mid-Atlantic and Northeast U.S. Since the NAO cannot be forecast more than a couple of weeks in advance, it's impossible to tell at this point how it will impact the upcoming winter in Virginia.

United States Geological Survey Streamflow and Ground Water Levels

Approximately one third of the surface-water gages in the State are recording streamflows below normal (Appendices G and H). Recent Statewide precipitation has increased streamflow levels at gages along the Blue Ridge Mountains in the Roanoke, James, Rappahannock, and Potomac River Basins from well below-normal to normal and below-normal levels. The remaining surface-water gages in the State are recording streamflows in the

normal to above normal ranges. Streamflow gages in southwest Virginia, which is usually one of the first areas in Virginia to show drought conditions, are recording levels above normal.

Ground-water levels across the State as shown by the Climate-Response well network are recording water levels in the normal range or above except for the well located near Roanoke, Va., which is recording levels well below-normal and the Rockingham well, which is recording levels below-normal (Appendix I).

Virginia Department of Environmental Quality Conditions of Major Reservoirs

Levels of large reservoirs statewide have continued to drop through October. 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. Of these four reservoirs Smith Mountain Lake, Lake Moomaw and Kerr Reservoir are currently in the Drought Watch stage and Lake Anna is in the Normal Range as defined in the Plan. At the time of the September 2009 Drought Status Report, only the Kerr Reservoir was in the Drought Watch stage. Below is a summary of reservoir conditions statewide:

- Lake Moomaw on the Jackson River has declined approximately 5.2 feet since September 15th and currently has 33% of its conservation storage remaining. In early September the Gathright Dam was assigned a US Army Corps of Engineers Dam Safety Action Classification (DSAC) of II. The dam is considered to be potentially unsafe and the Corps is implementing a number of monitoring and operational measures to reduce the risk to the public. These measures include the lowering of the water level in the reservoir 1 foot per week. The Corps is meeting with stakeholders the week of October 26th to discuss the short and long term plans to address dam safety concerns. If the lowering continues at the current rate, the minimum conservation pool will be reached by January 1, 2010.
- Kerr Reservoir is currently at elevation 293.6 feet (4.62 feet below guide curve) which is within the Drought Watch Stage defined in the Plan and within the Corps' Severe Drought designation. The reservoir level has dropped 1.78 feet since September 15th. September inflows into the reservoir have been the 8th lowest based on 79 years of record. The recent Kerr levels are comparable to reservoir levels observed during the 2002 drought. The bottom of the dependable power capacity pool is elevation 293 feet. The Corps' forecasts indicate the reservoir level will remain above 293 feet and begin to rebound by the end of the year. However, dry fall and winter conditions could result in the reservoir level continuing to decline. Kerr is currently operating at minimum energy declaration.
- Smith Mountain Lake is currently at elevation 792.2 feet (2.8 feet below full) and has dropped approximately 0.9 feet since September 15th. The Drought Watch Stage for Smith Mountain Lake is elevation 793 feet and below.
- Lake Anna is currently at elevation 248.8 feet (1.2 feet below full) and has dropped approximately 0.5 feet since September 15th. The Lake Anna level is approximately average for this time of year based on the last ten years of record. Dominion Power anticipates Lake Anna will return to full pool by the spring.
- Philpott Lake is approximately 3.0 feet below guide curve and has dropped 2.26 feet since September 15th. September inflows into the reservoir have been the 5th lowest in 55 years of record. Philpott is currently operating at minimum energy declaration and is within the Corps Mild Drought designation.
- South Holston Lake, straddling the Virginia and Tennessee border, is within the normal range and above the balancing guide. The reservoir level has dropped 4.3 feet since September 15th.
- The two major reservoirs for the Roanoke area, Carvins Cove and Spring Hollow Reservoirs are 4.4 feet and 8.4 feet below full, respectively. These levels correspond to 87% storage remaining at Carvins Cove and 89% storage remaining at Spring Hollow.
- The Rivanna Water and Sewer Authority reservoirs are in good shape for this time of year and are all anticipated to be full by spring.

Virginia Department of Agriculture and Consumer Services
Status of Agricultural Drought

Overview: According to the USDA Crop Weather Report released on October 19, 2009, 87% of topsoil moisture ranged from adequate to surplus. USDA also reports that, although rain showers in mid-October delayed fall harvesting activities, producers throughout the Commonwealth welcomed the much needed precipitation. Rainfall received in Mid-October was extremely helpful in replenishing soil moisture and was beneficial to pastures, field crops, and small grain germination. Now that the weather has cleared, harvesting of corn and early planted soybeans and planting of wheat and barley has begun. Some areas of the state reported their first frost of the season, as temperatures have been cooler than normal for this time of the year. To date, VDACS has not received notification that a Virginia locality has submitted a request to Governor Kaine seeking agricultural disaster designation for 2009.

Impact on Crops: Corn silage harvest continues as the late-planted corn slowly matures and dries down. Corn and soybeans will not be a record harvest, but these crops are expected to be better than average. Fall cover-crops are germinating very well given the timely rains that we continue to receive. Moderate rains allowed for timely and efficient harvest and planting of winter crops. Continued precipitation at and above average will provide good yields.

Impact on Dairies: Southwest Virginia producers are reporting a better than average year with excellent forage and corn crops. Expectations are for above average crop yields in this area.

Reports from southern Virginia indicate that most dairymen are having a good crop and forage year. Some areas of Franklin, Pittsylvania, Halifax, Mecklenburg, Charlotte, Nottoway and Amelia counties are quite dry, but the corn silage yield is respectable.

In the Shenandoah Valley area, corn is being chopped for silage. Yields and quality appear to be good. There are isolated areas in Rockingham and Augusta counties that were moderately dry in September and the silage yield is estimated to be about 2/3 of the normal yield. Most dairymen are experiencing an average year for crop and forage production. Fall hay also is expected to be good.

Producers in the Tidewater area have had a good year for corn and soybeans although the region was drier during August and September. Corn silage had to be cut quickly because it began to dry out.

Northern Virginia producers report the worst conditions in Virginia. Northern Virginia has only had about one inch of rain in the past six weeks. Fauquier, Culpeper, Loudoun, Prince William counties and the Winchester area are very dry. Corn yields are estimated to be about half of the normal yield. Many dairymen in the Northern Virginia area will have to purchase feed to make it through the winter.

Impact on Livestock: Pastures are generally in good conditions, especially in the western part of the state. This is helpful to livestock producers who can graze animals rather than have to rely on stored or bought feed. Cattle numbers are lower in the markets due to favorable grazing conditions. The first heavy frosts will bring them to market. During the upcoming months, hay is expected to be in good supply. This should provide above average winter nutrition.

Nursery Industry: The nursery industry reports that many areas of the Commonwealth continue to see adequate rainfall. However other areas of the state have been experiencing drought conditions over the past month which has increased the need for irrigation. Areas in the northern part of the state have been especially hard hit by these dry periods.

Impact on Creeks, Rivers, and Wells: There have been no reports of wells going dry and no municipal water restrictions. In Wytheville, thanks to heavy moisture in spring filling the aquifers, ground water is flowing well. In Lynchburg, creeks and streams are still low and additional rainfall is needed.

