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PROJECT SPOTLIGHT

Villanova University Stormwater Best Management Practice Research

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Figure 1: Villanova Urban Stormwater Partnership logo.

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Introduction

The advent of NPDES Phase II has brought a new direction to stormwater management design. Volume and quality have joined peak flow as design parameters, radically changing the design approach of the stormwater profession. Design elements used to mitigate these effects are termed Best Management Practices (BMPs). The design, performance, and maintenance of BMPs are still emerging as recognized by the EPA NPDES Phase II rule (2002b). Newer design practices have turned to volume control and infiltration to replace lost recharge, to reduce the increased runoff, and to reduce nonpoint source pollutants caused by changes in land use and increased impervious surfaces. Peak flows and stream bank erosion are evaluated on a watershed scale instead of a site-by-site basis. Recognizing the radical nature of these changes and the need to research new methods, Villanova University, in collaboration with PaDEP, created the Villanova Urban Stormwater Partnership (VUSP) in 2002.

Mission Statement: The mission of the Villanova Urban Stormwater Partnership is to advance the evolving comprehensive stormwater management field and to foster the development of public and private partnerships through research on innovative SWM Best Management Practices, directed studies, technology transfer and education.



- *Research and directed studies will emphasize comprehensive watershed stormwater management planning, implementation, and evaluation.*
- *Technology transfer will provide tools, guidance and education for the professional.*
- *Partnership Goal is to promote cooperation amongst the private, public and academic sectors.*

The VUSP partnership is currently focusing on the three mission goals of Research, Technology Transfer and Partnership. For research, the long-term performance of multiple Best Management Practices constructed on the university property is being evaluated. While the basic functions of the BMPs may be understood, many questions on their design, maintenance, and how to best utilize them as part of a watershed plan remain. A secondary but equally important aspect is the introduction of these facilities to the public so their value and

functions are recognized. Currently, a stormwater wetland, an infiltration traffic island, a porous concrete facility, and an infiltration trench have been constructed on the Villanova University campus and are under study. Each site is instrumented to facilitate study of runoff volume, peak flow and quality, and has been incorporated within the EPA Section 319 National Nonpoint Source Monitoring Program (NMP). Educational signage has been installed to enhance the learning experience and a website has been created to facilitate technology transfer. Funding for this work is through multiple grants, including EPA Region III 104B3, PaDEP 319 Non Point Source Program, Pennsylvania Growing Greener Program, NOAA Coastal Zone Management, and VUSP corporate member contributions.

BMP Descriptions

Stormwater Wetland

An existing stormwater detention basin on Villanova University property has been converted into an extended detention Stormwater Wetland BMP (Center for Watershed Protection, 1996; see Figure 2) using the design concepts presented in the Pennsylvania Handbook of Best Management Practices for Developing Areas (PACD, 1998). The wetland was designed to treat water quality and to reduce erosive peak flows from runoff from large parking lots, university buildings and dormitories, roadways and train tracks. The watershed draining to the wetland is approximately 40% impervious. Funding for construction of the wetland was provided by a PaDEP 319 grant (1998). The project has been published in EPA 319 Success Stories Part III (EPA, 2002a). Some limited unfunded flow studies have been conducted at this site, and exploratory water quality work is underway through the VUSP. With the awarding of a NOAA Coastal Zone Program Grant, this site is scheduled to be included in the National Monitoring Program in summer 2005.



Figure 2: Stormwater Wetland Outlet.

EDITOR'S NOTE

This issue of *NWQEP NOTES* features the most recent project to join the Section 319 National Nonpoint Source Monitoring Program (NMP). The project, located at Villanova University in southeastern Pennsylvania, focuses on evaluating stormwater best management practices for urban applications. Bioinfiltration, porous concrete, infiltration trench and constructed wetland demonstration sites installed on campus are undergoing long-term evaluation for their ability to reduce volume, peak flow and pollutant loadings of stormwater runoff. Inflow and outflow of the individual practices are monitored, including subsurface flow. Results of this project will provide much needed data on short- and long-term performance of stormwater practices that are being widely promoted as alternatives to conventional stormwater management. Successful outcomes of the study results should lead to greater acceptance and application of these practices, which hold the potential to help mitigate adverse impacts of development.

