Virginia Water Central

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A view of the Catoctin Creek bridge on Featherbed Road in Loudoun County on June 25, 2010. Virginia's Scenic River Advisory Program is observing its 40th anniversary in 2010.

IN THIS ISSUE

VirginiaTech
Invent the Future

Editor's Comment

Students Learning, Writing, and Serving

By Alan Raflo, Virginia Water Central Editor

For over 10 years, I have had the privilege of working with students doing writing internships through the Virginia Tech English Department. The students—typically in their senior year—seek internships to develop their skills in writing, editing, researching topics, and managing a project from start to finish. The Water Center welcomes the interns for their energy and ability to help the Center provide more information and service to Virginia's citizens.

These **service-learning partnerships** have resulted in a number of *Virginia Water Central* articles, such as "Loc, Lac, or Reservoir: There's More to Lakes than Water" (June 1999, by Dinesh Gupta); "Beaches and Bacteria" (August 2004, by Jackie McGeehan); "The Widespread Issue of Spreading Biosolids" (August 2005, by Katie Moore); and "Flood Hazard Mitigation from a Grundy, Virginia, Perspective" (June 2006, by Amanda Mullins). In these and other cases, the student interns researched important water resources topics and produced articles that continue to offer objective, well-referenced, and useful information.

I'm pleased to present in this issue of *Water Central* the work of Danielle Guerin, a May 2010 Virginia Tech graduate who was an intern at the Water Center in the Spring 2010 semester. Ms. Guerin's took on a challenging topic: **stormwater**, with its various connections between land use and water resources, and its multi-level regulatory situation that was changing in Virginia as she worked. Ms. Guerin's first article (p. 3) provides an introduction to the topic for Virginians who may be hearing about or confronting stormwater-related problems or requirements. Her second article (p. 6) compiles stormwater-information sources, focusing particularly on federal and state laws and regulations. Of particular note in the latter article is her list of information sources from Virginia's Chesapeake Bay neighbor states.

I hope you find Ms. Guerin's articles—and the rest of this issue—readable and valuable. Even more, I hope you take pride that every semester thousands of Virginia college students like Ms. Guerin are working hard to learn all they can and put their learning into practice to make our Commonwealth smarter, stronger, and more sustainable.

TEACHING WATER
Especially for Virginia's K-12 teachers

This Issue and the Virginia Standards of Learning

Below are suggestions for Virginia Standards of Learning (SOLs) that may be supported by items in this issue. The SOLs listed below are from Virginia's 2010 Science SOLs and 2008 Social Studies SOLs. Abbreviations: BIO = biology; CE = civics and economics; ES=earth science; GOV = Va. and U.S. government; LS=life science; WG = world geography.

Newsletter Section	Science SOLs	Social Studies SOLs
Feature: Stormwater Introduction	3.10, 4.5, 4.9, 6.5, 6.7, 6.9, LS.6, LS.11, ES.6, ES.8, BIO.8.	CE.1, WG.2, WG.11, GOV.1, GOV.16.
For the Record: Stormwater Information Sources	4.9, 6.7, 6.9.	CE.1, CE.6, CE.7, WG.2, WG.7, GOV.1, GOV.8, GOV.9, GOV.16.
Water Status: Precipitation, Groundwater, Streamflow, and Drought	3.9, 4.6, 4.9, 6.5, 6.7, LS.6, ES.6, ES.8, ES.12.	WG.2

FEATURE ARTICLE

Wherever You Are, Stormwater's On Your Street

By Danielle Guerin

Danielle Guerin, a May 2010 graduate from Virginia Tech with a B.A. in English, was an intern at the Virginia Water Resources Research Center during the Spring 2010 semester.

"When it rains, and sort of the city takes a bath, what do you do with the wash water?"—Robert Perciasepe, deputy administrator of the U.S. Environmental Protection Agency (EPA) ("Officials unveil $1.7 billion plan to clean Anacostia River," *Washington Post*, 4/20/10).

In the quote above, the U.S. EPA's Robert Perciasepe was referring to problems that stormwater runoff in Washington, D.C., causes for the Anacostia River. But Mr. Perciasepe's comment can be applied to all waterways that are affected by **stormwater**. Everyday activities influence the kinds of substances that can be carried by stormwater, and this in turn can negatively impact local ecosystems and water supplies.

This article is for homeowners, renters, pet owners, business owners, and others who live or work in urban and suburban areas, because stormwater starts on surfaces that are all around where we live, work, and travel. The article provides basic facts about stormwater and its many impacts on the environment, tips to help reduce the pollution and volume of stormwater, sources of more information. Photos throughout the article show examples of stormwater and some management practices.

Why Should I Care About Stormwater?

Stormwater is heavy rainfall or snowmelt that cannot infiltrate the ground and therefore flows off into natural surface waters—like streams, lakes, and coastal waters—or into constructed conveyance systems that eventually lead to natural waters. In woodlands and other areas with dense vegetation, relatively little stormwater runoff occurs because the vegetation intercepts rainfall, slows the water, and allows water to seep into the ground. In developed areas, however, there are more impenetrable, or **impervious**, surface—such as roads, roofs, parking lots, and sidewalks—where stormwater can easily run off into water supplies.

To a large extent, stormwater is precipitation that doesn't become **groundwater**. Groundwater flows below ground in the spaces between soil, sand, or rock, whereas stormwater flows above ground. These

materials serve to slow and filter water before it may eventually reach surface waterways (sometimes after many years). But stormwater, flowing above ground, typically goes unfiltered directly from the surface, through storm sewer systems, and into waters people use for swimming, fishing, and drinking.[1]

The Virginia Department of Conservation and Recreation (DCR) states that a high volume of stormwater runoff "can overwhelm waterways, causing [stream bank] erosion, localized flooding, and property damage" (http://www.dcr.virginia.gov/soil_and_water/stormwat.shtml, accessed 4/20/10). Also, debris, litter, animal or human wastes with bacteria or other pathogens, chemicals, excess sediments, excess nutrients (nitrogen and phosphorus), and other pollutants that are not filtered from stormwater can contaminate waterways, harming aquatic life and potentially humans.

Stormwater runoff in a Virginia Tech parking lot during a rainstorm.

The U.S. EPA states that "polluted stormwater runoff is a leading cause of impairment to the nearly 40 percent of surveyed U.S. water bodies which do not meet water quality standards" ("Stormwater Frequently Asked Questions," http://cfpub.epa.gov/npdes/faqs.cfm?program_id=6, accessed 8/23/10).[2] Here is one EPA list[3] of possible effects of stormwater pollution.

A stormwater-filled stream on the Virginia Tech campus, July 2006.

- **Sediments** can cloud water—making growth difficult for aquatic plants—and can cover aquatic habitats.
- Excess **nutrients** can cause algae blooms, leading to an oxygen deficit when the algae decompose.
- Debris (for example, plastic bags, six-pack plastic rings, and balloons) can suffocate or disable aquatic life.
- Household **wastes** (for example, insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids) can poison aquatic life and potentially sicken animals and humans who eat contaminated aquatic life or drink polluted water.
- **Bacteria and other pathogens** can be carried to swimming or shellfishing areas and cause health hazards and closures of such areas.

What Can I Do About Stormwater?

Many everyday activities add to the stormwater volume and pollution. Homeowners, renters, car owners, pet owners, and business owners can help reduce stormwater problems with a few simple actions. The following suggestions are taken from the EPA's Web site, "Polluted Runoff: Do's and Don't's Around the Home (http://water.epa.gov/polwaste/nps/dosdont.cfm, accessed 4/20/10); please see that site for more suggestions and details.

Residents can adjust **everyday household activities** to reduce stormwater quantity and pollutants.

- Recycle or properly dispose of household chemical products. Take unused household waste to hazardous-waste collection centers

A stormwater-detention pond at the Moog Components Group facility in Blacksburg, Va., April 2010.

[1] *Editor's note:* In some municipalities, the storm-sewer system is connected to the sanitary sewer system (the system that leads to a wastewater treatment plant). In such **combined-sewer** situations, stormwater normally is treated before discharge into a water body, but high stormwater flows can sometimes cause sewer system overflows. Many cities—including Lynchburg and Richmond—are spending millions of dollars over many years to disconnect their storm-sewer systems from their sanitary-sewer systems.

[2] Waters that are "too polluted or otherwise degraded to meet water quality standards set by the states, territories, or authorized tribes" are referred to as "impaired waters" under the federal Clean Water Act (U.S. EPA, http://www.epa.gov/owow/tmdl, accessed 4/20/10).

[3] U.S. EPA, "After the Storm," http://www.epa.gov/weatherchannel/stormwater.html, accessed 5/04/10.

instead of pouring the waste down the drain or on the ground where it can contaminate stormwater runoff.
- Recycle used motor oil and anti-freeze; do not dispose of these liquids on the ground or in the storm drains.
- Use non-toxic household products whenever possible.
- Use the least amount of chemicals needed and apply them only as directed.
- Wash cars only when necessary, and not on paved driveways—where the soapy water can will run off into the storm sewer—but either on grass to help water infiltrate the ground or at commercial carwashes that properly dispose of used water.

A "green roof" demonstration on Virginia Tech's Seitz Hall, April 2010. Green roofs are intended to reduce rooftop stormwater runoff.

Residents can also use **landscaping and outside water conservation techniques** to increase stormwater infiltration and decrease runoff.
- Avoid over-watering lawns.
- Compost or mulch yard waste, including grass clippings, which can serve as natural fertilizer.
- Use only the amount of fertilizer necessary and never more than directed.
- Use slow-watering techniques, such as trickle irrigation systems or soaker hoses instead of sprinklers.
- Catch water draining off the roof in rain barrels.
- Use plants, trees, or rain gardens to slow and disperse the surface flow of water.

Pet waste also contributes to stormwater pollution because it contains bacteria and nutrients that stormwater can carry unfiltered to local waterways.
- Collect and dispose of pet waste by putting it in the trash.

Business owners can also change their impact through correct waste-management practices and by cleaning their property:
- Keep dumpsters and grease storages covered and clean.
- Sweep litter and debris from sidewalks, driveways, and parking lots.
- Report any chemical spills to local hazardous waste cleanup teams.

Where Can I Find More Information About Stormwater?

Stormwater is federally regulated by the **U.S. EPA** under the Clean Water Act' National Pollutant Discharge Elimination System (NPDES), and is regulated state-by-state through individual state agencies. The **Office of Water Management (OWM)** is the EPA division that deals with stormwater. The EPA is home to three stormwater programs: the Municipal Stormwater Program (202-564-1939), the Industrial Stormwater Program (202-564-0577), and the Construction Stormwater Program (202-564-0721); the EPA Stormwater website is http://cfpub.epa.gov/npdes/home.cfm?program_id=6.

The EPA also has regional stormwater contacts. For Virginia, phone the Region 3 contact in Philadelphia at 215-814-2788.

The **Virginia Department of Conservation and Recreation (DCR)** is in charge of the **Virginia Stormwater Management Program (VSMP)**. The VSMP was mandated by and is modeled after the federal NPDES under the Clean Water Act (noted above). Virginia has specific stormwater treatment requirements, but many localities have their own requirements with additional specifications. For more information about the Virginia DCR's SWMP, including access to the Virginia Stormwater Management Handbook, visit http://www.dcr.virginia.gov/soil_and_water/stormwat.shtml or contact Virginia DCR headquarters at 804-786-2064.

(*Ed. note:* Please see the "For the Record" section of this issue of *Virginia Water Central*—immediately following this article—for more sources of information about stormwater. Also, the February 2000 issue of *Water Central*, p.1. has an introduction to urban stormwater; back issues of *Water Central* are available online at www.vwrrc.vt.edu/watercentral.html or by phoning 540-231-5463.)

Stormwater Information Sources

By Danielle Guerin

Water Central thanks David Dowling, Virginia Department of Conservation and Recreation; Lee Hixon, Town of Blacksburg; and Kurt Stephenson, Virginia Tech Department of Agricultural and Applied Economics, for their assistance with this article.

Stormwater is rainfall or snowmelt that is unable to infiltrate into the ground and consequently runs off to surface water bodies (streams, rivers lakes, or coastal waters). Stormwater can carry excess nutrients, sediments, and contaminants into surface waters or man-made conveyance systems and impair[4] water quality. Several federal and state regulations and programs exist to help control stormwater runoff from construction-related, industrial, or municipal sources. This article includes sources of information that explain the stormwater problem and the federal, Virginia, and other Chesapeake Bay states' stormwater regulatory programs.

Laws and Regulations

Federal Laws and Regulations

The **U.S. Environmental Protection Agency (EPA)** has placed all water laws, regulations, policies, guidelines, and legislation online at http://www.epa.gov/water/laws.html. The EPA is involved with stormwater through the **Clean Water Act (CWA)**, which regulates the release of pollutants into waterways through National Pollution Discharge Elimination System (NPDES) permits.[5] The **Office of Wastewater Management (OWM)** is the division under the EPA Office of Water that deals with stormwater. Information about OWM and the NPDES in general can be found at http://www.epa.gov/owm/ and http://cfpub.epa.gov/npdes/index.cfm, respectively. The Web site specifically for information about **EPA's stormwater program** (part of its NPDES responsibilities) is http://cfpub.epa.gov/npdes/home.cfm?program_id=6.

EPA stormwater regulations cover three types of stormwater generators: construction activities, industrial sites, and municipal sources (municipal sources are often referred to as **municipal separate storm sewer systems**, or **MS4s**[6]). EPA headquarters, in Washington, D.C., is home to all three separate stormwater programs: contact the Construction Program at (202) 564-0721, the Industrial Program at (202) 564-0577, or the Municipal Program at (202) 564-1939. The EPA also has regional stormwater contacts; phone the Region 3 contact for Virginia in Philadelphia, Penn., at (215) 814-2788.

Virginia Laws and Regulations

The **Virginia Department of Conservation and Recreation (DCR)** is in charge of the **Virginia Stormwater Management Program (VSMP)**. The VSMP was mandated by and is modeled after the federal NPDES under the Clean Water Act (noted above). According to the DCR's VSMP Web site at http://www.dcr.virginia.gov/soil_and_water/stormwat.shtml, the program was "developed to protect citizens, property and natural resources from unmanaged stormwater runoff," and the Virginia Stormwater Management Act and VSMP permit regulations "manage the quantity and quality of stormwater runoff on active construction sites and on a regional or watershed basis." Virginia has specific stormwater requirements, but many localities have their own requirements with additional specifications. For more information regarding DCR's VSMP, including access to the Virginia Stormwater Management Handbook, visit the Web site listed above or contact the Virginia DCR headquarters at 203 Governor Street, Suite 206,

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[4] Under Section 303(d) of the federal Clean Water Act, impaired waters are "too polluted or otherwise degraded to meet the water quality standards set by states, territories, or authorized tribes." (U.S. EPA, http://www.epa.gov/owow/tmdl, 4/20/10).

