

Virginia Water Central

Virginia Water Resources Research Center Blacksburg, Virginia January 2004 (No. 29)



The Virginia STEP program is looking for students and community groups for Summer 2004; see page 33. Photo: Signs of Wild Turkey and other visitors along the New River Trail, December 2003.

This issue includes two **Feature Articles**, one on water supply and the other on nutrient management. Service-learning students at Virginia Tech wrote both articles.



"Reading, interviewing, analyzing, explaining—these students did the job!"

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Science Behind the News does not appear in this issue. Watch for an upcoming article on water and economics.



"No room for me in this chock-full issue! Be back next time!"

Virginia
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VIRGINIA POLYTECHNIC INSTITUTE
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Experts Look at Reliability and Safety of Virginia's Water Supplies

Ed. note: This article was researched and written by Chris Brooks, Kate Feild, Stephanie Sullivan, Long Tran, and Pete Woody. All were students in English 3104, "Introduction to Professional Writing," taught by James Dubinsky at Virginia Tech in Fall 2003.

Water is, arguably, the most important natural resource people use—and sometimes overuse—on a daily basis. For the most part in Virginia, water seems to be in great abundance around us, but is that necessarily true? This vital resource is often taken for granted until there is a strain on the water supply, such as occurred during the drought that persisted, to varying degrees, from 1999 to 2002. "Most people are tolerant of the cable company when the cable flips off for a few minutes... but... I get more than a few phone calls at my *house* when somebody's out of water," said Mike McEvoy, Director of Utilities for the City of Roanoke, in an October 2003 forum in Blacksburg on Virginia's water supply.

In this article, we present the views and recommendations of water professionals across the state regarding maintaining a reliable and safe water supply. Our sources were published materials; the unpublished transcript of a water supply "roundtable" conducted by the Virginia Water Resources Research Center in Blacksburg on October 10, 2003; and personal interviews by phone or e-mail. A list of the people who provided information for this article, and the main water-supply issues they identified, appears at the end of the article.

Ensuring a Reliable Water Supply

The 1999—2002 Drought

The severe drought from the years 1999—2002 brought water quantity issues to the attention of all Virginia residents and the state's top political figures. According to Anne Spiesman, an environmental engineer with 15 years experience in the field, "The drought showed that Virginia is not immune to drought-related problems." The drought strained Virginia's water supplies in groundwater, streams, and reservoirs until above-normal rainfall in late 2002 and throughout 2003 restored supplies to normal.



Mr. McEvoy reinforced the power of a drought to focus people's attention. "At the lowest point, [Carvin's Cove] reservoir [the main water supply for the city of Roanoke] still had 1.5 billion gallons in storage, which, with the drought restrictions we had in place, was still about 200 to 250 days of supply...[but] people just look at the water levels dropping, and they want to know what you're doing to stop it [during a drought]."

Virginia Governor Mark Warner stepped in during the drought and created the Virginia Water Supply Initiative, Executive Order #39, signed on December 13, 2002.¹ This initiative directed the Virginia secretaries of Commerce and Trade, Health and Human Resources, and Natural Resources to accomplish various tasks toward creating strategies and guidelines to prevent the debilitating effects of any future droughts. The Initiative includes establishing a five-year plan for aiding the 25,000 Virginians who do not have a reliable source of drinking water.

¹ "Official Site of the Governor of Virginia," www.governor.virginia.gov/Press_Policy/Executive_Orders/html/EO_39.html, 12/14/03.

The Virginia Water Supply Initiative also directed the Deputy Secretary of Natural Resources to compose a drought response assessment plan by April 1, 2003. To complete this task, the Drought Response Technical Advisory Committee was formed. This 30-member committee's plan developed four drought indicators to be measured by the Virginia Drought Monitoring Task Force (DMTF), a group of representatives from state and federal agencies who monitor water conditions and the effects of droughts on society. Virginia's four drought indicators are the following: precipitation deficits, streamflows, groundwater levels, and reservoir storage levels. The DMTF will use these indicators to recommend a certain drought stage to the Virginia Drought Coordinator.²

[*Ed. note:* Another state-level response to the drought and water-supply concerns was SB 1221 in the 2003 Virginia General Assembly, which formalized a Water Policy Technical Advisory Committee that the Department of Environmental Quality (DEQ) created in 2002. The bill directed the Advisory Committee to assist the DEQ, the Department of Health, and the State Water Commission in addressing water-planning issues. The Advisory Committee issued a report to the General Assembly on December 1, 2003; an excerpt appears in this issue of *Water Central*, immediately following Feature Article 2.]

Options for Reliability

According to the sources consulted for this article, a number of possibilities exist to help ensure that Virginia water supplies remain adequate, or increase in areas where they are inadequate (either now or according to future projections). These include building new reservoirs, building pipelines to transfer water from a source to an area of need, water conservation, wastewater reclamation and reuse, and desalination technology.

Reservoirs. Reservoirs are expensive to build and maintain, but they provide a relatively safe and reliable water source. According to Dr. William Cox, a professor of Civil and Environmental Engineering at Virginia Tech, environmental regulations and the potential for local opposition, for various reasons, also make it difficult to build reservoirs. Dr. Cox cited the example of the proposed King William Reservoir,

² Virginia Department of Environmental Quality, "Draft Virginia Drought Assessment and Response Plan," www.deq.state.va.us/info/pdf/drought_response_plan.pdf, 12/15/03.

which would be a 1,526-acre on Cohoke Creek in King William County and would provide water to several southeastern Virginia localities.³ The reservoir's proponents have been trying since the 1990s to gain all the regulatory approvals necessary, while facing opposing arguments from various groups at each regulatory step. (In the latest development in January 2004, the Virginia Marine Resources Commission was ordered by the Norfolk Circuit Court to hold another formal hearing on Newport News' request to build the reservoir. In May 2003, the VMRC denied Newport News' request for an intake on the Mattaponi River that would supply the proposed reservoir.⁴) Both Dr. Cox and Joe Hassell, a regulator in the Office of Water Permits for the Virginia Department of Environmental Quality, noted that regulatory requirements and local opposition make reservoir development a costly, time-consuming alternative.

Pipelines. Pipelines can be used to move water from a watershed to be used elsewhere; this is referred to as an "interbasin transfer." Such transfers are a common feature of some states (for example, the transfer of Colorado River water to various southwestern states), but they have not been so common in Virginia. One example in Virginia is the Lake Gaston pipeline. Put into service on January 1, 1998, the Lake Gaston Pipeline stretches for 76 miles from a Brunswick County tributary of the lake to its discharge point in Isle of Wight County. The pipeline transports up to 60 million gallons of water per day.⁵

According to Dr. Cox, however, proposals for such transfers can generate significant controversy, typically involving several localities and sometimes more than one state. Besides having to overcome the potential hurdle of opposition by the areas providing the water, pipelines must also meet many environmental regulations before receiving the proper permits for development. The Lake Gaston Project, for example, went through years of controversy and legal challenges before receiving final approvals. Finally, long pipelines are expensive (whether or not an interbasin transfer is involved); the Lake

³ Regional Raw Water Study Group, "The King William Reservoir Project," www.kwreservoir.com/index.shtml, 12/15/03.

⁴ Lawrence Latane, "VMRC Ordered to Hold Hearing," *Richmond Times Dispatch* (January 8, 2004).

⁵ City of Virginia Beach, "Lake Gaston Water Supply Project—Questions and Answers," www.vbgov.com, 1/22/04.

Gaston pipeline cost hundreds of millions of dollars to build and maintain.

Wastewater Reclamation. Another alternative to increase water supply is wastewater reclamation. Reclamation involves treatment of wastewater to produce usable water for various purposes, but not for drinking water.⁶ According to Roanoke's Mike McEvoy, "Other than drinking it, you can use reclaimed water for pretty much everything that you can do with drinking water." Ms. Spiesman added that more research is needed before reclaimed wastewater could be used as a potable water source; one concern is that reclaimed wastewater may contain contaminants that cannot be determined through current testing processes.

Currently, reclamation is used in Virginia mostly for cooling power plants. In July, 2002, the York River Treatment Plant began producing over 500,000 gallons/day of reclaimed water. This new water source helps conserve drinking water that otherwise would be needed for industrial cooling. Other places where reclaimed wastewater is being used for non-drinking purposes include Florida and California.⁷

Desalination. Desalination (also referred to as "desalinization") is the removal of salts from water. According to Dr. Cox and Jerry Higgins, superintendent manager of the Blacksburg-Christiansburg-VPI Water Authority, desalination is not cost-effective at this time for many areas, because it is an energy-intensive process. Dr. Cox and Mr. Higgins explained that desalination is mostly used in two situations: 1) when an area has abundant, cheap energy along with a large supply of salt water, such as the Middle East; and 2) when freshwater alternatives are either unavailable or very expensive. Some areas where desalination is used include the Middle East, California, Florida, New Mexico⁸, and, more recently, James City County, Virginia.

[Ed. note: The 2003 General Assembly directed the Virginia Water Center to study desalination technology and whether it can be a

⁶ Hampton Roads Sanitation District, "Water Reuse," www.hrsd.state.va.us/waterreuse.htm, 12/15/03.

⁷ Ibid.

⁸ In December 2003, construction began on the Tularosa Basin Desalination Research Facility, which is to be a national research center to develop and test alternative desalination technologies. Source: New Mexico Water Resources Research Institute, "Desalination Facility to Break Ground in December 2003," *Divining Rod* (Sept. 2003), p. 7.

cost-effective option for localities near the ocean or a brackish water source. The study should be finished by April 2004.]

Water Conservation. Water conservation is another way to enhance existing water supplies. In the Water Supply Roundtable in Blacksburg, Kurt Stephenson, in the Department of Agricultural and Applied Economics at Virginia Tech, noted that "There are... a variety of water conservation programs... [such as] standards for plumbing, rebate programs, landscaping requirements, [and] education programs." During droughts, short-term conservation methods, such as restricting lawn watering, can be useful.

Dr. Stephenson pointed out that one important aspect of conservation is the price of water and how water-suppliers adjust price. For example, "block-pricing" and "peak-load pricing" can be implemented to further encourage water conservation. According to Dr. Stephenson, **block pricing** charges a customer a certain amount for a "block," or quantity, of water. Increasing block pricing means that, for each additional block or quantity used, the customer is charged an *increasing* rate for the block. Consequently, increasing block pricing encourages water conservation. As Dr. Stephenson put it, "If the price of a Hostess Twinkie goes up, you buy [fewer] Hostess Twinkies; it's the same with water." On the other hand, decreasing block pricing means that the customer is charged *less* for every block after the first, therefore encouraging more water use. Alternatively, **peak-load pricing** can encourage water conservation during the times of heaviest water use by charging more for water during those periods.

Ensuring a Safe Water Supply

Safety from Attacks

In the past two years, national events have forced the issue of increased security onto the agenda of everyone in the water-supply industry. After September 11, 2001, the Public Health, Security, and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act) was passed.⁹ The Act required all community water systems serving more than 3,300 people to conduct a **vulnerability assessment** of possible

⁹ Information on the Bioterrorism Act is from the U.S. Environmental Protection Agency, "Water Infrastructure Security," www.epa.gov/ogwdw000/security/community.html, 12/15/03.

security problems and then prepare (or update) an emergency-response plan (due within six months of the submission of the vulnerability assessment to EPA). Vulnerability assessments by large public water systems (serving 100,000 or more people) were due to the EPA on March 31, 2003; assessments by medium-sized systems (serving 50,000 to 99,999 people) were due on Dec. 31, 2003; and assessments by small systems (serving 3,301 to 49,999 people) are due June 30, 2004.

Safety from Pollutants

Filtration and **disinfection** are the two primary ways to ensure that drinking water is adequately free from human pollutants or other harmful substances. Standard filtration passes water through filters made of such minerals as sand, gravel, and charcoal that remove small particles from the water. Disinfection methods include use of chlorine, chlorine with ammonia, chlorine dioxide, ozone, and ultraviolet light.

[*Ed note:* For an introduction to drinking-water treatment, please see the January 2001 *Water Central*, p. 1.]

One big issue in drinking-water treatment currently is the pathogenic (disease-causing), one-celled animal called *Cryptosporidium*. (The following box provides an indication of the attention being paid to this organism.) According to the federal Centers for Disease Control, “*Cryptosporidium oocysts* [resistant structures that contain egg cells] are present in 65—97 percent of surface water tested throughout the United States.”¹⁰ According to Dickie Puckett, an engineering field director for the Virginia Department of Health in Washington County, water-treatment plants are currently upgrading treatment systems to remove *Cryptosporidium* oocysts. Special filtration systems have been found to remove a good proportion of these oocysts. Standard disinfection methods do not inactivate these organisms, although ultraviolet radiation or ozone at sufficient doses *can* do so, according to Ms. Spiesman.

Another current issue in drinking-water treatment, mentioned by Ms. Spiesman and Mr. Higgins, is the growing use of **membrane-filtration technology**. At one time,

Federal Attention to a Pathogenic Protozoan

In August 2003, the EPA proposed a regulation—the “Long-term 2 Enhanced Surface Water Treatment Rule”—that will affect how water systems deal with the possibility of contamination by the protozoan (one-celled animal) *Cryptosporidium* and other microbial pathogens. According to the summary of the proposal, published in the August 11, 2003, *Federal Register*, the rule “require[s] the use of treatment techniques, along with monitoring, reporting, and public notification requirements, for all public water systems that use surface water sources...[in order] to improve control of microbial pathogens, including specifically the protozoan *Cryptosporidium*, in drinking water.... and to address risk-risk trade-offs with the control of disinfection byproducts.” The public comment period on the proposed rule ended January 9, 2004.

membrane filtration was considered viable only for desalination, but its use for other purposes, such as removal of microorganisms and various contaminants, has become more common.

Membrane-filtration technology involves using pressure to push water through a synthetic “fabric” (the membrane), resulting in separation of the water from organisms or undesirable substances. (Traditional filtration does not involve pressure and the filtering medium is sand with or without another granular medium, such as anthracite coal.) Different pore sizes in the membranes allow progressively finer filtration, from microfiltration (with the largest pore size) through ultrafiltration, nanofiltration, and finally reverse osmosis (the smallest pore size). Each of these filtration levels has particular applications, technical requirements, and limitations. According to Ms. Spiesman and Mr. Higgins, two important advantages of membrane filtration are that it does not involve the addition of coagulation chemicals and that it can soften water (that is, remove magnesium and calcium ions that keep soap from lathering easily and that can leave deposits on pipes and fixtures).¹¹

¹⁰ Dennis D. Juranek, “Cryptosporidiosis: Sources of Infection and Guidelines for Prevention,” www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/crypto_sources_of_infect.htm, 12/15/03.

