



# Nonpoint Source News-Notes

July 2008, #84

*The Condition of the Water-Related Environment  
The Control of Nonpoint Sources of Water Pollution  
The Ecological Management & Restoration of Watersheds*



## Special Focus Issue: Web-based Watershed Tools

### Agricultural Notes

#### New Farm Bill Expands Conservation Programs

The new \$289 billion 2008 Farm Bill, enacted this spring, increases total spending on natural resources conservation programs by \$7.9 billion. The bill expands, extends, or strengthens a number of popular conservation programs including the Conservation Reserve Program, Wetlands Reserve Program, Environmental Quality Incentives Program, Grassland Reserve Program, and others. These programs work to enhance wildlife habitat and protect air, water and soil quality by removing marginal cropland from production, protecting wetlands and helping agricultural producers to implement conservation practices that reduce nonpoint source pollution.

The Farm Bill also creates some new programs such as the Agricultural Water Enhancement Program which helps producers achieve water quality goals and address water quantity concerns, and the Open Fields Program which provides incentives to states and tribes to provide public access to private land for hunting and fishing. For more information on the conservation provisions in the 2008 Farm Bill, see [http://agriculture.house.gov/inside/Legislation/110/FB/Conf/Title\\_II\\_fs.pdf](http://agriculture.house.gov/inside/Legislation/110/FB/Conf/Title_II_fs.pdf). To learn more about the entire Farm Bill, see <http://agriculture.house.gov/inside/FarmBill.html>.



**Citizen training programs aim to reduce erosion on construction sites. See page 14.**

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## Special Focus: Web-based Watershed Tools

### New EPA ATTAINS Database Facilitates TMDL, Water Quality Searches

The U.S. Environmental Protection Agency (EPA) just released a new online database that provides access to integrated water quality information reported biennially by the states under Clean Water Act sections 305(b) and 303(d). The Assessment TMDL Tracking And Implementation System (ATTAINS) database merges two formerly separate databases, the National Assessment Database [305(b) report information] and the National Total Maximum Daily Load (TMDL) Tracking System [303(d) report information], into one easy-to-navigate database. ATTAINS, available at [www.epa.gov/waters/ir](http://www.epa.gov/waters/ir), includes state-reported water quality information on the following:

- Support of designated uses in assessed waters
- Identified causes and sources of impairment
- Identified impaired waters
- TMDL status

ATTAINS users can view tables and charts summarizing state-reported data for the nation as a whole, for individual states, individual waters and for each of the 10 EPA Regions. The complete water quality story is provided, showing which waters have been assessed, which are impaired, and which are being (or have been) restored. ATTAINS includes water quality information reported by states since 2002.

#### ATTAINS: Getting Started

Finding water quality information in ATTAINS is easy. Users go to the ATTAINS homepage (see Figure 1) and click on a specific state on the national map or use the search boxes located under the map to find the most recent reports available for each state. The search boxes can also be used to perform specific waterbody searches. If a state has submitted an Integrated Report, selecting it on the map takes the user to a Water Quality Assessment Report page. (See box for an explanation of integrated reports.) If a user is not sure whether a state has submitted an Integrated Report, the *Which state reports are available?* link (to the top left of the U.S. map) takes the user to a list of the specific reports available for each state. States and territories that have not yet moved to the integrated reporting system will have a *Separate Impaired and Assessed Water Reports* link instead of *Available Integrated Report*. Water quality data for these states is presented in separate 305(b) or 303(d) reports.

#### Exploring Data for Individual States

For states that already submit Integrated Reports, users can quickly access details about which waters have been assessed, which are impaired, and which are being (or have been) restored. For examples, a user selecting Tennessee from the ATTAINS home page (Figure 1) is taken to a page with a clickable watershed map of Tennessee that serves as a quick way to navigate to a specific waterbody (see Figure 2). This Tennessee page offer links to many different types of detailed information, including assessments with color charts, impairment causes, impairment sources and TMDL information for rivers, streams, lakes, reservoirs and ponds.

#### What is an Integrated Report?

Before 2001, states and territories submitted two separate reports to fulfill requirements of the Clean Water Act sections 305(b) and 303(d). The section 305(b) report detailed the status of all the assessed waters as *good*, *threatened*, or *impaired*, and the 303(d) report identified the impaired waters, their causes of impairment, and the status of their TMDL development. The two reports often contained seemingly conflicting data.

In 2001 EPA issued guidance to the states and territories encouraging them to combine their 305(b) and 303(d) reports into one report, known as the Integrated Report. The Integrated Report streamlined and reduced the state's reporting burden and improved the accuracy of the information submitted. For more information about Integrated Reports, see [www.epa.gov/owow/monitoring/repguid.html](http://www.epa.gov/owow/monitoring/repguid.html) and [www.epa.gov/owow/tmdl/policy.html](http://www.epa.gov/owow/tmdl/policy.html).

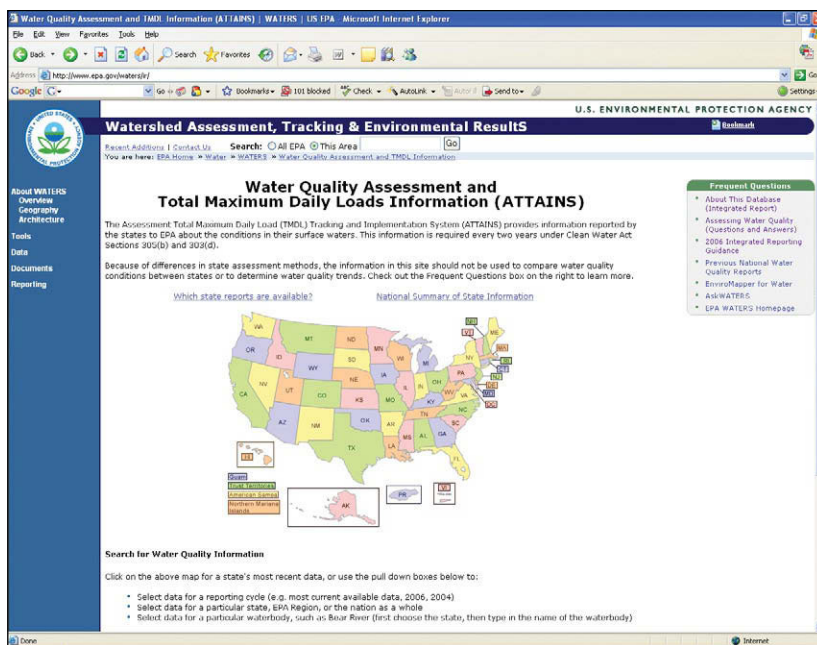


Figure 1. ATTAINS home page ([www.epa.gov/waters/ir](http://www.epa.gov/waters/ir)).

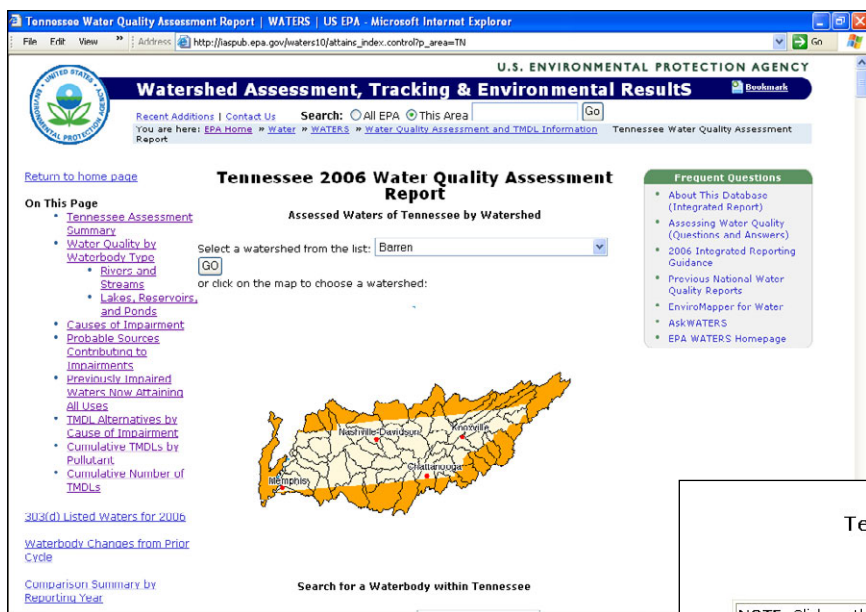


Figure 2. Exploring data for individual states—Tennessee example. This is the page that a user sees when selecting the state of Tennessee from the ATTAINS homepage.

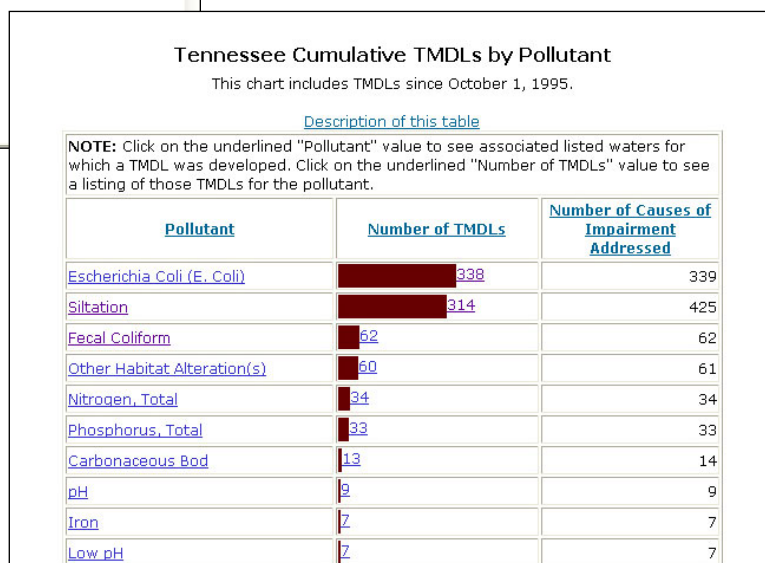


Figure 3. Exploring data for individual states—Tennessee example. This is a partial example of what an ATTAINS user sees when selecting the *Cumulative TMDLs by Pollutant* link for Tennessee. This page shows the number of TMDLs developed for each pollutant category, and offers links to more detailed information.

For example, by selecting the *Cumulative TMDLs by Pollutant* link on the left side of the Tennessee page (Figure 2), a user can view a chart outlining the number of TMDLs completed for each pollutant within the state (see Figure 3). This chart, like many other charts in ATTAINS, allows users to drill down further to get more detailed information. For example, if a user wants to know more about siltation TMDLs, he or she can select the number 314 in the *Number of TMDLs* column as seen in Figure 3. Figure 4 shows the top portion of the chart that is generated, which lists the names of all 314 siltation TMDLs available for Tennessee. Users can then click on the name of a specific TMDL to view all documents associated with that TMDL. Clicking on one of the numbers in the *Number of Listed Waters* column takes a user to detailed information, including maps, for each impaired segment that was addressed by the individual TMDLs.

State	TMDL Document Name	TMDL Date	EPA Action	TMDL Pollutant	Number of Listed Waters
TN	<a href="#">Caney Fork Siltation And Habitat Alteration Tmdl</a>	Aug-03-2005	EPA Approved	Siltation	20
TN	<a href="#">Collins River Watershed</a>	Feb-13-2003	EPA Approved	Siltation	7
TN	<a href="#">Harpeh River Watershed (Siltation And Habitat Alteration)</a>	Oct-31-2002	EPA Approved	Siltation	12
TN	<a href="#">Stones River Watershed</a>	Oct-31-2002	EPA Approved	Siltation	14
TN	<a href="#">Tmdl For Siltation And Habitat Alteration In The Clear Fork River Watershed (Huc 051301011) In Campbell, Claiborne, And Scott Counties, Tennessee</a>	Feb-26-2008	EPA Approved	Siltation	2
TN	<a href="#">Tmdl For Siltation And Habitat Alteration In The Emory River Watershed (Huc 06010209)</a>	Jul-31-2006	EPA Approved	Siltation	6
TN	<a href="#">Tmdl For Siltation And Habitat Alteration In The Ft. Loudoun Lake Watershed (Huc 06010201)</a>	Jan-27-2006	EPA Approved	Siltation	39
TN	<a href="#">Tmdl For Siltation And Habitat Alteration In The Hiwassee River Watershed (Huc 06020002)</a>	Jan-23-2006	EPA Approved	Siltation	16
TN	<a href="#">Tmdl For Siltation And Habitat Alteration In The Lower Clinch River Watershed (Huc 06010207)</a>	Mar-29-2006	EPA Approved	Siltation	14
TN	<a href="#">Tmdl For Siltation And Habitat Alteration In The Lower Elk River Watershed</a>	Oct-22-2004	EPA Approved	Siltation	3

Figure 4. Exploring data for individual states—Tennessee example. This is a portion of the chart generated when a user selects the link to show all siltation TMDLs in the state. Users follow links on this page to get more information about specific TMDLs or segments addressed by individual TMDLs.

