

February 2020

Interstate Waters



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Green**

Also:

**Measuring Mercury
Nation and Region**

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Established by an act of Congress in 1947, the New England Interstate Water Pollution Control Commission is a not-for-profit interstate agency that meets the water-related needs of our member states: Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The NEIWPCC Commissioners from each member state are appointed by their state governors.

Interstate Waters

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From the Executive Director

Upgrade the Clean Water Act

HOW IS IT, FORTY-SEVEN YEARS SINCE THE inception of the Clean Water Act, thirty-two years since it was last amended, that clean-water advocates have not found a champion for its reauthorization? I believe the reason is that advocates have not elevated clean water to the first rank of importance.

Consider two top problems, the crisis in Flint, Michigan, and per- and polyfluoroalkyl substances. Both of these conditions have received national attention and federal money. Why? Because the public has been unwavering in its opinion that these environmental circumstances are unacceptable.

Think about sewage right-to-know laws, which require public notification of combined-sewer-overflow discharges. New York, Connecticut, and Vermont have these legal requirements. There, money for infrastructure improvements has dramatically increased. An educated public is also a voting public.

I believe our advocacy efforts need to change. We need to be more visible to the public and our elected officials. They need to be more aware of our clean water circumstances and the fiscal resources necessary to improve these situations.

Our national partners do an amazing job of clean water advocacy. But the time has come for all of us to communicate directly with our elected leaders.

I challenge all of you individually to contact the person you voted for—hired—to represent you in your congressional district. Tell him or her that we need a new Clean Water Act, one that considers water-quality-based watershed solutions (point and non-point source), diverse funding opportunities, and coordination of drinking water, clean water, and stormwater efforts.

We need a new Act to address our twenty-first-century challenges. The old one has been extraordinary, but in 2020, we need an upgrade. I challenge you to ask for this change. I believe that our most pressing threats to water in the next decade are our own communication practices and acceptance of the status quo.

I challenge all of us to ask for change.

Sincerely,



Susan Sullivan

NEIWPCC Executive Director



Spotlight

THE COMMISSION WELCOMES ITS NEW-est member, **Lori Cragin**, an epidemiologist who directs the **Division of Environmental Health** at the **Vermont Department of Health**. She represents Health Commissioner **Mark Levine**.

Leaving the Commission, with our thanks for years of service, are **Denise Ruzicka** and **Suzanne Blancaflor** of Connecticut, and **Alicia Good** of Rhode Island.

Kudos—and gratitude!—to **Matthew Gorton**, who in early September intercepted an invasive plant about to enter Lake Champlain. Gorton is one of ten seasonal NEIWPCC employees who worked last summer as boat-launch stewards for the **Lake Champlain Basin Program**.


During a routine courtesy inspection at a popular boating area, Gorton spotted *Hydrilla verticillata*, an aggressive aquatic invasive, hanging off a boat trailer about to back into the lake. The plant is not native to the Americas and, if established, can crowd out native species and disrupt local ecosystems. Gorton's previous work, and that of the stewards, was the subject of a story in the September 2019 issue of this magazine.

The NEIWPCC staff is saddened to announce the passing of former commissioners **Astrid Hanzalek** and **Lester Sutton**. Hanzalek, who passed away on September 1, served as a commissioner from 1993 to 2015, representing the state of Connecticut. Her insights were informed by a career in public service and environmental advocacy.

Sutton was a former regional administrator of **New England EPA**. He served as a commissioner for Massachusetts from 1999 to 2011.

Peter Zaykoski represented the NEIWPCC states at a national meeting to discuss water-reuse activities and regulations. Zaykoski is an environmental analyst in NEIWPCC's Water Resource Protection Division. The meeting was held in September in San Diego.

November 22 marked **Susan Sullivan's** thirtieth anniversary at NEIWPCC. Sullivan joined the staff in 1989 as an environmental analyst. She has been the Commission's executive director since 2017.

Sullivan makes a point of thanking members of the NEIWPCC staff on their anniversaries. In that spirit, we say, *thank you, Susan, it's great to have you on the team!* 



Sherril Mackey/HREP

More than five thousand students of all ages from elementary school through college deployed to ninety-three locations in the Hudson River watershed on October 22 to measure salinity, study fish populations, and collect other data. The seventeenth annual Day in the Life of the Hudson and Harbor is supported by NEIWPCC staff members at the Hudson River Estuary Program and the Hudson River National Estuarine Research Reserve. Above, students at Hudson Shores Park in Watervliet, N.Y., use Clearwater's Key to Common Hudson River Fishes to identify a fish held by a staff member from the state Department of Environmental Conservation.

Lake Conference Draws Six Hundred

ON NOVEMBER 12, **Meg Modley**, a scientist on the staff of the **Lake Champlain Basin Program (LCBP)**, greeted more than six hundred who traveled to Burlington, Vermont, for the annual conference of the **North American Lakes Management Society**. Modley was a co-chair of the event, which drew lake-management professionals, engineers, biologists, and citizen scientists from across North America and beyond, with some from as far away as New Zealand.

The theme of the conference was "Watershed Moments: Harnessing Data, Science, and Local Knowledge to Protect Lakes." Day-long sessions focused on algal blooms, citizen science, drinking-water supplies, invasive species, and monitoring.

Also on the program were LCBP staff members **Ryan Mitchell** and **Eric Howe**: Mitchell as moderator of a session on using social and interactive media, and Howe moderating a panel on citizen science. LCBP staff members **Matthew Vaughan** and **Ellen Kujawa** also served on conference planning committees.

The LCBP is a member organization of the North American Lakes Management Society and was one of four conference sponsors. The LCBP's **Elizabeth Lee** designed the conference logo.

Other conference speakers included Society President **Sara Peel**, Burlington Mayor **Miro Weinberger**, Vermont Agency of Natural Resources Secretary **Julie Moore**, and **Nancy Mathews**, the dean of the **Rubenstein School of Environment and Natural Resources** at the **University of Vermont**. The keynote presentation, from **Doug Tallamy** of the **University of Delaware**, was "Restoring Nature's Relationships at Home." Seven other NEIWPCC staff members, including five from the LCBP, also attended some or all of the event.

Come Together

WATER PROTECTION EMBRACES many disciplines. Sometimes, they overlap. Recently, issues related to water pollution from solar farms have been on the agendas of two of the Commission's workgroups. PFAS (per- and polyfluoroalkyl substances), increasingly in the public eye, are being discussed by three.

