



Nonpoint Source News-Notes

May 2013, #94

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



Notes on the National Scene

New Clean Water Act Section 319 Guidelines Released

The U.S. Environmental Protection Agency (EPA) just released new guidelines that apply to recipients of grants made with congressionally appropriated Clean Water Act (CWA) section 319 funds which are used to help implement nonpoint source management programs. These guidelines apply to states, territories and the District of Columbia; EPA issues separate guidelines that apply to tribal recipients of section 319 funds. The newly revised guidelines provide updated program direction, an increased emphasis on project implementation in watersheds with impaired waters, and increased accountability measures.



To protect beachgoers, EPA recommends new recreational water quality criteria for bacteria. See [page 5](#).

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Note: Issue #92 (October 2012) was the final printed issue of *Nonpoint Source News-Notes*. Beginning with Issue #93, all issues will be available on EPA’s *Nonpoint Source News-Notes* website for viewing and download. If you have not already done so, please subscribe to the News-Notes notification service (instructions available at www.epa.gov/newsnotes) and we will notify you by email when each new issue becomes available.

EPA finalized the new guidelines after receiving input from stakeholders, including a comprehensive EPA-state workgroup process and a five-week public comment period. EPA issued draft revised guidelines in November 2012 for stakeholder review and released a final version in April 2013. States and EPA regions will implement these guidelines beginning in fiscal year 2014. The new guidelines replace the *Nonpoint Source Program and Grants Guidelines for States and Territories* that have been in effect since fiscal year 2004.

Key Changes Found in New Guidelines

The new guidelines revise the amount of money that states must set aside for watershed-based implementation. In fiscal year 2003, the total annual appropriation for the CWA section 319 program was \$238.5 million. The 2004 guidelines set aside \$100 million of the total appropriation to be used mostly for implementation of nine-element watershed-based plans that address nonpoint source problems in watersheds that contain impaired waters. The 2004 guidelines referred to this \$100 million set aside as “incremental” funds. Since then, the CWA section 319 appropriation has decreased to \$164.5 million; as a result, the \$100 million “incremental” set-aside no longer represents a reasonable balance in the allocation of nonpoint source management funds. The new guidelines recognize annual variability in appropriations, and require a revised set-aside of at least 50 percent of a state’s allocation for watershed projects to provide an appropriate balance between implementation of watershed-based plans and other important planning, assessment, management, and statewide nonpoint source (NPS) programs and projects. This 50 percent set-aside is referred to as “watershed project funds.” The remaining funds are referred to as “NPS program funds.”

In addition to the revised CWA section 319 watershed project set-aside, other significant changes in these revised guidelines include:

- The 2004 guidelines allowed states to use a portion (up to 20 percent) of their “incremental” funds for the purposes of developing watershed-based plans and total maximum daily loads (TMDLs). To increase the focus of CWA section 319 funding on watershed project implementation, these revised guidelines remove this allowance and require planning activities to be funded exclusively with the CWA section 319 program funds portion of their allocation.
- The guidelines continue to place a strong emphasis on restoring impaired waters with CWA section 319 watershed project funds. However, following consultation with EPA, states may use a limited amount of CWA section 319 watershed project funds for projects to protect high quality and unimpaired waters when protection is cited as a priority in the state’s updated nonpoint source management program.
- The guidelines include a renewed focus on ensuring that state nonpoint source management programs are updated on a five-year basis.
- To facilitate program efficiency, the guidelines require supplemental information for TMDLs developed with CWA section 319 funds. Specifically, for 319 funds to be used for TMDLs, supplemental information on nonpoint sources, loads and management measures must be developed.
- The guidelines provide an increased emphasis on coordination with U.S. Department of Agriculture (USDA) Farm Bill programs as a way to leverage water quality investments.
- The revised guidelines remove the 20 percent “base” funds cap on the use of CWA section 319 funds for statewide nonpoint source monitoring and assessment because these activities are important for measuring success and targeting watershed restoration and protection efforts.
- The revised guidelines require states with conditionally approved coastal nonpoint programs to set aside a portion of CWA section 319 funds to address all remaining conditions. (All states’ coastal nonpoint programs were initially approved with specific conditions where these programs were not yet in conformance with EPA’s published management measures across a range of nonpoint source categories to address impacts from agriculture, urban development, septic systems, timber harvesting, and marinas and boating.)

- The guidelines provide incentives for states to use innovative methods to leverage funds. States that leverage state or local funds equivalent to their total state CWA section 319 allocation for implementing approved watershed-based plans are exempt from needing to use half of their CWA section 319 funds to implement watershed projects. As a result, these states are granted more flexibility since the CWA section 319 program funds can be used much more broadly.

Nonpoint source pollution continues to dominate water quality impairments nationally, and although nonpoint source control funding needs far exceed the resources appropriated under CWA section 319, states are creatively addressing nonpoint source pollution by leveraging other federal and state resources, nurturing networks of community-based actions on a watershed scale, and developing statewide regulatory and non-regulatory programs. As a result, the nation is experiencing positive results in terms of both on-the-ground action and actual water quality improvements. Examples of improvements are summarized in CWA section 319 success stories, found at www.epa.gov/nps/success. Most of these successes are the direct result of state nonpoint source agencies' cooperation with other governmental agencies, private sector interests, and citizen groups at the state and watershed level.

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National Rivers and Stream Assessment Reveals Water Quality Challenges

In early 2013 the U.S. Environmental Protection Agency (EPA) released the draft results of the first comprehensive survey that revealed the health of thousands of stream and river miles across the country. The 2008-2009 *National Rivers and Stream Assessment* (see www.epa.gov/aquaticsurveys) reflects the most recent data available, and is part of EPA's expanded effort to monitor waterways in the U.S. and gather scientific data on the condition of the Nation's water resources.

During the summers of 2008 and 2009, more than 85 field crews sampled 1,924 river and stream sites across the country. Using standardized field methods, they sampled waters as large as the Mississippi River and as small as mountain headwater streams. Sites were selected using a random sampling technique that uses a probability-based design. This design allows for every element of the population to have a known probability of being selected for sampling. This study represents the first time that this statistically valid approach has been used to conduct a national monitoring study of the overall condition of streams and rivers. This design ensures that the results of the survey reflect the full variety of river and stream types and sizes across the United States. To determine water quality conditions, sampling results were compared to conditions at least-disturbed (or reference) sites in different ecological regions.

Key findings of the assessment include:

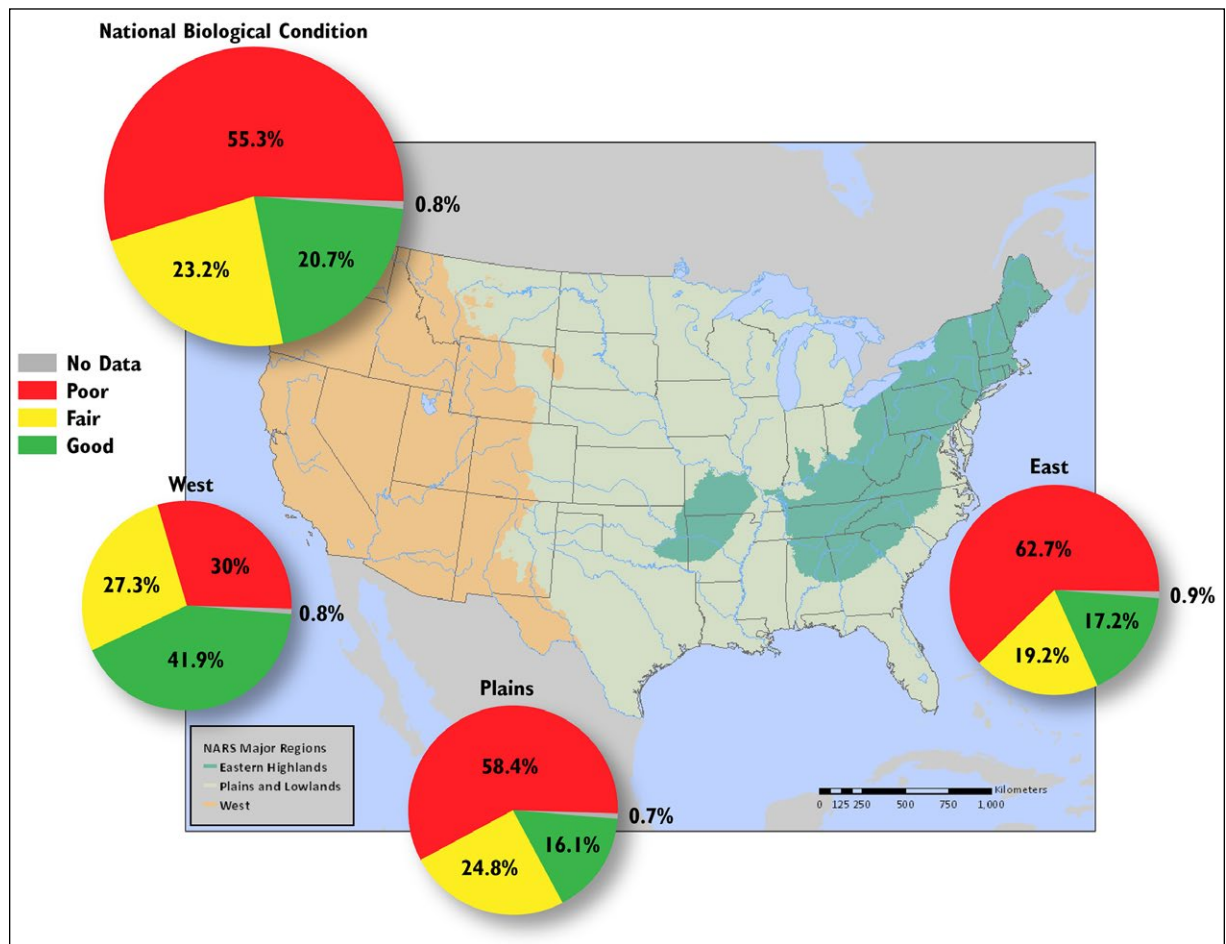
Most of streams are in poor biological condition. Twenty-one percent of the nation's river and stream length is in good biological condition, 23 percent is in fair condition, and 55 percent is in poor condition. Scientists arrived at these conclusions by applying a robust, commonly used biological assessment index that combines different measures of the condition of aquatic benthic macro-invertebrates (aquatic insects and other creatures such as crayfish). Biological condition assessment is the most comprehensive indicator of water body health: when the biology of a stream is healthy, the chemical and physical components of the stream are also typically in good condition.