**Tennessee, Caney Watershed**

Click on the watershed for an interactive map

Search for a Waterbody within Caney

Enter Waterbody Name:

**On This Page**

- [Assessment Summary](#)
- [Causes of Impairment](#)
- [Probable Sources Contributing to Impairment](#)
- [TMDL Alternatives by Cause of Impairment](#)
- [Cumulative TMDLs by Pollutant](#)

[Tennessee State Report](#)

Data are also available for these years: [2002](#) [2004](#)

For More Information:

- [Download Excel compatible information](#)
- [Download GIS Information \(Internet Explorer only\)](#)
- [Water Quality Data Available for this Watershed](#)

**Frequent Questions**

- [About This Database \(Integrated Report\)](#)
- [Assessing Water Quality \(Questions and Answers\)](#)
- [2006 Integrated Reporting Guidance](#)
- [Previous National Water Quality Reports](#)
- [EnviroMapper for Water](#)
- [AskWATERS](#)
- [EPA WATERS Homepage](#)

Figure 5. Exploring data for individual states—Tennessee example. This is an example of what an ATTAINS user sees when selecting the Caney watershed from the drop down box on the Tennessee homepage. This page provides access to water quality data and interactive maps.

ATTAINS users can also access water quality data for most watersheds. For example, if a user selects the Caney watershed from the drop-down list seen above the Tennessee map in Figure 2, a new page is displayed showing a map of the watershed (see Figure 5). This page provides access to data from EPA's STORET database, as well as to interactive subwatershed maps through EPA's Enviromapper for Water. Accessible local watershed data sets will continue to grow as more states move toward integrated reporting in upcoming reporting cycles.

To see an expanded explanation of how to access various documents and data through ATTAINS, download a slideshow presentation at [www.cluin.org/conf/tio/OWATTAINS/resource.cfm](http://www.cluin.org/conf/tio/OWATTAINS/resource.cfm). This slideshow was developed for EPA's ATTAINS webcast, which was held on June 18, 2008, and which is archived at [www.epa.gov/owow/watershed/wacademy/webcasts](http://www.epa.gov/owow/watershed/wacademy/webcasts). ATTAINS tutorial information will also soon be available through EPA's *Key Internet Tools for Watershed Management* Web-based training course, available at [www.epa.gov/owow/watershed/wacademy/epatools](http://www.epa.gov/owow/watershed/wacademy/epatools).

[For more information, contact Dwane Young, EPA, 1200 Pennsylvania Avenue, N.W., Mail Code 4503T, Washington, DC 20460. Phone: 202-566-0616; E-mail: [young.dwane@epamail.epa.gov](mailto:young.dwane@epamail.epa.gov)]

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## EPA Releases Urban BMP Performance Tool

Want to know which stormwater best management practices (BMP) might be most effective for your urban stormwater control needs? Check out the U.S. Environmental Protection Agency's (EPA's) new Urban Stormwater BMP Performance Tool. This Web-based tool provides stormwater professionals with easy access to past research results that report the performance of stormwater BMPs. The tool contains summary information and pollutant-removal and volume-reduction data from approximately 220 studies assessing the performance of more than 275 urban BMPs.

EPA developed the tool to help watershed planners; modelers; private landowners; and local, state and federal agencies learn more about urban BMP performance. Specifically, users can get information in two main areas: (1) how effectively the BMPs reduce specific pollutants of concern in

stormwater runoff and, (2) how effectively the BMPs reduce the volume of stormwater discharged to waterways. "Before we developed the tool, people frequently asked us about the performance of various BMPs for particular pollutants, and we had trouble providing specific answers," explained Nikos Singelis with EPA's Office of Wastewater Management. "Now, those same people can use the tool to find the information they need to help make decisions about which BMPs might work best for them." The tool pulls together relevant BMP research that was previously scattered; some studies were published in trade and academic journals, some posted on Web sites and some remained unpublished. The tool permits users to easily access these studies and compare the results. The tool includes a ranking system that provides a rough indication of the thoroughness of each study's monitoring information (ranging from one to three check marks, with three being the most thorough).

### What is an Urban BMP?

An urban BMP is a technique, process, activity or structure used to reduce the pollutant content, velocity and volume of a stormwater discharge. BMPs include simple nonstructural methods, such as good housekeeping and preventive maintenance. BMPs can also include structural devices and installations, such as biofilters and detention basins. So far, the BMPs featured in this database are primarily structural. BMPs are most effective when used in combination with each other and customized to meet the specific needs (e.g., drainage, materials and activities) of a given operation. For more information about urban BMPs, visit the National Menu of Stormwater BMPs page at [www.epa.gov/npdes/menuofbmps](http://www.epa.gov/npdes/menuofbmps). Also visit [www.epa.gov/npdes/greeninfrastructure](http://www.epa.gov/npdes/greeninfrastructure) and [www.epa.gov/nps/lid](http://www.epa.gov/nps/lid) for information on volume-reducing low impact development practices.

### Using the Tool

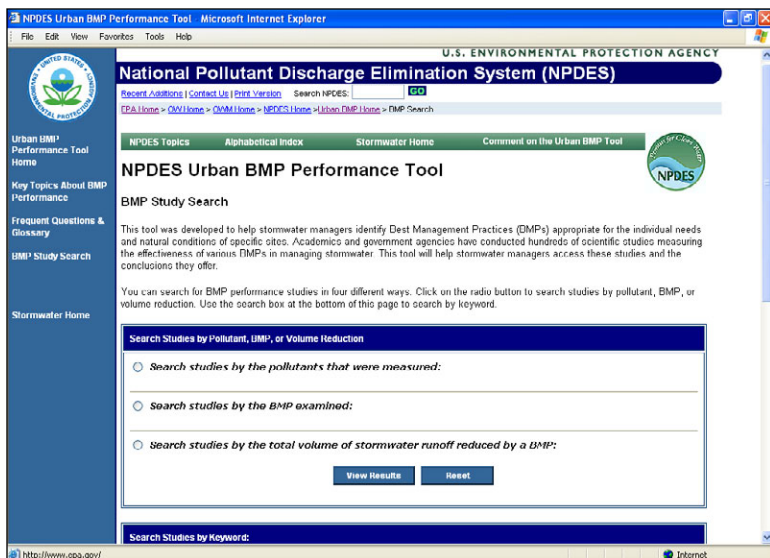
Users can access the tool at [www.epa.gov/npdes/urbanBMPtool](http://www.epa.gov/npdes/urbanBMPtool) and search for BMP performance studies in four ways—by pollutant of concern, type of BMP, volume reduction and keyword(s) (see figure). A search generates a table that lists the applicable BMPs and a summary of the data. The data are generally sorted by the thoroughness of the study (with three-check studies displayed before two-check studies) and then by effluent concentration (from lowest effluent concentration to highest). Users can re-sort these tables to help facilitate their searches. The tool allows users to further explore the individual studies to access the statistical summaries and other information about the design, location, soils and rainfall data.

To complement the search functions, the tool also contains a separate series of educational essays on various aspects of BMP performance and the importance of volume reduction and infiltration in these assessments. The tool includes a page explaining the information presented about each study, including study quality, inflow and outflow concentration, volume information, statistical summaries and other topics. To supplement the BMP information in the tool, links to other BMP performance summaries are provided.

### Tool Provides Broad Comparisons

Information about the expected performance of stormwater BMPs is critical to making decisions about which BMPs to choose and install. Because multiple factors affect overall BMP performance, stormwater managers should look at the result of many studies when choosing BMPs. The large number of studies featured in the tool allows users to assess the relative performance of a class of BMPs and the ranges of pollutant reductions and volume reductions they might achieve. EPA plans to add more studies to the tool in the near future, specifically focusing on expanding the collection of studies featuring low impact development or green infrastructure BMPs.

*[For more information, contact Nikos Singelis, EPA, 1200 Pennsylvania Avenue, N.W., Mail Code 4203M, Washington, DC 20460. Phone: 202-564-0692; E-mail: [singelis.nikos@epa.gov](mailto:singelis.nikos@epa.gov)]*



The Urban Stormwater BMP Performance Tool's search page provides a variety of search options.

## Key EPA Internet Tools for Watershed Management

The U.S. Environmental Protection Agency's (EPA's) Web site offers a tremendous amount of watershed, water quality and nonpoint source information. From water monitoring data to mapping applications and permit information, EPA maintains numerous tools and databases that provide nonpoint source and watershed practitioners with information that supports watershed planning, total maximum daily load (TMDL) development and other water quality-related programs. However, locating this data can be an overwhelming task for those who are new to the tools and databases. To encourage federal, state and local program managers and staff to use these freely available resources, EPA has developed the *Key EPA Internet Tools for Watershed Management* course (Tools Course).

Since its launch in 2006, EPA has offered the Tools Course 32 times, reaching more than 700 trainees around the country. Its hands-on format places trainees in front of a computer and walks them step-by-step through a variety of EPA's online resources, tools, databases, Web sites, publications and mapping applications. EPA constantly updates the course material to reflect new resources such as the recent launch of the ATTAINS Web site, which addresses information on water quality assessment and TMDLs. (For more information about ATTAINS, see the article in this issue.)

The comprehensive, two-part Tools Course is divided into an Overview Course and an In-Depth Course. These can be offered back-to-back or separately, although EPA recommends that trainees take the Overview Course first. The Overview Course identifies tools that support the steps of the *Handbook for Developing Watershed Plans*, including Surf Your Watershed, *Enviomapper for Water* and ATTAINS. The In-Depth Course then helps participants locate, download and manipulate data from EPA's online databases such as STORET and the Permit Compliance System. It also introduces information resources that support volunteer monitoring, nonpoint source outreach and watershed models. Each participant receives a Tools Course binder with step-by-step instructions, enabling them to share their knowledge with colleagues, as well as revisit the steps taken during

the course as needed. A recent participant noted that the Tools Course offered a “good mix of resources” for those who are unfamiliar with online tools.

People who are unable to attend a Tools Course but wish to learn more about what EPA has to offer through its Web site can download the Tools Course materials at [www.epa.gov/owow/watershed/wacademy/epatools](http://www.epa.gov/owow/watershed/wacademy/epatools). The “Quick link” documents list the Web addresses and links that take you directly to the sites covered in the course. You can download the In-Depth and Overview Course tutorial documents for additional help. The text of each tutorial includes active Web site links and screenshots to help you navigate.

Interested in having the Tools Course come to a computer lab near you? Contact Anne Weinberg (information below) to learn more. Please note, the Tools Course is designed to be hands-on and requires a computer lab with Internet access.

[For more information, contact Anne Weinberg, EPA, 1200 Pennsylvania Avenue, N.W., Mail Code 4503T, Washington, DC 20460. Phone: 202-566-1217; E-mail: [weinberg.anne@epa.gov](mailto:weinberg.anne@epa.gov)]

## USGS Expands Online Water Resource Tools

U.S. Geological Survey’s (USGS’s) vast collection of surface and groundwater data is becoming more accessible through the Web. USGS maintains a large database called National Water Information System (NWIS), which is similar to EPA’s STORET database. NWIS is a comprehensive application that supports the acquisition, processing and long-term storage of USGS-collected water data. NWIS contains data from all 50 states, plus border and territorial sites, and includes data from as early as 1899 to the present. Many types of data are stored in NWIS, including site characteristics, well construction details, time-series data for gage height, streamflow, groundwater level, precipitation and water quality measurements. Additionally, peak flows, chemical analyses for discrete samples of water, sediment and biological media data are accessible within NWIS.

NWISWeb (<http://water.usgs.gov/nwis>) is a publicly available Web portal and provides a framework to obtain data by category, such as surface water, groundwater or water quality and by geographic area. Further refinement is possible by choosing specific site-selection criteria and defining the output desired. NWISWeb is not, however, configured to present all NWIS data, and users might need to contact local Water Science Centers to obtain some information.

For example, well construction details, many miscellaneous measurements and peak flows less than annual maximums are not available from NWISWeb. NWISWeb data are updated from NWIS regularly, and real-time data are generally updated upon receipt. NWISWeb provides several output options including graphs of real-time streamflow, water levels and water quality; tabular output in HTML and ASCII tab-delimited files; and summary lists for selected sites that can be used to get refined details.