Other workgroups tackled issues related to proposed federal regulations that would relax pollution standards, backlogs of underground storage tanks needing remediation, new sources of federal aid, and issues related to so-called tiny houses.

PFAS

Pesticides and PFAS are very different contaminants, but last month two NEIWPCC workgroups met to explore the usefulness of the EPA's pesticide-dispersal model for anticipating the spread of per- and polyfluoroalkyl substances.

The joint meeting of the workgroups on **Emerging Contaminants** and **Residuals** also heard the latest national PFAS news and reports from the states.

Mike Winchell of Stone Environmental told participants that the EPA's Pesticide Root Zone Model, developed to evaluate pesticide-leaching threats to groundwater, could provide similar insights when wastewater-plant residuals containing PFAS have been used as fertilizer.

In the states, agency staffs are racing to develop and implement PFAS guidance and standards, in some cases under legislative mandates.

The **Water Quality Standards Workgroup** considered PFAS in an August 21 conference call. Group members compared different responses to PFAS. State-level measures include setting, and working toward setting, groundwater quality standards, and also maximum contaminant levels for drinking water, for substances in the class.

More generally, NEIWPCC hosted a regional training workshop about the fundamentals of water quality standards on October 9 and 10. Highly experienced state-agency personnel served as instructors, including the following members of the Water Quality Standards Workgroup: Anna Mayor from Massachusetts, Traci Iott from Connecticut, and Pete LaFlamme from Vermont.



Thirty-one environmental personnel from around the region attended a water-quality-standards training workshop October 9–10 at NEIWPCC's Lowell headquarters. Another eighteen people participated remotely. Collectively, they hailed from seven states (every NEIWPCC state except for New Hampshire, plus New Jersey) and two EPA divisions. Above: participants pause during a break in the workshop on October 9.

Topics ranged from mixing zones to antidegradation requirements. New and seasoned professionals alike discussed similarities and differences in states' regulations.

Tanks

Many states have a backlog of leaking underground storage tank projects. These known releases pile up when responsible parties are unresponsive or hard to track down. Funds are limited and go to cleaning up the sites that pose the highest risks to human health and the environment. Meanwhile, new releases from underground storage tanks add to the workload. At a September 10 meeting of the **Underground Storage Tanks Workgroup**, participants from two states described map layers and other tools their states are using to assess backlogs and to plan and monitor cleanup efforts.

Outside of the full workgroup meetings, some members are working with NEIWPCC staff members to select the next topics and speakers for two ongoing tanks-related webinar series.

Climate Adaptation

The Commission's **Water Resources Adaptation and Climate Change Workgroup** supports state efforts to adapt to and mitigate such effects of global warming as growing severity and frequency of extreme weather events. The workgroup met by telephone on November 4 to share news of the status of that work in the states.

To support this effort, the group plans to catalog tools and templates that might be generally useful to state adaptation programs.

Solar Farm Runoff

As the region shifts to renewable sources of electricity, solar farms are creating new water-protection issues. At the September 23 meeting of NEIWPCC's **Stormwater Workgroup**, participants compared state approaches to controlling erosion and runoff from large solar farms.

Workgroup members from Connecticut said that state's next construction general permit will have an appendix of regulations specifically for the design and con-

struction of large-scale solar arrays. They shared a draft of the appendix, which includes requirements to mitigate impacts from steep site slope, soil compaction, removal of vegetative growth, and other factors. The workgroup meeting also included discussions about states' municipal separate storm sewer system permits, and about multi-sector general permits.

Solar farms sited near wetlands are similarly of concern to members of the Commission's **Wetlands Workgroup**. On October 28, twenty-three state and federal wetlands program officers also discussed other topics, including proposals that would generally reduce federal and, in one case, state oversight over wetlands.

Workgroup members last winter helped to craft the Commission's response to plans by the Trump administration to remove from federal oversight most of the nation's wetlands. This regulatory action was one of four discussed at the meeting. Others included a proposal to limit the role of states in discharge permits under section 401 of the Clean Water Act. (The most recent news about these and other proposals is included in "The Docket" elsewhere in this issue.)

Workgroup members also assessed ways to track the effects of wetlands regulation, for instance the reduction in a permitted project's wetland footprint as a result of consultation with the state. Another topic was the certification of wetlands consultants. In Vermont, the legislature has instructed the state's Agency of Natural Resources to make recommendations by 2024 about certification.

Some common themes reported from state staff members at the meeting were personnel changes, budget priorities, and issues related to stormwater runoff from large-scale solar projects sited near wetlands and buffer areas. Members from Maine told the group that the Maine DEP intends to add numeric aquatic-life criteria to water-quality standards for wetlands.

Wetlands Biology

The Commission's **New England Biological Assessment of Wetlands Workgroup**, one of NEIWPCC's oldest, will continue for at least another two years with a grant from EPA New England. The grant will also fund a comparative study of the methods that states use to assess wetlands, and an attempt to characterize the health of wetlands in the Northeast based on those methods.

Workgroup members stayed in touch this quarter through a webinar that shared information about three projects in New

York. The Commission established the group in 1998.

Tiny Houses

On a September 23 conference-call meeting of the **Onsite Wastewater Workgroup**, state-agency personnel from multiple states said they have received inquiries about wastewater from tiny houses. These structures are typically no larger than 400 square feet.


The regulatory status of these homes, and how wastewater from them may be managed, is not clear-cut. A home's legal status may depend on such factors as how wide it is, whether it has wheels and a license plate, and whether it is used as a year-round residence.

These factors determine whether it is regulated as a house, an accessory dwelling, or a recreational vehicle.

Source Water

When members of the **Source Water Protection Workgroup** convened by conference call on September 5 and October 1, the main discussion topic was the funds included in the 2018 Farm Bill for source-water protection. In that bill, Congress allocated \$4 billion over ten years.

Members of the workgroup from New England EPA summarized a series of discussions the EPA has held about programs and agencies awarding Farm Bill funding, such as the USDA's Natural Resources Conservation Service (NRCS).

One project that received 2018 Farm Bill funding through the NRCS is focused on protecting the Merrimack River as a drinking water source for communities. Meeting participants from Massachusetts shared additional details about the project with the workgroup. 



Even Wade

The Watershed Approach: The Importance of Partnerships

31st Annual Nonpoint Source Pollution Conference

April 23-24

Woodstock, Vermont

Sponsored by the Vermont Department of Environmental Conservation, EPA Region 1, and NEIWPCC.

Mercury Progress: Up in Smoke?