[5] NPDES permits control water pollution by regulating point sources (conveyances such as pipes and man-made ditches) that discharge pollutants into waters. Industrial, municipal, and other facilities must obtain permits if their discharges go directly into surface waters. (U.S. EPA, http://cfpub.epa.gov/NPDES/, 5/3/10).

[6] An MS4 is a conveyance or conveyance system, owned by a state, city, town or other entity that discharges water into the United States that is designed or used to collect and convey stormwater. They are not combined sewers or part of sewage treatment plants. (U.S. EPA, http://cfpub.epa.gov/npdes/stormwater/munic.cfm, 5/3/10)

Richmond, Virginia 23219; (804) 786-2064. Additional information regarding **stormwater best management practices (BMPs)** may be found on the Virginia Stormwater BMP Clearinghouse at http://www.vwrrc.vt.edu/swc/. Information regarding *industrial* stormwater permits is available from the Virginia Department of Environmental Quality (DEQ) at http://www.deq.state.va.us/vpdes/stormwater.html or by contacting DEQ's Central Office at 804/698-4086.

Recent Virginia Stormwater Regulation Developments

Since publication of a November 2005 Notice of Intended Regulatory Action (online at http://www.dcr.virginia.gov/lr2a.shtml, 8/31/10), Virginia has been considering new revisions to the VSMP Permit Regulations for construction activities (4 VAC 50-60, Parts I, II, and III, in the *Virginia Administrative Code*). The new regulations would set new standards for stormwater runoff from construction in new developments and significant redevelopment projects. The new standards would be incorporated into MS4 programs, and because MS4s already address runoff from new development and redevelopment, the new regulations would reset the standard for the goals MS4 programs must reach.

On December 9, 2009, the Virginia Soil and Water Conservation Board adopted revisions to these sections of the VSMP. The regulations currently remain suspended, however, as required by the 2010 Virginia General Assembly in HB 1220.SB 395. These bills state that the regulations "shall become effective within 280 days after the establishment by the [U.S. EPA] of a Chesapeake Bay-wide Total Maximum Daily Load (TMDL) but in any event no later than December 1, 2011." The legislation also specifies that the Board "shall convene an advisory panel of stakeholders to review the regulation and to make recommendations to the Board on revisions to the regulations necessary to, among other things, comply with such TMDL." For more information about these bills, visit http://leg1.state.va.us/lis.htm, click on "2010" under "Other Sessions," click on "Bills and Resolutions," and then enter either bill number.

Stormwater Information in Other Chesapeake Bay States

Maryland stormwater information is provided by the Department of Environment, 1800 Washington Boulevard, Baltimore, MD 21230; (410) 537-3000; http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/index.asp.

Pennsylvania stormwater information is provided by the Department of Environmental Protection, 400 Market Street, Harrisburg, PA 17101; (717) 787-2814; http://www.portal.state.pa.us/portal/server.pt?open=514&objID=554331&mode=2.

New York stormwater information is provided by the Department of Environmental Conservation, 625 Broadway, Albany, NY 12233 (518) 402-8013; http://www.dec.ny.gov/chemical/8468.html.

Delaware stormwater information is provided by the Department of Natural Resources and Environmental Control/Division of Soil and Water Conservation, 89 Kings Highway, Dover, DE 19901; (302) 739-9921; http://www.swc.dnrec.delaware.gov/Pages/SedimentStormwater.aspx.

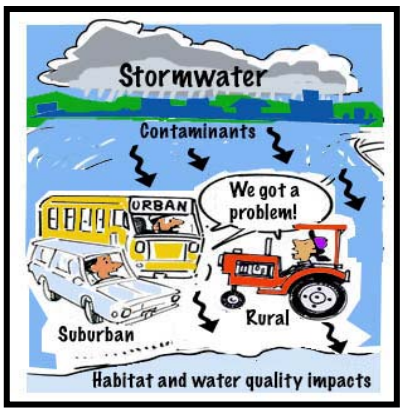
West Virginia stormwater information is provided by the Department of Environmental Protection/Division of Water and Waste Management, 601 57th Street, Charleston, WV 25304; (304) 926-0495; http://www.dep.wv.gov/WWE/Programs/stormwater/Pages/sw_home.aspx.

District of Columbia stormwater information is provided by the Department of the Environment/Stormwater Management Division, 1200 First Street, NE, Washington, DC 20002; (202) 535-1722: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495820,ddoeNav_GID,1486,ddoeNav,|31375|31377|.asp.

Previous *Water Central* Items on Stormwater

All issues of *Water Central* are available online at http://www.vwrrc.vt.edu/watercentral.html; or phone the editor at (540) 231-5463.

February 2000, p.1: "An Introduction to Urban Stormwater."
September 2006, p.11: News Focus on Stormwater.
April 2008, p.14: "Nutrient and Stormwater Researchers Tackle Two Water-quality Toughs"; and p.16: "A New Urban Stormwater Tool."
August 2009, p.8: "Potential Stormwater Impacts on Water Quality are the Focus of Two Significant Regulatory Proposals in Virginia."



VIRGINIA WATER STATUS REPORT

This section of Water Central presents recent and historical data on Virginia's precipitation, groundwater levels, stream flow, and occurrence of drought conditions.

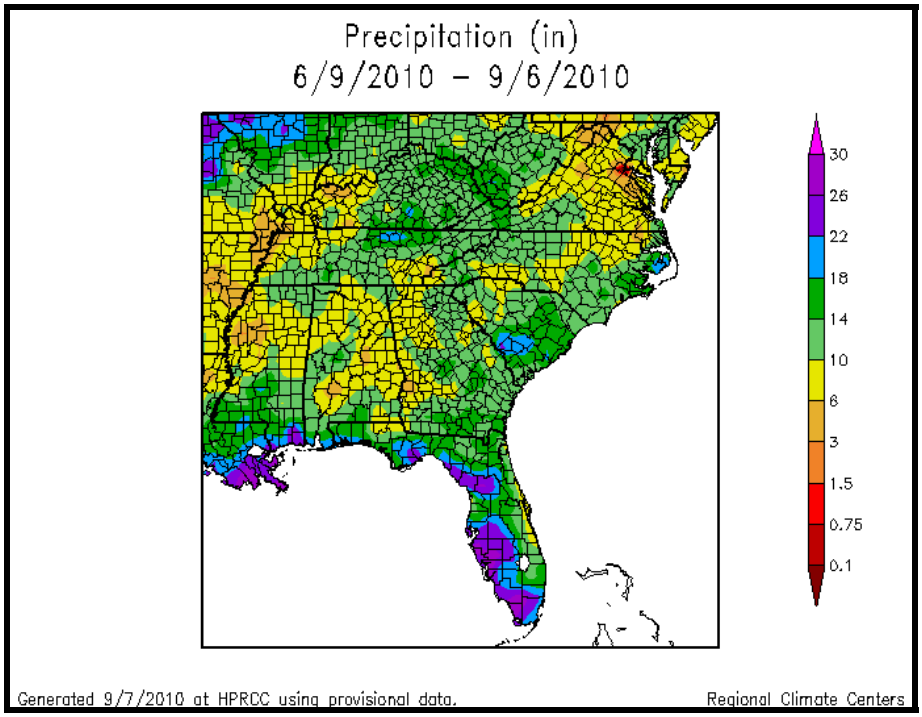
Precipitation in Virginia, September 2009-August 2010

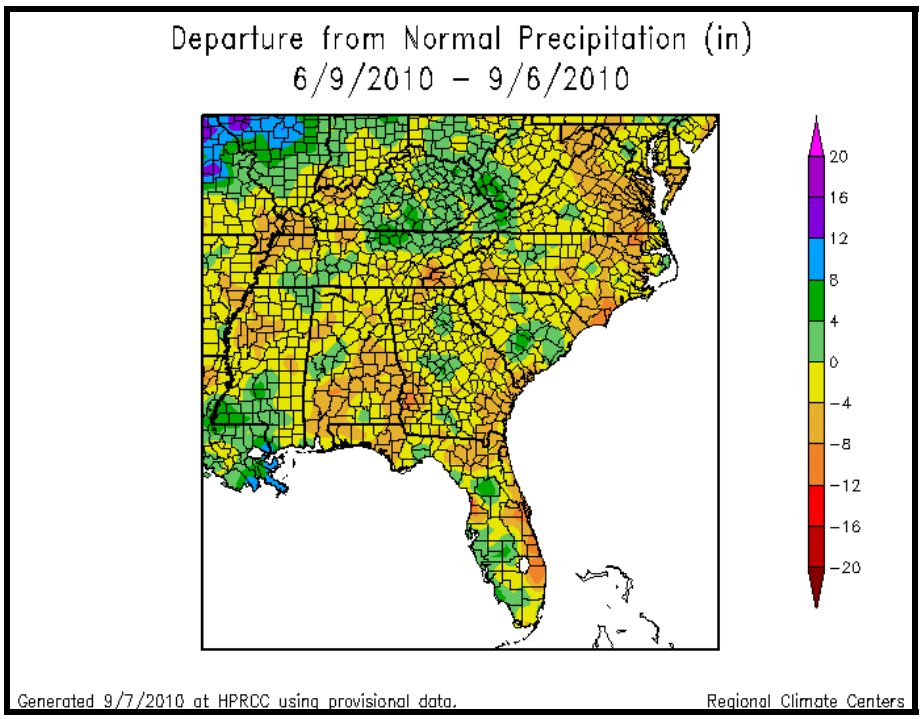
The chart below shows precipitation (in inches) over the last 12 months at nine National Weather Service (NWS) observation sites in or near Virginia. The upper number for each entry is the **total precipitation** for the respective site and month (with yearly total at the bottom of the chart), including the equivalent amount of water contained in any snowfall or other frozen precipitation. These values were found at the "Climate" sections of NWS Web sites, as follows: www.weather.gov/climate/index.php?wfo=mrx for the Tri-cities Airport in Tennessee, about 20 miles from Bristol, Va.; www.weather.gov/climate/index.php?wfo=rnk, for Blacksburg, Danville, Lynchburg, and Roanoke; www.weather.gov/climate/index.php?wfo=lwx, for Washington-Dulles; and http://mi.nws.noaa.gov/climate/index.php?wfo=akq, for Norfolk and Richmond. The lower number in each entry (in parenthesis) is the **average precipitation** for the locality and month (again, with the average yearly total at the bottom of the chart), over the period 1971—2000, according to the National Climatic Data Center, *Climatography of the United States No. 81* (available online at http://cdo.ncdc.noaa.gov/climatenormals/clim81/VAnorm.pdf). RL and RH mean record low or high, respectively, for that month. The amounts listed here are classified by the NWS as *provisional* data and are subject to revision; the National Climatic Data Center maintains any edited and *certified* data that are available.

	Bristol (Tri-Cities, Tenn., Airport)	Blacks-burg (Va. Tech Airport)	Danville (Airport)	Lynchburg (Regional Airport)	Norfolk (Internat. Airport)	Richmond (Byrd Intern. Airport)	Roanoke (Woodrum Airport)	Wash.-Dulles Airport
Sep. 2009	4.98 (3.08)	2.33 (3.39)	2.38 (4.08)	2.17 (3.88)	7.77 (4.06)	2.46 (3.98)	3.14 (3.85)	1.83 (3.82)
Oct. 2009	4.02 (2.30)	3.02 (3.19)	3.23 (3.71)	3.17 (3.39)	3.21 (3.47)	3.59 (3.60)	2.69 (3.15)	5.70 (3.37)
Nov. 2009	3.00 (3.08)	5.12 (2.96)	8.33 (3.07)	8.19 (3.18)	**9.20 RH** (2.98)	**9.60 RH** (3.06)	7.44 (3.21)	3.71 (3.31)
Dec. 2009	5.64 (3.39)	**6.66 RH** (2.87)	5.73 (3.16)	6.82 (3.23)	7.57 (3.03)	8.16 (3.12)	**8.22 RH** (2.86)	5.98 (3.07)
Jan. 2010	3.61 (3.52)	3.91 (3.37)	3.54 (4.03)	4.79 (3.54)	3.81 (3.93)	3.60 (3.55)	4.61 (3.23)	2.01 (3.05)
Feb. 2010	2.21 (3.40)	2.18 (3.02)	2.62 (3.41)	2.29 (3.10)	4.21 (3.34)	2.82 (2.98)	2.07 (3.08)	4.63 (2.77)
Mar. 2010	2.09 (3.91)	3.51 (3.83)	6.28 (4.25)	5.22 (3.83)	6.02 (4.08)	6.17 (4.09)	3.96 (3.84)	3.36 (3.55)
Apr. 2010	2.21 (3.23)	2.42 (3.83)	1.59 (3.83)	2.86 (3.46)	1.00 (3.38)	1.59 (3.18)	1.35 (3.61)	1.29 (3.22)
May 2010	2.58 (4.32)	4.89 (4.39)	4.02 (3.96)	4.56 (4.11)	4.60 (3.74)	2.62 (3.96)	5.35 (4.24)	5.42 (4.22)
June 2010	2.96 (3.89)	1.19 (3.93)	2.20 (3.50)	3.13 (3.79)	3.76 (3.77)	0.82 (3.54)	1.28 (3.68)	1.29 (4.07)
July 2010	1.58 (4.21)	4.62 (4.17)	2.09 (4.44)	2.89 (4.39)	5.84 (5.17)	1.19 (4.67)	5.73 (4.00)	4.17 (3.57)
Aug. 2010	6.26 (3.00)	5.09 (3.68)	5.52 (3.54)	6.53 (3.41)	3.59 (4.79)	3.92 (4.18)	5.00 (3.74)	4.42 (3.78)
Period Total	41.14 (41.33)	44.94 (42.63)	47.53 (44.98)	50.02 (43.31)	60.58 (45.74)	46.54 (43.91)	50.84 (42.49)	43.81 (41.80)

Precipitation, continued: Regional Precipitation Over the Past Three Months

For a more visual presentation over a wider area, the two graphs below—from the National Oceanic and Atmospheric Administration's (NOAA) Southeast Regional Climate Center, located at the University of North Carolina in Chapel Hill—show the total precipitation (in inches; top graph) over the past three months and the departure from normal (in inches above or below normal; bottom graph) over that period. Note that the values represented by a given color differ between the two graphs. T*hese data are provisional.* These graphs were taken from http://www.sercc.com/climateinfo/precip_maps on 9/7/10.





More Virginia climate information and data are available from the University of Virginia Climatology Office, online at http://climate.virginia.edu. To contact the office in Charlottesville, phone (434) 924-0548 or send e-mail to climate@virginia.edu.