Many streams have excessive nitrogen and phosphorus. Twenty-seven percent of the nation's rivers and streams have excessive levels of nitrogen, and 40 percent have high levels of phosphorus. Too much nitrogen and phosphorus in the water—known as nutrient pollution—causes significant increases in algae, which can harm water quality, food resources and habitats, and can decrease the available oxygen that fish and other aquatic life rely on to survive.

Streams and rivers are at an increased risk of becoming impaired because of decreased vegetation cover and increased human disturbance. These conditions can cause rivers and streams to be more vulnerable to flooding, erosion and pollution. Vegetation along rivers and streams slows the flow of rainwater, reduces streambank erosion, removes pollutants carried by rainwater and helps maintain water temperatures that support healthy aquatic life. Approximately 24 percent of the rivers and streams monitored were rated poor because of a loss of healthy vegetative cover.

Some streams contain elevated bacteria levels. High bacteria levels were found in nine percent (105,970 miles) of streams and rivers, making those waters potentially unsafe for swimming and other recreation.

Some streams have elevated mercury levels. Fish in more than 13,000 miles (one percent) of streams and rivers were identified as having elevated mercury levels in their tissue that may be unsafe for human consumption. For most people, the health risk from mercury by eating fish and shellfish is not a health concern, but some fish and shellfish contain higher levels of mercury that may harm an unborn baby or young child's developing nervous system.



The survey revealed the proportion of stream and river miles classified as being in good, fair or poor biological condition. Nationally, the survey showed that 55.3 percent of waters are classified as being in poor biological condition. Source: Draft National Rivers and Streams Assessment 2008–2009: A Collaborative Survey (EPA/841/D-13/001).

EPA held a free webcast on April 3, 2013 that discussed the key findings of the Draft National Rivers and Streams Assessment. The archived version of the webcast is available for viewing at www.epa.gov/watershedwebcasts.

EPA plans to use these new data to help make decisions about how to address critical restoration and protection needs for the country's rivers, streams and other waterbodies. This comprehensive survey will also help develop improvements to monitoring these rivers and streams across jurisdictional boundaries and enhance the ability of states and tribes to assess and manage water quality. Specific data summaries are available for a dozen geographic and ecological regions across the country.

“The health of our Nation’s rivers, lakes, bays and coastal waters depends on the vast network of streams where they begin, and this new science shows that America’s streams and rivers are under significant pressure,” said Office of Water Acting Assistant Administrator Nancy Stoner. “We must continue to invest in protecting and restoring our nation’s streams and rivers as they are vital sources of our drinking water, provide many recreational opportunities, and play a critical role in the economy.”

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EPA Releases New Recreational Water Quality Criteria Recommendations

In November 2012, the U.S. Environmental Protection Agency (EPA) recommended new, science-based recreational water quality criteria for states that will help protect peoples’ health during visits to beaches and waters year-round. The criteria provide information to help states improve public health protection by (1) addressing a broader range of illness symptoms, (2) accounting for pollution after heavy rainfall, (3) providing more protective recommendations for coastal waters, (4) issuing early alerts to beachgoers, and (5) promoting rapid water testing.



A girl plays in the South Carolina surf. New recreational criteria for bacteria will help states protect beachgoers, boaters and others who enjoy our waters.

The recommended criteria do not impose any new requirements. Instead, states can choose to use them to help set their own standards to protect swimmers from exposure to water that contains organisms that indicate the presence of fecal contamination.

The new criteria, developed pursuant to an order from a U.S. District Court and as required by the Beaches Environmental Assessment and Coastal Health Act of 2000, are based on several recent health studies. The criteria use a broader definition of illness to recognize that symptoms, such as stomach ailments, may occur without a fever. EPA also reduced the time period over which the results of monitoring samples may be averaged. Previously, states could average the samples over a 90-day period; the new recommendations call for a 30-day window instead. This produces a more accurate picture of water quality for that given time, allowing for improved public notification time. This shortened time period will account for heavy rainfall that can wash pollution into rivers, lakes or the ocean or cause sewer overflows.

The strengthened recommendations include:

- A short-term and long-term measure of bacteria levels that are to be used together to ensure that water quality is evaluated properly.
- Stronger recommendations for coastal water quality so public health is protected similarly in both coastal and fresh waters.
- A new rapid testing method that states can use to determine if water quality is safe within hours of water samples being taken.
- An early-alert approach for states to use to quickly issue swimming advisories for the public.
- Tools that allow states to predict water quality problems and identify sources of pollution, as well as to develop criteria for specific beaches.

The new criteria will help states and communities determine whether water quality is safe for the public and when to issue an advisory or a beach closure. The recommended criteria, background publications and a variety of evaluation and management tools for recreational water use are available on EPA’s website (<http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/>).

Long Term Agro-Ecosystem Research Network Created

In September 2012, the U.S. Department of Agriculture's (USDA) Agricultural Research Service (ARS) announced that it has established a Long Term Agro-ecosystem Research (LTAR) network from its existing experimental watersheds and rangelands scattered across the United States. The LTAR network will address large-scale, multi-year research, environmental management testing and technology transfer related to the nation's agricultural ecosystems.

ARS maintains approximately 22 watersheds and experimental range research sites in 15 states. Some of the ARS experimental watershed research sites date back to 1912, while others were established as recently as 2007. The initial LTAR network will include 10 of these sites, with more sites to be added later. The 10 sites chosen are affiliated with ARS research units located at Ames, Iowa; Cheyenne, Wyoming; Columbia, Missouri; El Reno, Oklahoma; Las Cruces, New Mexico; Mandan, North Dakota; Pullman, Washington; Tifton, Georgia; Tucson, Arizona; and University Park, Pennsylvania. ARS will be seeking partnerships in network research, as well as in development or selection of additional sites, with universities, other federal agencies and other interested parties.

"This network will further strengthen ARS' established, significant investment in long-term research to enhance agricultural sustainability, including our Benchmark Experimental Research Watershed and Experimental Range sites located in the nation's 10 major agro-ecosystems," said ARS Administrator Edward Knipling. "ARS' long-term research sites, projects and databases represent invaluable platforms on which to test our understanding and ability to manage emerging issues in agricultural sustainability."

Scientists in the LTAR network will interact and collaborate with those in other national ecological research networks, such as the National Science Foundation's Long Term Ecological Research (LTER) network (26 sites nationwide) and National Ecological Observatory Network, as well as the USDA Forest Service's Network of Experimental Forests and Ranges.

Data from the LTAR network can be used to develop innovative management systems that increase the resilience of agricultural ecosystems in the face of rapid environmental and socio-economic change. The data can help assess the environmental and societal impacts of different agricultural practices and land uses within a particular landscape. Information from LTAR can help to develop agricultural production systems that are profitable while also protecting natural resources and biodiversity, maximizing energy conservation, and reducing greenhouse gases. LTAR will allow scientists to address complex scientific questions about long-term processes on a regional or national scale that cannot be addressed by individual locations. For more information see www.ars.usda.gov/research/Docs.htm?docid=22480.

Notes on Green Stormwater Infrastructure

EPA Releases Low Impact Development "Barrier Busters" Fact Sheet Series

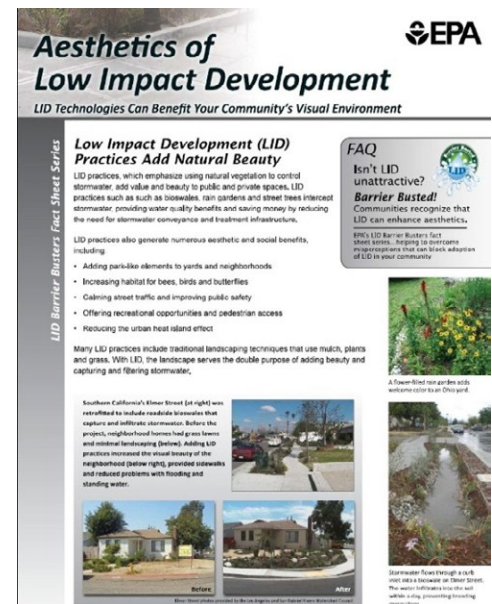
In late 2012, EPA released a seven-part fact sheet series describing the benefits of low impact development (LID) and focusing on how communities can overcome obstacles that sometimes stand in the way of wider adoption of LID. EPA developed the fact sheets in response to extensively investigating the most common reasons given by municipalities for not adopting LID. The fact sheets are one part of a multi-pronged strategy that relies on social marketing principles. The strategy also resulted in a series of short videos and webcasts created in 2009 and 2010, available at www.epa.gov/nps/lid#multimedia and www.epa.gov/watershedwebcasts#lid, respectively.

