



Interstate Water Report

THE NEWSLETTER OF NEIWPCC – THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

KATRINA AND HER LESSONS

The Water and Wastewater Side of the Story That's Far From Over

by Stephen Hochbrunn, NEIWPCC

As a senior environmental scientist with Louisiana's Department of Environmental Quality and director of the state's Clean Water Project, Chris Piehler has lived and struggled with the impact of Hurricane Katrina for months. Among other things, he helped coordinate the massive effort to assess the contaminants of the floodwaters in and around New Orleans. He is viscerally aware of the water and wastewater-related work yet to be done and the problems yet to be solved. What he wasn't completely aware of, until a multi-state conference call on mercury in January, was the gulf between his reality and the perceptions of some others. During the call, Piehler posed a question to a program manager from the Midwest, who seemed to have accomplished a good deal without a lot of money.

"I was curious about the resource allocations to the program, because we have budget issues here that are

going to be difficult to overcome," LDEQ's Piehler said, "And he basically said, 'Well, we have tornadoes up here, so don't give me your sob stories. We have problems up here too.' It became very obvious to me that, unless you're very, very involved, or have actually visualized and experienced on a fairly regular basis what's happening down here, most people have already forgotten it."

In much of the country, we've moved on. In the parts of Louisiana and Mississippi ravaged by Katrina, they haven't had that luxury—and won't, for a very long time. Water and wastewater systems in the region are in dire need of repair, and the bill will be staggering; based on current estimates, the cost of fixing the damage inflicted by Katrina and her sinister sister Rita on the systems could easily top \$10 billion. There are other less obvious water-related impacts: The population shift seen as flood victims moved to areas outside the hurricane-

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damaged region has led to the overloading of sewage treatment plants incapable of handling the enormous increase in flow associated with the influx of displaced citizens.

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Under Siege: Wastewater treatment plants in Louisiana's Plaquemines Parish (left) and St. Bernard Parish (right) lie virtually submerged in floodwater in the days after Hurricane Katrina roared ashore.

PHOTOS BY LOUISIANA DEPT. OF ENVIRONMENTAL QUALITY

A STUBBORN BACKLOG

Why So Many Pollutant Dischargers Lack the Permit They Need—and What's Being Done About It

by Laura Chan, NEIWPCC

It's a problem that many have identified: Too many facilities across the country are discharging pollutants into water bodies without an up-to-date version of the permit required to do so. Identifying the best ways to solve the problem has been the hard part—but it's not for lack of trying. In New England, where the permit backlog is greater than in any other region of the country, the drive to issue more permits comes from the top.

"When I came to the agency four and a half years ago, I was very concerned about the backlog from the standpoint of our environment and water quality," said Robert Varney, EPA New England's Regional Administrator, in an interview conducted for this article. "I recognized that many communities had old, out-of-date, backlogged permits and that if new permits were issued, there would be a significant reduction in water pollution. It wasn't simply an administrative concern

"In the past, there was often a tendency to focus on permits that were easier to issue... From an efficiency standpoint, that makes sense. But from the standpoint of improving the environment, it wasn't the best thing to do."

ROBERT VARNEY, EPA NEW ENGLAND'S REGIONAL ADMINISTRATOR

about the fact that there was a backlog, but it was primarily a water quality concern and an environmental quality concern. By increasing the number of new permits that are going out the door, which have more stringent standards in them, we can reduce the amount of pollution entering our waterways."

Thanks in part to Varney's persistent support of moves to address this issue, progress is being made in our region; the permit production rate rose dramatically

last year. But many, including Varney, would like to see the pace of permitting pick up even more. That won't be easy. For in the world of permitting, very little is.

PERMITTING 101

The quality of the water resources that we depend upon for everyday activities, such as drinking, swimming, fishing, and boating, is related to the amount of pollutants that enters the water through discharges. The control of such discharges is achieved through permitting.

Permitting has played a huge role in the improvement in water quality that the country has seen since the passing of the Clean Water Act and the creation of the National Pollutant Discharge Elimination System (NPDES) in 1972, and permitting continues to be major force for water pollution prevention. If we need a reminder of the ineffectiveness of pollutant control prior to this program, we can conjure up images of the Cuyahoga River bursting in flames due to unregulated waste dumped into the river by waterfront industries.

All facilities—industrial, municipal, or other—must obtain coverage under a NPDES (commonly pronounced "NIP-deez") permit in order to discharge

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Executive Director
Ronald Poltak

Deputy Director
Susan Sullivan

Established by an Act of Congress in 1947, the New England Interstate Water Pollution Control Commission is a not-for-profit interstate agency that utilizes a variety of strategies to meet the water-related needs of its member states—Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. NEIWPCC coordinates activities and forums that encourage cooperation among the states, educates the public about key water issues, supports scientific research projects, trains environmental professionals, and provides overall leadership in water management and protection. While NEIWPCC's initial emphasis was on surface water protection, the Commission now also devotes substantial attention and resources to such matters as wetlands restoration, nonpoint source pollution, water allocation, and underground storage tanks.

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Interstate Water Report

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FROM THE EXECUTIVE DIRECTOR

AN IDEA WHOSE TIME HAS COME

Once again, we look at a proposed federal budget from the Bush administration and see a dramatic cut to clean water funding. For fiscal year 2007, the reduction would be approximately \$300 million. The majority of this decrease would be accomplished by reducing EPA's commitment to the Clean Water State Revolving Fund program by \$200 million. This has become fairly standard operating procedure over the past several years. NEIWPCC and our member states will now jointly look for Congress to replenish these funds and, over time, will be very much consumed by our efforts on this issue.

There has to be a better way of funding our nation's water infrastructure needs, both now and in the future. A Clean Water Trust Fund just might be the answer. Thanks to the hard work of organizations too numerous to mention here, a proposed Clean Water Trust Fund Act has been making progress and garnering the attention of Congress.

This act would set up a federal financial trust fund to provide approximately \$7.5 billion a year for five years to guarantee the future stability of the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund. It would provide grants for high priority projects, such as combined and separate sanitary sewer overflows, priority watersheds, and stormwater.

Our infrastructure need, or better stated, gap in funding is more than \$300 billion. EPA Administrator Stephen Johnson, at a recent U.S. Senate subcommittee meeting, defended the Bush administration's proposed cut to clean water funding by noting that the needs for water infrastructure funding are far larger than any one spending cycle can address.

"EPA's \$7.3 billion budget is not going to solve a \$300 billion problem," Johnson said. "It never has."

He's right, but I would go a step further and say it's time we find another funding source. In my opinion, a Clean Water Trust Fund is a viable alternative.

Sincerely,

Ronald Poltak, NEIWPCC Executive Director



NEW ROLE FOR NEIWPCC JETCC to Coordinate Maine Wastewater Operator Certification Program

by Tom Groves, NEIWPCC

Due to organizational changes in Maine's Department of Environmental Protection, the state is moving the responsibility for coordinating its wastewater operator certification program to Maine's Joint Environmental Training Coordinating Committee. JETCC, which has been managed by NEIWPCC since 1985, is entering into an agreement with ME DEP to take over the certification program.

The change comes two years after a similar move in Massachusetts, in which NEIWPCC assumed primary responsibility for that state's wastewater operator certification and training programs. As in Massachusetts, the change will occur gradually. While the transition officially began on January 1, ME DEP training and certification staff initially will maintain their roles with the program, with their involvement diminishing over time as they assist with the shift to JETCC.

JETCC's role will include coordinating the state's wastewater operator certification examinations, which are traditionally held in May and November. (ME DEP staff will continue to proctor the exams.) JETCC will distribute and accept exam applications, and verify the qualifications of the applicants. It will contract with a testing agency for the development and correction of the exams, notify applicants of their exam scores, and forward all exam results to ME DEP's Commissioner, who will sign and issue certificates.

JETCC will also coordinate the renewal of the licenses of Maine's wastewater operators. By March 1, approximately half of the state's wastewater operators needed to have renewed their licenses; the remaining operators must renew by March 1, 2007. All operators are required to obtain 18 Training Contact Hours within the two-year renewal period. JETCC will coordinate sending renewal notices to operators, process payments

for renewals, verify training hours of applicants, provide ME DEP with a list of applicants for renewal, send out renewal authorizations (signed by ME DEP), and notify operators who do not renew in time that their license is inactive. ME DEP will continue to issue operator certificates, and review and act on emergency applications, appeals, and other matters as required by law.

To assist with the renewal process, JETCC will maintain the training records for all of Maine's licensed wastewater operators. Training organizations must provide JETCC with a schedule of their training programs, and at the conclusion of a course, send JETCC a final attendance list with the hours awarded. ME DEP will still be responsible for reviewing all courses and assigning the appropriate Training Contact Hours.

The fees generated by these programs will be used to support JETCC's activities as it assumes these new responsibilities. However, since many of the fees charged by ME DEP in the past did not totally cover the costs of the programs, a revised fee schedule has been negotiated between JETCC, NEIWPCC, and ME DEP. This new fee structure will include a \$75 application fee for the wastewater certification exam (both original application and retakes), a \$50 fee for license renewals, and a \$25 reactivation fee for operators who are inactive. The Executive Committee of the Maine Wastewater Control Association has endorsed the concept of outsourcing these programs to JETCC and has agreed to this initial fee structure.

For more information on the Maine wastewater operator certification program, contact JETCC at (207) 253-8020.

Tom Groves (tgroves@neiwppc.org) is NEIWPCC's Director of Wastewater and Onsite Programs.



WHEN THE UNIMAGINABLE OCCURS

The Epic Rains of October Had Treatment Plants Scrambling—and Learning Too

by Stephen Hochbrunn, NEIWPCC

Donna Hanscom has seen a lot during her 20 years of working at the wastewater treatment plant in Keene, N.H. But she never thought she'd see what she saw in October 2005.

"I don't think I ever realized how really bad it could get," said Hanscom, Keene's assistant public works director and manager of its water and wastewater laboratories.

Amid the deluge of rain dumped on New England last October, Keene took a particularly hard hit. From October 8 to October 10, more than 11 inches of rain fell on the city and its surroundings, causing a dramatic increase in flow to Keene's wastewater treatment plant and throwing a dangerous wrench into its operations. It happened as cities across New England struggled with the impact of October's downpours on their water and wastewater systems. In Chicopee, Mass., floodwaters poured into a sanitary sewer pump station, leaving it completely submerged; the city is now rebuilding the station at a cost of \$250,000. In Rhode Island, the rains and ensuing high flows inundated many collection systems and wastewater plants, with especially damaging effects in Woonsocket.

For those trying to save their facilities, the flooding meant long hours, exhausting work, and tough decisions under often desperate conditions. There was also one other result.

"When a system is stressed, that's when you learn where the cracks are," said Bill Patenaude, a principal engineer with Rhode Island's Department of Environmental Management and chair of the state's Board of Certification of Operators of Wastewater Facilities. "You can plan all you want, but the real world is the best teacher."

SURVIVING THE SURGE

The troubles at Keene's wastewater treatment plant were just one consequence of the flooding that ravaged the southwestern corner of New Hampshire. On Sunday, October 9, a dam overflowed in Alstead, sending a wall of water surging through the Cold River. Homes were swept away into the raging waters, and five people died. Governor John Lynch declared a state of emergency as officials raced to evacuate residents in the flooded areas. During a visit to the region on October 13, Don Kennedy, a NEIWPCC Training Coordinator, and I found destroyed bridges, roads in ruins, the National Guard out in force, and one young resident who captured the mood.

"Nobody is dealing with this well," said Michael Stanley, 20, of Alstead. "My basement's flooded, but a lot of people are in worse shape. They don't have houses at all. We lost all our memories of our town. They went right down the drain."

At the treatment plant in Keene, we found Hanscom and her staff trying to recover from the unimagined events of the preceding days. The plant serves several of the towns hit hardest by the rains, and while a wastewater treatment plant technically shouldn't see increased flows when it rains, virtually all do. This is due to "inflow and infiltration" or simply "I & I," and it's especially acute in the Northeast with our aging infrastructure. Cracks and open joints in the sanitary sewer lines that bring the wastewater to a plant allow rainwater to enter the system (infiltration); the flow can also increase due to sources such as sump pumps or roof drains being improperly or illegally connected to the lines (inflow). During a tour of the Keene facility, Hanscom



Road No More: A collapsed bridge near Alstead, N.H., reveals the power of the flow that surged through the Cold River on October 9, 2005.

pointed out high-water marks on equipment that indicated the astounding level of water they'd faced and were still facing.

"The spring flows that we had always considered high were about five or six million gallons a day, sometimes a seven," Hanscom said. "We now have a new perspective. Based on some of our instantaneous readings, we were at about 18 or 19 mgd on Sunday and Monday [Oct. 9 and 10]."

"When a system is stressed, that's when you learn where the cracks are. You can plan all you want, but the real world is the best teacher."

BILL PATENAUDE, RHODE ISLAND DEM

Amid such strong and unexpected flows, the plant staff worked around-the-clock, scrambling and ultimately succeeding in keeping the collection system's pump stations running, and coping with a myriad of other problems associated not only with the onrush of water but also the load of sand and other small, dense particles it was carrying with it. A powerful flow scours a sewer system's pipes clean as it races to a wastewater treatment plant (not a bad thing), but the amount of grit it picks up along the way far exceeds what a plant normally handles (not such a good thing). At one point, one of Keene's two primary clarifying tanks became plugged with grit, electrically tripping out the tank's sludge collector, and forcing Hanscom to shut off flow to the tank.

The staff also resorted to doing something Hanscom said had never been done before at the facility

—a controlled bypass of a portion of its secondary treatment process. To explain: At a modern plant, the wastewater first undergoes preliminary treatment, where it's passed through bar screens that remove large objects. It then moves on to a large tank where light solids settle to the bottom, known as primary treatment. In secondary treatment, the wastewater enters aeration tanks that have been "seeded" with bacteria and other microorganisms. As air is pumped into the tanks, the bacteria metabolize, feeding on the organic pollutants in the wastewater and decomposing the organic matter in the sludge. This process creates an "activated sludge," some of which is removed, and some returned to the aeration tanks to let the microorganisms do their job all over again. Powerful flows though can wash this activated sludge right out of a plant—exactly what was happening in Keene. Rather than lose all her precious sludge or "mixed liquor" as it's called—which can take weeks to generate—Hanscom preserved what was left by shutting off the flow into several of the plant's aeration tanks.

Hanscom's situation grew even more serious when the Ashuelot River, to which the plant discharges, overflowed its banks and backed up into the facility's effluent channel. This new threat prompted the staff to shut down power to the final step in the plant's treatment process, an expensive ultraviolet disinfection system, which might otherwise have been ruined by the encroaching waters. Hence, for a time, the wastewater discharged by the plant into the Ashuelot received minimal secondary treatment and no disinfection. Samples of the effluent taken during this period show significantly elevated levels of *E. coli* bacteria, an indication of contamination with sewage or animal waste. By the time of our visit, the plant had resumed secondary treatment and disinfection, but the loss of a lot of mixed liquor meant the effluent still didn't meet state standards—or Hanscom's.

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More than six months after Katrina struck, the floodwaters are long gone—but the misery, suffering and damage they caused are not. If there is a positive side to such a devastating hurricane, it's that Katrina also taught us powerful lessons—about the destructive potential of such a storm and its impact on water quality and infrastructure, about the value of helping when help is desperately needed, and most importantly, about how to be prepared for any disaster, natural or otherwise, that threatens our waters.

A DISASTER BEYOND BELIEF

Katrina careened into the Gulf Coast on August 29, making landfall as a Category 4 hurricane. In earlier times, Louisiana's coastal wetlands would have served as a natural buffer, absorbing some of the power of the storm. But due to levee building, oil and natural gas drilling, and natural causes, the wetlands are a fraction of their once prodigious size. As a result, the storm's surge smashed virtually unhindered into the region, accompanied by violent winds and torrential rains.

The surge and ensuing flooding overwhelmed all in their path. In Louisiana and Mississippi, more than 1,200 public drinking water systems were damaged or destroyed, and wastewater treatment plants fared no better. In Louisiana alone, Katrina damaged hundreds of wastewater treatment plants, with six major and 30 smaller plants devastated beyond repair by the storm.