Groundwater Levels at Selected Virginia Wells, September 2010

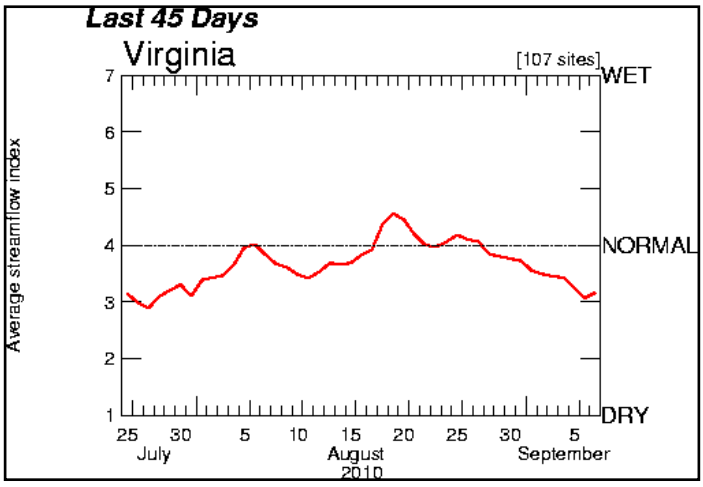
As of September 6, 2010, the Virginia Active Water Level Network—maintained by the U.S. Geological Survey (USGS) and available online at http://groundwaterwatch.usgs.gov/StateMaps/VA.html—provided access to groundwater levels at 522 wells in 67 Virginia counties and cities. At 116 of these observation wells in 40 localities, *real-time data* (updated every 5 to 60 minutes) were being recorded. The table below shows the September 6 daily average level from real-time wells in 19 localities (with one exception noted). These readings are *provisional* (i.e., subject to revision). All measurements are in **feet below the land surface**, rounded to the nearest 0.1 foot; **a smaller value means wetter conditions, while a larger value means drier conditions.** The table also shows levels reported in previous issues of *Water Central*, plus the median level for this month, the deepest (driest) level, and the shallowest (wettest) level (all for each well's period of record). Historical information on groundwater is also available from the USGS' annual reports of groundwater. Data for 2002 to 2009 are available online at http://wdr.water.usgs.gov/; for previous years, check your local library for printed copies of the reports.

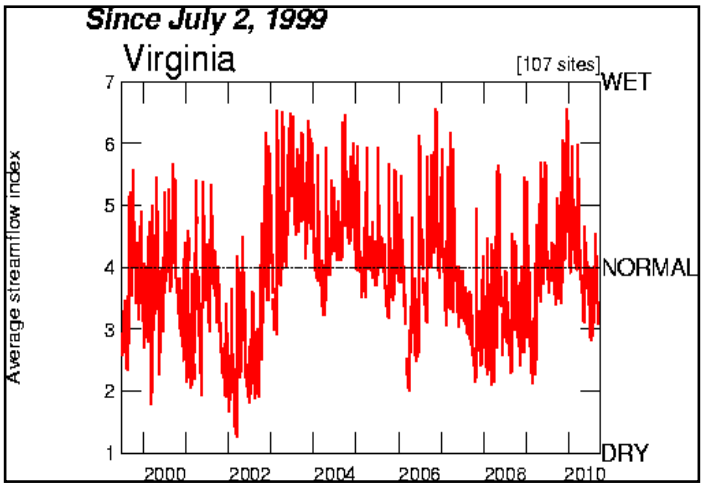
Well (Local #)	9/6/10 Level	6/8/10 Level	3/9/10 Level	Sept. Median	Record Deepest (Driest)	Record Shallowest (Wettest)	Period of Record
Accomack (66M19SOW110S)	10.5	9.2	7.4	10.1	11.3 (Nov. 1981)	6.8 (Mar. 2010)	Since Sep. 1978
Buckingham (41H 3)	21.1	15.5	15.5	22.9	36.4 (Oct. 2002)	7.4 (Apr. 1973)	Since Mar. 1971
Clarke (46W 175)	37.5	33.1	32.9	39.1	45.7 (Sep. 2002)	23.5 (Sep. 2003)	Since Mar. 1987
Fairfax (52V 2D)	16.9	13.7	9.8	15.8	24.9 (Dec. 1998)	6.5 (Mar. 1984)	Since Oct. 1976
Hanover (53K 19 SOW 080)	20.9	16.7	12.9	20.5	22.9 (Aug. 1984)	5.1 (Aug. 2004)	Since Jan. 1978
Loudoun (49Y 1 SOW 022)	60.4	58.9	55.7	60.2	62.0 (Feb. 2008)	48.0 (June 1972)	Since Nov. 1963
Montgomery (27F 2 SOW 019)	5.6	4.1	1.7	5.7	7.3 (Dec. 1969)	< 0.0 (Mar. 1993)	Since Apr. 1969
Northampton (63H 6 SOW 103A)	6.8	5.2	1.9	7.1	10.0 (Oct. 2002)	0.8 (Aug. 2004)	Since Sep. 1977
Orange (45P 1 SOW 030)	31.2	22.7	19.1	29.5	39.0 (Aug. 2002)	11.8 (Apr. 1973)	Since Feb. 1965
Prince William (49V 1)	10.7	9.0	7.2	10.6	13.1 (Sep. 1991)	6.5 (Mar. 2010)	Since Nov. 1968
Roanoke City (31G 1 SOW 008)	18.9	19.0	18.8	18.3	19.3 (Jun. 1987)	12.4 (Feb. 1986)	Since Aug. 1966
Rockbridge (35K 1 SOW 063)	27.5	24.3	19.9	26.2	30.4 (Sep. 2002)	14.3 (Apr. 1987)	Since Jun. 1972
Rockingham (41Q 1)	75.2	67.4 (6/5)	65.5	72.2	99.0 (Oct. 2002)	57.7 (Feb. 1998)	Since Aug. 1970
Shenandoah[7] (40U 3 SOW 218)	15.4	13.1	See footnote	Not available	16.3 (Oct. 2009)	11.2 (Mar. 2010)	Since Oct. 2006
Suffolk (58B 13)	12.1	8.4	5.5	10.8	13.4 (Jan. 1981)	2.0 (Sep, 1999)	Since Mar. 1975
Surry (57E 13 SOW 094C)	11.0	8.9	5.9	9.5	11.2 (Dec. 1981)	3.9 (May 1980)	Since Jul. 1978
Virginia Beach (62B 1 SOW 098A)	5.6	3.7	1.8	5.2	12.0 (Sep. 1980)	0.9 (Nov. 2009)	Since Jun. 1979
Westmoreland (55P 9)	9.2 (8/3)	5.9	<0.0	7.6 (Aug.)	12.8 (Dec. 1988)	< 0.0 (Dec. 2009)	Since Jul. 1977
York (59F 74 SOW184C)	11.7	8.3	6.1	Not available	14.1 (Jan. 2002)	0.9 (Nov. 2006)	Since Jun. 1990

[7] The Shenandoah County well has been included in this table only since the May 2010 issue of *Water Central*, when it was added to replace Frederick County well 46X 110, at which data collection was discontinued in November 2009.

Stream Flow in Virginia, July-September 2010

Average Daily Stream Flow Index, Compared to the Historical Average for the Date





The graphs above, from the U.S. Geological Survey's (USGS) "WaterWatch—Current Water Resources Conditions" Web site (http://water.usgs.gov/waterwatch/?m=real&r=va&w=real%2Cplot, 9/7/10), compare recent Virginia stream flow to historical records.

The data in the graphs come from 107 sites that have at least 30 years of records. Each graph uses a "**stream flow index**," which measures how a site's average stream flow *over 24 hours* (the **average daily stream flow**) compares to the historical average stream flow *for that same site and date*. The graphs show a further average: the stream flow index averaged *over all monitoring stations*.

Index values (1-7 on the vertical axis in the graphs) mean the following:

Values indicating dry conditions:

1 = average daily flow is record low for that date;
2 = average daily flow is in the lowest 10 percent of historical values for that date;
3 = average daily flow is in the lowest 25 percent of historical values for that date, but exceeds the lowest 10 percent.

Value indicating "normal" flow:

4 = average daily flow exceeds the lowest 25 percent of historical values for that date, but is less that the highest 25 percent of values.

Values indicating wet conditions:

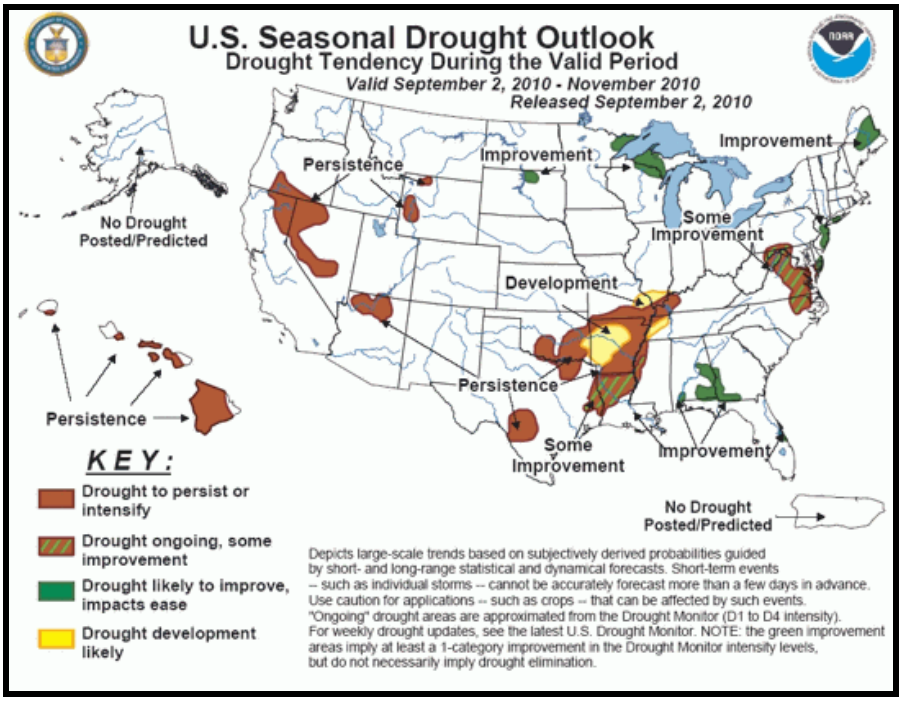
5 = average daily flow exceeds 75 of historical values for the date, but is lower than the highest 10 percent of values.
6 = average daily flow exceeds 90 percent of historical values for that date;
7 = average daily flow for the graphed date is record high for that date.

Gaps in the data: Data are not plotted for days when less than two-thirds of the sites report data (due to equipment or weather problems), because a statewide average on those days may misrepresent actual conditions.

Gaging station on South Fork Catoctin Creek near Waterford, Va. (Loudoun County), June 2010.

A USGS **map of current stream flow conditions** compared to historical flows is available online at http://water.usgs.gov/waterwatch/?m=real&r=va. This Web site also has maps that show average flows over the previous 7-, 14-, and 28-day periods.

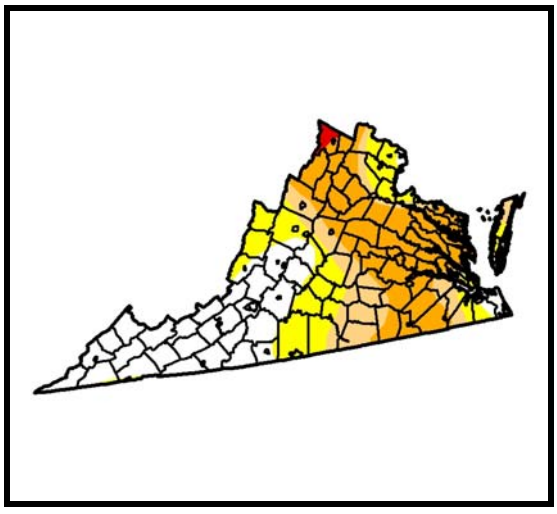
Drought Update



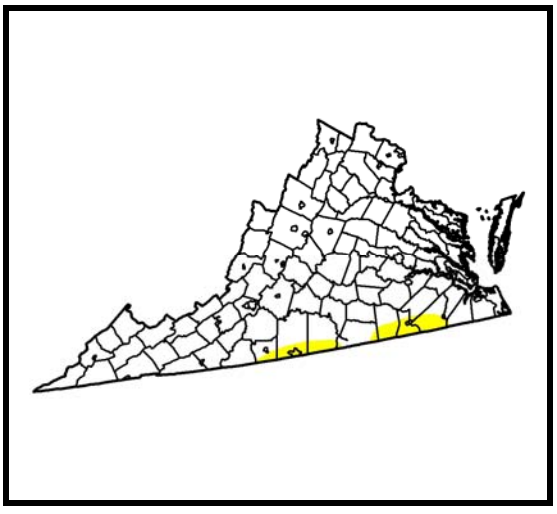
The national drought outlook for September-November 2010, according to the National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center Web site, www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html, accessed 9/8/10.

From the U.S. Drought Monitor: Virginia Conditions Now and One Year Ago

The U.S. Drought Monitor, available online at www.drought.unl.edu/dm/monitor.html, is a weekly nationwide drought assessment by federal agencies and state climatological centers. The following graphs show Drought Monitor assessments of Virginia conditions on September 7, 2010, compared to September 8, 2009. Note on the September 2010 map the band of severe drought covering most of the eastern third of the state, and the area of extreme drought in Frederick County.



September 7, 2010



September 8, 2009

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

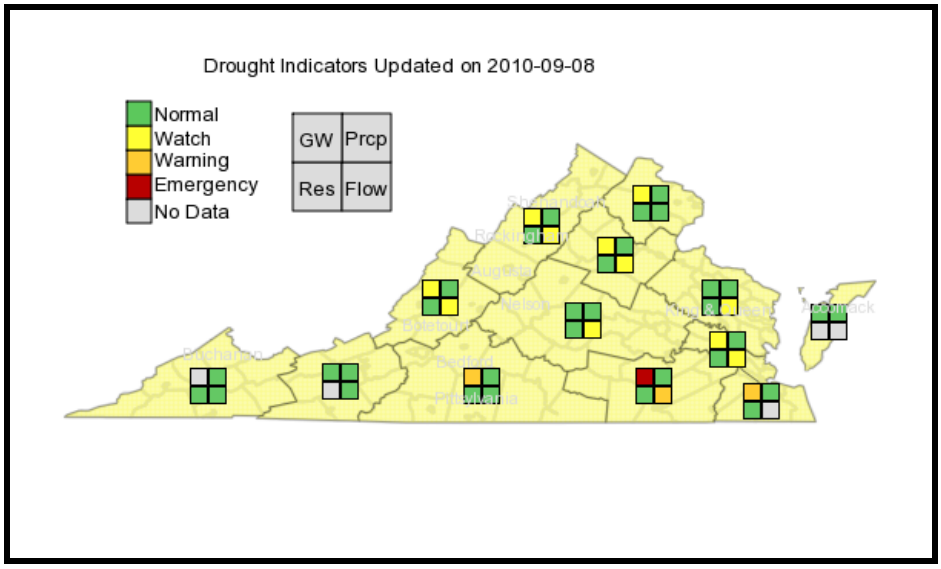
Source: Images taken from archive of U.S. Drought Monitor, www.drought.unl.edu/dm/archive.html, 9/9/10. Authors: M. Rosencrans, NOAA, for 9/7/10 map; Rich Tinker, NOAA, for 9/8/09 map.