¹¹ Membrane filtration information came from the National Drinking Water Clearinghouse, *Tech Brief*, No. 10 (Mar. 1999).

Conclusion

Water is one of our most important natural resources; therefore, we need to find ways to make sure Virginia residents have a reliable and safe water source at all times.

To ensure a reliable water supply, Virginia's possible options include building new reservoirs, transferring water from well-supplied areas to areas of high demand, utilizing reclaimed wastewater for certain purposes, investigating desalination, and developing more effective water-conservation programs; each of these options,

however, may involve technical, financial, or political challenges.

To ensure safe water, water-supply systems must address potential human attack and existing water-quality standards. To protect against potential terrorist threats, water-supply systems in Virginia are assessing their vulnerability, developing response plans, and implementing security measures. To provide clean drinking water, Virginia water-supply practitioners use a range of techniques, depending on regulatory requirements, the quality of the source water, the capabilities of the water-supply system, and the needs of the system's customers.

Table 1. Water-supply Issues Identified by Virginia Water Professionals in Fall, 2003.

Person	Information Method*	Issues
Chris Adkins, Virginia Department of Health, Richmond	Interview	•High naturally occurring fluoride levels in some groundwater sources in the eastern Coastal Plain of Virginia.
William Cox, professor in Virginia Tech Department of Civil and Environmental Engineering	Interview	•Impacts of water-price increases on lower-income citizens. •Difficulties that environmental regulations present to construction of new reservoirs.
Joe Hassell, Virginia Department of Environmental Quality	Water Supply Roundtable comments	•The lengthy process required for permitting surface water supplies, involving the need for approvals by various government agencies.
Jerry Higgins, superintendent manager of Blacksburg-Christiansburg-VPI Water Authority	Interview	•Vulnerability of Virginia to future drought, given current demands and available supplies. •Desalination not cost-effective currently.
Mike McEvoy, Director of Utilities for City of Roanoke	Water Supply Roundtable comments	•Water resources not being located where the need for water is. •Growing need to conserve water and to look into supply alternatives such as reclaimed wastewater.
Dickie Puckett, Engineering Field Director, Washington County office of the Virginia Department of Health	Interview	• <i>Cryptosporidium</i> , a water-borne pathogen for which many water-treatment facilities are having to implement special filtration techniques.
Bryan Ramaley, Director of Public Utilities for City of Newport News	Interview	•Groundwater desalination.
Anne Spiesman, environmental engineer with CDM, Annandale, Va.	Interview	•Concern about safety of reclaimed water.
Kurt Stephenson, associate professor in Virginia Tech Department of Agricultural and Applied Economics	Water Supply Roundtable comments	•Challenges of water conservation education, effectiveness, and enforcement.

*Interviews were by phone, e-mail, or both. "Water Supply Roundtable comments" refers to the unpublished transcript of participants' comments at the October 10, 2003, Water Supply Roundtable held in Blacksburg by the Virginia Water Resources Research Center.

FEATURE ARTICLE 2

Nutrient-management Programs: Taking Steps Toward a Solution

Ed. note: This article was researched and written by Irene Berry, Tim Johnson, Ian McFarlane, and Justin Pope. All were students in English 3104, "Introduction to Professional Writing," taught by James Dubinsky at Virginia Tech in Fall 2003.

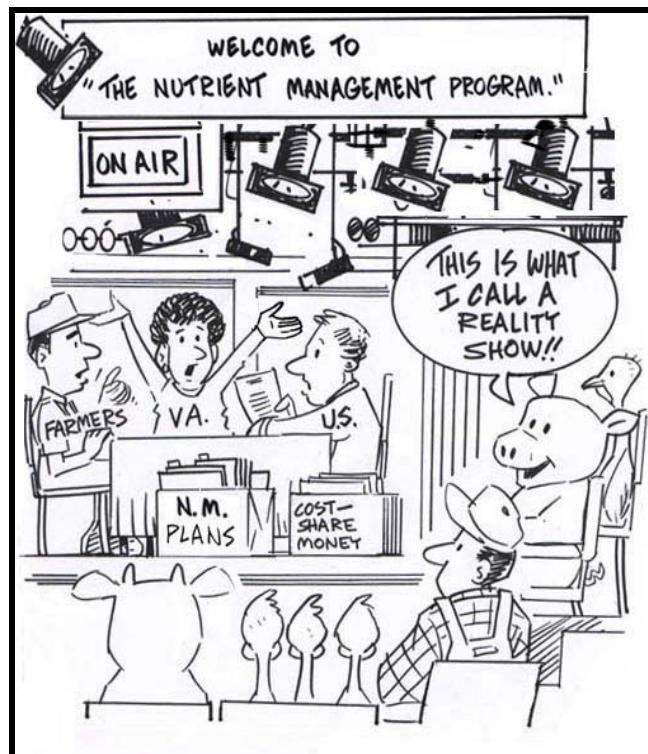
It's no secret that the Chesapeake Bay is more polluted today than it was when Virginia was settled almost 400 years ago. The Chesapeake Bay has been placed on the list of impaired waterways in Virginia, and the Chesapeake Bay Foundation estimates that the Bay's current health index is 27, based on a value of 100 for the year 1600.¹ One of the most striking features of the Chesapeake Bay's poor condition is a large area of very low oxygen, or "**dead zone**." According to the Chesapeake Bay Foundation Website, the dead zone in 2003 covered approximately 40 percent of the Bay.²

Virginia and other Bay states have responded to the Bay situation with a number of agreements, most recently *Chesapeake 2000*, to improve water quality in the Bay. One goal of *Chesapeake 2000* is reduce the flow of **nutrients** into the Bay, particularly **nitrogen** and **phosphorus**. Excess nutrients stimulate excessive growth of algae, which leads to low-oxygen areas and other problems in the Bay.

For this article, the authors interviewed several nutrient-management and water-quality specialists at Virginia Tech and at the Skyline Soil and Water Conservation District Office in Christiansburg, Virginia. We used these interviews, along with research into written materials, to give an introduction to federal and state nutrient-management programs, and two main features of these programs: nutrient-management plans and cost-share funds.

At the end of this article is a complete list of people who provided information for the article; a list of frequently used abbreviations and acronyms appears there, as well.

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The Dead Zone: Not Just a Television Series

A **dead zone** is an area of water with an oxygen deficiency, often caused by excess nutrients. Nutrients are vital for plant growth; however, excess nutrients, particularly nitrogen and phosphorus, cause serious problems when they enter water systems, stimulating algae growth. As algae grow and spread, they cover the water's surface forming what is called an algae bloom. The algae bloom blocks sunlight from reaching underwater aquatic plants that support a diversity of aquatic life; without the necessary amount of sunlight, the underwater plants die. The decomposition of these plants, as well as of the algae, removes oxygen from the water. As this continues, the oxygen level of the water becomes very low, turning the waterway into an area of "hypoxia," also known as a dead zone. Few plants or animals can survive in such an area.³

¹ Chesapeake Bay Foundation, "The Chesapeake Bay," www.cbf.org, 12/3/03.

² Chesapeake Bay Foundation, "The Chesapeake Bay's Dead Zone," www.cbf.org, 12/3/03.

³ Alan Raflo, "Nutrients in the Water and in the News," *Virginia Water Central* (June 2003), p. 3.

Continued from previous page

The Need for Nutrient Management

Nutrients in the Chesapeake Bay and other Virginia waters originate from many sources: industrial facilities, urban stream water, air pollution, septic systems, water treatment facilities, and agricultural operations. Nutrient sources (like sources of other pollutants) have been classified into **point** and **nonpoint sources** (NPS). Point sources release pollution from a single specific location or “point.” NPS pollution *does not* originate from one specific point.

As of 2000, agriculture and livestock operations were estimated to account for 40 percent of nitrogen and 44 percent of phosphorous reaching the Bay from its main tributaries.⁴ Agricultural sources are generally classified as nonpoint sources, but farms designated as **confined animal feeding operations** (CAFOs) are treated as point sources. The EPA defines a CAFO based on animal type, the number of animals, whether they are confined, and its discharge system.⁵ According to Dr. Jim Pease of the Virginia Tech Department of Agricultural and Applied Economics, a CAFO is generally thought of as “an animal feeding operation housing large numbers of [animals] in a confined area, thereby creating water-quality concerns resulting from the potential for manure and wastewater discharges.” At the beginning of 2003, the EPA released a new CAFO rule, broadening the definition of a CAFO. Authorities can also designate an operation as a CAFO if it is a significant contributor of pollutants.

Animal manure is one of the main agricultural nutrient sources. Farmers often spread excess manure on fields. This practice saves them from having to dispose of the waste and reduces the need to purchase fertilizer. Plants need more nitrogen than phosphorous to grow. Manure contains varying amounts of nitrogen and phosphorus, and adding enough

⁴ Chesapeake Bay Foundation, “Nutrients and the Chesapeake Bay,” *Bay Journal* (Jan.-Feb. 2001), pp. 12–13. In 2000, other main nitrogen sources were point sources, 21%; forests 14%; and urban, 13%. Other main phosphorus sources were point sources, 22%; urban 21%; and mixed open, 10%.

⁵ Information and quotes on CAFOs in this paragraph come from the U.S. Environmental Protection Agency, “Producer’s Compliance Guide for CAFOs,” www.epa.gov/npdes/cafo/producersguide, 12/9/03.

nitrogen to meet crop needs usually results in applying too much phosphorous.⁶ Soil erosion carries phosphorus attached to soil particles into nearby streams. Nitrogen, on the other hand, is more soluble in water and is transported both dissolved in water and bound to sediments.⁷

A commonly used tool to help address water-quality impacts by agriculture is a **nutrient-management plan**. By following a nutrient-management plan, agricultural producers and landowners can help reduce the amount of nutrients coming from their land. CAFOs are required to have a nutrient-management plan by EPA and Virginia regulations based on the Clean Water Act of 1972. When the EPA’s 2003 CAFO rule broadened the definition of a CAFO, it increased by approximately 15,500 the number of U.S. farms that are required to implement a nutrient-management plan.⁸ In the following sections, we examine nutrient-management plans and how their use is supported and funded by state and federal agencies.

Nutrient-management Plans

According to Cynthia Hancock at the Skyline Soil and Water Conservation District in Christiansburg, Virginia, every nutrient-management plan is site specific, based on soil type, land use, manure or fertilizer content, and water source. A typical plan includes utilization of **best management practices** (BMPs). A nutrient-management BMP is a method for reducing a farm’s nutrient losses. Some common BMPs include using rotational grazing, planting vegetative cover near waterways, using “no till” farming, and managing fertilizer application.⁹

According to Dr. Theo Dillaha, Virginia Tech Department of Biological Systems Engineering, and Dr. David Parrish, Virginia Tech Department

⁶ Interviews with Mark Alley and Theo Dillaha, Blacksburg, Virginia, 10/16/03 and 10/21/03, respectively.

⁷ Interviews with David Parrish, Blacksburg, Virginia, 10/16/03, and Theo Dillaha, 1/24/04.

⁸ Lal Almas, Steve Amosson, Kari Cohen, and Otto Doering, “Fact Sheet #30: EQIP Financial and Technical Assistance Available to CAFO Owners/Operators,” www.lpes.org/cafo/30FS_F_Bill.doc, 9/26/03.

⁹ Sources of common BMPs in use were interviews with Theo Dillaha, David Parrish, and Jim Pease, dates as cited above; and Chesapeake Bay Foundation, “The Chesapeake Bay,” www.cbf.org, 12/3/03.

of Crop and Soil Environmental Sciences, many BMPs benefit the landowner economically and while also reducing environmental impacts of the operation. By applying manure or fertilizer in the correct amount at the optimum times, producers can reduce their use of fertilizer and their costs. But Dr. Dillaha asserted that it is often difficult for farmers to follow conservation plans requiring more careful management than traditional practices. In addition, installing and implementing a BMP can be expensive in the short run; even though employing BMPs can increase long-term profit, farmers are reluctant to put forward the initial money for installation. Nutrient-management **funding programs** can help reduce these costs.

Nutrient-management funding programs use **cost-share** and **tax-credits** to provide money to help farmers implement nutrient-management plans. These programs supply funds to agricultural producers regardless of whether the producer is *required* to implement a nutrient-management plan. Both the federal government and the state of Virginia administer nutrient-management funding programs. There are slight differences between the two. For example, federal programs can be directed toward any type of environmental quality improvement, while state programs focus almost exclusively on water quality. This concept creates variations in the guidelines used to determine which farming operations and practices to fund. But, according to Ms. Hancock, the main difference between state and federal programs is their funding *source*.

Federal Programs to Fund Nutrient Management

Among other duties, the U.S. Department of Agriculture (USDA) is responsible for ensuring the quality of agricultural and forest land in the United States. As part of this responsibility, it administers all agricultural water programs at the federal level. The USDA provides funding for nutrient management via the Farm Service Agency and the Natural Resources Conservation Service.¹⁰

The Farm Service Agency

The Farm Service Agency (FSA) mission includes "stabilizing farm income, helping farmers conserve land and water resources, providing credit to new or disadvantaged farmers and

¹⁰ U.S. Department of Agriculture, www.usda.gov, 11/25/03.

ranchers, and helping farm operations recover from the effects of disaster."¹¹ The FSA provides federal money to agricultural producers enrolled in programs such as the Conservation Reserve Program and the Conservation Reserve Enhancement Program. Other USDA programs such as the Wetlands Reserve Program, Grassland Reserve Program, Wildlife Habitat Incentives Program, and Conservation Security Program perform similar functions. According to Dr. Pease, CREP is a very popular program for agricultural water-quality improvement.

Conservation Reserve Enhancement Program (CREP).¹² The Conservation Reserve Enhancement Program (CREP) is a voluntary program for agricultural producers to put a conservation program into practice, and it is a subset of the Conservation Reserve Program (CRP). A CREP is established through the joint efforts of the state and the FSA for a specific area and with a specific objective. (CRP is a federal program only and applies to all areas, without a specific goal.) To qualify for CRP or CREP, a landowner must remove land from agricultural production and plant "resource-conserving covers" on their land. The FSA provides the owner with cost-share money of up to 50 percent of the installation cost for the practice plus an annual rental payment to reduce the cost of leaving farmland idle.