### Online Tools to Access NWIS Data

While users can query water data directly from NWISWeb, USGS has developed several tools to help with specific types of queries.

- **WaterWatch** (<http://water.usgs.gov/waterwatch>) provides an instantaneous picture of water conditions nationwide in near real time through maps, graphs and tables describing real-time, recent and past streamflow conditions for the United States. Its point-and-click interface lets you retrieve maps and graphs of real-time stage and discharge data for individual stations. WaterWatch summarizes streamflow conditions in a state or hydrologic region in terms of the long-term typical condition at stream gages in the region. Summary tables are provided along with time-series plots that depict variations through time.



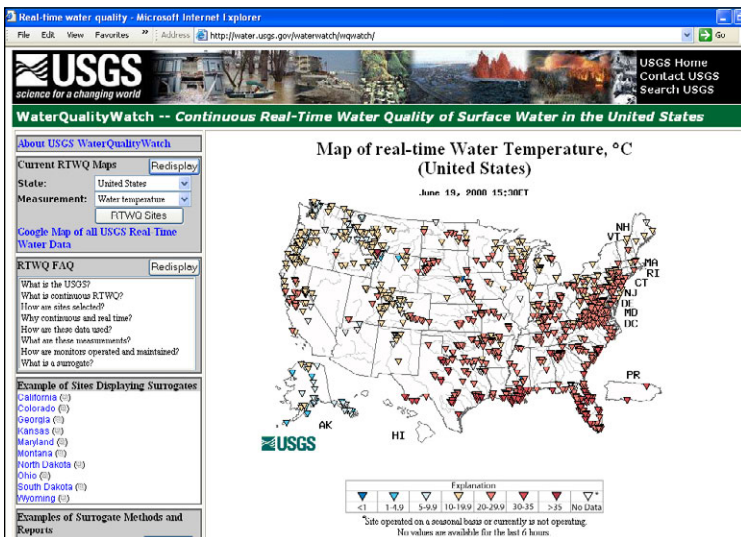
NWISWeb homepage (<http://water.usgs.gov/nwis>).

- **WaterQualityWatch** (<http://water.usgs.gov/waterwatch/wqwatch>) provides access to real-time water-quality monitoring data collected in U.S. surface waters. Measurements include water temperature, specific conductance, pH, dissolved oxygen and turbidity. These measurements are available at more than 1,300 sites in streams with watersheds as small as a few square miles to as large as 1,000,000 square miles in the case of the Mississippi River basin.
- **Ground-Water Watch** (<http://groundwaterwatch.usgs.gov>) groups related wells and data from these active well networks and provides basic statistics about the water-level data. In Ground-Water Watch, three networks help you locate three specific types of groundwater information:
  - *Active Ground-Water Level Network* contains water levels and well information from more than 20,000 wells that have been measured by the USGS or USGS cooperators at least once in the past 365 days. This network includes all the wells in the network, regardless of measurement frequency, aquifer monitored or the monitoring objective.
  - *Climate Response Network* monitors the effects of droughts and other climate variability on groundwater levels. The network consists of about 140 wells nationwide.
  - *Real-Time Ground-Water Level Network* provides real-time monitoring data, typically recorded at 15- to 60-minute intervals and uploaded to the site every one to four hours depending on the data relay technique used. Recording and transmission times could be more frequent during critical events.
- The new **Instantaneous Data Archive (IDA)** (<http://ida.water.usgs.gov/ida>) provides historical streamflow information from the late 1980s through 1994 at the time intervals at which it was collected (typically in 5-minute to 60-minute intervals). IDA offers approximately 1.5 billion instantaneous data values from 5,500 stream gages in 35 states, and USGS is adding data from additional states and stream gages as resources become available. USGS hopes to expand the IDA database in the future to include other variables such as temperature and pH.

### The Value of Time Dense Data

NWISWeb provides access to continuous, real-time water quality data (continuous refers to the frequent time intervals—as small as five minutes to hourly—that measurements are made; real-time

refers to the measurements being posted to the Web soon after they are collected). USGS's Andrew Ziegler notes, "The benefits of continuous, real-time water quality data are numerous. The time density of continuous data improves our knowledge and understanding of the relationship between water quality and changes in hydrology, geology and land use. These data will improve our understanding of cause-and-effect relations, resulting in observed water quality characteristics, such as the relationship between increased turbidity and elevated coliform levels. These data sets will be used to develop and improve water quality management tools and models. Furthermore, continuous, real-time water quality data are needed for decisions regarding drinking water, water treatment, regulatory programs, recreation and public safety. Water quality changes can also be measured at night and during storms—periods when samples are [otherwise] rarely collected but have significant effects on concentrations and loads that enter our waterways."



**USGS's WaterQualityWatch** (<http://water.usgs.gov/waterwatch/wqwatch>) provides access to real-time water-quality monitoring data. This map shows temperature data across the nation in the afternoon of June 19, 2008.

[For more information about specific USGS tools, contact (1) NWIS: Susan Trapanese, [mtrapan@usgs.gov](mailto:mtrapan@usgs.gov), 703-648-5632; (2) NWISWeb: Mark Hamill, [mdhamill@usgs.gov](mailto:mdhamill@usgs.gov), 703-648-5298; (3) WaterWatch: Harry Lins, [hlins@usgs.gov](mailto:hlins@usgs.gov), 703-648-5712; (4) WaterQualityWatch: Andy Ziegler, [aziegler@usgs.gov](mailto:aziegler@usgs.gov), 785-832-3539; (5) Ground-Water Watch: Bill Alley, [walley@usgs.gov](mailto:walley@usgs.gov), 619-225-6125; and (6) IDA: Joe Nielsen, [jnielsen@usgs.gov](mailto:jnielsen@usgs.gov), 207-622-8201 ext. 106]



# Notes on the National Scene

## More Nonpoint Source Success Stories Documented

Want to learn about waterbodies around the country where nonpoint source (NPS) reduction efforts are making a measurable difference? Check out the regularly expanded U.S. Environmental Protection Agency (EPA) *Section 319 Nonpoint Source Success Stories* Web site ([www.epa.gov/nps/Success319](http://www.epa.gov/nps/Success319)). This site highlights real world examples of NPS pollution-impaired waterbodies across the country where implementing NPS control and restoration projects has led to documented water quality improvements or removal of the waterbody from a state's Clean Water Act (CWA) 303(d) list. The site includes stories about projects that have received CWA section 319 funds and, in many cases, other funding sources dedicated to solving NPS impairments.

### Identifying Potential NPS Success Stories

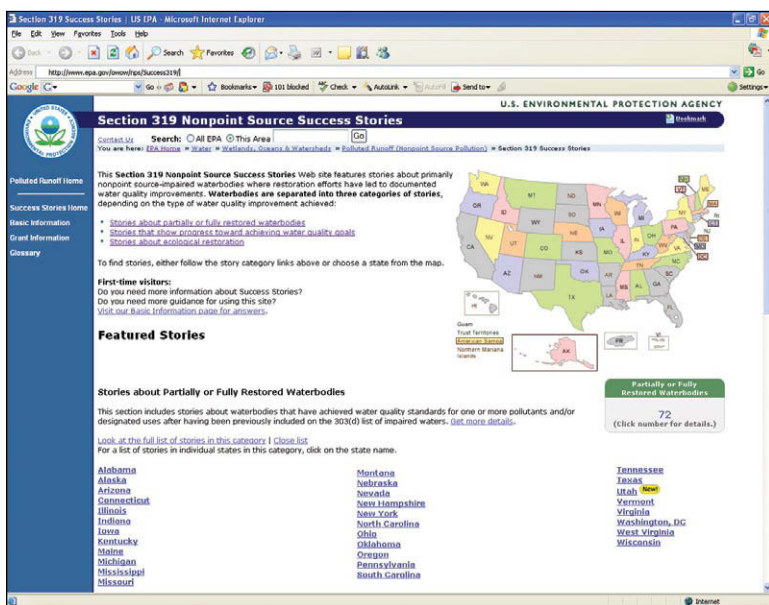
In its 2008 *National Water Program Guidance*, EPA estimates that almost 6,000 assessed waterbodies are primarily impaired by NPS pollution. EPA and states are working with local governments, watershed groups, property owners, tribes and others to implement programs and management

practices to control NPS-polluted runoff throughout the country. Typical efforts include educating the public about NPS pollution, restoring damaged streams and wetlands, and implementing best management practices (BMPs) in urban, suburban and agricultural areas. In some cases, these efforts have already improved water quality enough that the waterbodies are no longer considered impaired. Other waterbodies are showing measurable water quality improvements. EPA is spotlighting as many of these waterbodies as possible on its NPS Success Stories Web site.

What waterbodies qualify? In almost all cases, a state must have listed the waterbody as impaired on its 303(d) list during the 1998/2000 listing cycle or any year thereafter. Moreover, the waterbody must have benefitted from actual NPS control and restoration efforts, which then led to measurable improvements in water quality. To identify potential success stories, staff members from EPA's Nonpoint Source Program are working with the states to review the status of qualified waterbodies.

EPA classifies success stories into one of three types, depending on how the waterbodies demonstrate water quality improvement:

- **Fully or partially restored.** This type includes stories about waterbodies that have achieved water quality criteria for one or more pollutants (e.g., nutrients or sediment) or designated uses (e.g., drinking water supply, recreation, aquatic life support) after having been previously included on the 303(d) list of impaired waters. These waterbodies may be either partially or fully restored. By *fully restored*, EPA means that the waterbody meets all criteria for pollutants and fulfills all designated uses. By *partially restored*, EPA means that either of the following two conditions are being met: (1) a waterbody has a designated use that is initially impaired by more than one pollutant, and, after restoration efforts, the waterbody meets the criteria for one or more (but not all) of those pollutants; or (2) a waterbody initially has more than one designated use that is not fully supported, and, after restoration efforts, one or more (but not all) of those uses becomes fully supported.



EPA's Nonpoint Source Success Stories Web page ([www.epa.gov/nps/Success319](http://www.epa.gov/nps/Success319)).

### Need More Information about CWA Sections 319 and 303(d)?

See these Web pages:

CWA section 319:  
[www.epa.gov/nps/sec319cwa.html](http://www.epa.gov/nps/sec319cwa.html)

CWA section 303(d):  
[www.epa.gov/waterscience/standards/303.htm](http://www.epa.gov/waterscience/standards/303.htm)

- **Showing measurable progress.** This type includes impaired waterbodies that show significant progress toward achieving water quality goals but do not yet meet water quality standards. In such cases, water quality improvements include achieving measurable, in-stream reduction in a pollutant; or achieving improvement in a parameter that indicates stream health (e.g., increases in fish or macroinvertebrate counts).
- **Showing ecological restoration.** This includes waterbodies that had water quality problems that were not caused by a measurable pollutant (e.g., nitrogen or sediment) but by issues such as habitat alteration. This type of success story is unique because these waterbodies were not on the 303(d) list, but they deserve recognition for successful restoration efforts that led to water quality improvements.

At press time, the success stories Web site features 79 success stories that highlight water quality restoration or measurable progress in 92 waterbodies across the country. Of these, 72 waterbodies are partially or fully restored. EPA plans to continue adding success stories as they are realized.

### *A Sampling of Success Stories*

The success stories featured on the Web site describe NPS control projects that vary in their size, scope and structure. Some include large watersheds, while others address short segments of creek. Many describe innovative strategies used to reduce NPS pollution. All feature partnerships and a diversity of funding sources. The following success story examples, which feature waterbodies that are fully or partially restored, show the diversity of projects that are included on the Web site.

#### ***Upper Sun River, Montana***

An 80-mile segment of the Upper Sun River in central Montana was included on Montana's 2000 and 2002 303(d) lists of impaired waterbodies because of excess nutrients. Landowners; local watershed organizations; and many federal, state and local government agencies collaborated to develop a restoration plan and implement agricultural BMPs in the Upper Sun River and its tributaries. Farmers implemented nutrient management and riparian area BMPs and improved irrigation water management practices. The cumulative effects of these on-the-ground efforts, combined with outreach and education activities, resulted in 20 miles of stabilized streambank, 4 miles of restored primary fishery and spawning habitat, 800 feet of lined irrigation canal, and 50,000 acres of rangeland where grazing management practices have been implemented. Water quality improved as a result, allowing the Montana Department of Environmental Quality to remove the Upper Sun River from the 303(d) list for nutrients in 2006. The Sun River watershed project is a classic example of using the watershed approach to address NPS pollution.