The Drought Monitor also gives *percentages* of the country, of regions, and of individual states classified in the drought categories. The following table shows how much of the country and of Virginia received different Drought Monitor ratings in recent months and one year ago.

Drought Monitor Report Date	Percentage of area rated "abnormally dry" (D0) or worse	Percentage of area rated "severe drought" (D2) or worse
9/7/10	US = 27%; VA = 67%	US = 2%; VA = 31%
8/10/10	US = 25%; VA = 87%	US = 2%; VA = 34%
7/6/10	US = 27%; VA = 86%	US = 1%; VA = 0%
6/8/10	US = 25%; VA = 0%	US = 3%; VA = 0%
9/8/09	US = 31%; VA = 4%	US = 5%; VA = 0%

From the Virginia Drought Monitoring Task Force

On July 14, 2010, the Virginia Department of Environmental Quality issues a statewide drought watch, based on the percentage of the state categorized as abnormally dry by the U.S. Drought Monitor, below-normal precipitation over the previous 60 days, below normal stream flows (below the 25th percentile) in many gaging locations, agricultural impacts (poor hay harvests, pasture conditions, and corn-yield prospects), and above-normal wildfire activity. The map below, from the Virginia Drought Monitoring Web page at http://www.deq.virginia.gov/waterresources/drought/homepage.html, shows the **September 8 status of four drought indicators**—groundwater (GW), precipitation (Prcp), stream flow (Flow), and reservoir levels (Res)—in Virginia's 13 drought-evaluation regions.



Other Useful Sources of Information Online

- Va. Dept. of Forestry map of local burning restrictions: http://www.dof.virginia.gov/fire/burn-bans.htm.
- Va. Dept. of Environmental Quality water-conservation tips: www.deq.virginia.gov/waterresources/waterconservation.html.

Don't Forget the Water Center's Online Water Status Page!

The Water Center's online "Water Status Information" area has links to current and historical information on drought, groundwater, precipitation, stream flow, and severe weather. Find it at www.vwrrc.vt.edu/water_status.html.

IN AND *OUT OF* THE NEWS
Newsworthy Items You May Have Missed

The items in this section are based on information in the source(s) indicated in parentheses at the end of each item. Most of this issue's items were reported between June 1 and September 8, 2010. Except as otherwise noted, localities mentioned are in Virginia and dates are in 2010. All Web sites listed were functional as of September 9, 2010. Frequently used abbreviations: DEQ = Virginia Department of Environmental Quality; DCR = Virginia Department of Conservation and Recreation; DGIF = Virginia Department of Game and Inland Fisheries; EPA = U.S. Environmental Protection Agency; SWCB = Virginia State Water Control Board; VMRC = Virginia Marine Resources Commission.

*For a weekly report on Virginia water news, have a listen to **Virginia Water Radio**, online at www.virginiawaterradio.org. The weekly broadcast/podcast is normally about eight minutes long; the three-to-four-minute news section comes first.*

Focus on Water-supply Planning in Albemarle County and Charlottesville

The Albemarle County-Charlottesville area is in the midst of reconsidering a 2006 decision on a 50-year water-supply plan. In that year, Albemarle County and the City of Charlottesville to build a new, higher dam at Ragged Mountain Reservoir and transfer water—via a new pipeline—from the South Fork Rivanna Reservoir to Ragged Mountain. Here are some recent developments in this long-running, complicated story. (For a previous *Water Central* update, please see the May 2010 News Supplement, p.15. Also, see the *Charlottesville Tomorrow*, http://www.cvillepedia.org/mediawiki/index.php/Community_water_supply_plan, for a review (as of January 2010) of long-term water-supply planning in the area.)

••On May 24, the Rivanna Water and Sewer Authority (RWSA) released estimates from consultant firm Schnabel Engineering that a new earthen dam (rather than concrete) to expand the Ragged Mountain Reservoir could be constructed for $20-$27 million.

••On June 15, RWSA released a report by HDR Engineering, Inc., finding that about 65 percent of the South Fork Reservoir could be dredged, in two phases, at an estimated cost of $34-$40 million, providing 228 million gallons of additional storage. The 2006 proposed project was estimated to provide an additional 1.7 billion gallons of storage. (*Charlottesville Daily Progress*, 6/16/10)

Ragged Mountain Reservoir. *Photo by Skip Degan copyright Tailwheel Basics LLC; courtesy of Rivanna Water and Sewer Authority.*

••In late July, the Virginia Department of Environmental Quality (DEQ) estimated that a "safe yield" of 16.8 million gallons per day (MGD) would be provided by a water-supply plan combining South Fork Rivanna dredging with a 13-foot increase of the existing Ragged Mountain dam. The plan approved in 2006 called for a new dam and a 45-foot increase for Ragged Mountain. (*Charlottesville Tomorrow*, 7/25/10)

South Fork Rivanna Reservoir. *Photo courtesy of Laurel Woodworth.*

••On July 30, consulting firm Black & Veatch reported that the height of the *existing* Ragged Mountain dam can be increased as much as 45 feet. This would allow the current dam to meet required safety standards and increase its water-storing capacity enough to meet the current 50-year demand projection of 18.7 MGD provided by consulting firm Gannett Fleming in 2004. (*Charlottesville Daily Progress*, 8/5/10)

••In mid-August, engineering firm Swartz Engineering Economics submitted to RWSA its review of the 18.7 MGD demand projected for 2055 by the 2004 Gannett Fleming study. The Swartz report adjusted the projected demand to 18.45 MGD by 2060, based on what the consultants judged to be a one-time drop in average demand since 2002, when a drought led customers to reduce their water-use practices (average demand in 2000 was 11 MGD; in 2009,

9.1 MGD). The local citizens group Citizens for a Sustainable Water Plan criticized the report, asserting that it did not account fully for water conservation that has occurred in the area in the past decade. (*Charlottesville Daily Progress*, 8/20/10; and *Charlottesville Tomorrow*, 8/24/10)

••On September 7, Black & Veatch reported to Charlottesville City Council that a *new* dam to raise the Ragged Mountain Reservoir by 45 feet, as called for in the plan approved in 2006, would cost $21.4-$27 million; that raising the existing dam by 13 feet would cost $9.9-$13.1 million; and that the existing dam could be repaired (to meet safety requirements) for $5.5-$7.9 million. These estimates include the costs of protecting an I-64 embankment (part of the proposed pipeline between the South Fork Rivanna reservoir and Ragged Mountain) and of environmental mitigation. The City planned a public hearing for September 20 on how to proceed. (*Charlottesville Tomorrow*, 9/7/10)

Other Virginia News

Aquatic Systems, Water Quality, and Restoration (including Chesapeake Bay)

•On August 23, the Virginia DEQ released for public comment the **draft 2010 report on water quality in the Virginia's streams, rivers, lakes, and estuaries**. The federal Clean Water Act requires such a report every two years. The 2010 report covers conditions in Virginia's waters between 2003 and 2008. The report lists the water bodies that do not meet state water-quality standards and do not support the public uses designated for the water bodies; such waters are called "impaired" and will require a Total Maximum Daily Load (TMDL) study and implementation plan. Here are key findings from the 2010 draft report: 12,103 miles of impaired streams (in 965 sub-watersheds), an increase from 10,543 miles in the 2008 report; 96,510 impaired acres in public lakes (in 126 sub-watersheds), up from 94,004 acres in 2008; 2,157 square miles of impairments in estuaries (in 179 sub-watersheds), down from 2,182 square miles in 2008; and removal of 430 waters completely from the impaired list because they now meet standards. The report indicates that about 5,600 assessed stream miles, 16,000 assessed lake acres, and 113 square miles of assessed estuaries *do* meet water-quality standards. Approximately 34,000 stream miles and 3,700 lake acres were not assessed in this report, because the DEQ monitors about one-third of the state's watersheds every two years on a rotating basis, taking six years to complete a full monitoring cycle. The draft report is available online at www.deq.virginia.gov/wqa/305b2010.html. The DEQ is accepting public comments on the 2010 draft report through September 24. Write to Darryl M. Glover, DEQ Office of Water Monitoring and Assessment, Box 1105, Richmond, Va. 23218, e-mail: darryl.glover@deq.virginia.gov. (Virginia DEQ News Release, 8/23/10; and *Washington Post*, 9/3/10; *Virginian-Pilot*, 9/2/10. For an introduction to water quality and a summary of the previous (2008) Virginia water quality report, see the June 2008 *Water Central*, pp.6-11.)

About 202 miles of the James River—shown here below Scottsville (Albemarle County) in July 2009—are listed as impaired due to polychlorinated biphenyls (PCBs) in fish.

•In July, the Natural Resources Defense Council (NRDC) released its 2010 ***Guide to Water Quality at Vacation Beaches***, covering conditions in 2009 at 3,333 beaches nationwide (in 32 coastal states and four territories) that are monitored at least once per week. The report identifies beach closings, advisories, and pollution sources by state. Nationally, the report documented 18,682 days of closings and advisories in 2009, the sixth-highest total in the 20 years of NRDC reports, but a decrease from the over 20,000 closing/advisory days in 2008 (for 3,601 monitored beaches during that year). Nine Virginia beaches, out of 47 monitored, posted at least one closing or advisory in 2009. Collectively, the Virginia beaches posted closings or advisories on 51 days in 2009, compared to 29 days in 2008, 50 days in 2007, 43 days in 2006, and 42 days in 2005. Besides closings/advisories, another focus of the report is the number of beach samples that exceed state standards for bacteria. In Virginia, three percent of monitoring samples did not meet bacterial standards, compared to two percent in 2008 and one percent in 2006 and 2007. The nationwide rate in 2009 was seven percent, and Virginia ranked fourth best among states on this measurement. The *individual* Virginia beaches with the highest rates of samples exceeding standards were Fairview Beach in King George County (25 percent), Hilton Beach in Newport News (14 percent), and North Community Beach in Norfolk (10 percent).

Virginia Beach was highly rated in the report, receiving four stars out of five possible for the following criteria: water quality, water quality over the past three years, water quality testing frequency, promptness of issuing advisories, and methods of notifying the public. The NRDC report and other information is available online at http://www.nrdc.org/water/oceans/ttw/titinx.asp. (For a *Water Central* on last year's report: Aug. 2009, p.22. Also, see the June 2009 *Water Central*, p.3, for "Resources for Recreational Water Quality.")

Awards and Achievements

•On July 29, **Cleremont Farm in Loudoun County was named as one of seven regional winners of the National Environmental Stewardship Awards**, presented by the National Cattlemen's Association to farms or ranches for "outstanding resource management." The conservation practices at Cleremont include rotational grazing among 23 pastures, fencing five miles of streams and installing alternative watering systems, maintaining 1,000 acres of hardwood forest, and placing the entire working farm under a conservation easement. The national winner will be announced in February 2011. More information about the National Environmental Stewardship Award program is available online at http://www.environmentalstewardship.org/. (Virginia Governor's Office News Release, 7/30/10)

•In late July, the Virginia Environmental Excellence Program **awarded NASA's Goddard Space Flight Center on Wallops Island with its E4, or "Extraordinary Environmental Enterprise**," recognition, the highest level of recognition in the resource-protection and pollution-prevention program. Wallops Island becomes only the second federal facility in the Commonwealth, and one of only 23 facilities overall, to receive the E4 award. The recognition for Wallops Island is based on the facility's efforts in using renewable energy and alternative fuels, pursuing LEED certifications for resource conservation in buildings, managing hazardous waste, protecting endangered species, recycling, managing petroleum and chemical storage tanks, and environmental planning. More information about the Virginia Environmental Excellence Program is available at www.deq.state.va.us/veep/. (*Eastern Shore News*, 7/31/10)

Boats and Ships

•In July, the Virginia Department of Transportation awarded a $424,000 grant to Mathews County for **work to stabilize and protect the historic New Point Comfort Island lighthouse**. Since 1805, the lighthouse on the quarter-acre island has provided guidance to ship traveling Mobjack Bay, which separates the Middle Peninsula counties of Mathews and Gloucester. The new grant, coupled with a previous $149,000 grant and a 20-percent local match, will fund construction of a 12-foot high, 46-foot wide, and 300-foot long stone wall around the island. Construction is expected to begin in 2011. Meanwhile, a $10,000 donation by two descendants of Elzy Burroughs, the lighthouse's original stonemason, has started a long-term fund for maintenance and restoration of the lighthouse. (*Daily Press*, July 11, 2010)

Dams

•By early June, almost **280,000 American Eels had completed passage up two new fish ladders** at Dominion Virginia Power hydroelectric dam that creates Roanoke Rapids lake in North Carolina. Young eels produced from breeding of adults in the Sargasso Sea (a large area of the Atlantic Ocean near Bermuda) migrate up coastal rivers such as the Roanoke. That migration is blocked by dams unless fish ladders or other systems for passage are put into place. Dominion was required by its 2005 relicensing agreement with the Federal Energy Regulatory Commission to put in ladders for eels and American Shad on the Roanoke Rapids dam and the Lake Gaston dam. The third (and uppermost) dam on the Roanoke River, which creates Kerr Lake, is operated by the U.S. Army Corps of Engineers. A spokesperson for the U.S. Fish and Wildlife Service in Raleigh, N.C., said that Fish and Wildlife is negotiating with the Corps to put in ladders for migratory fish on the Kerr Lake dam. (*Virginian-Pilot*, 6/14/10)

Fish and Fisheries

•On June 2, in its Spring 2010 update on the occurrence of **chronic spring fish disease and mortality in the Shenandoah River basin (2004-2009) and James River basin (2007-2009)**, the Virginia Department of Game and Inland Fisheries (DGIF) reported that disease or death in Smallmouth Bass and sunfish this spring had been "light" in the Shenandoah basin and "almost non-existent" in the James basin. Anglers had reported between 2 and 10 dead fish over several-miles of the South Fork Shenandoah River, and 10 to 25 percent of sunfish had been showing signs of disease; both levels are similar to what was seen in 2009. Through studies of fish condition and health, aquatic invertebrates, potential chemical contaminants, and potential pathogens (bacteria or viruses), state agency staff and scientists continue to seek the cause or causes

of the kills and disease in past years. But "determining the cause…has proven to be extremely difficult," according to the DGIF report. (Virginia DGIF News Release, 6/2/10)

•In August, fisheries officials from Virginia, Maryland, the District of Columbia, and the Interstate Commission on the Potomac River Basin agreed to develop a **coordinated strategy to manage Blue Catfish in tidal river sections**. Native in the Mississippi, Missouri, and Ohio river basins, Blue Catfish have been stocked in several Virginia rivers for many years. In Virginia, the species is now widespread in tidal streams and rivers, especially in Virginia's James and Rappahannock rivers, and the large Blue Catfish populations can diminish other species, such as Channel Catfish and White Catfish. With an interstate, cooperative effort, fishery managers hope to understand, manage, and contain Blue Catfish populations and their impacts. Virginia Department of Game and Inland Fisheries (DGIF) information on Blue Catfish is online at http://www.dgif.virginia.gov/wildlife/fish/details.asp?fish=010390. (*Virginian-Pilot*, 8/30/10. Please see the Aug-Sept. 2001 *Water Central*, p.7, for an introduction to aquatic invasive species.)