New Orleans's complex sewer system, which relies on pumps to push wastewater out of the low-lying city, suffered perhaps the most of all. When the city's levees gave way, floodwaters swamped New Orleans's East Bank treatment plant, which served 1.2 million customers, leaving it completely underwater for nearly two weeks. With the city's other main treatment facility heavily damaged by Katrina's winds, the wastewater still flowing through the city's pipes was deposited into the Mississippi River with minimal treatment at best. Even worse, a lot of wastewater never made it to the river; as collection system pumps failed, sewage backed up into flooded homes and businesses, prompting widespread fears about disease. "Biggest Health Worry After Katrina is Clean Water," read a Reuters headline two days after the hurricane hit.

Damaged sewage systems weren't the only reason for the water worries. Crude oil facilities, of which there are many in the Gulf region, felt the full force of Katrina and later Rita, and several major spills occurred along the Mississippi River south of New Orleans. In total, 8 million gallons of oil spilled as a result of the storms, only 3 million less than was released during the 1989 Exxon Valdez catastrophe.

Nor was oil the only game in town. In the hurricane-affected region, there were 31 hazardous waste sites and 446 industrial facilities, which used a variety of hazardous compounds. In the immediate aftermath of Katrina, the floodwater was seen as possibly tainted by dangerous chemicals in addition to sewage and oil. EPA issued boil-water advisories to hundreds of areas, as concerns grew about the safety of the water in the supply pipes of damaged drinking water systems; with the reduction in pressure inside the pipes, they were less watertight and more vulnerable to contamination seeping in.

The severity of the situation led to extreme measures. Environmental regulators, who seldom embrace any bending of the rules, did just that. To dry out New



KIRK MANUEL/LDEQ

Rescue Mission: *This photo, taken by Kirk Manuel of the Louisiana Department of Environmental Quality, was among several attached to an email sent by Manuel to colleagues on Sept. 2, five days after Katrina struck. In the email, he wrote, "I spent Wednesday [Aug. 31] in New Orleans with six of my LDEQ TMDL watershed crew members and six boats to help with the rescue effort. The situation there is critical and deteriorating rapidly. It is beyond anything that any of us could ever imagine."*

Orleans as quickly as possible, EPA waived the need for Clean Water Act permits to allow the pumping of the floodwater out of the city and into Lake Pontchartrain. To help provide more gasoline to the recovery effort, LDEQ issued an Emergency Declaration suspending rules that operators of underground fuel storage tanks might need to violate to get their systems running again.

With time and heroic efforts, the chaos of the immediate post-Katrina period subsided. EPA reported that by October 10, more than 85 percent of drinking water systems and 95 percent of wastewater treatment facilities in the hurricane-battered region were working. By October 11, the "unwatering" of New Orleans was complete, the floodwaters a tragic memory. An unfathomably massive cleanup operation had begun. And the effort to get to the truth about the hurricane's impact on water quality, and to reveal that truth to the public, was well underway.

STATE OF THE WATER

First, a fact: Much of the water affected by Katrina wasn't exactly pristine to begin with. The Mississippi has long been regarded as one of the world's most polluted rivers, starved of oxygen by the immense amount of fertilizer and pesticide runoff it picks up from farms all along its route. The pollutants carried by the Mississippi have helped create the world's largest "dead zone" off the Louisiana coast. The water quality in Lake Pontchartrain, while significantly improved in recent years, still suffers from the impact of rapid growth and development along the lake's shores.

The water that swamped New Orleans after Katrina was something else entirely. Newspaper editors searching for a snappy headline described it as a toxic gumbo, a witch's brew. Even more frightening were the words of esteemed writers. In *The New Yorker*, Dan Baum described the water covering the city's streets as "an opaque, semi-gelatinous brew of sewage, fluids leaked from submerged cars, and bodies of rodents, cats, dogs, and people." Fear about the water was everywhere.

"We are gravely concerned about the potential for cholera, typhoid, and dehydrating diseases that can come as a result of the stagnant water and conditions," said Health and Human Services Secretary Mike Leavitt at an Aug. 31 news conference.

The fear was only amplified by the tales told by rescuers. Some reported getting headaches and rashes

from working in the polluted water. Among those boating through the floodwaters around New Orleans was Steve Stone, who once sampled waterways for LDEQ but now works for the U.S. Army Corps of Engineers. Stone and several of his colleagues from the Corps' office in Port Barre, La., arrived in New Orleans two days after Katrina hit. In the midst of the bedlam, Stone ferried engineers to the broken levees and helped in any way he could. But the water, and the threat he felt it posed, was a constant worry.

"I knew there was raw sewage in there, and I hadn't had my shots," Stone said. (Stone received his tetanus and hepatitis A and B inoculations ten days after arriving in New Orleans.) "Once, I got the boat stuck, and before I put it in reverse, I tilted the motor up quite a bit. When I hit the gas hard, water came splashing all over me. My pants were soaked. That was very scary."

On September 3, less than a week after Katrina blasted ashore, a multi-agency effort to test the waters around New Orleans, and get a clear picture of just what they contained, began. LDEQ, EPA, and the U.S. Geological Survey collected more than 500 water samples representing the floodwaters, the discharge of those waters to Lake Pontchartrain, and the ambient conditions of Lake Pontchartrain and surrounding estuaries. Bob Crain, a supervisor in LDEQ's Office of Environmental Compliance, was one of the men doing the sampling of the water in New Orleans. He didn't work alone.

"It was a little eerie at times," Crain said, "knowing we had a state police escort there. They had their arms drawn at all times, protecting you."

Despite the unusual conditions, the work proceeded in a scientific, controlled manner, and a picture of the water's quality began to emerge. The first glimpse wasn't encouraging. In mid-September, EPA announced that the tests showed the floodwater in New Orleans contained 10 times more *E. Coli* and fecal coliform bacteria than the agency considers safe for human contact. The water also contained high levels of chemicals such as hexavalent chromium, arsenic, and lead. In one sample, lead was found at 56 times EPA's limit for drinking water.

"Whether it's lead paint or lead from batteries, we don't know what the source is. But we know we've got a high level, and that's of concern to us," EPA Administrator Stephen Johnson told reporters at the time.

According to LDEQ's Chris Piehler, such statements added unnecessary fuel to the fire of worry about the water. He said EPA was acting overly cautious in light of the criticism it received for being too optimistic about the conditions in lower Manhattan after September 11.

"Sure, there were unsanitary conditions in the waters," Piehler said. "But the floodwaters in New Orleans, first of all, were not a drinking water source. Further, for a child to have a risk associated with consumption of water with those lead levels, they would have to consume a liter of water a day for six years. Obviously the floodwaters weren't going to be there for six years. The other thing is, it was brackish water, and a person would die of kidney failure from consuming salt water for that long before lead ever got to them. And because of the bacteria issues, they'd probably die even

quicker of dysentery. They were not stressing the real issue, and that was the commingling of the floodwaters with sewage. That was the problem. The water wasn't toxic. It was unsanitary."

As the sampling continued, confusion reigned. For every report indicating that fewer people than expected were suffering illnesses due to contact with the water, there were unsubstantiated stories circulating that stirred fears; one told of a recovery worker discovering the heel of his rubber boot had simply disintegrated as a result of the noxious nature of whatever he was standing in.

Test results soon clarified the picture. Researchers at Louisiana State University published data showing the floodwaters in New Orleans and Lake Pontchartrain contained elevated levels of fecal coliform bacteria, lead, arsenic, and chromium, but at levels "typical of stormwater runoff in the region." During a conference-call news briefing on October 21, LDEQ's Piehler told reporters that except for bacteria counts, the data collected by the multi-agency sampling effort had "thankfully come back very unremarkable." During the same call, the head of EPA's Office of Water, Ben Grumbles, announced that testing of river channels and near-shore waters surrounding the Mississippi Delta showed some elevation of levels of enterococcus, a bacteria indicating sewage in the water, but that the levels were low enough to even allow swimming.

about dangerous contaminants left behind in the soil by Katrina's flood. LDEQ and EPA disputed the NRDC's test results, and fired back by reiterating their claim that the pollution left behind by Katrina was far less than expected.

On February 2, the head of LDEQ, Mike McDaniel, sent a letter to the NRDC spelling out in detail the results of extensive multi-agency sampling of sediment, air, floodwater, and fish and shellfish. McDaniel closed his letter by writing, "LDEQ and its partner environmental and public health agencies continue to support the statement that there are generally no unacceptable long-term health risks directly attributable to environmental contamination resulting from the hurricanes."

STICKER SHOCK

No such dispute exists over the storm's impact on water and wastewater systems; they were hurt and hurt badly. New Orleans's East Bank wastewater treatment plant is now running again and running well, in part because the exodus from New Orleans means there's far less wastewater flowing to the plant than in the pre-Katrina days. Still, that the plant's running at all is a surprise given the early grim assessments by the city's Sewerage and Water Board of the plant's prospects for resuming

the storm surge barreled in and then left, collection system damage is harder to determine.

Completing repairs to water supply systems will be no bargain either. According to the American Water Works Association, repairing the damage caused by Katrina to drinking water infrastructure in Louisiana, Mississippi, and Alabama could cost utilities at least \$2.25 billion.

Where will the money come from? Within weeks of Katrina's disastrous pass over the Gulf Coast, Louisiana's lawmakers in Washington introduced the Louisiana Katrina Reconstruction Act, which seeks \$5 billion for infrastructure assistance in the state, with \$4 billion of that going directly for the repair of drinking water and wastewater systems. So far, the bill hasn't moved beyond the committee level. As of late February, the House had yet to vote on another emergency measure, the Gulf Coast Emergency Water Infrastructure Assistance Act, which has already been passed in the Senate.

Emergency federal appropriations aren't the only source of financial assistance, as seen by the long list of participating agencies at an open house held in Baton Rouge, La., on February 13 that focused on potential funding resources for restoring water and wastewater facilities. Representatives from 12 Louisiana and federal agencies took part, providing information on how they can help plants finance hurricane repairs and mitigate future storm damage. It was no surprise that the Federal Emergency Management Agency was there. Despite heavy criticism of the agency's actions in Katrina's wake, FEMA is still a major player in the reconstruction and is the administrator of the primary disaster assistance program for state and local governments overwhelmed by catastrophes. In the states slammed by Katrina, utilities are depending on FEMA money to fund a fair portion of the repairs.

TO THE RESCUE

It would be hard to argue that states outside the affected region haven't already done their share. Forty-four states sent more than 43,000 people to help with the response efforts in Louisiana and Mississippi, an enormous deployment carried out primarily through the Emergency Management Assistance Compact. Established in 1996, the EMAC is an agreement among 49 states to provide assistance across state lines when a disaster occurs. In the post-Katrina period, it worked beautifully as the main vehicle through which states provided everything from thousands of National Guard troops to water purification systems.

NEIWPCC's member states did their part. "I met quite a few people who came in from the Northeast," said LDEQ's Piehler, "from Massachusetts, Connecticut, and elsewhere. It was tremendous, the amount of people that came to our aid."

Any help was needed, even if it came from afar. New York State Department of Health's Dick Svenson, who represents NYS DOH at NEIWPCC meetings, described two critical initiatives in which staff in Albany played important developmental roles. The first was a secure Internet GIS application that could be used by Louisiana field offices to visualize the status of public water supplies; the second, a new field evaluation tool to track the condition of water systems following catastrophic loss. Both applications were quickly implemented after Katrina struck.

New York State's Department of Environmental Conservation sent four of its staff directly to the hurricane-hit region. On a normal day, Mike Cavanaugh works in NYS DEC's Bureau of Public Outreach, dealing periodically with water issues. For much of September,

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Symbolic Fall: In a sign of the damage done by Katrina to water and wastewater infrastructure, a 160-foot-high water tower lies toppled in a field in the Gautier, Miss., area, about 15 miles west of Pascagoula.

The good news kept coming. Although the pumping of floodwater into Lake Pontchartrain meant the lake absorbed years' worth of pollutants in a matter of weeks, LDEQ said the impact was fairly short-lived and that it was safe to swim in the lake and eat seafood caught in it. Louisiana health officials declared the water in most of New Orleans safe to drink, bathe in, and cook with. On November 10, EPA and the Mississippi Department of Environmental Quality said a water quality study along major bay systems on the Mississippi coast following Katrina and Rita showed few chemicals of concern in the waters.

The picture was not entirely pretty. Undeniable toxic hot spots existed, such as the one near Meraux, La., where an oil tank spilled, coating some 1,000 homes with oil-contaminated water and sediments. Health officials pointed to the wide variety of unusual water-related biological diseases seen after Katrina. The Natural Resources Defense Council conducted its own sediment tests, and accused regulators of failing to adequately warn the public

operation anytime soon. Board officials declined to respond to repeated efforts to conduct an interview with them for this article, but in November, they said restoration of the East Bank plant was estimated to cost \$164 million.

LDEQ's initial estimate for the total cost of bringing Louisiana's wastewater treatment and collection systems back into compliance with environmental laws was a staggering \$35 billion. The estimate has since dropped to \$5.85 billion, but that number could increase as agency field staff visit sites across the state to more accurately assess the damage. It's not the treatment plant, but subsurface sewer lines that represent the bulk of a community's capital investment in a sewage system, and until LDEQ analyzes the specific harm done to collection pipes in the flooded areas, the true cost of repairs won't be known. In New Orleans, significant damage to the subsurface lines is assumed, given the massive weight of the water pressing down from above for more than a month in some places. In areas where

MIKE CAVANAUGH/NYS DEC



London Avenue Canal to find out where the breaches are in the levee to fix it.' And a lot of them said 'Well, go, go!' But others were shouting, 'No you gotta save us! You gotta save us!' It was horrible."

As vivid as some of his memories are, Stone said there are gaps in his recall. Some days are a blank.

"Basically we were working 18 to 36 hours straight when we were down there," he said. "A lot of it is very blurry. I was on auto-pilot most of the time. It was a strange feeling."

WHAT HAVE WE LEARNED?

The tales of traumatized recovery workers, the desperate calls for aid, the near-hysteria over what contaminants lurked in the water—if any official needed to be persuaded of the importance of effective disaster planning and preparedness, Katrina probably did the trick. Watching the frenzied flight from New Orleans, you couldn't help but feel there had to be a better way.

Within days of the storm's landfall, Governor John Baldacci of Maine ordered a review of all the state's emergency response plans. "We are not going to let what happened down in the Gulf Coast states happen to Maine," Baldacci said. In Massachusetts,

Governor Mitt Romney asked the Massachusetts Emergency Management Agency to review its disaster plans and give him monthly updates on improvements. Just nine days after Katrina's landfall, Connecticut tested its response capabilities with a drill in which officials across the state reacted to a mock Category 5 hurricane.

The focus of much of this activity was on improving evacuation plans, but what was clear after Katrina was that any state's disaster response plans need to include being ready to deal with water supply disruption and contamination. On February 9, the Center for Public Health Preparedness at the University at Albany aired a satellite broadcast that examined what Katrina taught us about being prepared for water contamination events. The featured guest, Dr. Patricia Meinhardt of the Arnot Ogden Medical Center in Elmira, N.Y., and an author of books on waterborne disease and contamination, forcefully stressed the importance of planning ahead.

"The key strategy," she said, "that every state and locality needs to embrace is this: Careful disaster preparedness for water contamination events may make the difference between a controlled response and a public health crisis."

THINK A MONSTER HURRICANE COULD NEVER HIT HERE?

Read About the 1938 Storm, and You'll Think Differently

by Stephen Hochbrunn, NEIWPC

Consider the following lines: "Along the beaches and in the flooded cities, the stench of rotting sea creatures and sewage was revolting... Food and water sources were contaminated. Cars and corpses filled coves, ponds, and bays." The words of a reporter writing about Katrina's fury? You could be forgiven for thinking so, but you'd be wrong. They are the words of R.A. Scotti, a former journalist for the *Providence Journal-Bulletin* and *Newark Star-Ledger*, and they come from her 2003 book, "Sudden Sea: The Great Hurricane of 1938," published by Thorndike Press. Anyone skeptical about the possibility of a Katrina-like hurricane battering the Northeast would be wise to pick up a copy.

In the late 1930s, the Great Depression still kept the nation in its stranglehold, a menace called Hitler loomed ominously, and hurricane forecasting was a crude science at best. Forecasters relied on surface observations telegraphed to weather stations by ships at sea. As Scotti describes in her detailed, exhaustively researched, character-driven narrative, the science and system failed tragically on September 21, 1938, as forecasters failed to predict that a Category 5 storm churning in the Caribbean would take a northward path, and slam into southern New England—and the countless people who had sought relief at the sea from a late-summer heat wave.