#### ***Cobbossee Lake, Maine***

Central Maine's 5,238-acre Cobbossee Lake had a long history of nuisance algae blooms that turned its once-clear water to murky green. NPS pollution in Cobbossee Lake's watershed, plus pollution from upstream lakes, delivered excess phosphorus into the lake. Elevated phosphorus levels promoted algae blooms, which discouraged recreation, spoiled aquatic habitat and caused the lake to violate water quality standards. After 35 years of restoration work by public and private partners, including upstream alum treatments and widespread installation of erosion control and nutrient management BMPs, Cobbossee Lake exhibits remarkably improved water clarity (see photo). The lake has been free of nuisance algae blooms for the past 10 years and now meets water quality standards. This impressive recovery prompted the Maine Department of Environmental Protection to remove Cobbossee Lake from Maine's section 303(d) impaired waters list in 2006.



The Maine Department of Environmental Protection used these cylinders to represent how much Cobbossee Lake water quality had improved over the past 30 years (see *past* and *present* cylinders). The cylinder marked *future* indicates that the work will continue long-term until the lake water is pure.

### ***Brasstown Creek, North Carolina***

In 1994 North Carolina found that Brasstown Creek failed to meet aquatic life criteria and placed an 8.5-mile segment of the creek on the state's 303(d) list due to sediment impairments. Eroding streambanks, runoff from agricultural lands and livestock access all contributed to the pollution problems. In response, the Hiwassee River Watershed Coalition formed a locally driven partnership to restore the watershed and implement numerous BMPs. From 1994 to 2004, the partners revegetated 160 acres of critically eroding bare areas (lands within 1,000 feet of streams); installed nearly 6.2 miles of livestock-exclusion streambank fencing; reconstructed stream channels; and created, enhanced, or protected 48 acres of forested riparian buffer. In addition, project partners installed livestock trails, stream crossings, and alternative livestock watering practices, thereby improving more than 2,000 acres of pastureland. These practices kept an estimated 650 tons of soil, 162 pounds of nitrogen and 45 pounds of phosphorus out of Brasstown Creek annually. Thanks to these efforts, water quality improved enough to once again support a healthy macroinvertebrate community, and the state delisted Brasstown Creek in 2000.

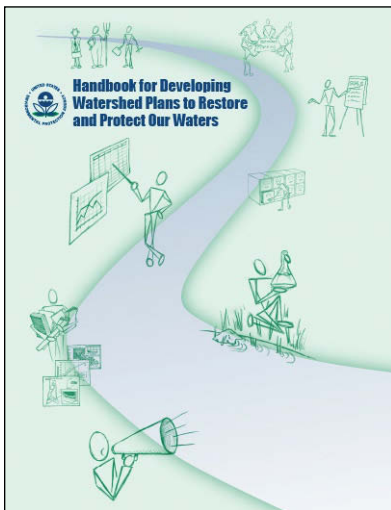
To learn more about the NPS success stories effort in your state, contact the EPA staff members listed below or your regional EPA staff person ([www.epa.gov/nps/regNPScoord.pdf](http://www.epa.gov/nps/regNPScoord.pdf)).

*[For more information, contact Andrea Matzke, EPA, 1200 Pennsylvania Avenue, N.W., Mail Code 4503T, Washington, DC 20460. Phone: 202-566-1150; E-mail: [matzke.andrea@epa.gov](mailto:matzke.andrea@epa.gov). You may also contact Jenny Biddle at the above address (Phone: 202-566-1281; E-mail: [biddle.jenny@epa.gov](mailto:biddle.jenny@epa.gov))]*

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## **EPA's Watershed Planning Handbook Finalized**

The U.S. Environmental Protection Agency's Office of Wetlands, Oceans and Watersheds recently released the final version of the *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* ([www.epa.gov/nps/watershed\\_handbook](http://www.epa.gov/nps/watershed_handbook)) to help communities, watershed organizations, and local, state, tribal and federal environmental agencies develop and implement watershed plans to meet water quality standards and protect water resources. The handbook is designed to help anyone undertaking a watershed planning effort, but should be particularly useful to communities working with waters that are impaired or threatened.



The handbook offers detailed and comprehensive instructions for developing, implementing and tracking watershed plans. It serves as a valuable resource because it provides a balanced offering of tools that address social and economic factors, incorporate watershed science, and involve a wide variety of stakeholders. Handbook users will especially benefit from a series of tools that help generate numbers, such as those that quantify existing pollutant loads and develop estimates of load reductions needed to meet water quality criteria. The handbook's tools also help identify the management measures appropriate for achieving the needed load reductions. "You typically manage more thoroughly things which are measured," explains EPA's Stuart Lehman. "That is why the handbook includes guidance and tools to quantify watershed management goals, objectives and eventual success measures, such as water quality loadings and ecological conditions. Having specific targets will improve the overall management for watersheds."

### ***Final Handbook Offers More***

EPA released the draft handbook for public review and comment in January 2006. In response, EPA received approximately 150 comments and suggestions from a cross section of watershed stakeholders including local and state government agencies, environmental organizations, engineering consulting firms, universities and other federal agencies. EPA fine-tuned the handbook to better meet the needs of the stakeholders. For example, the final version includes a list of state watershed planning contacts and additional case studies and worksheets. EPA also added new information about total maximum daily loads (TMDLs), point source programs and conservation techniques for preserving critical watershed habitats. Stakeholders are already finding the handbook useful—EPA has received several requests to use the handbook as a basis for workshops, and a college has adopted the handbook as its textbook for a watershed management course.

The handbook can be used in tandem with EPA's Watershed Plan Builder Tool (<http://iaspub.epa.gov/watershedplan>). "The Plan Builder complements the handbook," notes Lehman. "The handbook provides extensive, background information for each step of a plan's creation. The plan builder gathers user information and organizes customized links to support the development of a site specific watershed plan. The plan builder was developed using the handbook and other EPA resources as a knowledge base."

### Navigating the Handbook

The handbook is structured so that readers can either move step by step through the watershed planning process or go directly to individual sections that highlight specific technical tools for use in the watershed planning effort. Worksheets and checklists are provided throughout the handbook to help work through the watershed planning process. Each chapter includes information that addresses the key issues for each step, along with examples to illustrate how to apply these concepts.

EPA intends for the handbook to supplement, not replace, state and local watershed planning guides. You can order a free handbook in print form from the National Service Center for Environmental Publications (NSCEP). For ordering instructions, contact NSCEP at 800-490-9198 or see [www.epa.gov/nscep/ordering.htm](http://www.epa.gov/nscep/ordering.htm) and request document number EPA 841-B-08-002. You can find more information and download the handbook as a free PDF at [www.epa.gov/nps/watershed\\_handbook](http://www.epa.gov/nps/watershed_handbook).

*[For more information, contact Stuart Lehman, EPA Office of Wetlands, Oceans and Watersheds, 1200 Pennsylvania Avenue, N.W., Mail Code 4503T, Washington, DC 20460. Phone: 202-566-1205; E-mail: [lehman.stuart@epa.gov](mailto:lehman.stuart@epa.gov)]*

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## Notes from the States, Tribes, and Localities

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### *Cleaning Up Car Washes in Washington*

We often view the charity car wash as being as American as apple pie. It is almost a rite of passage for any athletic team or high school band wishing to earn money for an upcoming trip or new uniforms. However, car washing can significantly affect the environment, and some municipalities are making them illegal as part of their National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permits. Why? Car washes deliver large amounts of surfactants, phosphates, oil, grease and other contaminants into storm drains and receiving waterbodies. In contrast, commercial car washes are regulated by municipalities and must treat their water and comply with commercial wastewater regulations, making a commercial car wash a better choice.

But what is a soccer team in need of new uniforms to do? One Washington municipality has found a way to allow organizations to hold car wash fundraisers while also protecting water quality in the Puget Sound watershed. The King County Department of Natural Resources and Parks, Water and Land Resources Division (WLRD) developed a car wash kit that collects runoff water from the car wash area and pumps it into a nearby sink or toilet where it will enter the sanitary sewer. A kit contains these items:

- Storm drain insert (a plastic tub)
- Submersible sump pump
- GFCI adapter plug
- 100-foot hose (to connect pump to sink or toilet)
- 100-foot electrical cord
- 1 grate puller
- 2 or more orange safety road cones (to go around the open grate)
- Traffic vests for safety
- 1 heavy-duty nylon carry bag or any type of container to store kit items

Specifications for the kit components are at [http://dnr.metrokc.gov/wlr/pi/carwash\\_res.htm](http://dnr.metrokc.gov/wlr/pi/carwash_res.htm).

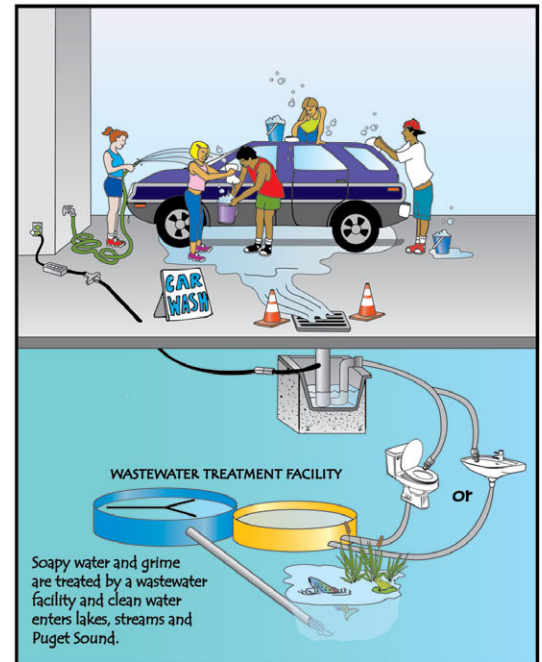
## Keep Soap Out Of Storm Drains... Use A Car Wash Kit!

Without the Kit ...



Soap and grime go untreated and polluted water enters lakes, streams and Puget Sound

With the Kit ...



Soapy water and grime are treated by a wastewater facility and clean water enters lakes, streams and Puget Sound.

This WLRD poster shows how a car wash kit works to capture and pump polluted carwash runoff to a treatment facility.

### Distributing the Kits

A car wash kit costs approximately \$500. Initially WLRD purchased the kit components and provided them as an in-kind donation to local groups. Groups could also purchase their own car wash kit with WLRD grant funds. Each grant recipient was required to share the kit with other organizations. Often this resulted in the kits residing at a gas station or store whose property was commonly used for charity car washes. WLRD promoted its car wash kit program through a Web site (<http://dnr.metrokc.gov/wlr/pi/carwash.htm>) and bus boards. In 2006 WLRD distributed 25 car wash kits to the community. Unfortunately, recent government funding cuts and limited staffing has reduced the county's ability to purchase car wash kits and to manage and promote the program. However, organizations can apply for a WaterWorks grant to purchase their own kit (<http://dnr.metrokc.gov/wlr/pi/grant-exchange/waterworks.htm>). WLRD maintains a list on its Web site of places in the community that already have car wash kits available for use.

### The Time is Right

Many MS4 communities are grappling with how to address the environmental threats posed by noncommercial car washes and are working to raise awareness using fact sheets, brochures, and radio ads (see box, next page). These education materials ask people to be mindful when washing cars; for instance, washing on or directing water to a gravel or



WLRD uses the familiar Bert the Salmon mascot to help share messages about pollution from car washes. For nearly ten years, Bert the Salmon has served as the environmental mascot for Seattle and King County and has been educating Puget Sound residents about things they can do to promote healthy waterways for salmon.

### How Does a Car Wash Affect Water Quality?

To learn more about how runoff from a car wash can affect the environment and what you can do about it, see these resources.

- (1) Maryland Department of the Environment car wash information at [www.mde.state.md.us/ResearchCenter/Publications/General/eMDE/vol1no4/car\\_wash.asp](http://www.mde.state.md.us/ResearchCenter/Publications/General/eMDE/vol1no4/car_wash.asp).
- (2) Stormwater Manager's Resource Center car washing fact sheet at [www.stormwatercenter.net/Pollution\\_Prevention\\_Factsheets/CarWashing.htm](http://www.stormwatercenter.net/Pollution_Prevention_Factsheets/CarWashing.htm).
- (3) RiverSides Stewardship Alliance's River Safe Car Washing Campaign at [www.riversides.org/riversafe](http://www.riversides.org/riversafe).
- (4) EPA's Nonpoint Source Toolbox offers several resources on car washing from localities around the country, including
  - Mid-America Regional Council's Wash Your Car the Right Way brochure ([www.epa.gov/nps/toolbox/other/KSMO\\_CarWashing.pdf](http://www.epa.gov/nps/toolbox/other/KSMO_CarWashing.pdf))
  - Maine Department of Environmental Protection's 60-second radio ad about car washing ([www.epa.gov/nps/toolbox/radio/me\\_tb\\_carwash.mp3](http://www.epa.gov/nps/toolbox/radio/me_tb_carwash.mp3))
  - City of San Diego's "Think Blue" Car Washing fact sheet ([www.epa.gov/nps/toolbox/other/tbsd\\_car\\_washing.pdf](http://www.epa.gov/nps/toolbox/other/tbsd_car_washing.pdf))

grassy area, partnering with a commercial car wash or finding a location that drains to a treatment facility. King County's car wash kit program takes these efforts a step further by taking the guesswork out of the equation—community groups have easy access to the resources needed to hold an environmentally friendly car wash fundraiser.