A U.S. Fish and Wildlife Service (FWS) employee holds a Blue Catfish caught in April 2008 at Dyke Marsh Wildlife Preserve, which is located along the Potomac River south of Alexandria, Virginia. *Photo courtesy of FWS National Digital Library.*

Laws and Regulations

•About 100 people attended a June 15 meeting by the **Loudoun County Board of Supervisors will adopt a proposed Chesapeake Bay Protection Ordinance**. The local ordinance would implement in the county the full stream- and wetland-protection measures of Virginia's Chesapeake Bay Preservation Act. The Bay Act, passed in 1988, required 84 Virginia Tidewater localities to implement its provisions, but allows voluntary implementation in other Bay watershed localities *not* located in the Tidewater region. Loudoun would be the first county to implement the full protection measures of the Act voluntarily. Opponents have questioned whether the ordinance is necessary and challenged its appropriateness for a locality as far from the Bay as Loudoun. Supporters have cited county documents indicating that 78 percent of Loudoun's streams are in poor condition. After the public comments and board discussion, the board voted 6-3 to continue discussion of the proposed ordinance at its September 21 meeting. The board also agreed to hold community meetings and post most information on its Web site about the proposed ordinance, prior to the September 21 meeting. (*Loudoun Times-Mirror*, 6/15/10; *Washington Post*, 5/26/10; *Field Notes*, Wetland Studies and Solutions, 7/6/10; and *Leesburg Today*, 8/27/10)

•On August 19, Governor Robert McDonnell announced that Virginia had a **$404-million surplus for the fiscal year ending June 30, 2010.** On July 14, the governor had announced that the Commonwealth expected a $220-million surplus based on tax collections; the additional $184 million resulted from unspent funds that had been allocated to state agencies. About ten percent of the surplus, **$36.4 million, will go to the Water Quality Improvement Fund (WQIF)**, as called for by state law (*Virginia Code* Section 10.1-2117 through 2134). The WQIF was established by the Virginia General Assembly in the 1997 to assist local governments and individuals in reducing nutrient loads to the Chesapeake Bay. (Virginia Governor's News Releases, 7/14 and 8/19/10)

Oceans

•On July 19, President Obama issued an **executive order establishing a national ocean policy based on the recommendations of the Interagency Ocean Policy Task Force**. According to the executive order, the ocean policy's purposes include ensuring "the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources [and] enhance ocean and coastal economies," in coordination with national security and foreign policy interests. The 10-point policy is to be coordinated by a new National Ocean Council, consisting of cabinet secretaries and representatives of federal natural resource and environmental agencies. (Web site of the White House Council on Environmental Quality, www.whitehouse.gov/administration/eop/ceq/initiatives/oceans, 9/14/10)

Wastewater

•On June 24, the **Town of Culpeper dedicated a $27.7 million upgrade at its wastewater treatment plant**. The two-year project increased the plant's capacity from 4.5 million gallons per day (MGD) to 6 MGD and added two biological nutrient-removal tanks that will reduce the plant's discharge of nitrogen and phosphorus from about 8-10 parts per million (ppm) to 1-2 ppm, according to the Town's director of environmental services. Culpeper's nutrient-removal improvements are one of hundreds occurring in Virginia and other Chesapeake Bay watershed states as a result of requirements to reduce nutrients reaching Bay waters. Culpeper's plant is one of the first dozen or so facilities in Virginia to have completed its needed improvements. The Town received $5.7 million in state grants for the work, plus a $246,000 federal stimulus grant to pay for converting methane gas produced at the plant to fuel that will replace over $100,000 annually in oil used to power the plant's boilers. (*Culpeper Star-Exponent*, 6/25/10)

Meanwhile, on August 17 **Culpeper County and the Town of Culpeper signed an agreement** that transfers the nutrient allocation or quota authorized at the county's Mountain Run treatment plant to the allocation authorized for the Town's treatment plant. The allocations are part of the state's overall nutrient allocation, which is regulated by the Virginia DEQ, so DEQ approval of the allocation transfer is needed. If this action is approved, it will allow the county and town to proceed with plans for the town eventually to provide wastewater service to the county areas around the town's borders, in anticipation of eventual annexation by the town. For at least 10 years, the county and town have been discussing and negotiating over possible water and wastewater service arrangements, particularly for commercial and industrial land in the county close to the town's limits. The county has been purchasing services from the town since 2003, but the localities went to court in 2009 over disputes about the cost of the services. A proposed joint water and sewer authority that would have operated independently of the two localities was ultimately rejected by the town. (*Culpeper Star-Exponent*, 8/18/10; and *Fredericksburg Free Lance-Star*, 8/19/10. For previous *Water Central* items: Feb. 2002, p.12; Jan. 2007, p.18; and Sep. 2008, p.11.)

•In mid-July, **Northampton County** announced that it will apply for $10 million from the Virginia DEQ to pay for connecting the town of Cheriton to the Cape Charles wastewater treatment plant. The connection would be intended to help generate development, serve existing households with failing septic fields, and help resolve a problem of high septic system pump-out fees resulting from the closing of septic storage lagoons on the Eastern Shore in recent years. Eventually, responsibility for the project—if it occurs—would be transferred from the county to a new public service authority, which is awaiting registration from the State Corporation Commission. The Northampton communities of Exmore and Nassawadox are also expected to seek funding for wastewater projects. (*Eastern Shore News*, 7/20/10. For a previous *Water Central* item on Eastern Shore wastewater issues generally: Nov. 2009 News Supplement, p.10.)

Water Supply and Conservation

•In May, the Interstate Commission on the Potomac River Basin (ICPRB) released the study of the **expected demand for and availability of water from the Potomac River for utilities serving the Washington, D.C., metropolitan area**, including some areas of northern Virginia. The study is repeated every five years. The utilities covered include the Washington Aqueduct, which serves Washington (via the D.C. Water and Sewer Authority) and as well as Arlington County, Falls Church, and the town of Vienna; the Washington Suburban Sanitary Commission, which serves several Maryland counties; and Fairfax Water, which serves most of Fairfax County and (as wholesale customers) Dulles International Airport, Fort Belvoir, the Town of Herndon, Loudoun Water, Prince William County Service Authority, and the Virginia American Water Company (serving the City of Alexandria and Dale City). According to the ICPRB Web site for the study, the main conclusions are as follows: •"The Washington area's current water supply system will continue to meet demands through 2030, under a range of hydrologic conditions similar to the 78-year period of historical record, with no water supply shortfalls and no emergency water use restrictions." •"By the year 2040 the current system may have difficulty meeting

The Potomac River (shown here near Little Orleans, Maryland, in July 2010) supplied a daily average of 486 million gallons of water to the Washington metropolitan area in 2009, according to the Interstate Commission on the Potomac River Basin.

the region's demands during periods of drought without water use restrictions, and/or the development of additional supply resources." ●"Summertime outdoor water use may be increasing in some areas of the WMA, offsetting the benefits of the adoption of more water efficient indoor fixtures and appliances." ●"The system's largest reservoir, Jennings Randolph, appears to be losing storage capacity due to sedimentation at a higher rate than previously estimated." The study, 2010 Washington Metropolitan Area Water Supply Reliability Study Part 1: Demand and Resource Availability Forecast for the Year 2040, is available at the ICPRB Web site at http://www.potomacriver.org/cms/.

•Following Cumberland County approval on July 27 and Henrico County approval on August 10, a plan will now go forward to construct a **$280-million, 1,110-acre water-supply reservoir on Cobbs Creek**, a James River tributary in northwestern Cumberland County. The agreement follows several years of planning, debate, and negotiation among Cumberland, Henrico, Goochland, Hanover, and Powhatan counties over a reservoir to serve as a regional water source. Under the approved deal, Henrico will build and operate the reservoir, pay Cumberland $56.6 million over 50 years in lieu of property taxes, and reimburse Cumberland $1.55 million for previously-incurred design costs. Eventually Cumberland and Powhatan will be allowed to purchase up to 7 million and 10 million gallons, respectively, from Henrico. Goochland and Hanover counties are current customers of Henrico, and the new reservoir is expected to make more water available to those two localities. Land use, development, and recreation around the reservoir will be under Cumberland's control, and that county is required to develop a watershed-protection plan. (*Richmond Times-Dispatch*, 7/22, 7/27, and 8/11/10)

•On August 17, Louisa County announced that it was ending discussions with Fluvanna County about a **proposed project to build a pipeline from the James River across Fluvanna** to the developing Zion Crossroads area on the Fluvanna-Louisa border. (Zion Crossroads is located near the intersections of Interstate 64 with north-south U.S. Route 15 and east-west U.S. Route 250). The counties had been discussing options for a joint water project for many years, and in April 2009 formed the James River Authority. In an August 6 letter, Louisa officials told those in Fluvanna that Louisa would look for other options to bring water to the area unless Fluvanna signed an agreement to establish shared funding of the James River Authority and seek funding from the Virginia Resources Authority for the Zion Crossroads pipeline, which would also allow service to other areas of Fluvanna. On August 16, however, the Fluvanna Board of Supervisors decided *not* to accept those terms. Opponents in Fluvanna to the project and to funding the James River Authority have expressed concerns about potential tax increases and about yielding county control to the Authority. (*Charlottesville Daily Progress*, 8/16 and 8/18/10)

•In August, **Pulaski County officials announced a plan to connect the county's water system with the City of Radford's system** in order to improve service to homes and businesses in the eastern part of the county. The Radford system can provide about four times the amount of water that the City needs for its own residents and businesses. Pulaski's connection to Radford's system will allow some of Radford's unused water to serve the New River Valley Commerce Park, a 973-acre industrial park co-owned by 11 localities. The $6.8 million project to connect Pulaski's system to Radford will be paid for by a $3 million grant from the U.S. Department of Commerce and a $3.8 million loan from the U.S. Department of Agriculture. (*Roanoke Times/New River Current*, 8/13/10)

•According to staff at **Newport News Waterworks, average daily water use by that system's customers decreased** from 44.3 million gallons per day (MGD) in 1990 to 39.7 MGD so far in 2010, despite a population increase from 350,000 to 410,000. The Newport News system serves customers in James City County, York County, and the cities of Hampton, Newport News, and Poquoson. The reduced water use is believed to be due to a combination of factors, including more water-efficient appliances, water-saving equipment for watering yards, a summertime water-rate surcharge, and decisions by residents to reduce lawn watering, car-washing, and other outdoor water uses. (*Daily Press*, 7/22/10)

Out of Virginia

Bay States

•Here are two "snapshots" on the **economics of paying for Chesapeake Bay-related upgrades to wastewater-treatment plants**, in order to remove more nitrogen and phosphorus. **First in Maryland**: The Georges Creek Wastewater Treatment Plant in Allegany County is one of 66 major plants in Maryland that must undergo nutrient-removal upgrades. The county's share of the $28-million project is $8.9 million, with grants paying for the remainder. Only the county residents actually served by the plant will share the cost of the upgrade, to be finances with a 20-year loan at a 1.1-percent annual interest rate. Tax rates on the system users are to increase from 16 cents to 47 cents per $100 of assessed property value in order to pay for the loan. **Second, in West Virginia**: In May, the Department of Environmental Protection reported that the state faces about $291 million in costs to upgrade wastewater treatment plants, either to meet Chesapeake Bay-related nutrient regulations, to replace outdated equipment, or to add needed capacity. State officials are working to identify for the 2011 West Virginia Legislature session some possible ways to help localities pay for the needed upgrades. (*Cumberland [Md.] Times-News*, 7/23/10; and *Martinsburg [W.Va.] Journal*, 6/2/10)

•On July 16, the Maryland Department of Agriculture presented the first two awards under the state's new **Farm Stewardship Assessment and Certification Program**, which recognizes farmers' efforts to use practices that conserve natural resources and protect water quality. The program also can help farmers determine their eligibility for nutrient-credit trading and energy audits, and can provide information on advanced conservation techniques. Information about the Maryland program is available online at http://www.mascd.net/FSCA/index.htm. The Virginia Department of Conservation and Recreation sponsors a similar program, the Clean Water Farm Award, to recognize farms that use practices to protect water quality and soil (*Va. Code*, 10.1-104.3; also see http://www.dcr.virginia.gov/soil_and_water/cwfa.shtml). (*Frederick News-Post*, 7/26/10. Additional information from "New Farm Stewardship Certification Program Launched," Maryland Department of Agriculture News, July 2010.

Elsewhere

•Researchers at New Mexico State University are investigating the **potential of common soil clays as a low-technology, low-energy way to reduce uranium levels in groundwater**. The work uses silica-containing molecules that can take ions (charged particles) of metals out of solution. Experiments have seen reductions of uranium concentrations from 500 parts per billion (ppb) to 1.5 ppb within eight hours (the uranium Maximum Contaminant Level set the U.S. EPA is 30 ppb, according to EPA's "Radionuclides in Drinking Water" Web site, http://water.epa.gov/lawsregs/rulesregs/sdwa/radionuclides/regulation.cfm, 8/25/10). Investigations are continuing on different types of clays as well as on the effects of the water's pH, beginning uranium concentrations, exposure time, and other variables. (New Mexico Water Resources Research Institute, *Diving Rod*, July 2010)

Final Words

•"Adult jellies are coming in and they're meeting other adult jellies and they're making baby jellies."—Beth Firchau, of the Virginia Aquarium in Virginia Beach, referring to the **annual summer mating congregations of jellyfish** in Chesapeake Bay waters. (WAVY-TV in Portsmouth, www.wavy.com, 7/9/10)

•"I do not remember a hotter, drier June, and I've been doing this since 1972." –Bill Micks, owner of the Virginia Outdoor Center, a Fredericksburg business that guides **paddling and tubing trips on the Rappahannock River**. (*Fredericksburg Free Lance-Star*, 7/9/10)

According to the National Oceanic and Atmospheric Administration (NOAA), the whitish *Chrysaora quinquecirrha* is the most abundant jellyfish found in Chesapeake Bay and its tidal tributaries. *Photo courtesy of NOAA/Chesapeake Bay Program Office, Hhttp://chesapeakebay.noaa.gov/products/identify-jellyfishH, 9/14/10.*

Additional Stories in News Supplement

For the following news items, please see the August 2010 News Supplement (7 pages), available online at www.vwrrc.vt.edu/pdfs/newsletter/Aug2010NewsSupplement.pdf:

In Virginia

- Chesapeake Executive Council annual meeting in June.
- Chesapeake Bay Foundation analysis Virginia's progress towards two-year "milestones" for Bay restoration.
- National Fish and Wildlife Foundation grants of $5.8 million in August for projects in the Bay watershed.
- "Mahogany tide" algal blooms in Chesapeake Bay water and Virginia rivers in summer 2010.
- Start of work to remove contaminated sediments from Elizabeth River Superfund site and place them behind a concrete wall.
- $720,000 annually to Shenandoah Resource Conservation and Development Council for agricultural conservation practices.
- Decrease in annual average percentage of native oysters dying from the disease MSX in York River.
- Panel to study Virginia's Menhaden fishery.
- EPA order for two Rockingham County livestock farms to cease discharging pollutants into North Fork Shenandoah River.
- July 1 take-effect date for Virginia law restricting phosphorus in household dishwashing detergents.
- U.S. Senate committee's June approval of Chesapeake Clean Water and Ecosystem Act of 2009 (S.1816), and House committee's July approval of Chesapeake Bay Program Reauthorization and Improvement Act (H.R.5509).
- July diesel fuel spill into Bluefield stream and Bluestone River.
- Tentative settlement for March 2010 train derailment over the Intracoastal Waterway in Chesapeake.
- Reedy Creek Coalition and Alliance for the Chesapeake Bay project to help homeowners and businesses in Richmond reduce residential stormwater runoff.
- Reduction of stormwater runoff expected from State Capital re-landscaping.
- June 21 *Federal Register* publication of EPA's proposed regulations for disposal of coal-combustion residuals (coal ash), with one public hearing in Virginia.
- DEQ's annual report on solid waste management in Virginia (for 2009).
- Expanded wastewater treatment plant in Onancock.
- First draft of a water-supply plan being produced for the Eastern Shore; groundwater focus.
- Agreement in Virginia Beach to purchase and preserve Pleasure House Point along the Lynnhaven River.