In March 2000, Virginia and the USDA created a CREP to restore water quality and wetland habitat in the Chesapeake Bay watershed. The program was aimed at reducing the amount of nitrogen and other sediments entering the Bay by planting permanent vegetative cover on agricultural streamside land. Other Virginia waterways are covered under the Southern Rivers CREP. To qualify, land must have supported agricultural crops at least two of the past five years. Landowners who commit to a 10-year CREP receive \$50 per acre, while those in a 15-year plan receive \$75 per acre. The total federal and state payment for the implementation of the two Virginia plans is \$91 million over 15 years. The state will pay \$23 million of this cost.

¹¹ Farm Service Agency, "Farm Service Agency Online," www.fsa.usda.gov, 11/18/03.

¹² References for this section were the following pages at the Farm Service Agency Website, www.fsa.usda.gov: "CREP," "Fact Sheet: Conservation Reserve Enhancement Program," and "Fact Sheet: CRP," all accessed between 11/20/03 and 12/2/03.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) is a USDA agency that “provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.”¹³ The NRCS supports environmental conservation activities such as restoring watershed dams, developing wetland areas, reclaiming abandoned mines, and reducing nutrient run-off from farms.

The NRCS is responsible for providing technical assistance to agricultural landowners by writing nutrient-management plans and approving best management practices. The NRCS also implements the Environmental Quality Incentives Program. This program promotes environmental conservation and agricultural production as compatible goals.

Environmental Quality Improvement Program.¹⁴ The Environmental Quality Improvement Program (EQIP) was formed under the Farm Bill of 1996 by combining several existing conservation programs. It is a voluntary program that provides financial assistance to farmers who implement environmental practices. To get EQIP funding, all livestock and poultry producers must have a certified nutrient-management plan. EQIP is the primary source of such funds for CAFOs. Cost-share rates under this program are now as high as 75 percent (90 percent for limited resource or beginning farmers). Requests for EQIP contracts currently outnumber available funding by six to one. Federal funds are allocated to states based on a set of National Priorities, including reductions to nonpoint sources of nutrients. For the 2003 Fiscal Year, Virginia was allocated to receive \$9,494,700 from

¹³ Natural Resources Conservation Service, www.nrcs.usda.gov, 11/16/03.

¹⁴ References for this section were the following: U.S. Department of Agriculture, “Environmental Quality Improvement Program Benefit Cost Analysis: Final Report,” www.nrcs.usda.gov/programs/Env_Assess/EQIP/EQIP_EA_finals/FINAL_BC_Analysis.pdf, 10/3/03; Lal Almas, Steve Amosson, Kari Cohen, and Otto Doering, *op. cit.* (footnote 8, above); and two Web pages of the Natural Resources Conservation Service: “Environmental Quality Incentives Program: Summary of Final Rule,” www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPRLSm.pdf, 9/26/03; and “FY 2003 EQIP Allocations to States,” www.nrcs.usda.gov/programs/2003Allocations/eqip_2003.pdf, 9/21/03.

EQIP. Because it is oriented toward working agricultural lands, EQIP will overlap with few other federal programs. For example, land under a CREP/CRP contract is not eligible for EQIP until the CREP/CRP contract is over.

Virginia State Programs to Fund Nutrient Management¹⁵

The Virginia Department of Conservation and Recreation (DCR) administers programs for managing nonpoint sources of pollution, especially that caused by agricultural operations. (The Virginia Department of Environmental Quality (DEQ) is responsible for point sources, such as large CAFOs.) Working through Virginia’s soil and water conservation districts (SWCDs), DCR provides technical assistance for the writing and approving of nutrient-management plan, and administers all state cost-share and tax-credit programs to help farmers pay to implement plans and BMPs. In order to receive state money, a producer must have and follow an approved conservation plan, which usually involves nutrient management.

BMP Cost-Share Program

The Virginia Agricultural Best Management Practice Cost-Share Program will pay up to 75 percent of the cost for a farmer to implement and use certain BMPs. However, the most that the state will pay any individual farmer is \$50,000. For very expensive practices, a farmer can often get financial support from both the state and the federal government. Cost-share money from Virginia and from the federal government together will then pay up to 75 percent of the total cost. In order to receive a Virginia Agricultural BMP Cost-Share, an individual must make an application to a nearby SWCD office and then be selected. Funds are awarded through a highly formulized system that considers location as well as the type of BMP employed. According to Ms. Hancock, there are considerably more requests for money than funds available.

¹⁵ Except as noted otherwise, information in this section came from the Virginia Department of Conservation and Recreation (DCR), “Water Quality Improvement Act,” www.dcr.state.va.us/sw/wqia.htm, 11/11/03; and the DCR’s 2003 BMP Cost-Share Program brochure, “Cost Share and Tax Credit for Virginia Agricultural BMPs.”

BMP Tax Credit Program

The Virginia Agricultural Best Management Tax Credit Program supports farmers as they implement an approved conservation plan. This program gives agricultural producers credit on state income tax, worth 25 percent of the cost of eligible BMP expenses that the farmer pays. According to Ms. Hancock, in cases where an individual has already received cost-share funds covering 75 percent of the total expenses, this program gives a tax-credit for 25 percent of the 25 percent that the farmer pays out of his own pocket. Tax-credit values cannot exceed \$17,500.

Conservation Equipment Tax Credit Program

The Conservation Equipment Tax Credit Program helps ease the financial burden for conservation equipment. This tax-credit is worth 25 percent, but no more than \$3,750, of the cost for approved pieces of equipment, such as manure spreaders, pesticide sprayers, and liquid fertilizer applicators. No-till planters are also eligible for a 25-percent state tax-credit, but only up to \$2,500.

Sources of the Funds

Funding of Federal Programs

Federal funding for nutrient management and other natural resources programs has increased in recent years. The Farm Security and Rural Investment Act of 2002 (Farm Bill) increased federal natural resources funding significantly. The 2002 Farm Bill raised the amount of funding authorized for EQIP, and required that 60 percent of funds be used for livestock-related practices. The \$6.16-billion increase in funds will be spread out over FY2002 through FY2007. Funding will increase each year to the 2007 level of \$ 1.3 billion.¹⁶ Between 1997 and 2001, EQIP's annual funding has never been higher than \$200 million. The 2002 Farm Bill also increased the maximum cost-share percentage that the program will cover from 65 percent to 75 percent and allows CAFOs to receive funding from EQIP.¹⁷

In January 2003, the Bush administration proposed \$3.9 billion for Farm Bill conservation programs in FY004; this represented an increase of \$600 million over FY 2003 and \$1.9 billion since

¹⁶ Lal Almas, Steve Amosson, Kari Cohen, and Otto Doering, *op. cit.* (footnote 8, above)

¹⁷ U.S. Department of Agriculture, "Environmental Quality Improvement Program Benefit Cost Analysis: Final Report," *op. cit.* (footnote 14, above).

FY 2001. Specifically, the proposal called for CRP to receive \$2 billion and EQIP \$850 million; the rest of the money was slated for other conservation and water-quality programs.¹⁸

Funding of State Programs

Most state-level water-resource programs in Virginia, including the nutrient-management activities of the DCR and DEQ, fall under the management of the Natural Resources Secretariat. Between FYs 1997 and 2001, this secretariat's annual budget (all programs for eight agencies, not just water-related ones) increased from \$176 million to \$288 million. In FY 2002, however, its budget decreased to \$246 million; for FY 2004, it has increased to \$252 million. In the governor's proposed 2004-2006 budget, Natural Resources would receive \$296 million in FY 2005 and \$289 million in FY 2006.¹⁹

An important source of nutrient-management funds in Virginia is the Virginia Water Quality Improvement Fund (WQIF). This account was created by the 1997 Virginia Water Quality Improvement Act and is usually funded from any surplus in the state's budget. There was no budget surplus for the 2002-2004 biennium, so no payment was made to the WQIF.²⁰ For the 2004-2006 biennial budget, however, Gov. Warner has proposed \$7.7 million for the WQIF in FY 2005: \$5.8 million for point-source nutrient reduction activities by the DEQ and \$1.9 million for NPS nutrient-reduction activities by the DCR.²¹

The only state nutrient-management funds *unaffected* by state-budget reductions in recent years were the tax-credits. The Virginia BMP Tax-credit and the Conservation Equipment Tax-credit do not depend on the WQIF. Consequently, even when they will not receive cost-share money, farmers often use BMPs purely for the tax-credit value. In 2003, however, the General Assembly debated removing these and several other state

¹⁸ Alisa Harrison, "President Bush to Propose Record-Level \$3.9 Billion for Conservation Programs," U.S. Department of Agriculture Press Release of January 30, 2003, www.usda.gov/news/releases/2003/01/0032.htm, 11/25/03.

¹⁹ Virginia Department of Planning and Budget, www.dpb.state.va.us, 1/23/04.

²⁰ Virginia Association of Counties, "Budgets Unveiled," *Connections* (January 1, 2002), pp. 1—4.

²¹ Virginia Department of Planning and Budget, *op. cit.* (footnote 19, above).

tax-credit programs from the state budget, according to Ms. Hancock.

Funding in a Nutshell

According to Ms. Hancock, who has worked at the Skyline SWCD for almost 15 years, funding seems to run in cycles. State programs will have significant funding for several years, while the federal funding is down; in time, the situation reverses. Ms. Hancock reported already seeing the recent increase in federal funds from the USDA through EQIP and CREP, although delays in the allocation of federal funds by states had left many farmers not knowing if they would get the necessary money to help install conservation practices, as of December 2003.

Impact

Since agricultural conservation programs were first implemented, use of BMPs and nutrient-management plans has increased significantly. A BMP that is funded by cost-share and tax-credit programs typically becomes a common farming practice over the course of 20 years or so. A prime example of this is rotational grazing. This practice, emphasized in the 1987 Farm Bill, gained momentum and is now a popular practice for grazing livestock operations, according to Ms. Hancock.

Even as BMP use increases, however, the full impact of these practices on the amount of nutrients in Virginia's waters is uncertain. Computer models of BMP acreage and miles of buffers placed on streams show that Virginia has made significant progress toward goals in these areas for 2010, but no significant reductions in nutrient levels in receiving waters have actually been detected, according to Drs. Dillaha and Parrish. Measurements taken in the Chesapeake Bay show that nutrient levels have ceased to rise, but they have not dropped. The Chesapeake Bay Foundation estimates that in order to remove the Bay from the list of impaired waters by 2010, nutrient pollution must be reduced by twice the amount achieved since 1987. The Foundation also predicts that to reach all of the *Chesapeake 2000* goals, Bay states must invest between \$1—2 billion every year.²²

²² Chesapeake Bay Foundation, "Fact Sheet on the Chesapeake Bay's Dead Zone" (November 2003), www.cbf.org/, on 12/3/03.

For More Information

For more information about nutrient-management, contact your local Soil and Water Conservation District Office. To find your local district, visit www.vaswcd.org/districts.htm, or phone toll free (800) 727-6354.

People Interviewed for This Article

Mark Alley, Professor, Virginia Tech
Department of Crop and Soil Environmental Sciences.

Theo Dillaha, Professor, Virginia Tech
Department of Biological Systems Engineering.

Cynthia Hancock, District Manager, Skyline Soil and Water Conservation District, Christiansburg, Virginia.

David Parrish, Professor, Virginia Tech
Department of Crop and Soil Environmental Sciences.

Jim Pease, Associate Professor, Virginia Tech
Department of Agricultural and Applied Economics.

Frequently Used Abbreviations/Acronyms

BMP—best management practice

CAFO—confined animal feeding operation

CREP—Conservation Reserve Enhancement Program

CRP—Conservation Reserve Program

DCR—Virginia Department of Conservation and Recreation

EQIP—Environmental Quality Improvement Program

FSA—Farm Service Agency

NPS—nonpoint source (of water pollution)

NRCS—Natural Resources Conservation Service (formerly Soil Conservation Service)

SWCD—soil and water conservation district

USDA—U.S. Department of Agriculture

Water Central thanks all the people who provided information and reviewed the two student articles, Jim Dubinsky for his collaboration, and especially the student authors for their service and a job well done.

GENERAL ASSEMBLY ITEM #1

Report of the Water Policy Technical Advisory Committee

In its 2003 session, the Virginia General Assembly passed Senate Bill 1221, which called for creation of the Water Policy Technical Advisory Committee to assist the Virginia Department of Environmental Quality (DEQ), the Virginia Department of Health (VDH), and the State Water Commission address statewide water-supply policy issues. On December 1, 2003, the Advisory Committee submitted to the General Assembly the report of its work during the year. This section presents an excerpt of that report. For a copy of the full report (52 pages) and other information about this Advisory Committee, go online to www.deq.state.va.us/info/waterpolicy.html or phone the DEQ Central Office in Richmond at (800) 592-5482.

I. Executive Summary

Pursuant to Senate Bill 1221 (2003), the Department of Environmental Quality (“DEQ”) created the Water Policy Technical Advisory Committee (WP-TAC) to assist DEQ, the Virginia Department of Health (VDH), and the State Water Commission in addressing water planning issues. The WP-TAC was deliberately made up of widely divergent interests, with the intention of creating the most broad-based consensus possible on these issues. Meetings of the WP-TAC have been conducted with the assistance of outside facilitators.

Criteria for Local/Regional Planning

While it was thought at the outset of the process that the result of the WP-TAC’s work would be draft regulations to propose to the State Water Control Board, after a great deal of discussion it was apparent that the group was not ready to commit to draft regulations. This was in part due to a sense that there was not enough time to review and discuss them in adequate depth before the deadline for submission of criteria. The group feels that a number of key issues must still be discussed, including the fundamental issue of how the state plan itself will work. There are important policy and guidance “overarching” issues (see Appendix G [of the full report]) that need to be decided in order for the regulations to have context so that the regulations can be discussed in a meaningful fashion. Instead, the WP-TAC did reach consensus on general Criteria for the Development of Local/Regional Plans, with the understanding that there were still many open issues to be discussed in future meetings.

Preliminary State Water Resources Plan

The second component of Senate Bill 1221 was that DEQ was to begin work on a preliminary water resources plan. Unlike the comprehensive



plan envisioned for completion in 2004, this year’s task was to create a compilation of existing plans as a baseline and a means of determining where gaps currently exist in planning. The gaps, or deficiencies, identified in this process will allow DEQ to note policy issues that will need to be addressed as a more comprehensive planning process is designed and implemented. The WP-TAC also identified issues and began discussion of the state’s role in water planning.

Future Steps

The WP-TAC remains committed to continuing work next year in this stakeholder-guided process in an effort to ensure that the needs of the citizens for water are served while the resources of the Commonwealth are protected. The WP-TAC is committed to continuing its work to: begin development of a state plan, discuss major policy issues left unresolved during the previous phase of work, and continue work on the final draft regulations once the state plan framework has been clarified.