As always, please feel free to contact me regarding your ideas, suggestions, and possible contributions to this newsletter.

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Bioinfiltration Traffic Island

A traffic island was retrofitted creating a Bioinfiltration BMP during summer 2001 (see Figure 3). Funding for the construction and initial research was provided through a grant from the Pennsylvania Growing Greener program. The facility is designed to capture and infiltrate the first inch of runoff from a student parking lot, roadway and lawn (approximately 50% impervious area). A recent thesis estimates that annually over 8 inches of water is infiltrated by this site.



Figure 3: Bioinfiltration Traffic Island.

Porous Concrete Demonstration Site

A PaDEP 319 grant (2002) funded the creation of a porous concrete infiltration facility in an existing central paved area on the Villanova University campus (see Figure 4). As shown in Figure 5, rock beds underlie three large paved areas, with porous concrete strips (the darkest gray edging around the white concrete) surrounding the beds (see Figure 6). The rock beds capture runoff directly from the surrounding roof drains



Figure 4: Porous Concrete Demonstration Site.

and also from drainage through the porous concrete strips. This site was first built in 2002, but the initial concrete pour failed. The surface was replaced in the summer of 2003 (see Figure 7), but again some material problems reemerged which were addressed through replacement of some of the surfaces in October 2004. Similar to the concept of the Bioinfiltration Traffic Island, runoff from the site and surrounding buildings (approximately 64% impervious) are captured and infiltrated, decreasing the flows and pollution to a high priority stream segment on the 303(d) list. The site has a much higher capacity than the Bioinfiltration Traffic Island as it overlies the large rock holding beds.



Figure 5: Construction of porous concrete infiltration beds with #4 baffle stone in place.



Figure 6: Runoff being infiltrated by porous concrete.



Figure 7: Pouring of porous concrete. Drum roller used for compaction and finishing.



Figure 9: Completion of trench prior to application of eco-pavers. Trench was filled with washed crushed stone, and perforated distribution pipe was installed.

Infiltration Trench

This project, funded through a PaDEP 319 grant, is designed to capture the first one-half inch of runoff from an elevated parking deck and infiltrate it through a rock bed into the ground. Figures 8 and 9 show construction of the infiltration trench and placement of monitoring wells. The box shown in Figure 10 contains the monitoring equipment including a V-notch weir used to measure inflow. The project presents some unique possibilities for research. As the water is piped through storm drains to the site, filtration devices can be used and tested at this site. Of the demonstration sites being evaluated, it is the only one with a 100% impervious drainage area. Constructed in August of 2004, this structure is being monitored and is under initial testing.

Featured websites on each of these stormwater BMP projects can be viewed through the following link: <http://www.villanova.edu/VUSP>.



Figure 10: Completed infiltration trench.

Project Design

Sampling/Flow Monitoring Scheme

The monitoring strategy for each BMP site is to assess flow volumes, rates and pollutant loads for wet weather flows entering and exiting the BMPs.

Infiltration Sites (Bioinfiltration Traffic Island, Porous Concrete, and Infiltration Trench)

Each site has rain gages, water sampling devices, and flow or level recorders as appropriate. V-notch weirs with pressure transducers are used to measure either the flow in or out of the BMPs. Pressure transducers are also used to measure the depth of water in the rock beds or surface bowls. First flush samplers are used to capture runoff inflow for water quality testing. Flow leaving the site is split into infiltration and overflow (large storm events). To collect water samples from the



Figure 8: Completion of trench excavation with geotextile fabric lining. Note locations of the two monitoring wells.

vadose zone, soil lysimeters are used. Note that only dissolved fractions are collected from the vadose zone samples and that the sample size is limited, occasionally restricting the number of tests performed.

Figures 11 and 12 illustrate the monitoring locations for the bio-infiltration and porous concrete practices.