BY RICHARD FRIESNER

A DECADE OF STEADY PROGRESS ON mercury, a potent neurotoxin, may be threatened by the Trump administration's tack towards coal. The saving grace? Power-plant owners want no part of it.

Airborne mercury from power plants and other sources becomes water pollution when deposited in water or washed into waterbodies after being deposited on land. Bacteria in the water convert it to a biologically dangerous form, methylmercury, which bioaccumulates in fish and other organisms.

National air quality standards adopted in 2011 reduced airborne mercury by requiring power-plant owners to install post-combustion technologies that remove mercury from smokestack emissions. Mercury reduction has also been boosted by market forces that are shuttering coal and oil power plants. The Clean Power Plan proposed by the EPA in 2015 to control greenhouse-gas emissions would also have the effect of phasing out more coal plants.

However, after the 2016 election, the EPA

reversed itself on the Clean Power Plan, which may be formally repealed or replaced. The agency is also taking aim at the 2011 rule, which significantly reduced mercury from power plants.

Potent Toxin

Mercury makes its way into the air from volcanoes and other natural processes, from the incineration of medical and municipal waste, and from power plant emissions. Mercury emissions in the Northeast dropped dramatically around the start of this century as states adopted aggressive mercury limits for incinerators.

Between 1998 and 2002, annual mercury emitted by municipal waste incinerators in eight northeastern states declined from 14,000 to 2,000 pounds, according to the Northeast States for Coordinated Air Use Management (NESCAUM). Mercury from the incineration of medical waste dropped from nearly 8,000 to less than 500 pounds.

By 2010, emissions from power plants, mostly in the Midwest, loomed largest as the mercury threat to water quality in the Northeast.

The States Act

In 2005, NEIWPCC began working with the seven northeastern states to develop a regional plan to limit mercury enter-

ing the region's waters. The Northeast Regional Mercury Total Maximum Daily Load (TMDL), finalized in 2007, focused on reducing the atmospheric deposition of mercury. This "mercury pollution diet" called for a 98% reduction in atmospheric sources of mercury from inside and outside of the region.

In 2008, NEIWPCC invoked Section 319(g) of the Clean Water Act and petitioned the EPA to hold an interstate management conference on mercury. That provision of the law had never before been used to address a water-quality concern.

Every NEIWPCC state attended a regional mercury management conference that the EPA convened in response to this petition, in Philadelphia in June 2010. Eleven other states also participated. After the management conference, NEIWPCC spearheaded the request from all of the NEIWPCC member states and five others asking the EPA to establish federal mercury standards for coal-fired power plants.

The EPA did so in 2011, when it finalized the Mercury and Air Toxics Standards (MATS). These were the first national air standards for mercury and other air pollutants from coal- and oil-fired power production.

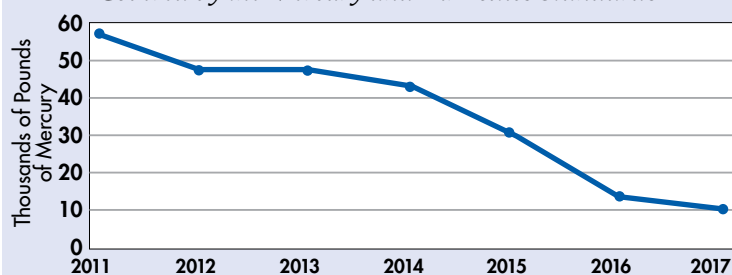
Mercury Declines

These standards have led to significant reductions in mercury emissions. Between

Richard Friesner, Ph.D., is the director of NEIWPCC's Water Quality division. NEIWPCC's communications director, Adam Auster, contributed to this story.

Power Plant Mercury Declines

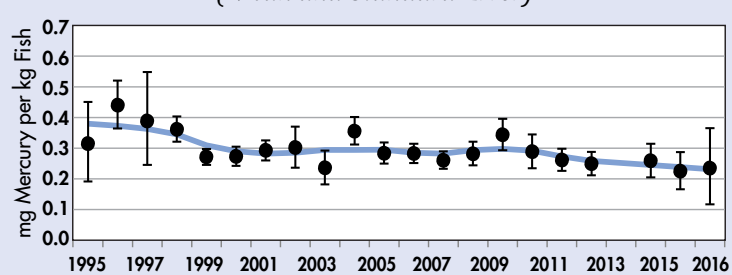
Total U.S. Annual Mercury Emissions from Power Plants Covered by the Mercury and Air Toxics Standards



Source: EPA.

Mercury in Fish over Time

Mercury in Yellow Perch Tissue (Mean and Standard Error)



Source: NH DES. No samples for 2013.

2011 and 2017, nationwide air emissions of mercury decreased by 81.7%. In 2014, coal-burning power plants were still the largest anthropogenic source of mercury emissions to the air in the U.S. (44% of all mercury emissions).

The rule has apparently made itself felt locally. In 2018, the New Hampshire Department of Environmental Services found, “There are indications that statewide mercury concentrations are declining in fish tissue, especially for yellow perch. The recent tendency in fish tissue concentrations of mercury coincides with reductions of in-state atmospheric emissions of mercury.” The Department also noted, however, “additional fish and emissions data” are required “to confirm this association.”

Today, NEIWPCC is working with the Connecticut Department of Energy and

Environmental Protection and the University of Connecticut to complete the third Connecticut-wide mercury fish-tissue assessment. For two decades, Connecticut has issued a consumption advisory to the public on most freshwater fish due to mercury contamination. The state initiated the advisory shortly after the conclusion of the first statewide assessment in 1996, and continued after a second assessment in 2006.

The second assessment found lower fish-tissue mercury levels generally, although levels remained above thresholds commonly advocated as posing risks to consumers. This third assessment will provide new data to revise the status and trend of fish-tissue mercury in largemouth bass.

Regionally, NEIWPCC is exploring ways to update the air-deposition modeling that underlies the TMDL, through the Commis-

sion’s TMDL Workgroup and its work with NESCAUM and the EPA.

Progress or Retreat?

Repeal of MATS, and the Clean Power Plan, would be blows to environmental quality. Nonetheless, the market has already spoken. Environmental controls on smokestack mercury, such as catalysts and filters, are already installed and operating in existing power plants, and new coal plants are not on the drawing board in the United States. The Edison Electric Institute, a trade group representing power plant owners, last year asked the EPA to leave MATS alone, citing a need for “regulatory and business certainty.”