II. Introduction

Authority and Scope of Work

The Department of Environmental Quality (DEQ) created a stakeholder committee in 2002 to assist DEQ and the State Water Commission by looking at water planning issues. The committee met four times and the consensus reached was incorporated into Senate Bill 1221. That bill formalized the Water Policy Technical Advisory Committee (WP-TAC) and asked that DEQ and the Virginia Department of Health (VDH) work with the WP-TAC “on the development of the plan, criteria, guidelines and regulations” required by the bill. The complete text of the bill is...Appendix A [of the full report].

In order to be as representative of the affected interests as possible, the original WP-TAC was expanded and additional members added. [The list of the participants in the WP-TAC is at the end of this article.]

Methodology

In an attempt to maximize the potential for this diverse group of stakeholders represented on the WP-TAC to have meaningful dialogue on these complex issues, DEQ hired professional facilitators through an RFP process to assist. At the first two meetings, the facilitators introduced certain key ideas to the group and discussed them. Guidelines for the conduct of the meetings themselves and information regarding consensus are attached as Appendices C and D [of the full report]. At the first meeting, a statement regarding the mission of the WP-TAC, which had been set out in a report by DEQ Director Robert Burnley to the Governor and the General Assembly, was shared with the TAC. The mission was described as follows: *“To identify the roles and responsibilities of state and local governments to assure groundwater and surface water resources are used in a sustainable way that protects the environmental resources and meets citizen water needs (agricultural, business and residential) now and in the future.”*

During each of the full-group meetings, the facilitators led the discussion. In addition to managing the meeting itself, the facilitator was also responsible for maintaining the “common memory” of the group. The visual memory of the flip chart notes created during the course of the meetings was one tool, in addition to more traditional minutes to supplement the flip chart notes. The minutes of each meeting were posted on the DEQ website.

Given the size of the WP-TAC, it was apparent that significant work would need to be

done in smaller groups. These groups were created based on interest expressed by members of the WP-TAC, as well as on DEQ staff’s and the facilitators’ assessment of the necessary composition of each group to ensure adequate representation of diverse interests. Each group was responsible for a set of issues, ranging from those that were seen as largely “water supply” issues to those which were more broadly “water resource” issues. The lists of the issues that were presented to the groups, as well as the composition of the groups themselves, are included as Appendix E [of the full report].

Given the diverse interests intentionally represented in the make-up of the WP-TAC, it is not surprising that the depth of the divisions among interest groups on certain issues was significant. Everyone participated fully, and all have agreed to participate in what has come to be called “Phase Two.” While the process has been difficult, there has been open dialogue and the prospects for continuing and moving to a successful conclusion keep people at the table.

Summary of Results

Consensus on Criteria. After a great deal of discussion on draft regulations that were compiled by DEQ based on input from the small groups, it was apparent that the entire group was not ready to commit to the regulations as proposed. This was in part due to a sense that there was not enough time to review and discuss them in adequate depth before the deadline for submission of criteria, and in part due to the strong feeling of the group that a number of key issues had not yet been discussed at all. These “overarching issues” (see Appendix G [of the full report]) were things that were not necessarily appropriate to put into the regulations themselves, but were important policy and guidance issues which needed to be decided in order for the regulations to be in context. Without decisions on those issues, it was not possible for the group to move forward on the regulations.

DEQ staff was aware that the key issues in dispute related to many of the details in the regulations and that a number of general concepts were not in dispute. As a result, the Criteria for the Development of Local/Regional Plans was proposed and presented at the final scheduled meeting of the WP-TAC on November 4.

At that meeting, the Criteria were revised slightly and then adopted by consensus. It was the understanding of the group that the Criteria were intended as the starting point for future discussions and that the issues which remained might make changes in the final criteria

necessary. A copy of the Criteria, as revised by the group at its meeting on November 4, is attached as Appendix F [of the full report].

Preliminary State Water Resources Plan. In addition to the Criteria for the development of local and regional plans, referred to above, Senate Bill 1221 directed the development of a preliminary state water resources plan. It was apparent that the task of the WP-TAC was too great to be accomplished in the timeframe established and that it would not be a productive use of time to ask the WP-TAC to be heavily involved, as a group, in the organizing of the preliminary plan.

Unlike the Comprehensive Water Resources Plan that will be developed in Phase Two of this process, the preliminary plan is simply a compilation of existing local and regional plans and an attempt to note areas of deficiencies. The compilation of existing plans will make some gaps evident, allowing DEQ to note key policy questions raised. During Phase Two of this process, those items will be added to the list of issues to be addressed by the WP-TAC, to the extent that they have not already been identified by the group or by DEQ itself.

Proposed Framework. DEQ provided several outlines of a proposed framework for a state plan to the WP-TAC. While the WP-TAC provided some initial feedback on the proposed framework, the preliminary plan is a partial listing of issues and remains a work in progress.

It is hoped that with additional work, the Comprehensive State Water Resources Plan can provide a “living” policy umbrella for balancing and prioritizing water supply projects and water resource protection. The work on the plan to date has focused on addressing what needs to be included in this plan, such as an identification of state and local roles, a repository of information needed for local and regional planning, an annual work plan for development of this information, and an acknowledgment of proposed water supply project alternatives that have met the water supply planning criteria. A copy of the partial listing of issues, as revised by the group at its meeting on November 4, is attached as Appendix H [of the full report].

Data Received. DEQ attempted to acquire information on the status of local and regional water supply planning through a variety of sources including the Virginia Chapter of the American Planning Association, the Virginia Association of Planning District Commissions, the Virginia Association of Counties, the Virginia

Municipal League, and the Virginia Chapter of the American Water Works Association (VA AWWA).

It became apparent very early in the process that water supply planning was highly variable among local and regional entities and in some cases the “plan” represented many volumes of information and in others the “plan” constituted several pages of a local comprehensive plan. DEQ staff ultimately decided to partner with the VA AWWA to survey 142 community water systems on some basic water supply planning issues.

The survey was conducted during August and September. DEQ was provided with 66 responses, including responses from the Commonwealth’s largest water providers. The surveys provided some useful information; however, work will need to continue with the VA AWWA to clarify some of the information so that the surveys can be useful in providing a snapshot of the status of local and regional water supply planning in the Commonwealth. The VA AWWA has indicated a willingness to continue working with DEQ to help make certain the survey results can be effectively used.

Consensus on Continuing to Work Together.

As set out more fully in Section II.D., below, the WP-TAC has agreed that it will continue its work for approximately another year. This will allow time for working toward consensus on some of the major policy issues facing the state as it balances the beneficial in-stream and off-stream uses of water.

The WP-TAC recognizes that responsible and sustainable provision of water for use by humans automatically includes protection of the environment. All interest groups represented also recognize that water must be provided to meet the needs of the human users. There is not yet agreement, however, as to how to balance all of the needs and desires of the interests represented. The WP-TAC is committed to additional small and large group work, and to try to accomplish its tasks as expeditiously as possible.

III. WP-TAC Process

[From the “Future Process” subsection, specifically the discussion of “Issues.”]

A great deal of thought and time has gone into the development of issues to be discussed. Some of these issues are captured in the list of “Overarching Issues” attached as Appendix G [of the full report], others are reflected in preliminary drafts of regulatory language and still others in a partial tentative draft of what might be contained

in a state plan (attached as Appendix H [of the full report]).

As stated in Robert Burnley's 2002 Water Resources Report to the Governor and the General Assembly, and to the WP-TAC at its first meeting, the issues to be addressed can be broadly stated as:

1. clarification of the roles and responsibilities of state government;
2. clarification of the roles and responsibilities of local government;
3. assurance that ground water and surface water are used in a sustainable way; and,
4. assurance that environmental resources and citizen water needs (agricultural, business and residential) will be protected now and in the future.

The TAC discussions raised a number of areas within these broadly stated issues that reflect very strong interests of the parties. As in any consensus-building process, the articulation of these interests provides the opportunity for collaborative problem solving.

All parties agree that it is most important for both the Commonwealth and localities to plan for the use of water resources. The Commonwealth has indicated a desire to do this planning for many years, but resource and policy issues have not allowed this to occur. Planning is necessary both to assure an adequate water supply for Virginia citizens and to protect the natural resources of the Commonwealth. The severe drought brought the need for planning to the forefront. While the recent rains are welcome, they have not diminished the need for planning.

The parties further agree that planning should be a locally driven effort. The state clearly has a significant role in the planning process but, at its most fundamental level, planning must be done locally. Localities should be encouraged to join with other localities to plan regionally. All parties agree that incentives should be created to encourage regional cooperation for a broad array of reasons, including economies of scale and the ability to view water resources more broadly. While there is not consensus on what entities should be able to submit plans, there is agreement that the local and regional focus is appropriate.

Planning is necessary and worthwhile, but it is expensive. Many of the larger localities already engage in extensive planning efforts, at great expense. Most smaller localities do not have institutionalized planning efforts and lack the resources to do so. All of the parties agree that planning should not become an "unfunded mandate" on local governments. Finding creative

solutions to the funding issue in a time of tight budgets is essential to the success of this effort.

The parties also agree that existing property rights to water as set forth in current law should be preserved.

There is broad agreement that there is a lack of necessary data, particularly in regard to groundwater. It goes without saying that planning is difficult when the water resources cannot be accurately characterized. The WP-TAC is clear that efforts should be made to gather existing data in one place so that it is more accessible to planners and, in addition, to begin the difficult process of gathering data where none currently exists. It is understood, however, that long-delayed planning efforts should not be delayed further while data collection and processing systems are improved.

The "Water Supply Planning Criteria" attached as Appendix F [of the full report] represents consensus on the broad outlines of a local water supply plan. However, many issues within this outline are yet to be resolved. There is agreement among the parties that it is necessary to suspend further work on the local plan regulation until funding issues are addressed and questions as to how these local plans will be used are answered.

A major area of future discussion is how the local plans will be utilized. One question is how the planning process relates to the permitting process. There is general agreement that the existing permitting process is cumbersome and expensive. Consequently, members of the WP-TAC are interested in exploring ways to streamline the permitting process, while preserving the statutory role of the agencies to raise issues within their respective expertise and function.

It is also recognized that the planning process, if appropriately executed, may also have an effect on the permitting process. Preparing a plan is not the same as applying for a permit; approving a plan is not the same as granting a permit. However, there may be an opportunity for a project to benefit in the permitting phase when it is consistent with a local plan that has already met certain planning criteria. Characterizing the appropriate relationship between planning and permitting will have a significant impact on the detail and extent of what should go into a local plan.

There will be localities for whom planning is a relatively truncated process, given the nature of their use of water and its availability. This, too, will affect the extent of required planning.

All of these issues require much more discussion than time has allowed to this point in the process.

These considerations begin to raise issues about the role of the state in the planning process. The parties understand that conflicts have arisen, and will continue to arise, regarding the use of water resources. Significant issues concerning the state's role in resolving these conflicts remain for discussion. The definition of this role also affects the nature and extent of information that should be contained in a local plan.

Another issue that has arisen is whether the state has a role to play vis-à-vis the federal government and conflicts with other states once all required Virginia permits have been granted. Coordination and facilitation roles have been discussed; some parties desire a stronger role, while others have reservations about the state intervening at all.

The above summary of issues is not intended to be comprehensive or exhaustive, but rather merely illustrative. Future discussions will require extensive healthy debate among all of the stakeholders. The WP-TAC is committed to improving and broadening the planning function by seeking collaborative solutions that promote the Commonwealth's welfare.

List of WP-TAC Participants

Participants are listed here in the order in which they are listed in the full report, where the list is grouped by stakeholder category (for example, conservation interest, trade association, academic, and several others).

Judy Dunscomb, The Nature Conservancy
 Patricia Jackson, James River Association
 Rev. Shelton Miles
 Ed Imhoff
 Chris Miller, Piedmont Environmental Council
 Samuel E. Hamilton, Virginia Agribusiness Council
 Wilmer N. Stoneman, III, Virginia Farm Bureau Federation
 Terrell J. Reid, Virginia Section of the American Water Works Association
 Mike McEvoy, Virginia Section of the American Water Works Association (alternate)
 Guy Aydlett, Virginia Association of Municipal Wastewater Authorities
 Christopher D. Pomeroy, Virginia Association of Municipal Wastewater Authorities (alternate)

Josh Rubinstein, Virginia Rural Water Association
 Thomas G. Botkins, Jr., Virginia Manufacturers Association
 Tom Roberts, Virginia Manufacturers Association (alternate)
 Robert Royall, Virginia Water Well Association
 Mike West, Home Builders Association of Virginia
 Mike Thacker, American Electric Power (AEP)
 Cathy Taylor, Dominion Virginia Power
 David K. Paylor, Deputy Secretary of Natural Resources
 Robert G. Burnley, Director of Virginia Department of Environmental Quality
 Robert Taylor, Director, Virginia Department of Health (VDH)/Office of Drinking Water
 Tom Gray, Virginia Department of Health (VDH)/Office of Drinking Water (alternate)
 Dan Kavanagh, Executive Director, Middle Peninsula Planning District Commission
 John M. Carlock, Deputy Executive Director, Hampton Roads Planning District Commission
 Eldon James, Coordinator, Rappahannock River Basin Commission
 Robert H. Conner, Roanoke River Basin Advisory Committee/Brunswick County
 Brian Ramaley, P.E., Director of Public Utilities, City of Newport News
 Kristen Lentz, P.E., Director of Utilities, City of Norfolk
 Frank Sanders, Jr., P.E., Director of Utilities, City of Winchester
 Arthur D. Petrini, Public Utilities Director, Henrico County
 Gerard Higgins, General Manager, Blacksburg-Christiansburg-VPI Water Authority
 Charlie C. Crowder, Jr., General Manager, Fairfax Country Water Authority
 Jesse J. Richardson, Jr., Assistant Professor, Virginia Tech Department of Urban Affairs and Planning/Virginia Chapter of the American Planning Association
 David Kovacs, Director for Policy and Legislation, Virginia Chapter of the American Planning Association (alternate)
 Jeffrey Irving, Chief, Civil Branch, Programs and Project Management, U.S. Army Corps of Engineers, Norfolk District
 Ward Staubitz, U.S. Geological Survey
 William E. Cox, Virginia Tech Department of Civil & Environmental Engineering
 Thomas A. Miller, Float Fisherman of Virginia.