APPENDIX A

Precipitation Departures by Drought Evaluation Region

PRELIMINARY PRECIPITATION SUMMARY

Prepared:

10/22/09

DROUGHT REGION	OBSERVED	Oct 1, 2009 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1 Big Sandy	1.72	1.95	-0.23	88%
2 New River	1.21	2.15	-0.93	57%
3 Roanoke	0.77	2.51	-1.74	31%
4 Upper James	1.02	2.20	-1.18	47%
5 Middle James	0.73	2.60	-1.87	28%
6 Shenandoah	1.37	2.16	-0.79	64%
7 Northern Virginia	2.19	2.36	-0.17	93%
8 Northern Piedmont	0.99	2.70	-1.71	37%
9 Chowan	0.93	2.43	-1.49	39%
10 Northern Coastal Plain	0.69	2.38	-1.69	29%
11 York-James	1.68	2.39	-0.71	70%
12 Southeast Virginia	1.94	2.48	-0.54	78%
13 Eastern Shore	3.25	2.17	1.08	149%
Statewide	1.16	2.37	-1.21	49%

DROUGHT REGION	OBSERVED	Sep 1, 2009 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1 Big Sandy	5.90	5.41	0.49	109%
2 New River	5.18	5.56	-0.38	93%
3 Roanoke	3.74	6.74	-3.00	56%
4 Upper James	4.23	5.70	-1.47	74%
5 Middle James	3.96	6.73	-2.77	59%
6 Shenandoah	3.49	5.83	-2.34	60%
7 Northern Virginia	4.47	6.43	-1.96	70%
8 Northern Piedmont	3.82	6.98	-3.17	55%
9 Chowan	5.11	6.86	-1.75	75%
10 Northern Coastal Plain	1.98	6.47	-4.49	31%
11 York-James	7.09	7.29	-0.20	97%
12 Southeast Virginia	8.47	6.91	1.56	123%
13 Eastern Shore	9.73	5.78	3.95	168%
Statewide	4.50	6.37	-1.87	71%

DROUGHT REGION	OBSERVED	Aug 1, 2009 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1 Big Sandy	10.60	9.24	1.35	115%
2 New River	9.17	8.87	0.30	103%
3 Roanoke	7.64	10.46	-2.82	73%
4 Upper James	7.29	9.03	-1.75	81%
5 Middle James	7.64	10.55	-2.91	72%
6 Shenandoah	6.79	9.16	-2.37	74%
7 Northern Virginia	8.06	10.28	-2.22	78%
8 Northern Piedmont	7.52	10.80	-3.28	70%
9 Chowan	8.78	11.17	-2.39	79%

10	Northern Coastal Plain	4.89	10.33	-5.44	47%
11	York-James	10.81	12.16	-1.35	89%
12	Southeast Virginia	17.80	12.03	5.77	148%
13	Eastern Shore	14.02	9.65	4.36	145%
	Statewide	8.41	10.20	-1.79	82%

DROUGHT			Jul 1, 2009	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	16.22	13.72	2.49	118%
2	New River	13.34	12.66	0.68	105%
3	Roanoke	11.41	14.85	-3.45	77%
4	Upper James	12.32	13.07	-0.75	94%
5	Middle James	10.94	14.96	-4.02	73%
6	Shenandoah	9.95	12.92	-2.98	77%
7	Northern Virginia	9.81	14.05	-4.23	70%
8	Northern Piedmont	10.35	15.20	-4.85	68%
9	Chowan	12.64	15.68	-3.04	81%
10	Northern Coastal Plain	8.11	14.78	-6.66	55%
11	York-James	18.35	17.26	1.09	106%
12	Southeast Virginia	21.27	17.10	4.17	124%
13	Eastern Shore	19.76	13.65	6.10	145%
	Statewide	12.28	14.54	-2.26	84%

DROUGHT			Jun 1, 2009	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	21.50	17.86	3.63	120%
2	New River	18.28	16.51	1.77	111%
3	Roanoke	17.45	18.74	-1.29	93%
4	Upper James	15.80	16.78	-0.98	94%
5	Middle James	15.44	18.47	-3.03	84%
6	Shenandoah	14.74	16.63	-1.89	89%
7	Northern Virginia	15.58	17.91	-2.33	87%
8	Northern Piedmont	16.02	19.21	-3.19	83%
9	Chowan	18.47	19.33	-0.86	96%
10	Northern Coastal Plain	13.25	18.34	-5.08	72%
11	York-James	21.89	20.67	1.22	106%
12	Southeast Virginia	26.34	20.71	5.63	127%
13	Eastern Shore	23.23	16.63	6.60	140%
	Statewide	17.37	18.33	-0.97	95%

DROUGHT			May 1, 2009	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	28.11	22.68	5.43	124%
2	New River	26.00	20.72	5.28	125%
3	Roanoke	23.68	23.07	0.60	103%
4	Upper James	22.34	21.06	1.28	106%
5	Middle James	20.97	22.71	-1.75	92%
6	Shenandoah	21.50	20.47	1.03	105%
7	Northern Virginia	23.55	22.25	1.30	106%
8	Northern Piedmont	23.08	23.43	-0.35	98%
9	Chowan	23.95	23.42	0.53	102%

10	Northern Coastal Plain	18.20	22.50	-4.29	81%
11	York-James	27.20	24.94	2.26	109%
12	Southeast Virginia	31.28	24.57	6.71	127%
13	Eastern Shore	26.82	20.15	6.67	133%
	Statewide	23.60	22.59	1.01	104%

DROUGHT			Apr 1, 2009	- Oct 21, 2009	
REGION	OBSERVED		NORMAL	DEPARTURE	% OF NORM.
1	Big Sandy	31.14	26.44	4.70	118%
2	New River	28.88	24.27	4.62	119%
3	Roanoke	26.90	26.87	0.02	100%
4	Upper James	25.88	24.46	1.42	106%
5	Middle James	23.94	26.05	-2.11	92%
6	Shenandoah	24.82	23.39	1.43	106%
7	Northern Virginia	27.69	25.55	2.14	108%
8	Northern Piedmont	26.63	26.72	-0.09	100%
9	Chowan	26.04	26.85	-0.80	97%
10	Northern Coastal Plain	21.05	25.59	-4.54	82%
11	York-James	30.74	28.24	2.50	109%
12	Southeast Virginia	33.98	27.82	6.16	122%
13	Eastern Shore	29.34	23.07	6.26	127%
	Statewide	26.68	26.01	0.67	103%

DROUGHT			Mar 1, 2009	- Oct 21, 2009	
REGION	OBSERVED		NORMAL	DEPARTURE	% OF NORM.
1	Big Sandy	35.45	30.69	4.76	116%
2	New River	33.29	27.94	5.35	119%
3	Roanoke	31.41	31.14	0.27	101%
4	Upper James	29.06	28.25	0.81	103%
5	Middle James	27.99	30.11	-2.12	93%
6	Shenandoah	26.86	26.59	0.27	101%
7	Northern Virginia	30.21	29.21	1.00	103%
8	Northern Piedmont	30.37	30.53	-0.16	99%
9	Chowan	32.39	31.22	1.18	104%
10	Northern Coastal Plain	27.47	29.87	-2.40	92%
11	York-James	36.75	32.93	3.82	112%
12	Southeast Virginia	40.19	32.02	8.17	126%
13	Eastern Shore	34.25	27.38	6.86	125%
	Statewide	31.02	30.05	0.97	103%