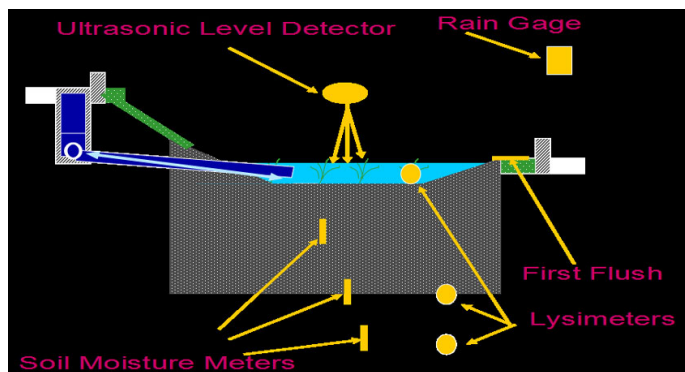


Figure 11: Monitoring schematic for bio-infiltration practice.

Stormwater Wetlands

Both wet weather and baseflow events are included in the monitoring program for this BMP. As the great majority of the inflow is piped to the wetlands through culverts, flow is measured using Sigma Corporation flowmeters. These units measure both velocity and level within the culvert at the inflow and outflow of the BMP (five minute intervals). A rain gage is connected to the flow meter to record the intensity and pattern of the storm. To measure quality, multiple discrete samples are taken during the storm events using automated samplers. Samples are taken at the inflow, the sediment forebay, and the outlet. Probes connected to the flowmeters continuously measure dissolved oxygen, pH, temperature and conductivity. Bimonthly baseflow samples are analyzed for these parameters plus fecal coliform and *E. coli*.

Table 2: Project schedule

Site	Status	Initial Monitoring Phase	Notes
Bio-Infiltration Traffic Island	Monitoring Underway Oct 2004 – Sept 2010	Oct 2003 – Sept 2004	Added first flush samplers Added bowl lysimeter
Porous Concrete Infiltration Site	Monitoring Underway Oct 2004 – Sept 2010	Oct 2003 – Sept 2004	Added first flush samplers Added gutter flow samplers
Infiltration Trench	Dec 2004 – Sept 2010	Sept 2004 – Dec 2004	Construction complete Aug 2004
Stormwater Wetland	Baseflow Monitoring June 2004 – Sept 2010	Complete	Need modifications to pressure transducers
	Wet Weather Flow Awaiting Contract Feb 2005 – Sept 2010	Complete	Scheduled to be added to the NMP Spring 2005

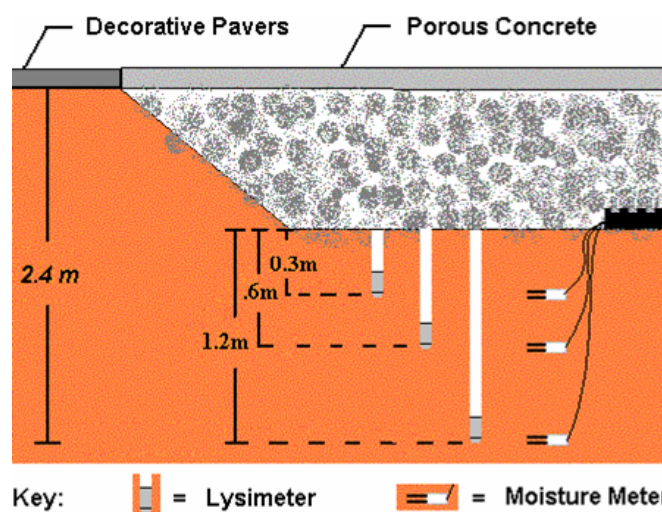


Figure 12: Cross-section of instrumentation for porous concrete.

See Table 1 for water quality parameters being tested at each of the BMP sites.

Table 1: Water Quality Parameters

Water Quality Test	Notes
pH	
Dissolved Oxygen	(Wetland only – probe)
Temperature	(Wetland only – probe)
Fecal Coliform / <i>E. coli</i>	(Wetland only)
Turbidity	(Wetland only)
Conductivity	
Total Suspended Solids	(surface samples)
Dissolved Solids	(depending on volume collected)
Chlorides	
Nutrients – N, P	(Dissolved – various forms)
Metals – various	(Dissolved – various forms)

The project time frame is to monitor all sites for 6 to 10 years (see Table 2).