GENERAL ASSEMBLY ITEM #2

Proposed 2004-06 Budgets of Agencies with Water Resource Programs

On January 12, 2004, the governor's proposed budget was introduced to the 2004 Virginia General Assembly as HB 30 (House of Delegates' Appropriations Committee) and SB 30 (Senate Finance Committee).

Some important Budget Bill deadlines for the 2004 session are as follows:

February 22, budget committees finish their work; February 26, houses of introduction complete their Budget Bills; March 3, last day for each house to act on the Budget Bill of the other house; March 11, Budget Bill(s) conference report available; March 13, session scheduled to end; April 24, reconvened session.

The following table shows the proposed funding (from *all* funds, both "general" and "non-general") for the state agencies most involved with Virginia's water resources: Chesapeake Bay Local Assistance Department; Department of Conservation and Recreation; Department of Environmental Quality; Department of Forestry; Department of Game and Inland Fisheries; Department of Health; Virginia Institute of Marine Science; Marine Resources Commission; Department of Mines, Minerals, and Energy; and Port Authority. (Please see the April 2001 issue of *Water Central*, pp. 1—5, for an introduction to state agency spending for water resources.)

The amounts shown below are for each agency's *entire* budget, not strictly water-related activities. The figures below came from "Executive Budget Document" at the Department of Planning and Budget's Website, www.dpb.state.va.us, on 1/19/04. The General Assembly's Budget Bills (as introduced) are online at leg2.state.va.us/MoneyWeb.NSF/sb2004 (as of 1/19/04).

Virginia Agency	FY04 (2003-2004)	FY05 (2004-2005)	FY06 (2005-2006)
Chesapeake Bay Local Assistance	\$1,435,053	\$1,449,221	\$1,451,098
Conservation and Recreation	\$50,372,082	\$52,664,093	\$50,918,397
Environmental Quality	\$144,889,144	\$175,161,375	\$169,256,290
Forestry	\$23,881,927	\$23,769,792	\$23,766,671
Game and Inland Fisheries	\$42,671,717	\$45,670,278	\$46,139,878
Health	\$442,292,025	\$475,246,899	\$476,372,849
Institute of Marine Science	\$35,331,947	\$37,144,304	\$36,787,416
Marine Resources Commission	\$14,372,470	\$14,589,537	\$14,345,060
Mines, Minerals and Energy	\$26,981,109	\$29,268,277	\$27,390,538
Port Authority	\$49,210,464	\$59,793,411	\$65,086,206

The following are some noteworthy water-related changes proposed in the Executive Budget Document.

Department of Health

- Transfer regulation of construction and operation of wastewater treatment plants to the Department of Environmental Quality, reducing the Health Department budget by \$552,006 annually.

Department of Conservation and Recreation

- Provide \$1.92 million (FY 05) in funding for the Water Quality Improvement Fund.
- Provide \$179,663 (FY 05) and \$335,996 (FY 06) to increase funds for the dam-safety program and to repair highest-hazard dams.

Department of Environmental Quality

- Provide \$500,000 (each year) of "additional funding for water supply planning."
- Provide \$2.64 million (FY 05) and \$2.55 million (FY 06) of "additional appropriations for water and waste permit programs."
- Provide \$5.8 million (FY 05) in funding for the Water Quality Improvement Fund deposit.
- Provide \$15 million (each year) in funding for the new Virginia Natural and Historic Resources Fund.
- Increase by \$3.92 million (each year) the non-general fund appropriation for Virginia Petroleum Storage Tank fund reimbursements.

Marine Resources Commission

- Provide \$100,000 (each year) for a study of the environmental impact of non-native oysters.
- Provide \$258,000 (over the two years) for construction of Tangier Island Seawall.

VIRGINIA WATER STATUS REPORT

This section of *Water Central* presents recent and historical data on Virginia's precipitation, stream flow, and groundwater levels (one topic per issue, rotating among the three topics).

Precipitation in Virginia, January—December 2003

The chart below shows precipitation (in *inches*) recorded at six National Weather Service observation sites in Virginia for each month from January—December 2003. The top number for each site/month is the total precipitation, including the equivalent amount of water contained in any snowfall or other frozen precipitation. These values were found at "Climate" sections of the Web sites of the National Weather Service offices in Blacksburg (www.erh.noaa.gov/er/rnk), Sterling (www.erh.noaa.gov/er/lwx/), and Wakefield (www.erh.noaa.gov/er/akq/) (as of 1/20/04). The bottom number (in parenthesis) is the **departure from normal**: the amount above (+) or below (-) the average monthly precipitation over the period 1971—2000, according to the National Climatic Data Center, *Climatography of the United States No. 81* (accessed at www5.ncdc.noaa.gov/climate normals/clim81/VAnorm.pdf on 1/20/04). The monthly amounts shown here are classified as "preliminary data" by the National Weather Service and have not yet been verified and certified by the National Climatic Data Center.

A previous report on Virginia precipitation (for May 2002—May 2003) appeared in the June 2003 issue of *Water Central*.

The Virginia State Climatology Office's latest *Virginia Climate Advisory* (04-01) discusses the large departure from normal precipitation seen statewide in 2003. The report is available online at climate.virginia.edu. To reach the Climatology Office by phone, call (434) 924-0548.

	Blacksburg	Charlottesville	Lynchburg (Municipal Airport)	Norfolk (Internat. Airport)	Richmond (Byrd Airport)	Roanoke (Woodrum Airport)	Wash.-Dulles Airport
Jan. 2003	1.19 (-2.18)	2.53 (-1.18)	1.53 (-2.01)	2.34 (-1.59)	2.18 (-1.37)	1.45 (-1.78)	2.69 (-0.36)
Feb. 2003	6.30 (+3.28)	5.76 (+2.46)	5.75 (+2.65)	5.25 (+1.91)	4.21 (+1.23)	5.80 (+2.72)	6.27 (+3.50)
Mar. 2003	3.09 (-0.74)	4.82 (+0.77)	4.17 (+0.34)	2.91 (-1.17)	5.92 (+1.83)	3.52 (-0.32)	3.71 (+0.16)
Apr. 2003	4.77 (+0.94)	4.62 (+1.28)	5.32 (+1.86)	6.39 (+3.01)	4.38 (+1.20)	5.02 (+1.41)	2.71 (-0.51)
May 2003	6.50 (+2.11)	7.07 (+2.21)	8.19 (+4.08)	4.66 (+0.92)	8.59 (+4.63)	10.13 (+5.89)	8.72 (+4.52)
June 2003	7.48 (+3.55)	6.22 (+1.76)	5.71 (+1.92)	3.43 (-0.34)	3.87 (+0.33)	6.32 (+2.64)	8.33 (+4.26)
July 2003	8.14 (+3.97)	6.95 (+2.01)	8.33 (+3.94)	8.56 (+3.39)	9.26 (+4.59)	5.16 (+1.16)	6.07 (+2.50)
August 2003	2.30 (-1.38)	4.71 (+0.57)	3.56 (+0.15)	6.08 (+1.29)	4.66 (+0.48)	4.04 (+0.30)	5.57 (+1.79)
Sept. 2003	4.03 (+0.64)	5.69 (+0.84)	7.13 (+3.25)	9.54 (+5.48)	10.12 (+6.14)	4.32 (+0.84)	7.27 (+3.45)
Oct. 2003	1.77 (-1.42)	3.30 (-0.92)	2.28 (-1.11)	3.91 (+0.44)	2.43 (-1.17)	1.49 (-1.66)	4.63 (+1.26)
Nov. 2003	3.87 (+0.91)	4.92 (+1.18)	3.63 (+0.45)	2.45 (-0.53)	3.39 (+0.33)	4.14 (+0.93)	5.20 (+1.89)
Dec. 2003	2.66 (-0.21)	4.42 (+1.16)	3.35 (+0.12)	6.24 (+3.21)	4.28 (+1.16)	2.95 (+0.09)	4.57 (+1.50)
Total for period	52.10 (+9.47)	61.01 (+12.14)	58.95 (+15.64)	61.76 (+16.02)	63.29 (+19.38)	54.34 (+12.22)	65.74 (+23.96)

IN AND OUT OF THE NEWS

Newsworthy Items You May Have Missed

The following summaries are based on information in the source(s) indicated in parentheses, usually at the end of each item. Selection of this issue's items ended January 16, 2004. Except as otherwise noted, the localities mentioned are in Virginia and the dates are in 2004.

In Virginia...

- **Heavy rainfall and flash flooding struck several southwestern Virginia localities** November 18—19, 2003. Several locations reported over four inches of rain during the event, with over five inches in Galax. (Over seven inches were reported in several Watauga County, North Carolina locations.) On November 20, Governor Warner declared a State of Emergency in the counties of Bland, Buchanan, Giles, Pulaski, Rockbridge, Smyth, and Tazewell, and the cities of Galax and Radford. On December 9, a Presidential Disaster Declaration was granted for individual assistance in the counties of Bland, Buchanan, Giles, Smyth, and Tazewell, and the city of Galax.

Two children in Buchanan County died. In the entire flood area, 76 homes were destroyed, 149 other homes had major damage, and 47 businesses were affected (with three destroyed). Damage also occurred to sewer pipes and private wells. At one point, over 200 roads were closed. Residential, business, and agricultural damage was estimated at about \$13.5 million; as of January 20, over \$760,000 had been disbursed for temporary housing assistance. (National Weather Service Public Information Statement of 11/20/03; and Virginia Department of Emergency Management, www.vdem.state.va.us, 1/20/04)

- Local elected officials in the **northern Shenandoah Valley** are taking steps toward a **regionally coordinated water resources policy**. The Regional Water Resources Policy Committee, coordinated by the Northern Shenandoah Valley Regional Commission (NSVRC) in Front Royal, began meetings in October 2002. The committee hopes to develop a comprehensive plan for the use and protection of groundwater and surface water in the Valley. In Fall 2003, the group offered a \$25,000 grant for a consultant to help develop the plan. Some input to the plan will come from another NSVRC-sponsored committee studying **minimum instream flow** issues on the North Fork Shenandoah River. That group expected in January to receive the results of a four-year study

of instream flow issues and begin deliberation on recommendations for the regional policy committee. (Northern Shenandoah Valley Regional Commission Request for Proposals 03-03, Sept. 2003; and *Winchester Star*, 1/12/04.)

• **Fauquier and Fairfax** counties have been engaged in a **regional issue of their own**. In October, the State Water Control Board (SWCB) approved the Fauquier County Water and Sanitation Authority's request to increase capacity at the Vint Hill Farms Station Wastewater Treatment Plant. The Fauquier plant is to expand from 246,000 gallons/day to 600,000 gallons/day by 2005 and ultimately to 950,000 gallons/day. The plant discharges into a waterway in the watershed of the Occoquan Reservoir, a water supply managed by the Fairfax County Water Authority. The Fairfax Authority argued before the SWCB that, while the expanded plant would be an improvement, it would not have the level of technology or treatment called for in a regional agreement known as the Occoquan Policy. (*Washington Post*, 11/6/03)

• **Oysters are in the news, because not many are in the water.** The 2002-2003 season's Virginia-Maryland catch was a record low of about 70,000 bushels, and state officials expect another bleak year in the 2003-2004 season (generally covering October to April). Within the first month of the current season on the Potomac River, no bushels had been reported (about 2,000 bushels were harvested last season). In November, the Potomac River Fisheries Commission rejected a motion to close the Potomac to all oyster harvesting, then approved a motion allowing—for the first time in decades—the use of power (motorized) oyster dredging in part of the river.

In December 2003, the Virginia Institute of Marine Science (VIMS) announced that a batch of Asian oysters—the non-native species being considered as a replacement for the native oyster in the Chesapeake Bay—sent from the VIMS hatchery to North Carolina died from a protozoan (one-celled animal) parasite, *Bonamia*. This parasite is known to cause problems in France, New Zealand, and Maine, but it has never been

found in the Bay. The VIMS oysters were certified disease-free, so scientists are trying to determine the source of parasite. Studies are also underway to see if *Bonamia* can survive Bay salinity conditions.

Finally, in the January 5, 2004, *Federal Register* the U.S. Army Corps of Engineers announced its intention to conduct an **environmental-impact statement on the use of Asian oysters** in the Chesapeake Bay. The Corps' Norfolk Office, the Virginia Marine Resources Commission (VMRC), and the Maryland Department of Natural Resources will conduct the study, which may take several years.

(*Richmond Times-Dispatch*, 11/7/03, 12/17/03, and 1/7/04; and Va. Marine Resources Commission Website, www.mrc.state.va.us, 1/23/04. For more on Asian oysters, please see the November 2003 *Water Central*, p. 18.)

- The status of oysters is only one of the factors in the annual **State of the Bay report** from the Chesapeake Bay Foundation, based in Annapolis, Maryland. The latest report, covering the 12-month period ending September 30, 2003, was released in November 2003. In each report, the Bay Foundation rates 13 biological and chemical factors from 0 to 100 (100 is intended to represent conditions as they existed before European settlement), then averages the scores to give an overall Bay score. The following table, using information from the Bay Foundation's Web site (www.cbf.org, as of 11/13/03) compiles the scores from the past five years.

	1999	2000	2001	2002	2003
Forested Buffers	53	53	54	54	55
Resource Lands	33	33	30	30	29
SAV*	12	12	12	12	22
Wetlands	42	42	42	42	42
Crabs	48	46	42	40	38
Oysters	2	2	2	2	2
Rockfish	75	75	75	75	75
Shad	3	5	6	7	9
Dissolved Oxygen	15	15	15	15	12
Nitrogen	16	15	15	16	13
Phosphorus	16	15	15	16	13
Toxics	30	30	30	28	28
Water Clarity	16	15	15	16	14
AVERAGE	28	28	27	27**	27

*SAV = submerged aquatic vegetation.

**Updated from 28 previously reported, because of change to SAV measurement.

On December 1, 2003, the Bay Foundation made two of the above factors—nitrogen and phosphorus, collectively referred to as **nutrients**—the subject of a **potential lawsuit** against the U.S. Environmental Protection Agency (EPA). The Foundation filed a 35-page petition calling for the EPA to require that Virginia, Delaware, Maryland, New York, Pennsylvania, and the District of Columbia include specific limits for nitrogen and phosphorus in wastewater discharge permits; and to require that at least 25 percent of EPA grant money be directed toward reducing nutrient discharges. The Foundation said that it would withdraw the petition if states agree to implement nutrient limits quickly, but that it would probably file a federal lawsuit under the Clean Water Act if they do not.