DROUGHT			Feb 1, 2009	- Oct 21, 2009	
REGION	OBSERVED		NORMAL	DEPARTURE	% OF NORM.
1	Big Sandy	37.55	34.27	3.28	110%
2	New River	34.43	30.87	3.57	112%
3	Roanoke	32.47	34.45	-1.99	94%
4	Upper James	30.00	31.10	-1.10	96%
5	Middle James	28.60	33.23	-4.64	86%
6	Shenandoah	27.35	29.00	-1.65	94%
7	Northern Virginia	30.67	31.88	-1.21	96%
8	Northern Piedmont	30.93	33.50	-2.57	92%
9	Chowan	33.18	34.39	-1.20	97%

10	Northern Coastal Plain	27.80	33.01	-5.21	84%
11	York-James	37.69	36.46	1.23	103%
12	Southeast Virginia	41.15	35.52	5.63	116%
13	Eastern Shore	34.63	30.57	4.06	113%
	Statewide	31.91	33.18	-1.27	96%

DROUGHT			Jan 1, 2009	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	43.10	38.00	5.10	113%
2	New River	37.93	34.08	3.86	111%
3	Roanoke	35.84	38.37	-2.54	93%
4	Upper James	33.10	34.38	-1.29	96%
5	Middle James	30.84	36.89	-6.05	84%
6	Shenandoah	29.51	31.85	-2.34	93%
7	Northern Virginia	33.19	35.16	-1.96	94%
8	Northern Piedmont	33.12	37.02	-3.90	89%
9	Chowan	35.29	38.50	-3.20	92%
10	Northern Coastal Plain	29.71	36.76	-7.05	81%
11	York-James	39.59	40.60	-1.01	98%
12	Southeast Virginia	43.17	39.68	3.49	109%
13	Eastern Shore	36.46	34.13	2.32	107%
	Statewide	34.78	36.82	-2.04	94%

DROUGHT			Dec 1, 2008	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	47.93	41.64	6.29	115%
2	New River	41.28	36.79	4.49	112%
3	Roanoke	39.57	41.62	-2.06	95%
4	Upper James	36.55	37.33	-0.79	98%
5	Middle James	34.78	40.06	-5.28	87%
6	Shenandoah	33.14	34.44	-1.30	96%
7	Northern Virginia	36.20	38.26	-2.06	95%
8	Northern Piedmont	36.69	40.30	-3.61	91%
9	Chowan	39.16	41.52	-2.35	94%
10	Northern Coastal Plain	32.67	40.04	-7.37	82%
11	York-James	43.69	43.99	-0.30	99%
12	Southeast Virginia	47.01	42.86	4.15	110%
13	Eastern Shore	41.60	37.37	4.23	111%
	Statewide	38.54	39.94	-1.40	96%

DROUGHT			Nov 1, 2008	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	50.48	44.92	5.56	112%
2	New River	42.95	39.82	3.14	108%
3	Roanoke	42.56	44.98	-2.42	95%
4	Upper James	38.96	40.69	-1.73	96%
5	Middle James	37.89	43.57	-5.68	87%
6	Shenandoah	35.03	37.49	-2.46	93%
7	Northern Virginia	38.27	41.67	-3.39	92%
8	Northern Piedmont	39.06	44.10	-5.05	89%
9	Chowan	42.40	44.63	-2.22	95%

10	Northern Coastal Plain	36.27	43.18	-6.91	84%
11	York-James	48.05	47.36	0.69	101%
12	Southeast Virginia	51.97	45.93	6.04	113%
13	Eastern Shore	46.32	40.31	6.01	115%
	Statewide	41.36	43.17	-1.82	96%

DROUGHT REGION		OBSERVED	Oct 1, 2008 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	52.25	47.80	4.45	109%
2	New River	44.15	42.99	1.16	103%
3	Roanoke	44.34	48.69	-4.35	91%
4	Upper James	40.36	43.94	-3.58	92%
5	Middle James	39.48	47.41	-7.93	83%
6	Shenandoah	36.66	40.68	-4.02	90%
7	Northern Virginia	39.75	45.15	-5.40	88%
8	Northern Piedmont	40.70	48.09	-7.39	85%
9	Chowan	43.85	48.21	-4.36	91%
10	Northern Coastal Plain	37.81	46.69	-8.88	81%
11	York-James	49.74	50.89	-1.15	98%
12	Southeast Virginia	53.47	49.59	3.88	108%
13	Eastern Shore	47.44	43.52	3.91	109%
	Statewide	42.92	46.67	-3.75	92%

DROUGHT REGION		OBSERVED	Sep 1, 2008 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	54.33	51.26	3.07	106%
2	New River	46.69	46.40	0.29	101%
3	Roanoke	48.68	52.92	-4.24	92%
4	Upper James	42.50	47.44	-4.94	90%
5	Middle James	44.69	51.54	-6.85	87%
6	Shenandoah	40.40	44.35	-3.95	91%
7	Northern Virginia	45.51	49.22	-3.71	92%
8	Northern Piedmont	46.01	52.37	-6.36	88%
9	Chowan	50.46	52.64	-2.18	96%
10	Northern Coastal Plain	42.87	50.78	-7.91	84%
11	York-James	55.66	55.79	-0.13	100%
12	Southeast Virginia	61.20	54.02	7.18	113%
13	Eastern Shore	51.55	47.13	4.42	109%
	Statewide	47.34	50.67	-3.33	93%

DROUGHT REGION		OBSERVED	Aug 1, 2008 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	58.41	55.09	3.32	106%
2	New River	51.16	49.71	1.45	103%
3	Roanoke	53.32	56.64	-3.32	94%
4	Upper James	46.59	50.77	-4.18	92%
5	Middle James	49.49	55.36	-5.87	89%
6	Shenandoah	43.92	47.68	-3.76	92%
7	Northern Virginia	47.55	53.07	-5.51	90%
8	Northern Piedmont	49.11	56.19	-7.08	87%
9	Chowan	53.48	56.95	-3.47	94%

10	Northern Coastal Plain	45.17	54.64	-9.46	83%
11	York-James	58.30	60.66	-2.36	96%
12	Southeast Virginia	63.44	59.14	4.30	107%
13	Eastern Shore	54.47	51.00	3.46	107%
	Statewide	51.10	54.50	-3.41	94%

DROUGHT REGION		OBSERVED	Jul 1, 2008 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	63.13	59.57	3.56	106%
2	New River	55.09	53.50	1.59	103%
3	Roanoke	56.75	61.03	-4.29	93%
4	Upper James	50.69	54.81	-4.12	92%
5	Middle James	53.32	59.77	-6.45	89%
6	Shenandoah	48.23	51.44	-3.21	94%
7	Northern Virginia	50.51	56.84	-6.32	89%
8	Northern Piedmont	52.95	60.59	-7.64	87%
9	Chowan	56.91	61.46	-4.55	93%
10	Northern Coastal Plain	48.69	59.09	-10.40	82%
11	York-James	62.02	65.76	-3.74	94%
12	Southeast Virginia	69.12	64.21	4.91	108%
13	Eastern Shore	58.37	55.00	3.37	106%
	Statewide	54.99	58.84	-3.85	93%