EPA's fact sheet series (available at <http://water.epa.gov/polwaste/green/bbfs.cfm>) is primarily intended for state and local decision makers who are considering adopting LID practices, but who have concerns or questions. These fact sheets explain the benefits of LID in clear terms and through real-life examples. Fact sheets in this series directly address specific concerns that

communities have voiced regarding the widespread adoption of LID as a stormwater management approach.

Fact sheets include:

1. *Benefits of LID: How LID Can Protect Your Community’s Resources.* This fact sheet challenges the perception that LID isn’t worthwhile and provides general background information that outlines hydrologic and economic benefits provided by LID.
2. *Terminology of LID: Distinguishing LID from other Techniques that Address Community Growth Issues.* This fact sheet explains where the term “LID” fits in the jumble of terms used by many for managing the environmental impacts of growth.
3. *Costs of LID: LID Saves Money and Protects Your Community’s Resources.* This fact sheet challenges the perception that LID is too expensive. It provides examples of economic benefits such as lower development costs, higher real estate values, and reduced stormwater management costs. Several case studies highlight examples of ways specific communities saved money by using LID.
4. *Aesthetics of LID: LID Technologies Can Benefit Your Community’s Visual Environment.* This fact sheet challenges the perception that LID stormwater management practices are unattractive. Numerous pictures present examples of how LID adds aesthetic value to the landscape and to the community as a whole.
5. *Effectiveness of LID: Proven LID Technologies Can Work for Your Community.* This fact sheet challenges the perception that LID practices such as swales and rain gardens work less effectively at controlling the volume of stormwater runoff than do conventional stormwater management practices like curbs, gutters and detention basins. Case studies explore how different communities have discovered that LID practices successfully control and treat stormwater runoff.
6. *Maintenance of LID: Communities Are Easily Managing LID Practices.* This fact sheet challenges the perception that LID practices are too difficult or costly to maintain. It describes the types of maintenance typically required and offers information about models and tools that communities can use to anticipate maintenance costs.
7. *Encouraging LID: Incentives Can Encourage Adoption of LID Practices in your Community.* This fact sheet highlights incentive strategies that communities can use to encourage the use of LID for both new and existing developments. It explores the four most common types of local incentive mechanisms—fee discounts or credits, development incentives, best management practice installation subsidies, and awards and recognition programs.



“Our guiding principle in developing these resources was to lend support to local decision makers who are considering an LID, or green stormwater infrastructure approach, but who have reservations,” noted Don Waye of EPA’s Nonpoint Source Control Branch, who spearheaded the development of these fact sheets.

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American Rivers Releases Guide to Permitting Green Infrastructure

In January 2013 American Rivers released *Permitting Green Infrastructure: A Guide to Improving Municipal Stormwater Permits and Protecting Water Quality*, designed as a resource for community and watershed advocates. The guide, available at www.americanrivers.org/assets/pdfs/reports-and-publications/permitting-green-infrastructure.pdf) explores new trends in stormwater permitting.

The document explains the current state of stormwater management system approaches, beginning with the passage of the Clean Water Act (CWA) in 1973 and evolving into EPA's current phased program to require permits for stormwater discharges from municipal separate storm sewer systems (MS4s), industrial operations, some construction sites, and other sources.

The guide discusses the emerging role of green infrastructure and low impact development (LID) practices in stormwater management—by encouraging infiltration and evapotranspiration, these types of practices can reduce the volume of stormwater leaving a site, which saves money and can improve water quality. To help communities see how others have successfully started to incorporate green infrastructure and LID into their permitting systems, this document includes a matrix containing model language for a variety of different EPA permit categories—along with legal and regulatory standards that inform them. The matrix also includes excerpts from watershed groups' comment letters, discussing ways that the stormwater management approaches outlined in these example permits could be strengthened further.

New Guides to Stimulate Private Investment in Natural Infrastructure

Two new green infrastructure documents are now available from the NatLab consortium—an innovative partnership between The Nature Conservancy, the Natural Resources Defense Council (NRDC) and EKO Asset Management Partners. The documents address the benefits and economic issues associated with using green infrastructure practices—such as porous pavement, green roofs, parks, roadside plantings and rain barrels—to address stormwater pollution. These practices capture rain on or near where it falls, allowing it to infiltrate on site instead of carrying dirty runoff to local waterways.

In March 2013, NatLab released “Creating Clean Water Cash Flows” (www.nrdc.org/water/stormwater/green-infrastructure-pa.asp), developed in collaboration with the Philadelphia Water Department and funded by the Rockefeller Foundation. The report focuses on Philadelphia's innovative “Green City, Clean Waters” program as a model for stimulating investment in natural infrastructure. It demonstrates how local municipalities and state government can potentially drive billions of dollars of private investment to modernize broken, aging stormwater systems and keep stormwater pollution out of waterways. The report provides in-depth guidance on key strategies that cities can deploy to attract private capital to green infrastructure development on private and public lands, including: project aggregation, offsite mitigation and credit trading programs, subsidies, private-public partnerships and transformation of vacant lands.

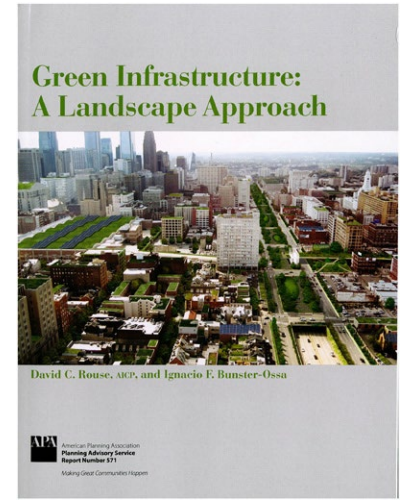
NatLab's second report, “Greening Vacant Lots” (http://docs.nrdc.org/water/wat_13022701.asp), describes the benefits of converting vacant lots in urban areas to green spaces that combine recreational use and stormwater management. The report presents case studies showing how 10 U.S. cities are planning, administering, financing and implementing programs to facilitate conversion of vacant lots. Each case study traces one program or initiative led by a public agency or nongovernmental organization from the planning stage through implementation, describing how each has overcome specific barriers.



Green Infrastructure Report Emphasizes Multiple Benefits

The American Planning Association recently released a 160-page book titled *Green Infrastructure: A Landscape Approach*. The book's authors, both practicing professionals in planning and design, explain how green infrastructure cleans the air and water, replenishes aquifers, reduces flooding, moderates climate, promotes healthy exercise and offers access to locally grown food. The report also notes that green infrastructure can make communities safer and even helps reduce crime, while boosting the economy as it attracts business, raises property values, and lowers energy and healthcare costs.

The authors describe six principles for successful green infrastructure projects and then present 12 detailed case studies describing these principles at work. Case studies include examples from across the country—from southern Pennsylvania to northwestern Washington. The book's appendix includes examples showing ways to integrate green infrastructure into municipalities' ordinances and codes. In this report, planners, urban designers and landscape architects can find proven ideas for making their regions, cities and neighborhoods more resilient and sustainable (\$60; see www.planning.org/apastore/Search/Default.aspx?p=4203).



EPA Launches Green Infrastructure Listserv

EPA's Green Infrastructure Program recently launched a free green infrastructure listserv, called GreenStream, to share training opportunities, newsletters and publications. Participants will receive periodic emails announcing green infrastructure-related information. To join, please send a blank email to the following address: join-greenstream@lists.epa.gov. For more information on EPA's Green Infrastructure Program, please visit www.epa.gov/greeninfrastructure.

EPA's Science Matters Newsletter Offers Look at Green Infrastructure Research

The September 2012 edition of *Science Matters*—an online newsletter produced by EPA's Office of Research and Development, featured numerous articles describing ongoing EPA green stormwater infrastructure research topics, including:

1. *Why Study Green Infrastructure?* This article provides an introduction to green infrastructure and offers links to other green infrastructure-related articles elsewhere in the newsletter.
2. *Stormwater Calculator to Manage Rainfall Runoff.* This article describes EPA's development of a National Stormwater Calculator (SWC) tool. Once complete, the SWC will estimate the annual amount and frequency of stormwater runoff from a specific site based on local soil conditions, land cover and historical rainfall records.
3. *Helping Cities Benefit from Green Infrastructure.* This article describes EPA's effort to help the City of Omaha and the Nebraska Department of Environmental Quality incorporate green infrastructure features such rain gardens, rain barrels, cisterns and natural areas into their combined sewer overflow control plans.
4. *Showing Buried Streams the Daylight.* This article discusses EPA's research into whether buried streams are less effective at removing nitrogen than streams above ground. If so, urban city managers could consider exposing buried streams and restoring them to their natural above-ground state—a process called daylighting—as a method for removing nitrogen from the water system.

Earlier issues of *Science Matters* featured individual articles about EPA's green infrastructure research. For example, the April/May 2012 issue included "Tapping Green Infrastructure to Curb Sewer Overflows," an article that describes EPA's work with the Ohio cities of Cleveland and Cincinnati to help them implement green infrastructure practices as part of a concerted effort to reduce combined sewer overflows. Additional information about EPA's green infrastructure research is available at www.epa.gov/research/waterscience/water-green.htm. This site lists links to additional articles and publications, and features a short, two-minute video featuring a look at EPA scientists' efforts to work with cities to reduce the number of combined sewer overflows by implementing green infrastructure.

Campus RainWorks Challenge Encourages Student Innovation

On Earth Day 2013 (April 22), U.S. Environmental Protection Agency (EPA) announced the four winners of its Campus RainWorks Challenge. EPA created this design challenge program to encourage and inspire college students to develop innovative green infrastructure systems that reduce stormwater pollution and support sustainable communities.