WLRD's Ken Pritchard believes other localities could easily adopt a car wash kit program. WLRD originally promoted the program through schools and sports teams but found that this outreach method was too diffused and lacked the ability to use local knowledge to target prospective charities. Therefore, Pritchard recommends that the program be run through local water-related agencies or community grassroots organizations like watershed groups or departments of public works.

*[For more information, contact Ken Pritchard, King County Department of Natural Resources and Parks, Water and Land Resources Division, 201 S. Jackson Street, Suite 600, Seattle, WA 98104. Phone: 206-296-6585; E-mail: [ken.pritchard@kingcounty.gov](mailto:ken.pritchard@kingcounty.gov)]*

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## Programs Teach Citizens to Get the Dirt Out

Sediment can be a very visible pollutant in creeks and rivers—and people are noticing. As people learn more about water quality issues, they become frustrated when they see sediment pollution originating from areas where the land is disturbed for construction or other purposes—especially if erosion control practices are either nonexistent, poorly designed or poorly maintained. In many cases, local governments do not have the staff resources to inspect all construction sites. In response, programs are cropping up around the nation to empower citizens with the tools to identify, document, and report sediment problems. Georgia's Get the Dirt Out (GTDO) and North Carolina's Muddy Water Watch are good examples.

### *Georgia Launches Citizen Training Program*

Like other states experiencing rapid population growth, Georgia has a sediment problem. According to Georgia's Environmental Protection Division, sediment-laden stormwater from land-disturbing activities is the state's leading source of nonpoint source water pollution. When the Atlanta-based, nonprofit Upper Chattahoochee Riverkeeper (UCR) formed in 1994, one of its first steps as an environmental advocacy group was to take action to reduce soil erosion and protect water quality, notes UCR's Jason Ulseth. "In times of tight budgets, states often do not have enough inspectors to keep pace with development and inspections occur only as a result of complaints. In some cases, the lack of erosion control measures results in significant personal property damage to citizens downstream."

*Programs Teach  
Citizens to Get  
the Dirt Out  
(continued)*

Using grant funds from the U.S. Environmental Protection Agency (EPA), UCR worked with other Riverkeeper programs in the state to study the effectiveness of Georgia's erosion control program between 2005 and 2007. UCR quickly realized that the Upper Chattahoochee watershed and the state needed a sediment best management practice (BMP) education program—and the GTDO program was born ([www.getthedirtout.org](http://www.getthedirtout.org)).



**The erosion control practices on this construction site are poorly designed and maintained, which allows excessive sediment to be carried off-site during heavy rainfall events.**

“GTDO empowers citizens to identify and take the appropriate steps to rectify sediment pollution using the Clean Water Act,” explains Ulseth. Targeted at citizens, developers and local governments, GTDO's educational materials incorporate information from the 2003-issued Georgia General Stormwater Construction Permit, BMP effectiveness information, and local government and Georgia Environmental Protection Division regulations. UCR and other state Riverkeepers held 30 GTDO workshops between 2005 and 2007 and trained more than 500 participants statewide.

Since 2007, UCR has focused its GTDO program efforts in high-priority watersheds within the Upper Chattahoochee River Basin and in negotiating the reissuance of the General Construction Permit in 2008. Today, the Georgia River Network ([www.garivers.org](http://www.garivers.org)) coordinates the implementation of the statewide GTDO program, including training new GTDO trainers, hosting biannual trainer meetings and orchestrating

GTDO trainings for interested organizations and citizens. The Turner Foundation pays for the train-the-trainer materials, but local training material costs are paid for by the participant at a cost of roughly \$20 per trainee.

### *North Carolina Adapts GTDO*

While UCR was developing GTDO, North Carolina's Upper Neuse Riverkeeper (UNR), Dean Naujoks, was struggling with similar construction sediment problems in North Carolina waters. According to UNR interviews with EPA Region 4 staff and local officials, more complaints were received for sediment than for any other environmental concern. “Sediment is the single largest source of impairments to our waters, and we must meaningfully address this problem,” says Naujoks.

As in Georgia, North Carolina had too few inspectors, and many citizens were feeling helpless when development-caused erosion and sedimentation damaged their property. “Homeowner associations have routinely spent \$70–150,000 to dredge ponds that have been filled with sediment due to upstream developments. When inspectors are not available or do not pursue stop work orders on violating sites, citizens often turn to local Riverkeeper programs to help understand their legal rights under the Clean Water Act when their property is damaged,” adds Naujoks. “I just can't

express the level of frustration that citizens have conveyed about this issue. They want something done about it.” UNR became overwhelmed as staff members received more citizen requests for help than they could effectively manage. Naujoks realized that citizens needed to be trained and engaged.



**At the confluence of North Carolina's Dry Creek (left) and the Haw River (right), an observer can clearly see the high sediment load carried by the Haw as it empties into the clear waters of Dry Creek. These types of visible pollution problems can jump start citizens to become involved in construction site monitoring. (Photo courtesy of Jerry Markatos.)**

Fortunately, word of Georgia's GTDO program spread to North Carolina. Naujoks attended one of UCR's first training sessions. Impressed by the program, he received permission to use the GTDO materials and developed a program for the Upper Neuse River watershed called the Muddy Water Watch ([www.muddywaterwatch.org](http://www.muddywaterwatch.org)). Since unveiling its program in January 2008, UNR has trained approximately 200 people in Raleigh, NC—and people are asking for more. Local elected officials have provided positive feedback. In fact, a number of state senators, city council members and county commissioners have contacted the UNR to learn how they can bring the program to their region. The positive response prompted Riverkeepers throughout North Carolina to adopt the program and coordinate their efforts to conduct trainings throughout the state. “Another benefit of this program is that it helps people understand the impact of stormwater on water quality,” notes Naujoks.

### *How Does it Work?*

The Muddy Water Watch Web site provides information about upcoming workshops and offers pictures of properly and improperly functioning erosion control practices with easy-to-understand explanations. Once trained, participants receive a username and password that provides them access to a general online report card. A participant completes a report card for any site with a suspected erosion problem. Citizens do not actually evaluate sites; instead, they gather important site information and direct inspectors' attention to problems. The report card includes a comment section where citizens include directions to help inspectors quickly find a problem site. The report is submitted electronically to the inspector and the Neuse Riverkeeper. Once an inspector arrives at a site, he or she officially evaluates the site and takes necessary action. The citizen who filed the complaint is encouraged to follow up with the inspector to identify inspection results. If the erosion problem isn't addressed within one week, a local partner group (Riverkeeper, watershed organization, etc.) is available to help identify additional ways to resolve it.

The Muddy Water Watch Web site also offers a mapping tool that allows citizens to upload and view data, photos and videos that document erosion and sediment control violations. The tool is part of IMRivers ([www.imrivers.com](http://www.imrivers.com)), a site developed by the nonprofit organization River Network for its partner groups to use to develop interactive watershed maps and make these maps available to the public. Groups such as Muddy Water Watch can customize IMRivers as needed (see the UNR's Neuse River-specific IMRivers Web site at [www.imrivers.com/neuseriver](http://www.imrivers.com/neuseriver)). Because this information is accessible to the public, it can attract attention. For example, a Neuse River watershed citizen recently posted a video of an improperly managed construction site that had extensive runoff into a lake. Within 45 minutes of posting, the local TV news media found the video and interviewed the contractor and site inspector. The state quickly dealt with the problem.

### *Programs Serve as Models for Others*

Groups from around the country are seeing the benefits of programs like GTDO and Muddy Water Watch. Some places already have programs in place (see box). Others are just getting started; groups from Tennessee, New York, Indiana, South Carolina, Alabama and the Chesapeake Bay region are considering adopting programs similar to GTDO. UNR's Naujoks encourages these efforts and offers a few words of advice: "For those considering adopting this program, know that it is a commitment of several years to see results. However, the base materials to start your program already exist in GTDO." Now, let's get that dirt out!

### **Other Programs Targeting Sediment Pollution**

Many other organizations have either developed or are considering new programs to train citizens to monitor sediment runoff from construction sites. Here are a few examples of other active programs:

**Mud Busters** ([www.cbf.org](http://www.cbf.org); look under Act: Join Team Mud Busters). The Chesapeake Bay Foundation's (CBF) Mud Busters program is a Web-based tutorial on how to spot nonexistent, bad or failing sediment and erosion control practices. Citizens train themselves via the Web, inspect sites on their own and send pictures and a report to CBF. CBF then determines whether to pass it on to the local or state authorities. CBF uses the data to help resolve runoff problems on individual construction sites and support broader efforts to improve erosion and sediment control program implementation across the region. CBF recently began expanding this effort to include live trainings in the bay region.

**Get The Dirt Out: Erosion and Sediment Control** ([www.kwalliance.org](http://www.kwalliance.org); look under Publications). The Kentucky Waterways Alliance (KWA) developed a program modeled after the UCR's GTDO program. KWA's Web site offers a lengthy slide show used for volunteer training. It also includes a number of documents supporting the program, including a volunteer agreement, a BMP field guide for erosion and sediment control, a guide to identifying and monitoring construction, and a document explaining how to understand stormwater permits.

**Stormwater Watcher Program** ([www.re-sources.org/stormwater.htm](http://www.re-sources.org/stormwater.htm)) Created by People for Lake Whatcom (Washington) and the nonprofit organization RE Sources in 2004, this program trains volunteers and interns in the Puget Sound area to assess construction sites to ensure that appropriate erosion control measures are installed and maintained. Program staff members hold two training sessions per year and recruit new volunteers on an ongoing basis. The site offers links to an electronic newsletter, an online training slide show, an evaluation form and a protocol document.



[For more information on the Georgia River Network and Georgia's Get the Dirt Out program, contact Jesslyn Shields, 126 South Milledge Avenue, Suite E3, Athens, GA 30605. Phone: 706-549-4508; E-mail: [jesslyn@garivers.org](mailto:jesslyn@garivers.org). For more information and permission to use the Get the Dirt Out program materials, contact Jason Ulseth, Upper Chattahoochee Riverkeeper, 3 Puritan Mill, 916 Joseph Lowery Boulevard, Atlanta, GA 30318. Phone: 404-352-9828 ext. 16; E-mail: [julseth@ucriverkeeper.org](mailto:julseth@ucriverkeeper.org). For more information on the Muddy Water Watch, contact Dean Naujoks, Upper Neuse Riverkeeper, 112 S. Blount Street, Suite 103, Raleigh, NC 27601. Phone 919-856-1180; E-mail: [dean@neuseriver.org](mailto:dean@neuseriver.org)]

## Thinking Blue Helps Make Maine Lawns Green

Spring brings warmer temperatures and new growth in lawns and gardens. For some homeowners, spring also brings visions of drinking lemonade in a favorite yard chair while the children and dog play on a lush, green lawn. However, many are not aware that the pesticides and herbicides that they use to create their *perfect* lawn are affecting human and pet health as well as water quality. Maine's Cumberland County Soil and Water Conservation District's (CCSWCD's) new YardScaping program ([www.cumberlandswcd.org/yardscape](http://www.cumberlandswcd.org/yardscape)) aims to alter people's perceptions and convince them to make more environmentally friendly lawn care choices, thereby improving the water quality in local streams.

### What are NPDES Minimum Control Measures?

Under the NPDES Phase II regulations, operators of MS4s in urbanized areas and operators of small construction sites (one to five acres) must implement programs and practices to control polluted stormwater runoff. These operators must prepare a stormwater management program containing elements that address the following six technical areas:

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Post-Construction Management
- Pollution Prevention/Good Housekeeping

More information about NPDES Phase II requirements can be found at [www.epa.gov/npdes/pubs/fact1-0.pdf](http://www.epa.gov/npdes/pubs/fact1-0.pdf). A listing of best management practices to address these six minimum control measures is available at <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>.