Despite this, the EPA could publish a rule repealing these standards at any time. Certainty is in short supply. 💧

‘Co-Benefits’ and No Benefits

IF THE TRUMP ADMINISTRATION IS SUCCESSFUL IN REPEALING the Mercury and Air Toxics Standards (MATS), which cap mercury emissions at power plants, it will be by counting all of the costs, but only some of the benefits, of the rule.

Fifty years ago, cost-benefit analysis (which simply weighs costs against benefits) was a business technique that was being adopted as a tool for public policy. It was controversial because using it involved assigning dollar values to such things as human health and life and to entire species. Today such analyses are routinely used to guide many policy decisions, such as the design of ratepayer-funded energy-efficiency programs offered by gas and electric utilities.

Where successful, a comparison of benefits and costs relies on a comprehensive account of all factors. In the case of MATS, that analysis should include all of the costs (for instance, of scrubbers at fossil fuel plants) and benefits (e.g., of health effects of less mercury in the food chain). The economic techniques for valuing human health and other non-monetary factors in dollar terms are widely accepted.

The Trump administration has proposed counting all of the costs of the rule, which it finds to be \$9.6 billion per year. However, it excludes from its calculus benefits that are

not directly related to mercury, which it calls “ancillary co-pollutant benefits.” It also declines to assign any value to some costs that mercury entails, such as “impacts on motor skills and attention/behavior.” This decision effectively values these and other effects as having zero cost.

The equipment that MATS require the owners of power plants to install to reduce mercury emissions also reduce other pollutants with consequences to human health, such as fine particulate matter. The EPA does not deny that these reductions are beneficial, and in 2011 valued them at \$30–90 billion per year. However, the EPA excludes these benefits from its new cost-benefit computation. The agency does count all of the costs of the equipment, however.

It’s not the first time that the administration has sought to undercount environmental and health benefits of a regulation. The proposal to repeal the Obama-era Clean Water Rule, for instance, was originally based in part on a cost-benefit analysis that valued wetlands (and other) benefits at zero. The analysis nonetheless counted costs of delivering those benefits.

These flawed cost-benefit analyses cannot provide meaningful guidance to decision-makers.

— Adam Auster

Building the Green Future

Connecticut Reaches for Ambitious Stormwater Goals

BY ANNA MEYER

IMAGINE A PLACE WHERE GREEN ROOFS, rain gardens, and permeable pavements are common, a place where stormwater is almost always managed close to its source and underground drainage pipes are a last resort.

Thanks to ambitious statewide requirements on discharges from municipal separate storm sewer systems, and an innovative program of guidance and support, more than a hundred communities in Connecticut are taking steps to make green infrastructure the norm.

New Permit

In January of 2016, Connecticut's Department of Energy and Environmental Protection (DEEP) issued a revised permit for municipal separate storm sewer systems (MS4s).

An MS4 is a system of catch basins, pipes, and other structures designed to drain runoff from roads and other impervious surfaces and discharge it, untreated, into a nearby water body.

Connecticut's "General Permit for the Discharge of Stormwater" from small MS4s is a set of requirements written and administered by DEEP to comply with the federal Clean Water Act. It outlines what municipalities and other entities with MS4s must do to manage discharges from those systems. In other words, the

requirements hold permittees accountable for the quality of stormwater coming from their jurisdictions.

The 2016 revised general permit applies to 121 of the state's 169 municipalities and to large state and federal institutions. Compared to the previous permit, issued in 2004, the new version significantly increases what it requires of permittees.

Challenges

A major new provision of the 2016 version requires permittees to estimate the total acreage of rooftops and other impervious surfaces that drain directly to the permittee's MS4 or a water body. The permit sets a 2022 goal for municipalities to reduce this *directly connected impervious area* by 2%.

Furthermore, the permit requires cities and towns to transition to managing stormwater primarily with low impact development—stormwater controls such as rain gardens that use nature to promote infiltration—rather than with conventional underground drainage systems.

These practices reduce both the volume of runoff from impervious surfaces and the amount of pollution discharged to nearby water bodies.

In addition, the 2016 permit has more extensive requirements for maintenance, monitoring, and reporting.

For permittees, meeting all of these requirements posed a daunting challenge.

Support

When Connecticut DEEP issued the updated permit in 2016, it sought help for cities and towns from the University of Connecticut's Center for Land Use Education and Research (CLEAR). The Center is known for its expertise in mapping and



Above, a bioretention swale on the University of Connecticut's Storrs campus. The swale removes pollutants from road runoff and promotes infiltration.

Anna Meyer is a NEIWPC environmental analyst. Faculty and staff of the NEMO Program at the University of Connecticut's Center for Land Use Education and Research contributed to this story.

outreach. For nearly thirty years, through its flagship NEMO (Nonpoint Education for Municipal Officials) Program, CLEAR has been educating local decision makers about the relationship between land use and water resource protection.

Connecticut DEEP has an agreement with CLEAR to provide a multifaceted program of compliance support to permittees



David Dickson/UCConn CLEAR

in the course of the five-year life span of the 2016 permit.

Now, over halfway through the agreement period, permittees appreciate CLEAR's efforts to use maps, templates, and technical support to ease the administrative and financial burdens of permit compliance. Moreover, statewide compliance has improved dramatically compared to that for the 2004 version, and CLEAR has received regional recognition for its work.

Low Impact Development

Low impact development (LID) is an approach to land development that works

with nature to manage stormwater as close to its source as possible. It employs, according to a resource by CLEAR, "small-scale controls integrated throughout [a] site."

These stormwater controls include such green-infrastructure elements as green roofs, permeable pavement, and rain gardens.

The updated MS4 permit requires municipal and institutional permittees to implement low impact development as the primary approach to stormwater management wherever possible. Municipalities must establish LID in their land-use regulations as the preferred approach to managing storm-

water, and remove any barriers to its use.

A dynamic online resource by CLEAR provides examples of various ways that towns have changed their land-use regulations to allow for—or encourage or even require—low impact development. CLEAR has also posted sample regulations, which towns can adapt.

Impervious Connections

The permit requires communities to calculate and reduce the impervious area that drains directly to an MS4 or directly to waters of the state. Stormwater systems

continued on page 10

Green Future
continued from page 9

convey runoff from impervious surfaces (including roofs, roads, sidewalks, and parking lots) and all the pollutants the runoff picks up, directly to water bodies,

degrading the water quality of those bodies, and causing flooding.