Initial Results

Initial results from the first year of monitoring under the National Monitoring Program are promising. First, all sites are performing within the original design parameters, fulfilling their volumetric and water quality purposes. Data are being forwarded to the ASCE / EPA BMP Database, and already several theses have been published on these sites, which are available through the VUSP website. Knowledge is also being gained on how these devices operate. For example, a cyclic change in infiltration rate has been observed for the Bio-infiltration traffic island, but not for the other infiltration BMPs, pointing toward biological activity. Chlorides from snow melt chemicals are not retained in the infiltration BMPs and are “washed” through these systems. Also, it appears that acid rain is quickly buffered and copper (from downspouts) is removed from the runoff by the soil. Initial studies indicate that the stormwater wetland removes TSS during storm events and dissolved forms of nutrients during dry weather flows during summer months. Chlorides from snow melt chemicals unfortunately are retained in the wetland, but peak flows are buffered, and Fecal Coliform and *E coli* are reduced. While these results are early in the timetable of the National Monitoring Program, they provide glimpses towards a productive future.

VUSP Membership

Funding for developing the BMP park concept, as well as for construction of the BMPs, was provided by PaDEP through the Section 319 Nonpoint Source Pollution Program and the Growing Greener initiative. This support does not imply endorsement of these projects. Research is funded by the VUSP Partners. The VUSP is governed by a board of directors, including both public and private sector representatives. Public sector members include state and local representatives of EPA Region III, PaDEP, Conservation Districts, and County Planning Commissions. Private sector members include corporate partners (Delaware River Basin Commission, and Cahill Associates, Inc.), as well as members (McCormick Taylor, O’Brien and Gere, F.X. Browne, and Momenee and Associates). To join the VUSP, visit the website at www.villanova.edu/VUSP or contact Dr. Robert Traver at 610-519-7899 or robert.traver@villanova.edu.

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References

- Center for Watershed Protection. 1996. *New Advances in Urban BMPs (Draft)*. Silver Spring, MD.
- Pennsylvania Association of Conservation Districts. 1998. *Pennsylvania Manual of Best Management Practices for Developing Areas*. Harrisburg, PA.
- U.S. Environmental Protection Agency (EPA). 1998. *National Water Quality Inventory-1996 Report to Congress*. Office of the Water Program Operations, Water Planning Division. Washington, DC.
- U.S. Environmental Protection Agency (EPA). 2002a. *Section 319 Success Stories, Vol. III*. Office of Water. Washington, DC.
- U.S. Environmental Protection Agency (EPA). 2002b. *National Pollutant Discharge Elimination System*. Office of Wastewater Management. <http://cfpub2.epa.gov/npdes>.

■

INFORMATION

New Erosion Control Field Guides Available

Kentucky just released a new Erosion Prevention and Sediment Control Field Guide in a pocket format with laminated photos. The text is succinct with numerous graphics including an extensive collection of photos of good and bad erosion and sediment control practices. The guide is available for download at: <http://www.water.ky.gov/sw/nps/Publications.htm> (under “Construction” heading).

In addition, the Minnesota Pollution Control Agency has just released two new guides on construction site erosion control. Both are available in PDF from: <http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>. The first, *Stormwater Compliance Assistance Tool Kit for Small Construction Operators*, was developed to assist construction operators disturbing less than 5 acres in complying with the State’s Construction General Permit and developing stormwater pollution prevention plans (SWPPP). It covers permit requirements, SWPPP development, common BMPs, and maintenance. It also includes a SWPPP template to help construction operators address all the required elements that are supposed to be included in the SWPPP.