The Campus RainWorks Challenge engages students and faculty members at colleges and universities to apply green infrastructure principles and design, encourage interdisciplinary collaboration, and increase the use of green infrastructure on campuses across the nation. Teams of undergraduate and graduate students, each working with a faculty advisor, developed innovative green infrastructure designs for a site on their campus showing how managing stormwater at its source can benefit the campus community and the environment.

The selected challenge winners are:

- **University of Florida, Gainesville, Florida (1st prize, large institution).** The team's design plan centers on the redevelopment of Reitz Lawn, an 11-acre open area and pedestrian corridor on campus. The plan aims to remove pollutants from stormwater before they reach nearby Lake Alice, which drains directly into the Floridian Aquifer. The team's plan incorporated student input into the project design and will include an educational component to raise awareness about how water travels through the urban environment.
- **Illinois Institute of Technology, Chicago, Illinois (1st prize, small institution).** The team's design plan centers on the redevelopment of a 1,200-foot long section of Dearborn Street on campus. The plan incorporates a number of green infrastructure design elements, including rain gardens that double as outdoor seating areas and permeable walkways. The plan estimates that, through collection, infiltration, and storage, stormwater runoff will be reduced from the site by 70 – 80 percent.



The University of Florida team's design plan centers on the redevelopment of Reitz Lawn, an 11-acre open area and pedestrian corridor on campus, which is bracketed by a central gathering place on one end and the student union on the other. The plan incorporates a number of green infrastructure design elements, including: two stormwater collection pools, rain gardens and bioswales, a green wall, green roof, and campus garden. Modeling of the bioswale component of the design plan shows that the bioswales can manage a 1-year and 100-year storm without flooding. The team's plan was unique among the entries received because it sought student input into the proposed design using an information kiosk and student surveys. For a closer look at the design, see www.epa.gov/campusrainworks.

- **University of Arizona, Tucson, Arizona (2nd prize, large institution).** The team's design plan centers on the redevelopment of a 70,000-square-foot parking lot located within a cluster of academic buildings. The design will replace the parking lot with a campus common area featuring two rings of retention basins to infiltrate stormwater runoff, five underground cisterns to harvest runoff and HVAC condensate from the adjacent buildings, and a translucent shade structure with an ephemeral water feature. Water collected in the underground cisterns is used to irrigate the landscape, reducing potable water use from 700,000 to 90,000 gallons per year.
- **Missouri University of Science and Technology, Rolla, Missouri (2nd prize, small institution).** The team's design plan focuses on three green infrastructure projects: green roof, rain garden and permeable pavement projects. Phased implementation will take advantage of existing plans for university projects, allowing for cost-effective improvements in campus stormwater management that will mitigate eutrophication and sedimentation in Frisco Lake.

EPA received submissions from 218 teams. Reviewers included more than 30 expert judges from EPA, the American Society of Landscape Architects, the Water Environment Federation and the American Society of Civil Engineers. Many of the submissions proposed transformative additions to the campus landscape that would reduce stormwater impacts while educating students about the movement of water through the urban environment. The winning teams were selected based on six criteria: analysis and planning; preservation or restoration of natural features; integrated water management; soil and vegetation management; value to campus; and likelihood of implementation. For more information see www.epa.gov/campusrainworks.

Notes on Education

Philadelphia Spokesdogs Share Water Quality Message

The Philadelphia Water Department (PWD) is now accepting nominations to fill the positions of two 2013 spokesdogs, who will be tasked with helping to teach bark-park buddies and their caretakers about the importance of picking up pet waste. Since 2011, the Philadelphia Water Department and the Partnership for the Delaware Estuary, a National Estuary Program based in Wilmington, Delaware, have teamed up annually to run the popular Spokesdog program (<http://phillywatersheds.org/spokesdog>).

Each year, PWD selects two Philadelphia neighborhoods for the Spokesdog program. In 2013, spokesdogs will be chosen from Philadelphia's Fittler Square and University City neighborhoods. Residents in the selected neighborhoods are invited to submit pictures and descriptions of potential Spokesdog dog candidates, which are then posted on the Spokesdog website. The public is invited to vote online (once a day between May 31 and July 31, 2013) to select 15 finalists from each neighborhood. Next, program partners—along with community sponsors—host a community event/awards ceremony for the 15 finalists from each neighborhood. The 15 finalists compete in front of a panel of judges, who select the top dog based on friendly nature, owner interest, charm and natural Spokesdog abilities.

Winning Spokesdogs receive \$200 worth of prizes from a pet shop in their neighborhood. As a part of the campaign, the winning dogs' images are used on a number of brochures, advertisements and websites. Spokesdogs and their owners are required to attend at least three community events to distribute information on living the eco-friendly dog life. Event attendees receive small 'bags-on-board' pet waste dispensers that clip to leashes and educational tipcards that explain how rain can wash pet waste into local storm drains, and ultimately, into local waterways.

In 2012, residents nominated 55 dogs for the Spokesdog position in the Queen Village and Northern Liberties communities. Winners were Joey Bag-o-Donuts, a Shiba Inu from Queen Village, and Scooter, a Schnauzer-Beagle mix from Northern Liberties. These events are increasing awareness about pet waste management, notes Jeanne Waldowski with PWD. "The local

veterinarians can't keep enough 'bags-on-board' in stock. Civic and community groups throughout the city are asking us to have contests in their area."



2012 Philadelphia Spokedogs: Joey Bag-o-Donuts (left), a Shiba Inu from Queen Village, and Scooter (right), a Schnauzer-Beagle mix from Northern Liberties.

[For more information contact Jeanne Waldowski, Philadelphia Water Department, 1101 Market Street, 4th Floor, Philadelphia, PA 19107. Phone: 215-685-4945; Email: jeanne.waldowski@phila.gov]

"Urban Runoff" Raises Money for Stormwater Education in Maine

Urban runoff can be a good thing—when it is the title of a race used to raise money. On April 20, 2013, Maine's Cumberland County Soil and Water Conservation District (SWCD) held its 2nd annual "Urban Runoff" 5-kilometer (5K) race and walk, designed to raise funds to support clean water education programs in schools in Southern Maine. Cumberland County SWCD implements clean water education programs on behalf of fourteen Southern Maine municipalities, collectively known as the Interlocal Stormwater Working Group (ISWG). Through these programs, local students receive hands-on, interdisciplinary lessons about water in both the classroom and the field.

First Race a Success

The 2013 Urban Runoff follows Cumberland County SWCD's extremely successful first Urban Runoff held in April 2012. Many local businesses supported the event through sponsorships, in-kind donations, and employee participation as racers and volunteers. The race was advertised in public schools in each ISWG community as well as through local publications, posters, websites and media outlets.



Runners participate in the Cumberland SWCD's first annual Urban Runoff in 2012. (Photo by Remick Photography)

The effort paid off—more than 560 people registered to take part in 2012. A post-race survey completed by race participants indicated that the cause of the race—clean water education—was a major reason they chose to participate. "Clean water is an important element of our economy here in Maine," explained Jami Fitch with the Cumberland SWCD. "Our clean water message resonated with people." To increase stormwater awareness, Cumberland County SWCD designed and placed signs along the course providing information on runoff and pollution. The SWCD also shared these messages on the race website (www.urbanrunoff5k.com) and in emails to registrants.

After the 2012 race, the Cumberland County SWCD held a Green Neighbor Family Fest, which was attended by approximately 1,000 people. Scheduled events in 2012 included the awards ceremony and three environmental and child-focused live performances involving music, theater and storytelling. Numerous exhibits were set up by local nonprofit and

*“Urban Runoff”
Raises Money
for Stormwater
Education in
Maine
(continued)*

governmental organizations, universities and businesses to provide hands-on educational activities for children, including a chance to perform water quality testing, a marine touch tank, and a “poo bag” toss (about proper disposal of pet waste). Children also took part in face painting and a “Pollution Solution” obstacle course. The 2012 race and festival netted approximately \$4,000 to support the Cumberland County SWCD’s clean water education programs.

The 2013 race was also very successful, but was impacted by poor weather conditions. The morning of April 20, 2013 happened to be “a good time to see urban runoff in action,” notes Fitch. Despite very cool and rainy conditions, almost 500 enthusiastic racers participated. Hundreds stayed to enjoy the Family Fest afterwards.

Looking to the Future

As the Cumberland SWCD continues to streamline its race planning and implementation procedures, Fitch expects the race to become even more profitable. “Our sponsorship base has grown in 2013 as more people have learned about the Urban Runoff. Local businesses see the race as a way to show their support for our community’s clean water.”

Cumberland SWCD intends to hold the race annually. “Planning the race is a huge undertaking,” explains Fitch. “We have a team of 1.5 staff people working full-time planning and promoting the race in the two months leading up to the event.” The SWCD’s efforts are paying off—both financially and through enhanced public awareness about stormwater runoff. Using its past experiences as a guide, Cumberland SWCD is considering developing an “Urban Runoff” race program (including planning and implementation guidance) that it can license to other groups around the country as a community-building fundraising and education tool.

[For more information please contact Jami Fitch, Cumberland County SWCD, 35 Main Street, Suite 3, Windham, ME 04062. Phone: 207-892-4700, Email: jami@cumberlandsxcd.org.]



A professor from the University of Southern Maine teaches visitors at the 2012 Green Neighbor Family Fest about macroinvertebrates (stream life). (Photo by Brian Peterson)

BLUE® Homeowners Create a Cleaner Lake Champlain

Property owners in the Lake Champlain watershed are taking advantage of a new program that allows them to show their concern for maintaining water quality. Since early 2010, the nonprofit group Lake Champlain International (LCI) has offered property owners the opportunity to participate in BLUE® (www.mychamplain.net/blue), an innovative, effective, simple and fun program that certifies residential properties as watershed-friendly.