The program developed as a group of communities along Maine's southern coast worked to implement their National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permits and address their impaired waters. Fourteen communities in Cumberland and York counties joined together to form the Interlocal Stormwater Group (ISWG). The ISWG provides its members with a forum to collaborate and share costs to implement several of the NPDES minimum control measures (see box). When it was time for the ISWG to address the public education minimum control measure, feedback from municipal staff and communities identified lawn care as a primary target. In fact, from 1995 to 2001, the number of lawn care companies in Maine had tripled, and amounts of yard care pesticides distributed had doubled to 1.8 million pounds. Not surprisingly, water quality monitoring data showed measurable pesticide levels in Casco Bay. In response, ISWG decided to develop an education program promoting environmentally friendly lawn care.

### Addressing the Problem

Fortunately, Maine has a statewide YardScaping program ([www.yardscaping.org](http://www.yardscaping.org)), which offers valuable educational information and resources about lawn care. ISWG decided to use the statewide program as a starting point and build a new, significantly expanded program to meet the needs of its region. ISWG hired CCSWCD to develop a YardScaping program that incorporated social marketing principles to identify and remove barriers to behavior change. To help support program development, CCSWCD secured grant funding from the Maine's Fund for Efficient Delivery of Local and Regional Services and also collaborated with the Casco Bay Estuary Partnership and the Presumpscot River Watershed Coalition for an EPA Targeted Watershed Grant.

As a first step, CCSWCD gathered information to determine the most effective delivery method for the YardScaping message. The group collected information through a telephone survey that helped define the demographics of their target audience, the audience's current practices, and motivations for action or inaction. Of the 388 phone surveys, 18 percent of households hire a lawn care company, 68 percent do their own lawn care and 14 percent do not have a lawn. CCSWCD also looked to lawn care focus groups for information. These groups noted that people look for lawn care information at stores where they purchase their lawn care products. These groups also identified the yellow rubber duck logo from Maine's *Think Blue* stormwater campaign ([www.thinkblumaine.org](http://www.thinkblumaine.org))

Thinking  
Blue Helps  
Make a Maine  
Lawn Green  
(continued)

as a recognized brand, which led CCSWCD to incorporate the duck picture into its YardScaping materials. By taking time to gather information, CCSWCD was able to learn more about their target audience, determine where to put their outreach materials and identify what brand would resonate with the public.

### Spreading the YardScaping Message

In fall 2007 and spring 2008, CCSWCD offered YardScaping educational classes in all 14 ISWG communities. They also initially posted YardScaping materials in four lawn care stores in South Portland as a successful pilot project; now, they offer the materials in 16 stores, including several major nurseries. Additionally, South Portland included brochures with tax bills, reaching more than 8,900 tax payers. Weekly YardScaping advertisements ran in early summer 2007 in the local *South Portland Sentry* newspaper. CCSWCD arranged for sticky notes with the YardScaping Web address to be attached to 50 *Do You Want a Lush Green Lawn Safe for Kids and Pets?* posters displayed at a variety of South Portland businesses such as doctor offices and health centers.

#### How Do I Implement Social Marketing Techniques?

EPA's *Getting In Step—A Guide for Conducting Watershed Outreach Campaigns* provides easy-to-follow instructions, case studies and worksheets to organize a social marketing campaign. Download *Getting In Step* at [www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf](http://www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf) or visit the *Getting In Step* Web-based training module at [www.epa.gov/watertrain/gettinginstep](http://www.epa.gov/watertrain/gettinginstep).

CCSWCD continues to hone the YardScaping message and delivery methods. For example, originally the group had envisioned YardScaping socials (i.e., a gathering in someone's home with friends and neighbors to share YardScaping information) as a key method of message delivery. However, YardScaping socials proved to be unsuccessful. CCSWCD learned that while many wish to learn more about how they should care for their lawn, it is a personal decision, and a social event in someone's home was not the right setting.

In 2008 they plan to distribute 5,000 door hangers in targeted neighborhoods, set up displays with handouts in every municipal center and most of the communities' libraries, and distribute more than 10,000 bookmarks with a *Six Easy Steps to a Healthy Lawn* message at community fairs and garden and home shows. CCSWCD hopes that their diverse methods of sharing the YardScaping message will pay off. "Outreach is needed on many levels for people to see our message multiple times in many places. Our budget is small, so we struggle to do as much as we believe is ideal," noted CCSWCD's Tamara Lee Pinard.



CCSWCD incorporated Maine's well-known *Think Blue* yellow duck into the YardScaping campaign for ISWG communities.

CCSWCD also uses the Web to reach and educate people. Their YardScaping Web site offers slide shows, articles, fact sheets and a listing of upcoming public workshops to help citizens implement these techniques. The site includes a pledge page for homeowners promising to adopt YardScaping techniques. Homeowners that pledge to YardScape are eligible to receive a free, weather-resistant Maine YardScaping yard sign ([www.yardscaping.org/involved.htm](http://www.yardscaping.org/involved.htm)) or a CCSWCD YardScaping yellow rubber duck flag (<http://cumberlandswcd.org/yardscap/pledge.htm>). CCSWCD encourages homeowners to proudly display these in a visible location where neighbors will notice and ask questions—thereby creating another avenue to get the Yardscaping message out to the public. The pledge program has been very popular—CCSWCD is currently developing a system to track the total number of people that have pledged to YardScape so far.

### Tracking Behavior Change

The group is also beginning a project to follow-up with past participants to assess how the YardScaping program has influenced behavior change. Homeowners who completed a YardScaping class or participated in an outreach event during the past year usually filled out a survey asking what environmentally friendly lawn care practices they intended to adopt in their yards now that they knew more about them. This summer, CCSWCD will ask many of these same individuals to fill out a follow-up survey to see which practices they actually adopted, explained Pinard. "The survey results will allow us to better assess how well our program has influenced people's behavior over time." Results are expected later this year.

The program's future looks bright, as requests for more YardScaping educational classes continue to pour in from garden clubs, homeowner associations and condo associations. CCSWCD also plans to target additional outreach at specific neighborhoods that they have identified as high priority. They intend to approach larger-scale lawn product businesses in the future—relying on experience with their current target group of 16 stores and nurseries to guide their efforts. Feedback and survey results will help lead CCSWCD staff members as they work to find new ways to promote their “YardScaping for a healthy Maine” message.

[For more information, contact Tamara Lee Pinard, Cumberland County Soil and Water Conservation District, 35 Main Street, Suite 3, Windham, ME 04062. E-mail: [tamara@cumberlandswcd.org](mailto:tamara@cumberlandswcd.org); Phone: 207-892-4700; Web: [www.cumberlandswcd.org](http://www.cumberlandswcd.org).]

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## Reviews and Announcements

### *Benefits of Low Impact Development Outlined in New EPA Report*

EPA has published *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, a new report that highlights 17 case studies from across North America that show the economic viability of LID practices. The report found that, in almost all cases, using LID practices in lieu of conventional development and stormwater management practices reduced project costs while improving environmental performance. Total capital savings in each case study ranged from 15 to 80 percent, with a few exceptions in which LID project costs were higher than conventional stormwater management costs. For a copy of the report, see [www.epa.gov/owow/nps/lid/costs07](http://www.epa.gov/owow/nps/lid/costs07).

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### *Country's Largest Permeable Parking Lot Unveiled*

The Illinois Sports Facilities Authority (ISFA), developer, owner and operator of U.S. Cellular Field in Chicago, recently unveiled the first environmentally friendly permeable paving parking lot to be used by a Major League sports facility. The new parking lot spans more than six acres and is the largest permeable paving parking lot in the country. The permeable paving system allows water to infiltrate and collect below the paving surface, substantially reducing or eliminating the amount of water entering the city's stormwater system and reducing localized flooding. The detained water is eventually absorbed into the subgrade below the surface and released naturally back into the environment, filtering out most contaminants. For more information, see the April 8, 2008 ISFA press release at [www.isfaauthority.com](http://www.isfaauthority.com).

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### *EPA Launches New Smart Growth Podcast Series*

In June 2008 EPA's Office of Wetlands, Oceans and Watersheds posted *From Gray Funnels to Green Sponges*, its first podcast in a planned series of audio programs about smart growth and green development. Hosted by EPA's Jamal Kadri, this program features a discussion with EPA's senior urban designer and smart growth expert Clark Wilson on how communities can more effectively manage rainwater and snow melt where it falls. Green streets can make great places, preserve water quality and restore our nation's waterways. These and other practices such as rain gardens and green roofs are helping many urban communities (e.g., Portland, Chicago, and Washington, D.C.) manage stormwater runoff as well as provide aesthetic benefits. In addition, green streets and other environmentally friendly landscape designs can help minimize the urban heat island effect, reduce a community's carbon footprint, and cool the planet. To access the podcast, see [www.epa.gov/owow/podcasts](http://www.epa.gov/owow/podcasts).

EPA also offers archived versions of Watershed Academy Webcasts as podcasts (see [www.epa.gov/watershedwebcasts](http://www.epa.gov/watershedwebcasts)).

## *EPA Offers Agricultural Regulatory Matrix*

EPA created a regulatory matrix titled *Major Existing EPA Laws and Programs That Could Affect Agricultural Producers* that provides a succinct, general description of EPA's requirements for both regulatory and voluntary programs. This compliance assistance tool, available at [www.epa.gov/agriculture/agmatrix.pdf](http://www.epa.gov/agriculture/agmatrix.pdf), is designed for agricultural producers, federal and state regulators, and third parties who provide information and services to agricultural producers.

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## *EPA Releases Watershed Outreach Resources in New Formats*

EPA recently made two of its popular resources available on CD and DVD:

- (1) EPA's *Nonpoint Source Outreach Toolbox* was just released as a CD edition (publication # 841-C-05-003). With nearly 700 MB of multimedia files, this is a slightly scaled-down version of all the resources available at [www.epa.gov/nps/toolbox](http://www.epa.gov/nps/toolbox). (All TV, radio and print ads are available, but no "other products.")
- (2) *Getting in Step: A DVD Guide for Conducting Watershed Outreach Campaigns* (publication # 841-C-07-001). This 2003 classic, originally released in VHS format, is now out on DVD. The DVD includes chapter menu and closed captioning.

Both resources are available for free through the National Service Center for Environmental Publications (NSCEP) by calling toll-free 1-800-490-9198 or e-mailing the National Service Center for Environmental Publications ([nscep@bps-lmit.com](mailto:nscep@bps-lmit.com)).

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## *FY 2009 National Water Program Guidance Released*

EPA has released the final Fiscal Year 2009 National Water Program Guidance (see [www.epa.gov/water/waterplan/fy09.html](http://www.epa.gov/water/waterplan/fy09.html)). This is the second annual water program guidance to implement the EPA 2006-2011 Strategic Plan. This guidance describes water program priorities and strategies, including a suite of water performance measures and their targets.

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## *Kit Available for Smart Watershed Benchmarking Tool*

The Center for Watershed Protection recently released its popular Smart Watershed Benchmarking Tool as spiral-bound guidebook with a CD containing a PDF form that a user can fill out on a personal computer and save for later use. Available for \$30, the materials can be ordered from CWP's Web site at [www.cwp.org](http://www.cwp.org). For more information, see the 2006 *NPS News-Notes* article about the original Smart Watershed Benchmarking Tool at [www.epa.gov/owow/info/NewsNotes/pdf/79issue.pdf](http://www.epa.gov/owow/info/NewsNotes/pdf/79issue.pdf).

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## *Manual Helps Integrate Water and Waste Programs to Restore Watersheds*

A new EPA manual, *Integrating Water and Waste Programs to Restore Watersheds: A Guide for Federal and State Project Managers*, is designed to help project managers in water and waste programs who are working on assessment or cleanup projects in watersheds contaminated by hazardous materials or waste. The manual also serves as a helpful reference document for stakeholders involved in watershed cleanup efforts. The goal of the manual is to enhance coordination across EPA and state waste and water programs by identifying opportunities for streamlining requirements, leveraging resources and implementing restoration activities more efficiently. This manual provides valuable guidance and information to enable effective use of water and waste program authorities and resources to restore and protect watersheds. The manual is available at [www.epa.gov/superfund/resources/integrating.htm](http://www.epa.gov/superfund/resources/integrating.htm).

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## Model Stormwater Construction SWPPPs Available

EPA has developed two example stormwater pollution prevention plans (SWPPPs) to supplement EPA's popular *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites* (commonly known as the EPA SWPPP guide). The first example SWPPP addresses a medium-sized residential subdivision and the second addresses a small commercial site. Both examples utilize the SWPPP template found in the SWPPP guide. These examples use hypothetical sites and conditions to demonstrate how to develop a SWPPP that meets permit requirements and accurately describes steps taken to prevent stormwater pollution. To view these model SWPPPs, find an updated SWPPP template, or access any of EPA's SWPPP resources, please visit [www.epa.gov/npdes/swpppguide](http://www.epa.gov/npdes/swpppguide).