Continued on p. 9

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Publication Number	Reports & Journal Articles	Price(\$)	Quantity	Total(\$)
WQ-131	Stream Restoration: A Natural Channel Design Handbook (2003) (129p) http://www.ncsu.edu/sri/stream_rest_guidebook/guidebook.html	35.00	_____	_____
WQ-130	Changes in a Stream's Physical and Biological Conditions Following Livestock Exclusion (2003) (7p)	Free	_____	_____
WQ-129	Changes in Land Use/Management and Water Quality in the Long Creek Watershed (2002) (11p)	Free	_____	_____
WQ-128	2002 NC Stream Restoration Conference (Conference Agenda and Proceedings) (2002) (73p)	10.00	_____	_____
WQ-127	Hydraulic Geometry Relationships for Urban Streams Throughout the Piedmont of North Carolina (2002) (11p)... ..	Free	_____	_____
WQ-126	Pollutant Export from Various Land Uses in the Upper Neuse River Basin (2002) (9p)... ..	Free	_____	_____
WQ-125	Efficiencies of Temporary Sediment Traps on Two North Carolina Construction Sites (2001) (9p)... ..	Free	_____	_____
WQ-124	Section 319 Nonpoint Source National Monitoring Program: Successes and Recommendations (2000) (32p)... http://www.ncsu.edu/waterquality/section319/index.html	Free	_____	_____
WQ-123	Nonpoint-Source Pollutant Load Reductions Associated with Livestock Exclusion (2000) (9p).....	Free	_____	_____
WQ-120	Comparing Sampling Schemes for Monitoring Pollutant Export From a Dairy Pasture (1998)	Free	_____	_____
WQ-119	Performance Evaluation of Innovative and Alternative On-Site Wastewater Treatment Systems in Craven County, NC (1998) (12 p)	Free	_____	_____
WQ-109**	Techniques for Tracking, Evaluating, and Reporting the Implementation of Nonpoint Source Control Measures: Forestry (EPA/841-B-97-009) (1997)	Free	_____	_____
WQ-108**	Techniques for Tracking, Evaluating, and Reporting the Implementation of Nonpoint Source Control Measures: Agriculture (EPA/841-B-97-010) (1997)	Free	_____	_____
WQ-103	WATERSHEDSS: A Decision Support System for Watershed-Scale Nonpoint Source Water Quality Problems (Journal of the American Water Resources Association) (1997) (14p)	Free	_____	_____
WQ-105	Linear Regression for Nonpoint Source Pollution Analyses (EPA-841-B-97-007) (1997) (8p)	Free	_____	_____
WQ-104	Water Quality of First Flush Runoff from 20 Industrial Sites (Water Environment Research) (1997) (6p)	Free	_____	_____
WQ-100	Water Quality of Stormwater Runoff from Ten Industrial Sites (Water Resources Bulletin) (1996) (10p)	Free	_____	_____
WQ-96	Goal-Oriented Agricultural Water Quality Legislation (Water Resources Bulletin) (1996) (14p)	Free	_____	_____
WQ-92	The Rural Clean Water Program: A Voluntary, Experimental Nonpoint Source Pollution Control Program and its Relevance to Developing Countries (1995) (18p)	Free	_____	_____
WQ-83	Effective Monitoring Strategies for Demonstrating Water Quality Changes from Nonpoint Source Controls on a Watershed Scale (Wat. Sci. Tech.) (1993) (6p)	Free	_____	_____
WQ-21	Setting Priorities: The Key to Nonpoint Source Control (EPA 841-B-87-110) (1987) (50p)	Free	_____	_____
WQ-60	Selecting Priority Nonpoint Source Projects: You Better Shop Around (EPA/506/2-89/003) (1989) (39p)	5.00	_____	_____
WQ-24	Selecting Critical Areas for NPS Pollution Control (J. Soil & Water Conservation) (1985) (4p)	Free	_____	_____
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WQ-27	Increasing Sensitivity of NPS Control Monitoring Programs (Water Res. Assoc. Proc.) (1987) (15p)	Free	_____	_____
WQ-30	Pollution From Nonpoint Sources: Where We Are and Where We Should Go (J. Env. Science & Technology) (1987) (6p)	Free	_____	_____
WQ-32	Determining Statistically Significant Changes in Water Pollutant Concentrations (J. Lake & Reservoir Mgmt.) (1987) (7p)	Free	_____	_____