LCI's Ross Saxton meets with a watershed resident for a BLUE® property evaluation. (Photo by Angie Duke, Waterbury Record)

To participate in the program, a property owner schedules a time for a certified BLUE® evaluator to assess the property and its potential sources of pollution. The evaluator works with the property owner to review a checklist of both physical and behavioral practices that help prevent or reduce water pollution. After the initial assessment, the certified BLUE® evaluator explains the practices that the property owner would need to adopt or install to become BLUE® certified. The program offers \$250 grants (funded by federal, state, municipal and private funds) to help property owners install necessary practices.

After the property owner completes the necessary changes, the evaluator returns to confirm that the property meets requirements for certification. “One of the greatest benefits of the BLUE® program is that it allows us to both educate homeowners about problems and implement practices that help to solve the problems—all in the same package,” explains Saxton, LCI’s BLUE® program coordinator.

A property may be certified at one of three levels—basic, advanced or leader—depending on the type of practices in place.

- *BLUE® Basic Certification* includes fairly simple practices such as regularly maintaining septic systems, using phosphorus-free detergents, only fertilizing when a soil test indicates a need, properly disposing of pet waste, applying only environmentally friendly asphalt sealants, and using swales and rain barrels for capturing runoff water. As of April 2013, 58 residential properties were certified at the Basic level.



Property owners receive a BLUE® yard sign to display their achievement and commitment to clean water. (Photo by Ross Saxton, LCI)

- *BLUE® Advanced Certification* requires more intensive pollution control efforts that cost more, such as installing low-flow fixtures indoors, planting/maintaining a 50-foot naturally vegetated buffer along all surface waters, implementing erosion control practices as needed, restoring aquatic habitat using organic materials, and properly maintaining private roads and driveways. As of April 2013, 18 residential properties were certified at the advanced level.

- *BLUE® Leader Certification* requires significant financial outlay for practices to reduce water use and runoff, such as installing water-saving EnergyStar appliances, restoring historical wetlands on the property, replacing hard-armored streambanks with bioengineered practices, using best management practices for forestry activities, and replacing impervious pavement with pervious alternatives. As of April 2013, one residential property was certified at the leader level.

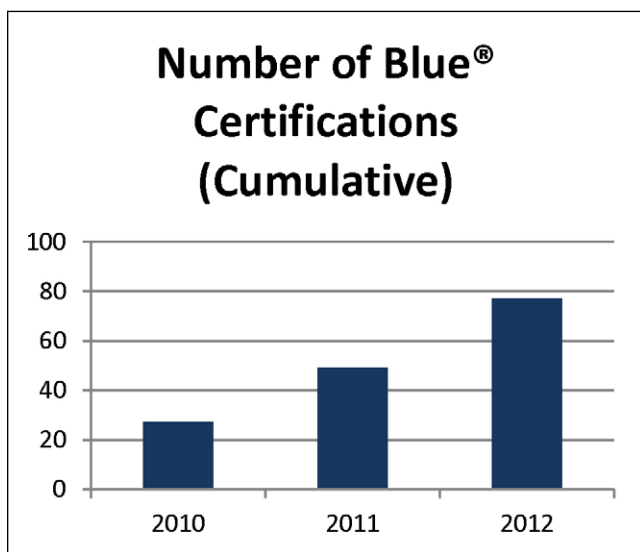
To be certified, a property owner is required to sign a legally binding three-year maintenance agreement that includes an annual inspection. After three years, the property will be evaluated for recertification. Each certified property receives a “BLUE®” yard sign for display.

Incentives Encourage Participation

To encourage homeowners to participate, LCI points to the numerous incentives available, including the small implementation grants, the yard signs, increased property values, and possible stormwater utility fee reductions. “A clean lake is important to property owners, since poor water quality and algae blooms can lead to decreased property values,” explained Saxton. “By participating in BLUE®, neighbors can help neighbors ensure that property values do not depreciate due to poor local water health.” Depending on the location, some BLUE® certified properties receive the added benefit of reduced or waived stormwater utility fees from their local municipality.

The program is currently available to homeowners in five municipalities in the Lake Champlain watershed. Outreach efforts are targeting properties adjacent to or draining into impaired surface waters within these areas. “We have reached about 3,500 people over the past few years,” explains Saxton. “We have found that once we certify three or four properties in a row as BLUE®, many of the neighboring property owners will sign up as well.”

As public awareness grows, Saxton anticipates a spike in the number of certifications in 2013—especially since they recently expanded the program into Burlington, Vermont’s biggest city. LCI is tracking the sites of BLUE® certified properties and hopes to someday be able to link water quality improvements to program implementation.



The number of properties certified as BLUE® continues to grow as residents become more familiar with the program and its benefits.

We have found that once we certify three or four properties in a row as BLUE®, many of the neighboring property owners will sign up as well.

—Ross Saxton, LCI’s BLUE® Coordinator.

Want to Bring BLUE® to Your Watershed?

Vermont-based Tethys Environmental (www.tethysenvironmental.com) developed the BLUE® Program, which has been piloted by LCI in the Lake Champlain watershed to demonstrate to future partners that the program is successful. The practices required by the BLUE® program were developed in cooperation with the International Water Quality Council, an organization that consists of numerous experts and specialists that are professionals in the areas of biology, engineering, real estate, economics, natural resources, wastewater, water pollution and law. BLUE® is a trademarked program for which nonprofits, municipalities and private companies nationwide can receive a license to operate in their watershed. The cost of adopting BLUE®, which includes a “package” and training to implement the vetted program, varies depending on the number of people targeted by the program.

Although initially focused on residential properties, LCI and Tethys Environmental have been working to expand BLUE® certification options to local colleges, businesses and municipalities—and possibly to agricultural producers as well. BLUE® certification can serve as a good marketing tool, and in some cases, save money. For example, because homeowners are required to sign a legally binding three-year maintenance agreement, the use of the BLUE® program can help municipalities meet the public participation and outreach-related activity requirements in their municipal separate storm sewer system (MS4) permits.

Saxton is pleased with the progress of the BLUE® program as both an educational and implementation tool—and is looking forward to expanding and improving the program in the future. “BLUE® is helping watershed residents become part of the solution.”

[For more information contact Ross Saxton, Director of Conservation & Education, Lake Champlain International, Inc., 531 Main Street, Colchester, VT 05446. Phone: 802-879-3466; Email: ross@mychamplain.net; Web: www.mychamplain.net/blue]

Water Cycle for Kids Diagram Updated

The U.S. Geological Society and the Food and Agriculture Organization of the United Nations recently teamed up to create an updated water cycle diagram targeted at elementary school-aged children. The diagram’s introductory text explains the water cycle on a child’s level: “You may think that every drop of rain that falls from the sky, or each glass of water that you drink, is brand new, but it has always been here and is a part of The Water Cycle. The water cycle describes how

water is not only always changing forms (liquid water, ice, and vapor (gas)), but also moving around all over the world (above, on, and underground). This process is always happening everywhere, be it in your body or on your lawn or in the clouds or in the swimming pool.” Small, friendly looking icons, including water drops, snowflakes, etc., show the movement of water through a landscape. Legends along the left and right sides of the diagram identify the icons and offer brief, easy-to-understand explanations of the different stages of the water cycle. The diagram is available for free download and printing at <http://ga.water.usgs.gov/edu/watercycle-kids.html>.



Managing Manure Nutrients Curriculum Materials Available

Cooperative Extension, a university-based education resource, is offering free curriculum materials addressing the management of manure and manure nutrients in agriculture. These materials, available for free download at www.extension.org/pages/65573/managing-manure-nutrients-curriculum-materials, were developed for use in classrooms and extension programs—and for self-study by farmers and agricultural professionals. Although initially developed for Wisconsin, the concepts introduced are applicable nationwide. The curriculum materials are provided in both PDF and Microsoft Word formats to allow users to modify the materials to be site- or state-specific, as needed.

Available curriculum materials focus on nine different areas, including nutrient management planning, nutrient regulations, water quality and nutrients, manure storage and others. This curriculum is designed to teach manure and nutrient management concepts from environmental risks to planning, application and public relations. The nine sections together highlight the end goal of giving crops the nutrients they need while protecting the environment and being a good neighbor. These concepts are reinforced through worksheets, videos and PowerPoint-based activity games. A self-study module is available that gives users the option to receive a certificate upon successful completion of a quiz.

Septic System Public Service Announcements Available

The National Environmental Services Center (NESC) has developed three 30-second video public service announcements (PSAs) about the importance of maintaining septic systems to ensure a community's water quality. The PSAs reflect NESC's ongoing commitment to effective wastewater



In the “Lifestyle” PSA, a small girl drinking from a park water fountain makes a “yuck” face when asked “What happens when a septic tank fails?” The PSA goes on to explain what people need to do to ensure that their septic tanks function properly.

treatment and source water protection, and are available for communities and watershed groups to use for free. Presented in a humorous light, each video drives home the message that homeowners are responsible for safeguarding drinking water by properly operating and maintaining septic tanks. NESC encourages communities to use these brief PSAs as part of a public awareness campaign to protect source water. To view and download the videos, see www.nesc.wvu.edu/subpages/psa.cfm. The videos are also available through EPA's Nonpoint Source Outreach Toolbox (www.epa.gov/nps/toolbox).

Software Spotlight

New iTree Tools Available from the Forest Service

i-Tree is a state-of-the-art, peer-reviewed software suite from the U.S. Department of Agriculture's Forest Service that provides urban forestry analysis and benefits assessment tools. The many i-Tree Tools help communities of all sizes strengthen their urban forest management and advocacy efforts by quantifying the structure of community trees and the environmental services that trees provide.