Drawing in part on accounts of the storm written by survivors, Scotti weaves a vivid, powerful tale that allows us to experience the hurricane through the eyes of a wide range of people, from the actress Katherine Hepburn to a Jamestown, R.I., school bus driver who ultimately fails in a desperate bid to protect the children in his care.

The hurricane ravaged much of Long Island and large parts of Connecticut and Massachusetts. But Rhode Island took the heaviest blow, with the greatest toll along the beaches of South County. The storm surge caught Providence completely off guard. "Workers trying to leave their offices at five o'clock plunged into a whitecapped lake, 17.6 feet at its deepest point. Pedestrians wrapped themselves around lampposts and clung to fire escapes. Drivers who managed to get free of their cars swam into stores," Scotti writes. "Almost fifteen hundred moviegoers, marooned in the city's five downtown theaters, crowded into the highest balcony seats as the water rushed in.... the H.L. Wood Boat Co. launched rowboats through the windows to rescue the stranded."

As the waters subsided, the impact of the hurricane was measured in numbers—682 dead, another 1,754 seriously injured—and images: Before-and-after photos in "Sudden Sea" show scenes of summer tranquility followed by complete devastation. From Long Island to Cape Cod, the storm reduced beachfront communities to little but debris.

Could such a storm scream into New England again? Absolutely. While exceedingly rare, the conditions that led to the development of the 1938 storm and its subsequent power and path could occur again. We'd have plenty of warning this time, thanks to the sophisticated tools now employed by meteorologists. But scream in, the storm would. Scotti writes of various efforts made over the years to weaken hurricanes before they came ashore. Scientists have tried everything from seeding a hurricane with dry ice to spreading plastic sheets across the sea. Nothing has worked. If a storm's headed your way, the only thing to do is get out of the way. And it doesn't hurt to have a head start—something they didn't have on September 21, 1938. 🌊



Washed Away: An aerial photograph of Pascagoula, Miss., taken by NYS DEC's Mike Cavanaugh, reveals the brute force of Katrina.

Katrina continued from page 5

he was in Jackson County, Mississippi, an area severely punished by Katrina. For three weeks, he worked 14-16 hour days, conducting media tours and orientations for recovery volunteers, and supporting local public information efforts. The memories of what he saw will never fade.

"The storm surge was the major thing that caused the damage in Jackson County," Cavanaugh said, "so there were areas where literally four or five blocks back from the water, in some fairly nice neighborhoods, things were just right down to the bare concrete slab. There wasn't even evidence of wreckage of the house. It was all washed away."

With so much media attention focused on New Orleans, Cavanaugh saw things that much of America missed. "One of our biggest problems was a large fishing boat, about 115 feet long, that ended up landing on top of a warehouse and processing facility that formerly had half a million pounds of frozen fish in it," he said. "It wasn't frozen after that. That became a real environmental problem, because of the rotting fish and the crushing of the facility."

Anyone who participated in the recovery effort came away with similar tales, some more harrowing than others. The U.S. Army Corps of Engineers' Steve Stone, who once spent his time doing comparatively sedate work on Total Maximum Daily Load programs, spent 17 often frightening days in New Orleans.

"I was extremely afraid," Stone said. "The people were at their wits' end. They were extremely hot, very irritable, and scared. And when they saw a government person, a boat with 'Corps of Engineers' written on the side of it, they were just very furious."

"On the first day [Aug. 31], just after we put the boat in, there were people in the houses all along Elysian Fields Avenue, yelling at us, telling us, 'Save us. We need water. We need food.' And I'm trying to explain to them, 'Look, we're trying to get to the

Meinhardt offered 15 strategies for addressing the specific challenges associated with water being contaminated in a disaster. Some seemed obvious: Have a plan to provide alternate sources of drinking water for days to weeks after a water contamination event. Prioritize on the special needs of susceptible populations who are at increased risk for illness and death from dehydration, waterborne disease, and the health effects of water contamination. Others were less intuitive: Strategy 13, for example, urged that plans take into account that co-infections with multiple waterborne pathogens coupled with multiple chemical agent exposure may result in both acute and delayed symptoms complicating accurate and timely diagnosis.

Such specific recommendations, requiring specialized expertise, highlight the need for a team approach to disaster planning. Meinhardt calls for states to engage in a collaborative partnership that includes health care providers, public health officials, water utility managers, the National Guard, law enforcement professionals, and others. It's what she wants to see, but doesn't see enough.

"As I've been providing training across the country, I've noticed that interagency cooperation on this issue is very inconsistent throughout the U.S.," Meinhardt said. "It requires a multi-disciplinary effort from diverse disciplines that are traditionally not used to working together. It's a challenge just to get everyone at the same table. I've gone to states where there's an extraordinary amount of collaboration and coordination, and then in others, there's absolutely none. I'm hoping that after the floods in the Gulf region we have finally shaken the public into understanding they can't their water for granted. I'm hoping everybody understands how important it is that we all work together. It's vital, if we're to prevent the kind of disaster that occurred this summer."

Meinhardt is not alone in pushing for greater cooperation in the wake of Katrina. On February 15, the

"The key strategy that every state and locality needs to embrace is this: Careful disaster preparedness for water contamination events may make the difference between a controlled response and a public health crisis."

PATRICIA MEINHARDT, M.D. AND AUTHOR

American Water Works Association, the Association of State and Interstate Water Pollution Control Administrators, and other agencies with which NEIWPCC works closely, released a joint statement calling on all partners in the water and wastewater community to work together to establish intrastate mutual aid and assistance networks. The networks would provide a means for water and wastewater utilities that suffered damages in a disaster to get emergency help in the form of personnel, equipment, or materials from other water and wastewater utilities.

The proposal was clearly inspired by the success of Florida's Water/Wastewater Agency Response Network, or FlaWARN, which is made up of Florida water and wastewater utilities who've signed legally-binding agreements to help each other during emergencies. FlaWARN allowed Florida utilities to coordinate a response and send 130 workers to Mississippi just three days after Katrina stormed ashore. In December, Texas water and wastewater utilities showed they learned a lesson from FlaWARN's success by launching a similar emergency response network.

NEVER-ENDING STORY

Perhaps the lessons learned from the entire Katrina experience will linger because the disaster itself has had such staying power. In New Orleans, uninhabitable homes are still being bulldozed, mountains of debris are

still growing. Evacuees remain scattered across the country. The water quality impacts aren't over yet either. The massive amount of organic matter—leaves, branches, entire trees—that was blown by the storm into surface waters across the coastal areas is now decaying and combining with traditional organic enrichments such as sewage to reduce oxygen levels in the waters even further.

A full recovery is a long way off, particularly for water and wastewater systems. More than half a year after the storm, LDEQ's Piehler still sounded overwhelmed.

"There are so many, many problems facing the state," he said, "and we don't have the luxury that some organizations do to just focus on one particular issue."

Among the many issues Piehler's focusing on now is how to help the small wastewater treatment plants in towns that have absorbed displaced populations. In some cases, the plants have seen their flows increase threefold. Grant opportunities for expanding the plants' capacity or adding additional types of treatment are among the options being explored.

For everyone involved in the recovery effort, there's one additional worry—the calendar. With each passing day, the 2006 hurricane season edges a little closer. It begins on June 1, and forecasters are predicting another rough season. With any luck, they'll be wrong. 🌊

The entire University at Albany satellite broadcast, entitled "Water Contamination Events: Lessons Learned from Katrina," is available as a free download at www.ualbanycph.org/GRS/eventpast.cfm?ID=49

An excellent summary of federal programs to provide help in repairing and restoring disaster-impacted water and wastewater systems is the Congressional Research Service Report "Federal Disaster and Emergency Assistance for Water Infrastructure Facilities and Supplies," available online at http://digital.library.unt.edu/govdocs/crs//data/2005/upl-meta-crs7645/RS22248_2005Sep09.pdf

OTHER VOICES

Wetlands' Importance Now Made Clear

by Dennis Hirsch, Associate Dean and Professor at Capital University Law School in Columbus, Ohio.
Professor Hirsch directs the school's Environmental Law Concentration Program

This article first appeared in the Atlanta Journal-Constitution.

Environmental issues often get framed as a choice between economic prosperity and environmental protection. Hurricane Katrina demonstrates the fallacy of that view. Wetlands on the Gulf Coast once served as a natural buffer against hurricanes. Had we invested in protecting them, they could have significantly lessened Katrina's damage, now estimated at more than \$100 billion.

What can we do to ensure that we do not miss such opportunities in the future? One answer lies in the field of ecosystem services. This growing movement seeks to better understand nature's valuable services and to develop regulatory mechanisms for protecting them.

For millennia, the Mississippi River deposited millions of pounds of sediment daily into the Gulf outside of New Orleans. This created millions of acres of wetlands that slowed hurricanes, reduced storm surges and, until modern times, protected the city from flooding. These wetlands were producing an "ecosystem service" to society. Other examples include bees that pollinate crops, soils that purify water, insects and birds that control pests, and forests that sequester carbon and so stabilize the climate.

Despite their great value, ecosystem services are seldom protected. The Gulf wetlands are a case in point.

Government levees have channeled the Mississippi away from the wetlands, leaving no opportunities for controlled flooding to replenish the essential sediments. Private companies have sliced waterways through the wetlands to get at energy sources buried there. Starved of essential soils and weakened by a thousand cuts, the wetlands shrink by the size of Manhattan Island each year. New Orleans is being stripped of its natural shield and left naked to weather the storms of the Gulf.

Similar stories can be told about other ecosystems throughout the world. Because their contributions are hard to see it becomes difficult to rally political support for preserving them.

What can be done to protect ecosystem services? The answer lies in policies that enable people to see the value these natural systems provide. New York City's decision to invest in conserving watershed lands is a good example. The city derives much of its drinking water from the Catskills. Due to increased development in that area, the city found itself close to violating federal drinking water standards and having to build a \$4 billion water treatment plant. Instead, it opted to invest \$1 billion in land acquisition and restoration in the Catskills, thereby ensuring clean water.



The ecosystem services field seeks to identify such opportunities. These include government-funded restorations such as the \$7 billion federal effort in the Florida Everglades; health standards that allow regulated parties to comply through ecosystem preservation, as in the New York City example; subsidies for those who act to protect ecosystems such as farmers who set aside a buffer of land to prevent fertilizer runoff; and fees for those, such as energy companies who slice through wetlands, who damage important ecosystems. The ecosystem services approach is stuck between environmental purists who argue that nature must be treated as priceless, and shortsighted developers who insist all environmental protections hurt the economy. Drowned out by such voices, the idea that environmental protection could be essential to the economy has attracted little attention.

Until now. The horrific flooding of New Orleans provides a unique opportunity to see, in bold relief, the value that wetlands and other natural systems provide to human society. Katrina could be the catalyst that jump-starts the field of ecosystem services. That would help to prevent other such catastrophes and so would draw something positive out of the tragedy. 🌊

NPDES Permits *continued from page 1*

pollutants from a point source directly into waters of the United States. Failure to do so can result in an enforcement action brought by the permitting authority or a citizen lawsuit.

Under the Clean Water Act, the U.S. Environmental Protection Agency is authorized to implement the NPDES program. EPA can, in turn, authorize states, territories, or tribes to implement all or parts of the program. In cases where the state is authorized to issue NPDES permits (known as a “delegated” state), EPA maintains the right to review each permit issued by the permitting authority. Conversely, in states where EPA is the permitting agency (“non-delegated” states), the state must approve the permit and ensure that it meets state requirements. Nationwide, only a handful of states are not delegated. With the exception of Massachusetts and New Hampshire, all of NEIWPCC’s member states have been delegated some level of NPDES permitting authority.

OBJECTIVES AND OBSTACLES

Regardless of permitting agency, the backlog of NPDES permits is a major concern. As specified in the Clean Water Act, a NPDES permit may not be issued for longer than five years. Permits that have been administratively continued beyond their expiration date, and facilities awaiting their first NPDES permits, are considered “backlogged.” EPA developed a backlog reduction strategy with two primary goals: (1) the number of major facilities with current NPDES permits was to be increased to 90 percent in all states by the end of 2001, and (2) the number of major and minor facilities with current NPDES permits was to be increased to 90 percent in all states by the end of 2004. These goals were reached in some states, but far from all of them.

Nationwide, the backlog appears to be the result of two driving forces working against each other—decreasing state and regional resources in the face of an ever-expanding universe of required NPDES permits and expiring permits. Keeping resources dedicated to this program amid competition from other programs as well as maintaining the technical expertise and staff to write quality permits have emerged as some of the more difficult challenges facing program managers. At the National State/U.S. EPA NPDES Managers Summit held last October in Atlanta, states repeatedly raised the issue of limited resources as a key barrier to running an efficient program.

Envisioning an effective and well-run NPDES program that focuses on priorities and achieves more environmental results was a focal point of the national meeting. State NPDES managers were asked to share experiences as well as frustrations in permitting. They explored permit quality, enforcement, electronic systems, municipal wet weather challenges, stormwater management, general permits, and program integration. Priority issues that emerged from the discussions included providing training to improve knowledge and quality of staff and to reduce turnover, and developing a systematic approach that prioritizes permitting problems, acts as a clearinghouse for good management practices, and addresses issues through a partnership process between EPA headquarters, EPA regions, and states. Attendees emphasized the need to develop an effective electronic tool that manages the permitting process and a system for ongoing communication among Water Quality Standards, TMDL, and NPDES programs. They stressed the importance of developing a system to set priorities as partners, of determining what constitutes adequacy for state and permittee stormwater programs, and of establishing program measures for environmental results. Another priority—ensuring that general permits remain a viable tool.



EPA New England Regional Administrator Robert Varney speaking with NEIWPCC's Laura Chan, the writer of this article, following a meeting of NEIWPCC's Commissioners on January 12 at which Varney was a guest speaker.

VARNEY'S VIEWS

These priorities are particularly important in New England, which has a NPDES permit backlog of 37 percent, the highest percentage among EPA's regions. That may seem surprising in light of Varney's emphasis on the issue, but in our interview, he pointed out one important reason.

“Because our states have adopted more stringent water quality standards, it is more difficult to meet those standards,” Varney said. “Therefore, the permits may become more complex because they are trying to evaluate new technology to achieve the standards, or it may be a cost issue where it is very expensive for them to build a treatment facility that will meet the standard. Our strong water quality standards in the region make the NPDES program even more challenging.”

Consistent with Varney's emphasis on environmental quality, there has been a shift in program management towards focusing more on environmentally significant permits. Managing the NPDES program essentially becomes a balancing act between reducing the backlog and focusing on permits with environmental significance.

“In the past, there was often a tendency to focus on permits that were easier to issue,” Varney said. “Those permits that were controversial or highly complicated were set aside and the easier ones were issued. From an efficiency standpoint, that makes sense. But from the standpoint of improving the environment, it wasn't the best thing to do. We've tried to focus on environmentally significant permits.

“An example would be Brayton Point in Somerset, Massachusetts, where there is a power plant that uses about a billion gallons of water per day for cooling. Associated with that significant intake of water is the destruction of adult and juvenile fish, fish larvae, and fish eggs. There is also thermal loading as the water is discharged back into Mount Hope Bay—a shallow bay with an average depth of about 15 feet. That thermal plume together with the intake of water has had a significant impact on the ecosystem.

“Brayton Point is a highly complicated permit and is currently being appealed. But the key point is that under the old model, that type of project would've been set aside. Staff would have instead focused on permits that were easier, because a discharge permit for a small wastewater treatment plant was measured equal to a permit for a very large one. They each counted as one permit and yet one might have 50 times the environmental impact of the other.”

Under Varney's watch, that approach to permitting has changed. “On one hand, we are trying to reduce the backlog and on the other hand, we are trying to focus on the most environmentally significant permits. That is obviously difficult to do,” Varney said. “But we should be proud of the fact that the NEIWPCC states and Regions 1 [New England] and 2 [includes New York State] have

been working to implement these new measures and to focus on environmentally significant permits.”

Of course, the work that facilities must do to obtain a permit and live up to its requirements comes with a price tag—and that is another key challenge in New England.

“One of the difficulties that we face is the fact that a new NPDES permit, which is reducing pollutant loadings in our water bodies, often has a cost associated with it that is passed on to local government,” Varney said. “States issue new NPDES permits to help achieve state water quality standards. Municipalities receiving these new permits have lower limits. As municipalities try to meet these lower limits, they must invest in their wastewater treatment plants, and there is a fiscal impact to local government. This has always been the greatest challenge, and it translates into political concerns and financial constraints that are associated with the program.”