DROUGHT REGION		OBSERVED	Jun 1, 2008 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	66.67	63.71	2.96	105%
2	New River	57.56	57.35	0.22	100%
3	Roanoke	59.66	64.92	-5.27	92%
4	Upper James	53.29	58.52	-5.24	91%
5	Middle James	55.44	63.28	-7.85	88%
6	Shenandoah	52.12	55.15	-3.03	95%
7	Northern Virginia	55.15	60.70	-5.54	91%
8	Northern Piedmont	58.21	64.60	-6.39	90%
9	Chowan	58.62	65.11	-6.48	90%
10	Northern Coastal Plain	53.13	62.65	-9.52	85%
11	York-James	64.15	69.17	-5.02	93%
12	Southeast Virginia	71.02	67.82	3.20	105%
13	Eastern Shore	62.93	57.98	4.94	109%
	Statewide	58.09	62.63	-4.54	93%

DROUGHT REGION		OBSERVED	May 1, 2008 NORMAL	- Oct 21, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	69.25	68.53	0.71	101%
2	New River	60.14	61.56	-1.42	98%
3	Roanoke	63.50	69.25	-5.75	92%
4	Upper James	56.65	62.80	-6.15	90%
5	Middle James	59.66	67.52	-7.86	88%
6	Shenandoah	56.65	58.99	-2.34	96%
7	Northern Virginia	63.61	65.04	-1.43	98%
8	Northern Piedmont	64.40	68.82	-4.42	94%
9	Chowan	62.03	69.20	-7.17	90%

10	Northern Coastal Plain	59.38	66.81	-7.43	89%
11	York-James	66.91	73.44	-6.53	91%
12	Southeast Virginia	74.81	71.68	3.13	104%
13	Eastern Shore	68.23	61.50	6.72	111%
	Statewide	62.30	66.89	-4.59	93%

DROUGHT			Apr 1, 2008	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	73.57	72.29	1.28	102%
2	New River	64.93	65.11	-0.18	100%
3	Roanoke	68.90	73.05	-4.16	94%
4	Upper James	61.48	66.20	-4.72	93%
5	Middle James	65.85	70.86	-5.01	93%
6	Shenandoah	62.05	61.91	0.14	100%
7	Northern Virginia	69.27	68.34	0.94	101%
8	Northern Piedmont	70.42	72.11	-1.69	98%
9	Chowan	69.23	72.63	-3.39	95%
10	Northern Coastal Plain	65.34	69.90	-4.56	93%
11	York-James	73.22	76.74	-3.52	95%
12	Southeast Virginia	81.49	74.93	6.56	109%
13	Eastern Shore	72.65	64.42	8.23	113%
	Statewide	67.93	70.31	-2.38	97%

DROUGHT			Mar 1, 2008	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	77.94	76.54	1.40	102%
2	New River	67.56	68.78	-1.21	98%
3	Roanoke	72.10	77.32	-5.22	93%
4	Upper James	64.30	69.99	-5.69	92%
5	Middle James	69.15	74.92	-5.77	92%
6	Shenandoah	64.85	65.11	-0.26	100%
7	Northern Virginia	71.71	72.00	-0.29	100%
8	Northern Piedmont	73.52	75.92	-2.40	97%
9	Chowan	73.15	77.00	-3.85	95%
10	Northern Coastal Plain	67.82	74.18	-6.36	91%
11	York-James	77.06	81.43	-4.37	95%
12	Southeast Virginia	84.42	79.13	5.29	107%
13	Eastern Shore	74.43	68.73	5.70	108%
	Statewide	71.12	74.35	-3.24	96%

DROUGHT			Feb 1, 2008	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	81.14	80.12	1.02	101%
2	New River	69.58	71.71	-2.13	97%
3	Roanoke	74.39	80.63	-6.25	92%
4	Upper James	66.51	72.84	-6.33	91%
5	Middle James	71.80	78.04	-6.25	92%
6	Shenandoah	67.15	67.52	-0.37	99%
7	Northern Virginia	74.50	74.67	-0.17	100%
8	Northern Piedmont	76.16	78.89	-2.73	97%
9	Chowan	75.99	80.17	-4.17	95%

10	Northern Coastal Plain	70.38	77.32	-6.94	91%
11	York-James	80.36	84.96	-4.60	95%
12	Southeast Virginia	88.54	82.63	5.91	107%
13	Eastern Shore	77.73	71.92	5.81	108%
	Statewide	73.75	77.48	-3.73	95%

DROUGHT			Jan 1, 2008	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	84.12	83.85	0.27	100%
2	New River	70.85	74.92	-4.06	95%
3	Roanoke	75.28	84.55	-9.28	89%
4	Upper James	68.15	76.12	-7.97	90%
5	Middle James	72.85	81.70	-8.85	89%
6	Shenandoah	68.16	70.37	-2.21	97%
7	Northern Virginia	75.70	77.95	-2.24	97%
8	Northern Piedmont	77.22	82.41	-5.19	94%
9	Chowan	77.06	84.28	-7.21	91%
10	Northern Coastal Plain	71.54	81.07	-9.53	88%
11	York-James	83.07	89.10	-6.03	93%
12	Southeast Virginia	89.95	86.79	3.16	104%
13	Eastern Shore	79.67	75.48	4.19	106%
	Statewide	75.12	81.12	-6.00	93%

DROUGHT			Dec 1, 2007	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	87.41	87.49	-0.08	100%
2	New River	73.45	77.63	-4.17	95%
3	Roanoke	78.58	87.80	-9.22	89%
4	Upper James	71.45	79.07	-7.62	90%
5	Middle James	76.05	84.87	-8.82	90%
6	Shenandoah	71.19	72.96	-1.77	98%
7	Northern Virginia	78.69	81.05	-2.36	97%
8	Northern Piedmont	80.58	85.69	-5.12	94%
9	Chowan	81.32	87.30	-5.98	93%
10	Northern Coastal Plain	74.66	84.35	-9.69	89%
11	York-James	87.18	92.49	-5.31	94%
12	Southeast Virginia	93.80	89.97	3.83	104%
13	Eastern Shore	84.37	78.72	5.65	107%
	Statewide	78.44	84.24	-5.80	93%

DROUGHT			Nov 1, 2007	- Oct 21, 2009	
REGION	OBSERVED	NORMAL	DEPARTURE	% OF NORM.	
1	Big Sandy	89.59	90.77	-1.19	99%
2	New River	74.02	80.66	-6.64	92%
3	Roanoke	79.14	91.16	-12.02	87%
4	Upper James	72.47	82.43	-9.96	88%
5	Middle James	76.72	88.38	-11.66	87%
6	Shenandoah	72.56	76.01	-3.45	95%
7	Northern Virginia	80.19	84.46	-4.27	95%
8	Northern Piedmont	81.79	89.49	-7.70	91%
9	Chowan	81.94	90.41	-8.46	91%

10	Northern Coastal Plain	75.93	87.49	-11.56	87%
11	York-James	87.98	95.86	-7.88	92%
12	Southeast Virginia	94.36	93.04	1.32	101%
13	Eastern Shore	85.39	81.66	3.72	105%
	Statewide	79.46	87.47	-8.01	91%