Initially developed by the Forest Service, i-Tree is a free, public domain resource (see www.itreetools.org). The Forest Service, Davey Tree Expert Company, National Arbor Day Foundation, Society of Municipal Arborists, International Society of Arboriculture, and Casey Trees have entered into a cooperative partnership to further develop, disseminate and provide technical support for the suite. While most of the more than 10,000 people using i-Tree are in the U.S. and Canada, it has been used in more than 108 countries.

In late 2012, the Forest Service released i-Tree version 5.0, which includes additional tools for analyses and expands the range of devices that can use it to include smartphones and tablets. i-Tree now features a data collection Web form that allows any device with a modern internet browser to be used to collect and enter field data. Using the following tools and utility programs, i-Tree allows

users to easily and accurately find the dollar value of the benefits provided by urban forests, including energy cost savings, stormwater capture and city pollution absorption. Detailed examples of how each tool can be used are available on the i-Tree website.



i-Tree Analysis Tools

- *i-Tree Eco* provides a broad picture of the entire urban forest. It is designed to use field data from complete inventories or randomly located plots throughout a community along with local hourly air pollution and meteorological data to quantify urban forest structure, environmental effects and values to communities.
- *i-Tree Streets* focuses on the benefits provided by a municipality's street trees. It makes use of a sample or complete inventory to quantify and put a dollar value on the street trees' annual environmental and aesthetic benefits.
- *i-Tree Hydro* (beta) is an application designed to simulate the effects of changes in tree and impervious cover characteristics within a watershed on stream flow and water quality. The i-Tree Hydro model can be used to determine how various best management practices affect water quality. The SUNY College of Environmental Science and Forestry offers a Web page describing how i-Tree Hydro can be used to simulate hydrologic impacts of green infrastructure practices (www.esf.edu/ere/endreny/GI-iTree/GI-iTreeHydro.htm).
- *i-Tree Vue* allows you to make use of the freely available National Land Cover Database satellite-based imagery to assess your community's land cover, including tree canopy, and some of the ecosystem services provided by your current urban forest.
- *i-Tree Design* is a simple online tool that provides a platform for assessments of individual or multiple trees at the parcel level. This tool links to Google Maps and allows you to see how tree selection, tree size and tree placement around your home affects energy use and other benefits.
- *i-Tree Canopy* offers a quick and easy way to produce a statistically valid estimate of land cover types (e.g., tree cover) using aerial images available in Google Maps. Canopy can be used by urban forest managers to estimate tree canopy cover, set canopy goals and monitor canopy change over time. Canopy can also be used to estimate inputs for use in i-Tree Hydro and elsewhere where land cover data are needed.

i-Tree Utility Programs

- *i-Tree Species* is a free-standing utility designed to help urban foresters select the most appropriate tree species based on environmental function and geographic area.
- *i-Tree Pest Detection Module* is a portable, accessible and standardized protocol for observing a tree for possible insect or disease problems.
- *i-Tree Storm* provides a method for a community to assess widespread storm damage after a severe storm. It is adaptable to various community types and sizes and provides information on the time and funds needed to mitigate storm damage.

Since the Forest Service first released i-Tree in 2006, communities, nonprofit organizations, consultants, volunteers and students have used the software application to analyze individual trees, parcels, neighborhoods, cities and entire states. In cities across the country, findings from i-Tree have helped spur greater investments in municipal trees and green spaces. For example, one recent i-Tree study found that street trees in Minneapolis provided \$25 million in benefits ranging from energy savings to increased property values. Urban planners in Chattanooga, Tennessee, were able to show that for every dollar invested in their urban forests, the city received \$12.18 in benefits. New York City used i-Tree to justify setting aside \$220 million for planting trees during the

next decade. Additional examples of i-Tree applications across the country are featured at www.itreetools.org/resources/projects.php.

“Urban forests are vital and dynamic forests,” said Forest Service Chief Tom Tidwell. “They clean our air and water, and they make our cities more beautiful and livable. i-Tree exemplifies the Forest Service commitment to supporting the health and productivity of all of the nation’s forests, including those that line our city streets.”

Reviews and Announcements

Agricultural Nonpoint Source Pollution

Toolkit for Protecting Drinking Water Sources with Conservation Practices Now Online

The collaboration toolkit “Protecting Drinking Water Sources through Agricultural Conservation Practices” is now available online at www.sourcewatercollaborative.org/swp-usda. The toolkit offers effective steps that source water protection professionals working at the state level can take to build partnerships with the U.S. Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) to get more agricultural conservation practices on the ground to protect sources of drinking water. Developed by the Source Water Collaborative, a group composed of 23 organizations working together to protect sources of drinking water, with support from EPA and in consultation with NRCS, the toolkit includes insightful tips and highlights specific opportunities states can take advantage of immediately. In addition, the Source Water Collaborative is working with the National Association of Conservation Districts to develop a locally focused supplement to the toolkit to provide a step-by-step process for collaborating with conservation districts.

Research Shows Drainage Ditches Help Clean Up Field Runoff

Research conducted by USDA Agricultural Research Service (ARS) scientists shows that drainage ditches can serve as a low-cost alternative for managing agricultural pollutants and protecting natural resources. ARS scientists evaluated the transport and capture of the herbicide atrazine and the insecticide lambda-cyhalothrin for 28 days in a 160-foot section of a vegetated agricultural drainage ditch in Mississippi. Within one hour of starting a simulated runoff event, 61 percent of the atrazine and 87 percent of the lambda-cyhalothrin had transferred from the water to the ditch vegetation. At the end of the ditch, runoff pesticide concentrations had decreased to levels that were generally non-toxic to downstream aquatic fauna. Similar work in California indicated that vegetated drainage ditches helped mitigate pesticide runoff from tomato and alfalfa fields. For more information see www.ars.usda.gov/is/AR/archive/jan13/ditch0113.htm.

Climate

EPA Climate Ready Estuaries Report Available

EPA Climate Ready Estuaries (CRE) program recently released “Climate Ready Estuaries 2012 Progress Report,” describing CRE program accomplishments and projects that have been started by the National Estuary Programs during 2012. This report, available at <http://water.epa.gov/type/oceb/cre/explore.cfm>, uses National Estuary Program projects from 2008 to 2011 to show how climate change adaptation can help meet clean water goals.

EPA Releases 2012 Strategy: Response to Climate Change

EPA has released the “National Water Program 2012 Strategy: Response to Climate Change” document, which describes how EPA’s water-related programs plan to address the impacts of climate change. The document provides long-term visions, goals and strategic actions for the management of sustainable water resources for future generations. The strategy, which builds upon EPA’s first climate change and water strategy released in 2008, focuses on five key areas: infrastructure,

watersheds and wetlands, coastal and ocean waters, water quality, and working with tribes. It emphasizes working collaboratively with partners and stakeholders, developing information and tools, incorporating adaptation into core programs, and managing risks of impacts such as extreme weather events. For more information see www.epa.gov/water/climatechange.

USDA Reports Feature Climate Change Effects and Adaptation Strategies

Two USDA reports, entitled “Climate Change and Agriculture: Effects and Adaptation and the Effects of Climate Variability” and “Change on Forest Ecosystems: A Comprehensive Science Synthesis for the U.S. Forest Sector,” are now available (see www.usda.gov/oce/climate_change/effects.htm). Scientists from the federal service, universities, non-governmental organizations, industry, tribal lands and the private sector contributed to the peer-reviewed studies, which were created to support the National Climate Assessment. The reports discuss how climate change is affecting U.S. farms, forests, grasslands and rural communities. While U.S. agriculture and resource management have long histories of successful adaptation to climate variability, the accelerating pace and intensity of climate change presents new challenges to be addressed, as highlighted in the reports. The reports evaluate current conditions and look ahead to the next 25 to 100 years and the potential consequences of climate change.

U.S. Forest Service Releases Report on Water Resources Vulnerabilities to Climate Change

The Forest Service recently released a report detailing the impacts that climate change might have on water resources in national forests. The report, “Assessing the Vulnerability of Watersheds to Climate Change: Results of National Forest Watershed Vulnerability Pilot Assessments” (see www.fs.fed.us/ccrc/), was sponsored by the Forest Service’s Stream Systems Technology Center. Eleven national forests from throughout the United States conducted assessments of potential hydrologic change due to ongoing and expected rapid climate warming. Staff from each national forest identified water resources important in their area, assessed climate change exposure and watershed sensitivity, and evaluated the relative vulnerabilities of watersheds and water resources to climate change. The report provides an overview of core assessment components and highlights similarities and differences of the 11 pilot assessments.

Website Features Articles About Water in a Warming World

Two science magazines—*Nature Geoscience* and *Nature Climate Change*—are jointly contributing to a new website (www.nature.com/ngeo/focus/water-warm-world) that features overview articles, original research and opinion pieces that analyze the availability and governance of fresh water in a changing world.

Education

Extreme Events Workshop Planning Tool Announced

EPA’s Climate Ready Water Utilities just released its “Preparing for Extreme Weather Events: Workshop Planner for the Water Sector” (Workshop Planner) to help utilities plan for extreme events (see www.epa.gov/climate-ready-utilities). The Workshop Planner provides all of the materials needed to plan, conduct and facilitate an adaptation planning workshop on five extreme event scenarios: floods, drought, wildfire, sea level rise and reduced snowpack.

Radio Program Explores 40 years of the Clean Water Act

On December 28, 2012, Public Radio International’s “Living on Earth” program aired a special focusing on the Clean Water Act (CWA). The show includes a look back at the passage of the CWA in 1972 and the years since then, the predominant threats to clean water today (nonpoint source pollution, crumbling infrastructure and a lack of enforcement), and a look ahead at what the future will hold for the CWA and water quality. To listen online go to www.loe.org/shows/shows.html?programID=12-P13-00052.