- There was other **recent action on nutrients in the Bay**. On December 9, 2003, the Virginia and Maryland governors signed a resolution with EPA Administrator Mike Leavitt supporting a **watershed-based permitting program** to reduce nitrogen and phosphorus in the Bay watershed. Under this program, by April 2004 states would set a maximum amount of nutrients allowed (a nutrient “**cap**”) for the watershed of each Bay tributary (such as the Potomac and James rivers). Having caps in place would then allow nutrient-credit **trading**, the plan envisions. The Bay Foundation's petition discussed above specifically questions the resolution's approach. (*Baltimore Sun*, 12/2/03; *Virginian-Pilot*, 12/2/03; and *InsideEPA.com*, 12/9/03. For more on pollution-credit trading programs, please see the August 2003 *Water Central*, p. 2.)

And in Maryland, Governor Robert Ehrlich proposed in January a \$2.50 monthly **surcharge on residential sewage bills** to help finance nitrogen-reduction upgrades at the state's 66 largest sewage-treatment plants. The governor's proposal also includes a sewage-volume-based fee on businesses. Septic-system users (16 percent of Maryland residents) would also pay a fee, but a specific amount was not part of the governor's proposal. (*Washington Post*, 1/9/04)

- In November 2003, the City of Virginia Beach received a Virginia Marine Resources Commission **permit to repair the rock jetty system around the city's Rudee Inlet**. The jetties were first installed in 1968 to maintain the constructed inlet, which generates an estimated \$17 million per year through tourism and fishing. The main intent of the \$3.2-million repair project, expected

to begin in March, is to prevent shoaling at the inlet's entrance. (*Virginian-Pilot*, 11/13/03)

- In November 2003, the Virginia Department of Environmental Quality (DEQ) received a **\$3.22 million** grant from the National Oceanic and Atmospheric Administration for continued funding of the **Virginia Coastal Resources Management Program**.

Highlights of the grant include the following:

- \$447,731 to continue the Virginia Seaside Heritage Program, a three-year program (started in 2002) to restore and protect aquatic resources on the seaside of Virginia's Eastern Shore;
- \$570,000 to the Department of Conservation and Recreation, with about \$400,000 to be distributed to local governments for projects related to polluted runoff to coastal waters, and a portion to be retained by DCR to continue the Coastal Nonpoint Pollution Control Program;
- \$213,000 to support DEQ staff for *nontidal* wetland permitting and compliance activities in the Tidewater area and other aspects of Virginia's nontidal wetlands regulatory program;
- \$197,000 to support a *tidal* wetlands management technical program at the Virginia Institute of Marine Science (VIMS) and a permit-compliance and -inspection program by the Virginia Marine Resources Commission;
- \$200,000 set aside each year to acquire significant coastal lands in Virginia;
- \$71,000 to map critical aquatic and terrestrial natural resources needed to support the coastal ecosystem and economy;
- \$120,000 to the Middle Peninsula Planning District Commission (Essex, Gloucester, King and Queen, King William, Mathews, and Middlesex counties) to continue implementation of a special-area management plan for Dragon Run (a tributary of the Piankatank River) and its associated wetlands.
- \$59,010 for VIMS to continue the annual program (begun in 1984) of mapping submerged aquatic vegetation in the Chesapeake Bay and its tributaries and in Virginia's seaside coastal bays. (News release from the Va. DEQ, 11/18/03. More information about Virginia's Coastal Program is available online at www.deq.state.va.us/coastal/about.html, or by calling [804] 698-4319.)

- The **Smyth County town of Chilhowie** is trying to decide what to do about **recurrent flooding on the Middle Fork of the Holston River**. The river flooded the town significantly in 1952, 1977, 1992, 2001, and 2002. As of November 2003, the Army Corps of Engineers was

set to present findings of preliminary study to the town council, which would have to decide whether to pursue a full study costing up to \$250,000. According to the town manager, options for reducing flood damage are building a levy, channelizing the river, buying and removing flood-prone properties, or living with the problem. (*Smyth County News*, 11/21/03)

• The Virginia DEQ's process to identify the **sources of PCBs** (polychlorinated biphenyls) in the **James, New, and Roanoke rivers** could take months or even years, without guarantee of success. According to spokesman Bill Hayden, the agency has a "huge amount of [PCB] work to do statewide." For any given location, sampling (for the right kind and size of fish) and analyses each can take months. One particular goal is to determine if there are any *continuing* sources of contamination. (Associated Press, as printed in *Roanoke Times*, 12/4/03)

• On November 24, 2003, the U.S. District Court for the Western District of Virginia ruled "void and unenforceable" two **Appomattox County ordinances regulating land application of biosolids**. Also known as "sewage sludge," biosolids are the solid material remaining after wastewater treatment. One ordinance restricted biosolids application to special areas, required a special local permit in addition to a Virginia Department of Health (VDH) permit, and prohibited application on slopes greater than seven percent. The other ordinance required a monitoring process and allowed only direct soil injection of the material. The court ruled that the ordinances effectively prevented biosolids application by landowners who had obtained a VDH permit, thus violating a Virginia law. As of mid-December, the county had not yet decided whether to appeal. (*Inside EPA's Water Policy Report*, 12/15/03)

• In December 2003, public meetings were held in Virginia and West Virginia on a **proposal to add 20 miles of the New River to the National Wild and Scenic River System**. The proposed section would begin near the Giles County town Glyn Lyn. The National Park Service is preparing a study of the proposal to be presented to Congress. A public draft of the study should be available by mid-2004. (*Roanoke Times*, 12/4/03)

• As of December 2003, the **Nature Conservancy was set to purchase 2,400 acres along Dragon Run** (a swampy, biologically rich tributary of the Piankatank River on Virginia's Middle Peninsula) for \$3.2 million from the John

Hancock Company. To help finance the purchase, the State Water Control Board will loan the Conservancy \$2.9 million at one-percent interest for three years. The Conservancy will sell at least 1,700 acres for about \$2 million to Virginia for a state forest and allow about 270 acres to be used for public access to Dragon Run. (Associated Press, as printed in *Roanoke Times*, 12/9/03)

...and Outside of Virginia

- Here are two ideas the U.S. EPA is considering to promote water conservation. First, the agency is considering a water-efficiency product-labeling program, similar to energy-use ratings on appliances. Second, in the August 28, 2003, *Federal Register*, the agency proposed a regulation providing that owners of rental property may install water "submeters" (meters for individual tenants) without becoming subject to Safe Drinking Water Act regulations solely because of the submetering. The proposal stated that "[For the] 15 percent of Americans who live in apartments, submeters are needed if their water consumption is to be linked to prices. Throughout the country, submetering of apartment buildings has been found to be an effective but little-used tool to support water conservation." (*Arizona Water News*, Sep.-Oct. 2003; and *Federal Register* at www.gpoaccess.gov)
- Researchers in North Carolina are using instruments mounted on ferries to water quality in Pamlico Sound. The automated system is intended to provide more continuous and longer-term monitoring than isolated studies in the past have provided. (Univ. of North Carolina *WRRI News*, Sep.-Oct. 2003)
- North Carolina State University researchers and National Weather Service forecasters are studying the patterns of inland flooding that followed hurricanes Floyd (1999) and Isabel (2003). The research seeks to determine factors that affect rainfall amounts from hurricanes, identify flood-prone areas of the state, assess surface runoff patterns, and help weather forecasters use this information. The research is funded from the federal Tropical Cyclone Inland Forecasting Improvement and Warning System Development Act of 2001. (*Raleigh News & Observer*, 11/17/03)
- December 8, 2003, was the deadline for water systems serving 25 or more customers to comply with an EPA regulatory limit of 30 parts per billion for radium in drinking water. Two issues raised over the rule are disposal of the

hazardous material that will result from removal of radon from water and the cost of compliance for small water systems. EPA is developing a guidance document on the radioactive waste issue. As for small systems, EPA has been asked to grant them a variance allowing use of less expensive technology that would provide water close to the new limit, if a facility cannot afford the technology EPA recommends. Another alternative some small systems are proposing is to buy and distribute bottled water. (Inside EPA's *Water Policy Report*, 12/1 and 12/15/03)

• On December 16, 2003, the Bush administration announced it would **not issue a new regulation on the scope of waters subject to the federal Clean Water Act**. This halted the process begun in January 2003, when the U.S. EPA and the Corps of Engineers jointly issued an "Advanced Notice of Proposed Rulemaking on the Clean Water Act Regulatory Definition of the 'Waters of the United States'" (in the *Federal Register*, 1/15/03). The proposed rulemaking was a response to the U.S. Supreme Court's 2001 decision in *Solid Waste Agency of Northern Cook County [Illinois] vs. U.S. Army Corps of Engineers*, known as the SWANCC case. In that case, the Court held that the Corps was wrong to apply CWA jurisdiction to isolated, intrastate wetlands on the basis of their use by migratory waterfowl. There has been considerable disagreement, including among federal appeals courts, over whether the decision applies broadly to all water bodies and wetlands considered isolated from navigable waterways, or only narrowly to the migratory bird-use justification. (*Washington Post*, 12/17/03; and InsideEPA.com, 12/17/03. For a previous item, please see the June 2003 *Water Central*, p. 18.)

Meanwhile, the **Corps plans to document** for one year the **impact of the SWANCC case** on Corps' decisions about whether particular wetlands are subject to CWA jurisdiction. Currently Corps district officials are under orders to seek headquarters approval before applying jurisdiction to waters that may be covered by the SWANCC ruling (district decisions *not* to apply jurisdiction do not need higher approval). (Inside EPA's *Water Policy Report*, 12/1/03)

- In 2003, Congress considered but did not pass at least three bills to increase **federal funding for water and wastewater infrastructure**.
- **H.R.1560**, Water Quality Financing Act, would authorize \$20 billion over the next five years for the Clean Water State Revolving Loan Fund (SRF). Introduced 4/2/03 by Rep. John Duncan

(R-Tenn.); last action 7/17/03; remains in House Committee on Transportation and Infrastructure.

••S.170, Clean Water Infrastructure Financing Act, would authorize \$15 billion over the next five years for the Clean Water SRF. Introduced 1/15/03 by Sen. George Voinovich (R-Ohio); last action 1/15/03; remains in Senate Committee on Environment and Public Works.

••H.R.20, also Clean Water Infrastructure Financing Act, would authorize \$25 billion over the next five years for the Clean Water SRF. Introduced 1/7/03 by Rep. Sue Kelly (R-N.Y.); last action 1/8/03; remains in subcommittee of the House Committee on Transportation and Infrastructure. (Inside EPA's *Water Policy Report*, 12/1/03; and Library of Congress' legislative Web site, thomas.loc.gov, 1/27/04. For an item on the fate of water infrastructure funding in Congress in 2002, please see the October 2002 *Water Central*, p. 21.)

Here are some other water-resources bills to watch in 2004:

••H.R.866/S.1039, Wastewater Treatment Works Security Act, would authorize over \$200 million in grants to wastewater treatment systems for security efforts.

••H.R.2557, Water Resources Development Act, would reauthorize funds for the U.S. Army Corps of Engineers, with provisions that would affect the process for reviewing Corps projects.

••S.1072, Safe, Accountable, Flexible, and Efficient Transportation Equity Act, currently includes (in this Senate version, but not in its

House companion bill, H.R.2088) a provision to apply \$958 million over six years toward reducing stormwater runoff from new and existing highways. (Inside EPA's *Outlook 2004*, Jan. 2004)

The "Thomas" Web site noted above, thomas.loc.gov, is a great tool for following pending bills in Congress.

A Final Word

"Ugly never gives a community an edge, and we're trying to eliminate ugly in Arlington!"—Kathy Freshley, commenting on Arlington County's plans for a \$2—3 million project to improve the appearance of the county's sewage-treatment facility. (*Washington Post*, 1/11/04)

CORRECTION FROM PREVIOUS WATER CENTRAL

In the November 2003 *Water Central*, there were two mistakes in the "In and Out of the News" items on the U.S. Supreme Court case of *Virginia v. Maryland*: 1) on page 19, the correct Website address to find the October 7, 2003, oral arguments is www.supremecourtus.gov; 2) on page 20, in the "Final Word," Stuart Raphael presented the oral argument for the State of *Virginia*, the plaintiff, *not* for Maryland. (For online readers, the page numbers refer to the *two-column* version of *Water Central*.)

TEACHING WATER Especially for Virginia's K-12 teachers

This Issue and the Virginia Standards of Learning

Below are suggestions for Virginia Standards of Learning (SOLs) that may be supported by this issue's two Feature Articles and the Water Status Report. The SOLs listed below are from Virginia's 2003 Science SOLs and 2001 Social Studies SOLs. Abbreviations: BIO = biology; CE = civics and economics; ES=earth science; GOVT = Va. and U.S. government; LS=life science; WG = world geography.

Feature Article 1—Water Supply Issues

Science: 6.5, 6.9, LS.12, ES.9.

Social Studies: WG.7, GOVT.9, GOVT.16.

Feature Article 1—Nutrient Management

Science: 6.9, LS.11, LS.12, ES.9, BIO.9

Social Studies: CE.6, WG.2, WG.7, GOVT.9, GOVT.16.

Water Status Report—Precipitation

Science: 3.9, 4.6, 6.6, ES.13.

AN ASSESSMENT OF VIRGINIA'S RESPONSE TO HURRICANE ISABEL

December 8, 2003, marked the final day that the Federal Emergency Management Agency accepted applications for assistance from the effects of Hurricane Isabel, which struck Virginia and other Atlantic Coast states in September. By that date, 92,765 Virginians from 99 jurisdictions had requested assistance. The next day, Gov. Mark Warner's three-person Hurricane Isabel Assessment Team and its technical-assistance partner, Systems Planning Corporation of Arlington, presented their report on the state's response to the storm. The 95-page report, *An Assessment: Virginia's Response to Hurricane Isabel*, is available online at www.sysplan.com. Following is an excerpt from the Executive Summary of the report.

Governor Mark Warner appointed a Hurricane Isabel Assessment Team to help the Commonwealth and local governments identify the problems that occurred in responding to Hurricane Isabel. W. Robert Herbert, former Roanoke City Manager, served as Chairman, with team members, Claire A. Collins, Bath County Administrator, and William B. Rowland, Jr., former Deputy Director of Planning and Budget for the Commonwealth. The team was asked to research and report on how government handled the hurricane, what lessons could be learned, and how problems could be corrected so that emergency preparedness and response could be improved.

System Planning Corporation and its TriData division were chosen to assist the team in collecting information, analyzing the findings, and preparing a report....

Research Methodology

The Hurricane Isabel Assessment Team (Team) worked for seven weeks.... The Team's goal was to reach as many jurisdictions as possible among the 99 affected by the hurricane, and to meet with Commonwealth staff and officials to understand how key departments and agencies addressed preparedness, response, and recovery....