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## National Green Infrastructure Plan for Urban Wet Weather Management Launched

In January 2008 EPA and state and national partners released a comprehensive strategy to reduce runoff and increase environmental and economic benefits for communities. Titled *Managing Wet Weather with Green Infrastructure Action Strategy 2008*, the strategy will help reduce stormwater runoff and sewer overflows by promoting "green infrastructure" approaches, such as green roofs, trees and tree boxes, rain gardens and porous pavements. Green infrastructure techniques, technologies and practices reduce the amount of water and pollutants that run off a site. The plan explains how states, municipalities, permitting authorities and non-governmental organizations can use green infrastructure practices to meet water quality goals while sustaining their water infrastructure. The document outlines ways to bring green infrastructure technologies and approaches into mainstream use for runoff and sewer overflow management. For more information, see [www.epa.gov/npdes/greeninfrastructure](http://www.epa.gov/npdes/greeninfrastructure).

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## New EPA Report Summarizes 17 TMDLs with Stormwater Sources

EPA recently issued a new document called *Total Maximum Daily Loads with Stormwater Sources: A Summary of 17 TMDLs*. This report summarizes TMDLs that have been developed for stormwater sources in 16 states throughout the country. These TMDL summaries represent a range of pollutants, models used, and different allocation and implementation methods that will be helpful to TMDL practitioners, NPDES permitting agencies and permittees as they develop and implement new stormwater source TMDLs. To download this new publication, see [www.epa.gov/owow/tmdl/techsupp.html](http://www.epa.gov/owow/tmdl/techsupp.html).

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## New Enviromapper for Water Released

EPA recently launched a new version of *Enviromapper for Water*, a Web-based tool to help the public access water data. Available at <http://map24.epa.gov/emr>, the new site offers improved mapping capabilities that makes data and reports easier to access and download. For example, users can use the new Enviromapper to zoom to a watershed, area, or set of monitoring locations and get summary information. Users can also download water quality data for a specific location directly from the mapping interface. More details will be provided in an upcoming issue of *Nonpoint Source News-Notes*.

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## NPDES Compliance Monitoring Strategy Released

EPA's Office of Enforcement and Compliance Assurance has issued its *Clean Water Act National Pollutant Discharge Elimination System Compliance Monitoring Strategy for the Core Program and Wet Weather Sources*. This new strategy, which takes effect in 2009, outlines inspection and compliance goals for the entire NPDES program, including major and minor NPDES facilities, pretreatment programs, biosolids, CSOs, SSOs, stormwater, and CAFOs. It places increased emphasis on wet weather issues, particularly stormwater sources, and sets ambitious targets for audits and inspections of Phase I and II MS4s, construction sites, and industrial facilities. For more information, see [www.epa.gov/compliance/monitoring/programs/cwa/npdes.html](http://www.epa.gov/compliance/monitoring/programs/cwa/npdes.html).

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## Report Guides Application of Watershed Ecological Risk Assessment

EPA Office of Research and Development's National Center for Environmental Assessment just published a new report, *Application of Watershed Ecological Risk Assessment Methods to Watershed Management*, which addresses issues that are unique to ecological assessments of watersheds. Intended to supplement the *Guidelines for Ecological Risk Assessment* (USEPA, 1998), the report incorporates lessons learned from previous watershed ecological risk assessments and offers guidance and examples for scientists performing watershed ecological risk assessments today. Available at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=162845>, the report also serves as a valuable resource to risk assessors, watershed associations, landscape ecologists and others seeking to increase the use of environmental assessment data in decision making.

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## Stormwater Center Report Details Performance of Treatment Systems

The University of New Hampshire Stormwater Center and its partner, Cooperative Institute for Coastal and Estuarine Environmental Technology, recently published a report that offers performance data on stormwater treatment systems. Between September 2004 and August 2006, researchers evaluated 16 stormwater treatment systems for their ability to improve runoff water quality and reduce runoff quantity during 30 rainfall-runoff events with a range of seasonal and storm characteristics. The report includes the data collected during this time, as well as information on the land use settings in which the evaluated systems are typically deployed, the type of application to which they are best suited, installation costs and required maintenance. The report can be downloaded at [http://ciceet.unh.edu/unh\\_stormwater\\_report\\_2007](http://ciceet.unh.edu/unh_stormwater_report_2007).

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## Stormwater Management Guides Available for Municipalities

EPA Region 3 has developed guides to help municipalities implement municipal stormwater management programs under the National Pollutant Discharge Elimination System (which authorizes discharges from point sources to U.S. waters). The documents, available at [www.epa.gov/npdes/stormwater/municipal](http://www.epa.gov/npdes/stormwater/municipal), include:

- Evaluating the Effectiveness of Municipal Stormwater Programs
  - Funding Stormwater Programs
  - Incorporating Environmentally Sensitive Development Into Municipal Stormwater Programs
  - Understanding Impaired Waters and Total Maximum Daily Load (TMDL) Requirements for Municipal Stormwater Programs
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## Tool Can Help Keep More Beaches Open

EPA has released a new tool that can help keep beaches open for swimming. Developed and piloted at beaches around the Great Lakes, the *Great Lakes Beach Sanitary Survey Tool* can be applied at any beach around the country. The beach sanitary survey tool evaluates the beach area and surrounding watershed for existing and potential sources of pollution. Information collected may include the number of birds at a beach, slope of the beach, location and condition of bathrooms, amount of algae present, location of storm water outfalls and soundness of residential septic tanks. The tool essentially helps beach managers identify sources of bacterial contamination at their beaches so they can quickly address them. For more information, see [www.epa.gov/waterscience/beaches/sanitarysurvey](http://www.epa.gov/waterscience/beaches/sanitarysurvey).

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## Water Quality Standards Academy Offers New Online Training Course

EPA has developed a multi-media, Web-based training course for state and tribal employees and the general public about key aspects of the water quality standards program and other related Clean Water Act programs. This online training program is an abbreviated version of the week-long, classroom-based Water Quality Standards Academy course, and includes the following modules:

(1) Introduction to EPA and the Clean Water Act; (2) Waterbody Uses; (3) Water Quality Criteria; (4) Antidegradation; (5) Standards Submittal and Approval; and (6) Variances, Using Attainability Analyses, Mixing Zones and Other Flexibility Options. Each module is designed to be completed in approximately 15 minutes. The modules present text-based information across a sequence of pages that include user interactions, links to further information and resources, brief video clips that expand on important points and brief quizzes. The online training course is designed for people with little familiarity with the water quality standards program, but it can also serve as a good refresher course for people with experience in this subject. To access the online training course, see [www.epa.gov/waterscience/standards/academy](http://www.epa.gov/waterscience/standards/academy). For more information, contact Bryan Goodwin at 202-566-0762 or [goodwin.bryan@epa.gov](mailto:goodwin.bryan@epa.gov).

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### *Watershed-based Plan Certification Granted to Tribe*

EPA Region 10 recently certified the Jamestown S’Klallam Tribe’s watershed-based plan, *Protecting and Restoring the Waters of the Dungeness*. Certification was based on compliance with federal tribal nonpoint source program guidelines. The Jamestown S’Kallam Tribe, based along the north coast of Washington’s Olympic Peninsula, is the first Native American Tribe to achieve certification of a watershed-based plan. The purpose of the plan, as described by the Tribe, is to characterize the Dungeness Watershed area, highlighting the causes and sources of nonpoint source pollution. The detailed plan describes watershed area goals along with management measures for protecting water quality and restoring impaired water bodies. Numerous water bodies in the Dungeness Watershed are impaired by low dissolved oxygen, fecal coliform contamination, loss of habitat and the presence of heavy metals. For more information, go to [www.epa.gov/newsroom/newsrooms.htm](http://www.epa.gov/newsroom/newsrooms.htm), select “Region 10,” and search for the 01/31/2008 press release.

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### *WEF Third-Party TMDL Toolkit Released*

The Water Environment Federation (WEF) released a new Tool Kit for the development of third-party TMDLs. A third-party TMDL is one in which an organization or group other than the lead water quality agency takes responsibility for developing the TMDL document and supporting analysis. Third parties such as watershed management groups, industries, municipalities, utilities, local and state environmental regulators, planning agencies, universities and other stakeholders are often very familiar with local watershed issues. They can provide valuable insights to the TMDL process and may be able to help leverage state funds, as well as the resources and expertise of other agencies and non-governmental organizations. For more information, see [www.wef.org/ThirdPartyTMDL](http://www.wef.org/ThirdPartyTMDL).

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### *Wetlands and Watersheds Article Series Complete*

The Center for Watershed Protection recently released the final article of its six-part *Wetlands and Watersheds Article Series*. The last article, *The Next Generation of Stormwater Wetlands*, provides information about stormwater wetlands with improved performance and community acceptance. CWP hopes to rejuvenate the use of wetlands as a stormwater treatment practice. Two new stormwater wetland designs are presented, including an emergent wetland/pond system and a wooded wetland. The authors recommend their use in place of the classic shallow marsh and pond/wetland system designs, and discuss some ways to further develop and test these new prototypes. To download all articles in the series, see [www.cwp.org/Resource\\_Library/Special\\_Resource\\_Management/wetlands.htm](http://www.cwp.org/Resource_Library/Special_Resource_Management/wetlands.htm).

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## **Recent and Relevant Periodical Articles**

### *Beyond the Pond—A Low-Cost, Low-Tech Way to Manage Manure*

By Laura McGinnis ([www.ars.usda.gov/is/AR/archive/nov07/pond1107.htm](http://www.ars.usda.gov/is/AR/archive/nov07/pond1107.htm))

This article, which appeared in the November/December 2007 issue of *Agricultural Research* magazine, describes a new method of manure runoff control from feedlots. In the United States, feedlot runoff is often stored in a large pond or basin. From there, it is either distributed as nutrient-rich

irrigation water or processed for safe disposal. Ponds are expensive to maintain and may cause problems over time such as leaking nutrients through the soil into groundwater. This article describes an alternative system, designed by research leader John Nienaber and agricultural engineers Roger Eigenberg and Bryan Woodbury. The new system holds runoff containing manure solids in temporary storage basins at the base of the sloped feedlot. The basin is large enough to hold runoff for several hours to allow the solid waste to settle to the bottom. The remaining liquid is then drained through distribution tubes that provide even dispersal over a grassy field or vegetative treatment area. This system has many benefits: it requires minimal management, significantly reduces waste storage time, eliminates the need for costly runoff pumping, and removes standing water.

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## *Differences in Phosphorus and Nitrogen Delivery to the Gulf of Mexico from the Mississippi River Basin*

By Alexander, Smith, Schwarz, Boyer, Nolan, and Brakebill  
([http://water.usgs.gov/nawqa/sparrow/gulf\\_findings](http://water.usgs.gov/nawqa/sparrow/gulf_findings))

This report, developed by U.S. Geological Survey staff and others, finds that nine states in the Mississippi River Basin contribute the majority of nutrients to the northern Gulf of Mexico, threatening the economic and ecological health of one of the nation's largest and most productive fisheries. Excessive nutrients have resulted in elevated algae growth; when the algae die, they sink to the bottom and decompose, in turn creating a zone of low dissolved oxygen or hypoxia. This can stress and cause death in bottom-dwelling organisms in the Gulf. The states of Illinois, Iowa, Indiana, Missouri, Arkansas, Kentucky, Tennessee, Ohio and Mississippi make up only one-third of the 31-state Mississippi River drainage area, but contribute more than 75 percent of nitrogen and phosphorus to the Gulf. Corn and soybean cultivation is the largest contributor of nitrogen to the Gulf. Animal manure on pasture and rangelands and crop cultivation are the largest contributors of phosphorus.

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## *National, Holistic, Watershed-Scale Approach to Understand the Sources, Transport and Fate of Agricultural Chemicals*

By Capel, McCarthy, and Barbash (<http://jeq.scijournals.org/cgi/reprint/37/3/983>)

This article is the first of a series of reports which features in-depth U.S. Geological Survey investigations in five agricultural watersheds across the United States. Findings highlight how natural environmental processes and agricultural practices interact to determine the transport and fate of agricultural chemicals in the environment. The holistic study design focuses on the catchment scale and addresses several environmental components, including surface water, ground water, the unsaturated zone, the streambed, and the atmosphere. The study areas were selected to represent major agricultural settings and, therefore, findings are relevant throughout much of the nation. The remaining reports can be accessed at <http://jeq.scijournals.org/content/vol37/issue3/> by selecting "Special Submissions."

