

Virginia Water Central

Virginia Water Resources Research Center Blacksburg, Virginia November 2013 (No. 61)



Sandy River Reservoir near Rice in Prince Edward County, Virginia, November 21, 2013.

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Editor's and Director's Comment



Where's the Newsletter Been, and Where's It Going?

By Alan Raflo, *Virginia Water Central* Editor, and Stephen Schoenholtz, *Virginia Water Resources Research Center* Director



Readers have good reason to ask the first question above, because the last issue of *Virginia Water Central* was a year ago, November 2012.

Like many state water centers around the country, the Virginia Water Resources Research Center has traditionally used a periodic newsletter—first in print, and now increasingly in digital formats—to provide water-related news, reference material, data, and information sources to citizens, elected officials, and natural-resources professionals. Over the past two or three years, the *Water Central* editor has devoted significant time to exploring new methods for distributing much of the information previously presented only in the newsletter. That work has resulted in two new information services:

- **Virginia Water Radio**, online at <http://www.virginiawaterradio.org>, with weekly, two-to-four-minute segments of sounds and music that introduce or illustrate Virginia water resources topics. Listeners can subscribe to be notified electronically when new episodes are posted online.
- **Virginia Water Central News Grouper**, <http://vawatercentralnewsgrouper.wordpress.com/>, with annotated links to water news articles, events, and resources, all grouped into topics. Recurring posts are the weekly Virginia Government Water-related Meetings, monthly Virginia Water-Status Report, and the monthly Quick Guide to Virginia Water-related Events. Readers can receive e-mail notification of posts (immediately, daily, or weekly). We announce newsletter issues and Virginia Water Radio episodes on the Grouper, so an e-mail subscription to the Grouper allows people to follow all three products.

Meanwhile, the **Virginia Water Monitoring Council's "Announcements,"** coordinated by the Water Center, is a popular, weekly e-mail about meetings, reports, and other items related to water quality and water monitoring. You can receive those e-mails by contacting Jane Walker at 540-231-4159 or janewalk@vt.edu. The Water Monitoring Council's Web site is <http://vwrrc.vt.edu/vwmc/default.asp>.

These developments have led us to the second question above: *where's the newsletter going?* Frankly, we're trying to figure that out. The world of information delivery keeps changing dramatically, for small operations like ours as well as for worldwide TV networks and big-city newspapers. The world of *water* information and issues, similarly, continues to grow and present new challenges.

As we face these challenges, the most important voices for us to hear belong to you—the citizens we serve. So we welcome your comments, and we promise that any changes to our information services will be driven by our mission to provide water-related research, information, and service to the Commonwealth.

TEACHING WATER Especially for Virginia's K-12 teachers

This Issue and the Virginia Standards of Learning

Below are suggested Virginia Standards of Learning (SOLs) that may be supported by items in this issue. The SOLs listed 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
Water News June-November 2013 (starts p.3)	ES.6, ES. 8, ES. 10, ES. 12, BIO. 8	CE.1, CE.9, WG.2, WG.7, GOV.8, GOV.9, GOV.16
Water Status Report (starts p. 20)	4.6, 4.9, 6.7, LS.6, ES.6, ES.8, ES.12.	WG.2

IN AND OUT OF THE NEWS

Newsworthy Items You May Have Missed

This section presents headlines and notes for a selection of water-news stories in, nearby to, or related to Virginia for the period June 7—November 19, 2013. The headlines are grouped by topics and—within those groups—from newest to oldest. Explanatory notes have been added after the publication and date. Unless otherwise noted, all places mentioned are in Virginia. As of 12/5/13, all underlined headlines listed below had working hyperlinks to take you to the full article; headlines in bold and quotation marks no longer had working hyperlinks as of that date; also as of 12/5/13, all other Web links were functional.

Frequently used abbreviations: DEQ = Virginia Department of Environmental Quality; EPA = U.S. Environmental Protection Agency; SWCB = Virginia State Water Control Board; VMRC = Virginia Marine Resources Commission.

These items were previously posted on the Virginia Water Central News Grouper, online at <http://vawatercentralnewsgrouper.wordpress.com/>. New items are added to the News Grouper frequently and have category labels for searching out a particular water-related topic. We hope you'll try some Grouper!

Air-Water Connections

- [EPA gets high court hearing on coal pollution](#), *Richmond Times-Dispatch*, 6/25/13. On June 24, 2013, the U.S. Supreme Court agreed to hear the appeal by the U.S. EPA of a federal appeals court's decision in 2012 that the EPA's exceeded its authority in issuing its regulation on air-pollution that crosses state lines, including emissions from many coal-fired power plants. Deposition into water bodies is part of the impacts of the nitrogen and sulfur compounds in these air emissions.

Aquatic Life and Habitats

- [American Rivers and U.S. EPA Potomac Highlands Implementation Grant Program](#), 10/23/13; and [Waynesboro receives \\$163K grant toward South River restoration](#), *Augusta Free Press*, 10/21/13. In October 2013, the non-profit organization American Rivers and the U.S. EPA announced grants of over \$1.67 million for eight watershed restoration or protection projects in the Potomac River Highlands area of Virginia, Maryland, Pennsylvania, and West Virginia. In Virginia, the grants are \$209,000 for restoration of Peyton Creek in Staunton; \$163,000 for South River restoration in Waynesboro; and \$150,000 for land conservation along the North Fork Shenandoah River and Cedar Creek in the northern Shenandoah Valley (*photo at right*).



Above: Cedar Creek on Middle Road in Frederick County, Virginia, October 18, 2008.

- [Grant will bolster oyster reef work](#), *Virginian-Pilot*, 10/22/13. On October 22, 2013, the National Oceanic and Atmospheric Administration announced over \$6 million in grants for aquatic-habitat-restoration projects in Virginia, Maryland, Maine, and Massachusetts, including a \$434,000 grant to the Chesapeake Bay Foundation for oyster-reef reef construction in the Lafayette River in Norfolk.

- [Report: James River cleanup has stalled](#), *Richmond Times-Dispatch*, 10/23/13; and [James River's water quality grade increases slightly](#), *Lynchburg News & Advance*, 10/22/13. On October 22, 2013, the James River Association released its latest biennial "State of the James River" report, covering conditions as of 2012. (State of the James" reports are available online at <http://www.jamesriverassociation.org/the-james-river/state-of-the-james/>.) The report uses 20 water-quality and habitat indicators to give the river an overall score and grade. This report's score of 53 percent (of stated goals)—a grade of "C"—is a slight improvement on the 51 percent score in the 2011 report (for conditions as of 2010). The report states that a lack of progress in reducing **sediment pollution** is counteracting other pollution-reduction achievements. In a related item from another Chesapeake Bay state: Sediment also is the largest Chesapeake Bay-tributary issue in Pennsylvania, according an October 15, 2013, report by that state's Department of

Environmental Protection to its Citizen Advisory Council. [Manure From PA Not The Leading Cause Of Nitrogen Pollution To Chesapeake Bay](#), *NorthCentralPA.com*, 10/22/13.

• [Bay gets big boost from tiny seed pods](#), *Fredericksburg Free Lance-Star*, 10/10/13. An approximately two-week period in late September and early October is the time of year for harvest of Wild Celery seed pods by volunteers participating in the Chesapeake Bay Foundation's (CBF) "Grasses for the Masses" program. Wild Celery is one of several plants—collectively called submerged aquatic vegetation (SAVs) or "Bay grasses"—that are important for water quality and aquatic-life habitat in the Bay. In the CBF program, volunteers plant and tend grass seeds for 10 to 12 weeks, then gather the seed pods for eventual transplant to the James and Potomac rivers.

• [Great blue herons make huge comeback, survey shows](#), *Richmond Times-Dispatch*, 9/30/13. In late September 2013, scientists with the Center for Conservation Biology at the College of William and Mary and at Virginia Commonwealth University released results of a survey during May-June 2013 of Great Blue Herons in the Chesapeake Bay region of Virginia, Maryland, and Delaware. The survey found over 14,000 pairs of nesting birds in 407 colonies, compared to only 12 colonies found during surveys in the 1960s.

• [Dolphin deaths follow Va. aquarium's prediction](#), WAVY (Chesapeake Va.), 9/17/13; [Dead dolphin found on KI](#), *The Queen Anne's County (Md.) News*, 8/30/13; [Virus epidemic likely cause of dolphin deaths](#), *Daily Press*, 8/28/13; [Dolphin die-off stretches Virginia Aquarium resources](#), WVEC 13 (Norfolk, Va.) TV, 8/19/13; and [Dolphin deaths up in Washington region](#), *Washington Post*, 8/6/13. In summer 2013, Atlantic Coast states—including Virginia, Maryland, Delaware, and New Jersey—saw a significant increase in deaths of dolphins. As of mid-September, the Virginia total for 2013 was 316, compared to an average yearly total of about 60. A virus was determined to be the cause of the dolphin deaths.

• [A Whale of a Find](#), WYPR (Baltimore Md.) 88.1 FM, 8/16/13. In July 2013, an employee at Stratford Hall, the historic home of Robert E. Lee in Westmoreland County, found the **fossil skull of a whale**, estimated at 15 million years old, in a cliff beside the Potomac River, some 150 feet below the residence. Stratford Hall officials enlisted the help of paleontologists from the Calvert Marine Museum in Solomons, Maryland, to extract the skull and the rest of the skeleton, which they did in July and August. The skeleton is being kept at the Calvert Museum. Cliffs at Stratford Hall line up—geographically and geologically—with cliffs in Calvert County that are popular sites for hunting fossils, such as sharks' teeth. Both areas were once covered by water when seas were higher thousands of years ago.

• [Largemouth Bass Virus Found in Northern Snakeheads in Virginia](#), U.S. Geological Survey News Release, 8/13/13. In research published in late July 2013, U.S. Geological Survey scientists reported that they had found largemouth bass virus in Northern Snakehead fish (*photo at right*) in two Potomac River tributaries in northern Virginia. The virus previously has been found in other members of the sunfish family but had not been found before in Northern Snakeheads.

• [Study finds toxins in James River crabs](#), *Richmond Times-Dispatch*, 8/12/13. As part of an ongoing three-year (2012-2014) study of algae in the James River, Virginia Commonwealth University (VCU) researchers in summer 2012 found Blue Crabs in the tidal, freshwater James that contained the **microcystin toxin** produced by some types of blue-green algae. Researchers and state officials stated that the presence of the toxin does not represent a human health issue at this time, that they do not yet know if it is having an impact on Blue Crab populations, and that the issue merits further study.

• [Wakefield Run Stream Restoration Project off With a Splash](#), *The (Alexandria Va.) Connection*, 7/24/13. An approximately \$350,000 stream-restoration project began July 24, 2013, on Fairfax County's Wakefield Run, a tributary of Accotink Creek (in the Potomac River watershed).

• [Large crowd gathers for VB turtle release](#), WAVY (Chesapeake Va.) TV, 7/11/13; and [Sea turtles returned to the wild at Point Lookout](#), *Southern Maryland Newspapers Online*, 6/26/13. On July 11, 2013, two **Green**



Above: Northern Snakehead, photographed in May 2005. Photo by Brett Billings, provided for public use by the U.S. Fish and Wildlife Service's National Digital Library, <http://digitalmedia.fws.gov/cdm/>.

Sea Turtles (*photo at right*) that had become stranded in cold waters in December 2012 were released by Virginia Aquarium staff at First Landing State Park in Virginia Beach. The turtles were implanted with sonic tags so that their movements can be monitored in order to give information about Green Sea Turtle distribution. The U.S. Navy's Fleet Forces Command funded the tagging effort. Similarly, on June 22, 2013, at Point Lookout State Park on the Chesapeake Bay in Maryland, staff of the National Aquarium at Baltimore released seven sea turtles that had been undergoing rehabilitation at the Aquarium since the cold weather in December 2012.



Above: Green Sea Turtle (*Chelonia mydas*), photographed in April 2008. Photo by David Voegel, provided for public use by the U.S. Fish and Wildlife Service's National Digital Library, <http://digitalmedia.fws.gov/cdm/>.

• [Study: source of organic matter affects Bay water quality](#),

William & Mary (Williamsburg Va.) News, 6/11/13. A study in the April 2013 issue of the *Journal of Geophysical Research* found evidence that organic matter originating in urban areas may take longer to decompose in aquatic systems than does such material originating in non-urban areas, indicating that the source of organic material may play a role in its ultimate impact on oxygen levels in the Chesapeake Bay. The research team included scientists from the College of William and Mary and from the Virginia Institute of Marine Science.

• [Eelgrass continues its comeback in coastal bays](#), *Daily Press*, 6/3/13. Over 4200 acres of Eelgrass have been restored near Wreck Island, in South Bay on the Atlantic side of Virginia's Eastern Shore, east of Northampton County.

Chesapeake Bay Total Maximum Daily Load (TMDL)

• **"Farmers' groups appeal decision by U.S. judge in Pa. to uphold EPA's Chesapeake Bay cleanup plan,"** Associated Press, as published in *Washington Post*, 10/8/13. On October 8, 2013, the American Farm Bureau Federation and the National Corn Growers Association announced that they had filed an appeal of the September 13, 2013, federal district court opinion that upheld the U.S. EPA's Chesapeake Bay Total Maximum Daily Load (TMDL) pollution-reduction plan, issued in December 2010.

• [Groups say Virginia meeting most bay cleanup goals](#), *Richmond Times-Dispatch*, 7/8/13; [Report: Some Chesapeake Bay cleanup goals unmet](#), Associated Press, as published in *Virginian-Pilot*, 7/8/13; [Report: Virginia meeting most of its bay blueprint milestones](#), *Daily Press*, 7/8/13. On July 8, 2013, the Chesapeake Bay Foundation and the Choose Clean Water Coalition released a report on Bay states' progress toward meeting its 2012-2013 goals under the Chesapeake Bay TMDL. The assessment looked at eight selected goals (out of 42 in the entire plan) in the areas of agricultural runoff, urban/suburban runoff, and wastewater treatment. It concluded that Virginia is making adequate progress in five areas (wastewater-treatment plant upgrades, keeping cattle from streams, urban stream restoration, streamside tree planting, and conventional stormwater ponds), but inadequate progress in three areas (alternative stormwater-management practices such as pervious pavement, grass buffer strips along agricultural streams by farms, and conservation tillage on farms). A CBF July 8, 2013, news release on the report is available online at <http://cbf.org/milestones>. Here is a link to a response from Virginia Secretary of Natural Resources Doug Domenech, challenging the report's emphasis and conclusions: [Sound measures show progress in the Chesapeake](#), *Richmond Times-Dispatch*, 7/28/13.

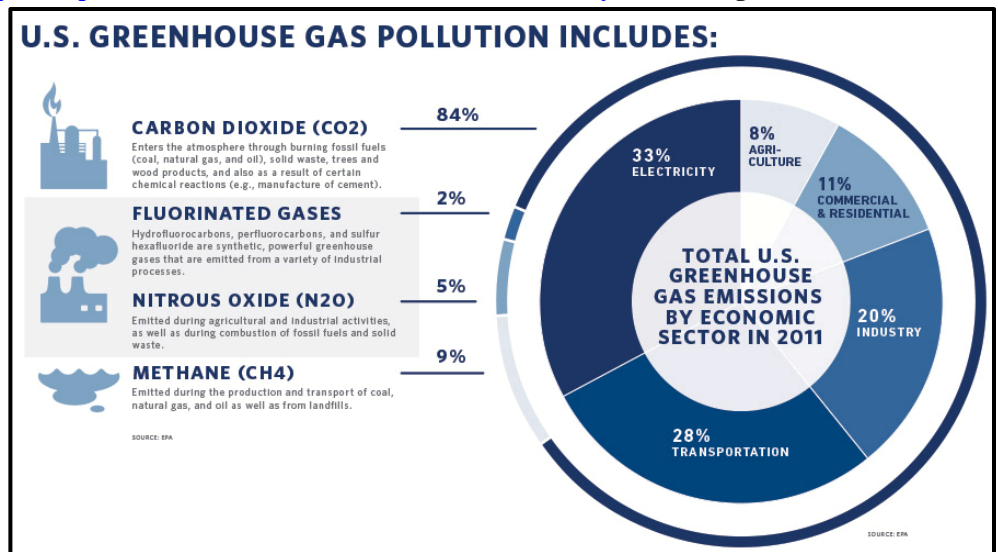
• [EPA says it would accept data from Augusta County on bay pollution monitoring](#), *Waynesboro News-Virginian*, 6/27/13. In summer 2013, the Augusta County Board of Supervisors was considering a \$256,000, four-year sampling program to monitor the amounts of nitrogen, phosphorus, and sediment that county rivers and streams are carrying out of the county. The work would be done to monitor compliance with the nutrient- and sediment-reductions called for under the December 2010 Chesapeake Bay TMDL.

Climate Change

• [Greenhouse gas emissions from power plants declined from 2011 to 2012, EPA says](#), *Washington Post*, 10/23/13. On October 23, 2013, the U.S. EPA reported that emissions of carbon dioxide and other “greenhouse gases” from power plants and industrial plants decreased by 4.5 percent from 2011 to 2012, as a result of many plants switching from coal to natural gas as their fuel source. According to the *Washington Post*, power plants account for about 31 percent of greenhouse-gas emissions annually in the United States.

• [Supreme Court will review EPA’s authority to regulate power-plant and factory emissions](#), *Washington Post*, 10/15/13. On October 15, 2013, the U.S. Supreme Court announced that it will hear several challenges to the U.S. EPA’s regulation of emissions of carbon dioxide and other greenhouse gases from power-generating plants and other stationary sources. The petitions accepted by the Court allege that the EPA overstepped its authority under the Clean Air Act

recognized by the Court in its 2007 *Massachusetts v. EPA* decision. That decision applied to automobile emissions (*mobile* sources), and the petitions accepted for hearing by the court challenge the EPA’s extension of regulation to stationary sources.



Above: U.S. Greenhouse Gas Emissions by Economic Sector in 2011. Graph by U.S. EPA, accessed at <http://www2.epa.gov/carbon-pollution-standards>, 12/9/13.