The Team mailed [a six-page, 56-question] questionnaire to 128 individuals at both the state and local level of government, 76 of whom replied....

In the cover letter accompanying the questionnaire, the Team invited government leaders and staff to...discuss in person how the hurricane affected them and how they responded. [Sixty-two people were interviewed between November 3 and 10 in Richmond, Norfolk, Fredericksburg, and the site of the annual VACo conference in Hot Springs.]

In addition to collecting information from the survey questionnaire and field interviews, the research team also read through a substantial amount of press clippings and the daily situation



reports that were posted by the Virginia Department of Emergency Management (VDEM)....

The Team's research had some limitations, however. The Team did not meet with anyone from the Federal Emergency Management Agency (FEMA), nor did it talk to anyone from the electric companies, the American Red Cross, or other private organizations. The timeframe for accomplishing the Governor's assignment limited the Team's range in researching sources for response and recovery information. The Team also was aware that a separate study of the electric companies was underway and that several critical state agencies that were involved in the response were conducting their own internal reviews. Finally, though every effort was made to obtain feedback from each of the local governments affected, the Team did not receive participation from all of them....

Primary Concerns Voiced by State and Local Officials

...Some aspects of response and recovery went reasonably well. With the Governor's early declaration of disaster, low-lying communities began evacuating residents so that by the time Isabel arrived in the state, most of the Tidewater population had left to stay with friends or

relatives, or moved into shelters. Nonprofit organizations prepared and served hundreds of thousands of meals. Power crews worked around the clock to repair downed lines, starting with the highest priorities, e.g. hospitals, fire and rescue stations, public works facilities, 911 centers, and so forth. State Police and the Virginia Department of Transportation pre-positioned personnel and equipment in the areas they expected to be hardest hit. Disaster reservists arrived by the dozens to augment staff in Richmond.

Despite best efforts, numerous problems arose, some of which were significant. The most serious of these, and the ones most often mentioned, are as follows:

1. Emergency Planning and Preparedness needs to be improved. The main issues discussed pertained to training, conducting a comprehensive update and review of the Commonwealth's emergency operations plan, a vastly improved communications strategy for state government to local government communications, and reorganization of the state Emergency Operations Center to include regional liaisons.

2. Local preparedness to accommodate 72-hours of self-sufficiency is far from uniform. Primary among the topics under this heading were concerns that some local governments sought help before exhausting their own resources, some local staff did not know about established procedures for requesting resources, a few local shelters and other facilities were not equipped with back-up generators or water, and various communities did not have adequate disaster plans or training because they had not taken advantage of available training.

3. The Commonwealth's system for handling resource requests failed. Not only was the state EOC inundated with requests, but it did not have a basic system in place that could adequately and efficiently track requests and progress on providing the resources that local governments needed....

4. Without power, local governments faced difficulties communicating with the public. Television, emails, website news, faxes, and phones all were affected by power outages and caused communications problems. Radio became the single most important vehicle for emergency notifications, yet obtaining access to airtime was difficult. Participants applauded local government operated radio stations where news could be channeled and broadcast as often as necessary.

5. Volunteers and federal disaster

employees were not organized. Numerous participants expressed concern that the situation in the state EOC was chaotic and that FEMA's personnel traveled out to the local communities en masse demanding information but providing little in return....

6. Citizens with special medical or accessibility needs encountered problems at shelters. Many shelters do not have accommodations for evacuees who arrive needing medical care or having accessibility problems. People with allergies and babies needed special food and soy milk. [Having] more shelter workers who speak Spanish was a need mentioned.

7. The public's expectations of government during disasters can be unrealistic. Just as local governments need to become more capable of managing on their own for 72 hours, citizens need to be responsible for making their own preparations during events where there is advance notice.... There was significant discussion over the real importance of ice and whether that should be an expected commodity for government to supply.

Recommendations

Following are the Team's main recommendations, based on careful analysis of all the information collected.

1. Key Commonwealth disaster response agencies should review the Emergency Operations Plan and annexes and update them based on the lessons learned from major incidents over the last several years, including considerations for terrorism preparedness.

2. Local emergency management officials need to ensure that they have adequate disaster response and recovery plans, including a list of local resource providers with pre-negotiated emergency contracts.

3. Education must occur on all levels to ensure that assistance request procedures are understood before an event occurs.

4. Local jurisdictions that do not currently have the forms and procedures necessary to request essential resources beyond that which local jurisdictions can supply on their own, should ensure that they are cognizant of proper procedures for future emergencies, and that they have sample forms in stock.

5. VDEM has identified many problems in its own after-action assessment; however, VDEM should comprehensively examine the entire system to identify and implement substantive changes.

- 6.** The overall data management system for the EOC needs to grow beyond a basic database to a more sophisticated and integrated consequence management software suite that ties into the Virginia Department of Transportation, the Virginia State Police, the Department of Health and Human Resources, and utility companies....
- 7.** VDEM should change its restrictive protocol for local governments to request resources so that requests for resources during the initial stages of the disaster can be submitted on-line, by fax, by telephone, or by radio, depending on the best available communications....
- 8.** The Commonwealth should establish emergency management standards and minimum competency levels for key state and local elected and appointed officials, as well as for EOC staff....
- 9.** VDEM should ensure that all personnel who are assigned as disaster reservists are adequately trained for their respective jobs, and that all reservists have had training on Virginia's emergency operations plan as well as on basic information about the jurisdictions they are assigned to help....
- 10.** The Commonwealth should adopt a financial incentive program that ties preparedness and training to the Commonwealth's (non-federal) share of disaster recovery reimbursement to local governments or to future grant awards....
- 11.** VDEM should focus its disaster assistance to local governments by using regional or district action officers and assistant officers to maintain liaison with local EOCs. The action officers should be physically located in the EOC as the primary points of contact for all local government requests and communications during disasters. Status briefings should occur whenever shifts change, so that any outstanding contacts or requests can be carried forward and resolved.
- 12.** VDEM (and local disaster agencies, where applicable) should establish and enforce a work/rest policy that applies to all emergency personnel while they are engaged in disaster-related activities.... Guidelines should be widely disseminated and supervisors should be expected to enforce the guidelines.
- 13.** Establish a staffing plan to better organize all state disaster resource personnel assigned to the state EOC and those that are likely to arrive through FEMA. Additional personnel from FEMA need to be identified prior to their arrival and VDEM should inform FEMA about what types of expertise are needed and the number of FEMA employees to be assigned. FEMA should ensure that the individuals they send possess the requisite credentials and experience to serve in the capacity directed by VDEM. No FEMA personnel should be dispatched to the field unless authorized by VDEM, with clear missions. VDEM should communicate with local authorities in advance if disaster reservists are expected to be sent so the locality can confirm that they are needed, and make accommodations for housing and food, if necessary.
- 14.** The Commonwealth should establish a disaster communications committee for the purpose of identifying which local public and private radio stations were used successfully for public information during the hurricane. The work group should prepare a brief report for local governments on how local radio stations (such as private, NPR affiliate, university, and state stations) helped communicate emergency information. The report should provide guidelines on how local governments can obtain better control of emergency public information. The work group should examine policies governing emergency broadcasts on all radio stations with stations operating in Virginia.
- 15.** The Commonwealth should develop a public information campaign about the role of the individual, and of local and state government before, during, and after emergencies....
- 16.** State and local EOCs should ensure that they have adequate space, back-up power, and equipment to continue operations during emergencies.... All facilities providing care to special needs populations must confirm the adequacy of their emergency power and of their ability to maintain self-sufficiency in communications, water, food, and pharmaceutical supplies for emergencies.
- 17.** VDEM should develop an improved state and local communications system for the two-way transmission of information during emergencies. The system should set clear guidelines for conference calls and for the transmission of requests for assistance. The system should be organized by region.
- 18.** The Governor should facilitate the development of a joint work group including the State Corporation Commission, key executive branch agencies, and senior managers of the state's electric companies, and should seek cooperation from the state legislature, to improve coordination and information sharing during power outages.
- 19.** VDEM should prepare a debris management plan and offer guidance and training to local governments in generating policies and procedures to quickly and efficiently clear and remove debris after disasters.

HEALTHY FORESTS RESTORATION ACT OF 2003—SUMMARY

On December 3, 2003, President George W. Bush signed the Healthy Forests Restoration Act of 2003 (H.R. 1904 in the 108th Congress, now Public Law No: 108-148). The legislation, introduced in the Congress in May 2003, resulted from an initiative that the president first announced in August 2002.

According to the Virginia Department of Forestry¹, Virginia has an estimated 15.8 million forested acres, or 62 percent of the state's total land area. Private individuals own 10.1 million acres; non-forestry corporations 2 million acres; the forest industry owns 1 million acres; and federal, state, and local government own 2.1 million acres.

Forests and land management within forests have a large influence on watersheds and water quality (in fact, Title III of H.R. 1904 addresses watershed issues specifically). Because of the link between water and forests, *Water Central* presents the following summary of H.R. 1904, prepared by the Congressional Research Service. The summary, the full text of the bill, and details on the bill's passage through Congress are available online at the Library of Congress' Web site, www.thomas.gov.

Title I: Hazardous Fuels Reduction on Federal Land

(Sec. 102) Directs the Secretary of Agriculture, with respect to National Forest System lands, and the Secretary of the Interior, with respect to public lands administered by the Bureau of Land Management, to plan and conduct hazardous fuel reduction projects (fuel projects) on specified types of Federal lands, including on certain lands that contain threatened and endangered species habitat.

Directs the Secretary concerned to fully maintain, or contribute toward the restoration of, the structure and composition of old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old growth structure.

Directs the Secretary concerned to: (1) establish in certain areas a multiparty monitoring, evaluation, and accountability process to assess ecological and social effects of authorized fuel projects; (2) track, by the degree of severity, acres burned by large wildfires; and (3) develop a process for monitoring the need for maintenance of treated areas, over time, to preserve the forest health benefits achieved.

(Sec. 103) Directs the Secretary concerned to give priority to fuel projects that provide for the protection of communities and watersheds.

(Sec. 104) Requires the Secretary concerned to: (1) plan and conduct fuel projects in accordance with the National Environmental Policy Act of 1969 and other applicable laws; (2) analyze alternative options to proposed agency actions, with exceptions for projects in wildland-urban interface areas; and (3) facilitate collaboration among State and local governments, Indian tribes, and interested persons during the preparation of each fuel project in a manner consistent with standards in the Western Governors Association's wildfire management strategy.

(Sec. 105) Directs the Secretary of Agriculture to issue interim and final regulations establishing a process that shall serve as the sole means by which an eligible individual shall be able to seek administrative review regarding a fuel project on Forest Service land.

(Sec. 106) Sets forth special requirements regarding judicial review of fuel projects in U.S. district courts, including injunctive relief.

(Sec. 107) States that nothing in this title shall be construed to affect the use by the Secretary concerned of authorities other than this Act to conduct a fuel project on Federal lands.

(Sec. 108) Authorizes appropriations.

Title II: Biomass

(Sec. 201) Amends the Biomass Research and Development Act of 2000 to expand certain research by developing new tools for land managers, including tools to estimate the cost to deliver varying quantities of wood to a particular location.

(Sec. 202) Amends the Food, Agriculture, Conservation, and Trade Act of 1990 to allow the Secretary of Agriculture, acting through the Chief of the Forest Service and in collaboration with eligible institutions, to: (1) accelerate adoption of biomass technologies; (2) create community-based

¹ Information on Virginia forest acres came from the Virginia Department of Forestry's Web site, www.vdof.org, on 1/22/04.

enterprises; and (3) establish small-scale business enterprises to make use of biomass. Authorizes appropriations.

(Sec. 203) Authorizes the Secretary to make grants to persons that own or operate facilities that use biomass for wood-based products or other commercial purposes to offset the costs incurred to purchase biomass. Authorizes appropriations.

Title III: Watershed Forestry Assistance

(Sec. 302) Amends the Cooperative Forestry Assistance Act of 1978 to permit the Secretary of Agriculture, acting through the Forest Service (and, where appropriate, through the Cooperative State Research, Education, and Extension Service), to provide assistance to State foresters and State officials, or to Cooperative Extension officials at land grant colleges and universities and specified institutions, for the purpose of expanding State forest capacities and activities to address watershed issues on non-Federal forested lands and potentially forested lands.

Directs the Secretary to: (1) develop, with relevant parties, a program of technical assistance to protect water quality; and (2) establish a watershed forestry cost-share program. Authorizes appropriations.

(Sec. 303) Directs the Secretary of Agriculture, acting through the Chief of the Forest Service, to provide assistance to Indian tribes for the purpose of expanding tribal stewardship capacities through tribal forestry best management practices to improve watershed health. Authorizes appropriations.

Title IV: Insect Infestations and Related Diseases

(Sec. 403) Directs the Secretary concerned to establish an accelerated program to plan, conduct, and promote comprehensive and systematic information gathering on forest-damaging insects and associated diseases.

(Sec. 404) Allows the Secretary concerned to conduct applied silvicultural assessments on Federal lands that are infested with forest-damaging insects or that are at risk of such infestation.

(Sec. 405) States that the authority provided to each Secretary in this title is supplemental to, and not in lieu of, any authority provided to the Secretaries in any other law.

(Sec. 406) Authorizes appropriations.

Title V: Healthy Forests Reserve Program

(Sec. 501) Directs the Secretary of Agriculture to establish the healthy forests reserve program (the program) within the Forest Service for the purpose of restoring and enhancing forest ecosystems to promote the recovery of threatened and endangered species as well as improve biodiversity and enhance carbon sequestration.

(Sec. 502) Directs the Secretary of Agriculture, in coordination with the Secretaries of the Interior and Commerce, to designate rare forest ecosystems to be eligible for the program. Sets forth eligibility criteria (for private lands). Specifies that lands may be enrolled pursuant to: (1) a 10-year cost-share agreement; (2) a 30-year easement; or (3) a long-term easement with a buyback option.

(Sec. 503) Subjects lands enrolled in the program to a restoration plan, which shall be developed jointly by the landowner and the Secretary of Agriculture.

(Sec. 504) Sets forth the payment structures for the various methods of enrollment in the program.

(Sec. 505) Directs the Secretary of Agriculture to provide landowners with the technical assistance necessary to comply with the terms of plans under the program.

(Sec. 506) Directs the Secretary of the Interior to provide safe harbor under the Endangered Species Act of 1973 to landowners who enroll land in the program when such enrollment will result in a net conservation benefit for listed, candidate, or other species.