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## *Rivers Great and Small Can Fight Pollution, If Given Chance*

From Science Daily ([www.sciencedaily.com/releases/2008/03/080312140118.htm](http://www.sciencedaily.com/releases/2008/03/080312140118.htm))

This press release discusses a new national research study published in the journal *Nature* that shows that healthy streams with vibrant ecosystems play an important role in removing excess nitrogen caused by human activities. A team of 31 aquatic scientists across the country documented the amount of nitrogen that rivers and streams can filter through tiny organisms or release into the atmosphere through a process called biological denitrification. The scientists conducted experiments in 72 streams across the United States (including Puerto Rico) that spanned a diversity of land uses, including urban, agricultural and forested areas. They discovered that, in healthy ecosystems, roughly 40 to 60 percent of nitrogen was taken up by a river system within 500 meters of the source where it entered the river. The study is important, scientists say, because it provides some of the best evidence of the extent to which healthy rivers and streams can help prevent eutrophication.



## *River Plants May Play Major Role in Health of Ocean Coastal Waters*

By Denise Brehm (<http://web.mit.edu/newsoffice/2008/techtalk52-16.pdf>)

This article, featured in the February 13, 2008 issue of the Massachusetts Institute of Technology's (MIT's) *Tech Talk*, describes recent research conducted by MIT's Department of Civil and Environmental Engineering on how aquatic plants in rivers and streams affect the health of large areas of ocean coastal waters. This work describes the physics of water flow around aquatic plants and demonstrates the importance of basic research to environmental engineering. This new understanding can be used to guide restoration work in rivers, wetlands and coastal zones by helping ecologists determine the vegetation patch length and planting density necessary to dampen storm surge, lower nutrient levels, or promote sediment accumulation and protect the new patch from erosion.

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## **Web Sites Worth a Bookmark**

### *Clean Boats Campaign* ([www.iwla.org/index.php?id=461](http://www.iwla.org/index.php?id=461))

The Izaak Walton League's Clean Boats Campaign is designed to teach people about cleaning boats and other recreational equipment between waterway visits to prevent aquatic invasive species from hitching a ride. The Web site includes educational information and a "Clean Boats Challenge" sweepstakes quiz that visitors can take to test their knowledge. Each month through October 2008, the Izaak Walton League will randomly select one correct entry—the winner will receive a \$100, \$500, or \$2,500 boater's shopping spree. The site also offers links to other online aquatic invasive species resources.

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### *eXtension* ([www.extension.org](http://www.extension.org))

This Web site, pronounced "e-extension," is a new initiative developed through a partnership of 74 universities in the United States. The site provides objective and research-based information and learning opportunities that are designed to help people improve their lives and protect the environment. Cooperative Extension professionals from across the nation use eXtension to post new educational and information resources on wide-ranging topics. Resource topic areas continue to expand; currently, topics include community, disaster, family, farm, pest management, and youth. The site's intended target audience includes students, researchers, clinicians, professors, and the general public.

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### *Impaired Waters and TMDLs* ([www.epa.gov/owow/tmdl](http://www.epa.gov/owow/tmdl))

EPA's recently revised Impaired Waters and Total Maximum Daily Loads (TMDLs) homepage features an overview of the Clean Water Act section 303(d) program activities, highlights new resources, and provides easier access to program resources, such as EPA's new Water Quality Assessment and TMDL Information (ATTAINS) Web site (see the ATTAINS article earlier in this newsletter for more information). The site also features a new TMDL Stormwater Resources page that hosts several stormwater-source TMDLs and case studies highlighting the innovative approaches that states are using to address stormwater pollution (see [www.epa.gov/owow/tmdl/stormwater](http://www.epa.gov/owow/tmdl/stormwater)). EPA plans to add additional pages in the near future, including a new TMDLs at Work page, which will highlight successful restoration efforts where TMDL and 303(d) activities were an important part of the process, and a TMDL Mercury Air Deposition page that will host a variety of resources and examples for developing TMDLs for waters impaired by mercury.

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### *Nutrient and Pesticide Management* ([www.usawaterquality.org/themes/npm](http://www.usawaterquality.org/themes/npm))

This site is part of the National Water Program Web site, which is developed and maintained by the U.S. Department of Agriculture's Cooperative State Research, Education and Extension Service. The site explores approaches and new techniques to reduce or target levels of nutrient and pesticide use in agriculture, at home and in commercial sectors. The site discusses ongoing nutrient and pesticide management research, opportunities for child and adult education, examples of Cooperative

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Extension efforts pertaining to Nutrient and Pesticide Management, several success stories and numerous links to other online resources.

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### *Pharmaceuticals and Personal Care Products as Pollutants ([www.epa.gov/ppcp](http://www.epa.gov/ppcp))*

This new EPA Web site is dedicated to the scientific issues associated with the occurrence of pharmaceuticals and personal care products (PPCPs) in the environment. The site includes (1) basic information about PPCPs and why their presence in water is a concern; (2) answers to frequent questions about PPCPs; and (3) descriptions of EPA's PPCP-related research projects.

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### *Using Rainwater to Grow Livable Communities ([www.werf.org/livablecommunities](http://www.werf.org/livablecommunities))*

The Water Environment Research Foundation recently developed a new Web site to facilitate the integration of stormwater BMPs into development projects. The site can be used by municipalities and others to educate and inform constituents and stakeholders about sustainable stormwater practices. Learn about Kansas City's "10,000 rain gardens" initiative, Chicago's green roofs program, or how Philadelphia is converting vacant land covered with trash and debris into valuable assets that offer stormwater management benefits. Information from these and other case studies, as well as tools that can be used for effective communication on sustainable stormwater BMPs, is available at [www.werf.org/livablecommunities](http://www.werf.org/livablecommunities).

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### *Your Water. Your Decision. ([www.ProtectDrinkingWater.org](http://www.ProtectDrinkingWater.org))*

The Source Water Collaborative, a group of 16 national organizations including EPA, is launching a campaign to help local decision makers take advantage of opportunities to protect sources of drinking water, understand the costs involved and consider ways to pay for it. The campaign's Web site offers a guide for community leaders, a toolkit for using the guide and links to technical and educational information.

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## **Calendar**

For an updated events calendar,  
see [www.epa.gov/newsnotes/calendar.htm](http://www.epa.gov/newsnotes/calendar.htm).

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### **July 2008**

- 21-23 *Working Forum on Nature Education: New Tools for Connecting the World's Children with Nature*, Nebraska City, NE. For more information, see [www.worldforumfoundation.org/wf/wf2008\\_nature](http://www.worldforumfoundation.org/wf/wf2008_nature).
  - 23 *Stormwater 101*, Webcast. For more information, see [www.epa.gov/npdes/outreach\\_files/sw\\_webcasts\\_2008.pdf](http://www.epa.gov/npdes/outreach_files/sw_webcasts_2008.pdf).
  - 26-30 *Soil and Water Conservation Society Annual Conference*, Tucson, AZ. For more information, see [www.swcs.org/en/conferences/2008\\_annual\\_conference](http://www.swcs.org/en/conferences/2008_annual_conference).
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### **August 2008**

- 3-7 *StormCon: North American Surface Water Quality Conference & Exposition*, Orlando, FL. For more information, see [www.stormcon.com](http://www.stormcon.com).
  - 4-8 *21st North American Prairie Conference: The Prairie Meets the River*, Winona, MN. For more information, see <http://bio.winona.edu/NAPC>.
  - 12-14 *Building Sustainable Communities for the 21st Century*, Charleston, SC. For more information, see [www.southeastwaterforum.org/roundtables](http://www.southeastwaterforum.org/roundtables).
  - 15 *Implementing a Nutrient Management Plan*, Webcast. For more information, see [www.extension.org/pages/Upcoming\\_Webcasts](http://www.extension.org/pages/Upcoming_Webcasts).
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### **September 2008**

- 2-5 *Floodplain Sustainability: Integrating Flood Risk, Land Use and Environmental Stewardship*, San Diego, CA. For more information, see [www.floodplain.org](http://www.floodplain.org).
  - 3 *Illicit Discharge Detection and Elimination (IDDE) 301*, Webcast. For more information, see [www.epa.gov/npdes/outreach\\_files/sw\\_webcasts\\_2008.pdf](http://www.epa.gov/npdes/outreach_files/sw_webcasts_2008.pdf).
  - 3-5 *50 Years of Soil and Water Research in a Changing Agricultural Environment: USDA-ARS National Sedimentation Laboratory, 1958-2008*, Oxford, MS. For more information, see <http://nsl.olemiss.edu>.
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- 7-12 *2008 Eastern Regional Wetland Restoration Training*, Olympia, KY. For more information, see [http://tfce.uky.edu/wri\\_2008.htm](http://tfce.uky.edu/wri_2008.htm).
- 11 *TMDL Development and Implementation: Current Progress and Future Direction*, Baltimore, MD. For more information, see [www.wef.org/ConferencesTraining/Seminars/TMDLDevelopment](http://www.wef.org/ConferencesTraining/Seminars/TMDLDevelopment).
- 14-18 *16th National Nonpoint Source Monitoring Workshop*, Columbus, OH. For more information, see <http://streams.osu.edu/conf.php>.
- 15-19 *Wetlands 2008: Wetlands and Global Climate Change*, Portland, OR. For more information, see <http://aswm.org/calendar>.
- 17-20 *Managing Water in a Climate Changing World: Implications for Irrigation, Drainage and Flood Control*, Portland, OR. For more information, see [www.uscid.org/08gcc.html](http://www.uscid.org/08gcc.html).
- 22-24 *California Stormwater Quality Association Conference*, Oakland, CA. For more information, see <http://stormwaterconference.com>.
- 25-27 *West Coast Green 2008*, San Jose, CA. For more information, see [www.westcoastgreen.com](http://www.westcoastgreen.com).

## October 2008

- 7-9 *FLOW 2008: Interdisciplinary Solutions to Instream Flow Problems*, San Antonio, TX. For more information, see [www.instreamflowcouncil.org](http://www.instreamflowcouncil.org).
- 8-10 *WaterSmart Innovations*, Las Vegas, NV. For more information, see [www.watersmartinnovations.com](http://www.watersmartinnovations.com).
- 11-15 *4th National Conference on Coastal and Estuarine Habitat Restoration: Creating Solutions through Collaborative Partnerships*, Providence, RI. For more information, see [www.estuaries.org/conference](http://www.estuaries.org/conference).
- 13-14 *International Conference on Non-renewable Groundwater Resources*, Portland, OR. For more information, see [www.unesco.org/water/water\\_events/Detailed/1570.shtml](http://www.unesco.org/water/water_events/Detailed/1570.shtml).
- 17 *Physical, Chemical, and Biological Impacts of Manure on Soil and Water*, Webcast. For more information, see [www.extension.org/pages/Upcoming\\_Webcasts](http://www.extension.org/pages/Upcoming_Webcasts).
- 18-22 *WEFTEC.08 Conference*, Chicago, IL. For more information, see [www.weftec.org](http://www.weftec.org).
- 20-22 *Farming with Grass: Achieving Sustainable Mixed Agricultural Landscapes in Grasslands Environments*, Oklahoma City, OK. For more information, see [www.swcs.org/fwg](http://www.swcs.org/fwg).
- 26-30 *Annual International Conference on Contaminated Soils, Sediments and Water*, Amherst, MA. For more information, see [www.umasssoils.com](http://www.umasssoils.com).
- 26-30 *International Water Conference*, San Antonio, TX. For more information, see [www.eswp.com/water](http://www.eswp.com/water).

## November 2008

- 3-6 *Southeast Regional Stream Restoration Conference*, Asheville, NC. For more information, see [www.bae.ncsu.edu/programs/extension/wqg/srp/2008conference](http://www.bae.ncsu.edu/programs/extension/wqg/srp/2008conference).
- 16-19 *2008 International Low Impact Development Conference*, Seattle, WA. For more information, see [www.asce.org/conferences/lid08](http://www.asce.org/conferences/lid08).
- 17-20 *AWRA 44th Annual Water Resources Conference*, New Orleans, LA. For more information, see [www.awra.org/meetings/NewOrleans2008](http://www.awra.org/meetings/NewOrleans2008).
- 17-20 *Coastal Cities Summit: Values and Vulnerabilities*, St. Petersburg, FL. For more information, see [www.coastalcities.org](http://www.coastalcities.org).

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