• [EPA Proposes Carbon Pollution Standards for New Power Plants / Agency takes important step to reduce carbon pollution from power plants as part of President Obama’s Climate Action Plan](#), U.S. EPA News Release, 9/20/13; and [EPA moves to limit emissions of future coal- and gas-fired power plants](#), *Washington Post*, 9/19/13. On September 20, 2013, the U.S. EPA proposed regulations on the amount of carbon dioxide that can be emitted by new electricity-generating power plants. According to the EPA’s news release on the announcement, under the proposed regulations “new large natural gas-fired turbines would need to meet a limit of 1,000 pounds of CO2 per megawatt-hour, while new small natural gas-fired turbines would need to meet a limit of 1,100 pounds of CO2 per megawatt-hour. New coal-fired units would need to meet a limit of 1,100 pounds of CO2 per megawatt-hour, and would have the option to meet a somewhat tighter limit if they choose to average emissions over multiple years, giving those units additional operational flexibility.” The proposed regulations undergo a 60-day public-comment period once they are published in the *Federal Register*. The EPA’s Web site on the proposed standards is <http://www2.epa.gov/carbon-pollution-standards/2013-proposed-carbon-pollution-standard-new-power-plants>.

• [On Climate Change, Obama bypasses Congress with ambitious plan](#), *Washington Post*, 6/25/13. On June 25, 2013, President Obama made a major announcement on actions his administration plans to take on reducing emissions of carbon dioxide and other greenhouse gases that contribute to climate change.

Coal and Water

• [Report: Chesapeake fly-ash site safe for some housing](#), *Norfolk Virginian-Pilot*, 10/9/13; and [Knee-deep in coal ash: Is it really hazardous?](#), *Chesterfield Observer*, 10/9/13. The City of Chesapeake and Chesterfield County are among Virginia localities currently participating in a long-running debate of the costs vs. benefits of different uses **for coal-combustion by-products**, commonly referred to as coal ash or coal fly-ash. In Chesapeake, ash was buried in the 1990s on a site now being considered for the proposed Campostella Square low-income housing development. On October 8, 2013, a consultant told the Chesapeake City Council that remediation of the site to allow residential housing would cost millions of dollars, although remediation for non-residential use would be less costly. Meanwhile, in Chesterfield

County, some citizens began in February 2013 to raise concerns about placement and use of coal ash in solid-waste facilities. Coal ash contains various toxic metals, but under Virginia law various uses of the material are allowed without the material being subject to regular Virginia solid-waste management regulations; *Virginia Administrative Code* section [9 VAC 20-81-95](#) describes allowable exemptions for fossil fuel combustion by-products (paragraph C.7.h, lists the allowable beneficial uses). Virginia law follows federal law, which does not classify coal ash as a hazardous substance; the U.S. EPA has been considering for several years, however, whether coal ash should be classified as hazardous waste.

Dams

• [‘Pulse release’ will raise James River levels](#), *Lynchburg News & Advance*, 8/11/13; and [Corps of Engineers and commonwealth of Virginia announce Gathright Dam pulse release dates](#), U.S. Army Corps of Engineers news release, 5/24/13. On August 13, 2013, the U.S. Army Corps of Engineers released a large amount of water into the Jackson River (*photo at right*) from the Gathright Dam in order to improve water-quality in the river by increasing dissolved oxygen and removing algae. Gathright Dam is located in Alleghany County, north of Covington, and creates Lake Moomaw. This “pulse release” was one of six scheduled by the Corps at Gathright between June and October 2013.



• [Ivy Lake residents request repeal of state regulation forcing dam repairs](#), *Lynchburg News & Advance*, 6/7/13. As of June 2013, some Bedford County residents were trying to challenge regulations under the Commonwealth’s Dam Safety Act that must be met for the Ivy Lake dam to be recertified by the Virginia Department of Conservation and Recreation. The residents disagreed with the level of rainfall that the state regulations call for the dam to be able to withstand and claimed that meeting that level would be too expensive for the community.

Above: Downstream of Gathright Dam, the Jackson River (left) joins the Cowpasture River, forming the James River in Botetourt County, Virginia. This view is from July 19, 2009.

Education

• “2 Va. schools recognized for energy efficiency, environmental awareness,” Associated Press, as published in *Washington Post*, 6/7/13. At a Washington, D.C. ceremony in early June, Stony Point Elementary in Albemarle County and Magna Vista High School in Henry County were among 64 schools across the United States to receive a U.S. Department of Education “**Green Ribbon Schools Program**” award for activities to reduce energy use, use local food, help restore trout populations, and help restore wildlife habitat.

Energy

• [Virginia Outdoors Foundation places moratorium on conservation easements that allow fracking](#), *Fredericksburg Free Lance-Star*, 10/28/13. In late October 2013, the board of the Virginia Outdoors Foundation (VOF) voted to put a moratorium until at least June 2014 on approving any conservation easements that allow gas or oil drilling. The move is in response to concerns and questions about the potential impacts of **hydraulic fracturing** to extract gas or oil on lands under conservation easements. According to the *Free Lance-Star*, the VOF is the largest holder of conservation easements in Virginia; such easements typically do not allow gas or oil drilling, but VOF may allow easements that do so if a landowner requests that.

• [Coalition opposes Bay natural gas export facility](#), *Capital News Service*, 9/17/13. On September 11, 2013, the U.S. Department of Energy conditionally approved the application by Dominion Resources, based in Richmond, Virginia, to export **liquefied natural gas (LNG)** to non-Free Trade Agreement countries. Dominion is proposing to convert an LNG-import facility in Calvert County, Md., to an export facility.

• [Dominion Virginia Power wins first Virginia offshore wind energy auction](#), *Richmond Times-Dispatch*, 9/5/13; and [Dominion wins bid for wind farm, environmentalists wary](#), *Daily Press*, 9/5/13. On September 4, Dominion Virginia Power made the winning \$1.6-million bid to lease over 112,000 acres off the coast of Virginia to develop what would be Virginia's first offshore wind-energy facility. Construction of any facilities is at least several years in the future, and the scale of any project is yet to be determined.

• [Buckroe Beach replenishment: Cost of sand increases with demand](#), *Daily Press*, 9/2/13. The U.S. Geological Survey has reported that the price of sand used in beach replenishment increased 14 percent in from 2012 to 2013 and 82 percent since 2005, due to demand for sand in hydraulic-fracturing operations to recover natural gas.

• [Hydraulic Fracturing Fluids Likely Harmed Threatened Kentucky Fish Species](#), U.S. Geological Survey News Release, 8/28/13. Research from scientists with the U.S. Geological Survey and the U.S. Fish and Wildlife Service indicates that **federally threatened Blackside Dace** (*photo at right*) were damaged by water-quality impacts from a spill of hydraulic fracturing fluids in Kentucky in 2007. The only known populations of this fish species are in the Cumberland River basin in Kentucky and Tennessee and in the Powell River basin in Virginia. The research was published in a *Southeastern Naturalist* issue (Volume 12, Special Issue 4) on Blackside Dace, available online at <http://www.eaglehill.us/SENAonline/sena-v12-sp4-2013.shtml>.



Above: School of Blackside Dace, photographed in Kentucky in 2013 by J.R. Schulte. Photo provided for public use by the U.S. Geological Survey Multimedia Gallery, <http://gallery.usgs.gov/>.

• [Waste-to-energy plan in Stafford County gets reboot](#), *Fredericksburg Free Lance-Star*, 9/18/13; [Waste-to-energy proposal in Stafford County sent back to square one](#), *Fredericksburg Free Lance-Star*, 8/13/13; [Plan gets more scrutiny](#), *Fredericksburg Free Lance-Star*, 8/8/13; [Waste plan finds few fans](#), *Fredericksburg Free Lance-Star*, 8/5/13; [Fredericksburg City Council approves landfill lease](#), *Fredericksburg Free Lance-Star*, 7/9/13; and [Stafford approves lease](#), *Fredericksburg Free Lance-Star*, 6/6/13. On July 9, 2013, the Fredericksburg City Council tentatively approved a lease for a \$73-million facility proposed by Energy Extraction Partners LLC (EEP) to capture and use **natural gas from landfill waste** at the Rappahannock Regional Landfill, located in Stafford County. On June 4, the Stafford County Board of Supervisors had granted the county attorney authority to draw up a lease. The Fredericksburg council was scheduled to take a final vote on the lease on August 13, but in July, elected officials in both jurisdictions began receiving comments from citizens opposing the proposed project. On August 13, the Stafford board voted to rescind the approval it granted in June for a lease to be developed, and the board said it plans to consider other options along with EEP's proposal. On September 18, the Rappahannock Regional Waste Management Board voted to re-open a bid process for a waste-to-energy project proposals.

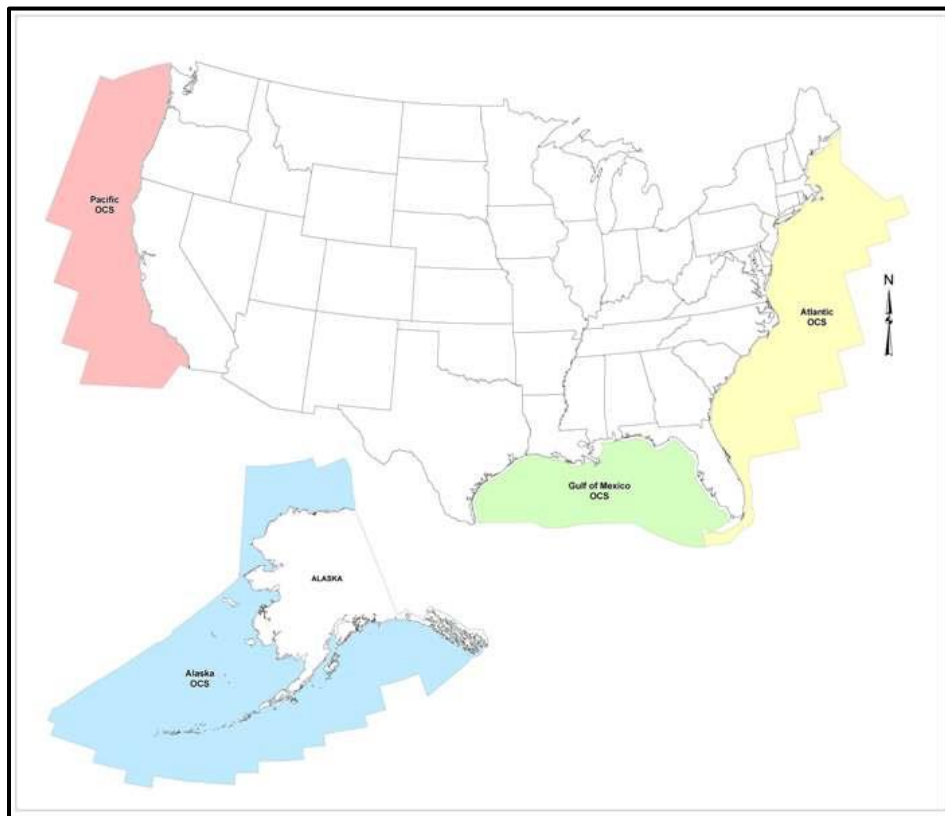
• [Brunswick power plant wins nod](#), *Richmond Times-Dispatch*, 8/5/13; and [SCC official: Reject plan for Brunswick plant](#), *Richmond Times-Dispatch*, 6/14/13. On August 2, 2013, the Virginia State Corporation Commission (SCC) approved the application by Dominion Virginia Power to build a \$1.27-billion, 1358-megawatt-capacity, **natural-gas fired power plant** in Brunswick County. On 6/11/13, an SCC State hearing examiner had recommended that the commission deny the application. Also on August 2, an SCC hearing examiner recommended that the SCC approve Dominion Virginia's application for an eight-mile, \$155-million, 500-kilovolt transmission line from its power station in Surry County across the James River to a switching station (proposed) in James City County.

• [US bank sued over pollution from coal exports](#), Associated Press, as published by yahoo.com, 8/1/13; and [Lawsuit seeks to stop federal loan guarantee for coal planned for export from Hampton Roads](#), *Daily Press*, 8/1/13. On July 31, 2013, six environmental groups filed a lawsuit in U.S. District Court in San Francisco alleging that in the U.S. Export-Import Bank should have conducted an environmental-impact analysis—including assessment of the potential health effects of coal dust—before it guaranteed loans in 2012 to help finance overseas exports of coal from Norfolk and Baltimore, Md. The plaintiffs are the Chesapeake Climate

Action Network, the Center for International Environmental Law, Friends of the Earth, Pacific Environment, the Sierra Club, and the West Virginia Highlands Conservancy.

- [Dominion's Altavista biomass plant commercially operational](#), *Lynchburg News & Advance*, 7/16/13. The Altavista Power Station (in Campbell County) operated by Dominion Virginia Power returned to commercial operation on July 12, 2013, after being closed in 2010 to allow conversion from using coal as its fuel source to **using waste-wood materials**, referred to as “biomass.” Dominion has said that two other plants, in Southampton County and the City of Hopewell, will be using biomass by the end of 2013.

- [U.S. House Backs Bill To Expand Offshore Oil and Gas Drilling](#), *Bloomberg Businessweek*, 6/28/13; and [Statement of Governor McDonnell on Passage of the Offshore Energy and Jobs Act \(HR 2231\)](#), Virginia Governor's Office News Release, 6/28/13. On June 28, 2013, the U.S. House of Representatives passed (by a vote of 235-186) the Offshore Energy and Jobs Act, H.R. 2231, which would require the Obama administration to expand the Atlantic, Pacific, and Alaskan coastal areas where it will offer leases for offshore oil and gas exploration (*map below*). The expansion would include **Lease Sale 220**, an area off the Virginia coast. This bill would also set the federal revenue-sharing percentage for states at 37.5 percent, the rate currently for offshore operations in the Gulf of Mexico. As of 11/6/13, the bill was in the Senate Committee on Energy and Natural Resources, according to the Library of Congress' “Thomas” Web site, <http://thomas.loc.gov/home/thomas.php>.



Atlantic, Gulf of Mexico, Pacific, and Alaska areas of United States' Outer Continental Shelf. Map from U.S. Bureau of Ocean Energy Management (formerly Minerals Management Service), accessed online at <http://www.boem.gov/Five-Year-Program-2012-2017/>.

- [Proposed ban on fracking in Va. forest sparks debate](#), *Virginian-Pilot*, 6/2/13; [Government considers allowing fracking in GW national forest](#), *Lynchburg News & Advance*, 4/28/13; and U.S. Forest Service Web site, <http://www.fs.usda.gov/main/gwj/landmanagement/planning>, 10/29/13. Bay Fall 2013, the U.S. Forest Service planned to release its updated 15-year management plan for the **George Washington National Forest**. A point of debate and controversy is whether the plan will call for allowing or preventing hydraulic fracturing/horizontal drilling for natural gas in the part of the Marcellus Shale formation that underlies the national forest.

Fisheries

• [Virginia Posts Largest Oyster Harvest Since 1987](#), Virginia Governor's Office News Release, 11/18/13; [Virginia oyster harvest biggest in 26 years](#), *Daily Press*, 11/18/13; and [More Chesapeake Bay oysters harvested, but officials keep fingers crossed for true rebound](#), *Washington Post*, 11/19/13. On November 18, 2013, Virginia Gov. Robert McDonnell's office announced that Virginia's 2012-2013 oyster harvest was 406,000 bushels, the largest harvest since 1987 and about 60 percent higher than the 2011-12 harvest. The harvest included 149,000 bushels from public oyster grounds and 257,000 bushels from oyster grounds leased for private aquaculture operations.

• [Virginia closes the bay's winter blue crab dredge fishery for another year](#), *Daily Press*, 10/23/13; and [Crab harvest lowest in years](#), *Southern Maryland Newspapers Online*, 9/18/13. On October 22, 2013, the Virginia Marine Resources Commission (VMRC) voted unanimously to continue the ban on winter dredging season for Blue Crabs (photo at right) in Virginia's Chesapeake Bay waters. Winter dredging has been banned by Virginia since 2008 as part of efforts to improve Blue Crab populations (dredging for crabs is illegal in Maryland). The VMRC rejected a proposal that would have allowed a limited winter-dredge season. In a related previous development: As of mid-September, the Blue Crab harvest in 2013 had been one of the lowest in several years all along the Atlantic Coast. For a detailed look at the low Blue Crab harvest, particularly in relation to recent high-population estimates, see [The mystery of the missing blue crabs](#), *Bay Journal*, Nov. 2013.



Above: Blue Crab preparing to molt, October 1999, Tangier Island, Va. Photo by Mary Hollinger, made available for public use by the National Oceanic and Atmospheric Administration Photo Library, online at <http://www.photolib.noaa.gov/index.html>.

• [MD striped bass spawn better but still below average](#), *Baltimore Sun*, 10/22/13. **Striped Bass, or Rockfish**, reproduction in Chesapeake Bay watershed rivers—as measured between July and September 2013—improved over 2012 levels in Virginia and Maryland. The 2013 levels were about average in Virginia but below average in Maryland (despite the increase in that state's waters).

• [Setting sights on the Potomac's recovery](#), *Fredericksburg Free Lance-Star*, 9/9/13. Marylander Martin Gary took over in July 2013 as the executive director of the **Potomac River Fisheries Commission**. A 1958 compact between Virginia and Maryland created the Commission to allow the states to collaborate in regulating commercial and recreational fish and fisheries in the river.

• [Virginia has first oyster disease outbreak](#), *Virginian-Pilot*, 7/16/13. On July 12, 2013, the Virginia Department of Health announced that it was closing shellfishing waters around **Fisherman's Island**—in Northampton County, off the southern end of Virginia's Eastern Shore—for up to year after three people became ill from the *Vibrio parahaemolyticus* bacterium after eating oysters harvested in private waters in the area in May 2013.

• [York County teen grooms oysters for Chesapeake Bay restoration](#), *Daily Press*, 7/11/13. This year, York County, Virginia, teen David Lewis received one of 14 International **Youth Eco-Hero Awards**, given by Action for Nature (an international non-profit organization headquartered in San Francisco; online at <http://www.actionfornature.org/home.aspx>) for his four years of raising baby oysters as part of the Chesapeake Bay Foundation's oyster-gardening project.

• [Ghost pots estimated to kill 1.25 million blue crabs in VA's Bay waters; VIMS researchers experimenting with larger, biodegradable cull panels](#), *Bay Journal*, June 2013. A four-year study (2008-2012) by the Virginia Institute of Marine Science (VIMS) found approximately 32,000 **lost or abandoned crab pots**, containing 25,000 Blue Crabs and 30 other aquatic species, in Virginia's Chesapeake Bay waters. From these results, the researchers estimated that over one million Blue Crabs per year may be getting caught in lost pots throughout the Bay.