* new addition to publication list

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WQ-33	Water and Sediment Sampler for Plot and Field Studies (J. Environmental Quality) (1987) (6p)	Free	_____	_____
WQ-35	Agricultural Nonpoint Source Control: Experiences from the Rural Clean Water Program (J. Lake & Reservoir Management) (1988) (6p)	Free	_____	_____
WQ-36	Determining the Statistical Sensitivity of the Water Quality Monitoring Program in the Taylor Creek Nubbin Slough, Florida, Project (J. Lake & Reservoir Management) (1988) (12p)	Free	_____	_____
WQ-65	Determining and Increasing the Statistical Sensitivity of Nonpoint Source Control Grab Sample Monitoring Programs (Colorado Water Resources Research Institute) (1990) (17p)	Free	_____	_____
WQ-70	North Carolina's Sediment Control Program (Public Works) (1991) (3p)	Free	_____	_____
WQ-98	Farm*A*Syst Fact Sheets (7 fact sheets) (1997) (http://h2osparc.wq.ncsu.edu/info/farmassit/index.html)	Free	_____	_____
WQ-99	Home*A*Syst Fact Sheets (5 fact sheets) (1997) (http://h2osparc.wq.ncsu.edu/info/farmassit/homeindx.html)	Free	_____	_____
WQ-89	Rural Clean Water Program Technology Transfer Fact Sheets (10 fact sheets) (1995) (http://h2osparc.wq.ncsu.edu/info/concepts.html)	Free	_____	_____
WQ-91	Watershed Management: Planning and Managing a Successful Project to Control Nonpoint Source Pollution (contains a list of resources specific to North Carolina) (1995) (8p) (http://www.bae.ncsu.edu/bae/programs/extension/publicat/wqwm/ag522.html)	Free	_____	_____
WQ-86	Paired Watershed Study Design (EPA 841-F-93-009) (1993)	Free	_____	_____
WQ-48	Pesticide Fact Sheets (10 fact sheets) (1988)	4.00	_____	_____
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- NCSU Water Quality Group home page: <http://www.ncsu.edu/waterquality/>
- U.S. Environmental Protection Agency's Office of Water publications list: <http://www.epa.gov/OW/info>
- WATERSHEDSS — Water, Soil, Hydro-Environmental Decision Support System, Internet-based management tool: <http://www.water.ncsu.edu/watershedss/>
- Understanding the Role of Agricultural Landscape Feature Function and Position in Achieving Environmental Endpoints: Final Project Report (to the U.S. Environmental Protection Agency) (1996) (118p) (*abstract and instructions for downloading the report available at: ftp://ftp.epa.gov/epa_ceam/wwwhtml/software.htm*)

The second guide, *Stormwater Construction Inspection Guide*, is targeted to State and local construction inspectors responsible for conducting stormwater inspections at construction sites. The guide walks an inspector through the inspection process, from pre-inspection preparation to exit interview. It also includes guidance on how to conduct an on-site inspection and provides tips on inspecting common BMPs.

New LID Report for Great Lakes Region

American Rivers recently released a new report on low impact development (LID) techniques called *Catching the Rain: A Great Lakes Resource Guide for Natural Stormwater Management*. This handbook offers an easy reference to a variety of natural stormwater management approaches suitable for the Great Lakes region. It provides basic information on use, space requirements, cold weather considerations and costs, and is most appropriate for public works staff, developers, and citizens. The report can be downloaded at: <http://www.americanrivers.org/newreportonstormwatermanagement.html>.

Department of Defense LID Manual Available

The Department of Defense has just published, under its *United Facilities Criteria*, a new 100-plus page document entitled *Design: Low Impact Development Manual*. It is authorized by the U.S. Corps of Engineers' Chief of the Engineering and Construction Division, top engineers of the Navy and Air Force, and a senior official in the Department of Defense. The Forward states: "UFC will be used for all DoD projects and work for other customers where appropriate." The manual is available for download in pdf at: http://www.wbdg.org/pdfs/3_210_10.pdf.

USGS Reports on Water Quality

USGS has released reports on water quality in 15 more of the Nation's most important river basins and aquifers. The reports are part of the National Water-Quality Assessment Program, which is designed to describe the status and trends in the quality of ground water and surface water resources around the country.

Geographic areas covered in the recently released reports are in Hawaii, Alaska, California, Washington, Wyoming, Montana, Utah, Idaho, North Dakota, Ohio, Indiana, Kentucky, Illinois, Wisconsin, Louisiana, Mississippi, Alabama, Georgia, Tennessee, Maine, New Hampshire, Massachusetts,

Rhode Island, Pennsylvania, New Jersey, New York, Delaware, Maryland, and Virginia.