In contrast, LID, according to materials prepared by CLEAR, “can lower flood risk, replenish groundwater reserves...protect water resources, limit erosion, and reduce stress on municipal sewer systems.” Con-

sequently, directly connected impervious area (or DCIA) is at the heart of every community’s stormwater problems.

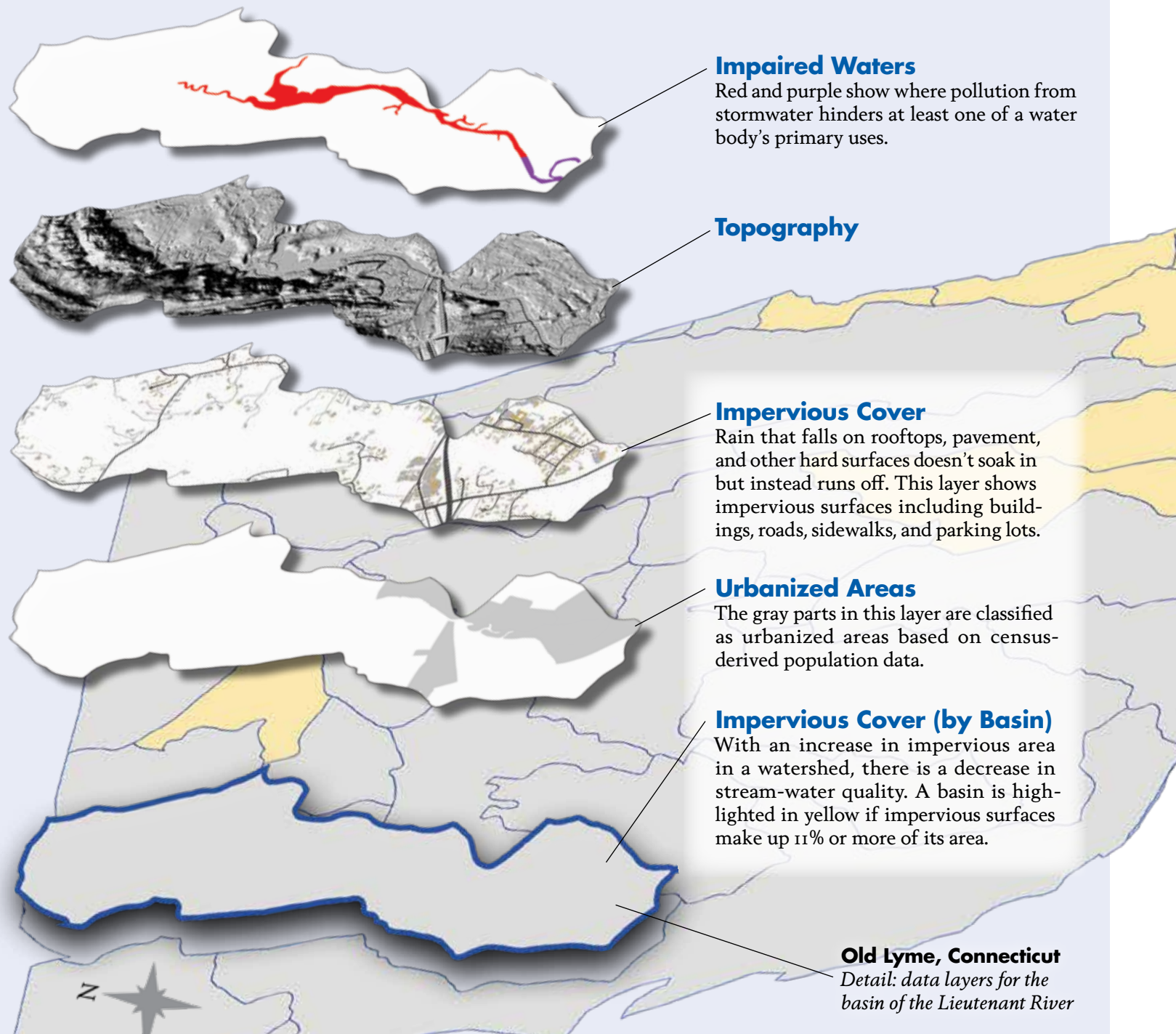
Estimating directly connected impervious area is one of the more challenging parts of the permit. A related challenge is identifying where to work first, given

Mapping the Critical Areas

Rich Data Layers Aid Decision Makers

Permittees can use an online mapping resource from CLEAR to identify places where pollution from stormwater is most problematic and green stormwater controls would make the biggest improvement. The state requires permittees to identify the areas based on criteria related to population, impervious

cover, and water bodies that are impaired due to stormwater. The map viewer allows decision-makers to see these criteria layered on top of one another. The most critical places are where the criteria overlap.



limited resources. CLEAR helps with both.

When the 2016 permit was being developed, the only data about impervious cover available for the whole state were derived from satellite imagery with a thirty-meter resolution. These data are too coarse to identify impervious cover accurately, let alone to estimate how much of it is connected to a stormwater system.

To remedy this, CLEAR commissioned a geospatial data company to create a new statewide map layer showing impervious cover (including buildings, roads, and other impervious areas) at a resolution of one foot. The company used high-resolution aerial imagery to make the layer.

The geospatial team at CLEAR then made the data layer, and many other statewide layers, available in an interactive online map viewer.

The impervious cover layer and online viewer help towns to estimate how much impervious cover they have and where it is most highly concentrated. Permittees can then use a formula provided by DEEP to approximate how much of the total impervious area is directly connected to the MS4 or a water body.

Priority Places

Through the permit, DEEP also requires permittees to identify priority geographic areas based on criteria related to population density, prevalence of directly connected impervious area, and proximity to a water body that is impaired due to stormwater. The MS4 map viewer allows decision-makers to see these criteria layered on top of one another. The most critical areas are where the criteria overlap.

Improvements to these priority areas will largely be achieved by switching from traditional stormwater infrastructure to low impact development. Permittees must map all elements of the stormwater system within priority areas to find places where runoff from impervious surfaces can be disconnected from the system and replaced with LID. Through its online Connecticut MS4 Guide, CLEAR provides information about a range of options for beginning or expanding mapping of stormwater systems.

More Help

Each MS4 permittee must develop a stormwater management plan. In addition, these towns and institutions must inform their communities and DEEP annually on their progress under the plan.

Door-to-Door Assistance

UNDER A KEY PROVISION OF THE AGREEMENT WITH DEEP, A CLEAR STAFF member travels around the state providing technical assistance to municipal employees and talking with local decision makers about the new requirements. This “circuit rider,” Amanda Ryan, says many towns reach out to her with questions about the permit and how they can comply with it.