Despite the challenges, addressing the NPDES backlog is and will remain a high priority for EPA New England. “A number of actions have been taken to reduce the backlog,” Varney said, “including issuing general permits and electronic permit applications, reducing transaction costs for permit reissuance, and increasing the permit production rate.”

The result—progress. “This past year, due to our emphasis on reducing the backlog and improving permit efficiency, we had a 50 percent increase in our permit production rate,” Varney said. “The number of permits that we issued increased significantly.”

Still, there's room for improvement. The region needs to find a consistent way to measure the results of NPDES programs and a way to make those results known publicly.

“If the states and EPA are better able to communicate the environmental results of the permitting program, we are likely to gain political support for staffing,” Varney said. “Generally speaking, we have not been entirely successful in both measuring the success of the program and communicating those successes to the public. We are working with NEIWPCC and the states on measuring the results of the NPDES program and on developing a consistent measuring system that all of our states can agree to. We can then accumulate the data, show the results, and have the ability to explain at the state level the environmental benefits associated with the program.”

REGIONAL ASSISTANCE

NEIWPCC is involved on many levels in helping our states with their NPDES programs. We participated in a Regional Innovations Workgroup Meeting in July 2005 where a project to promote innovative solutions in NPDES permitting was discussed and developed. A focus of this effort is to explore ways to streamline the permitting process and optimize environmental outcomes. The problem statement was articulated as “existing current measures and processes are not addressing environmental priorities.” The project seeks to make the NPDES permitting process more effective and efficient. To this end, NEIWPCC and EPA have discussed potential ways to refine the problem, propose solutions, and identify funding needs. Areas of opportunity for improvement in the state and federal NPDES permitting program might include increasing program efficiencies, getting credit for important work focused on environmental outcomes, better understanding of state and federal permitting priorities, and distributing program resources to address the most important environmental problems.

Currently, EPA evaluates a state's permitting performance based on a credit system. Accounting mechanisms are in place to ensure that state programs are meeting EPA's overall goals. EPA gives states credit for

renewing or reissuing permits that have been continued beyond their expiration date and for which there is a pending renewal application. Concurrent with this effort is a particular focus on processing renewal applications for permits that have been continued in effect for two or more years beyond their expiration dates and are deemed to be environmentally significant based on certain criteria. This system places heavy emphasis on expired permits and does not take into account the environmental significance of other permit and compliance-related efforts conducted within the NPDES program that are not related to permit reissuance, even if such efforts or the permits themselves may be more environmentally significant than an expired permit waiting to be renewed.

Based on the initiative that came out of the Innovations meeting, NEIWPCC is helping our member states develop innovative solutions to meet their permitting needs. One idea being discussed is giving states credit for pollution and flow reduction achieved via NPDES permitting. Ozzie Inglese of the Connecticut Department of Environmental Protection raised this issue because his state finds itself investing significant time and resources on NPDES-permitted facilities that will not be acknowledged through the current backlog reduction system, even when the work focuses on environmentally significant or priority permits. For example, some facilities in Connecticut have current permits but are still undertaking pollution prevention or resource conservation efforts at their own initiative that are resulting in substantial reductions in pollutant loading or discharge volume.

"This effort is considerable, and we think we are getting a significant environmental outcome," said Inglese. "But it's not going to be registering as a credit in terms of our permit backlog reduction efforts, even for environmentally significant permits. We need to find a way to give 'weight' to these activities in lieu of a 'bean' for reissuing a NPDES permit."

According to Roger Janson, the head of EPA New England's Municipal NPDES Permits Branch, other states are in a similar situation, and are especially concerned about the two-year cutoff date. Janson expressed this concern on behalf of Rhode Island at the meeting in Atlanta, noting that Rhode Island has spent a lot of time working on nitrogen modifications and limits to permits that were current instead of some of the backlogged ones. Because the permits were still current, no credit was awarded for this work in terms of backlog reduction.

NEIWPCC will work with our member states to articulate this problem on a regional level and move forward as a group to achieve the desired results at the national level. We believe this is an attainable objective consistent with the goals that were set forth in the federal initiative and would benefit state programs unilaterally. Changing the credit system in this way would provide more balance between the expenditure of effort towards environmental outcomes and the receipt of credit.

Streamlining NPDES permitting and optimizing environmental outcomes are high priorities for maintaining and improving water quality in our states. As James Giattina, EPA Region 4 (Southeast), put it at the Atlanta meeting, "Permits need to be vehicles for innovation." We must continue to rely on permits to control pollution in our nation's waters, and we should take advantage of every opportunity to protect our resources through this important program. ♪

Laura Chan (lchan@neiwpcc.org) is a NEIWPCC Environmental Analyst and the manager of all of our NPDES and stormwater-related projects.

ON THE FRONT LINES

What It Takes to Write a Permit

by Laura Chan, NEIWPCC

What exactly does writing a permit involve? In addition to helping states with managing their NPDES programs, NEIWPCC is involved with providing states with much-needed staffing for their permitting programs. Christopher Keim is a NEIWPCC Environmental Engineer who works in the New York State Department of Environmental Conservation's Bureau of Water Permits. Keim and his three colleagues in the bureau write State Pollutant Discharge Elimination System permits. (SPDES is the New York State version of NPDES.) The workload is high, and the staffing low. Furthermore, individual permits are intrinsically different from one another, so there is no standard approach to writing a permit.

"Basically, you have to have an understanding of how the permit works and what they are trying to accomplish," Keim said. "It is different working on an industrial permit versus a wastewater treatment plant permit."

How long on average does it take to write and issue a permit? According to Keim, this question does not have a straight answer.

"You have some permits that go out immediately and some that take forever," he said. The complexity of the process varies from situation to situation. "You have some that are real small plants that always have the same levels of everything in their effluent. You could write their permit, send it to them, they accept it, and it gets issued. You have other treatment plants, such as one in Long Island that serves millions of people, that are enormous and their permit could be 30 to 35 pages long. To get something like that issued can take several years."

Not only does an individual permit require individual attention, but the overall process of reviewing and issuing a permit involves a lot of back-and-forth interaction between the permitting agency and the permittee.

"We meet with their consultants and sometimes their lawyers, with our engineers and regional people, and we work out a plan together, reaching a consensus on what should be in the permit," Keim said. "So the meeting process, the negotiation process, and the back-and-forth phone calls are what holds a permit up most of the time."

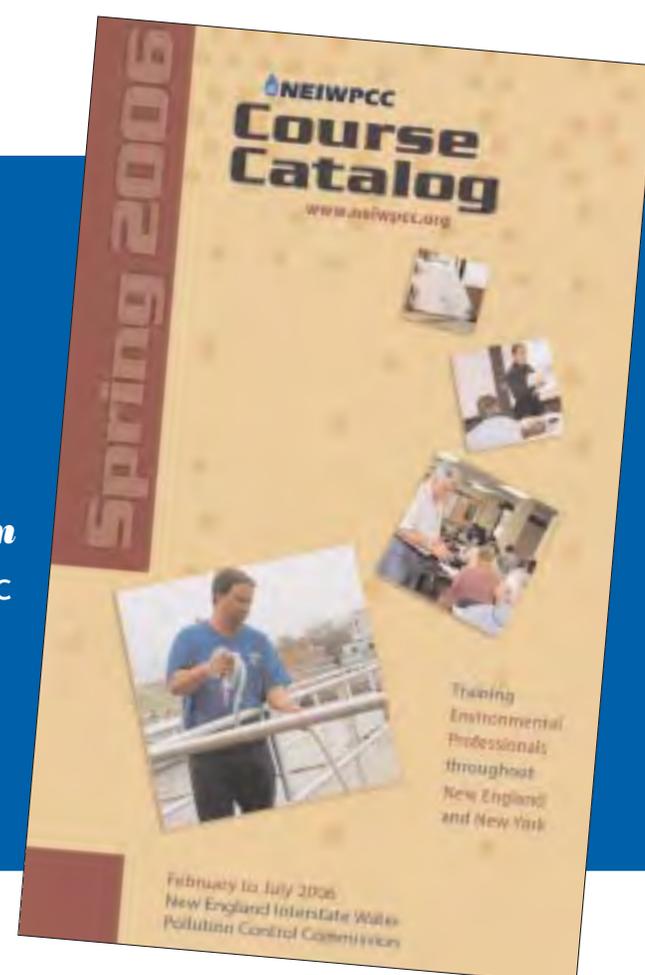
Writing a permit requires a complex combination of technical expertise and knowledge. The writer needs to have an understanding of policy and regulations, as well as the technical expertise to review engineering plans and documents. Not only must you come into the job with a strong technical background, you must acquire additional skills and expertise necessary for the position while on the job.

"The set of skills is something that you have to develop when you are doing the job because there are so many intricacies," Keim said. "You have to apply the policies and regulations to the permit, and there are so many different instances and special conditions."

Clearly, it's not the kind of job that you can simply fall into; the permitting agency must invest considerable time and resources into training a quality permit writer. This is why it is imperative that quality staff members are retained once they are trained. At the National State/U.S. EPA NPDES Managers Summit held last October in Atlanta, it was pointed out that one of the biggest challenges to NPDES managers nationwide is maintaining qualified staff to write permits. If you have people like Christopher Keim on your staff, you don't want to lose them. Replacing that much expertise and experience is a very tough task. ♪

The new year meant a fresh slate of training courses from NEIWPCC's Environmental Training Center. If you didn't receive our Spring catalog in the mail, visit our website at www.neiwpcc.org/etc.htm to access a complete electronic version of the catalog and a detailed course schedule.

Get started now on getting the training you need!



Epic Rains of October *continued from page 3*

“As a wastewater operator, I’m not happy about what happened here,” Hanscom said. “I’m not happy seeing our effluent the way it is. I think any operator will tell you that the proudest moment is when you take people around your plant and show them how good your effluent looks. You take them into the lab, show them little jars of influent and effluent and shake them up and say, ‘Look, look at this.’ Our effluent usually has a TSS [Total Suspended Solids] of five or less, and has turbidity of two or less. It’s gorgeous. Right now, it’s not so gorgeous.”



Donna Hanscom, Keene’s assistant public works director, and Don Kennedy, NEIWPC, in the building that houses the wastewater treatment plant’s ultraviolet disinfection system, which was shut down as waters from the flooded Ashuelot River backed up into the chamber.

LESSONS LEARNED

It didn’t take long to look much better. By October 31, Keene’s effluent was fully back in compliance with state regulations, and due to the extraordinary nature of the event, no fines were imposed. Regulators obviously agreed with Kennedy, who after our visit on Oct. 13, told me Hanscom and company had clearly done all they could to save the plant and minimize the environmental impact. Hanscom herself was her toughest critic. When asked what she might have done differently, she spoke openly so that others, she said, might learn from what she went through.

“We probably should have started pumping our primary sludge right away,” she said, meaning it may have been helpful to immediately remove the solids from the first settling tank to minimize the chance of them being flushed through the plant during the partial bypass and into the river. She felt she should have checked ahead of time to be sure the bypass valves operated correctly (which they did thankfully). She added that in the future her emergency plan would take into account the possibility of such extraordinary flows. At times, she said, “We walked around in disbelief.”

The incident underscored the importance of maintaining an up-to-date list of service providers. Hanscom had one, and it was indispensable.

“We knew who and where to call for help,” she said. “We knew, for example, who the people were to come and fix our SCADA [a computerized equipment control system]. That was part of the planning we’d done.”

Hanscom said she was pleased that the damage from the flooding wasn’t worse, and she gave credit to the plant’s staff.

“Operators are always very good at routines, but in this case they had to step up, and they did,” she said. “They’ve taken the initiative to say ‘Here’s what needs to be done, and I’m doing it now.’ I’ve been very, very

proud of all our people. One of our lab techs and an industrial pretreatment technician were out shoveling solids in the [plugged] clarifier the other night, after they’d worked their regular day. They started shoveling at 3:30 and didn’t stop until 10:30. No questions asked.”

Even the staff’s fortitude couldn’t prevent all damage. In an email from Hanscom in early December, she provided “very preliminary estimates” of the financial impact of the flooding: \$16,000 in personnel and equipment costs, \$33,000 to repair the UV system, \$15,000 in increased electrical costs (to pump out the water), and as much as \$60,000 to remove the excess grit. The Federal Emergency Management Agency was expected to cover some of the costs, but would pay a maximum of 75 percent. Hanscom wrote that she expected more equipment repairs, just from wear and tear associated with the flooding, but that “nothing else has broken down—yet.”



Arrow indicates high-water mark on the Keene plant’s UV equipment.

WOONSOCKET’S WOES

Heavy rain fell again on the Keene area during the second weekend in October, prompting another brief bypass at the treatment plant, but an even bigger downpour swamped Woonsocket, R.I. The city received 8.3 inches of rain during a 24-hour span that began at 10:30 p.m. on Friday, Oct. 14. As in Keene, the rainwater rapidly made its way into the wastewater collection system.

“We had so many roads under water that the water was just entering the system everywhere,” said Michael Annarummo, Woonsocket’s director of public works.

On average, Woonsocket’s wastewater treatment plant treats 8 million gallons of wastewater a day. As the water rushed in on that weekend, the plant’s meters measured a flow of 36 mgd, but it was likely even higher since the meters don’t measure the raw influent but rather the output of the pumps in the plant’s wet wells, large tanks where the wastewater is held before treatment begins.

Whatever the precise amount of flow, it was more than the wet well pumps could handle. The water in the wells rose so high that it began surcharging through the plant’s drain system into other areas of the facility. The water flowed out of second-level floor drains, toilets, sinks, then flowed down corridors to the so-called dry wells, areas where pumps vital to the operation are installed. Sump pumps in the dry wells initially contained the flooding, but as the water level rose, the sump pumps that weren’t submersible shut down. That

allowed the water to rise further, until it finally tripped out one of the pumps critical to moving the raw wastewater into primary treatment.

Elsewhere in the facility, other essential equipment was being threatened by the water flowing up and out of the drain system. Flooding in one basement took out the pumps and instrumentation associated with secondary treatment, including the four blowers that pump air into the aeration tanks.

While the plant’s staff raced to send out the damaged pump and blower motors for repair, the plant’s supervisor, John Oatley, worked on acquiring other pumps to use as replacements. Oatley said it helped that the Woonsocket plant is operated by Veolia Water, a private entity, as he was able to lean on other Veolia facilities for personnel and equipment. Several pumps came in the nick of time, arriving as the rising water crept perilously close to the second floor of the administration building.

“If the water had gotten to that second level, and believe me, it was a matter of inches,” said Oatley, “it would have hit our electrical transfer switches for our emergency generators and all our motor control centers [MCCs] for all the raw pumps. I had brought the fire chief and several emergency management people from the state into the facility and told them, ‘OK, here’s where the water level is now. If it hits this MCC area, and the power’s still on, we’re probably going to lose the whole facility, at which point we’d probably have to evacuate.’ I was concerned about fire at that point, with that kind of voltage going under water. The decision would have to have been made shortly whether to have the utility cut power to the plant.”

With the timely arrival of the pumps, that decision never had to be made. The water level stabilized, and the arduous process of getting the plant dried out and fully operational again began. Like Keene’s Hanscom, Oatley raved about his staff and what he called their “Herculean” efforts during and after the crisis.

“To see these guys working as hard as they were under the most difficult conditions, it just speaks to the professionalism they have,” Oatley said. “Our guys worked tirelessly to get the plant up and running. Then, when we finally got the water level to the point where we could go after the equipment, it was a mess. You submerge equipment without any debris removal for three or four days, it gets pretty nasty. I can’t even tell you how many things we pulled out of those raw pumps, which isn’t an easy thing—buckets, a chain-link fence, all sorts of crazy stuff.”

Although the facility lost secondary treatment for several days, the fact that much of the flow was unpolluted rainwater limited the environmental impact. Oatley reported only three violations of effluent standards throughout the entire event, although at one point about 10,000 gallons of water were pumped directly out of the wet well into the Blackstone River. Of course, news about the troubles at the plant and the potential environmental threat—however benign in the end—generated significant media interest. In Woonsocket, the city’s public works staff and Veolia officials handled reporter inquiries, protecting Oatley and his overworked crew from a distraction that could have pulled their focus off their work. Had I, for example, tried to interview Oatley in the midst of the event—rather than several weeks later—the response to my request would have been unequivocal.