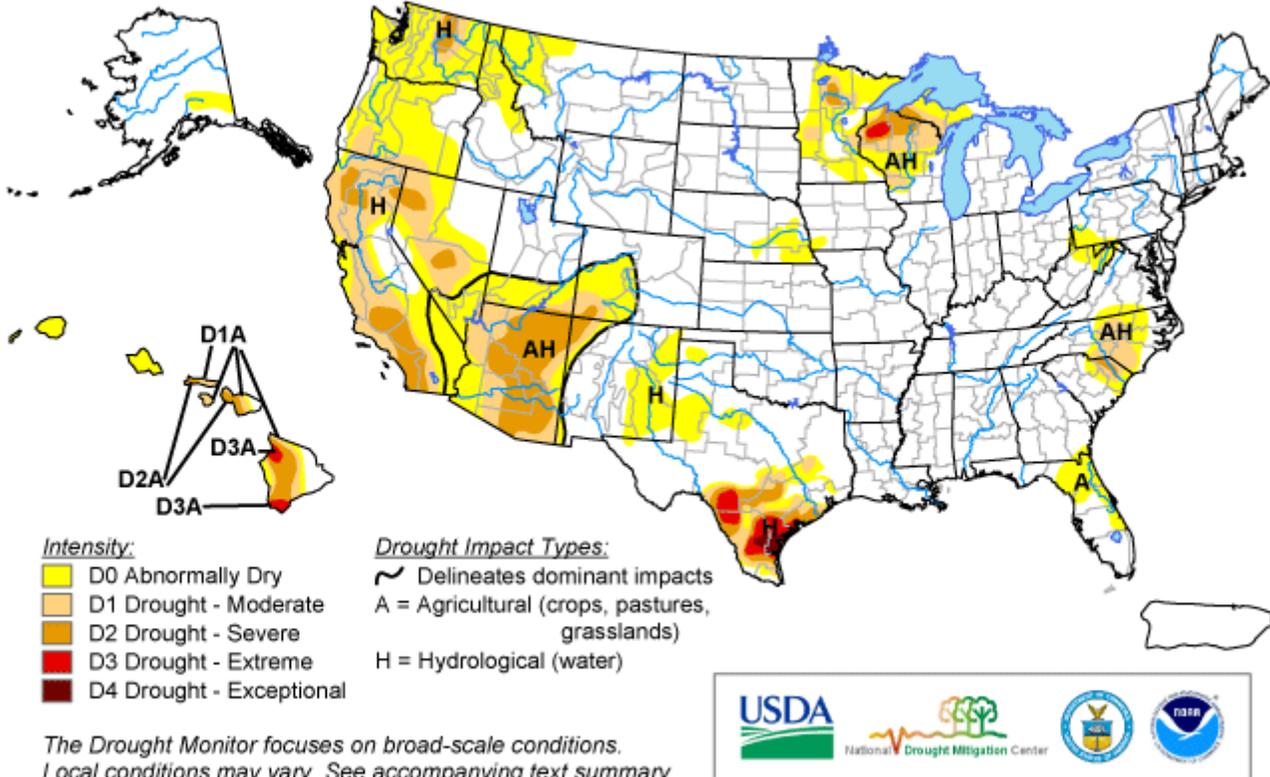
DROUGHT			Oct 1, 2007	- Oct 21, 2009	
REGION		OBSERVED	NORMAL	DEPARTURE	% OF NORM.
1	Big Sandy	92.27	93.65	-1.38	99%
2	New River	80.13	83.83	-3.69	96%
3	Roanoke	84.88	94.87	-9.99	89%
4	Upper James	76.51	85.68	-9.17	89%
5	Middle James	81.72	92.22	-10.51	89%
6	Shenandoah	75.99	79.20	-3.21	96%
7	Northern Virginia	84.42	87.94	-3.52	96%
8	Northern Piedmont	86.27	93.48	-7.21	92%
9	Chowan	86.78	93.99	-7.20	92%
10	Northern Coastal Plain	80.85	91.00	-10.15	89%
11	York-James	92.51	99.39	-6.88	93%
12	Southeast Virginia	99.52	96.70	2.82	103%
13	Eastern Shore	89.07	84.87	4.20	105%
	Statewide	84.08	90.97	-6.89	92%

APPENDIX B

U.S. Drought Monitor

October 20, 2009

Valid 8 a.m. EDT



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, October 22, 2009
Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC

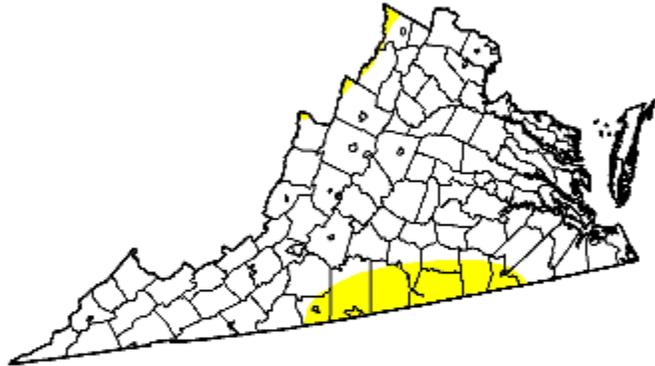
APPENDIX C

U.S. Drought Monitor Virginia

October 20, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	90.3	9.7	0.0	0.0	0.0	0.0
Last Week (10/13/2009 map)	86.8	13.2	0.4	0.0	0.0	0.0
3 Months Ago (07/28/2009 map)	83.1	16.9	0.0	0.0	0.0	0.0
Start of Calendar Year (01/06/2009 map)	63.0	37.0	24.7	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 (10/21/2008 map)	57.6	42.4	28.3	17.2	1.5	0.0



Intensity:

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

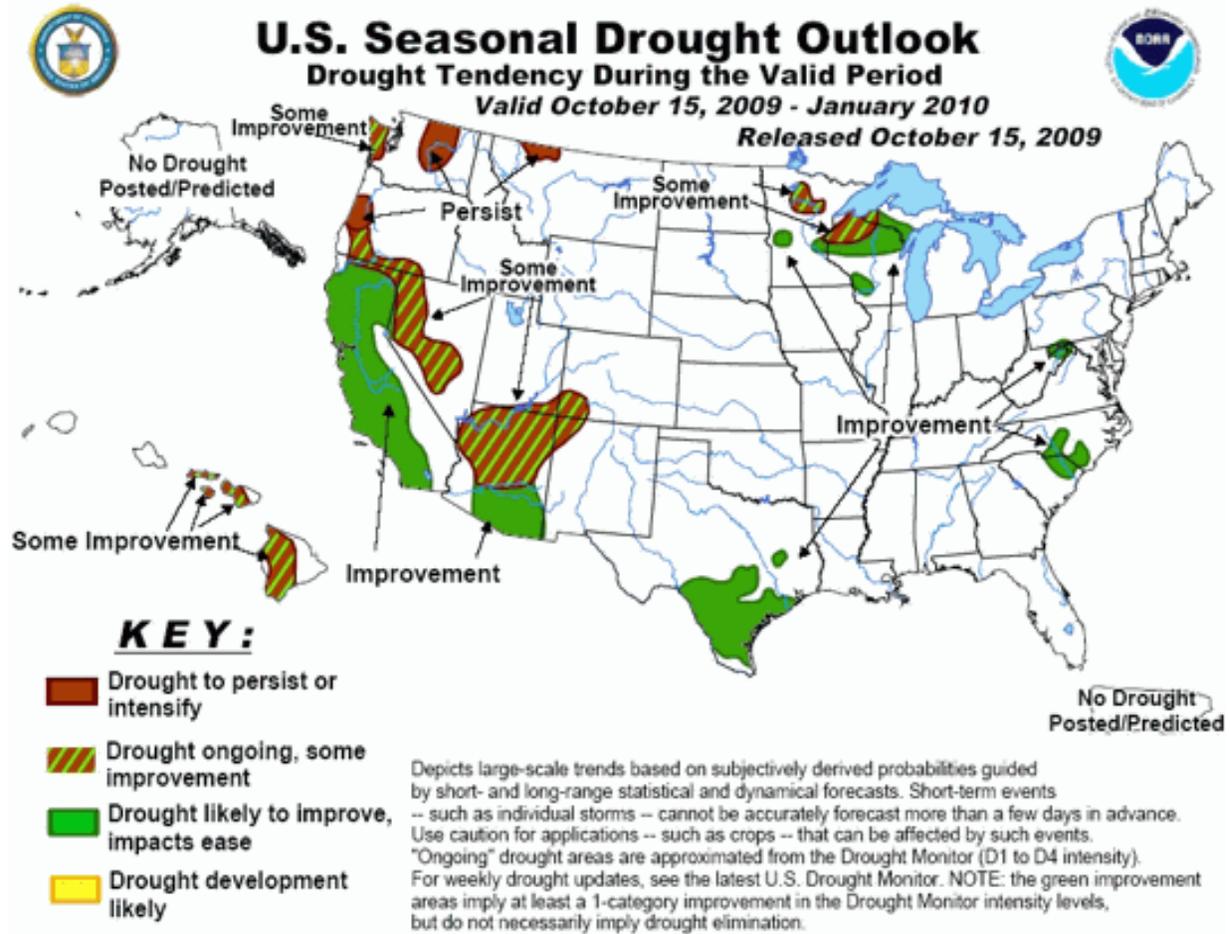
The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements

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



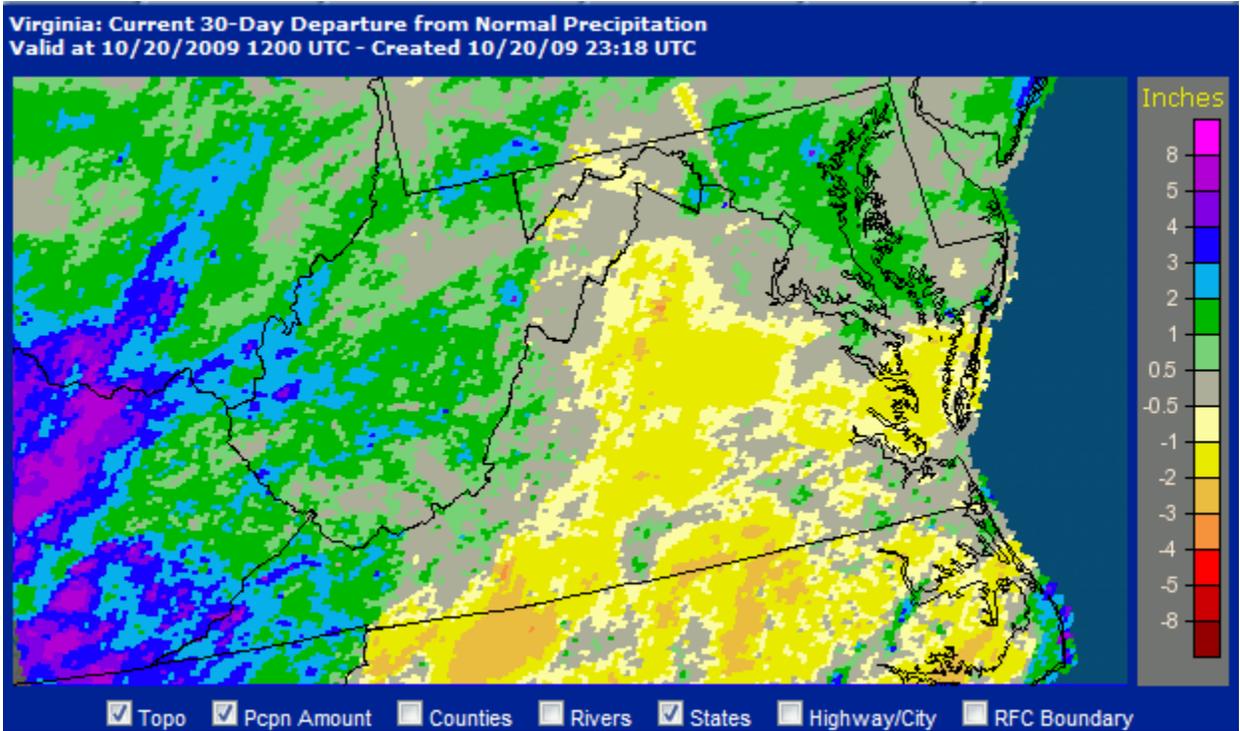
Released Thursday, October 22, 2009
Author: M. Rosencrans, CPC/NOAA

APPENDIX D



APPENDIX E

30-Day Departure from Normal Precipitation



APPENDIX F

Condition of Public Water Supplies

October 14, 2009

ODW Drought Situation Report

Date: **10/14/09**

	Restriction totals
Mandatory	2
Voluntary	22
Total	24

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 - 10/07/09 - 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	S - 10/07/09 - Waterworks production rate reduced due to lower demand; river level sufficient to allow plant operation at 2.0 mgd.	7,190
3093120	Isle of Wight County	Suffolk	V	B - 10/08/09 - Obtains water from Suffolk. Follows Suffolk's lead on conservation.	1,284
3550050	Chesapeake - Western Branch system	City of Portsmouth	V	S -10/08/09 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.	36,404

3550051	Chesapeake	Northwest River, City of Norfolk Raw Water (Lake Gaston)	V	B -10/08/09 Chesapeake is in good shape. There is no active water use restriction in place. For the past eight months greater than average rainfall levels observed. 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 chlorides remain slightly elevated in the NWR. Current levels are in the range of 18-46 mg/l. The average for September was 26 mg/l. Continuing to purchase raw water from Norfolk (7.0 MGD average)	102,292
3550052	Chesapeake - South Norfolk system	City of Norfolk	V	S -10/08/09-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.	38,706
3570150	Colonial Heights	ARWA	V	S - 10/07/09 - Lifted mandatory restrictions on 12/1/07. Voluntary restrictions currently in place.	17,286
3595250	Emporia	Meherrin River	N	S - 10/07/09 - Reservoir level sufficient for normal operation.	5,600
3670800	Virginia-American Water Company (Hopewell)	Appomattox & James Rivers	N	S - 10/07/2009 - Level at intakes still sufficient to supply plant. September rainfall significantly below monthly and yearly averages.	25000 - Primary / 42463 Total including Consecutive System (Ft. Lee)
3700500	Newport News	Chickahomony River, Skiffs Creek, Diascand, Little Creek, Harwoods Mill, Lee Hall	N	B --10/07/09 - Total reservoir capacity at 91.2%. Last report was 90%	406,000
3710100	Norfolk	Lake Prince, Lake Burnt Mills, Western Branch reservoir, Nottoway River, Blackwater River, 4 western wells; Little Creek reservoir, Lakes	V	B - As of 10/05/09, reservoirs at 91.6% (up from from 88.3% on 08/24/09). Historic reservoir capacity is 83.1% at this time of year. Avg. pumping from Lake Gaston	261,250 - Primary / 755,617 - Total including consecutive systems (Va