Findings of regional and national interest are highlighted in a separate report "Water Quality in the Nation's Streams and Aquifers? Overview of Selected Findings, 1991-2001." Overall, the findings indicate that water is generally suitable for drinking, irrigation, recreation, and other uses. However, major challenges remain in protecting water resources from contamination in every water basin, which are related to human activities in agricultural and suburban/urban areas, as well as natural sources from rocks and soils.

All reports are available on <http://water.usgs.gov/nawqa> (look under "NEW" in the upper right corner). Also available on the website are a listing of USGS contacts in the study areas (for additional information and questions on specific basins), press releases for individual assessments, and chemical, physical, and biological data for all 51 study areas.

If you would like to receive paper copies of these reports, please provide your contact information in an email to nawqa_info@usgs.gov. Or, call NAWQA Program assistants at 703-648-5715 or 703-648-6860.

A New Version of EnviroMapper Now Available

EPA's Office of Water has recently released a new version of *EnviroMapper for Water* (<http://www.epa.gov/waters/enviromapper/>). *EnviroMapper for Water* provides a Web-based mapping connection to a wealth of water data. It can be used to view and map data such as the designated uses assigned to local waters by state agencies (fishing, swimming, etc), waters that are impaired and do not support their assigned uses, the reasons why waters are impaired, water quality monitoring information, closures of swimming beaches, and the location of dischargers. Maps can be viewed at the national, regional, state or local levels. This latest release of *EnviroMapper for Water* (Version 3.0) features several new layers of water data including EPA's national water quality database STORET, National Estuary Program study areas, and the location of nonpoint source projects. Other enhancements simplify locating and viewing these data, and instructions are included describing how to incorporate the resulting map into a web page. For more information, contact Tommy Dewald at dewald.tommy@epa.gov or 202-566-1178.

■

ANNOUNCEMENTS

NCSU Water Quality Group Adds Staff

The NCSU Water Quality Group welcomes Dave Penrose! Prior to joining the Group in April 2004, Dave spent most of his professional career (over 23 years) with the Environmental Sciences Branch of the NC Division of Water Quality, where he assessed stream quality using benthic macroinvertebrates as indicators. Dave spent his last four years at NC DWQ with the 401 Certification Unit, focusing on stream restoration issues, and also worked on defining the use of aquatic insects as indicators of perennial versus intermittent stream features. Dave's responsibilities at the NCSU Water Quality Group will again focus on stream restoration and developing restoration success criteria using aquatic insects as indicators. Dave will also be developing and teaching workshops on the ecology of aquatic insects and the practical identification of taxonomic families.

Dave has a Masters degree in Public Health from the University of Michigan and a Bachelors degree in biology from Northern Michigan University in Marquette. Welcome Dave!

Conference Report

The 12th National Nonpoint Source Monitoring Workshop was held September 27-30, 2004 in Ocean City, MD. The theme of this year's conference was managing nutrient inputs and exports in the rural landscape. The workshop focused on the technical issues of quantifying effectiveness of best management practices in improving water quality, including challenges of nonpoint source management, study design, monitoring approaches, and data analysis. Progress of Section 319 National Nonpoint Source Monitoring Program (NMP) projects, as well as other nonpoint source control watershed projects, were highlighted at the workshop. Approximately 185 people participated in the conference, which included a pre-conference field tour, two ½ day workshops, 47 presentations, plus posters and exhibits.

A special thanks to John McCoy, Maryland Department of Natural Resources, for chairing the conference planning committee. Thanks also to Tammy Taylor with Conservation Technology Information Center (CTIC), Cathy Smith with NCSU Water Quality Group, the rest of the conference planning committee and the workshop sponsors and hosts for organizing a successful and informative event.

Next year's annual conference will take place September 19-22, 2005 in Raleigh, NC. The theme will be *From Projects to Programs: Enhancing States' NPS Management Programs*

through Lessons Learned from NPS Monitoring Projects. See Page 11 for the Call For Abstracts announcement.

MEETINGS

Call for Abstracts

13th National Nonpoint Source Monitoring Workshop: Sept 19-25, 2005, Raleigh, NC. See Call For Abstracts on Page 11.