Out of Virginia

- July public hearings by Maryland Department of Natural Resources on the oyster-recovery plan first announced in December 2009.
- Two experimental floating wetlands placed in Baltimore's Inner Harbor in August.
- Recent developments in Pennsylvania related to recovering natural gas from the Marcellus shale formation.
- American Rivers' 2010 list of the 10 rivers it considers currently "most endangered' in the United States.

VIRGINA GOVERNMENT WATER ISSUES OVERVIEW

*For a weekly summary of upcoming Virginia government meetings on water-related topics, have a listen to **Virginia Water Radio**, online at www.virginiawaterradio.org. The weekly broadcast/podcast is normally about eight minutes long; the events section comes about five minutes into the show.*

This section lists water issues under current consideration (study or regulation) by state boards, commissions, or agencies in Virginia. Information in this issue is based on public meetings listed **June 1-September 8, 2010**, on the **Virginia Regulatory Town Hall** Web site, at www.townhall.state.va.us/L/meetings.cfm. The Town Hall site posts agendas of upcoming meetings and minutes of past meetings held by Virginia's boards, commissions, and departments; **the site can be searched for "water" or other specific topics**. Unless otherwise noted, all contact people listed in this section are Virginia state employees. To find the e-mail address any state employee, go online to www.employees.state.va.us/directory-search.cfm. You can also request state employee phone numbers by calling (800) 422-2319. All Web sites listed in this section were functional as of 11/10/09.

Total Maximum Daily Load (TMDL) Processes

Under the federal Clean Water, when a water body fails (with a certain frequency) to meet state water-quality standards, the water is to be designated as "impaired," requiring development of a total maximum daily load (TMDL). A TMDL *study* identifies the pollutant source(s) causing the impairment and determines how much of the pollutant(s) the water can receive (the "load") and still meet standards. A TMDL *implementation plan* (required by Virginia law) maps a process for reducing the pollutant load to the TMDL level. Many Virginia TMDLs are underway, each involving many public meetings. The table below lists those where public meetings were held during the period noted above; unless otherwise noted, the contacts listed for more information are with the Virginia Department of Environmental Quality. Information on the status of all TMDLs in Virginia is available online at www.deq.state.va.us/tmdl/.

Location	Water(s) & Impairment	Larger Watershed(s)	For More Information
Arlington and Fairfax counties and cities of Alexandria and Falls Church	Cameron Run, Holmes Run, and Hunting Creek for bacteria	Potomac River	Katie Conaway, DEQ
Augusta and Rockbridge counties	Hays Creek, Moffatts Creek, Otts Creek, and Walker Creek for bacteria	James River	Nesha McRae, DCR
Brunswick and Greensville counties	Fontaine Creek for bacteria	Chowan River/ Albemarle Sound, N.C.	Margaret Smigo, DEQ
Chesterfield, Henrico, and Powhatan counties and Richmond City.	James River and several tributaries—Almond, Bernards, Falling, Gillie, Goode, No Name, Powhatan, Powhite, and Reedy creeks—all for bacteria.	Chesapeake Bay	Margaret Smigo, DEQ
Dinwiddie and Sussex counties	Hatcher Run in Dinwiddie County and unnamed tributary to Nebletts Mill Run in Sussex County, both for bacteria.	Nottoway River/Chowan River	Margaret Smigo, DEQ
Fairfax County and City of Fairfax	Accotink Creek for aquatic-life (benthic) impairment	Potomac River	Gregory Voigt, U.S. EPA, (215) 814-5737 or voigt.gregory@epa.gov
Madison County	Little Dark Run and Robinson River, both for bacteria.	Rappahannock River	Bob Slusser, DCR
Russell County	Lewis Creek for aquatic life impairment.	Clinch River	Martha Chapman, DCR
Tazewell County	Clinch River and tributaries Coal Creek, Middle Creek, and Plum Creek, all for bacteria.	Tennessee River/Ohio River/Gulf of Mexico	Shelley D. Williams, DEQ

Other Topics Under Current Consideration

The following lists topics considered in public meetings held during the period noted at the beginning of this section. *This list does not necessarily include all meetings of significance to Virginia water resources.* Items are listed alphabetically by topic, followed by the agency or group coordinating state study or action and then a contact name. Minutes of most meetings listed are available at the Virginia Regulatory Town Hall Web site, www.townhall.state.va.us/L/meetings.cfm, Agency Abbreviations: DCR = Dept. Conservation and Recreation; DEQ = Dept. Environmental Quality; DGIF = Dept. Game and Inland Fisheries; DMME = Dept. Mines, Minerals and Energy; DPOR = Department of Professional and Occupational Regulation: SWCB = State Water Control Board; VDH = Department of Health. "VAC" numbers indicate the *Virginia Administrative Code* section for a particular regulation; you can access and search the VAC at http://legis.state.va.us/Laws/AdminCode.htm. "NOIRA" stands for Notice of Intended Regulatory Action.

Confined Animal Feeding Operations (CAFOs) General Discharge Permit (9 VAC 25-191)—Advisory Committee meeting: 6/7/10. The SWCB is working toward reissuance and possible amendment of this regulation. More information: Betsy Bowles, DEQ.

Biosolids Land-application Permits—●7/6/10 public hearing on application by Recyc Systems, Inc., to land-apply biosolids on approximately 683 acres in Shenandoah County. Public comment period: 7/6-7/21/10. More information: Tim Higgs, DEQ. ●8/4/10 public meeting on application by Recyc Systems, Inc., to land-apply biosolids on approximately 623 acres in Westmoreland County. Public comment period: 8/4-9/7/10. More information: Anita Tuttle, DEQ. ●8/5/10 public hearing on application by Agri-Services Corp. to land-apply biosolids on approximately 2512 acres in Fauquier County. Public comment period: 6/9-8/20/10. More information: Elizabeth Biller, DEQ.

Invasive Species—Dept. of Conservation and Recreation (DCR) Invasive Species Working Group meeting: 8/20/10. More information: David Dowling, DCR.

Mined Land Reclamation. 1) The Governor's Mined Land Reclamation Advisory Committee met 6/10/10. More information: Jackie Davis, DMME. 2) DMME's Coal Surface Mining Reclamation Fund Advisory Board met 7/8/10; more information: Gavin Bledsoe, DMME.

Pesticide Discharge Regulation (9 VAC 25-800)—Advisory Committee meetings: 7/14/10, 7/28/10; 8/18/10. The SWCB and DEQ are developing a General Virginia Pollutant Discharge Elimination Systems permit for pesticide discharges. The NOIRA was published in the 5/10/10 issue of the *Virginia Register of Regulations*. More information: William K. Norris, DEQ.

Recycling—DEQ's Recycling Markets Development Council meeting: 9/1/10. More information: Steve Coe, DEQ.

Roanoke River Basin Issues—Meeting of the *Virginia* Roanoke River Basin Advisory Committee: 6/2/10 and 8/18/10; meeting of the Roanoke River Basin *Bi-state* Commission: 8/18/10. More information: Scott Kudlas, DEQ.

Seafood Processing Facilities General Discharge Permit Regulations (9 VAC 25-115)—Advisory Committee meetings: 3/24 and 4/14/10. The SWCB proposing amendments to this regulation. The proposal appears in the *Virginia Register of Regulations* on July 19, 2010. The public comment period was 7/19-9/17/10. More information: George E. Cosby, DEQ.

Scenic Rivers—Specific river advisory committees meetings: Goose Creek Advisory Committee, 7/14/10. More information: David C. Dowling, DCR.

Sewage Handling and Disposal: Onsite Sewage Handling and Disposal Appeals Review Board: Most recent meeting: 6/23/10. The VDH's Sewage Handling and Disposal Appeals Review Board hears all administrative appeals of denials of onsite sewage disposal system permits and appeals of refusals of indemnification requests. More information: Donna Tiller, VDH.

Solar Energy Permitting—Meetings of the regulatory advisory panel for small renewable solar energy projects permit: 6/8 and 7/20/10. This advisory panel is helping the DEQ in development of a permit by rule for small renewable solar energy projects, a regulatory action that the 2009 General Assembly (HB 2175/SB 1347) required for small renewable energy projects from various sources. A NOIRA was published in the 3/29/10 *Virginia Register*. More information: Carol C. Wampler, DEQ.

Solid Waste Management and Groundwater—1) 6/16/10: Public hearing on a draft permit for the industrial landfill for the American Electric Power (AEP) plant at Glen Lyn (Giles County). Under consideration is a proposed 11.8-acre expansion and accompanying flexible membrane liner, leachate-collection system, and groundwater monitoring. The public comment period was 5/12-7/1/10. More information: Jenny Poland, DEQ.

State Parks—1) 8/30/10: Public presentation on possible marina at marina facility proposed for future development at **Occoneechee State Park in Mecklenburg County**. More information: Danette Poole, DCR.

Stormwater Best Management Practices (BMPs)—Virginia Stormwater BMP Clearinghouse Committee meeting: 8/12/10. The BMP Clearinghouse Committee, coordinated by the Va. DCR and the Virginia Water Resources Research Center, is working to develop design guidelines and Web site that will serve as the Virginia's reference point for stormwater BMPs. More information: David Dowling, DCR.

Stormwater Management Regulations (4 VAC 50-60)—Regulatory Advisory Panel meeting: 7/23/10 (full panel); *sub-committee* meetings were held 8/16, 8/17, and 9/1/10. The panel is advising the Soil and Water Conservation Board in considering amendments to Parts 1, 2, 3, and 13 of the Virginia Stormwater Management Program Permit Regulations to address criteria for water quality and quantity, criteria and procedures for local stormwater-management programs, and the administration and schedule of fees. The sub-committees are addressing grandfathering, offsets/credits, water quality, and water quantity. More information: David Dowling, DCR.

Wastewater Discharges under 1,000 Gallons per Day (9 VAC 25-110)—Public hearing 8/26/10. The SWCB is proposing amendments to the Virginia Pollution Discharge Elimination System general permit for discharges under 1000 gallons per day. The proposal appears in the *Virginia Register of Regulations* on July 19, 2010. The public comment period was 7/19-9/17/10. More information: George E. Cosby, DEQ.

Water Supply Planning—State Water Supply Plan Advisory Committee meeting: 8/31/10 (first meeting of the committee). The State Water Supply Plan Advisory Committee was established by the 2010 Virginia General Assembly to assist the DEQ in developing and implementing a state water resources plan. The bill creating the committee was SB 569; information about that bill is at the Virginia Legislative Information System Web site, at http://leg1.state.va.us/cgi-bin/legp504.exe?101+sum+SB569. More information: Scott Kudlas, DEQ.

Wind Energy Permitting—Meetings of the regulatory advisory panel for small renewable offshore wind energy project permit by rule: 6/8; 7/7; 7/29; 8/10; and 8/17/10; public hearing on proposed regulation: 8/3/10. The advisory panel is helping the DEQ develop a permit by rule for small renewable wind energy projects, a regulatory action that the 2009 General Assembly (HB 2175/SB 1347) required for small renewable energy projects from various sources. The proposed regulation was published in the June 21, 2010, *Virginia Register*, with a public comment period until 8/20/10. More information: Carol C. Wampler, DEQ.

General Information for Key Water-related Statewide Boards and Commissions

Marine Resources Commission—Meets monthly; minutes of meetings are available online at www.mrc.virginia.gov/calendar.shtm. More information: phone (757) 247-2200, TDD (757) 247-2292.

State Water Control Board—Meets quarterly; minutes of meetings are available at http://www.deq.state.va.us/cboards. More information: (800) 592-5482 (main number for DEQ).

Cave Board— Meet three times per year. More information: phone (804) 786-7951; Web site: www.dcr.virginia.gov/natural_heritage/cavehome.shtml.

Chesapeake Bay Local Assistance Board—Meets March, June, September, and December. More information: phone (800) 243-7229; Web site: www.dcr.virginia.gov/chesapeake_bay_local_assistance/board.shtml.

Conservation and Recreation Board—Meets at least three times/year, upon call of chair. More information: (804) 786-1712 (main number for DCR); Web site: www.dcr.virginia.gov/bcr.shtml.

Game and Inland Fisheries Board—Full board meets bimonthly; committee meetings at other times. More information: (804) 367-1000 (main number for DGIF); Web site: www.dgif.virginia.gov/about/board/.

Gas and Oil Board—Meets monthly, usually in southwestern Virginia. More information: (804) 692-3200 (main number for DMME); Web site: www.dmme.virginia.gov/divisiongasoil.shtml.

Groundwater Protection Steering Committee—Meets third Tuesday of odd-numbered months. More information: Mary Ann Massie, (804) 698-4042; Web site: www.deq.virginia.gov/gwpsc/.

Land Conservation Foundation—Meets about three times per year. More information: phone (804) 786-3218; Web site: www.dcr.virginia.gov/virginia_land_conservation_foundation/index.shtml.

Licensing and Regulation Boards—Licensing boards for engineers, geologists, onsite sewage system professionals, soil scientists, waste-management facility operators, waterworks and wastewater works operators, and wetland delineators are under the Dept. of Professional and Occupational Regulation; phone (804) 367-8500, TDD (804) 367-9753; Web site: www.dpor.virginia.gov/dporweb/boards.cfm.