Water Quality Standards Academy Webinar Posted

EPA has posted a recording of its Water Quality Standards Academy Webinar: Water Quality Standards 101, held on October 4, 2012, online at <http://water.epa.gov/learn/training/standardsacademy>. The free webcast provides an overview of EPA's Water Quality Standards program and is targeted toward a broad audience, including states, territories, tribes, environmental groups, industrial groups, municipalities, the academic community, federal agencies, watershed groups and any other interested parties. To access the recording and supporting materials, scroll down the page until you reach the "Archived Webcasts" section.

Webcast Explains the Water Quality Exchange Data Tool

EPA recently released a free, online webcast (see www.epa.gov/watershedwebcasts#tools) designed to show interested stakeholders how to enter their water quality monitoring data into EPA's Water Quality Exchange (WQX Web) and how to make these data available to the public via the Water Quality Portal. WQX Web is a Web-based data entry tool that enables data owners to upload their data to EPA's STORET Data Warehouse using a spreadsheet. Once the data are in STORET, they can be safely stored, viewed and downloaded by a wide variety of potential data users. Originally conducted on March 6, 2013, the webcast helps water quality program managers, data managers, and others understand WQX, how it relates to STORET and the Water Quality Portal, and how to begin submitting data using WQX Web. For more information on WQX/STORET, visit www.epa.gov/storet. For more information on the Water Quality Portal, visit www.waterqualitydata.us.

Stormwater

Low Impact Development Instructional Videos Available

The Chesapeake Stormwater Network recently released a series of three free instructional videos designed to help local governments, contractors and involved homeowners with constructing, installing and maintaining low impact development practices (LID). The video series, available at www.chesapeakestormwater.net/training-library/design-adaptations/stormwater-bmp-maintenance was produced by the Center for Watershed Protection in cooperation with the Chesapeake Stormwater Network.

Puget Sound Low Impact Development Technical Manual Released

Washington State University's Puyallup Research and Extension Center and the Puget Sound Partnership have released the 2012 Low Impact Development Technical Guidance Manual (see <http://1.usa.gov/W9kDFt>). The manual, first produced in 2005, is the region's primary technical guidance for siting, designing, installing and maintaining LID practices and projects. The manual covers site assessment, site planning, vegetation protection and restoration, precision site clearing, integrated management practices, research and performance, modeling techniques in approved runoff models, bioretention plants, street trees, bioretention soil testing and maintenance of LID techniques.

Rain Garden App Available

The Connecticut Nonpoint Education for Municipal Officials (NEMO) program has released a smart phone app designed to help homeowners and contractors design, install and maintain rain gardens. NEMO's "Rain Garden App" leads a user through the proper siting, sizing, construction, planting and maintenance of a rain garden. It includes tools to help the user determine the proper size of the garden, find out about local soil conditions, estimate the price of construction, and customize a plant list that will delight the eye while soaking up stormwater. In addition, the app includes six short video segments explaining various aspects of rain garden care and feeding. As of press time, the App is available for iPhones, with an Android release imminent. In addition, the imagery and plants are currently specific to Connecticut, but the designers are developing a national version that will have extensive databases for each area of the country. For more information see <http://nemo.uconn.edu/tools/app/raingarden.htm>.

Study Shows Effect of Urbanization on Stream Ecosystem

A 2000-2012 U.S. Geological Survey (USGS) study of streams in nine metropolitan areas across the continental U.S. shows that the loss of sensitive species in streams begins to occur at the initial stages of urban development. Contaminants, habitat destruction and increasing stream-flow flashiness resulting from urban development can degrade stream ecosystems and cause degradation downstream with adverse effects on biological communities and on economically valuable resources, such as fisheries and tourism. For example, by the time urban development had approached 20 percent in watersheds in the New England area, the aquatic invertebrate community had undergone a change in species composition of about 25 percent (to include 25 percent more pollution-tolerant species). Although urban development creates multiple stressors that can degrade stream health, such as an increase in concentrations of insecticides, chlorides and nutrients, no single factor was universally important in explaining the effects of urban development on stream ecosystems. The USGS developed an innovative modeling tool to predict how different combinations of urban-related stressors affect stream health. This tool, initially developed for the New England area, can provide insights on how watershed management actions to improve one or more of these stressors may increase the likelihood of obtaining a desired biological condition. The effects of urbanization on streams, including information about this and past studies, as well as graphics and maps, and videos can be found at <http://water.usgs.gov/nawqa/urban>.

Wetlands

Coastal Wetland Review Reports Released by EPA

EPA recently released four Coastal Wetland Review Reports containing information from stakeholder meetings in coastal watersheds from Texas to Massachusetts. The reports are a useful resource for those working to protect the nation's coastal wetlands—they include discussions about regional stressors on wetlands in coastal watersheds, local protection strategies, and key information gaps that, if addressed, could help reverse the trend of wetland loss. The reports highlight issues surrounding coastal wetlands throughout the Mid-Atlantic (Delaware Estuary, York River), South Atlantic (Middle and Lower Neuse River, Indian River Lagoon), North Atlantic (Cape Cod), and Gulf of Mexico (Galveston Bay, Mississippi Coast) regions. Although each discussion was specific to the watershed in which it occurred, many observations and ideas are transferable throughout the region and the country. To view EPA's Coastal Wetlands webpage and access the reports, visit <http://water.epa.gov/type/wetlands/cwt.cfm>.

Wetlands Live! Webcasts Online

WetlandsLive! (<http://wetlandslive.pwnet.org>) is a series of live webcasts featuring students working in wetlands from Panama to Alaska. The first two free webcasts were broadcast from Canada (October 2012) and Panama (March 2013). The final webcast will be held May 9, 2013 in Cordova, Alaska. Targeted at grades 4-6, classes watch and interact online through the website to learn about the important role wetlands play in all our ecosystems, and to share their own stories. The website also features information, lesson plans and wetland project ideas. Once completed, the programs become available for viewing online at <http://WetlandsLIVE.pwnet.org>.

Other

Brochure Highlights Water Security Efforts

EPA's Water Security Division recently released a brochure highlighting water security and resiliency efforts. The four-page brochure, which includes overview information about tools and training related to water security, may be downloaded at <http://water.epa.gov/infrastructure/watersecurity/upload/epa817f12012.pdf>.

EPA Releases Online Water Efficiency Guides

EPA's WaterSense program has created "WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities," an online compilation of best management practices to

help commercial and institutional facilities better manage their water use through efficient practices and products. Building owners and managers can significantly reduce their water use, energy requirements and operating costs by understanding how to use water more efficiently in their facilities. “WaterSense at Work” addresses water use in educational facilities, offices, restaurants, hotels, hospitals, laboratories and other organizations. It presents numerous tactics for businesses and organizations to use to achieve water, energy and operational savings, and explores case studies describing different types of facilities that have achieved savings by using water efficiently. For more information see www.epa.gov/watersense/commercial/bmps.html.

Government Establishes 21st Century Conservation Service Corps

In early 2013, leaders of eight federal departments and agencies signed a Memorandum of Understanding (MOU) setting up a national council to guide implementation of the Obama Administration’s 21st Century Conservation Service Corps (21CSC). The 21CSC focuses on helping young people – including diverse low-income, underserved and at-risk youth, as well as returning veterans – gain valuable training and work experience while accomplishing needed conservation and restoration work on public lands, waterways and cultural heritage sites. It builds on existing partnerships with youth conservation corps across the country to engage thousands of young Americans in hands-on service and job training experiences on public lands and community green spaces. For a copy of the MOU see <http://on.doi.gov/UZma3a>. For additional information on the 21CSC see www.doi.gov/21csc.

Report Examines Use of Biological Assessment for Nutrients in State Water Programs

In fall 2012, the Association of Clean Water Administrators (ACWA) published “Use of Biological Assessment in State Water Programs: Focus on Nutrients,” a report that provides an overview of how states, the District of Columbia and the Delaware River Basin Commission use biological assessments to address nutrients in state water programs. Most states reported using some form of biological monitoring to assess their waters, with macroinvertebrates being the most common indicators of aquatic life support. The report is available on the ACWA’s website: www.acwa-us.org.

Runoff and Streamflow Email-Based Action Alerts Available

Three text- and email-based services are available to help water managers prepare for and manage runoff and high-water events: (1) USGS’ WaterNow (<http://water.usgs.gov/waternow>) and WaterAlert (<http://water.usgs.gov/wateralert>) programs will text or email you with water conditions from any of more than 16,000 stream gauges and other sites across the country; (2) CustomWeather and its affiliate, Sailer Environmental, manage StormWaterSamplingAlert.com (SWSA), a service that will email you when a qualifying storm (one that would trigger a need for stormwater sampling necessary to comply with NPDES permit requirements) is forecast or occurring; and (3) Stormwater Forecast™ (www.stormwaterforecast.com), will email you when a current National Weather Service forecast includes precipitation levels that meet your specified threshold requirements for depth and locations.

Watershed Payments Study Released

“Charting New Waters: State of Watershed Payments 2012,” a study by Forest Trends’ Ecosystem Marketplace, showed that countries across the globe invested approximately \$8.17 billion in watershed protection services (e.g., payments for habitat protection, stream restoration, ecosystem services, water quality trading, etc.) in 2011 to safeguard drinking water and regional supplies—\$2 billion more than they spent in 2008. The group tracked 205 active watershed investment programs in 29 countries around the world. More than half of the active programs were in China (61) and the United States (67). For more information see www.forest-trends.org/embargoed_water_2013.php.