Meeting Announcements — 2005

February

2005 International Erosion Control Association Annual Conf and Expo: Feb 20-24, 2005, Dallas, TX. Website: www.ieca.org/

April

Environmental Banking & Beyond: The 8th National Mitigation & Conservation Banking Conference: April 18-21, 2005 (NEW DATES), Charlotte, NC. Web site: www.mitigationbankingconference.com; Tel: 703-548-5473.

9th Biennial Conference on Stormwater Research and Watershed Management: April 27-29, 2005, Tampa, FL. For more information, contact Ms. Tammy Smith at Tel: 850-906-0099; email: Tammy@mcraeco.com; web site: www.mcraeco.com/stormwater_conf.html.

June

TMDL 2005: June 26-29, 2005, Philadelphia, PA. Web site: www.wef.org/Conferences/.

July

StormCon '05, the North American Surface Water Quality Conference & Exposition: July 18-21, 2005, Orlando, FL. Web site: www.StormCon.com.

September

13th National Nonpoint Source Monitoring Workshop: Sept 19-25, 2005, Raleigh, NC. See the highlighted workshop announcement on Page 11.

Call For Abstracts

13th National Nonpoint Source Monitoring Workshop

September 19-25, 2005
Sheraton Capital Center Hotel
Raleigh, NC

You are invited to submit proposals for oral and poster presentations. Presentations will be 20 minutes, followed by 10 minutes for discussion. Posters are also encouraged.

Presentations should focus on one of the following **session topics**:

- Enhancing States' nonpoint source management programs
- Impact of NPS project monitoring results and lessons learned on States' NPS programs
- Detecting change in water quality from agricultural or urban BMP implementation
- Modeling applications for NPS pollution
- TMDLs
- Education and Outreach on NPS pollution control
- Riparian area and stream protection/restoration
- Monitoring Low Impact Development

INSTRUCTIONS FOR SUBMITTING PROPOSALS

1. Submit online at: http://www.ncsu.edu/waterquality/nmp_conf/abstracts.html.
2. Email or mail a proposal with the following information included: (MS Word or Text file)
 - Author name, affiliation, session topic the presentation will address, and preferred presentation format (oral or poster). Also include mailing address, phone, fax and email.
 - The circumstances creating the need for the project/program.
 - The measurable objectives of the project/program.
 - Impact on NPS programs from project monitoring results and lessons learned.
 - Partnerships (public and private) supported and/or created by this project/program, including partner role and contribution to the project.
 - A description of how the project/program integrated monitoring and implementation.

- A discussion of results:
 - Did the monitoring indicate that project goals were accomplished?
 - What changes in land treatment/land uses occurred?
 - How did these changes relate to water quality monitoring results?
 - How was modeling used in conjunction with BMP implementation?
 - How was the TMDL implemented?

3. Submit a short bio-sketch of yourself to appear in the printed program.
4. Submit a short statement regarding the following question: If you were king or queen, what one program change would you make to your state's NPS program to improve water quality (does not have to be related to your submittal paper, and it will not be printed in the workshop program)?
5. Below the short statement in item # 4, also let us know if you do **not** want to give us permission to post your presentation on our website after the conference. We plan to post a low-resolution pdf file of your presentation with the accessibility disabled so that there can be no content copying or extraction and no changing. If you do not indicate anything on the statement, we will assume you are giving permission.

Mail to:

NCSU Water Quality Group
Dr. Jean Spooner, Conference Chair
Campus Box 7637
Raleigh, NC 27695-7637
Phone (919) 515-3723; Fax (919) 515-7448
Email: waterquality@ncsu.edu

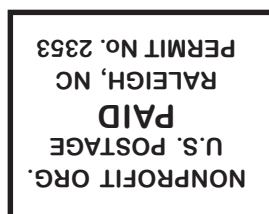
Deadline for submission of abstracts is **March 24, 2005**.

Review and Notification

Authors will be notified of receipt of their abstract. The workshop program committee will review abstracts. Authors will be notified by May 2, 2005 regarding the status of their abstract. An update of accepted abstracts may be submitted by Sept 1 (optional), which will be published in the workshop program.

Contact person: Jean Spooner at jean_spooner@ncsu.edu.

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