"I wouldn't have let you anywhere near him," Annarummo said. "I don't want to say they were dealing with a life or death situation, but they were dealing with a potential environmental crisis. The difference between some minor noncompliance and virtually months of no treatment if this plant had gone down or been substantively damaged is monumental environmentally."

The effective media management certainly helped, but just as in Keene, even the right moves by officials and staff couldn't prevent serious consequences from the flood. While the plant had all its treatment processes back online by Wednesday, Oct. 19, the passing of the crisis brought with it a realization of the damage done. Annarummo put the cost of repairs at about half a million dollars.

READY FOR NEXT TIME

Changes have already been made to the Woonsocket facility's drain system to prevent the surcharging that occurred in October, but officials caution that it's unrealistic to expect plants to ever easily handle flows so far in excess of their average—at least no plant built with an eye on the typical municipal budget.

"Everybody's taxes would be very high if you wanted to design for a 500- or 600-year storm," said RI DEM's Patenaude. "It becomes cost-prohibitive."

There are also tremendous costs associated with making every wastewater collection system watertight and thereby eliminating I & I. But events like this only increase the pressure on states and communities to conduct studies of their collection systems and implement upgrades that would limit the amount of rainwater that makes its way into a wastewater treatment plant.

In the aftermath of the floods, officials emphasized the importance of eliminating excessive flows due to I & I. They also know it won't be happening anytime soon. What can be done *now* to improve the response in the event of an encore of October's deluge? When I spoke with Patenaude, he said RI DEM would be huddling to review everything that happened, every

"I don't want to say [the Woonsocket WWTP staff] were dealing with a life or death situation, but they were dealing with a potential environmental crisis. The difference between some minor noncompliance and virtually months of no treatment if this plant had gone down or been substantively damaged is monumental environmentally."

MICHAEL ANNARUMMO,
WOONSOCKET (R.I.) PUBLIC WORKS DIRECTOR

decision that was made. He too said he was very impressed with the performance of the state's wastewater operators—"completely committed to whatever needed to be done" were his words—but he was concerned that in some facilities, there may not have been enough of them.

"You can have all the plans in the world that you want," Patenaude said, "but if plants didn't have adequate staffing, that's certainly something that would need to be corrected."

Angelo Liberti, the chief of surface water protection at RI DEM, spoke of his plan to make sure every wastewater facility had an effective emergency response plan in place, with fully updated contact numbers for service providers.

"I'm sure some of the plans could use some fine-tuning," Liberti said. "I'm also wondering if there's anything more we can do to promote sharing of resources, some way to help with the exchange of expertise."

What about more training for operators in the specific actions to be taken in such emergencies? It certainly couldn't hurt, and NEIWPCC is taking a step in that direction with our new offering of online wet weather training (see page 14). But the finger of blame in this case is pointed primarily at the skies—who could have expected so much rain in so short a time?—and most assuredly not at the operators. In its official summary of the crisis, New Hampshire's wastewater operations team was lavish in its praise: "The wastewater treatment plant operators in N.H. are true professionals, as exemplified by the fact many of the operators visited their facilities on their own time as the rain event occurred. Through their efforts, damage to infrastructure and the environment was minimized, and major potential health crises averted."

With the lessons learned and the experience gained, it's likely that the next time a rainfall of this magnitude occurs in the affected regions, the damage to the plants and their receiving waterways will be even less. But don't blame anyone involved for hoping that the "next time" doesn't happen for a long time—or better yet, never happens at all. 🌧️

SNAPSHOT OF A SHORTAGE

Survey Results Support Development of New WWTF Workforce Recruitment Program

by Marianna Vulli, NEIWPCC

NEIWPCC continues to pursue solutions to the labor shortage issue that many believe looms large on the horizon for wastewater treatment facilities in the Northeast. As reported in the last issue of *IWR*, NEIWPCC conducted a survey of wastewater treatment facilities in the region in an effort to collect real-world labor market data to support the development of a workforce recruitment program in coordination with the U.S. Department of Labor's Job Corps program.

NEIWPCC administered the survey during the summer and fall of 2005, targeting WWTFs in our member states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Facilities in Rhode Island and New York received electronic surveys via email in June; surveys were sent to facilities in the remaining states through their respective state wastewater associations, which handled distribution. Depending on their capabilities, the associations either sent the surveys to facilities by email or regular mail, and/or posted the survey on their websites.

Facilities responded to questions about plant characteristics, in addition to more focused questions on their present workforce, current and future staffing needs, hiring procedures, and salary/benefits packages. The 123 facilities that responded collectively employ 1,177 workers. Of these 123 facilities the highest percentage (44 percent) employ one to five employees. Of the 1,177 employees, most fall into the middle (39 percent) and senior level (41 percent) categories, with 31 percent of the employees over 51 years old. Of the 123 facilities, 112

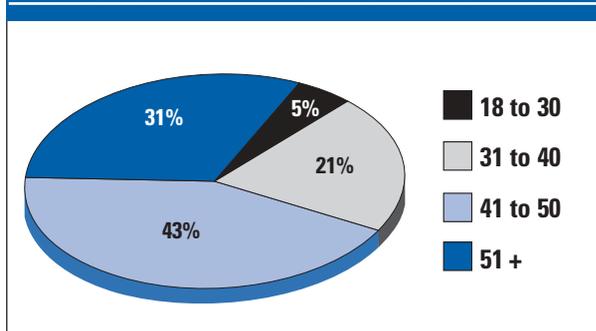


NEIWPCC's Marianna Vulli presenting the WWTF labor market survey findings on Oct. 23, 2005, at the New England Water Environment Association's annual conference in Boston.

included starting salary information for entry-level employees, which ranged from \$17,000 to \$46,000.

Although the rate of response to the survey was lower than expected, the results provide a revealing representation of the current state of the region's wastewater labor market. The older age makeup of the workforce, the high percentage of middle and senior level employees, and the expected employment vacancies in the next five years lend credence to the labor shortage theory and indicate that there will be a significant demand for workers in the field in coming years. The attractive entry-level salaries (averaging \$30,000) and benefits packages, the lack of recruitment programs (94 percent of responding facilities have no recruitment program), and the recep-

AGE OF NORTHEAST WWTF EMPLOYEES



tiveness of the facilities to hiring Job Corps graduates also support our plans to move forward with the NEIWPCC/Job Corps wastewater program.

In the coming months, NEIWPCC will continue to work in partnership with Job Corps to develop and establish a WWTF operator training program. NEIWPCC will be looking for support from the wastewater industry to develop the curriculum and identify instructors for this program, and will recruit facilities to provide on-the-job training opportunities as part of the program.

A more detailed summary of the survey results can be accessed through our website's home page (www.neiwpcc.org) and through our Web page that provides information and resources related to water quality careers (www.neiwpcc.org/careerinformation.htm). 🌧️

Marianna Vulli (mvulli@neiwpcc.org) is the coordinator of NEIWPCC's Regional Research Initiative and the coordinator of the WWTF survey. Please contact her for more information about the survey.

Editor's Note: A special edition of IWR published last year examined the growing difficulties faced by states as they try to maintain a well-trained, high-caliber wastewater workforce. The issue can be downloaded at our website (www.neiwpcc.org/iwr.htm).

CHANGE AT THE TOP

New Hampshire's Stewart Takes Helm as NEIWPCC Chair

by Stephen Hochbrunn, NEIWPCC

On January 1, Harry Stewart of the New Hampshire Department of Environmental Services took over as NEIWPCC's latest Chair. While new to the post, he's certainly no stranger to the environmental community.

Stewart has worked in environmental program management for more than three decades. Currently, he's the Director of NH DES's Water Division, a job he's held for the past eight years. He previously worked for NH DES in a variety of capacities, including stints as Chief Engineer of the agency's Contaminated Sites Cleanup program and as the original administrator of the Groundwater Protection Bureau. Stewart's also worked as an environmental consultant, and for U.S. EPA in the Clean Water Act Wastewater Construction Grants program. He has an MBA from Northeastern University, a master's degree in sanitary engineering from the Georgia Institute of Technology, and is a Registered Professional Engineer.

In an email sent in February, Stewart shared some of his thoughts about NEIWPCC and what he hopes the Commission will accomplish during his tenure.

"For many years, NEIWPCC has served as a regional and national leader in environmental programs, including wastewater facility operations and infrastructure improvement, drinking water supply protection, and underground storage tank compliance. NEIWPCC's roles continue to evolve in response to the needs of the states.

"In 2006 and 2007, NEIWPCC will take a leadership role in a number of regional multimedia efforts towards implementation of strategies for regional- and national-level mercury reductions to improve surface water quality in the Northeast. We also will continue to provide regional focus to support and promote energy

reduction by water supply and wastewater utilities, as well as training and recruiting the next generation of operators. At the national level, declining federal resources coupled with increasing demands on all environmental programs are concerns that NEIWPCC will help the states address with EPA and Congress."

Stewart moved up to the Chair seat after spending two years as NEIWPCC's Vice-Chair. He succeeds Glenn Haas, the Director of the Division of Watershed Management at the Massachusetts Department of Environmental Protection. It's expected that Stewart, like Haas and most of his predecessors in the post, will serve two one-year terms.

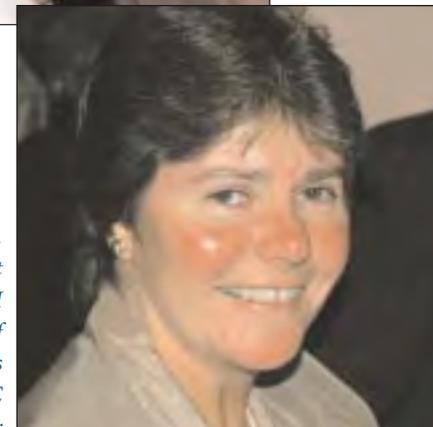
Taking over for Stewart as NEIWPCC's Vice-Chair is Alicia Good, the Assistant Director of the Rhode Island Department of Environmental Management's Office of Water Resources. Good has worked for RI DEM for 23 years, and in her current position, she's responsible for the administration of the agency's programs to protect surface water, groundwater, and freshwater wetlands. Good has a bachelor's degree in civil engineering from the University of Vermont, and like Stewart, is a Registered Professional Engineer.

As NEIWPCC's Vice-Chair, Good will in all likelihood assume the role of Chair once Stewart's tenure ends. That will make her the first woman to serve as Chair in NEIWPCC's history.

There also are a couple of new names on NEIWPCC's slate of Commissioners. Late last year, the New York State Senate voted to confirm Denise Sheehan as Commissioner of the New York State Department of Environmental Conservation. Sheehan has been with NYS DEC since 1998, and previously held the positions of Acting Commissioner and Executive Deputy Commissioner. She is being represented at NEIWPCC



Harry Stewart,
Director of
NH DES's
Water
Division and
NEIWPCC
Chair



Alicia Good,
Assistant
Director of RI
DEM's Office of
Water Resources
and NEIWPCC
Vice-Chair

PHOTOS BY PAULA ROGERS FOR NEIWPCC

meetings by Sandi Allen, Director of NYS DEC's Division of Water, who performed the same role for Sheehan's predecessor, Erin Crotty.

In Maine, David Littell is the new Commissioner of the Department of Environmental Protection, after easily winning the state Senate's confirmation in January. Littell previously served as Deputy DEP Commissioner under former Commissioner Dawn Gallagher, who resigned in December. As with the change in New York, this switch doesn't mean a new face at NEIWPCC meetings. Andy Fisk, Director of ME DEP's Bureau of Land and Water Quality, will represent Littell at our Commission and Executive Committee meetings, just as he previously represented Gallagher. ♠

FAREWELL TO A FRIEND

Former NEIWPCC Head Al Peloquin Dies at 83

by Stephen Hochbrunn, NEIWPCC

NEIWPCC and the entire environmental community in New England lost one of its true leaders with the passing of Alfred E. Peloquin, who died on October 21 in Peoria, Arizona, of complications from a lung and heart condition. From 1967 to 1983, Peloquin served as NEIWPCC's executive secretary, a position now referred to as executive director. In 1983, he moved on to a position in the Region 1 offices of EPA, but he eventually returned to NEIWPCC as our treasurer from 1993 to 1995.

Under Peloquin's leadership, NEIWPCC evolved significantly. In a profile that appeared in the Fall 2005 issue of *IWR*, Peloquin pointed out that when he began his tenure with NEIWPCC, his goal was to make the organization the "pipeline of information" on water pollution issues. He started a newsletter to publicize the need for pollution control, and testified frequently at congressional hearings. He also led numerous efforts to alleviate tensions between the states and the federal government on water pollution issues.

Peloquin played an instrumental role in the development of training programs for wastewater

treatment plant operators. He succeeded in convincing NEIWPCC's member states to contribute federal operating money to the establishment of the New England Regional Wastewater Institute in South Portland, Maine. NERWI closed as an official entity in 1998, but its programs were folded into those run by NEIWPCC's Environmental Training Center, an active and growing entity to this day.

"It is impossible to overstate the impact that Al had," said NEIWPCC Executive Director Ron Poltak. "He fought so hard for so many years and on so many fronts to help our member states protect and clean up their waterways, which were grossly polluted when he started with NEIWPCC back in the '60s. He was also a generous, thoughtful, caring man, and a true professional in every sense of the word."

During his long career, Peloquin also served as president of the Association of State and Interstate Water Pollution Control Administrators and executive director and president of the New England Water Environment Association. In 1992, NEWEA established the Alfred E. Peloquin Award, which goes to an individual who has made significant contributions to the wastewater field.



During the interview for the profile in *IWR*, Peloquin said, "I'm proud of the opportunity for public service. I feel that I initiated a number of things that have continued, such as the training, and I see the results today. It's very satisfying to know that I was a part of it."

The part he played was undeniably significant, and it is with deep sadness that we bid him farewell. ♠

Donations in Al Peloquin's memory may be sent to:

VistaCare Hospice Foundation
4800 N. Scottsdale Road
Suite 5000
Scottsdale, AZ 85251

WHAT'S IN THE WATER?

The Concern Over Pharmaceuticals in the Waste Stream

by Kathryn Riley

Chemicals associated with common medications and everyday products that are found on shelves across America are also showing up in an unintended place—our lakes, rivers, and streams.

“There are literally thousands of pharmaceuticals entering the environment, and no one really knows how they are reacting,” said Ann Pistell, an environmental specialist at the Maine Department of Environmental Protection. “But we’re seeing their effects, and we know that organisms are being exposed.”

While Europe has studied this issue since the 1980s, it wasn’t until the last decade that it began to draw attention in the United States. What some researchers have discovered since then is not comforting.

A 2002 U.S. Geological Survey study found that, of 130 waterways surveyed in 30 states, 80 percent contained trace amounts of pharmaceuticals and personal care products. PPCPs, as they’re called, include prescription and over-the-counter drugs such as painkillers, antidepressants, lipid regulators, and contraceptive pills as well as substances such as nicotine, caffeine, food supplements, cosmetics, sunscreen, and cleaning products.

PPCPs can enter the environment in many ways—through the excretion of ingested drugs, disposal of unwanted or expired pharmaceuticals, washing of externally applied drugs and products, household cleaning, and even stormwater runoff. The amount of pharmaceuticals and personal care products entering our environment on a daily basis should not be a surprise when you consider the ever-expanding universe of PPCPs, the large quantities that are manufactured, and their widespread use.

“Americans probably take more pharmaceuticals than other countries,” Pistell said. “We even medicate our farm animals, which is not done in Europe.”

But why are PPCPs in waterways a concern? Why would a trace amount of a chemical have a damaging effect in a waterway containing millions of gallons of water?

One danger is that the exposure of aquatic organisms to PPCPs is continual, said Hilary Snook, a research scientist at EPA New England.

“In a nutshell, studies have shown that parts per trillion of a chemical can have a huge effect in minutes,” Snook said. “When you’re a small, developing organism, it’s not good for you.”

There is evidence to suggest that PPCPs may already be affecting aquatic life. A University of Georgia study tied developmental problems in frogs and fish to exposure to low concentrations of antidepressants found in surface water and wastewater. Frogs and fish exposed to the drugs, which included well-known brands such as Zoloft and Prozac, took much longer to develop than normal.

Other studies have revealed another disturbing trend, possibly related to the estrogen in female contraception pills.

“Some rivers have been found to be dominated by one sex, which is considered to be an effect of PPCPs,” Snook said. Partly feminized male fish were found in a United Kingdom lagoon; researchers in Colorado made a similar finding. In addition, scientists in Europe have tied lower sperm counts in male fish to an increased amount of estrogen and hormones in the water.