• [Concrete reef balls lowered into river in Norfolk](#), Associated Press, as published in *Virginian-Pilot*, 6/26/13. In summer 2013, the Chesapeake Bay Foundation, the Virginia Marine Fisheries Commission, and other

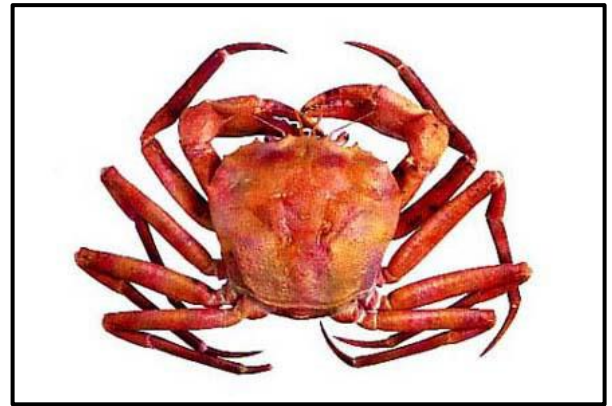
agencies and groups were cooperating to place concrete oyster “reef balls” into the **Lafayette River** in Virginia Beach as part of oyster-restoration efforts.

• [Governor McDonnell Welcomes New Seafood Industry Expansion to Commonwealth](#), Virginia Governor’s Office News Release, 6/26/13. On June 26, 2013, the first harvest of **Atlantic Red Crab** (*photo at right*) in Virginia took place as a new joint venture began among Massachusetts-based Atlantic Red Crab Company and Virginia-based L.D. Armory Co., Inc., and Graham & Rollins, Inc.

• [Shad catch limited in move to restore depleted fishery](#), *Washington Post*, 6/16/13. In early June 2013, the **Atlantic States Marine Fisheries Council** imposed for the first time ever a limit on the allowable by-catch of shad and river herring by trawlers in the Atlantic Ocean beyond three miles from shore.

• [Oyster beds get re-shelled in the Great Wicomico River](#), *Daily Press*, 6/9/13. In summer 2013, the Great Wicomico River was one of several Virginia Chesapeake Bay tributaries receiving oyster shells to replenish beds, after the 2013 Virginia General Assembly put \$2 million towards the effort, a state-funding record amount.

• [Omega Protein assessed \\$5.5M in U.S. penalties](#), *Virginian-Pilot*, 6/5/13. On June 4, 2013, the Omega Protein Corp., headquartered in Texas and operating a **Menhaden fishing and processing operation** out of Reedville, Va., agreed in federal district court to \$5.5 million in penalties under the Clean Water Act for illegally disposing of oil-containing ship bilge water and factory wastewater into the Atlantic Ocean and Chesapeake Bay between 2008 and 2011.



Above: Atlantic Red Crab, *Chaceon quinque-dens*. Photo from National Oceanic and Atmospheric Administration, online at <http://www.nefsc.noaa.gov/sos/spsyn/iv/redcrab/>, 12/11/13.

Groundwater

• [EPA to test toxins at Avionics site near airport](#), *Charlottesville Daily Progress*, 7/25/13; and [Cleanup of toxic site in Earlysville long overdue, regulators say](#), *Charlottesville Daily Progress*, 7/27/13. In July 2013, the U.S. EPA began an investigation expected to take 18 months to determine the location and levels of five toxic chemicals that have been found in soil and groundwater at the former Avionics Specialties, Inc., site, near the **Charlottesville airport**.

• [State getting tougher on some groundwater withdrawals](#), *Richmond Times-Dispatch*, 6/18/13; and [State expands groundwater regulation into Middle Peninsula](#), *Daily Press*, 6/20/13. On June 17, 2013, the Virginia State Water Control Board voted to add 10 counties and parts of six others to the **Eastern Virginia Groundwater Management Area**, in which a permit is needed for groundwater withdrawals of over 300,000 gallons per month.

Land Use

• [Draft of Fort Monroe master plan calls for mix of housing and park land](#), *Daily Press*, 9/27/13. On September 26, 2013, the Fort Monroe Planning Authority Advisory Group approved a draft master plan for the former military base turned over to the Commonwealth of Virginia in 2012. The full Fort Monroe Board of Trustees was scheduled to consider the plan on October 24, 2013. If that board approves the plan, it goes to the governor for review.

• [Va. group seeks more money for environment](#), *Richmond Times-Dispatch*, 9/23/13. In a report released on September 21, 2013, the group Virginia Forever called on the Commonwealth to spend **\$833.8 million over the period 2015-2019** for protection of agricultural lands, forests, other natural lands, and historic places; and \$805 million over that period for water-quality efforts. These amounts would add \$245 million and \$725 million, respectively, to the land-protection and water-quality funds “already identified” by the Commonwealth, according to the report. According to its Web site, Virginia Forever is a “coalition of businesses, environmental organizations, and outdoor enthusiasts that advocates for increased funding for

water quality improvements and land conservation across the Commonwealth. The report, “Investing in the Commonwealth’s Land and Water: Virginia Forever’s Five-year Plan, 2015-2019,” and more information about Virginia Forever is available online at <http://virginiaforever.org/>.

- [Widewater State Park Presented as Top Priority along Potomac River](#), *Potomac Local*, 8/29/13. On August 27, 2013, the Virginia Department of Conservation and Recreation (DCR) presented the proposed master plan for Widewater State Park, a new park to be located on 1,100 acres between the Potomac River and Aquia Creek in Stafford County. DCR’s three-phase plan would cost an estimated \$43 million.
- [Conservation group buys 443 acres of forest, swamp](#), *Virginian-Pilot*, 7/26/13. In late July 2013, the Nature Conservancy announced that on July 11 it closed a deal to pay \$400,000 to purchase 443 acres of forest and **wetlands along the Blackwater and Nottoway Rivers** (Chowan River tributaries) in Southampton County, Va. The area, known as Byrd’s Point, is to become part of the Commonwealth’s South Quay Sandhills Natural Preserve, which was created in 2013.
- [Portsmouth's Paradise Creek Park is found again](#), *Virginian-Pilot*, 7/1/13. On June 22, 2013, the City of Portsmouth officially opened Paradise Creek Nature Park, a 40-acre, \$14.6-million project that includes trails and wildlife habitat in woodlands and wetlands.
- [Richmond wins EPA grant for “brownfield” sites](#), *Richmond Times-Dispatch*, 6/23/13. In late June 2013, the City of Richmond announced that it had received a \$400,000 grant from the U.S. EPA for environmental assessments of potential hazardous substances or petroleum products on former commercial and industrial sites—so called “brownfield” sites—in order to help facilitate their possible re-development.
- [Werowocomoco ceremony: America didn’t begin in 1607](#), College of William and Mary News Release, 6/24/13. On June 21, 2013, Virginia Governor Robert McDonnell, Virginia Native Americans, and the Virginia Department of Historic Resource officially placed a conservation easement on about 60 acres at the site of Werowocomoco, the center of the **area dominated by the Powhatan Indians** prior to European settlement and the place where Chief Powhatan, Captain John Smith, and Pocahontas first met in December 1607. The area is along the York River in Gloucester County. Information about William and Mary’s research project on the site is available online at <http://powhatan.wm.edu/>.

Laws and Regulations

- [Va., Riverkeeper differ on how to handle algae in Shenandoah](#), *Bay Journal*, 9/9/13. The Shenandoah Riverkeeper has been advocating for Virginia to list the Shenandoah River (*photo at right*) as impaired on the basis of annual algal blooms, but current Virginia standards do not allow a listing for that cause. Nutrient criteria that might allow such a listing are being developed by the Commonwealth.
- [Animal feeding operation rules get legal tweak](#), *Daily Press*, 6/8/13. In early June 2013, the U.S. EPA and the Chesapeake Bay Foundation (CBF) amended a 2010 settlement of a CBF lawsuit over regulation of surface-water runoff from large animal-feeding operations. The amended agreement removed the obligation for the EPA to develop new regulations at this time, in favor of the agency auditing each Chesapeake Bay state’s current practices to determine whether new rules are needed.



Above: Early-summer view of the Shenandoah River from U.S. Rt. 7 in Clarke County, Va., June 17, 2009.

Military

• [Hearing held on plans for fiber optic line under Chesapeake to Taylors Island](#), *The Dorchester (Md.) Star*, 8/22/13. On August 19 and 20, 2013, public hearings were held in Maryland concerning the proposal by the U.S. Department of Defense to run a fiber-optic line under the Chesapeake Bay in Maryland, part of a larger effort to have a dedicated fiber-optic line from the Patuxent River Naval Air Test Center in St. Mary's County, Maryland, to the Wallops Island Flight Center in Accomack County, Virginia.

Mining

• [A&G Coal Corp. found guilty of polluting at Wise County mine](#), *Roanoke Times*, 7/24/13; and [Judge orders mining company to make changes following toxic discharge](#), *Bristol Herald Courier*, 7/24/13. On July 22, 2013, a federal district court judge in Big Stone Gap, Va., ruled that A&G Coal Company had been violating the federal Clean Water Act (CWA) by discharging **selenium**, a regulated pollutant under the CWA, without a permit. The company was ordered to apply to the Commonwealth for such a permit and to begin daily monitoring for selenium, with the testing results to be assessed by District Court Judge James Jones to determine whether the company may face civil penalties.

Oceans

• **“Smithsonian names Virginia professor to lead new network of ocean science observatories,”** Associated Press, as published in *Washington Post*, 6/20/13. In mid-June 2013, the Smithsonian Institution announced that it had appointed Emmett Duffy, a professor at the College of William and Mary in Williamsburg, to lead a worldwide network of coastal observatories to monitor climate change and aquatic life impacts. The network will include one observatory for the Chesapeake Bay.

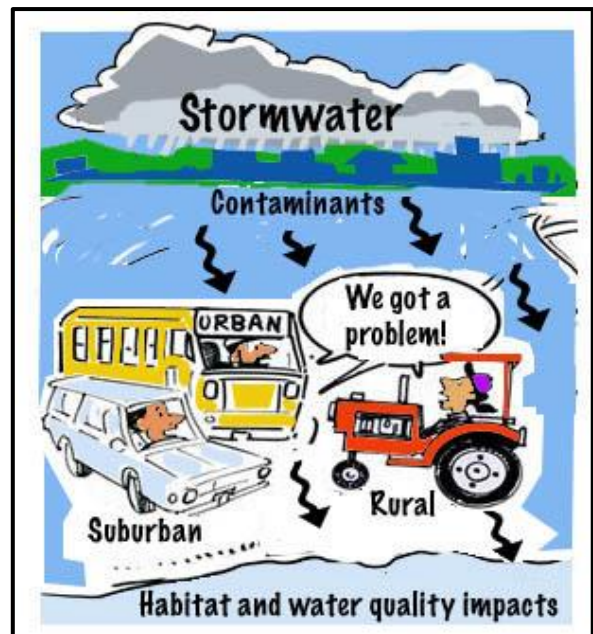
Stormwater Management

• [Housing project marries low-income and low-impact development](#), *Bay Journal*, 10/17/13. A four-acre, 24-lot development of housing for low-income residents in the **City of Lexington** is being designed with “low-impact development” (LID) features to reduce water-consumption and stormwater runoff.

• [Virginia alters course on how it regulates runoff](#), *Virginian-Pilot*, 7/17/13. July 1, 2013, was the effective date for Virginia's programs for **stormwater management and regulation**—including administration of the Commonwealth's Chesapeake Bay Preservation Act—to transfer from the Department of Conservation and Recreation (DCR) to the Department of Environmental Quality. Programs related to *agricultural* stormwater runoff remain with DCR.

• [EPA fines Hampton, Newport News on storm water](#), *Daily Press*, 7/9/13. A series of audits by the U.S. EPA found that the cities of Hampton and Newport News were not adequately monitoring stormwater-management at construction sites, and the agency fined the cities \$62,000 and \$80,000, respectively. The audits also found violations in the counties of Chesterfield and Henrico and the City of Chesapeake, with resulting fines of over \$330,000 across the three localities.

• **“Charlottesville fined \$26,000 for stormwater mitigation violations,”** *Charlottesville Daily Progress*, 7/1/13. On July 1, 2013, the Charlottesville City Council agreed to a proposed consent order with the U.S. EPA that would assess the City a \$26,000 civil penalty for violation of stormwater-management requirements at some construction sites; as of that time, the problems had been or were being corrected, according to city officials.



Above: Stormwater-management issues are far-reaching, affecting many interests. Cartoon by George Wills of Blacksburg, Va., published first in the September 2006 issue of *Virginia Water Central*.

Uranium Mining

• [McAuliffe looks to bury uranium issue](#), *Richmond Times-Dispatch*, 11/13/13; and [Drive to Mine Uranium in Va. Comes to Quiet Pause](#), Associated Press, as published by ABC News, 12/14/13. On November 11, 2013, Virginia Gov.-elect Terry McAuliffe told the *Virginian-Pilot* newspaper that he would veto any bill from the Virginia General Assembly that removed the Commonwealth's moratorium (in place since 1982) on uranium mining and milling, and that he would not allow development of regulations that would govern any potential future mining. In a financial statement filed in November 2013, Virginia Energy Resources, Inc., the parent company for Virginia Uranium, Inc., stated that the company will not attempt to gain legislation in the 2014 Virginia General Assembly that would allow a proposed uranium mining and milling operation in the Coles Hill area of Pittsylvania County, Va. (photo at right).



Above: September 2012 view of the Pittsylvania County, Va., landscape in the vicinity of Coles Hill, where Virginia Uranium, Inc., has proposed a uranium mining and milling operation.

Waste Management (including Waste-to-Energy Projects)

- [Hampton Roads Sanitation District goes greener](#), *Virginian-Pilot*, 9/14/13. On September 13, 2013, Hampton Roads Sanitation District officials had a public showing of a new, \$9.1-million, **waste-to-energy facility in Virginia Beach**, reported to be the largest operation in Virginia that captures methane generated from solid waste.
- [Recycle, reuse, tax? Norfolk targets plastic bags](#), *Virginian-Pilot*, 7/26/13. The City of Norfolk is pursuing various methods to get citizens to reduce **use of disposable plastic bags**, including supporting related measures in the Virginia General Assembly and creating a task force that will give out re-usable bags and provide presentations to civic groups and schools. The task force has estimated that up to 10 percent of disposable plastic bags become litter on roadways or in waterways.
- [Campaign aims to clean up](#), *Suffolk (Va.) News-Herald*, 7/16/13. In 2013, the **Keep Virginia Beautiful** program celebrated its 60th anniversary, and the program undertook a campaign this year to encourage more local litter clean-up efforts. People interested in participating can sign up online at www.kvb60.org/register.

Wastewater

- [State renews permit](#), *Petersburg Progress-Index*, 10/14/13. In early October 2013, the Virginia State Water Control Board (SWCB) approved the renewal of a permit for the **Dinwiddie County Water Authority** for future discharge of up to four million gallons per day of wastewater into Hatcher Creek (a Chowan River tributary), if the county eventually builds a wastewater-treatment facility on the stream. The authority would have to secure several other permits to begin construction on a facility. The Virginia Department of Environmental Quality received about 100 comments from citizens expressing concerns about the permit renewal.
- [Study: Cities can save \\$1B if agency controls sewers](#), *Virginian-Pilot*, 9/25/13. On September 24, 2013, the commission of the Hampton Roads Sanitation District Com (HRSD; online at <http://www.hrsd.com/>) approved a recommendation that localities in the district **consolidate their wastewater systems**, a move that could save over \$1 billion on the work needed to upgrade systems to meet stricter requirements from the U.S. EPA and Virginia Department of Environmental Quality. For the consolidation to proceed, approval is needed from localities operating their own wastewater-treatment systems. The HRSD service area includes eight counties and nine independent cities.
- [Owner of Rocky Mount sewage service faces fresh counts of illegal waste disposal](#), *Roanoke Times*, 8/14/13. As of mid-August, the owner of a septic-system service in Rocky Mount faced 32 misdemeanor charges and three felony charges for allegedly dumping sewage illegally at several sites in the county.

Water Supply

• [Car wash water conservation program launched](#), *Charlottesville Daily Progress*, 11/13/13. In November 2013, officials in Albemarle County and the City of Charlottesville announced a new car-wash water-conservation certification program. The program encourages car wash facilities to install water-saving devices.

• [Water authority seeks input on proposed upgrades](#), *Chesterfield Observer*, 10/2/13. In October 2013, a proposed Virginia Department of Environmental Quality (DEQ) water-supply permit for the **Appomattox River Water Authority** (in the James River basin) was open for public comment. Two key changes to the existing permit involve how the Authority calculates how much water flows into its Lake Chesdin reservoir, and how much water the Authority is required to release downstream during drought periods.

• [Virginia DEQ grants permit for Smith Mountain Lake water project](#), *Lynchburg News & Advance*, 10/1/13; and [Bedford a step closer to water self-reliance](#), *Lynchburg News & Advance*, 7/17/13. On September 19, 2013, the Virginia Department of Environmental Quality (DEQ) issued a permit for the **Bedford Regional Water Authority** to increase its water withdrawal from Smith Mountain Lake from 3 million gallons per day (MGD) to 12 MGD, an increase that could eventually allow the county to serve the Forest area and to reduce its water purchases from the City of Lynchburg. Approvals from the Bedford County Board of Supervisors and the Federal Energy Regulatory Commission were still necessary for the county to begin construction of the project.

• [Report: Area water supply sufficient for now](#), *Northern Virginia Daily*, 9/11/13. On September 11, 2013, a 90-day public comment period ended for the **Northern Shenandoah Valley Water Supply Plan**, and the Virginia Department of Environmental Quality notified the Northern Shenandoah Regional Commission that the plan met compliance with state requirements. The plan indicates that area water supplies should be able to supply expected growth, but that some jurisdictions are approaching the limits of their supply and might face a deficit over the 50-year planning period assessed in the plans. This region's plan is part of a **statewide planning process** that the Virginia General Assembly required in response to drought in the early 2000s. Information on this process is available online at <http://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/WaterSupplyPlanning.aspx>.

• [Water panel hears intriguing idea for conserving groundwater](#), *Richmond Times-Dispatch*, 7/17/13. At the Virginia State Water Commission meeting on July 16, 2013, Middlesex County Board of Supervisors member Peter Mansfield suggested that the RockTenn Company's paper mill in West Point (King William County) might be able to use **recycled water from a regional wastewater-treatment system plant**, rather than using groundwater as the plant currently does (23 million gallons per day). Groundwater levels in eastern Virginia's Coastal Plain have been declining in some areas, and the groundwater situation was one of the main topics of the Commission's meeting. The Commission is made up primarily of members of the Virginia General Assembly.