Ryan shares cost estimates compiled from conversations and meetings with other municipalities and, on request, delivers presentations about the permit to municipal boards charged with implementing and paying for the new requirements.

Ryan and her colleagues at CLEAR also offer workshops and webinars to help communities work through particularly complex or confusing parts of the permit.

Below, at a workshop on low impact development, Ryan (at left) talks with Laura Pulie, senior civil engineer for the Town of Fairfield, Connecticut.



Kara Bonsack/UCConn CLEAR

The CLEAR staff created templates for the main plans and reports required by DEEP, including the stormwater management plan and the annual progress report. The templates save time and money, not only for permittees, but also for DEEP, which reviews the plans and reports.

In addition, the University of Connecticut campus is a showcase of LID practices. “We have over sixty-five different practices installed on campus,” says David Dickson,

Regional Recognition

IN 2017, THE NEW ENGLAND Stormwater Collaborative awarded CLEAR its Stormy Award for Best Stormwater Idea in New England. The award recognized the practice of accompanying new regulatory requirements with a program of assistance, tools, and education as among the best approaches to stormwater management.

a faculty member of CLEAR and the NEMO Program. “We provide tours of the practices and talk about what has worked and what hasn’t.” For those who can’t make it to campus, “we also have the virtual tour,” he says.

Dickson also describes a forthcoming program called Stormwater Corps “where we are training undergraduates to identify opportunities for LID retrofits and prepare retrofit plans for towns.” This student corps will help municipalities to “meet their 2% disconnect requirement,” he says.

Results

Connecticut DEEP’s investment in a compliance support program has already paid off for the agency, for towns, and for the environment.

“The template for the stormwater management plan alone saved the town a significant amount of money,” said Warren Disbrow, the assistant town engineer for East Hartford.

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The Nation and the Region

Ongoing: Clean Water Rule

It took a single day for environmental groups to ask a federal court to block the Trump administration's repeal of the 2015 Clean Water Rule. That rule was itself mired in litigation from its inception.

Official notice of the repeal, formerly **Docket No. EPA-HQ-OW-2017-0203**, appeared on October 22, effective on December 23 unless blocked by court action. The next day, nine regional and national environmental groups asked the U.S. South Carolina District Court to set the repeal rule aside. Their lawsuit cites potential harm to U.S. waters and alleges violations of both law and the Due Process clause of the Constitution.

The repeal rule is linked to another proposal, still pending at press time, that would remove from federal jurisdiction most of the nation's wetlands. NEIWPCC registered strong objections in that regulatory proceeding, **Docket No. EPA-HQ-OW-2018-0149**, before comments closed on April 15 of last year.

In a related proceeding two years ago (not docketed), the Commission advised the EPA to base any changes to the rule on the agency's own 2015 literature review of science related to hydraulic connectivity. The EPA has eschewed scientific evidence in both rule-makings.

The connectivity study figures prominently in criticism of the new rule from within the EPA itself. On December 31, the EPA's Science Advisory Board made available a draft of a letter from the board noting that the rule "does not fully incorporate EPA's 2015 Connectivity Report."

At press time, the board was scheduled to discuss the letter, which is addressed to EPA Administrator Andrew Wheeler, on January 17. Among other criticisms, the draft says "aspects of the proposed (clean-water-act) rule are in conflict with established science...and the objectives of the Clean Water Act."

The proposal, the draft concludes, "decreases protection for our nation's waters."

The board will also consider draft letters critical of administration proposals to inhibit the use of scientific data by the EPA and to roll back standards for fuel efficiency and toxic air emissions, including mercury.



The 2015 rule was procedural and did not change the scope of federal jurisdiction significantly. Nonetheless, lawsuits delayed the rule from taking effect until 2017, and then in less than half of the states.

Will litigation similarly hamstring the Trump administration's efforts to curb the scope of Clean Water Act jurisdiction? Eventually, these conflicts will likely be settled by the Supreme Court, which sowed the seeds of today's legal thicket in a divided decision in 2006. The court's next opportunity to weigh in could come as early as next summer in *County of Maui, Hawaii v. Hawaii Wildlife Fund*, heard by the Court on October 6, 2019.

Meanwhile, the South Carolina District Court had not responded to the petitioners' request to delay the effectiveness date for the repeal as this magazine was going to press.

The legal dispute over federal Clean Water Act jurisdiction was the subject of a story in the March, 2018, issue of *Interstate Waters*.

Ongoing: Permit Review

Spurning the advice of NEIWPCC and others, the EPA is advancing a plan that would curtail the time states have to certify or deny permits, and the grounds on which states may make those decisions.

As reported in the September, 2019, issue of *Interstate Waters*, the proposal, **Docket No. EPA-HQ-OW-2019-0405**, has advanced to the formal rule-making stage. It would, according to NEIWPCC Executive Director Susan Sullivan, "result in increased certification delays, denials, and confusion" and

violate the Clean Water Act by "diminishing state water authority to protect water resources."

Sullivan made her remarks on behalf of the seven NEIWPCC states in a nine-page comment letter on October 21. Previously, Sullivan had counseled the EPA to work closely with states on the issue. "States have a unique understanding of waters within their jurisdiction and are best positioned to provide input," she wrote in May.

The proposed rule does not reflect that advice.

The rule would govern state review of projects under Section 401 of the Clean Water Act. That part of the law bars the EPA and other federal agencies from permitting activities that may result in a discharge unless a state or tribe certifies or waives compliance with existing water-quality requirements.

In the proposed rule, the limited time states have to review applications could begin and even expire before states have all of the information they require. Also, the rule would block states from considering water-quality impacts that are not within the scope of the Clean Water Act as redefined by the EPA. The rule would allow the federal government to override state certification conditions or denials.

The proposal could subject states to more frequent lawsuits when the curtailed process requires states to make decisions without a complete record of factual evidence.

The EPA initiated the new rulemaking in response to **Executive Order 13868**, which is largely about streamlining rules for the siting of energy facilities.

Back Again: Regional EPA Lab

The fate of the regional EPA laboratory in Chelmsford, Massachusetts, is still in doubt despite earlier assurances that the lab would continue to operate.

The Commission has been outspoken in its opposition to this plan, which would shift work to expensive private contractors and to EPA facilities in Rhode Island and New Jersey. Chelmsford's central location allows for rapid response to spills and fires, and is a boon to states using the facility for training.