Even more worrisome, of course, is the possibility that small amounts of PPCPs in the environment may not only affect fish. Consider, for example, the potential

hazards posed by triclocarban, one of the many PPCPs found in waterways.

“It was first used to make medical facilities super-clean, but now it’s also used in things like antibacterial soap,” Snook said. “The problem is that this chemical can wipe out healthy bacteria as well as the bad.” A fear is that triclocarban’s strong antibacterial effects may promote the growth of bacterial strains resistant to antibiotic treatment, which may eventually find their way into drinking water.

There are some scientists who believe the threat that PPCPs in the environment pose to people is overblown. Others point out that even the possibility of a risk to humans is significant, especially as communities with limited water supplies pursue reusing wastewater for crop and landscape irrigation as well as groundwater recharge. The bottom line is more information is needed. Researchers are still in the early stages of determining the risk of PPCPs for humans and wildlife.

“We’re not sure if this is a huge problem yet,” Snook said. “We’re still seeing what’s out there and what to do about it. It’s one of those things that’s hard to put a finger on, because PPCPs are ubiquitous.”

ME DEP’s Pistell agreed, saying researchers are just scratching the surface of the issue.

“The current treatment process may not have an effect on PPCPs, and we may need something more advanced than biological treatment. But you need sound science to make these decisions... More research definitely needs to be done.”

MARK YOUNG, LOWELL (MASS.) REGIONAL WASTEWATER UTILITY

“It will be a very long time before we understand all the factors,” she said. “We don’t know how significant this is yet. No one really knows.”

The lack of information about PPCPs in the environment makes the issue an even greater challenge for Mark Young, executive director of the Lowell Regional Wastewater Utility. Young has been keeping an eye on current PPCP research and reports, but the limited data available make doing anything difficult, especially concerning wastewater treatment options.

“The current treatment process may not have an effect on PPCPs, and we may need something more advanced than biological treatment,” Young said. “But you need sound science to make these decisions. You can’t deal with a problem until it’s defined. More research definitely needs to be done.”

Recognizing the potential threat to the aquatic environment and human health from PPCPs, EPA’s Office of Water is looking into how these compounds might be addressed by the Clean Water Act/Safe Drinking Water Act regulatory structure. While gaps in the data on PPCPs constrain EPA’s ability to regulate them at this time, the agency is collecting information to evaluate the possibility of prioritizing PPCP contaminants, and is collaborating on PPCP research with other agencies, such as USGS.

Also noteworthy is the work being done by the Product Stewardship Institute, a Boston-based organiza-



Scott Cassel, executive director of the Boston-based Product Stewardship Institute, is working with state agencies, environmental groups, and manufacturers to generate discussion and collaboration on the issue of pharmaceuticals in the environment.

tion that works with state agencies, environmental groups, and manufacturers on environmental protection matters.

“What we do is provide a forum for discussion,” said PSI executive director Scott Cassel. “We facilitate and mediate the solutions.”

Having initiated dialogues on everything from left-over paint in 2003 to mercury thermostats in 2004, PSI has now turned its attention to pharmaceutical waste, an issue brought to the organization by its members.

“This is our first foray into this issue,” Cassel said. “What we’re trying to achieve is to identify the problem and reduce impacts from pharmaceutical waste in the environment. We’re not experts on pharmaceutical waste, but through our network, we hope to bring together the experts. For us, a success would be having results. And results start with hard agreements and commitments that are made by each of the stakeholder groups to the issue and to projects that would lead to environmental results.”

Another focus is preventing pharmaceuticals from entering waterways in the first place. The most common way that PPCPs enter the environment is through personal disposal of medications—people tossing unwanted or expired pharmaceuticals in the trash or flushing them down the toilet.

“It’s important to start reeducating the public and medical community,” said Ann Pistell. “The most important thing is ‘don’t flush your drugs down the toilet,’ but then what do people do? They could throw drugs in the trash, but then we have concerns about poisonings.”

A little known fact is that anyone wishing to safely dispose of a prescription drug can actually walk it into their neighborhood police department, which will dispose of it effectively along with confiscated illegal drugs. But that’s hardly convenient. In Maine, they believe they have a better way. The state has passed legislation to create the first pharmaceutical mail-back program in the country. The law had the support of the Maine Association of Psychiatric Physicians (MAPP) and the Maine Medical Association, but it’s yet to have an impact.

“We’ve received legislative permission,” said Dr. Stevan Gressitt, medical director of the Northeast Occupational Center and a member of MAPP. “Now it needs regulations written and funding.”

continued on page 14

What's in the Water *continued from page 13*

If and when that happens, Maine residents will be able to mail unused or expired pharmaceuticals to the Maine Drug Enforcement Agency.

"The goal is to see what kinds of drugs are sent back and to destroy them completely to prevent them from entering the environment," Gressitt said. The parties involved in the project are hopeful that other states will be inspired by Maine's example and create their own take-back programs.

While debate continues over the threat posed by PPCPs, you can count Dr. Gressitt among those who believe it's time to take action. He wishes that researchers had focused on the issue sooner.

"I think we're ten years too late," said Gressitt. "We should have been addressing this a long time ago. This is an ongoing problem, and we need to pay attention." 🌊

Kathryn Riley, a student at Wheaton College in Norton, Mass., wrote this article during an internship at NEIWPCC's Lowell headquarters.

Editor's Note: A helpful guide to environmentally classified pharmaceuticals has been produced by the Stockholm County Council in Sweden, a world leader on the issue of pharmaceuticals in the environment. The guide rates different pharmaceuticals based on a system that considers the drug's persistence, toxicity, and bioaccumulation in the environment. The guide was designed to help consumers in Sweden make informed decisions about pharmaceutical use, but should be of interest to anyone concerned about this issue. It is available online at www.janusinfo.se/imcms/servlet/GetDoc?meta_id=7242

TRAINING FOR WET WEATHER

NEIWPCC to Debut Online Course

by Michael Jennings, NEIWPCC

This spring NEIWPCC will add a new element to its repertoire of training programs—an online course focused on wet weather operations at wastewater treatment plants. The online training course is NEIWPCC's first involvement with distance learning, which allows students to take a class at their own pace and eliminates the need to travel to a central training location. We expect the course will pave the way for more such online training programs in the future.

NEIWPCC's online wet weather training is based on a one-and-a-half day course developed for the New York State Department of Environmental Conservation. The Environmental Training Center at Kirkwood Community College in Cedar Rapids, Iowa—a leader in environmental technology online training development—took the materials produced for NYS DEC and adapted them for training over the Internet. The development and hosting of the online course is being coordinated by the Partnership for Environmental Technology Education.

NYS DEC provided the funding for the development of the online course. New York's regulations require wet weather operating plans for facilities with combined collection systems and for facilities subject to wet weather upsets. These wet weather plans allow operators to anticipate weather-related impacts and implement process changes to minimize the release of untreated wastewater to the environment. The goal of the online training course is to educate students so that they can develop a wet weather operating plan for their facility. While the initial content of the course is focused on wet weather regulations for New York State, these regulations are adapted from federal EPA regulations and the principles of the course are widely applicable to treatment plants in other states.

The online wet weather training course is expected to be completed and ready for general registration by the end of March. Students will register through NEIWPCC and receive a login ID and password allowing them to take the course over the Internet. To receive credit for completing the online course, students must successfully pass a series of self-quizzes and exams and complete a course evaluation. Upon completion of the course requirements, students will be issued a certificate indicating their training contact hours. 🌊

Michael Jennings (mjennings@neiwpcc.org) is a NEIWPCC Environmental Analyst and the coordinator of our work on the online wet weather training project.



EXPERT OPINIONS

USGS's Phillips on the Threat From PPCPs, New Research, and the Progress in Europe

by Stephen Hochbrunn, NEIWPCC

On November 10, one of the Northeast's top experts on the environmental impact of pharmaceuticals and personal care products spoke at a meeting of NEIWPCC's Regional Research Initiative Steering Committee. Pat Phillips of the U.S. Geological Survey in Troy, N.Y., presented the preliminary findings of a study of "emerging contaminants," primarily PPCPs, at five wastewater treatment plants. USGS and the engineering firm Metcalf & Eddy conducted the study, which targeted 63 compounds and detected more than 55 of them in the plants' effluents.

In addition to looking at occurrence, the study looked at the removal capabilities of conventional wastewater treatment processes. The results indicate that the type of system and its operation impact removal rates. Plants with an activated sludge system were remarkably effective at removing the bulk of the contaminants. Far less effective at doing so was the one plant in the study that used a trickling filter treatment process.

"By looking at a large variety of compounds and different types of treatment," Phillips told the committee, "we begin to see patterns emerge. We can see what types of plants may be more problematic."

Phillips shared more of his thoughts on the issue of PPCPs during a conversation after the meeting.

IWR: During your study, did you get a sense of real concern among those at wastewater treatment plants about removing PPCPs?

Phillips: They know it's coming. We've had positive relationships with them, because they know that it's something that they're going to have to deal with. I think their attitude is, "Well, we already remove a lot of things, and we can see that this will be another issue to concern us."

IWR: But some say the potential threat from PPCPs is being overblown. Is there too much hype associated with this?

Phillips: Most of the people talking about this right now are reputable scientists who aren't overhyping it. Something can get into the news media and get overhyped, as we saw in the *New York Post* ["Rx-Drug H2-Woe: Antibiotics, Painkillers Seep into City Water," Aug. 23, 2004]. But if you get your science from the *New York Post*, you're in big trouble anyway. I think most scientists are being cautious.

IWR: Should the U.S. have started looking into this problem a long time ago, as the Europeans did?

Phillips: First of all, hindsight is 20/20. Second, a lot of advances in instrumentation have occurred over the past couple of years that are allowing us to make better measurements of these things. Ten years ago, we didn't have that technology. Yes, we have been behind the Europeans in doing this work, but I see no reason to look back and say, "We could have done this or should have done that." The question is what we're going to do now.

IWR: And are we doing enough now?

Phillips: I've seen more attention paid to this issue by a larger variety of people in the last three or four months than I've seen in the last three or four years. But we have to build up a certain level of science, enough scientific conclusions, to support any movement toward regulation.

IWR: Do you see that on the horizon? Are we going to get that critical mass of science that eventually will support regulation of PPCPs on a compound-by-compound basis?

Phillips: I see steps in that direction. There's no question that we're moving beyond just worrying about



USGS's Pat Phillips spoke about PPCPs in the environment during a meeting at NEIWPCC last fall.

nutrients and some of the older organic contaminants. But I think the number one impetus for pushing this issue faster will be water reuse, whether it's indirect potable water reuse or maintaining stream flows.

Look at the problems in Massachusetts. You do a great job treating your sewage now, but there's less water in the streams, right? You have rivers here that dry up, so clearly we need to be thinking of ways to treat our wastewater better and leave it in the streams.

IWR: Are some of the European studies of value to us here?

Phillips: Yes, a lot of them are useful. But there are certain chemicals that we use that are banned over there. They also have a lot more regulation in this sphere than we do. I'm not saying that's good or bad. I'm just saying it's a fact.

IWR: Well, we have virtually no environmental regulation on these compounds, right?

Phillips: Yes, but I wouldn't be surprised if we had more regulation in ten years. I'm not a regulator, of course. That's just a wild guess. But I wouldn't be surprised. 🌊

FISHING FOR BALANCE

Managing the Benefits of Fish Consumption and the Risks of Mercury Exposure

by Susy King, NEIWPCC

Fish is good, mercury is bad. This simple statement is the title of a brochure put out by the Rhode Island Department of Health that provides information about managing fish consumption to protect against the harmful effects of mercury. While there is much to debate regarding mercury, few people would argue with Rhode Island's statement. Unfortunately, the issues surrounding mercury and fish consumption are not so simple. How do we get the health benefits of fish without exposing ourselves to dangerous levels of mercury? How do we warn the public about the dangers of mercury without scaring them away from fish completely?

The urgent need to effectively answer these questions was illustrated in a 2003 study led by Emily Oken of Harvard Medical School. The study showed that pregnant women reduced consumption of dark-meat fish, canned tuna, and white-meat fish following dissemination of the 2001 federal mercury advisory. That reduction was wise with regard to dark-meat fish, which tend to have high mercury levels. But canned light tuna and white-meat fish tend to be lower in mercury, and studies show the benefits associated with moderate consumption far outweigh any risk. When people reduce fish consumption virtually across the board due to concerns about mercury, they may substitute less healthful foods for the fish in their diet, and they lose the health benefits associated with fish for themselves and their families.

PROS AND CONS

Those benefits, as health experts have been telling us for years, are substantial. Some fish contain high levels of omega-3 fatty acids, which have been linked with good heart health. Epidemiological and clinical trials have shown that omega-3 fatty acids reduce the incidence of cardiovascular disease. Research has shown that these substances decrease the risk of arrhythmias, lower triglyceride levels, slow the growth of atherosclerotic plaque, and slightly reduce blood pressure. As a result, the American Heart Association recommends eating fish at least twice per week. Additionally, docosahexaenoic acid (DHA), one of the omega-3 fatty acids found in fish, is an important component for building brain tissue in infants. Mackerel, lake trout, herring, sardines, albacore tuna, and salmon contain high levels of omega-3s.

As for the mercury in fish, it's actually methylmercury, the most toxic form of the element. How it gets in the fish is no mystery. Mercury is primarily released into the environment from the burning of fossil fuels and mercury-containing waste. Once in the atmosphere, mercury reaches waterbodies through rain and snow. Bacteria convert it to methylmercury, which can accumulate in fish and shellfish.

Eat the fish, and you get the methylmercury too. Developing fetuses are particularly susceptible to its effects when they are exposed in the womb. Exposure to methylmercury may impact cognitive thinking, memory, attention, language, and fine motor and visual spatial skills. In addition, there is evidence to suggest cardiovascular effects in adult men.

CRAFTING THE MESSAGE

If the health benefits of fish were not so plentiful, the jobs of those responsible for issuing fish consumption

advisories would be much easier. They could tell the public to avoid or limit fish consumption without concerns that people would miss out on the omega-3s and other health benefits. Instead, it's a balancing act. How do you best convey both the risks and benefits of fish consumption?

For four days in September 2005, environmental and public health specialists, researchers, federal government officials, and NGO representatives gathered in Baltimore to discuss this issue and other related topics at the National Forum on Contaminants in Fish. U.S. EPA and the Maryland Department of the Environment sponsored the meeting, which featured presentations on the toxicology of mercury and other contaminants, health benefits of fish consumption, balancing risks and benefits, and risk management.

In one presentation, Harvard's Oken spoke about another of her studies, which looked at maternal fish consumption, hair mercury, and infant cognition. Researchers collected hair samples from mothers at the time of delivery, recorded information about the mothers' fish intake during the second trimester of pregnancy, and performed a cognitive test on the infants at six months of age. Although the sample size was small, the results showed that higher fish consumption during pregnancy was associated with better infant cognition, while higher mercury levels were associated with lower cognition. The authors concluded that women should continue to eat fish during pregnancy, but should choose varieties that are lower in mercury.

This study by Oken provides more evidence of the need for fish consumption advisories to advise both sensitive populations and the public to limit consumption of certain types of fish, but not all fish. In Maine, the desire to avoid scaring people away from eating the right fish has inspired a new outreach effort. Currently, the state's Bureau of Health offers a brochure titled "Protect Your Family. Eat Fish Low in Mercury." The brochure focuses on the harmful effects of mercury and how Maine residents can manage their fish consumption to protect themselves and their families from mercury's harmful effects.

At the forum in Baltimore, Eric Frohberg of the Maine Bureau of Health said the state will soon produce a new brochure titled "Fish: Two Meals a Week for Good Health," which focuses more on which fish you should eat instead of which to avoid. Fish are broken down into three groups: best choices, which are low in mercury and high in omega-3 fatty acids; next best choices, which are

low in mercury (and also low in omega-3 fatty acids); and fish to limit or avoid, which are high in mercury. Best choices include fresh salmon, canned salmon, smelt, Atlantic mackerel, shrimp, sardines, and mussels. Next best choices include light canned tuna, clams, scallops, haddock, hake, pollock, lobster, flounder, sole, imitation crab, and lobster.

Fish to limit or avoid are swordfish, shark, king mackerel, and tilefish. Women who are pregnant, may become pregnant, or are nursing, and children under eight should avoid these fish. All others can eat two meals of these fish per month.