• [State water board approves disputed offset plan for Cobbs Creek Reservoir](#), *Richmond Times-Dispatch*, 6/18/13. On June 17, 2013, the Virginia State Water Control Board voted to approved the mitigation plan for the proposed Cobbs Creek Reservoir in Henrico County, under which some 75 percent of the mitigation for impacted stream miles would be accomplished by implementing buffers to prevent logging along certain



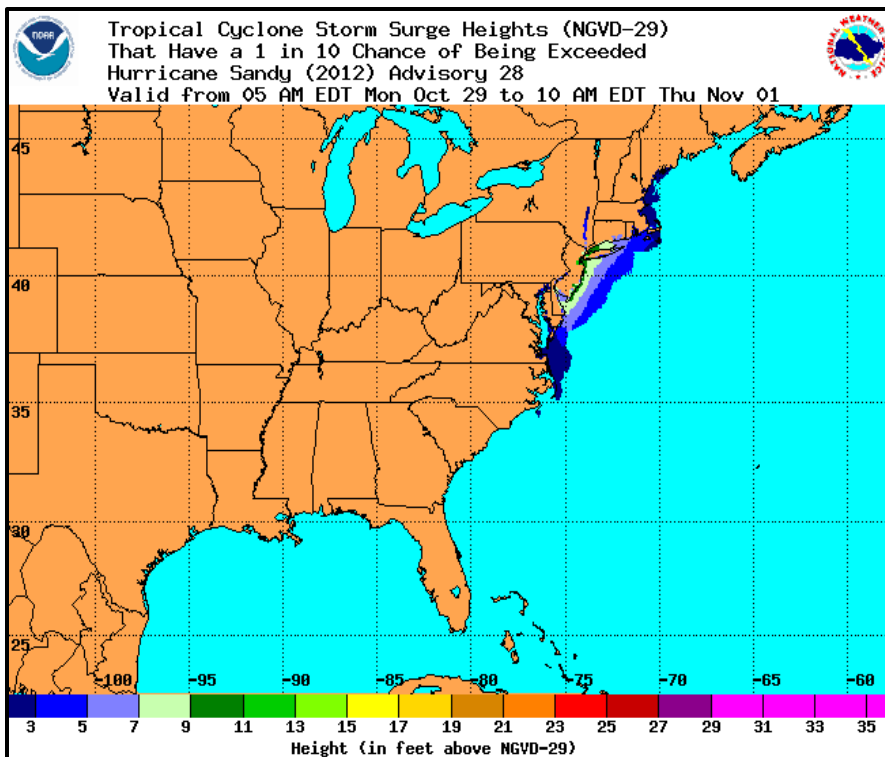
Above: A key source of data used to make water-supply decisions are stream-flow gages—such as this one on the North Fork Shenandoah River near Mt. Jackson (Shenandoah County), photographed in January 2010—operated in Virginia by the U.S. Geological Survey or the Virginia Department of Environmental Quality.

stream sections in the Cumberland State Forest. Other mitigation actions will be taken for impacts on the other stream sections (about 15 miles total) and on about 30 acres of wetlands.

Weather

- [Freak 'twister' near Bassett lifted tents and nearly some people](#), *Roanoke Times*, 9/18/13. On September 14, 2013, an uncommon weather phenomenon called a “**dust devil**” appeared at the Bassett Heritage Festival in Henry County.

- [Updated model to aid in hurricane evacuation plans](#), *Washington Post*, 8/25/13. During the Atlantic tropical storm season (June 1–November 30) in 2013, the National Hurricane Center was developing and using better computer models—run on faster computers—to improve its ability to predict **storm surge**, one of the most dangerous coastal aspects of tropical storms. The Center also changed its forecasts from feet above normal high-tide level to depth above ground level. The Center’s online overview of storm surge is available at <http://www.nhc.noaa.gov/surge/>. (Related diagram and additional information below.)



Left: Possible storm-surge levels predicted along the Atlantic coastline as Hurricane Sandy was approaching landfall on October 29, 2012. Note that in 2012, the map used “feet above NGVD,” that is, feet above “National Geodetic Vertical Datum,” previously known as the “Mean Sea Level Datum of 1929,” according to the National Geodetic Survey (<http://www.ngs.noaa.gov/faq.shtm#WhatVD29VD88>, 12/12/13).

Map from National Oceanic and Atmospheric Administration (NOAA)/National Weather Service’s “Probabilistic Hurricane Storm Surge” Web page archive, online at <http://www.nws.noaa.gov/mdl/psu/rge/archive.php>, 12/12/13.

- Among news items about the effects of **Virginia’s above-normal rainfall in the first half of 2013** were the following three. 1) [Indian Creek Discharge](#), National Committee for the New River, 8/29/13; and [Wythe company cleaning up environmental mess](#), WDBJ-TV Roanoke, 9/16/13. Heavy rains in early 2013 led to increased levels of zinc in surface water runoff from a former mine site (closed in 1981) on Indian Creek, a New River tributary near Austinville in Wythe County. Since 1994, the site has been under a state enforcement order to remove mining tailings, and significant progress has been made over the years to remove the materials. But the 2013 rainfall created a new drainage channel through which runoff from the tailings was flowing without any treatment. The Virginia departments of Environmental Quality and of Mines, Minerals and Energy met with the property owners in late August to establish a plan for remediating the drainage issues that led to the increased zinc discharges this year. 2) [Crews remove debris from Smith Mountain Lake](#), *Lynchburg News & Advance*, 7/19/13. By July, above-normal rainfall had led to above-normal amounts of tree branches, trash, and other debris flowing into Smith Mountain Lake (in Bedford, Franklin, and Pittsylvania counties). 3) [Part of York River closed to shellfish harvesting](#), *Virginian-Pilot*, 6/11/13. In June, heavy rainfall from Tropical Storm Andrea caused high stormwater runoff and wastewater overflows that elevated bacteria levels in sections of the York River, leading the Virginia Health Department to close the sections to shell-fishing until bacteria levels dropped.

• [Governor McDonnell Announces \\$405,000 in Community Development Block Grant Urgent Needs Funding; Town of Strasburg will receive grants to assist with rebuilding and improving storm drainage system after Hurricane Sandy](#), Virginia Governor's Office News Release, 8/19/13. This grant will help repair Hurricane Sandy damage that occurred in October 2012 to Ash Street in the Shenandoah County town of Strasburg.

Wetlands

• [Threat to wetlands could be threat to new U.S. 460](#), *Virginian-Pilot*, 10/30/13; [VDOT, Corps at odds over new road's toll on wetlands](#), *Virginian-Pilot*, 8/9/13; and [U.S. 460 plan hits speed bump over wetlands](#), *Virginian-Pilot*, 10/31/12. Virginia is planning a \$1.4-billion, 55-mile-long, four-lane, **tolled highway roughly paralleling U.S. 460 from Petersburg to Suffolk**. The project has been under consideration for years and currently is being designed, with some parts possibly to be under construction by 2014. The U.S. Army Corps of Engineers has asserted that potential wetlands impacts could prevent the Corps from granting a permit for the Virginia Department of Transportation's (VDOT) to build the new road, and that a preferred option would be to expand and add urban by-passes to the existing 460 corridor. (Under the federal Clean Water Act, the Corps has permitting jurisdiction over projects that affect wetlands considered part of the "waters of the United States.") As of July 2013, the federal agency and VDOT were not in agreement about VDOT's analysis of alternatives, including expansion of the existing U.S. 460. In late October 2013, the *Virginian-Pilot* reported that VDOT had most recently estimated (in a report to the Corps) that the project could destroy up to 480 acres of wetlands, compared to an earlier estimate of 129 acres potentially destroyed.

Outside of Virginia but in the Chesapeake Bay Watershed

• [Phosphorus regulations delayed, again](#), *Bay Journal*, 11/19/13; and [Proposed phosphorus rules pulled for further review](#), *The (Easton, Md.) Star Democrat*, 11/19/13. On November 15, 2013, the Maryland Department of Agriculture announced that it was withdrawing proposed regulations that would have required use of a new tool for **farmers to calculate how much phosphorus** could be applied to agricultural lands. The regulations were proposed and withdrawn in 2012, as well. Concerns were raised during the public-comment period that the new tool, which would replace a current index for measuring phosphorus needs and potential runoff, would be too complicated and too expensive.

[Growing Blue Award Nominations](#), *Southern Maryland News Net*, 11/7/13. On November 6, 2013, at the American Water Summit in Washington, D.C., Maryland's nutrient-credit trading program received a Growing Blue Award. Growing Blue, online at <http://growingblue.com>, seeks to increase public understanding of water's importance for economies, society, and the environment. The Maryland program was one of four nationwide recognized at the November 6 event.

• **"W.Va. chicken farmer wins lawsuit against EPA over stormwater runoff, permit requirement,"** Associated Press, as published in *Washington Post*, 10/23/13. On October 23, 2013, a federal district court judge ruled that pollutants reaching waterways after being blown through **ventilation fans on a West Virginia poultry farm** are *not* part of a point-source of pollution, and therefore are not subject to permitting under the federal Clean Water Act.

• [Maryland Sued Over Menhaden Quota Reductions](#), *Delmarva Public Radio*, 10/22/13. In October 2013, citizens filed a lawsuit against the Maryland Department of Natural Resources challenging the state's newly issued quota on **harvest of Atlantic Menhaden in Chesapeake Bay waters**. Part of the complaint is that Maryland's harvest quota is 5.3 million pounds annually, compared to a quota of 600 million pounds in Virginia.

• Here are three of many possible examples of **local wastewater-treatment improvement efforts in the Chesapeake Bay watershed**, in response to the requirements of the Bay Total Maximum Daily Load (TMDL) pollution-reduction plan published in December 2010 by the U.S. EPA. 1. [Bonds to be issued for sewer plants](#), *The (Martinsburg W.Va.) Journal*, 9/27/13. As of late September 2013, West Virginia planned by the end of 2013 to issue bonds for between \$70 million and \$90 million to help pay for Chesapeake Bay restoration-related upgrades at 12 wastewater-treatment plants in the state's Eastern Panhandle, part of the Potomac River basin (*related photo next page*). 2) [City approves contract for sewer plant](#), *The (Martinsburg W.Va.) Journal*, 9/5/13. On September 4, 2013, the city of Martinsburg, West Virginia,

awarded a construction contract for a new, \$38.8-million wastewater treatment plant that will reduce nitrogen and phosphorus levels in the city's wastewater discharge. 3. [Baltimore approves \\$263 million for Chesapeake Bay cleanup](#), *Baltimore Sun*, 8/14/13. On August 14, 2013, the City of Baltimore's Board of Estimates approved a \$263-million contract for the first phase of constructing a nutrient-removal facility at the city's Back River Wastewater Treatment Plant.

- [Susquehanna River center grows](#), Lancaster (Penn.) Online, 8/19/13. As of mid-August 2013, construction was scheduled to begin soon and be completed by winter 2013-14 on a \$1.4-million project to create recreational and educational facilities related to the **heritage of the Susquehanna River** at the John and Kathryn Zimmerman Center for Heritage in York County, Pennsylvania.

- [First-of-Its-Kind Easement from Sea Level Rise Impacts](#), *Southern Maryland News Net*, 8/22/13. On August 22, 2013, Maryland Gov. Martin O'Malley and the state's Board of Public Works approved funding to purchase the state's first **Coastal Resilience Easement**, covering 221 acres in Dorchester County (along the Harriet Tubman Underground Railroad National Historic Park) that is considered susceptible to flooding from observed and predicted sea-level rises.

- [Chesapeake Bay Foundation\] Files to Intervene in Conowingo Dam Relicensing](#), *The Chestertown (Md.) Spy*, 8/20/13; [Groups push sediment, eel-fishing issues at Conowingo Dam](#), Lancaster (Penn.) Online, 7/22/13; [18 Riverkeepers Intervene In Conowingo Relicensing](#), *The Chestertown (Md.) Spy*, 7/23/13; [Counties seek to intervene in Conowingo relicensing](#), *The (Easton Md.) Star Democrat*, 7/2/13; and [Coalition tries to intervene in dam relicensing in effort to curb pollution](#), *The Cumberland (Md.) Times-News*, 7/1/13. On August 20, 2013, the Chesapeake Bay Foundation filed a motion to be allowed to intervene in the relicensing process by Excelon Corporation for the **Conowingo Hydroelectric Dam on the Susquehanna River in Maryland**. Previously, in July 2013, a coalition of several riverkeeper groups in the lower Susquehanna River basin and the Chesapeake Bay watershed filed a motion to intervene in the relicensing process; these groups are seeking action by Excelon on sediment behind the dam, public-fishing access, and American Eel restoration. Also, in late June 2013, the Clean Chesapeake Coalition, representing (at the time) the Maryland counties of Allegany, Caroline, Carroll, Cecil, Dorchester, Frederick, and Kent, filed a motion to intervene based also on concerns over sediment at the dam.

- [80 Years Ago Storm Created Ocean City Inlet](#), *The (Ocean City Md.) Dispatch*, 8/13/13. This article provides an interesting look back at the impacts on Ocean City, Maryland, of the **August 1933 Chesapeake-Potomac hurricane**, which also seriously affected Virginia, including causing Norfolk's lowest barometric pressure and highest tide recorded up to that time. Information from the National Weather Service (Eastern Region Headquarters) on the impact of the hurricane on Virginia and North Carolina is available online at <http://www.erh.noaa.gov/er/akq/Hur30s.htm>.

- [17th Century Sunken Ship Discovered in the Chesapeake Bay](#), *Your4State.com*, 8/1/13. In late July 2013, Maryland archeologists confirmed that a sunken vessel discovered earlier in 2013 in the Saint Mary's River in St. Mary's County (on the western side of the Chesapeake Bay) is a **17th-Century tobacco-hauling ship**, apparently the first ever discovered in Chesapeake Bay waters.

- [1st step for private water well testing OK'ed](#), *The (Williamsport Pa.) Sun Gazette*, 7/26/13. In late July 2013, Lycoming County, Pennsylvania, commissioners gave approval for a \$250,000 grant application to the state to fund a county-wide **program to monitor groundwater quality in private wells**.

- [Maryland to increase RPS further reduce power usage cut emissions by 40%](#), *Electric Power*, *Platts News*, 7/25/13. On July 25, 2013, Maryland Gov. Martin O'Malley announced that Maryland will increase its **renewable-energy portfolio standard (RPS)**, increase efforts to reduce energy use, and required



Above: Potomac River below Paw Paw, West Va., in the state's Eastern Panhandle, July 11, 2010.

increased emission reductions from power plants, all as part of the state's effort to reach its greenhouse-gas emissions target for 2020.

- [Vulnerable Maryland weighs threat of sea-level rise](#), *Washington Post*, 7/21/13. On June 26, 2013, the Maryland Commission on Climate change released "Updating Maryland's Projected Sea-level Rise," a 22-page report stating that water levels along Maryland's coastline are currently predicted to rise by up to two feet by the middle of this century and from two to six feet by the end of the century. The report is available (as PDF) online at <http://www.umces.edu/sites/default/files/pdfs/SeaLevelRiseProjections.pdf>.

- [Maryland Offshore Wind Farm Threatens Bald Eagles](#), *The (Chicago Ill.) Heartlander*, 6/10/13. Texas-based Pioneer Green Energy is proposing a 60-turbine wind project in Somerset County, Maryland, which is on the Delmarva Peninsula just north of the Virginia border. The U.S. Fish and Wildlife Service and the U.S. Navy have raised concerns about the proposed project.

- [Hundreds tackle 4.4-mile Great Chesapeake Bay Swim](#), (Annapolis Md.) *Capital Gazette*, 6/9/13. On June 9, 2013, over 550 swimmers took place in the **22nd Great Chesapeake Bay Swim in Maryland**. The swim was from Sandy Point State Park to Kent Island (*photo at right*), beside the Bay Bridge carrying U.S. Rt. 50. The event, which started with a solo swimmer in 1982, is a fundraiser for the Maryland March of Dimes and other organizations.

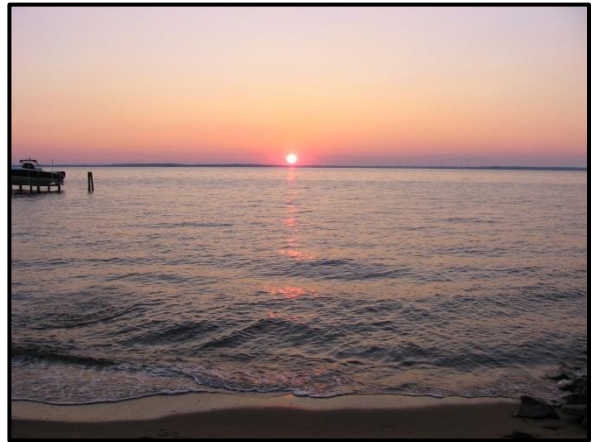
Outside of Virginia but in the Gulf of Mexico Watershed

- [Polluted farm runoff linked to toxic green algae slime in U.S. waters](#), *Washington Post*, 9/27/13. On September 20, 2013, U.S. District Court Judge Jay Zainey in New Orleans (Eastern District of Louisiana) ordered the U.S. EPA to determine within six months whether or not the federal Clean Water Act requires the agency to set **regulatory criteria for nitrogen and phosphorus** in certain waters in the Mississippi River and Gulf of Mexico. (In Virginia, the New River, Big Sandy River, and Upper Tennessee River basins are in the Mississippi River/Gulf of Mexico watershed.) Nitrogen and phosphorus are nutrients that, in excess, can lead to excessive growth of algae and eventually to depletion of oxygen dissolved in water, a situation sometimes called a "dead zone" and seen in the Chesapeake Bay, Gulf of Mexico, and other water bodies.

- [Real-time Monitoring Pays Off for Tracking Nitrate Pulse in Mississippi River Basin to the Gulf of Mexico](#), U.S. Geological Survey News Release, 8/21/13. Along the Mississippi River, the U.S. Geological Survey (USGS) is using **optical sensors to measure and transmit data on levels of nitrate** (a compound of nitrogen and oxygen) every 15 minutes to three hours. The monitoring seeks to clarify how nitrate concentrations from tributaries contribute to a watershed "pulse" of nitrate in response to rainfall and seasons.