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The Docket

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New: Water Reuse

The Commission has encouraged the EPA to pursue a plan to foster greater reuse across the water sector. The proposal in **Docket No. EPA-HQ-OW-2019-0174** includes such measures as preparing case studies of successful applications of water reuse. Another possible project would be developing a searchable inventory of water-reuse research. NEIWPCC's November 26 comments described ways that the Commission, and its member states, might contribute to these and other efforts.

New: Algal Blooms

The Commission on October 31 provided both policy and technical advice to the EPA in a preliminary discussion that could focus federal attention and resources on the problem of harmful algal blooms.

The agency is developing criteria for designating some bloom incidents as nationally significant events. Under the Harmful Algal Bloom and Hypoxia Research and Control Act, such designations may enable mobilization of federal resources to assess and mitigate some blooms or hypoxia.

The Commission warned the EPA that focusing only on “nationally significant” events could shortchange some regions and cause the agency to miss important areas of research. Accordingly, the Commission said, the effort to assess the significance of particular blooms should be state-led.

In its comments, NEIWPCC identified modeling of HABS as a useful area for federal research with potentially broad applicability. Federal support, the Commission said, could also take the form of research into the potential for biomanipulation to control nutrients and blooms.

One such technique manipulates entire ecosystems by adding or removing top predators.

The Commission also advised the EPA as follows:

- States would benefit from national HABS standards, and tools for assessing public-health risks from blooms;
- While toxicity of blooms is a concern, “it should not be the primary metric” of severity;
- Historical data should be used “in conjunction with current and future climate conditions;”
- The economic impact of blooms “should be measured in percentage of total revenue

lost” when assessing the significance of a bloom, rather than total dollars lost.

Harmful algal blooms in the Northeast, and public-health messaging about them, is the subject of a report in the March, 2016, issue of the *Interstate Water Report*, the predecessor of this magazine.

New: Water Quality Trading

The Commission cautiously supports water-quality trading, that, properly implemented, would give states flexibility in meeting water-quality objectives, often at less cost. A similar trading mechanism is the lynchpin of the Regional Greenhouse Gas Initiative.

The EPA is seeking advice about how to incorporate market-based trading of water-quality credits into strategies to meet the requirements of discharge permits and total maximum daily loads.

The agency has proposed guidelines in **Docket No. EPA-HQ-OW-2019-0415** favoring trading as an optional mechanism to satisfy some or all of the load requirements. These guidelines are the first of several expected from the EPA related to market-based mechanisms for water quality improvement. When final, these principles will inform future guidance and policy.

Trading systems can be a cost-effective way to reduce pollution in a watershed, especially where the cost to reduce pollution varies significantly among sources. For example, implementing stormwater best-management practices may reduce an equivalent amount of nutrient loading to a river as installing additional treatment in a nearby wastewater treatment plant, at a fraction of the cost.

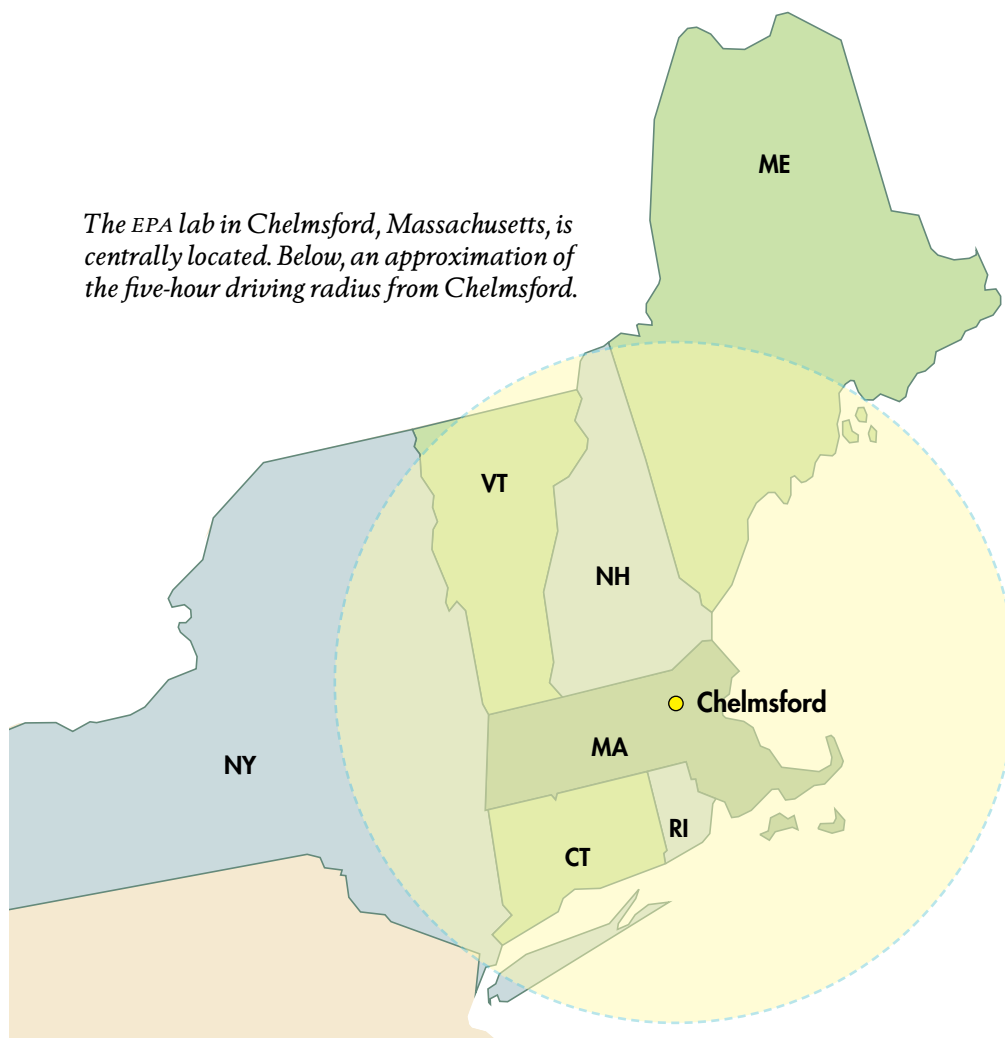
In comments filed on November 15, NEIWPCC qualified its support of market-based mechanisms by citing the EPA's stated goals of maintaining clarity and flexibility for states in implementing such policies. Furthermore, the letter identified some potential difficulties in accounting for nonpoint-source reductions accurately. As NEIWPCC Executive Director Susan Sullivan noted in the letter, “Existing successful trading programs focus on trading between point sources,” where generation of credits is “readily measurable.”