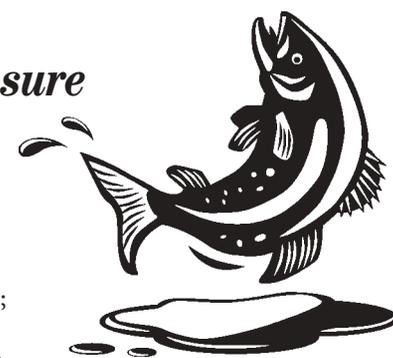
EDUCATION IS THE KEY

The issue of balancing the risks and benefits of fish consumption is further complicated by the fact that mercury is not the only contaminant in fish. For example, wild and farm-raised salmon are both low in mercury, but farm-raised salmon contain polychlorinated biphenyls (PCBs) and other contaminants that are found in the food they eat. However, these same contaminants are found in meat and dairy products, and unlike salmon, these food products do not contain high levels of omega-3 fatty acids. The high levels of omega-3s in farm-raised salmon make it worth eating up to once per week. Wild salmon are low in all contaminants and always a healthy choice.

With so many issues to think about, how are consumers supposed to make the choices that are best for their health? The best advice is to follow the advisory information offered by state health departments. Consumers should be careful to pay attention not only to the safe number of meals, but also which types of fish are safe to consume and which are not.

Fish consumption advisory materials issued by NEIWPCC's member states are available at our website (www.neiwpcc.org/mercury/advisories_materials.htm). Presentations from the 2005 National Forum on Contaminants in Fish, as well as information about the forum are available at EPA's site (www.epa.gov/waterscience/fish/forum/2005/index.htm). 

Susy King (sking@neiwpcc.org) is a NEIWPCC Environmental Analyst and the coordinator of our Mercury-Fish Workgroup.



A new brochure from NEIWPCC conveys the latest information about mercury and its health effects, and includes a list of state agency websites where more information can be obtained. Download a copy from the mercury section of our website (www.neiwpcc.org/mercury) or order hard copies by calling 978-323-7929.



LEGAL LINES



U.S. Supreme Court Mulls Arguments in Three Clean Water Act Cases

by Beth Card, NEIWPCC

Just when you thought the U.S. Supreme Court couldn't get any more press, now you have to read about it in *IWR*! Wait, don't turn the page. After months of news about Justice O'Connor's retirement, the death of Chief Justice Rehnquist, and then the process of appointing their successors, the revamped U.S. Supreme Court finally got down to business in February. The justices heard oral arguments in a wide range of cases, including three of great importance to the water community and *IWR* readers.

WETLANDS REGULATIONS CHALLENGED

Two of the cases are wetlands-related and were among many new cases that were decided by circuit courts following the SWANCC decision in 2001 (a U.S. Supreme Court case that essentially narrowed Clean Water Act jurisdiction but left questions about what kinds of waterways constitute a nexus between waters of the United States). The Supreme Court had previously denied review of two cases (Newdunn and Deaton) out of the 4th and 5th Circuits, where the courts were split over what is jurisdictional under Clean Water Act authority. The wetlands cases heard by the high court in February came out of the 6th Circuit (Mich., Ohio, Ky., and Tenn.).

Let's look at them in detail.

Carabell, et al. v.

U. S. Army Corps of Engineers, et al.

The Carabells own 19 acres of land in Macomb County, Mich., and 16 of those acres are considered to be wooded wetlands. Within the property lines there is a ditch through which water flows to a drain that leads to a creek and eventually to Lake St. Clair. The Carabells wanted to build a 130-unit condominium complex on the property and, after some state and federal agency disagreement, the state of Michigan issued a permit for the construction.

It was clear to all, however, that the state permit did not waive the need for a federal permit. The Carabells applied to the U.S. Army Corps of Engineers for a permit and were denied. They then filed an administrative appeal, which was also denied, prompting the Carabells to appeal to the district court. A magistrate judge was assigned, and the district court adopted that judge's decision, which was that the Corps' denial of the permit application was rational, that there was indeed a significant nexus to waters of the United States, and that the Carabells had failed to demonstrate less damaging practicable alternatives.

In their appeal to the 6th Circuit, the Carabells maintained that the district court erred when it 1) held that the Corps had Clean Water Act jurisdiction and 2) affirmed the Corps' decision to deny their permit application. The 6th Circuit discussed that waters of the United States that are separated by a man-made barrier, as is the case on the Carabells' property, are considered "adjacent" to navigable waters—and still jurisdictional. The circuit court noted that the U.S. Supreme Court decision in SWANCC did nothing to persuade them otherwise.

Rapanos et al. v.

United States of America

The situation in this case is similar to what took place in Carabell, but with an added twist—accusations of criminal behavior. Through wholly owned companies, John

and Judith Rapanos own various parcels of land in Michigan. Despite assessments that one of the parcels contained a large amount of wetlands, Mr. Rapanos proceeded to hire workers to level ground, clear brush, move dirt, etc., on the site. When Rapanos refused to comply with an EPA order demanding that the work stop, federal prosecutors charged the Rapanoses, both criminally and civilly, with illegally discharging fill into wetlands from 1988 to 1997.

The district court in the criminal case sentenced Mr. Rapanos to three years probation and a \$185,000 fine. A series of procedural actions followed, which eventually led Rapanos to the U.S. Supreme Court in 2001 where, in light of SWANCC, the high court vacated the conviction and sent the case back to the district court for further consideration. After the district court also set aside the conviction, the government appealed, and Rapanos landed back in the 6th Circuit Court of Appeals, where it was determined that despite SWANCC, the United States had retained jurisdiction over the wetlands. The 6th Circuit reinstated Rapanos's conviction, and the Supreme Court declined to review a last ditch (no pun intended) appeal of the criminal charge.

On the civil side of the Rapanos action, the district court learned that the government had established a total of 54 acres on Rapanos properties that were considered to be wetlands (due to characteristics of soil, vegetation, and hydrology) and that those 54 acres had indeed been filled. The district court decided and the appellate court confirmed that the disturbed wetlands were adjacent to a navigable water, because they had a surface connection to waters of the United States. The courts ruled that three of the parcels had a hydrological connection to navigable waters and were therefore jurisdictional.

QUESTIONS... AND ANSWERS?

The decisions of the 6th Circuit in Carabell and in the civil case against Rapanos were appealed, and the U.S. Supreme Court under the very new leadership of Chief Justice Roberts agreed to hear the cases. They were consolidated for oral arguments, which took place on February 21 and lasted just over an hour. Arguments were allowed on the following questions.

Carabell:

- Does the Clean Water Act extend to wetlands that are hydrologically isolated from any "waters of the United States"?
- Do the limits on Congress's authority to regulate interstate commerce preclude an interpretation of the Clean Water Act that would extend federal authority to wetlands that are hydrologically isolated from any of the "waters of the United States"?

Rapanos:

- Does the Clean Water Act prohibition on unpermitted discharges to "navigable waters" extend to nonnavigable wetlands that do not even abut a navigable water?
- Does extension of Clean Water Act jurisdiction to every intrastate wetland with any sort of hydrological connection to navigable waters, no matter how tenuous or remote the connection, exceed Congress's constitutional power to regulate commerce among the states?

"FRIEND OF THE COURT"

Because of the extreme importance of this issue, NEIWPCC signed onto a brief of Amici Curiae along with the Association of State Wetlands Managers and the Association of State Floodplain Managers. The brief provides information to assist the Supreme Court in its decisions on the cases, and focuses on defining navigable waters to mean "waters of the United States," legislative intent on the geographic scope of the Clean Water Act, existing case law (SWANCC and Riverside Bayview), and agency interpretation of "waters of the United States." The brief was among many filed for the cases, including one representing more than 30 states through their Attorneys General. The Supreme Court is expected to release its opinion in late Spring.

DAM DISPUTE

Attorneys from the state of Maine also took a trip to Washington D.C. this February, as they presented oral arguments before the Supreme Court in a case that will certainly impact the state and potentially other state programs across the country.

The facts of this case are as follows.

S.D. Warren Co. v. Maine Department of Environmental Protection

The S.D. Warren Company owns and operates five contiguous hydroelectric dam projects on the Presumpscot River in Cumberland County, Maine. The dams pull river water from its natural course, and the water is temporarily held within the dam system before being added back to the river further downstream. In lower courts, lawyers for Warren argued that the company should not be required to get state permits for the dams just because water flows through them, and that the Federal Energy Regulatory Commission's approval was what mattered since it controls the dams' licensing.

In its February 2005 opinion on the case, the Maine Supreme Judicial Court didn't dispute FERC's authority. The court noted that, "It is the responsibility of [FERC]...to issue licenses for the construction, operation, and maintenance of hydroelectric dams located in any body of water over which Congress has jurisdiction pursuant to the Commerce Clause of the United States Constitution."

However, it is not FERC's authority that is at issue in this case. Clean Water Act Section 401 requires that if the regulated activity may result in a discharge to navigable waters, then the applicant for a federal license or permit—like the one issued to S.D. Warren—must receive certification from the State of Maine that the discharge will comply with water quality standards of the Clean Water Act and of the state. The Maine Supreme Judicial Court concurred with Maine DEP and the Maine Board of Environmental Protection that Clean Water Act certification rights had vested with the state, and state authority to certify the discharge had not been exceeded. In October, the Supreme Court accepted the case for review.

OPPORTUNITY FOR CLARIFICATION

This history brings us to the real issue in this case—whether the releases from the dams are actually "discharges" under the law. The question presented for review before the U.S. Supreme Court asks, "Does the mere flow of water through an existing dam constitute a "discharge" under Section 401 of the Clean Water Act, despite this Court's holding last year in *Miccossukee* that a discharge requires the addition of water from a distinct body of water?" The definition of "discharge" for CWA Sections 401 and 402 (402 was the focus in *Miccossukee*) is the same, and the Supreme Court now has the opportunity to further elaborate on what is

required of federal and state governments in such cases as well as of potential permittees who move water around for the purposes of agricultural irrigation, drinking water, or dam management. The environmental, administrative, and legal impacts could be significant. The Supreme Court opinion on this case is also expected later in the spring. 🌊

To learn more about vulnerable waters and the science and policy involved in protecting these systems, please consider attending the "Vulnerable Wetlands Forum" on November 9 in Westford, Mass. More information is available at the forum's Web page (www.neiwpcc.org/vulnerablewetlandsforum).

Beth Card (bcard@neiwpcc.org) is NEIWPCC's Director of Water Quality Programs. She is also a licensed attorney in Massachusetts.

NEW RULES IN EFFECT

Long-Anticipated Drinking Water Regulations Are Finalized

In early January, U.S. EPA published the final Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) and Stage 2 Disinfectants and Disinfection By-Products Rule (DBPR). Water systems of all sizes and types are strongly encouraged to review these rules, which have changed significantly since proposed in August 2003.

WHO IS AFFECTED?

Stage 2 DBPR – This rule applies to all community and non-transient non-community water systems that treat their water with a disinfectant other than ultraviolet light or deliver water that has been treated with a disinfectant other than ultraviolet light. Key provisions include calculating locational running annual averages at each monitoring location for determining compliance and conducting an initial distribution system evaluation (IDSE) to identify locations at which DBP concentrations are highest. Maximum contaminant levels remain the same at 80 and 60 µg/L respectively for total trihalomethanes (TTHM) and five haloacetic acids (HAA5), and compliance is no longer determined on a distribution system-wide running annual average.

LT2ESWTR – This rule applies to all systems, regardless of type or size, that use surface water or groundwater under the direct influence of surface water. Key provisions include source water monitoring for *Cryptosporidium* with a screening provision for small systems, increased treatment requirements for systems with high *Cryptosporidium* source water results, and covering or treating finished water storage facilities.

Unlike most rules, these requirements go into effect prior to states receiving primacy and the legal authority to enforce the rules. So for many states, EPA's regional staff will oversee the early rule deadlines, provide training to water systems, and answer questions regarding requirements.

NEIWPCC's Director of Drinking Water Programs, Denise Springborg, is assisting our member states as they prepare for early implementation with EPA. In October, she reviewed EPA IDSE guidance manuals and attended a meeting in Washington to discuss her comments. She also participated in early implementation discussions as a member of the Association of State Drinking Water Administrators Rules Workgroup and prepared rule summaries for the states and water systems. 🌊

For more information on the new rules, contact Denise at dspringborg@neiwpcc.org.

CHALLENGING ACT

New Law Means New Mandates for State Underground Storage Tank Programs

by Kara Sergeant, NEIWPCC

When President Bush signed the Energy Policy Act of 2005, he ushered in the most significant piece of legislation in the world of underground storage tanks since the inception of government tanks programs more than 20 years ago. The Underground Storage Tank Compliance Act, a subsection of the Energy Act, includes many new mandates for state UST programs, with very tight deadlines. The mandates are meant to significantly strengthen the program to prevent releases and thereby better protect human health and the environment—and they should do just that. That is, if the states can find a way to do what the act requires.

NEIWPCC is working closely with our member states to determine how each intends to meet the requirements, some of which pose more of an obstacle than others. For instance, the law requires that each state conduct routine inspections of tank systems every three years. Bear in mind that tank systems include not only the tank itself, but also the piping, dispensers, and any leak detection equipment. Inspectors must make sure everything is being maintained and operated correctly.

Before the act, states differed on how frequently they visited a gas station to inspect whether it was in compliance with tanks regulations, with most taking anywhere from four to ten years between visits. This situation was never ideal: When station owners know a lot of time will pass before a state inspector visits again, there's less incentive for them to maintain compliance (except, of course, to prevent a release into the environment). Congress recognized that more frequent inspections would help ensure the systems are running properly.

The trouble is many states don't have the personnel necessary to complete inspections every three years. (Of NEIWPCC's member states, only New Hampshire currently has enough inspectors to meet this need.) States are responding by coming up with creative ways to enhance their inspection programs, but it's unclear whether any of the methods will count as inspections under the act.

Rhode Island recently implemented an Environmental Results Program (ERP), which allows gas station owners to self-certify that they are in compliance. Under this program, which was introduced in Massachusetts and targeted at dry cleaners, photo processors, and printing facilities, each operator has the opportunity to attend a workshop and receive a workbook and checklist that outlines how to determine if they are in compliance. Vermont has also begun looking into establishing an ERP, even amid uncertainty over whether self-certifications will count as inspections.

Another alternative to having the states inspect each tank themselves is to hire certified third-party inspectors. EPA has allowed third-party inspections for the first round of inspection requirements under the act, which requires states to inspect any tank not inspected since 1998. But it's not clear whether they'll be allowed for the next round in the three-year inspection cycle.

A second major concern for the states is the act's requirement that EPA develop guidelines for operator training and that states develop state-specific training requirements consistent with EPA's guidelines. State training programs will need to address three types of personnel: the owner/operator, the daily on-site person responsible for the UST, and the onsite emergency

responder. While many states have been pushing for such training and certification, none of our member states has an active program at this time. They'll need to develop and implement one, an additional burden on an already overburdened staff.

NEIWPCC is in the early stages of pursuing the idea of a regional training and certification program, but there are obvious challenges, including creating an examination that would incorporate state and federal regulations. Although a few states such as California and Oregon require gas station operators to be certified, there is no specific test required to operate a facility. Many of the major gasoline distributors provide training programs to their new employees, but testing is seldom part of their programs. States also will have to address the high turnover in the field, and how to ensure each operator receives the training.

The act also calls for EPA to develop guidelines for delivery prohibition. Any noncompliant station will be required to be identified as an ineligible facility for delivery, preventing that station from receiving fuel until the state determines that appropriate corrective actions have taken place. The threat of no fuel delivery should be a large incentive for stations to stay in compliance, and several of our states currently have such programs in place. Others however will need to develop one and seek legislative or regulatory changes. Under the act, they'll have only one year to do so after EPA produces its guidance.

Clearly, complying with the new requirements will be tough for states—especially without full funding. Congress has authorized more than \$6.5 billion in the next five years to fulfill the mandates, but none of the money has been appropriated to date. Officials at U.S. EPA are examining whether states have any flexibility under the act, because the states fear that if they do not fulfill all its requirements, then their program will not be eligible for federal funding, when it finally does come. For most of our states, this is a significant portion of their funding.