Out of This World

- [Scientists Detect Magmatic Water on Moon's Surface](#), U.S. Geological Survey News Release, 8/26/13. In the August 25, 2013, edition of the scientific journal *Nature Geoscience*, scientists reported that NASA's Moon Mineralogy Mapper had detected magmatic water, that is, water originating deep within the interior of the moon.



Above: Sunset on the Chesapeake Bay, viewed from Kent Island, Md., September 11, 2005.

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, December 2012—November 2013

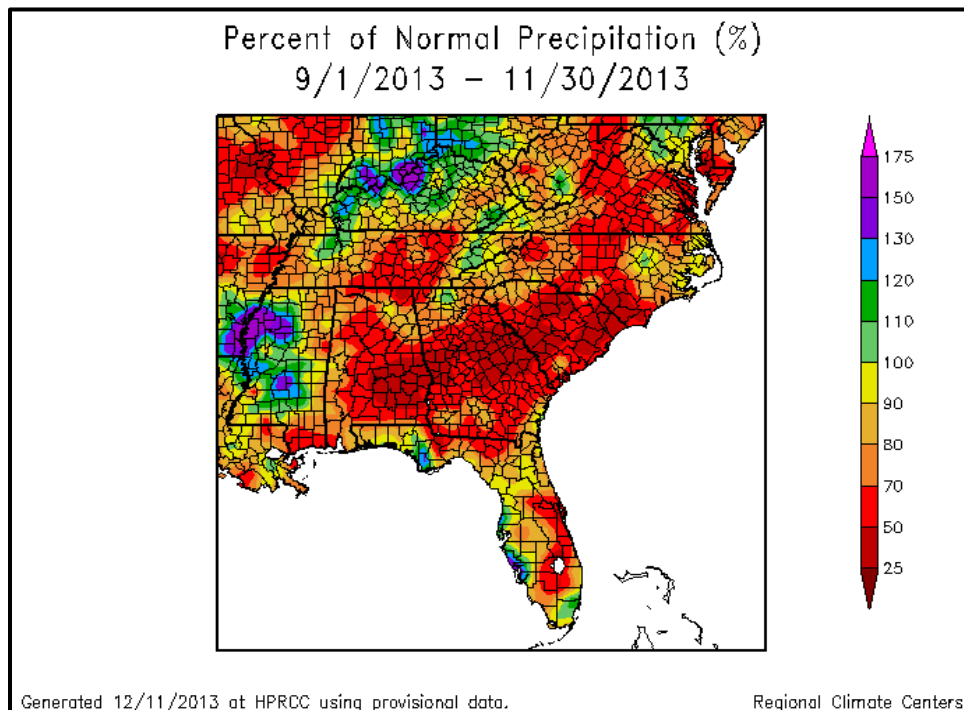
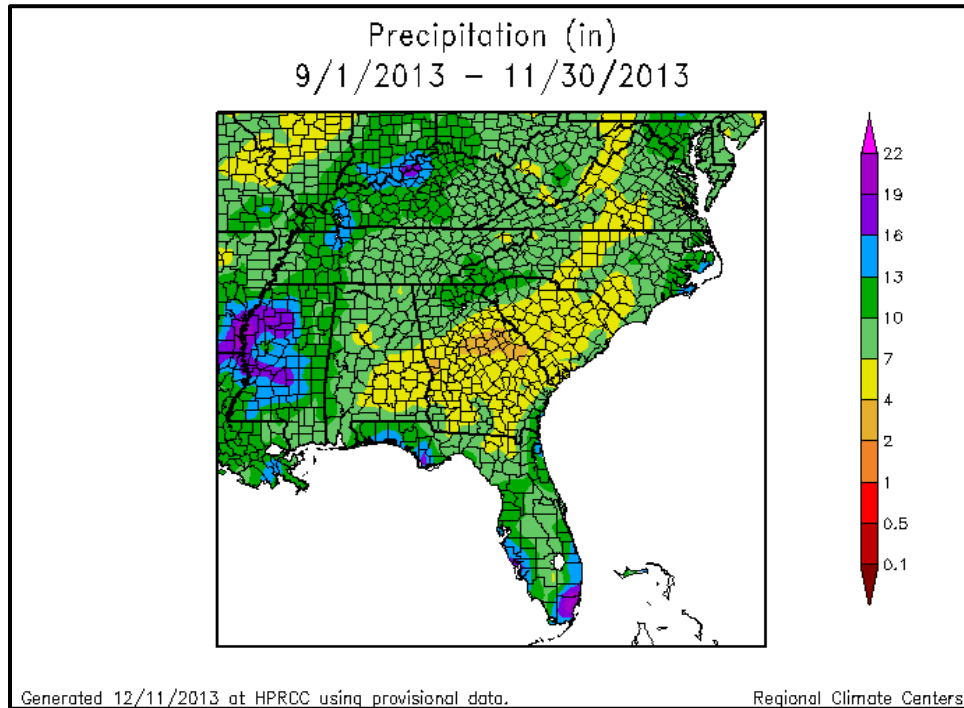
The chart below shows precipitation (in inches) over the last 12 months at nine National Weather Service (NWS) observation sites in or near Virginia. The numbers in the rows marked "O" are **observed precipitation** (rain plus the water amount in any frozen precipitation) for the respective site and month (with yearly total at the bottom of the chart). 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=lwj, for Washington-Dulles; and <http://mi.nws.noaa.gov/climate/index.php?wfo=akq>, for Norfolk, Richmond, and Wallops Island. The number in the rows marked "N" (in red) are the **normal** (average) **precipitation** for the locality and month, from 1981-2010 records that were published in 2011 by the National Climatic Data Center (NCDC) (<http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html>). The amounts listed here are classified by the NWS as *provisional* data and are subject to revision; the NCDC maintains any edited and *certified* data that are available.

	Bristol (Tri-Cities Airport)	Blacksburg (VT Airport)	Danville (Station #37)	Lynchburg (Regional Airport)	Norfolk (Internat. Airport)	Richmond (Byrd Intern. Airport)	Roanoke (Woodrum Airport)	Wash.- Dulles Airport	Wallops Island
Dec12 O	4.00	2.41	2.46	2.65	4.48	2.83	2.58	2.87	3.85
Dec N	3.37	2.95	3.27	3.24	3.26	3.26	2.94	2.96	3.43
Jan13 O	9.99*	7.74*	7.16	6.06	2.76	5.33	7.21	3.70	3.61
Jan N	3.37	3.08	3.42	3.14	3.40	3.04	2.92	2.68	3.04
Feb13 O	1.86	1.36	2.65	1.57	4.80	2.60	2.08	1.63	4.63
Feb N	3.45	2.81	3.01	2.93	3.12	2.76	2.89	2.74	2.76
Mar13 O	4.62	3.32	2.55	3.31	2.50	5.57	3.40	3.16	4.67
Mar N	3.44	3.64	4.11	3.58	3.68	4.04	3.46	3.38	4.00
Apr13 O	4.13	3.62	3.04	3.38	3.21	2.88	2.94	2.30	3.77
Apr N	3.33	3.48	3.46	3.31	3.41	3.27	3.37	3.47	3.07
May13 O	4.09	5.83	4.81	6.12	4.15	2.50	4.91	3.20	1.39
May N	3.80	4.33	3.88	3.73	3.41	3.78	4.06	4.55	2.95
Jun13 O	8.37	7.94	5.94	6.32	2.62	6.50	6.49	4.64	3.81
Jun N	3.90	4.00	3.85	3.62	4.26	3.93	3.83	3.98	3.29
Jul13 O	7.11	7.78	11.50*	3.41	8.19	5.88	12.73*	7.27	5.74
Jul N	4.69	4.26	4.59	4.36	5.14	4.51	4.04	3.67	4.09
Aug13 O	4.70	1.96	3.66	3.55	5.04	7.64	2.55	1.95	1.74
Aug N	3.47	3.59	3.97	3.26	5.52	4.66	3.56	3.53	4.19
Sep13 O	1.85	1.13	1.15	0.48	0.93	1.39	1.13	1.61	1.30
Sep N	2.99	3.10	3.96	3.88	4.76	4.13	3.89	3.92	3.98
Oct 13 O	0.68	2.65	1.20	2.34	4.13	4.25	2.54	7.51	4.20
Oct N	2.10	2.78	3.53	3.11	3.42	2.98	2.89	3.25	3.17
Nov13 O	3.94	3.01	2.89	3.35	2.57	3.06	2.74	2.79	2.48
Nov N	3.10	2.87	3.36	3.41	3.15	3.24	3.40	3.41	2.87
TOTAL O	55.34	40.97	49.01	42.54	45.38	50.43	51.30	42.63	41.19
TOTAL N	41.01	40.89	44.41	41.57	46.53	43.60	41.25	41.54	40.84

* Record high for month.

Precipitation, continued: Regional Precipitation September-November 2013

For a visual presentation of recent regional precipitation, the two graphs below show the southeastern United States' September 1—November 30, 2013, total precipitation (in inches; top graph) and the departure from normal (in percentage of normal; bottom graph). *These data are provisional.* These graphs were taken from the National Oceanic and Atmospheric Administration's (NOAA) **Southeast Regional Climate Center**, located at the University of North Carolina in Chapel Hill, accessed online at http://www.sercc.com/climateinfo/precip_maps, 12/13/13.



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, Mid-December 2013

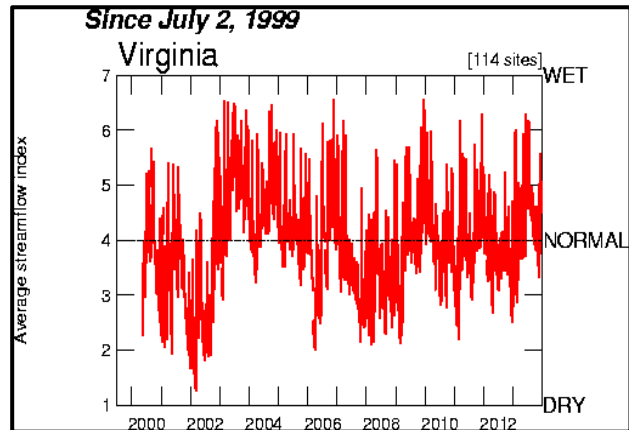
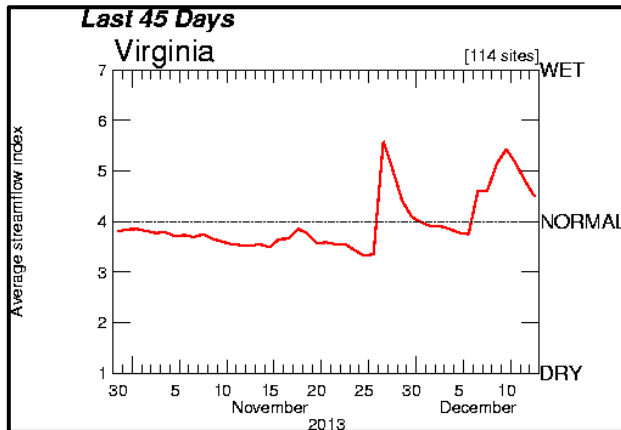
(Please note: The Web site for the Virginia Active Water Level Network, maintained by U.S. Geological Survey and found online at <http://groundwaterwatch.usgs.gov/StateMaps/VA.html>, is normally used for this section of *Virginia Water Central*, but that Web site was not fully functional at the time of this writing. As a result, monthly median values—normally shown in this section's table—were not available.)

As of December 13, 2013, the U.S. Geological Survey (USGS) National Water Information Service, online at <http://waterdata.usgs.gov/nwis/current/?type=gw>, provided data from 131 real-time groundwater wells in 41 Virginia cities and counties (values recorded about every 15 minutes). The table below shows the December 13 readings between 2 p.m. and 3 p.m. EST at one real-time well in each of 19 localities. These readings are *provisional* (i.e., subject to revision). All measurements are in **feet below the land surface**, rounded (by *Virginia Water Central*) 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 deepest (driest) level, and the shallowest (wettest) level for each well's period of record. Historical information on groundwater is also available from USGS annual reports of groundwater, available online at <http://wdr.water.usgs.gov/> for years 2002 to 2011; for previous years, check your local library for print copies. For more on groundwater monitoring in Virginia, please see the Virginia Department of Environmental Quality's Groundwater Characterization Program Web site at <http://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/GroundwaterCharacterization/StateObservationWellNetwork.aspx>.

Well (Local #)	12/13/13 Level	12/19/12 Level	8/16/12 Level	Record Deepest (Driest)	Record Shallowest (Wettest)	Records Since
Accomack (66M19SOW110S)	9.7	9.2	10.1	11.3 (Nov. 1981)	6.8 (Mar. 2010)	Sep.1978
Buckingham (41H 3)	28.1	30.4	28.1	36.4 (Oct. 2002)	7.4 (Apr. 1973)	Mar. 1971
Clarke (46W 175)	34.4	38.5	40.3	45.7 (Sep. 2002)	23.5 (Sep. 2003)	Mar. 1987
Fairfax (52V 2D)	14.3	15.8	16.3	24.9 (Dec. 1998)	6.5 (Mar. 1984)	Oct. 1976
Hanover (53K 19 SOW 080)	17.6	21.2	20.1	22.9 (Aug. 1984)	5.1 (Aug. 2004)	Jan. 1978
Loudoun (49Y 1 SOW 022)	58.8	59.9	60.3	62.0 (Feb. 2008)	48.0 (June 1972)	Nov.1963
Montgomery (27F 2 SOW 019)	3.1	5.9	5.7	7.3 (Dec. 1969)	< 0.0 (Mar. 1993)	Jul. 1953
Northampton (63H 6 SOW 103A)	7.0	7.9	8.5	10.0 (Oct. 2002)	0.8 (Aug. 2004)	Sep.1977
Orange (45P 1 SOW 030)	23.7	30.7	31.3	39.0 (Aug. 2002)	11.8 (Apr. 1973)	Feb. 1965
Prince William (49V 1)	7.8	9.5	10.9	15.4 (Jul. 2011)	6.5 (Mar. 2010)	Nov.1968
Roanoke City (31G 1 SOW 008)	18.7	19.1	19.0	19.3 (Jun. 1987)	12.4 (Feb. 1986)	Aug.1966
Rockbridge (35K 1 SOW 063)	23.7	28.5	25.6	30.4 (Sep. 2002)	14.3 (Apr. 1987)	Feb. 1964
Rockingham (41Q 1)	78.9	85.7	73.5	99.0 (Oct. 2002)	57.7 (Feb. 1998)	Aug.1970
Shenandoah (40U 3 SOW 218)	13.1	14.1	13.0	16.3 (Oct. 2009)	10.6 (May 2011)	Oct. 2006
Suffolk (58B 13)	6.9	8.8	9.4	13.4 (Jan. 1981)	2.0 (Sep. 1999)	Mar. 1975
Surry (57E 13 SOW 094C)	6.7	7.5	8.1	11.3 (Sep. 2010)	3.9 (May 1980)	Jul. 1978
Virginia Beach (62B 1 SOW 098A)	1.5	1.9	2.4	12.0 (Sep. 1980)	0.8 (Nov. 2009)	Jun. 1979
Westmoreland (55P 9)	8.2	10.4	9.0	12.8 (Dec. 1988)	< 0.0 (Dec. 2009)	Jul. 1977
York (59F 74 SOW184C)	7.7	8.8	9.0	14.1 (Jan. 2002)	0.9 (Nov. 2006)	Jun. 1990

Stream Flow in Virginia: Halloween to mid-Dec. 2013, and 2000-2013

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



The graphs above, accessed 12/13/13 from the U.S. Geological Survey's (USGS) "WaterWatch" Web site, at <http://water.usgs.gov/waterwatch/?m=real&r=va> (for Virginia), compare recent Virginia stream flow to historical records.

The data in the graphs come from 114 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:

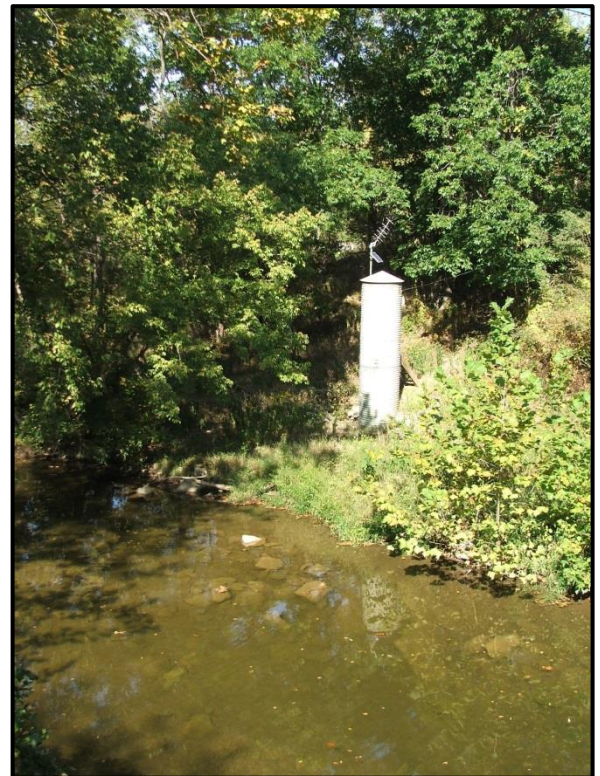
- 4 = average daily flow exceeds the lowest 25 percent of historical values for that date, but is less than the highest 25 percent of values.

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 is record high for that date.