		Smith, Lawson, Whitehurst, and Wright. Lake Gaston.		= 44.31 MGD. Called for voluntary conservation 11/1/07.	Beach + military bases).
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	V	B - As of 09/25/09, reservoirs at 99% (up from 96% on 08/28/09). Median reservoir capacity is 95% for the month and historical average capacity is 88% (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 - 10/08/09-Will follow Portsmouth's lead and the region as far as conservation. Average reservoir levels : Southern Lakes at 75.42% capacity, for the Northern Lakes at 97.65% and Crumps Mill Pond at 94.45% The Southern Lakes are for emergency use only. Overall they are at 89.17% capacity for the reservoirs for the period (July-September 2009). The operator states that they are in better condition this year when compared to 2008 (65.98%) for the same period. Still purchasing water from Portsmouth per their contract, no drought measure taken to date.	62,562
3810900	Virginia Beach	Norfolk	V	B - 10/05/09 - Obtains water from Norfolk. Called for voluntary conservation on 9/19/07.	423,743
3830850	Williamsburg	Waller Mill Reservoir	N	B - 10/08/09: 5.5" below primary spillway - about 87% 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 full level.	200,000

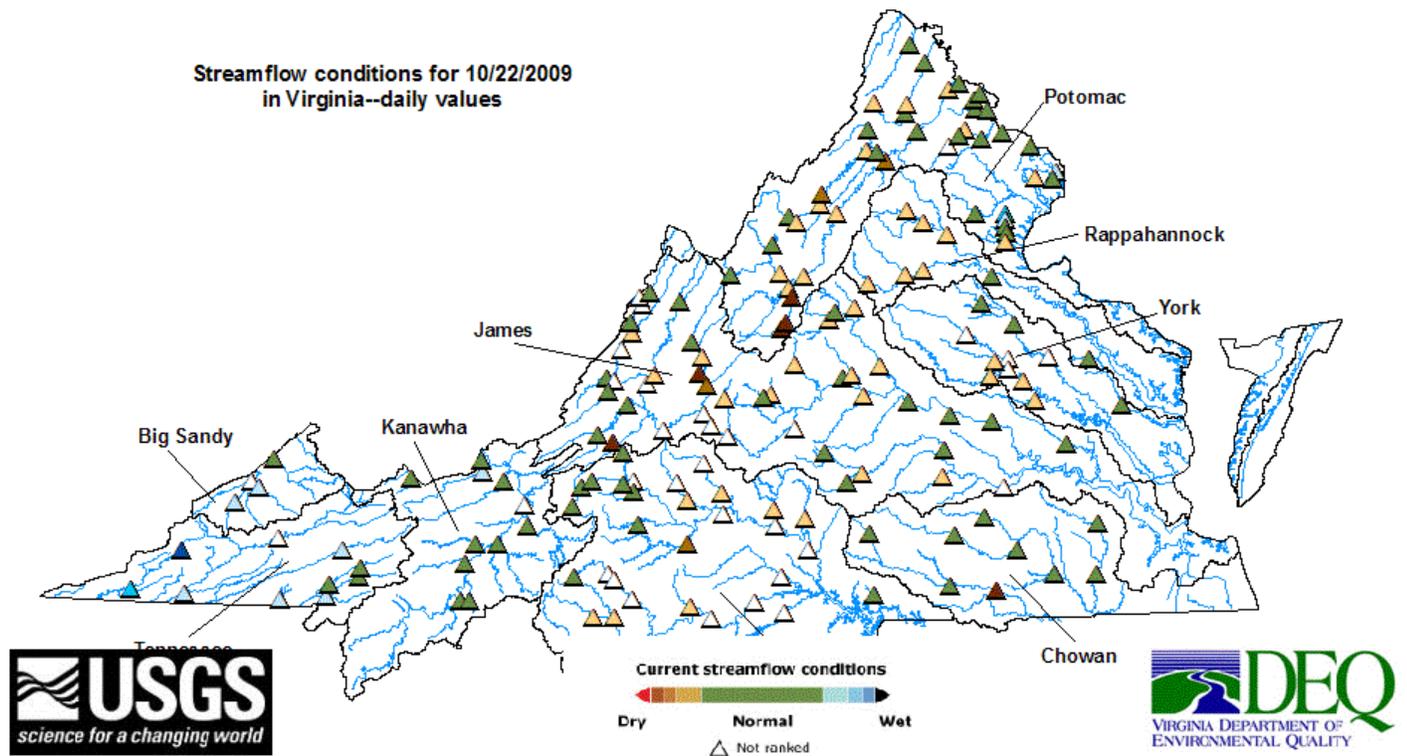
4041845	CHESTERFIELD CO CENTRAL WATER SYSTEM	Surface water; Swift Creek reservoir; purchases finished water	N	S- Purchases water from the City of Richmond and the Appomattox River Water Authority. Reservoir is at full level.	286,000
4057800	TAPPAHANNOCK, TOWN OF	Groundwater wells	N	S	2,100
4073311	GLOUCESTER 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	V	S- Conservation at all DOC facilities	9,300
4085398	HANOVER SUBURBAN WATER SYSTEM	Surface water; North Anna River; some groundwater wells; purchases finished water	V	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	V	S (see Richmond)	289,000
4101900	WEST POINT, TOWN OF	Groundwater wells	N	S	3,000
4127110	DELMARVA PROPERTIES	Groundwater wells	V	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	V	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	S- reservoir full but not overflowing as of 10/5/2009	2,500
5029085	Buckingham County	Troublesome Creek Reservoir	N	S	5,751
5037300	Town of Keysville	Keysville Reservoir	N	S	800
5780600	HCSA-South Boston	Dan River	N	S	11,388

5141640	Town of Stuart	South Mayo River	N	S	1,500
5147170	Town of Farmville	Appomattox River	N	S	7,011
5011050	Town of Appomattox	Wells	V	S	1,708
5067265	Hales Point	Wells	N	S - hauling water	46
5067348	Westlake Water Co	Wells	V	S - hauling water	620
5690400	City of Martinsville	Beaver Creek Reservoir	N	W - reservoir 1.7 feet below spillway as of 10/6/2009- level continuing to drop but not problem	16,000
6061200	Marshall	Groundwater	M	S - The WSA Alert Messaging Service maintains the Water Use Restriction Notice as of 10/7/2009. 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 - 10/7/09 No water supply problems. Voluntary water use restrictions until new Well 14 is placed in service.	2,000
6107200	Town of Hillsboro	Spring/Well	V	W -10/7/09 Hauling water. Combined yield from new well and spring has not been consistently adequate to meet current demand. A leak survey revealed 10 potential leaks in the distribution system.	58
6107601	LCSA Raspberry Falls Subdivision	Groundwater	V	S -10/709 Both wells in service. No problems with water supply - quantity. Voluntary conservation in place beginning 3/11/08.	400
6107400	Town of Lovettsville	Groundwater	V	S -10/7/09 Voluntary water use restrictions remain in place; however there is no problem with water supply.	1,280
6107650	Town of Round Hill	Groundwater	V	S - 10/7/09 - No water supply problems. Voluntary water use restrictions replace mandatory water use restrictions on 4/1/08.	3,156