The Commission also advised the EPA to account for interstate trading regimes, and for regional differences among nonpoint sources, when crafting its final guide. 💧

The status of some or all of these rules and other matters may have changed since this issue of *Interstate Waters* went to press.

— Adam Auster

The EPA lab in Chelmsford, Massachusetts, is centrally located. Below, an approximation of the five-hour driving radius from Chelmsford.





On Main Street in Bridgeport, Connecticut, a linear roadside bioretention basin stands ready to absorb stormwater.

Green Future

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According to a 2018 estimate by CLEAR, each town using the template for the stormwater management plan realizes a cost savings of approximately \$10,000. Similarly, using CLEAR's annual report format instead of hiring a consultant to do it saves towns that use it about \$4,000 each.

Even if only half of the towns used each of the templates, and many more than half did, that is a total savings of \$600,000 for the stormwater-management-plan template and \$240,000 for the annual report.

Overall, CLEAR estimates that the program had already saved the state and MS4 towns well over \$1.6 million, more than covering DEEP's investment of \$1.2 million to acquire the necessary geospatial data and fund CLEAR's outreach support.

The improvement in compliance has been dramatic. Under the 2004 version of the permit, it took DEEP more than two years, seven notices of violation, and two consent decrees to get all towns to develop

stormwater management plans. This time, despite significantly increased requirements, all towns had complied within six months and without any enforcement actions. A member of DEEP's stormwater section wrote to CLEAR, "Frankly, our success in getting such good compliance this time around has to do with you folks."

Across the state, as permittees comply with the challenging requirements, as they start to use low impact development more and more, they are making strides toward two beautifully simple goals: reducing flooding and protecting water environments from pollution. 

Tools that CLEAR has created to support Connecticut cities, towns, and other MS4 permittees include an online mapping resource, a story map with examples of ways towns have changed their land-use regulations, a virtual tour of dozens of green stormwater infrastructure practices at the University of Connecticut, and a website that houses all of these materials and much more. For links to these resources, visit neiwpc.org/clear.

Northeast Aquatic Biologists Conference

*Crucial Benefits
of
Water Monitoring
Programs*

**March 4–6
Newport, Rhode Island**

Session Topics

Volunteer Monitoring
 Modeling for
 CWA Assessments
 Contaminants
 Innovative
 HABs Monitoring
 River Water Quality
 Monitoring
 River Connectivity and
 Dam Removal
 HABs in the
 Finger Lakes Studies
 Biological Stream Monitoring
 Freshwater Bivalves
 Lake Management
 and Analysis
 Low-Gradient
 Stream Biocriteria
 Estuary Monitoring
 and Assessment
 Lake Indicators
 Modeling
 Ecological Relationships
 Watersheds and
 Water Quality
 Fish Assemblages
 Stream Flow
 Microbial Source Tracking

*Sponsored by the
 Rhode Island Department of
 Environmental Management
 and NEIWPC.*

Parting Shot



IN ACTON, MASSACHUSETTS, ON SEPTEMBER 12, three budding soil evaluators practice soil identification with help from instructor Paul Blain (right). A “monolith” of three vertical feet of soil lies on its side to show the students different soil types by layer.

The students are using pages from the *Munsell Soil Colorbook* to assess the color attributes of different layers in the soil, practicing skills they will need in the field when they evaluate the suitability of different sites for septic systems.

Suitable soil falls into the “Goldilocks” range of permeability, neither too compact (which would prevent timely percolation of septic effluent) nor too loose (which would fail to treat the effluent). A good site must also not be too close to the water table, to surface water, or to a wetland or floodway.

Color and texture are two keys to iden-

tifying soil types. Students also learn uniform systems for describing the structure of soils, such as granular and the nature of platy (plate-like), columnar, and blocky soil structures. The Munsell system helps trained evaluators to identify fine differences in color that indicate the presence of organic matter, the composition of the soil, and other key characteristics.

In Massachusetts, Title 5 of state law requires state-certified soil evaluation before construction of septic systems. Other states have similar requirements, but in the Northeast, Massachusetts provides the most robust support for the training and certification of the professionals.


Instructors from the Massachusetts Department of Environmental Protection, UMass Amherst, and NEIWPCC train and certify Title 5 soil evaluators. NEIWPCC similarly provides training and certification

for the professionals who inspect septic systems prior to property transfer.

The Commission offers classes twice a year for both soil evaluators and system inspectors, in spring and fall. Locations for the training move around the state.

The class for soil evaluators spans basic geology, some microbiology, and soil chemistry. Students gain an understanding of soil structure, which varies by soil type, and map reading. They learn how to measure characteristics relevant to soil’s ability to filter and treat effluent.

The course comprises classroom and field instruction, and both written and field certifying examinations.

Instructor Blain is a former senior hydrogeologist at the Massachusetts Department of Environmental Protection. He is one of several NEIWPCC soils instructors. 

— Adam Auster

Events

January 14-17, Mobile, Ala., Association of Boards of Certification annual conference, "Innovation in Certification." tinyurl.com/abc20al

January 26-29, Boston, Mass.: New England Water Environment Association. tinyurl.com/newea2020

February 3-5, New York, N.Y.: New York Water Environment Association annual meeting. bit.ly/NYWEA2020

March 4-6, Newport, R.I., Northeast Aquatic Biologists Conference, "Crucial Benefits of Water Monitoring Programs." neiwpc.org/nab2020

April 28-29, Bridgeport, Conn., "Community Based Social Marketing," Long Island Sound Study workshop.

April 23-24, Woodstock, Vt, Thirty-First Annual Nonpoint Source Pollution Conference, "The Watershed Approach." neiwpc.org/NPS31VT

May 7-8, Old Saybrook, Conn., NEIWPC Executive Committee and Commission meeting.

May 16, World Fish Migration Day, various events on the Hudson River and elsewhere in the region.

September 22-24, Pittsburgh, Penn., National Tanks Conference. neiwpc.org/ntc2020

On our cover, University of Connecticut students stroll along permeable interlocking concrete pavers, which are among sixty-five different green stormwater controls on the campus. When it rains, water passes through spaces between the pavers and infiltrates into the ground below.

In the upper left corner of the photo, soil and plants on a green roof are ready to retain and treat precipitation.

Photo: Kara Bonsack/UConn CLEAR.