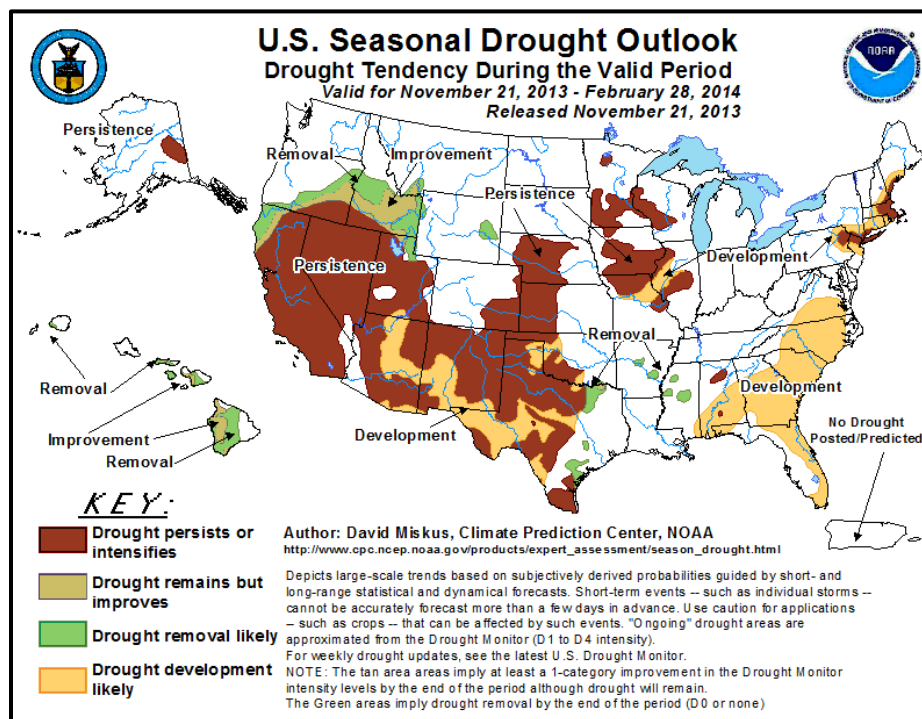
Gaps in the data: Data are not plotted for days when less than two-thirds of the sites report data (due to equipment or weather problems), because a statewide average on those days may misrepresent actual conditions.

The USGS WaterWatch site also has color-coded maps of stream flow conditions—compared to historical records—for current (real-time) flow and for average levels over the previous 1 day, 7 days, 14 days, 28 days, and month.



Above: Stream-gaging station on Catawba Creek in Botetourt County, Va., 9/19/10.

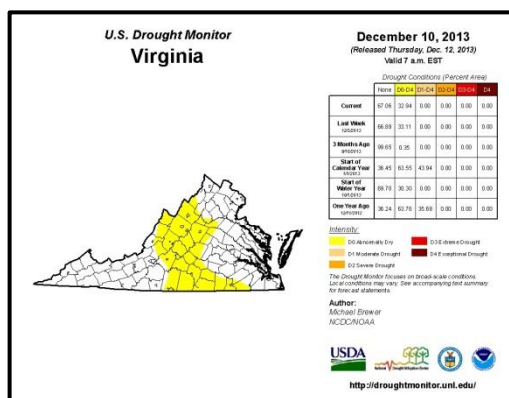
Drought Update



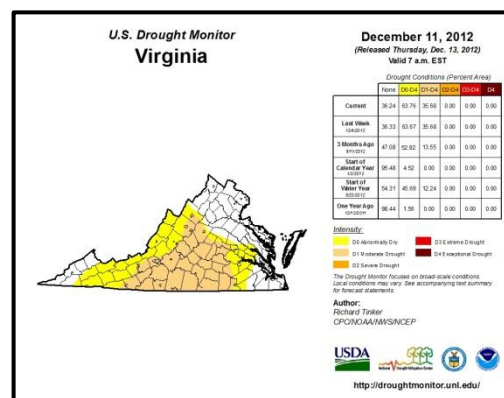
The national drought outlook for November 12, 2013—February 28, 2014, according to the National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center Web site, http://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.html, accessed 12/17/13.

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

The U.S. Drought Monitor, produced by the University of Nebraska-Lincoln and available online at <http://droughtmonitor.unl.edu/>, is a weekly nationwide drought assessment by federal agencies and state climatological centers. The following graphs show Drought Monitor assessments of Virginia conditions on December 10, 2013, compared to December 11, 2012.



December 10, 2013



December 11, 2012

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

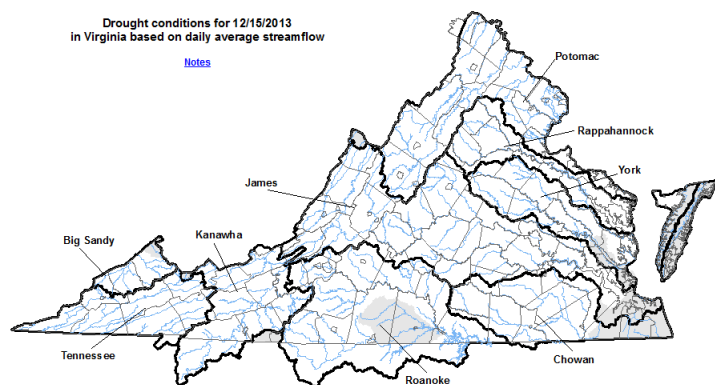
Source: Images taken U.S. Drought Monitor map archive, <http://droughtmonitor.unl.edu/DataArchive/MapArchive.aspx>, 12/17/13. Authors: Michael Brewer, National Climatic Data Center/NOAA, for 12/10/13 map; Rick Tinker, Climate Prediction Center/NOAA, for 12/11/12 map.

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
12/10/13	US = 49%; VA = 33%	US = 14%; VA = 0%
11/12/13	US = 52%; VA = 52%	US = 14%; VA = 0%
10/8/13	US = 54%; VA = 30%	US = 16%; VA = 0%
9/10/13	US = 61%; VA = 0.4%	US = 28%; VA = 0%
12/11/12	US = 69%; VA = 64%	US = 36%; VA = 0%

U.S. Geological Survey Drought Assessment based on Stream Flow

Another look at drought conditions comes from the U.S. Geological Survey, whose Virginia Water Science Center (<http://va.water.usgs.gov/>) produces daily maps assessing drought conditions based on stream flow averages from the previous 1 day, 7 days, 14 days, and 28 days. The December 17, 2013, map of drought conditions based on average 1-day stream flow is shown below. The USGS’ chart explaining map colors is also shown (the 12/17/13 map had no drought conditions, so no colors). The maps are available online at http://va.water.usgs.gov/drought2/drght_map.htm.



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

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 information: <http://www.deq.virginia.gov/Programs/PollutionPrevention/VirginiaGreen/ResourcesLinks/Water.aspx>.

Don't Forget the Water Center's Other Water Status Services!

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 http://vwrrc.vt.edu/waterstatus_new.html. And the Virginia Water Central News Grouper posts a Virginia water-status update at the beginning of each month and a mid-month drought update. Find these posts at the weather category link, <http://vawatercentralnewsgrouper.wordpress.com/category/weather/>.

VIRGINIA GOVERNMENT WATER ISSUES OVERVIEW

For an online list—updated weekly—of upcoming Virginia government meetings on water-related topics, visit the Virginia Water Central News Grouper, at <http://vawatercentralnewsgrouper.wordpress.com/category/events/>.

This section lists water issues under consideration (study or regulation) at meetings between **January 7—December 30, 2013**, by state boards, commissions, or agencies in Virginia. This list *does not necessarily include all* meeting topics of significance to Virginia water resources, and *does not list regular meetings* of state boards or commissions. Information in this issue is based on public meetings listed on the **Virginia Regulatory Town Hall** Web site, at <http://townhall.virginia.gov/L/meetings.cfm?time=future>. The Town Hall site posts agendas of upcoming meetings and minutes of past meetings; 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 <http://www.employeeDirectory.virginia.gov/>. You can also request state employee phone numbers by calling the State Operator, (804) 786-0000, 8 a.m.-5 p.m. Eastern Time on days when state offices are open. All Web sites listed in this section were functional as of 12-17-13.

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://leg1.state.va.us/cgi-bin/legp504.exe?000+men+SRR>. “NOIRA” stands for Notice of Intended Regulatory Action.

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 (listed chronologically, then alphabetically by location). If you are reading this online, click on any meeting date to go to the respective Town Hall listing. Information on the status of all TMDLs in Virginia is available from the Department of Environmental Quality online at <http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL.aspx>.

Location	Water(s) & Impairment	Larger Watershed(s)	Most Recent Meeting Date	For More Information, as of Most Recent Meeting Date
Hanover and Henrico counties	Aquatic life (sediment) impairment in Chickahominy River.	James River	1/30/13	Margaret Smigo, DEQ
Hanover, Henrico, Charles City, and New Kent counties and City of Richmond	Bacterial impairments in the Chickahominy River and several tributaries.	James River	2/7/13	Margaret Smigo, DEQ
Caroline, Hanover, King William, Louisa, New Kent, and Spotsylvania counties	Bacterial impairments in the Pamunkey River and several tributaries.	York River	2/20/13	Margaret Smigo, DEQ
Bedford and Campbell counties	Aquatic life (benthic) impairments the Little Otter	Roanoke River	2/20/13	Mary Dail, DEQ

and the City of Bedford	River and Buffalo Creek watersheds.			
Gloucester, Mathews, and Middlesex counties	Bacterial impairments in the Upper Piankatank River and in 16 tidal shellfish tributaries to the Piankatank River and Milford Haven.	Chesapeake Bay	2/27/13	Contact no longer available in state employee directory, as of 12/17/13
Brunswick, Greenville, Southampton, and Sussex counties	Bacterial impairments in Darden Mill Run, Mill Swamp, and Three Creek.	Chowan River/ Albemarle Sound, N.C.	3/21/13	Jennifer Howell, DEQ
Smyth, Washington, and Wythe counties	Bacterial and sediment impairments in the Middle Fork Holston River and Wolf Creek.	South Holston Lake/Upper Tennessee River	3/28/13	Contact no longer available in state employee directory, as of 12/17/13
Henry and Patrick counties	Bacterial impairments in Blackberry Creek, Leatherwood Creek, Marrowbone Creek, North Mayo River, South Mayo River, and Smith River.	Dan River/ Roanoke River	3/28/13	Contact no longer available in state employee directory, as of 12/17/13
Halifax County	Aquatic-life (dissolved oxygen) impairment in Gibson Creek and bacterial impairments in Winn Creek and the Banister River.	Dan River/ Roanoke River	4/4/13	Paula Nash, DEQ
Bland, Scott, Smyth, Tazewell, and Washington counties	Bacterial impairments in the North Fork Holston River and 21 tributaries.	Holston River/Upper Tennessee River	4/18/13	Martha Chapman, DEQ
Amherst and Appomattox counties	Aquatic-life (benthic) impairments, bacterial impairments, or both (varying with different waterways) in the James River and 11 tributaries.	James River/ Chesapeake Bay	4/25/13	Paula Nash, DEQ
Smyth and Wythe counties	Bacterial impairment in Cripple Creek.	New River	4/30/13	Contact no longer available in state employee directory, as of 12/17/13
Bedford, Botetourt, Floyd, Franklin, Craig, Montgomery, and Roanoke counties and cities of Roanoke and Salem	Bacterial impairments in the Roanoke River and 11 tributaries; and sediment impairment in the Roanoke River.	Albemarle Sound, N.C.	6/11/13	Mary Dail, DEQ
Charles City, Henrico, Prince George, and Surry counties	Bacterial impairments in the James River in five tributaries.	Chesapeake Bay	6/26/13	Margaret Smigo, DEQ
York County and cities of Hampton, Newport News, and Poquoson	Bacterial impairments in the Poquoson River, Back River, and several tributaries.	Chesapeake Bay	7/30/13	Jennifer Howell, DEQ
Rockbridge County and city of Buena Vista	Aquatic life impairment in Colliers Creek; and bacterial impairments in the Maury River and several tributaries in the Buffalo Creek watershed.	James River	8/6/13	Tara Sieber, DEQ

Accomack and Northampton counties	Aquatic life (dissolved oxygen) impairment in Red Bank Creek and bacterial impairments in Red Bank Creek and the Machipongo River.	Atlantic Ocean	8/15/13	Jennifer Howell, DEQ
Rockingham County	Aquatic life (benthic) and bacteria impairments in Linville Creek	Shenandoah River	8/21/13	Contact no longer available in state employee directory, as of 12/17/13
Lee, Russell, Scott, Tazewell, and Wise counties	Aquatic life (benthic), aquatic life (pH), and bacterial impairments in the Clinch River and 18 tributaries.	Upper Tennessee River	8/22/13	Martha Chapman, DEQ
Cities of Chesapeake and Virginia Beach	Aquatic-life (dissolved oxygen and pH) and bacterial impairment in Lower Ashville Bridge Creek; aquatic-life (dissolved oxygen) and bacterial impairment in the Pocaty River; and bacterial impairments in Beggars Bridge Creek, Upper and Lower Hell Point Creek, Muddy Creek, and Middle North Landing River.	Currituck Sound, N.C.	10/22/13	Jennifer Howell, DEQ
Buchanan, Lee, and Wise counties	Aquatic-life impairments in Bull Creek and Levisa Fork, North and South Fork Pound River, and Powell River.	Big Sandy River for Bull Creek, Levisa Fork, and Pound River; Clinch River for Powell River	10/24/13	Martha Chapman, DEQ
Russell and Tazewell counties	Bacterial impairments in the Clinch River and seven tributaries.	Upper Tennessee River	11/5/13	Martha Chapman, DEQ
Nelson County	Bacterial impairments in the Tye River and tributaries Hat Creek, Piney River, and Rucker Run.	James River	11/7/13	Contact no longer available in state employee directory, as of 12/17/13
Montgomery County	Bacterial and sediment impairments in Crab Creek.	New River	11/12/13	Contact no longer available in state employee directory, as of 12/17/13

Other Water-related Topics Addressed in Government Meetings, Jan.—Dec. 2013

Items below are listed alphabetically by topic category and then by date (oldest first). More information on the meetings listed is available at the Virginia Regulatory Town Hall Web site, <http://townhall.virginia.gov/L/meetings.cfm?time=future>, (organized by date, going back one year). If you are reading this online, click on any meeting date to go to the respective Town Hall listing.

Above-ground Storage Tanks

[9/9/13](#): **State Water Control Board/Department of Environmental Quality (DEQ) public hearing** on proposed amendments to the **Facility and Aboveground Storage Tank Regulations** (9 VAC 25-91 in the *Virginia Administrative Code*). The proposal appeared in the *Virginia Register of Regulations* on August 12, 2013. The public comment period runs August 12, 2013 to October 11, 2013. More information on the

proposed changes is online at <http://townhall.virginia.gov/L/viewaction.cfm?actionid=3568&display=stages>. Contact: Melissa Porterfield, DEQ.

Agriculture

8/8/13: Department of Conservation and Recreation **Agricultural Needs Assessment Stakeholder meeting**. At the Department of Environmental Quality's Piedmont Regional Office, 4949-A Cox Road in Glen Allen. According to the Regulatory Town Hall notice on this meeting, Subsection C of §10.1-2128.1 of the Virginia Water Quality Improvement Act calls for the Department of Conservation and Recreation to consult with stakeholders, including representatives of the agricultural community, the conservation community, and the Soil and Water Conservation Districts, in determining annual funding needs for Soil and Water Conservation District technical assistance and implementation of agricultural best management practices. Contact: David Dowling, DCR.

Boating

6/7/13: Board of Game and Inland Fisheries' **dedication of public boat landing on the Nottoway River** in Southampton County. Contact: Frances Boswell, DGIF.

7/18/13: Board of Game and Inland Fisheries' **dedication of public boat landing on the Blackwater River** in the City of Franklin. Contact: Frances Boswell, DGIF

Electricity Generation

2/4/13: Air Pollution Control Board/DEQ public hearing on application from Virginia Electric and Power Company for a permit to build the **Brunswick County Electric Power Plant, a proposed natural-gas-fired plant in Freeman**. The public comment period ran 1/2/13 to 2/19/13. Contact Alison Sinclair, DEQ.

3/13/13: Air Pollution Control Board/DEQ public hearing on draft construction permit for INGenco Renewable Development, LLC, to build a **landfill gas-to-electricity generating plant in Pulaski**. The public comment period ran 2/10/13 to 3/28/13. *Listed contact not in state employee directory, 12/17/13.*

4/3/13: Air Pollution Control Board/DEQ public hearing and information session on draft permit for Green Energy Partners/Stonewall, LLC, to build and operate **the Stonewall Combined-Cycle Project, a natural gas-fired electric-power generating facility** proposed in Loudoun County. The public comment on the draft permit ran 2/27/13 to 4/19/13. Contact: Thomas Valentour, DEQ.

9/25/13: Air Pollution Control Board/DEQ public hearing on draft construction permit application by INGenco Renewable Development, LLC to construct a 6.3 megawatt-capacity, **landfill gas-to-electricity generating facility proposed for Bristol**. The public comment period on the draft permit ran 8/22/13 to 10/10/13. *Listed contact not in state employee directory, 12/17/13.*

Fisheries

12/18/13: Board of Health public hearing on proposed modifications to **regulations for the repacking of crabmeat** (12 VAC 5-165 in the *Virginia Administrative Code*). More information on this regulation and the proposed changes is online at

<http://townhall.virginia.gov/L/viewaction.cfm?actionid=3425&display=stages>. Contact: Robert Croonenberghs, VDH.

9/30/13 through 10/22/13: DGIF and Virginia Tech Department of Fish and Wildlife Conservation public meetings on a statewide **Stocked Trout Management Plan**. DGIF is held eight public meetings to gather comments from anglers and other interested people.

Infrastructure Construction Funding—Wastewater Treatment

11/14/13: DEQ public meeting on **Fiscal Year 2014 priority list for the Virginia Clean Water Revolving Loan Fund**. More information on the loan fund priority list process is available in a Regulatory Town Hall notice at <http://townhall.virginia.gov/L/ViewNotice.cfm?gnid=477>. Contact: Walter Gilles, DEQ.

Infrastructure Construction Funding—Water Supply

2/6/13, 9 a.m.: VDH workshop on drinking water infrastructure-construction funding available for Fiscal Year 2014 through the **Drinking Water State Revolving Loan Fund Program and the Water Supply**

Assistance Grant Fund Program. For details on drinking water funding, visit the VDH Web site at <http://www.vdh.virginia.gov/odw/financial/dwfundingprogramdetails.htm>. Contact: Theresa Hewlett, VDH.

Invasive Species

7/29/13: Board of Agriculture and Consumer Services public hearing on a **proposed regulation for listing, eradicating, suppressing, and preventing dissemination of noxious weeds** in the Commonwealth. The respective section in the *Virginia Administrative Code* is 2 VAC 5-317. More information is online at <http://townhall.virginia.gov/L/viewaction.cfm?actionid=3473&display=stages>. *Listed contact not in state employee directory, 12/17/13.*

Mined Land Reclamation

3/4/13: Public-comment meeting on Department of Mines, Minerals and Energy (DMME)/Division of Mined Lands Reclamation's **Fiscal Year 2013 Abandoned Mine Land Grant Application**. Each year, DMME applies to the federal Office of Surface Mining for grants to reclaim high-priority abandoned mine lands. Information about Virginia's program is available online at <http://www.dmme.virginia.gov/DMLR/DmlrAmlLandingPage.shtml>. Contact: Richard Davis, DMME.