6153260	Woodbridge Mobile Home Park	Groundwater	M	<p>S -- 10/7/09 Low water pressure problem continues. Waterworks continues to have low pressure due to inadequate sources and leaks in the distribution system. This problem is indirectly related to drought as source problems existed previously.</p> <p>A new well was drilled in November 2008. Developmental Testing completed in December 2008, all water quality results reviewed by VDH ODW. Plans for connecting new well to waterworks have been reviewed and comments issued to owner.</p>	320
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APPENDIX G

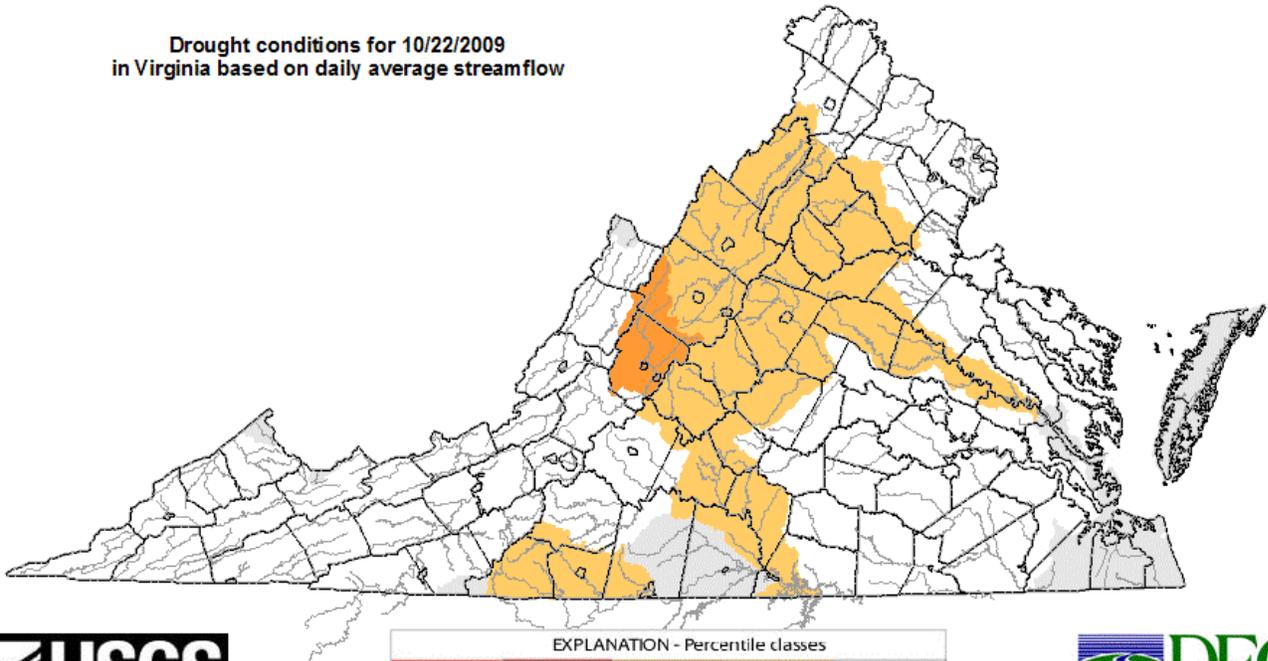
USGS Streamflow Conditions for October 22, 2009



APPENDIX H

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

Drought conditions for 10/22/2009
in Virginia based on daily average streamflow



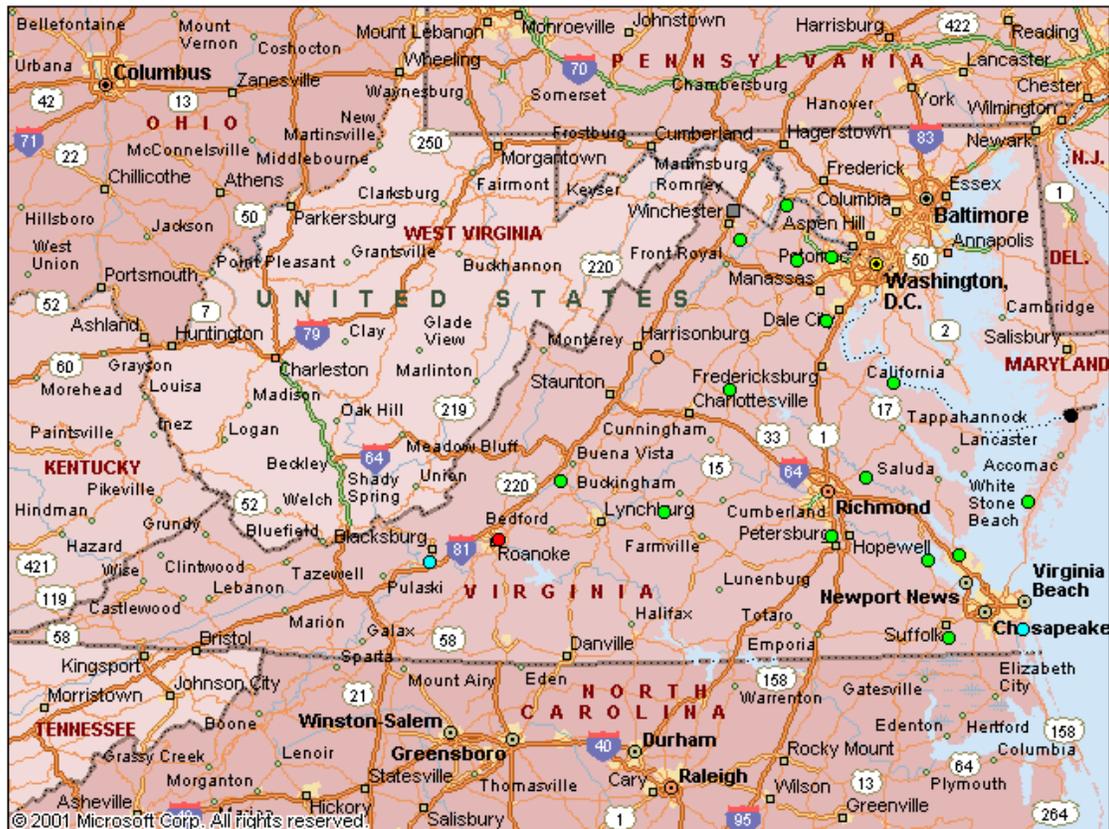
EXPLANATION - Percentile classes				
Low	<-5	6-9	10-24	Insufficient data
Extreme drought	Severe drought	Moderate drought	Below normal	



APPENDIX I

Virginia Climate Response Network

October 22, 2009



Explanation - Percentile classes (symbol color based on most recent measurement)

New	<10	10-24	25-75	76-90	>90	New	Not
Low	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal	High	Ranked

Map generated 10/22/2009 9:28:38 AM