Outdoors Foundation—Meets at least quarterly. More information: (540) 327-7727; Web site: www.virginiaoutdoorsfoundation.org.

Scenic River Advisory Board—Meets at least two times a year. More information: Lynn Crump, (804) 786-5054; Web site: www.dcr.virginia.gov/recreational_planning/srmain.shtml.

Soil and Water Conservation Board—Meets bimonthly. More information: (804) 786-1712 (main number for DCR); Web site: www.dcr.virginia.gov/soil_and_water/vs_and_wcb.shtml.

Waste Management Board—Meets about three times per year; minutes of meetings are available at http://www.deq.state.va.us/cboards. More information: (800) 592-5482 (main number for DEQ).

N O T I C E S

*If you would like to receive **regular e-mail notifications** about meetings, reports, and other items related to water quality and water monitoring, you may do so by joining the **Virginia Water Monitoring Council**; contact Jane Walker at (540) 231-4159 or janewalk@vt.edu.*

For a regularly updated, online list of Virginia water-related educational events, please see the Water Center's "Quick Guide to Virginia Water Conferences, Meetings, and Other Events," at www.vwrrc.vt.edu/VAConfQuickGuide.html.

And for a weekly list of upcoming events, have a listen to Virginia Water Radio at www.virginiawaterradio.org/.

All Web sites listed in this section were functional as of 9/9/10.

Virginia Citizens for Water Quality Update

The Virginia Citizens for Water Quality is a collaboration of volunteer water-quality monitoring organizations. According to its mission statement, the organization seeks to coordinate volunteer water-quality monitoring efforts, identify appropriate volunteer monitoring methods, identify appropriate uses of volunteer water-quality monitoring data, and promote watershed water quality and stream health. As of August 2010, the organization has a new Web site at http://vcwq.wordpress.com/. Current contacts for the organization are Wayne Kirkpatrick, VCWQ chair, at wynbtyk@embarqmail.com; and Chris French, Alliance for the Chesapeake Bay, (804) 775-0951 or cfrench@allianceforthebay.org.

On the Jellyfish Watch

"Forecasting Sea Nettles," from the National Oceanic and Atmospheric Administration (NOAA), is an experimental, online mapping program to predict the daily and three-day locations of the sea nettle *Chrysaora quinquecirrha*—more commonly known as a jellyfish—in the Chesapeake Bay and its tidal tributaries in Virginia and Maryland. The interactive map also shows sea surface temperature and salinity. The site is http://chesapeakebay.noaa.gov/forecasting-sea-nettles/.

Virginia Shoreline and Tidal Wetlands Management

In the Summer 2010 issue of *Rivers and Coast* (Vol. 5, No. 2), the Center for Coastal Resources Management (CCRM) at the Virginia Institute of Marine Science presents the first of several planned **"decision trees**" to help private property owners and public officials make shoreline-management choices that balance property use with protection of public aquatic resources. The decision tree in this issue is designed for "untreated shorelines"—those with no existing bulkheads, riprap, or other hardening features, or with failed shoreline structures. Future decision trees will address dredging; marinas; wetland mitigation and restoration; ramps, piers, and aquaculture; fill projects; and utility/transportation crossings. The publication is online at http://ccrm.vims.edu/publications/pubs/rivers&coast/index.html, or contact CCRM at (804) 684-7380, ccrm@vims.edu.

A Partnership on Drinking Water from the Potomac River Basin

The Potomac Drinking Water Source Protection Partnership, online at www.potomacdwspp.org, is a voluntary collaboration among water-supply systems and government agencies involved in use of the Potomac River and its tributaries as sources of water. The partnership—which currently has 20 member organizations from Virginia, Maryland, West Virginia, and the District of Columbia—seeks to develop a comprehensive approach to protection of the Potomac watershed as a source of drinking water. For more information, contact Karin Bencala at (301) 274-8139 or kbencala@icprb.

Pocket Guide to Water Conservation

The Water Resources Center at the University of Minnesota has produced "A Pocket Guide to Reducing Your Water Footprint." The 8-panel, fold-up document explains the concept of a "water footprint" and offers suggestions for reducing water use in everyday situations. The guide is available online at www.wrc.umn.edu, or contact the Minnesota Center at (612) 624-9282 or umwrc@umn.edu.

Pocket Guide to Paddling in the Northern Neck

The Northumberland Association for Progressive Stewardship (NAPS) has prepared several materials to help guide paddlers in Northumberland County. A tri-fold brochure consisting of a master map, with

information on marinas, motels and museums is available in print. In addition, the master map and more detailed maps of the Coan, Great Wicomico, Little Wicomico, and Yeocomico rivers are posted on the NAPS Web site at www.napsva.org (see under the "What's New?" link); or contact NAPS at P.O. Box 567, Heathsville VA 22473.

Virginia Monitors and Other Information in the *The Volunteer Monitor*

The Volunteer Monitor is the national newsletter of volunteer watershed monitoring. The Spring 2010 edition (Vol. 21, No. 1) focuses on emerging issues and new technologies, with articles on gas-drilling technologies, freshwater algae blooms, marine algae, mapping information, and electronic meters. The article "Examples of Data Mapping" (p. 10) highlights data-mapping work by three Virginia monitoring groups: the Goose Creek Association, StreamWatch in the Rivanna River watershed, and Friends of the Shenandoah River. The newsletter is available for online at http://www.epa.gov/OWOW/volunteer/vm_index.html; or contact the newsletter at 50 Benton Avenue, San Francisco, CA 94112-1104.

USGS Studies on Urban Development and on Mercury in Fish

An April 2009 U.S. Geological Survey (USGS) study examined effects of urban development on stream ecosystem health in nine metropolitan areas: Portland, Oregon; Salt Lake City; Birmingham, Alabama; Atlanta; Raleigh, North Carolina; Boston; Denver; Dallas; and Milwaukee. The study, "Selected Physical, Chemical, and Biological Data Used to Study Urbanizing Streams in Nine Metropolitan Areas of the United States, 1999–2004," is available online at http://pubs.usgs.gov/ds/423/. Another USGS study, published in June 2010 in *Environmental Monitoring and Assessment*, reports the trends of mercury levels in fish sampled from rivers and lakes nationwide between 1969 and 2005. The report, "Mercury trends in fish from rivers and lakes in the United States, 1969–2005," is available online at http://water.usgs.gov/nawqa/mercury/. To request publications or for other questions, contact USGS at (888) ASK-USGS (888-275-8747).

The Gulf Oil Spill as Reported by Local Newspapers

For accounts from local perspectives of the major developments following the April 20 explosion, fire, sinking, and oil spill at BP's Deepwater Horizon rig in the Gulf of Mexico, visit the following Web sites:

- *Mobile (Ala.) Press-Register* Web at http://topics.al.com/tag/Gulf%20of%20Mexico%20oil%20spill/index.html;
- *Miami Herald* at www.miamiherald.com/oilspill/;
- *New Orleans Times-Picayune* at www.nola.com/news/gulf-oil-spill/index.ssf/archive/index.html;or
- *Sun-Herald* (Biloxi, Mississippi) at http://www.sunherald.com/oilspill/.

Energy and Climate Notices

•**Three recent climate reports from the National Research Council (NRC)**—On May 19, the NRC released *Advancing the Science of Climate Change* (506 pp.), *Limiting the Magnitude of Future Climate Change* (258 pp.), and *Adapting to the Impacts of Climate Change* (325 pp.). The reports are part of a set of five studies requested by Congress and known as "America's Climate Choices." The NRC news release, at the following Web site, has descriptions of the main themes of each report and access to the complete publications: http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=05192010; or phone the NRC Office of News and Public Information at (202) 334-2138.

•**A "roadmap" on algae and biofuels**: On June 29, the U.S. Department of Energy released the *National Algal Biofuels Technology Roadmap*, a document intended to "summarize the state of technology for algae-based fuels and document the research and development challenges associated with producing them at a commercial scale." The document resulted from a December 2008 workshop held in College Park, Maryland. A news release on the report and access to the document are available online at www1.eere.energy.gov/biomass/news_detail.html?news_id=16123.

•**Climate change and water in the western United States:** In July, Western Resource Advocates and the Environmental Defense Fund released *Protecting the Lifeline of the West: How Climate and Energy Policies Can Safeguard Water*, a 44-page report that discusses impacts of climate change on water supplies in western states. Available online at http://www.westernresourceadvocates.org/water/lifeline.php, or contact Western Resource Advocates in Boulder, Colorado, at (303) 444-1188 or info@westernresources.org.

•**"Carbon Markets: A Method to Improve Water Quality?":** This article, in the March/April 2010 issue of *Potomac Basin Reporter* from the Interstate Commission on the Potomac River Basin, reports on the Mid-Atlantic Carbon Symposium, held in February. The symposium's purpose was for participants to explore interest in a regional voluntary market for trading carbon credits. The article is available online at www.potomacriver.org/cms/reporterpdf/2010/v662.pdf, or contact the Commission at (301) 984-1908 or info@icprb.org.

• **"Aiming for the Bull's Eye: The Future of Oil Shale Development in the White River Basin,"** in the Winter 2010 issue of *Headwaters*, from the Colorado Foundation for Water Education. This five-page article discusses the water-resource implications of large increase since the late 1990s in extraction of oil and gas from shale in Colorado. The water-resource issues are similar to those associated with the increase in recent years of natural gas extraction from the Marcellus shale formation underlying parts of several middle-Atlantic states, including Virginia. Available at http://www.cfwe.org, or phone (303) 377-4433.

Upcoming Conferences, Workshops, and Other Events

Events In Virginia

•Sep. 1 through Oct. 31, statewide: **Virginia Waterways Cleanup.** Organized by Clean Virginia Waterways at Longwood University; part of the International Coastal Cleanup, organized by the Ocean Conservancy. More information: Clean Virginia Waterways at (434) 395-2602 or cleanva@longwood.edu; Web site: www.longwood.edu/cleanva.

•Sep. 1 through Oct. 31, statewide: **Stewardship Virginia Fall Campaign**. Virginia natural resource agencies encourage citizens to organize and register events to enhance water quality, control invasive species, improve recreational resources, preserve historic or cultural resources, conserve natural heritage resources, provide education about natural or historic resources, or improve wildlife habitat or tree cover. Coordinated by the Virginia Department of Conservation and Recreation. More information: (877) 42-WATER, or bonnie.phillips@dcr.virginia.gov; Web site: www.dcr.virginia.gov/stewardship.

•Sep. 23-24, Arlington County Department of Parks, Recreation, and Cultural Resources, Arlington: **Valuing Urban Forests—Science, Application, and Action.** A public meeting takes place 7 p.m.-9 p.m. on Sep. 23; a conference takes place 10 a.m.-3:30 p.m. on Sep. 24. Organized by the Virginia Tech Department of Forest Resources and Environmental Conservation, along with several co-organizers. More information: John Munsell at (540) 231-1611 or jfmunsel@vt.edu; Web site: www.frec.vt.edu/urbanforestvalue/.

•Sep. 29, James Madison University Festival Conference and Student Center Grand Ballroom, Harrisonburg: **Virginia Biodiesel Conference: Fueling Virginia Jobs and Economic Development.** Organized by Virginia Clean Cities. More information: Ryan Cornett at (540) 568-5586 or rcornett@hrccc.org; Web site: http://vabiodiesel.eventbrite.com/.

•Oct. 7-10, Cape Charles: **Eastern Shore of Virginia Birding and Wildlife Festival.** More information: Beth Davis, (757) 581-1081; Web site: http://www.esvafestivals.org/.

•Oct. 14-16, Hotel Roanoke and Conference Center, Roanoke: **Imagining the Blue Ridge Parkway for the 21st Century: *Sustaining Communities, Environments, and Economies***. A symposium in connection with year-long observances of the Parkway's 75th anniversary. Organized by the Virginia Tech College of Natural Resources and Environment and Blue Ridge Parkway 75, Inc. More information: Bob Smith, (540) 231-7679 or rsmith4@vt.edu; for Web site, click here.

•Oct. 15, Frontier Culture Museum, Staunton: **Innovative Research and Technology in Conservation.** Annual meeting of the Virginia chapter of the Soil and Water Conservation Society. More information: Dennis Jones, (804) 248-9623 or dennis.jones@usda.va.gov; Web site: http://www.bse.vt.edu/swcs/.

•Oct. 21, Trani Center for Life Sciences, Virginia Commonwealth University, Richmond: **2010 Virginia Stormwater Symposium: Navigating Changes in Stormwater Technology and Policy.** Organized by the Virginia Water Resources Research Center. More information: Jane Walker, (540) 231-4159 or janewalk@vt.edu; Web site: http://www.vwrrc.vt.edu/symposium2010/index.html. ***Please see the full-page notice on the following page.***

• Oct. 30, Charlottesville: **Volunteer Training for Virginia Master Well Owner Network.** For people who would like to help other understand, protect, and manage their private water supplies. More information: Erin James Ling, (540) 231-9058 or ejling@vt.edu; Web site: http://www.wellwater.bse.vt.edu/vamwon.php.

(Events outside of Virginia begin on second page following.)

2010 VIRGINIA STORMWATER SYMPOSIUM

Navigating Changes in Stormwater Technology and Policy

October 21, 2010

Trani Center for Life Sciences, Virginia Commonwealth University
Monroe Park Campus, Richmond, Virginia

Organized by the Virginia Water Resources Research Center and the Virginia Commonwealth University Rice Center for Environmental Life Sciences

Featured speakers include the following:

●Jennifer Molloy, Stormwater Coordinator, U.S. EPA.

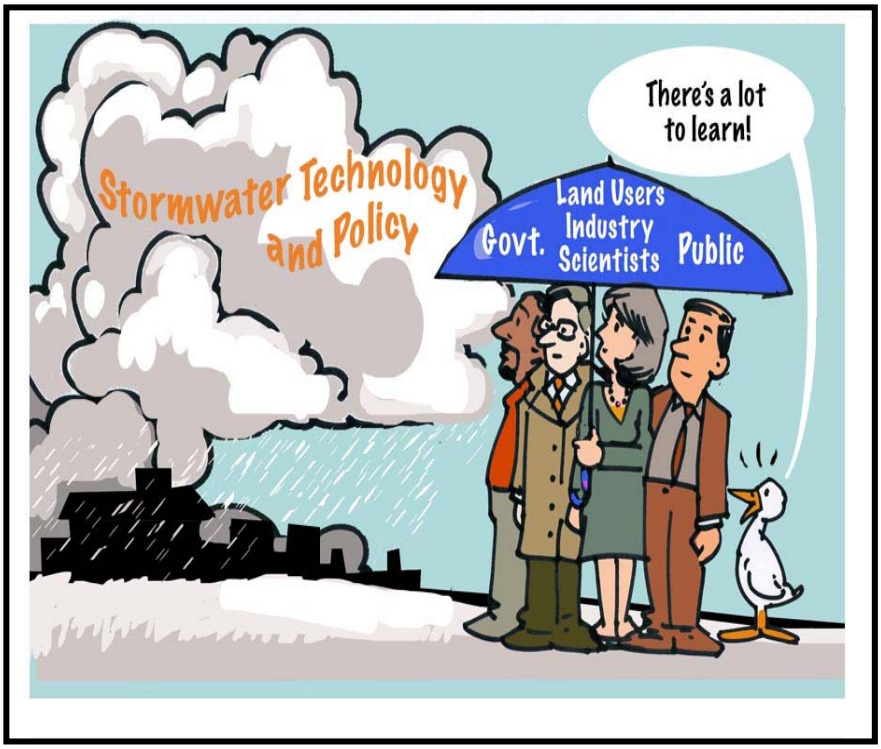
●David A. Johnson, Director, Virginia Department of Conservation and Recreation.