(Sec. 508) Authorizes appropriations.

Title VI: Miscellaneous

(Sec. 601) Directs the Secretary of Agriculture: (1) to carry out a program to inventory and monitor forest stands and potential forest stands in the National Forest System and (with the consent of the owners) on private forest land; and (2) in carrying out such program, to address issues such as the early detection and assessment of environmental threats and to develop an early warning system for potential catastrophic environmental threats to forests. Authorizes appropriations.

NOTICES

State Meetings and Hearings

The Virginia Department of Environmental Quality (DEQ) posts notices of regulatory action, public hearings and meetings, and other events on-line at www.deq.state.va.us/info/ (click on "Public Calendar" or "Public Notices"). The DEQ Coastal Program posts events and other notices on-line at www.deq.state.va.us/coastal/calendar.html. Following are several recent and upcoming water-related public meetings; we include selected past events in case readers wish to enquire about what occurred at a given meeting. To reach the contact people by e-mail, go to the Public Calendar Website, find the event, and click on the name; by phone, call the DEQ's Central Office at (800) 592-5482.

12/16/03, Luckett's: Public meeting on proposed "total maximum daily load" (TMDL) for bacteria impairment of Limestone Branch in Loudoun County. More information: Katherine Bennett.

12/18/03, Neersville: Public meeting on proposed TMDL for bacteria impairment of Piney Run in Loudoun County. More information: Katherine Bennett.

1/20/04, Richmond: Public meeting on proposed TMDL for bacteria and dissolved oxygen impairments of Tuckahoe Creek, Little Tuckahoe Creek, and Deep Run in Henrico County. More information: Mark Alling.

1/20/04, Richmond: Technical advisory committee on proposed general permit regulations for combined animal feeding operations. More information: Scott Haley.

1/22/04, Mechanicsville: Public meeting on proposed TMDL for bacteria and pH impairments of Matapequin Creek in Hanover County. More information: Mark Alling.

1/26/04, Tacoma: Public meeting on proposed TMDL for bacteria impairment of Sepulcher Creek, Toms Creek/Little Toms Creek and Crab Orchard Branch watersheds in Wise County. More information: Nancy Norton.

1/26/04, Warrenton: Public meeting on proposed TMDL for bacteria impairment of Great Run in Fauquier County. More information: Katherine Bennett.

1/28, 2/24, 3/24, 4/28, and 5/26/04, Glen Allen: Advisory committee on proposed water quality standards amendments for Chesapeake Bay and tidal waters. More information: Elleanore Daub.

1/28/04, Marshall: Public meeting on proposed TMDL for bacteria impairment of Carter Run in

Fauquier County. More information: Katherine Bennett.

1/29/04, Verona: Public meeting on proposed TMDL for Middle River watershed. More information: Robert Brent.

1/29/04, Richmond: Public meeting on proposed TMDL for bacteria and pH impairments of White Oak Swamp Creek and Fourmile Creek in Henrico County. More information: Mark Alling.

2/10/04, Tazewell: Public meeting on proposed TMDL for benthic impairment of Clinch River in Tazewell County. More information: Nancy Norton.

2/11/04, Bristol: Public meeting on proposed TMDL for benthic and bacteria impairments of Beaver Creek in Washington County and Bristol. More information: Nancy Norton.

2/12/04, Harrisonburg: Public hearing on proposed Virginia Pollution Abatement permit for Houff's Feed & Fertilizer Company in Weyers Cave. More information: Brandon Kiracofe.

2/12/04, Honaker: Public meeting on proposed TMDL for benthic impairment of Lewis Creek in Russell County. More information: Nancy Norton.

2/23/04, Halifax: Public meeting on proposed TMDL for bacteria impairment of Birch Creek in Halifax County. More information: Kelly Wills.

2/24/04, Brookneal: Public meeting on proposed TMDL for bacteria impairment of Falling River in Campbell County. More information: Kelly Wills.

2/26/04, Glen Allen: Public meeting on notice of intended regulatory action for proposed amendments to policy for nutrient-enriched waters. More information: John Kennedy.

3/2/04, Blackstone: Public meeting on proposed TMDL for benthic impairment of unnamed tributary of Hurricane Branch in Nottoway County. More information: Kelly Wills.

3/3/04, Charlotte Court House: Public meeting on proposed TMDL for benthic impairment of Twitty's Creek in Charlotte County. More information: Kelly Wills.

Water Topic of the Month

Since June 2002, the U.S. EPA has been posting online various publications highlighting a different water topic each month, in observance of the 30-year anniversary of the Clean Water Act. The topics are available at www.epa.gov/water/yearofcleanwater/month.html. If you do not have Internet access, try contacting the National Service Center for Environmental Publications in Cincinnati, (800) 490-9198.

Environmental Leadership Awards

Nominations are being accepted (*online only*) until February 17 to award Virginians who show leadership in environmental efforts in state government, local government, non-profits, and education. The winners will be announced at the 2004 Environment Virginia conference in Lexington (see below). To review the rules and make a nomination, visit environmentva.org.

"Hotline" for Well Owners

Wellcare® Hotline offers answers to questions about wells or well water. The service is available by phone at (888) 395-1033 or online at www.wellcarehotline.org.

Wastewater Security Guide

Protecting Your Community's Assets: A Guide for Small Wastewater Systems is a workbook to help wastewater utilities and local officials identify and reduce vulnerabilities to natural disasters and human attacks. The guide, developed by the National Environmental Training Center for Small Communities, is available online at www.netc.wvu.edu, or in paper (while supplies last) by calling (800) 624-8301.

Lessons from Lights Out

In December 2003 the Association of Metropolitan Water Agencies (AMWA) published a short report on lessons for water and wastewater utilities from the massive power outage in August 2003. *Water and Wastewater System Interdependencies with the Power Sector* is available at www.amwa.net/security/Water-Power-LessonsLearned.pdf; to reach AMWA by phone, call (202) 785-1845.

National Fellowship Opportunity

The National Water Research Institute (NWRI) is accepting until March 1, 2004, applications for fellowships worth up to \$15,000 to support graduate research in water resources. More information is available online at www.nwri-usa.org; to contact NWRI (in California) by phone, call (714) 378-3278.

Conferences and Other Gatherings

•**Workshop on Voluntary Wetland Restoration Opportunities in Virginia.** Mar. 3, 2004, Woodbridge; sponsored by the Alliance for the Chesapeake Bay and the Va. Dept. of Environmental Quality. For more information: phone (804) 775-0951; e-mail hmilliken@acb-online.org; or visit www.alliancechesbay.org.

•**Virginia Water Conference 2004.** Mar. 7—9, 2004, Virginia Beach; sponsored by the Virginia Lakes and Watersheds Association. For more information: Stuart Stein at (703) 642-5080, or sstein@gky.com.

•**15th Annual Environment Virginia Conference.** Mar. 30—Apr. 1, 2004, Lexington; sponsored by Virginia Military Institute and several co-sponsors. For more information: phone (540) 464-7551; e-mail conference@vmi.edu; or visit www.environmentva.org.

Also Out There...

From the many water-related publications that arrive in the Water Center's mail, here are brief descriptions of some recent, detailed articles on various subjects.

•“Surfacing for Science.”—Discusses Virginia’s two species of **sea turtles** and current studies to monitor their populations. *Virginia Marine Resource Bulletin*, Fall 2003; Virginia Sea Grant College Program, (804) 684-7167; available online: www.virginia.edu/virginia-sea-grant/library.htm.

At the Water Center

To reach the Virginia Water Resources Research Center: (540) 231-5624; water@vt.edu; www.vwrrc.vt.edu.

•Water Center's New Academic Expert Database

To facilitate communication Virginia's academic researchers and decision makers, the Water Center has established an electronic database of water-resource experts in Virginia. As of mid-January 2004, the database contained over 70 people with expertise in almost 90 areas, ranging from acid mine drainage to wetland ecology. Users can view the entire list of experts or search by area of expertise. To search for an expert, or to add yourself to the database, please visit www.vwrrc.vt.edu/Experts/experts.asp.

•Award Applications and Grant Proposals

The Water Center is soliciting applications until March 15 for two student award programs: Undergraduate Research Summer Fellowships, and the William R. Walker Graduate Research Fellowship Award. In addition, the Center is soliciting proposals until March 31, 2004, for its Competitive Grant and Seed Grant funding program. For details on these opportunities, please see the following page.

Virginia Water Center Award and Grant Opportunities for 2004

For more information about the opportunities listed on this page: Please contact Dr. Tamim Younos, Interim Director, Virginia Water Resources Research Center, 23 Agnew Hall, Virginia Tech, Blacksburg, VA 24061-0444; phone (540) 231-8039; FAX (540) 231-6673; or e-mail tyounos@vt.edu. Award application materials and research proposal guidelines are available at the Water Center's Website, www.vwrrc.vt.edu, under "Announcements."

UNDERGRADUATE RESEARCH SUMMER FELLOWSHIP AWARDS FOR 2004

The Virginia Water Resources Research Center will award up to two undergraduate research summer fellowships in any area related to water resources protection and management. The goal of the program is to provide a research opportunity for outstanding undergraduates with anticipation that these students will pursue a graduate degree in a water resources related field. Since 1996, 15 outstanding students have received summer fellowships under this program. **The deadline for application submission is 5:00 p.m., March 15, 2004.** Awards will be announced on April 1, 2004.

WILLIAM R. WALKER GRADUATE RESEARCH FELLOW AWARD FOR 2004

The Virginia Water Resources Research Center's William R. Walker Graduate Research Fellow Award provides up to \$2,500 to individuals preparing for a professional career in water resources. Only individuals pursuing graduate work in a field different from their field of emphasis as an undergraduate, or individuals with work experience returning to graduate school, are eligible to apply. A special panel selects the award recipient. The award will be effective July 1, 2004, and can be used at the recipient's discretion during residency in a university as a student, for professional development (such as attending workshops and conferences), and purchasing materials that will enhance professional productivity (such as books and software). **Application deadline is March 15, 2004.** The competition results will be announced on May 30, 2004.

VWRRC COMPETITIVE GRANTS FOR 2004

The Virginia Water Resources Research Center requests research proposals to be considered for funding up to \$20,000 and project duration of one year (July 1, 2004 through June 30, 2005). Proposals will be considered in areas related to watershed sciences, urban runoff remediation and management, water supply demand and management, groundwater remediation, desalination, and water pollution prevention and control. Research proposals should demonstrate the potential for significant

contribution to advancing the scientific foundation for water resources management in the Commonwealth of Virginia. Demonstration of the importance of research to decision making in Virginia should be documented in the proposal. The proposed project should provide research opportunities for graduate and undergraduate students. Submission of interdisciplinary proposals is encouraged. A detailed budget justification is required. A peer review panel will review the submitted proposals and make recommendations for funding. **The deadline for electronic proposal submission is 5:00 p.m., March 31, 2004.** Successful proposals will be announced by May 30, 2004.

VWRRC SEED GRANTS FOR 2004

The Virginia Water Resources Research Center will provide a limited number of research seed grants of up to \$5,000. These grants are to be used in support of background studies and preliminary research that will lead to submission of full water resources research proposals to outside funding agencies in areas related to watershed sciences, urban runoff remediation and management, water supply demand and management, groundwater remediation, desalination, and water pollution prevention and control. By accepting a seed grant award, the principal investigators commit to the development of a full proposal suitable for submission for full funding to outside funding agencies. Duration of each award is one year (July 1, 2004 to June 30, 2005). Funds may be used for student support, lab supplies, preliminary analysis to develop a project proposal, and travel to visit a potential research site or to establish appropriate linkages with funding agencies. Funds may *not* be used to purchase office supplies or pay tuition. A peer review panel will review the submitted proposals and make recommendations for funding. Recipients of seed grants are expected to submit to the VWRRC a brief progress report by December 30, 2004; and a final report in the form of a full research proposal suitable for submission to a funding agency by June 30, 2005. **The deadline for electronic proposal submission is 5:00 p.m., March 31, 2004.** Successful proposals will be announced by May 30, 2004.

The Virginia STEP Program: A Valuable Opportunity for Students and Communities

Virginia Service Training for Environmental Progress (Va. STEP) is an environmental service-learning program. STEP is based in the Virginia Water Resources Research Center and operated in partnership with the Virginia Tech Service-Learning Center. Through STEP, students work in Virginia communities **to investigate water-related environmental issues identified by the community**. Since 1986, the program has placed 80 students in over 70 communities throughout Virginia. In Summer 2004, students will be at their community sites June 6—August 5.

Each community hosts one or two students, providing housing and board and designating a site supervisor who gives direction and assistance to the students. STEP pays students wages, covers work and travel expenses, and coordinates the students' internship planning, training, record keeping, and report writing.



STEP intern helping a community member identify aquatic organisms
in the Piney River in Rappahannock County, Va., Summer 2001.

Students receive training designed to prepare them for a range of water-resource issues or activities with which communities might need technical assistance. Student activities typically include field and library research, interacting with and learning from community members, presenting environmental information or training to the community, writing a project report, and presenting the report to the sponsoring community group.

For Summer 2004, STEP plans to select four students (current juniors, seniors, or graduate students, or recent graduates). STEP welcomes applications from students in any major who have a strong interest in water and communities. The program is not restricted to Virginia residents or students at Virginia schools, but *those two groups receive priority if there are more qualified applicants than available positions*.

To apply as a student, submit a resume, transcript (minimum 2.5/4.0 GPA), and recent writing sample (up to 750 words; any subject) by **February 27, 2004**. Students will be selected by March 22.

To apply as a community, contact STEP at the address below to request a one-page application form. Community applications for Summer 2004 are due **March 19, 2004**. Communities will be selected by April 9. (Dates may vary slightly from those mentioned.)

For more information and requesting/submitting application materials:

Alan Raflo, STEP Assistant Director
Virginia Water Resources Research Center
23 Agnew Hall (0444), Blacksburg, VA 24061
(540) 231-5463; e-mail araflo@vt.edu.

Information is also available at the Water Center Web site: www.vwrrc.vt.edu (click on "Education," then "STEP").

Guide to Water Central Articles, June 1998–November 2003

The following lists the main topics in *Water Central* issues from June 1998 (the first issue) through November 2003 (issue #28). The list does not include items from the “In and Out of the News” or “Notices” sections of the newsletter. All issues of *Water Central* are available online at www.vwrrc.vt.edu; page numbers below refer to the two-column versions of each issue (a one-column version of recent issues is also available online). To request a paper copy: phone (540) 231-5624; e-mail water@vt.edu.

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Virginia Water Central

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