Recent and Relevant Periodical Articles

Mining Waste Byproduct Capable of Helping Clean Water

By the U.S. Geological Survey, December 2012
(www.usgs.gov/newsroom/article.asp?ID=3482&from=rss)

This press release discusses a study by scientists from the U.S. Geological Survey's Leetown Science Center, which shows that dried acid mine drainage sludge, or residuals, that result from treating acid mine drainage discharges can be used as a low-cost adsorbent to efficiently remove phosphorus from agricultural and municipal wastewaters. The phosphorus that has been adsorbed by the mine drainage residuals can later be stripped from the residuals and recycled into fertilizer. The mine drainage residuals can be regenerated and reused for a number of additional treatment cycles. The study was published in the October 2012 issue of the *Journal of Water, Air, & Soil Pollution* (<http://link.springer.com/article/10.1007%2Fs11270-012-1262-x>).

Pittsburgh's Leaky Faucet: How Aging Sewers Are Impacting Urban Watersheds

By University of Pittsburgh, March 6, 2013 (www.news.pitt.edu/sewer_watersheds)

This press release reviews results from a recent study on the amount of sewage leaking into surface waters in Pittsburgh, Pennsylvania. Using water samples from the Pittsburgh-based Nine Mile Run watershed, a University of Pittsburgh research team reports in *Environmental Science & Technology* (see <http://pubs.acs.org/doi/abs/10.1021/es304331m?journalCode=esthag>) that an estimated 10 to 20 tons of reactive nitrogen from sewage flows into Pittsburgh's Monongahela River every year from the six-square-mile watershed. That means that up to 12 percent of all sewage produced by residents living in the Nine Mile Run watershed area leaks from the sewers and is transferred to the stream, negatively affecting stream water quality.

Rainwater Harvesting

By Steve Goldberg, *Stormwater*, March/April 2013
(<http://digital.stormh20.com/publication/?i=144788&pn=10>)

The article discusses the various methods for harvesting rainwater from rooftops and explores the economic and environmental benefits of using the captured water for non-potable uses (e.g., irrigation, toilet flushing).

Streams Stressed by Pharmaceutical Pollution

In The Cary Institute of Ecosystem Studies' *EcoFocus Newsletter*, April 2013
(www.caryinstitute.org/newsroom/streams-stressed-pharmaceutical-pollution)

This press release discusses a new paper, published in *Ecological Applications*, which highlights the ecological cost of pharmaceutical waste and the need for more research into environmental impacts. Cooperators from the Cary Institute of Ecosystem Studies, Indiana University and Loyola University-Chicago assessed the impacts of six common pharmaceuticals on natural biofilms in streams (slippery coatings on rocks) in New York, Maryland and Indiana. The study found that exposure to an antihistamine (diphenhydramine) caused biofilms to experience up to a 99 percent decrease in photosynthesis, as well as significant drops in respiration.

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—Cary Institute of Ecosystem Studies.

Sustainable Programs: Black River Action Team Thinks Outside the Box

In *Volunteer Monitoring News*, December 2012

(http://acwi.gov/monitoring/vm/publications/newsletters/VM_News_Issue2_Dec2012.pdf)

This article discusses the successful and sustainable fundraising ideas implemented by Kelly Stettner, founder and director of Vermont's Black River Action Team (BRAT) (<http://blackriveractionteam.org/wp>). Because BRAT's fundraising techniques rely on local efforts and engagements, they also help build community and stewardship. For example, Stettner spearheaded an "Adopt-the-River" campaign to keep the river clear of trash. She also tweaked this idea and added an "Adopt-a-Swimming Hole" option to raise money to conduct weekly water quality sampling at popular swimming areas along the river. Another new BRAT funding source includes recycling e-waste (empty printer ink cartridges, old cell phones, etc.) for cash.

Websites Worth a Bookmark

OneNOAA Science Seminars (www.nodc.noaa.gov/seminars)

The National Oceanographic and Atmospheric Administration's (NOAA) National Oceanographic Data Center (NODC) hosts frequent science seminars conducted by NODC and other partner organizations such as the National Ocean Service, the National Weather Service and the National Marine Fisheries Service.

Stormwater Report (<http://stormwater.wef.org>)

The Water Environment Federation (WEF) recently launched a website dedicated entirely to stormwater news. The home page presents recent news and a feature story. All news stories on the site are searchable, and information is categorized by news type, region and topics. A sidebar provides information about upcoming events, stormwater videos, a poll question and a feed from WEF's newly launched Stormwater Twitter account (www.twitter.com/WEFstormwater).

Stormwater Solutions: Curbing Toxic Runoff

(<http://daily.sightline.org/projects/stormwater-solutions-curbing-toxic-runoff>)

This site is part of an ongoing research project looking at ways to control polluted stormwater. Although written from the perspective of the Pacific Northwest, the site offers valuable background information on stormwater runoff and its impacts on the environment.

Calendar

May 2013

For an updated events calendar,

see <http://water.epa.gov/polwaste/nps/outreach/calendar.cfm>.

5/7	<i>2013 National Mitigation and Ecosystem Banking Conference</i> , New Orleans, LA (www.mitigationbankingconference.com)
5/18	<i>Ohio Stormwater Conference</i> , Sharonville, OH (www.ohioswa.com/calendar-events/annual-conference/)
5/14–15	<i>New England Interstate Water Pollution Control Commission's 24th Annual Northeastern Nonpoint Source Conference</i> , Burlington, VT (www.neiwpcc.org/npsconference)
5/15–16	Bioretention Summit (Washington, DC), Arlington, VA (www.bae.ncsu.edu/stormwater/training/bioretention_summit.html)
5/19–22	<i>13th National Watershed Conference A Forum: The Future of Watershed Based Natural Resource Conservation</i> , Tunica, MS (www.asabe.org/meetings-events/2013/05/13th-national-watershed-conference-a-forum-the-future-of-watershed-based-natural-resource-conservation.aspx)
5/19–23	<i>Joint Conference: National Outdoor Recreation Conference and Forests for People</i> , Traverse City, MI (www.recpro.org/2013-sorp-ffp-conference)
5/21–22	<i>Grey to Green: A Conference on the Economics of Green Infrastructure</i> , Toronto, Ontario, Canada (http://greytogreenconference.org)

June 2013

- 6/2–6 *Benefits of Wetlands, Values to Society: 2013 Society of Wetland Scientists' International Conference*, Duluth, MN (www.swsannualmeeting.org/)
- 6/7–8 *New England Waters Conference*, Sebago Lake, ME (<https://sites.google.com/site/necnalms/conference>)
- 6/9–13 *America Water Works Association Annual Conference and Exposition 2013 (ACE13)*, Denver, CO (<http://www.awwa.org/conferences-education/conferences/ace13-annual-conference.aspx>)
- 6/9–14 *Association of State Floodplain Managers 2013 Conference: Remembering the Past—Insuring the Future*, Hartford, CT (www.floods.org/index.asp?menuID=223)
- 6/17–18 *Bioretention Summit* (Chicago), Lisle, IL (www.bae.ncsu.edu/stormwater/training/bioretention_summit.html)
- 6/17–20 *Aquatic Ecosystems at the Edge: Managing for Sustainability*, Victoria, British Columbia, Canada (<http://conferences.aehms.org/AEHMS11>)
- 6/19–22 *Association for Environmental Studies and Sciences 2013 Annual Conference*, Pittsburgh, PA (http://aess.info/content.aspx?page_id=22&club_id=939971&module_id=124341)
- 6/24–26 *American Water Resources Association Summer Specialty Conference: Environmental Flows*, Hartford, CT (www.awra.org/meetings/EnvironmentalFlows2013)
- 6/25–28 *Agriculture in the Classroom: National Conference*, Minneapolis, MN (www.agclassroom.org/conference2013/index.htm)
- 6/26–28 *American Water Resources Association Summer Specialty Conference: Healthy Forests=Healthy Waters*, Hartford, CT (www.awra.org/meetings/HealthyForest2013)

July 2013

- 7/21–24 *2013 American Society of Agricultural and Biological Engineers Annual International Meeting*, Kansas City, MO (www.asabemeetings.org/index.html)
- 7/29–8/2 *5th National Conference on Ecosystem Restoration*, Chicago, IL (www.conference.ifas.ufl.edu/ncer2013/)
- 7/30–8/1 *EPA Community Involvement Training Conference*, Boston, MA (www.epa.gov/ciconference/index.htm)

August 2013

- 8/18–21 *2013 International Low Impact Development Symposium*, Saint Paul, MN (www.cce.umn.edu/2013-International-Low-Impact-Development-Symposium/index.html)
- 8/18–22 *StormCon*, Myrtle Beach, SC (www.stormcon.com)

September 2013

- 9/9–11 *California Stormwater Quality Association: 9th Annual Conference*, Lake Tahoe, CA (<http://stormwaterconference.com>)
- 9/25–28 *Midwest Environmental Education Conference*, Coralville, IA (<https://sites.google.com/a/cfu.net/icec/home/winter-solstice-scholarship>)

October 2013

- 10/5–9 *86th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC)*, Chicago, IL (www.weftec.org/)
- 10/6–11 *Society for Ecological Restoration's 5th World Conference on Ecological Restoration: Reflections on the Past, Directions for the Future*, Madison, WI (<http://www.ser2013.org/>)
- 10/9–12 *Promoting Excellence in Environmental Education: 42nd Annual North American Association for Environmental Education Conference*, Baltimore, MD (www.naaee.net/conference)

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Do you have an article or idea to share? Want to ask a question or need more information? Please contact *NPS News-Notes*, c/o Don Waye, by mail at U.S. EPA, Mail Code 4503-T, 1200 Pennsylvania Ave., NW, Washington, DC 20460, or by email at waye.don@epa.gov.

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