Pesticides

5/17/13: SWCB public hearing on reissuance and possible amendments to the **general permit for discharges resulting from the application of pesticides to surface waters**. The *Virginia Administrative Code* section is 9 VAC 25-800. The public comment period ran 4/8/13 to 6/17/13. More information is online at <http://townhall.virginia.gov/L/viewaction.cfm?actionid=3665&display=stages>. Contact: William K. +Norris, DEQ.

Professionals Licensing and Operations

8/7/13: Board for Professional Soil Scientists, Wetland Professionals and Geologists regulatory public hearing on proposed **change from certification to licensure for soil scientists**. The pertinent section of the *Virginia Administrative Code* is 18 VAC 145-20. More information is online at <http://townhall.virginia.gov/L/ViewStage.cfm?stageid=6178>. Contact: Kate Nosbisch, Department of Professional & Occupational Regulation.

8/7/13: Board for Professional Soil Scientists, Wetland Professionals and Geologists regulatory public hearing on proposed increase in **certification fees for professional geologists** and alignment of the fees with those of professional soil scientists and wetland professionals. The pertinent section of the *Virginia Administrative Code* is 18 VAC 145-40. More information is online at <http://townhall.virginia.gov/L/ViewStage.cfm?stageid=6281>. Contact: Kate Nosbisch, Department of Professional & Occupational Regulation.

12/18/13: Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals public hearing on proposed regulation amendments on the **definition of supervision, experience requirements, and document requirements for installers of sewage disposal systems**. More information is online at <http://townhall.virginia.gov/L/viewaction.cfm?actionid=3223&display=stages>. Contact: Kate Nosbisch, Department of Professional & Occupational Regulation.

Soil and Water Conservation Districts

7/19/13: Department of Conservation and Recreation's (DCR) **2013 Summer Study Stakeholder Advisory Group**. The 2013 Appropriation Act in the Virginia General Assembly called for the Secretary of Natural Resources to convene a stakeholder advisory group to examine funding needs for the administration and operation of the soil and water conservation districts and for the technical assistance that districts provide for implementing agricultural best management practices needed to meet Virginia's Watershed Implementation Plan (WIP) under the Chesapeake Bay Total Maximum Daily Load (TMDL) pollution-reduction plan, established by the U.S. EPA in December 2010. Contact: David Dowling, DCR.

11/7/13 (last of a series of seven meetings, starting 10/1/13): DCR **public meetings on the role of soil and water conservation districts** (SWCDs). According to the Regulatory Town Hall notice for this meeting, Enactment Clause 12 of [House Bill 2048](#) and [Senate Bill 1279](#) of the 2013 General Assembly Session (bills that moved certain water-quality programs from the DCR to the Department of DEQ) called for an

examination of the role of SWCDs in delivering water-quality services and technical assistance. Contact: Rick Weeks, DEQ.

Solid or Hazardous Waste Management

2/12/13: DEQ public meeting to receive comment on the **crushing of fluorescent lights/mercury-containing lamps** under the Universal Waste (UW) provisions of the Virginia Hazardous Waste Management Regulations (9 VAC 20-6-273 in the *Virginia Administrative Code*). DEQ information on regulation of fluorescent lights/mercury-containing lamps is online at <http://www.deq.virginia.gov/Portals/0/DEQ/Land/fluorescentlight1.pdf>. DEQ background information about use of fluorescent lights is online at <http://www.deq.virginia.gov/Programs/PollutionPrevention/MercuryReduction/Fluorescents.aspx>. Contact: Willard Keene, DEQ.

State Parks Master Plans

Public meetings for updates and comments on various park plans were the following:

8/26/13 and 12/9/13: **Breaks Interstate Park Master Plan Advisory Committee meeting and plan update.**

8/27/13: **Widewater State Park master plan update and public meeting.** (Widewater State Park is about 1100 acres in Stafford County, between the Potomac River and Aquia Creek. The Commonwealth purchased the land from Dominion Resources in 2006. The ongoing master plan process is to determine how the facility will be used and developed. Information about the park is available (in a PDF) at http://www.dcr.virginia.gov/recreational_planning/documents/mp4wwexecsum.pdf.)

11/20/13: **Twin Lakes State Park master plan amendment public meeting.**

11/21/13: **Wilderness Road State Park master plan update public meeting.**

12/5/13: **Holliday Lake State Park master plan update public meeting.**

Stormwater

8/29/13: SWCB/DEQ public hearing on proposed amendments to the general permit **for stormwater discharges associated with industrial activity** (9 VAC 25-151 in the *Virginia Administrative Code*). The public comment period ran 7/15/13 to 9/13/13. More information on the regulation is available online at <http://townhall.virginia.gov/L/viewaction.cfm?actionid=3780&display=stages>. Contact: Burt Tuxford, DEQ.

5/20/13: DCR public hearings on the **general permit for discharges from construction activities**. The relevant section in the *Virginia Administrative Code* is 4 VAC 50-60-1100 *et seq.*, Part XIV. Contact: David Dowling, DCR.

8/14/13: DEQ public meeting on **proposed guidelines for Virginia's new Stormwater Local Assistance Fund**. The draft guidelines are available online at <http://www.deq.virginia.gov/programs/water/cleanwaterFinancingAssistance.aspx>; the public comment period end 9/18/13. Contact: Walter Gills, DEQ.

8/26/13 and 8/27/13: SWCB special meetings on **changes to the Virginia Stormwater Management Program Regulations**. The changes were the transfer of authority for the program from the Department of Conservation and Recreation to the DEQ, and the integration of the following stormwater-related regulatory areas: 1) Virginia Stormwater Management Program, 9 VAC 25-870 in the *Virginia Administrative Code*; 2) General Permit for Discharges of Stormwater from Construction Activities, 9 VAC 25-880; 3) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems, 9 VAC 25-890; 4) Chesapeake Bay Preservation Area Designation and Management Regulations, 9 VAC 25-830; 5) Erosion and Sediment Control Regulations, 9 VAC 25-840; and 6) Erosion and Sediment Control and Stormwater Management Certification Regulations, 9 VAC 25-850. The DEQ's Web site for the Virginia Stormwater Management Program is <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx>.

9/26/13: **Stakeholder Advisory Group for MS4 TMDL Action Plans Guidance**. This group is advising the DEQ on developing guidance for the components of Chesapeake Bay Total Maximum Daily Load (TMDL)

Action Plans and Local TMDL Actions Plans required by under new Municipal Separate Storm Sewer System (MS4) permits. Contact: William K. Norris, DEQ.

10/8/13 (one of several meetings in 2013): **Stormwater Local Government Advisory Committee**. The committee is advising the DEQ on the process of developing local stormwater programs statewide under the **new stormwater management regulations by the July 1, 2014, implementation date**. *Listed contact for meeting not in state employee directory, 12/17/13.*

10/28/13 (one of several meetings in 2013): **Stormwater Best Management Practices (BMPs) Clearinghouse Committee**. The Clearinghouse is a Web site on design standards and specifications of stormwater BMPs in Virginia. The Clearinghouse Committee advises the DEQ and the SWCB. More information about Clearinghouse is available at <http://www.vwrrc.vt.edu/swc/>. The DEQ's Web page for the Virginia Stormwater Management Program is <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx>. *Listed contact for meeting not in state employee directory, 12/17/13.*

Wastewater Regulation

1/8/13: DEQ Advisory Group on Reevaluation of the Trading Ratio for Nutrient Allocation **Acquisition**. This advisory group was established—following General Assembly legislation in 2012 ([HB 176](#) and [SB 77](#))—to assist in reevaluating the nutrient-credit trading ratio for new or expanding wastewater facilities registered under the Chesapeake Bay Watershed General Virginia Pollutant Discharge Elimination System Permit). Contact: Russ Baxter, DEQ.

2/14/13: SWCB/DEQ public hearing on proposed amendments to the general permit for **discharges from potable water-treatment plants**. The relevant section of the *Virginia Administrative Code* is 9 VAC 25-860. The public comment period ran 12/31/12 to 3/1/13. Contact: Elleanore Daub.

5/10/13: VDH's **Drip Dispersal Technical Advisory Committee**. This committee was advising the VDH on establishing emergency regulations for drip dispersal of wastewater effluent. *Listed contact for meeting not in state employee directory, 12/17/13.*

8/29/13: SWCB/DEQ public hearing on proposed amendments to the **general permit for discharges from nonmetallic mineral mining** (9 VAC 25-190 in the *Virginia Administrative Code*). The comment period ran 7/15/13 to 9/13/13. More information on the proposed regulation is available online at <http://townhall.virginia.gov/L/viewaction.cfm?actionid=3779&display=stages>. Contact: Elleanore Daub, DEQ.

9/25/13 and 10/9/13: VDH stakeholder meetings on the implementation of a Best Management Practices (BMP) policy to recognize **treatment units for nitrogen reduction in small, alternative onsite sewage systems**. Contact: Marcia Degen, VDH.

10/17/13 (last of 10 meetings): **Nutrient Credit Certification Regulatory Advisory Panel**. The 2012 Virginia General Assembly passed the Nutrient Trading Act ([HB 176](#) and [SB 77](#)), which required regulations related to certification of nutrient credits from non-point sources, including credits generated from agricultural and urban stormwater best management practices, incineration or management of manures, land-use conversion, stream or wetlands restoration, shellfish aquaculture, algal harvesting, and other methods of nutrient control or removal. More information about Virginia's nutrient credit-trading program is online at <http://www.deq.virginia.gov/Programs/Water/PermittingCompliance/PollutionDischargeElimination/NutrientTrading.aspx>. Contact: Debra Harris, DEQ.

12/19/13 (last of four public-hearing dates in Dec. 2013): SWCB/DEQ public hearing on proposed amendments to the general permit for **discharges from animal-feeding operations** (9 VAC 25-192 in the *Virginia Administrative Code*). The public comment period run 11/18/13 to 1/21/14. More information on the proposal is available online at <http://townhall.virginia.gov/L/viewaction.cfm?actionid=3733&display=stages>. Contact: William K. Norris, DEQ.

Water Quality Regulation and Standards

[8/13/13](#), and [11/22/13](#): Stakeholder advisory group meeting (and scientific advisory group meeting, respectively, on the **James River Chlorophyll Study**. The advisory groups are assisting the DEQ on a comprehensive review of the existing chlorophyll-a criteria and associated modeling for the tidal James. The pertinent section in the *Virginia Administrative Code* is VAC 25-260-310 bb. Contact for stakeholder advisory group: David Whitehurst, DEQ; contact for scientific advisory group: Arthur Butt, DEQ.

[9/10/13](#) and [12/13/13](#): DEQ public meeting and advisory committee meeting, respectively, on **the triennial review of water-quality standards**. The pertinent section in the *Virginia Administrative Code* is 9 VAC 25-260. Virginia's State Water Control Law requires the SWCB to review and update the Commonwealth's water-quality standards at least every three years. More information is online at <http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityStandards/LawsMandates.aspx>. Contact: David Whitehurst, DEQ.

General Information for Key Water-related Statewide Boards and Commissions (as of 12/18/13)

Marine Resources Commission—Meets monthly. Phone (757) 247-2200, TDD (757) 247-2292. Web site: <http://www.mrc.virginia.gov/index.shtm>.

State Water Control Board—Meets quarterly. Phone (800) 592-5482 (main number for DEQ; toll-free in Virginia). Web site: <http://www.deq.state.va.us/LawsRegulations/CitizenBoards.aspx>.

Cave Board—Meet at least three times per year. Phone (804) 786-7951 (DCR's Natural Heritage Program); Web site: www.dcr.virginia.gov/natural_heritage/cavehome.shtml.

Conservation and Recreation Board—Meets at least three times/year, upon call of chair. Phone: (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. Phone: (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. Phone: (276) 415-9700 (DMME's Division of Gas and Oil); Web site: <http://www.dmme.virginia.gov/dgo/DgoBoard.shtml>.

Groundwater Protection Steering Committee—Meets via conference call several times per year. Phone: Mary Ann Massie, (804) 698-4042; Web site:

<http://www.deq.state.va.us/Programs/Water/WaterSupplyWaterQuantity/GroundwaterProtectionSteeringCommittee.aspx>.

Land Conservation Foundation Board of Trustees—Meets about three times per year. Phone (804) 225-2048; 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: <http://www.dpor.virginia.gov/Boards/>.

Outdoors Foundation Board of Trustees—Meets at least quarterly. Phone: (540) 327-7727; Web site: www.virginiaoutdoorsfoundation.org.

Soil and Water Conservation Board—Meets bimonthly. Phone: 804-225-3653 (DCR's Water Quality Division); Web site: http://www.dcr.virginia.gov/water_quality/vs_and_wcb.shtml.

Waste Management Board—Meets about two times per year. Phone: (800) 592-5482 (main number for DEQ). Web site: <http://www.deq.state.va.us/LawsRegulations/CitizenBoards.aspx>.

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 an online list of Virginia water-related events (updated regularly), please see the Virginia Water Central News Grouper's "Quick Guide to Virginia Water Events," at <http://vawatercentralnewsgrouper.wordpress.com/?s=Quick+Guide>.

For an online list of water-related conferences and meetings outside of Virginia (updated quarterly), please see the Virginia Water Central News Grouper's "Water Conference Sampler from around the United States and Elsewhere," at <http://vawatercentralnewsgrouper.wordpress.com/?s=Water+Conference+Sampler>.

All Web sites listed in this section were functional as of 12/18/13.

A Sampler of Virginia Streamflow Reports from the U.S. Geological Survey (USGS)

Here are several USGS reports published in 2011-2012 on stream flow in Virginia, all from the USGS's Virginia Science Center (1730 East Parham Road, Richmond, VA 23228; (804) 261-2600; <http://va.water.usgs.gov>). Online links are given for each publication. To request a print copy of a USGS publication, contact the **USGS Store** by phone: (888) ASK-USGS, mail: USGS Information Services, Box 25286, Federal Center, Denver, CO 80225-0046; or e-mail: usgsstore@usgs.gov.

Austin, S.H., *et al.* 2011. "Low-flow characteristics of Virginia streams." USGS Scientific Investigations Report 2011-5143; 122 pp. Online at <http://pubs.usgs.gov/sir/2011/5143/>.

Austin, S.H., *et al.* 2011. "Peak-flow characteristics of Virginia streams." USGS Scientific Investigations Report 2011-5144; 106 pp. Online at <http://pubs.usgs.gov/sir/2011/5144/>.

Sanford, W.E., *et al.* 2012. "Quantifying components of the hydrologic cycle in Virginia using chemical hydrograph separation and multiple regression analysis." USGS Scientific Investigations Report 2011-5198; 152 pp. Online at <http://pubs.usgs.gov/sir/2011/5198/>.

Rice, K.C., and Hirsch, R.M. 2012. "Spatial and temporal trends in runoff at long-term stream gages within and near the Chesapeake Bay Watershed." USGS Scientific Investigations Report 2012-5151; 56 pp. Online at <http://pubs.usgs.gov/sir/2012/5151/>.

Krstolic, J.L., and Ramey, R.C. 2012. "South Fork Shenandoah River habitat-flow modeling to determine ecological and recreational characteristics during low-flow periods." USGS Scientific Investigations Report 2012-5081; 64 pp. Online at <http://pubs.usgs.gov/sir/2012/5081/>.

Reports from Virginia Department of Environmental Quality on Groundwater, Water Use Overall, and Water Supply Planning

Groundwater Reports: Two September 2012 reports on groundwater resources and on water use in Virginia are now available online from the Virginia Department of Environmental Quality's (DEQ) Groundwater Characterization Program. The reports are the following:

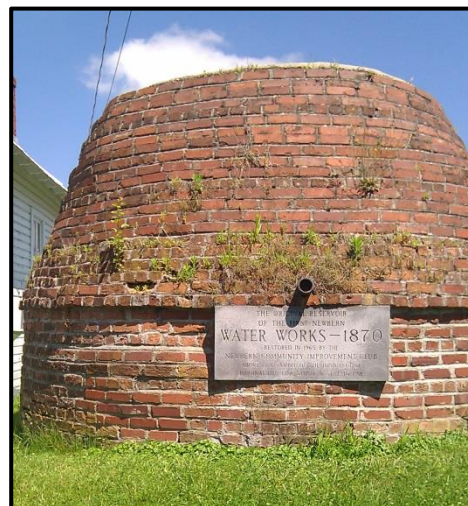
"Groundwater Resources of the Blue Ridge Province, Virginia" (VDEQ OWS Technical Bulletin 12-01: September 2012); and "Water Use in the Shenandoah Valley, Virginia 1982-2010" (VDEQ OWS Technical Bulletin 12-02: September 2012). Links to the report files are available at www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/GroundwaterCharacterization.aspx (click on the "Reports & Publications" link).

Water Resources Status Report: In October 2013, the Virginia DEQ released "Status of Virginia's Water Resources: A Report on Virginia's Water Resources Management Activities" (81 pages); online at <http://www.deq.state.va.us/Programs/Water/WaterSupplyWaterQuantity/WaterSupplyPlanning/AnnualWaterWithdrawalReporting.aspx>. This is the latest DEQ annual report submitted to the governor and Virginia General Assembly in accordance with Section 62.1-44.40 of the *Virginia Code*. According to the report's summary, it "describes the status of the Commonwealth's surface and groundwater resources, provides an overview of climatological conditions and impacts on water supplies in the Commonwealth, and provides an update on the Commonwealth's Water Resources Management Program for the calendar year 2012, as well as an update regarding current 2013 conditions." The report includes tables and graphs showing water uses by various categories and by water source (surface water or groundwater).

Water-supply Planning Report: In December 2012, the State Water Supply Plan Advisory Committee approved its final report (*historically related photo below right*). In 2010, the General Assembly required the DEQ to establish this advisory committee to advise the DEQ in developing, revising, and implementing a state water resources plan. A link to the committee's final report (49 pages) is online at <http://www.deq.state.va.us/Programs/Water/WaterSupplyWaterQuantity/WaterSupplyPlanning/AdvisoryCommittee.aspx>.