●Christopher D. Pomeroy, President, AquaLaw.

●Kurt Stephenson, Professor, Agricultural and Applied Economics, Virginia Tech.

●Thomas R. Schueler, Executive Director, Chesapeake Stormwater Network.

●Glenn E. Moglen, Professor, Civil and Environmental Engineering, Virginia Tech.



●Robert M. Roseen, Assistant Research Professor, Civil Engineering, University of New Hampshire and Director, UNH Stormwater Center.

The symposium will also offer a poster session on basic and applied research related to stormwater. Symposium participants will have the opportunity to ask questions and contribute to group discussions.

The Web site for more information and registration is www.vwrrc.vt.edu/symposium2010/index.html. If you have questions, please contact Jane Walker at janewalk@vt.edu or (540) 231-4159.

Upcoming Events, continued

Events Outside of Virginia

•Sep. 27-30, North Carolina State University, Raleigh: **Workshop on Computer Aided Design for Stream Restoration.** More information: Cathy Smith: 919-515-6780 or cathy_smith@ncsu.edu; Web site: http://www.ncsu.edu/srp/autocad.html.

•Sep. 27-30, Portland, Maine: **Working Waterways and Waterfront: A National Symposium on Water Access.** Organized by Maine Sea Grant. More information: (207) 288-2944, x5834 or nspringuel@coa.edu; Web site: www.wateraccessus.com.

•Sep. 28-30, West Yellowstone, Mont.: **Wild Trout X Symposium—Conserving Wild Trout.** More information: Dirk Miller, symposium chair, dirk.miller@wgf.state.wy.us; Web site: www.wildtroutsymposium.com/index.php.

•Oct. 2-6, New Orleans, La.: **WEFTEC 10.** Annual conference by the Water Environment Federation (headquartered in Alexandria. Va.). More information: (800) 666-0206; Web site: www.weftec.org.

•Oct. 6-7, Morgantown, W. Va.: **West Virginia Water Resources—Threats and Opportunities.** Annual West Virginia Water Conference, organized by the West Virginia Water Research Institute. More information: wvwaterconference@mail.wvu.edu; Web site: www.wvwaterconference.org/index.cfm.

•Oct. 6-8, Biloxi, Miss.: **Southeast Stormwater Association Annual Conference.** This association covers Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee. More information: (850) 561-0904; Web site: www.seswa.org/content.asp?pl=296&sl=309&contentid=309.

•Oct. 17-21, Pittsburgh, Penn.: **Annual Conference of the Association of State Drinking Water Administrators.** More information: Tom Maves, (202) 293-7655; Web site: www.asdwa.org.

•Oct. 25-26, Chapel Hill, N.C.: **Water and Health: Where Science Meets Policy.** Organized by the University of North Carolina. More information: Tony Reevy at (919) 966-9927 or tony_reevy@unc.edu; Web site: www.ie.unc.edu/content/news_events/symposia/2010/index.cfm.

•Nov. 1-4, Philadelphia, Penn: **2010 American Water Resources Association (AWRA) Annual Water Resources Conference**. Sponsored by the Delaware and New Jersey sections of the AWRA. More information: (540) 687-8390 (AWRA headquarters in Middleburg, Va.); Web site: http://www.awra.org/meetings/Philadelphia2010/index.shtml.

•Nov. 2-5, Henderson, Nev.: **Floodplain Management Association Annual Conference.** More information: (619) 204-4380 or admin@floodplain.org; Web site: http://www.floodplain.org/conference.php.

•Nov. 9-10, Brookings, S.D.: **Eastern South Dakota Water Conference.** Organized by the South Dakota Water Resources Institute. More information: Denise Hovland at (605) 688-4910 or denise.hovland@sdstate.edu.

•Nov. 14-17, Baltimore, Md.: **TMDL 2010—Watershed Management to Improve Water Quality.** Organized by the American Society of Agricultural and Biological Engineers (the symposium chair is Brian Benham, of Virginia Tech's Department of Biological Systems Engineering). More information: Sharon McKnight, (269) 932-7033, mcknight@asabe.org; Web site: www.asabe.org/meetings/TMDL2010/.

•Nov. 11-14, Shepherdstown, W. Va.: **5th Annual Chesapeake Watershed Forum.** More information: Lou Etgen, (410) 377-6270 or letgen@acb-online.org; Web site: www.rivernetwork.org/events/chesapeake-watershed-forum.

•Nov. 13-17, Galveston, Tex.: **Preparing for Climate Change: Science, Practice, and Policy: 5th National Conference on Coastal and Estuarine Habitat Restoration.** Organized by Restore America's Estuaries (headquartered in Arlington, Va.). More information: Howard White, (703) 524-0248, ext. 10, or hwhite@estuaries.org; Web site: www.estuaries.org/CONFERENCE/.

•Nov. 17-20, Charleston, S.C.: **13th International Conference on Shellfish Restoration.** Organized by the South Carolina Sea Grant Consortium. More Information: **Elaine Knight** at (843) 953-6406 or elaine.knight@scseagrant.org; Web site: www.scseagrant.org/Content/?cid=297.

•Nov. 18, Maritime Institute, North Linthicum, Md.: **Maryland Water Monitoring Council's Annual Conference**. This year's theme is "Environmental Justice: Healthy Waters, Healthy Communities." More information: Dan Boward, (410) 260-8605 or dboward@dnr.state.md.us; Web site: http://mddnr.chesapeakebay.net/MWMC/conf/2010/.

•Dec. 1-3, Las Cruces, New Mexico: **55th Annual New Mexico Water Conference.** Organized by the New Mexico Water Resources Research Institute. More information: (575) 646-4337 or nmwrri@wrri.nmsu.edu; Web site: http://wrri.nmsu.edu/conf/confsymp.html.

SPECIAL NOTICE: CHESAPEAKE BAY TMDL UPDATE

Since 2009, the U.S. EPA has been developing a Total Maximum Daily Load, or TMDL, restoration plan for the Chesapeake Bay. A TMDL is required for the Bay under the federal Clean Water Act because the Bay does not meet certain water-quality standards and is therefore classified as "impaired." The key aspects of the TMDL will be strategies for reducing the amounts of nitrogen, phosphorus, and sediment in the Bay watershed. In July and August 2010, the EPA announced draft allocations for these three substances from the six Bay watershed states and the District of Columbia. The proposed basin-wide limits are 187.4 million pounds per year of nitrogen, 12.5 million pounds per year of phosphorus, and 6.1-6.7 billion pounds of sediment. These overall amounts are divided among the Bay jurisdictions and among the major Bay tributary rivers. Virginia's allocations are 53.4 million pounds per year of nitrogen, 5.4 million pounds per year of phosphorus, and 2.4-2.7 billion pounds of sediment. Bay jurisdictions used the allocations to develop draft Phase I Watershed Implementation Plans, which were due September 1. Virginia submitted its plan on September 3; the plan is available at the Department of Conservation and Recreation or Department of Environmental Quality Web sites listed below.

Here are the planned deadlines and other dates leading to the final TMDL:

September 24 - EPA issues a draft Bay TMDL, including the states' draft Watershed Implementation Plans, for a 45-day public comment period.

September 24- November 8 - Bay TMDL public comment period includes a series of public meetings and online seminars throughout the watershed. **Public meetings in Virginia** will be on the following dates (all scheduled for 6 p.m.-8. p.m., but check the EPA Web site given below to confirm):

Oct. 4, Grafton Theatre, James Madison University, Harrisonburg.
Oct. 5, Northern Virginia Community College, Annandale.
Oct. 6, Jepson Alumni Center, University of Richmond.
Oct. 7: Crowne Plaza Hampton Marina Hotel, Hampton.
Oct. 7, 1 p.m-3 p.m.: Online meeting (Webinar).

November 29 - The states and the District complete their final Phase I Watershed Implementation Plans.

December 31 - EPA establishes the Bay TMDL.

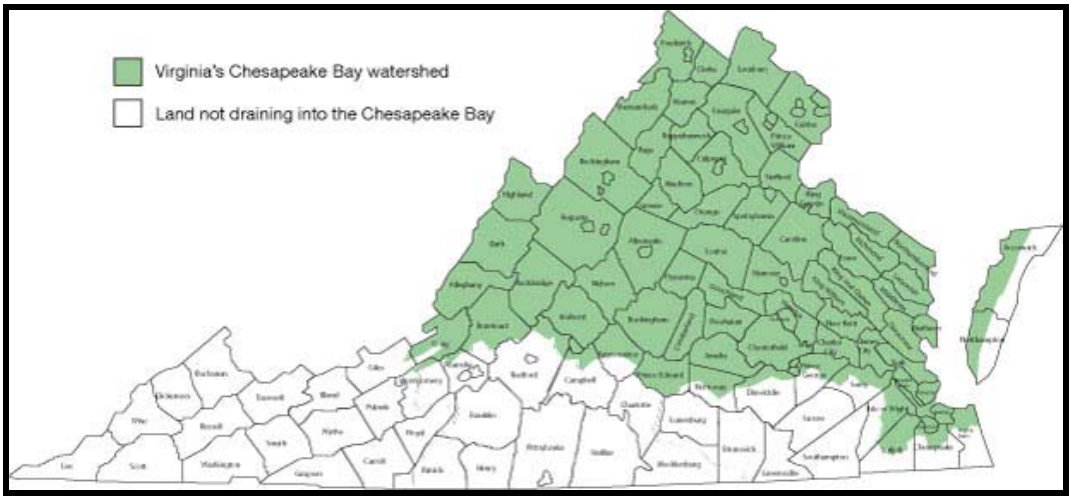
For information about the Bay TMDL and Virginia's role:

U.S. EPA: www.epa.gov/chesapeakebaytmdl/; Tom Damm, (215) 814-5560 or damm.thomas@epa.gov.

Virginia Department of Conversation and Recreation: http://dcr.vi.virginia.gov/soil_and_water/baytmdl.shtml; e-mail: vabaytmdl@dcr.virginia.gov.

Virginia Department of Environmental Quality: www.deq.virginia.gov/tmdl/chesapeakebay.html; David Lazarus, 804) 698-4299 or david.lazarus@deq.virginia.gov.

For a compilation of other Bay TMDL references and recent news articles, visit the *Virginia Water Central* Grouper's Chesapeake Bay TMDL site, at www.delicious.com/araflo/ChesBayTMDL.



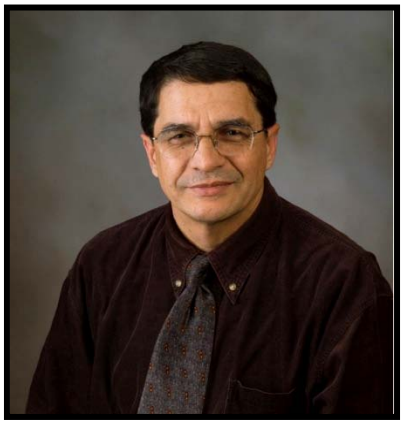
Map courtesy of Virginia Department of Conservation and Recreation, "Bay Total Maximum Daily Load" Web site, http://dcr.vi.virginia.gov/soil_and_water/baytmdl.shtml, 9/9/10.

AT THE WATER CENTER

To reach the Virginia Water Resources Research Center: phone (540) 231-5624; FAX (540) 231-6673; e-mail water@vt.edu; Web site www.vwrrc.vt.edu.

One Farewell, One Change, and One Welcome for Water Center Staff

On June 30, 2010, **Tamim Younos** retired from the Water Center and Virginia Tech after 16 years of service at the Water Center and 31 years overall at the university. Beginning in 1979 as a research associate in Tech's Agricultural Engineering Department (now the Biological Systems Engineering Department, or BSE), Tamim held a series of research and teaching positions in BSE, the Virginia Tech Geography Department, and the Water Center, where he was associate director for research and program development at the time of his retirement. He also served as interim director of the Water Center from 2002 to 2006. In July, Tamim became executive vice-president at the Cabell Brand Center for Global Poverty and Resource Sustainability Studies, located in Roanoke.



Photos courtesy of Virginia Tech University Relations.

In July 2010, **Kevin McGuire** became the new associate director of the Water Center. Kevin came to the Center in January 2009 from a joint position with Plymouth State University and the Northern Research Station of the USDA Forest Service, both in New Hampshire. He received a B.S. degree from Susquehanna University in Pennsylvania, M.S. from Penn State, and Ph.D. from Oregon State. Kevin maintains an appointment as research assistant professor in the Virginia Tech Department of Forest Resources and Environmental Conservation, where he advises graduate students and teaches hydrology courses. Kevin's research focuses on how water moves through forested landscapes, on watershed management issues associated with land use, and on climate-change effects on watershed processes and water quality.

Charley Kelly began work as a post-doctoral research associate with the Water Center in June 2010. She will work closely with Water Center Associate Director Kevin McGuire and with scientists from the U.S. Forest Service's Coweeta Hydrologic Laboratory in North Carolina to investigate how forest management practices and climate change may affect stream yield from forested watersheds. Charley received a B.S. in from the University of Dayton in Ohio and an M.S. from West Virginia University, both in Environmental Biology. She recently completed her PhD from Virginia Tech in Forest Resources and Environmental Conservation, where her research under Water Center Director Stephen Schoenholtz focused on watershed biogeochemistry and the effects of vegetation type and atmospheric nitrogen deposition on water quality.

Virginia Water Central

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Water Central is available online at www.vwrrc.vt.edu/watercentral.html. If you would like an e-mail notification when new issues are posted, please notify us at (540) 231-5463 or araflo@vt.edu. Also, please let us know if your e-mail address has changed or if you no longer wish to receive the e-mail notification.

If you do not have Internet access and would like a photocopy of the newsletter, please contact us.

Thank you!

YOU GET THE LAST WORD

Please answer the following questions to let us know whether the newsletter is meeting your needs. Please mail this page to the Water Center address listed in the box above, or e-mail your responses to araflo@vt.edu. Thank you.

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3. Would you rate the **readability** of the articles as good, fair, or poor?

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