And While We're Talking About Water Supply: Consider the 40 Gallon Challenge

The 40 Gallon Challenge is an initiative started in 2011 to encourage citizens and businesses to reduce water use by an average of 40 gallons per person per day. The 40-gallon amount was targeted because 40 gallons/day amounts to over 1000 gallons per month, and water-use bills are often reported in 1000-gallon increments. The program's Web site, at <http://www.40gallonchallenge.org/>, lets users choose a state and enter a water-reduction pledge amount, and it shows the number of pledges and amount of reductions pledged by state and nationwide. The 40 Gallon Challenge is coordinated by the Georgia Center for Urban Agriculture at the University of Georgia (online at <http://apps.caes.uga.edu/urbanag/>) and the Southern Regional Drinking Water Program, headquartered at Texas A&M University (online at <http://srdwqis.tamu.edu/>).



Above: Water-supply structure built in 1870 in Newbern, Va. (Pulaski County), 6/22/13.

November 2013 Report by Center for Watershed Protection on Links Between Local Watershed Clean-up Plans and Overall Chesapeake Bay Cleanup Goals

On November 19, 2013, the James River Association (JRA) released "Achieving a Healthy James River: Linking Local Cleanup Plans to Chesapeake Bay Water Quality Goals," a 19-page report prepared by the Center for Watershed Protection in Ellicott City, Md. (the Center for Watershed Protection also has an office in Charlottesville). According to an e-mail notice from JRA, "the study...investigated local bacteria cleanup plans in Lynchburg, Richmond, and James City County to determine how the practices included in such plans could be used to meet the requirements of the Chesapeake Bay cleanup." Access to the report is available online at <http://jrava.org/what-we-do/achieving-james-river-water-quality-goals>. The JRA contact for questions or comments is Adrienne Kotula, phone (804) 788-8811 x206, or e-mail: akotula@jrava.org.

Leesville Lake Water Quality Report

In February 2013, the Leesville Lake Association and Lynchburg College reported on water-quality conditions in 2012 in Leesville Lake, a reservoir on the Roanoke (Staunton) River in Bedford, Campbell, and Pittsylvania counties. Leesville Lake—about 17 miles long and covering 3270 acres—is formed by a hydroelectric dam owned by American Electric Power, which provides funds annually for water-quality monitoring. The current and previous reports (back to 2007) are available online at <http://leesvillelake.org/ComWaterQ.htm>.

Report on Water and Wastewater Infrastructure Spending by Local Governments

Growth in Local Government Spending on Public Water and Wastewater—But How Much Progress Can American Households Afford? is a 16-page report, released May 8, 2013, by the U.S. Conference of Mayors. It highlights trends in water and wastewater spending and discusses the financial challenges faced by communities in the future. Available (as PDF) online at <http://usmayors.org/pressreleases/uploads/2013/0508-release-waterlocalcosts.pdf>, or contact the Conference of Mayors in Washington, D.C., at phone (202) 293-7330 or e-mail to info@usmayors.org.

Stormwater Calculator

In 2013, the U.S. EPA released its **National Stormwater Calculator**, a desktop application for estimating the annual amount of rainwater and frequency of runoff from a specific site anywhere in the United States (including Puerto Rico). Estimates are based on local soil conditions, land cover, and historic rainfall records. The calculator is online at <http://www.epa.gov/nrmrl/wswrd/wq/models/swc/>.

An Introduction to Stormwater Ponds

“Understanding Stormwater Ponds” is a four-page article explaining common terms and aspects of this widespread practice intended to manage the quantity and quality of stormwater runoff (*related photo below*). Written by Emily McVearry, a University of Maryland graduate student in Environmental Management and intern with the Northern Virginia Soil and Water Conservation District in Fairfax, the article focuses on Fairfax County—home to over 2000 stormwater ponds—but most of the information is applicable elsewhere. The article is in the Winter 2013 issue of the District’s newsletter, *Conservation Currents*, available online at <http://www.fairfaxcounty.gov/nvswcd/newsletter/understanding-stormwater-ponds.htm>; or contact the District at 12055 Government Center Parkway, Suite 905, Fairfax, VA 22035; 703-324-1460, TTY 711.

And More on Stormwater: Homeowners’ Guide to Stormwater

“Reduce Your Stormwater” is an online guide from the Alliance for the Chesapeake Bay to help homeowners learn about stormwater and to take actions to reduce the negative impacts of stormwater on water quality. The Web site is at <http://stormwater.allianceforthebay.org/>. For more information, contact the Alliance’s Virginia office in Richmond at (804) 775-0951.

Sea-level Rise in Virginia’s Coastal and Tidal Waters

“Rising Tides, Sinking Coast,” in the Winter 2012-13 issue of *Virginia Issues and Answers* (Vol. 17, No. 2; published by the Virginia Tech Office of University Relations), explains several factors leading to rising water levels in Virginia coastal and tidal waters, reviews four different scenarios of how high water levels might rise by 2100, and discusses three kinds of possible responses. Issue archives are available online at <http://www.via.vt.edu/archives.html>, or contact the magazine at (540) 231-2214 or via@vt.edu.



Above: A stormwater-retention pond (or “wet” pond) in Leesburg (Loudoun County), Virginia, March 22, 2008.

Virginia Natural Heritage Online Tool for Finding Organisms or Habitats

In early July 2013, the Virginia Department of Conservation and Recreation’s (DCR) Natural Heritage Division announced its new Virginia Natural Heritage Data Explorer, online at <https://vanhde.org>. The tool provides public access to many maps and data about specific habitats, specific organisms, and protected lands. For more information, contact Julie Buchanan, phone (804) 786-2292.

Wetlands One-Stop Mapping Tool

Online at <http://aswm.org/wetland-science/wetlands-one-stop-mapping>, this Web site provides access to wetlands and soils geospatial data from by federal and state agencies and other Web sites. The site is provided by the Association of State Wetland Managers in collaboration with Virginia Tech’s Conservation Management Institute and the U.S. Fish and Wildlife Service’s Northeast Region.

State of the Susquehanna River

In mid-February 2013, the Susquehanna River Basin Commission (SRBC) released the “2013 State of the Susquehanna” report on conditions in the Chesapeake Bay’s largest tributary. The document examines seven water resource indicators throughout the basin: water use and development, floods and droughts, stormwater, mine drainage, sediment and nutrients, human health and drinking water protection, and habitat and aquatic resources. The most recent previous report was in 2010. The report is online at <http://www.srb.net/stateofsusq2013/>; or contact the SRBC at (717) 238-0423 or srbnet@srbc.net.

Survey of Groundwater Governance in United States

In May 2013, the University of Arizona’s Water Resources Research Center and its Udall Center for Studies in Public Policy released the first report in their “**Groundwater Governance in the U.S.**” project. “Summary of Initial Survey Results” presents findings from a survey of state agency officials, conducted between November 2012 and February 2013 (the Virginia Water Resources Research Center provided

information on Virginia for this survey). The report is online at <https://wrrc.arizona.edu/groundwater>; or contact the Arizona center at (520) 621-9591 or wrrc@cals.arizona.edu.

Two Climate-change Information Resources

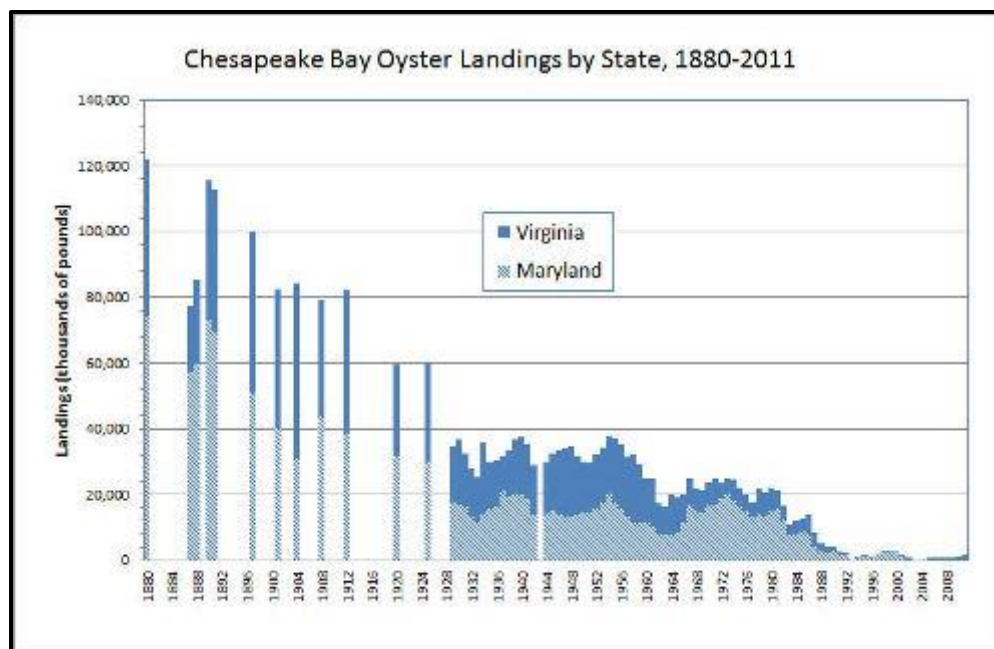
•In February 2013, the U.S. Department of Agriculture (USDA) released two reports synthesizing the **scientific literature on climate-change impacts and adaptation strategies for agriculture and forestry**. “Climate Change and Agriculture: Effects and Adaptations and the Effects of Climate Variability”; and “Change on Forest Ecosystems: A Comprehensive Science Synthesis for the U.S. Forest Sector” are online at http://www.usda.gov/oce/climate_change/effects.htm. For more information, contact the USDA Office of Communications at (202) 720-4623.

•In late June 2013, the U.S. Geological Survey (USGS) released the first detailed assessment of the **carbon-storage potential of 36 sedimentary-rock basins nationwide**. According to the USGS news release on the assessment, these are areas of “technically accessible storage resources... that can be accessed using today's technology and pressurization and injection techniques” to do the “most common method of geologic carbon storage: pressurizing carbon dioxide (CO₂) gas into a liquid, and then injecting it into subsurface rock layers for long-term storage.” More information is available in USGS’ 6/27/13 news release, online at <http://www.usgs.gov/newsroom/article.asp?ID=3628>.

Also Out There...

(Brief descriptions of some interesting articles *Water Central* has recently discovered.)

•“**Lowcountry Living Shorelines—Restoring Carolina’s Reefs**,” in the Winter 2013 issue of *Coastal Heritage*, from the South Carolina Sea Grant Consortium. This nine-page article the diverse history of oystering along the Atlantic Coast, with particular focus on the role of replacement oyster shells in maintaining oyster grounds (*related diagram below*). A companion two-page article, “**Oysters and the Public Trust Doctrine**,” discusses how conflict over oyster grounds in New Jersey led to federal court cases holding submerged lands, navigable waters, and other areas that the British king or Parliament formerly held in trust for use by the public were now (after the United States gained its independence) held in such trust by state governments. The newsletter is available online at <http://www.scseagrant.org>, or contact the S.C. Sea Grant Consortium at (843) 953-2078 or Annette.dunmeyer@scseagrant.org.



This illustration shows the historical importance, and then the dramatic decline, of oysters in the Chesapeake Bay. From the Chesapeake Field Office of the National Oceanic and Atmospheric Administration (NOAA), accessed online at <http://chesapeakebay.noaa.gov/fish-facts/oysters>, 12/18/13.

Upcoming Conferences, Workshops, and Other Events

Events In Virginia

- Jan. 24-26, 2014, Virginia Beach: **Winter Wildlife Festival**. Organized by the City of Virginia Beach and the Virginia Department of Game and Inland Fisheries. More information: <http://www.vbgov.com/government/departments/parks-recreation/special-events/Pages/winter-wildlife-festival.aspx>; (757) 385-4461; e-mail: outdoors@VBgov.com.
- Feb. 11-12, 2014, Richmond: **Energy and Sustainability Conference—Advancing Business with Leadership in Sustainability**. Organized by Virginia Commonwealth University and the Virginia Chamber of Commerce. More information: <http://www.esc-east.org/>; Larry Cummings at (804) 496-4146 or Larry.cummings@trane.com.
- Mar. 9-11, 2014, Richmond: **Virginia Water Conference 2013**. Organized by the Virginia Lakes and Watersheds Association. More information: <http://www.vlwa.org/VirginiaWaterConference.aspx>.
- Mar. 11-14, 2014: Westmoreland State Park, Montross: **National Association for Interpretation Region 2 Chesapeake Workshop**. Organized by the National Association of Interpreters. This year's theme is "Westmoreland, Watermen, and Wildlife: Bay Stories—Interpreting Our Shared Heritage." More information: <http://nairegion2.weebly.com/>; e-mail: dodie.lewis@loudoun.gov.
- Apr. 8-10, 2014, Virginia Military Institute, Lexington: **25th Annual Environment Virginia Symposium**. Organized by the VMI Center for Leadership and Ethics. More information: <http://www.vmi.edu/environmentva>; Kathy Wirtanen at (540) 464-7361 or wirtanenki@vmi.edu.

Events Elsewhere

- Jan. 14-16, 2014, Tampa, Fla.: **2014 Green Infrastructure and Water Management in Growing Metropolitan Areas Conference**. Organized by the University of Florida and the University of South Florida. More information: <http://psgs.usf.edu/patel-center/2014-green-infrastructure-conference/>; Bessie Skoures at skoures@usf.edu.
- Jan. 29-31, 2013, Denver, Colo.: **Colorado Water Conference Annual Convention**. More information: http://www.cowatercongress.org/cwc_events/Annual_Convention.aspx; (303) 837-0812; info@cowatercongress.org.
- Feb. 26-27, 2014, Toronto, Canada: **International Conference on Stormwater and Urban Water Systems Modeling**. Organized by Computational Hydraulics International (CHI), located in Guelph, Ontario. More information: <http://www.chiwater.com/Training/Conferences/conferencetoronto.asp>; (888) 972-7966; info@chiwater.com.
- Mar. 4-5, 2014, Sacramento, Calif.: **Groundwater Issues and Water Management—Strategies Addressing the Challenges of Sustainability in California**. Organized by the Groundwater Resources Association of California. More information: <http://www.grac.org/giwm.asp>; Chris Peterson, (530) 792-3239 or cpetersen@westyost.com; Steve Phillips, (916) 278-3002 or sphillip@usgs.gov; or Vicki Kretsinger Grabert, (530-661-0109 or ykretsinger@lsce.com.
- Apr. 8, 2014, Tucson, Ariz.: **Annual conference of the University of Arizona Water Resources Research Center**. More information: <https://wrrc.arizona.edu/node/12404>; (520) 621-9591.
- Apr. 28-May 2, 2014, Cincinnati, Ohio: **9th National Monitoring Conference**. This year's theme is "Working Together for Clean Water." Organized by the National Water Monitoring Council, the U.S. EPA, the U.S. Geological Survey, and the North American Lake Management Society. More information: <http://acwi.gov/monitoring/conference/2014/index.html#>.
- May 12-14, 2014, Salt Lake City, Utah: **2014 American Water Resources Association's Spring Specialty Conference—"GIS and Water Resources VIII—Data to Decisions."** More information: <http://www.awra.org/meetings/SnowBird2014/index.html>; (540) 687-8390 (Middleburg, Va., headquarters of AWRA); e-mail: info@awra.org.

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.

Water Center Research in Coalfield Streams Highlighted in May 2013 *Environmental Monitor* Article

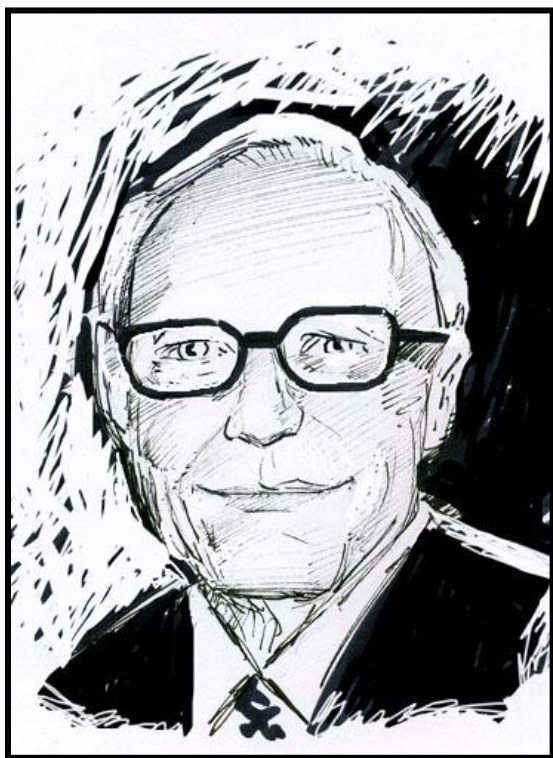
For several years, Water Center Director Stephen Schoenholtz, Anthony Timpano (formerly a Water Center research associate and now a Virginia Tech graduate student), and several graduate students have been studying the potential impact of total dissolved solids (TDS) on **macroinvertebrates** living in streams in Virginia's coalfield area. (Macroinvertebrates are animals that can be seen without a microscope—"macro"—and which do not have a backbone—"invertebrate." The large and varied group includes many insects, but also crustaceans, such as crayfish; mollusks, such as snails; worms; and other creatures.) The research is important to federal and state regulation of coal-mining activities that affect water resources. An overview of the work was published on May 17, 2013, by *Environmental Monitor*, a journal from Fondriest Environmental, Inc., of Fairborn, Ohio. The article is available online at <http://www.fondriest.com/news/mining-stream-insects-dissolved-solids.htm>, or contact Fondriest Environmental at (888) 426-2151.

Also, a 1 minute/43 second video (from Virginia Tech University Relations) on the research is available online at http://www.unirel.vt.edu/audio_video/2013/06/062713-cnre-waterquality.html.

Walker Award Winners

The Water Center is pleased to announce the **2013 William R. Walker Graduate Research Fellows**: J.P. Gannon, Virginia Tech Department of Forest Resources and Environmental Conservation; and Stephanie Houston, Virginia Tech Department of Biological Systems Engineering.

The Walker Award, which honors the late founding director of the Water Center (please see portrait below), is given annually to help water resources graduate students. In spring 2014, the Water Center will begin accepting applications for the 2014 Walker Award. More information on the Walker Award is available online at http://vwrrc.vt.edu/walker_fellowship.html, or contact Dr. Kevin McGuire at kevin.mcguire@vt.edu or (540) 231-6017.



William R. Walker (1925-2007), founding director of the Virginia Water Resources Research Center.

Portrait by George Wills of Blacksburg, Va.; done for a tribute article in the May 2007 issue of *Virginia Water Central*.

Virginia Water Central

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