Fortunately, the challenges posed by the act are not being overlooked in Washington and elsewhere. In one large initiative already underway, EPA's Office of Underground Storage Tanks and the Association of State and Territorial Solid Waste Management Officials have formed state workgroups on each of the major tasks outlined by the act. The workgroups are mainly prioritized by deadline. Staff from most of our member states and EPA New England are involved in the workgroups, which will allow our states to have a major role in how EPA's guidance is shaped. There will also be several sessions devoted to Energy Act issues during the National Tanks Conference in Memphis, Tenn., in March. On the regional level, EPA New England has held a general information meeting with states at NEIWPCC's Lowell headquarters.

NEIWPCC will continue to be a resource for the states as they adapt to the new requirements. In addition to exploring a regional operator training and certification program, we are urging our commissioners to be informed about the resources needed to complete the new mandates, and are actively informing states of new developments as they arise. 🌊

Kara Sergeant (ksergeant@neiwpcc.org) is a NEIWPCC Environmental Analyst and the coordinator of our Underground Storage Tanks Workgroup.

IN THE SPOTLIGHT



NEIWPCC's **Beth Card** (left), **Susy King** (right), and **Laura Chan** were guest speakers at a National Park Service training session held on December 15 for the staff of the Lowell National Historical Park. The session was designed to inform the park staff about water quality issues and their relevancy to the Merrimack River; the information will come in handy as the park staff conduct boat tours of the river as well as tours of the park's new Suffolk Mill Exhibit, which features several interactive river-related exhibits.

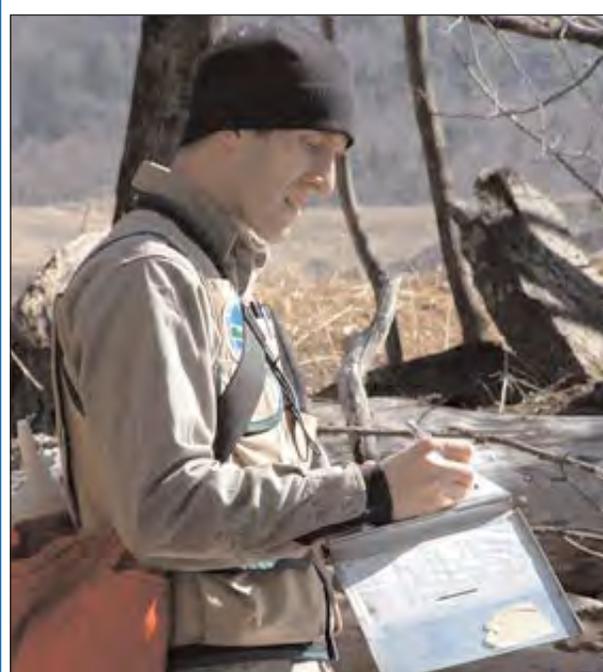
"Having NEIWPCC here is key," said Carolyn Goldstein, the park's curator, during a break in the training. "Our rangers and teachers need to bring a historical and policy understanding to their work. They need to know who makes decisions about water, and why the rivers are cleaner. It's hugely insightful for us to hear what you do."



NEIWPCC's **Mike Jennings** moderated a session entitled "Hot and Sticky: Managing Fats, Oils, and Grease" at a two-day conference in November on biosolids management in New England, sponsored by the New England Water Environment Association and the New England Biosolids and Residuals Association. Other sessions at the conference, which was held in Westborough, Mass., examined new treatment technologies, sludge handling and reduction, and odor control. During Jennings's session, he delivered a presentation on NEIWPCC's many activities and resources related to fats, oils, and grease (FOG), which include a Web page (www.neiwpcc.org/fog) that features presentations from our FOG Management Alternatives workshops as well as links to numerous FOG control and management program resources.

The New York State Department of Environmental Conservation's **Hudson River Estuary Program**, to which NEIWPCC provides funding and staff, was one of five finalists for the 2005 International Thiers Riverprize, a prestigious award for excellence in river management announced each year at the International Riversymposium in Brisbane, Australia. In announcing the nomination, the festival's organizers praised the estuary program's success in coordinating legislation, research, management, and public education activities to improve the ecosystem health of the Hudson's estuary. The \$150,000 (Australian dollars) prize, however, went to a river restoration project that has worked to clean up the once highly polluted Drome River in southern France. In 2004, the award went to the Siuslaw Basin Partnership in Oregon for its work aimed at restoring the Siuslaw River watershed.

A website developed by New York City's PBS channel **Thirteen/WNET** as a companion to its "Planet H2O" television series features material developed by NEIWPCC. In the site's "For Educators" section (www.thirteen.org/h2o/educators.html), the "Water Use and Conservation" lesson plan includes a handout entitled "Getting Up to Speed." This material first appeared in "**That Magnificent Ground Water Connection**," a resource book for teachers produced in 1996 by NEIWPCC in partnership with EPA New England. NEIWPCC authorized the reuse of the material for the WNET project, which aims to inform young people about fresh water systems around the world and their impact on land, air, and living things.



NEIWPCC's **A.J. Smith** spends much of his time in the field sampling rivers throughout New York State, but he's also an expert in the laboratory. This spring, he'll be sharing that knowledge as an instructor during a three-day workshop on the fundamentals of Aquatic Chironomid Taxonomy. The Hudson Basin River Watch is sponsoring the session, which takes place May 24-26 at the Black Rock Forest Science and Education Center in Cornwall, N.Y. The workshop will cover the basics of aquatic chironomid larvae morphology while providing participants with hands-on instruction in the materials and equipment required for slide mounting specimens. (See www.hudsonbasin.org/midgeworkshop.htm for more details.)



NEIWPCC's **Tom Groves**, **Susan Bailey**, and **Mike Jennings** (left to right) pose outside our Lowell headquarters after being among those honored last fall for achieving milestones in their service to NEIWPCC. Groves and **Leo Hetling**, a NEIWPCC Commissioner from New York, received commendations for 15 years of service. Bailey and Jennings were honored for five years of service, as were NEIWPCC's **Ann-Marie Caprioli**, **Amanda Higgs**, **John Ladd**, **Dan Miller**, **Beth Waterman**, and **Matt Witten**. Commissioners honored for five years of service were **Charles Button** of Massachusetts, **Albert Curran** of Maine, **Alicia Good** of Rhode Island, and **Salvatore Pagano** of New York. Congratulations to all!

Congratulations are also in order for the employees of six wastewater treatment facilities recently recognized by EPA New England for exemplary performance in 2005. The plants in **East Hartford, Conn.**; **Franklin, N.H.**; **Warner Village, N.H.**; **Bethel, Vt.**; **Randolph, Vt.**; and the **South Essex Sewerage District WWTF in Massachusetts** received EPA Regional Operations and Maintenance Excellence Awards in their respective categories. The award honors employees of publicly owned wastewater treatment plants for their commitment to improving water quality not only with outstanding operation and maintenance, but also through a combination of continued permit compliance, effective financial management, and ongoing operator training. All six facilities now have the opportunity to be nominated for an EPA 2006 National Operation and Maintenance Excellence Award. Four facilities in NEIWPCC's member states received this national honor in 2005. The **Village of Lima (N.Y.) WWTP** took second place in the small advanced plant category; in the small secondary plant category, the **Newington, N.H., WWTP** took first place and the **Town of Canton (Conn.) Water Pollution Control Facility** took second place; the **North Conway (N.H.) WWTF** took first place in the large nondischarging plant category.

New faces at NEIWPCC! Since Jan. 1, the following staff have joined us in full-time positions: **Carol Haskins** is an assistant environmental analyst with Maine's drinking water program; **Thomas Mulcahy** is an environmental analyst in the water quality division at our Lowell headquarters; and **Bruce Mussett**, **Laura Stephenson**, and **Heather Young** are environmental analysts based in New York State.

Welcome aboard!

Elsewhere on the awards front: The New Hampshire Department of Environmental Services' **Wes Ripple**, who's worked with NEIWPCC on a variety of training programs, received EPA New England's 2005 State Wastewater On-Site Technical Assistance Provider Award. For years, Ripple has been training wastewater treatment plant operators and providing technical assistance to facilities to help them improve their biological nutrient removal capabilities.

In a statement, EPA Regional Administrator Robert Varney said, "The professionals providing technical assistance and training to wastewater treatment plants play a crucial role in ensuring that our lakes and rivers are protected from unnecessary pollution. I am proud to acknowledge Wes Ripple's contributions to keeping New Hampshire's rivers, lakes and streams clean."

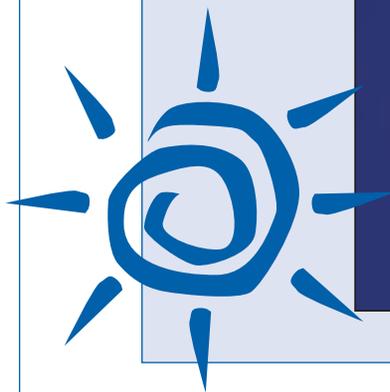
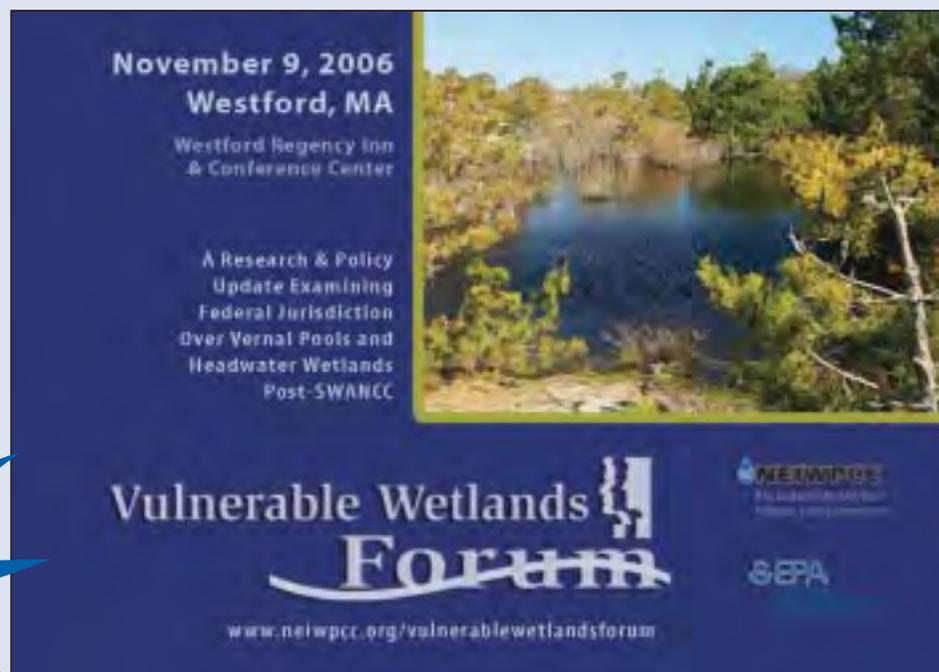
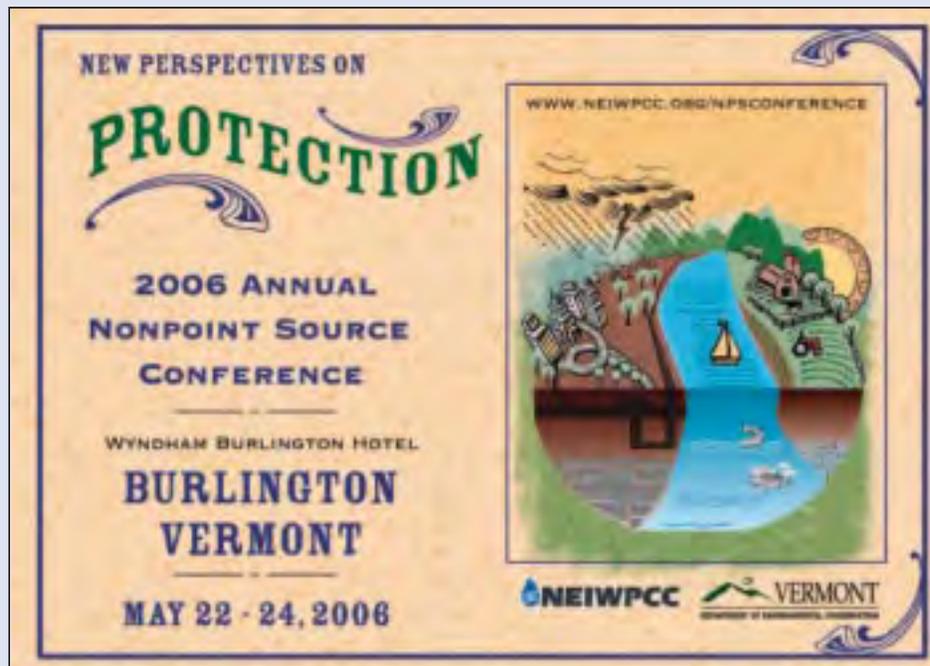


Jane Carroll (left) and **Karen Tangeman** of the Augusta (Maine) Sanitary District received the 2005 Lee Agger Award, which is presented by the Maine Joint Environmental Training Coordinating Committee. JETCC, which NEIWPCC has managed since 1985, established the award in 1990 in memory of Agger, who was JETCC's second training coordinator and established its network of volunteer hosts and trainers. The award recognizes those who've displayed a special commitment and dedication to supporting environmental training in Maine.

"Jane and Karen have made numerous volunteer contributions not only to the JETCC program but also to the various water pollution control endeavors of the Maine Wastewater Control Association, Maine Department of Environmental Protection and other educational organizations," said **Leeann Hanson**, JETCC's current training coordinator. "Whether we need meeting space, technical assistance, guidance on a document or agenda, or help with laboratory procedures, these two always come through, going above and beyond what is requested."

Carroll is the laboratory director and safety coordinator at the Augusta Sanitary District. Tangeman is a wastewater quality specialist. When asked for their comments on the award, they said it's their pleasure to do whatever they can for JETCC because, as Carroll put it, "JETCC is an integral part of the wastewater profession."

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CALENDAR OF EVENTS

Please note that NEIWPC workgroup meetings are designed to foster focused small-group discussions among workgroup members on specific issues. Workgroup members are drawn from state and federal regulatory agencies and NEIWPC staff. For general information about our workgroups and their points of focus, please visit our website (www.neiwpc.org) or call 978-323-7929.

APRIL

April 5
NEIWPC Nonpoint Source Workgroup Meeting

April 6
NEIWPC Regional Nutrient Criteria Meeting

April 6-8
New England Estuarine Research Society
Spring 2006 Meeting
Hull, Mass.

April 11
NEIWPC UST/LUST State Funds
Workgroup Meeting

April 25
ABC Eastern North America Regional Meeting
Saratoga Springs, N.Y.

April 25
NEIWPC Groundwater/Source Water
Workgroup Meeting

April 25-27
Annual NEIWPC 104(g) Regional Meeting
Saratoga Springs, N.Y.

April 25-27
EPA Co-Regulator Workshop on Designated Uses
Chicago, Ill.

April 25-28
NALMS 19th Annual Conference on Enhancing the
States' Lake Management Programs
Chicago, Ill.

April 26-27
Northeast Regional Mercury Science &
Policy Conference
Newport, R.I.

MAY

May 5
Reducing and Preventing Beach Closures on
Lakes and Rivers in Northern New England
Fairlee, Vt.

May 7-11
5th National Monitoring Conference
San Jose, Calif.

May 8-10
AWRA 2006 Spring Specialty Conference:
GIS and Water Resources IV
Houston, Texas

May 8-11
2006 National Environmental Partnership Summit
Atlanta, Ga.

May 14-19
14th International Conference on Aquatic
Invasive Species
Key Biscayne, Fla.

May 16-18
EPA Science Forum 2006
Washington, D.C.

May 18-19
NEIWPC Executive Committee &
Commission Meeting
Newport, R.I.

May 22-23
NEANS Panel Spring Meeting
Hyannis, Mass.

May 22-24
NEIWPC's 17th Annual Nonpoint Source
Pollution Conference
Burlington, Vt.

JUNE

June 1
NEIWPC Drinking Water Administrators
Workgroup Meeting

June 2-3
2006 New England Lakes Conference
Farmington, Maine

June 4-7
National 104(g) Conference
Chicago, Ill.

June 4-7
2006 Joint NEWEA/NYWEA Spring
Meeting & Exhibition
Groton, Conn.

June 8
TMDLs & Stormwater Permitting Workshop
Chelmsford, Mass.

June 11-14
15th Annual State Fund Administrators Conference
Oklahoma City, Okla.

June 26-28
AWRA 2006 Summer Specialty Conference:
Adaptive Management of Water Resources
Missoula, Mont.

*To check for additions or changes to this listing, and to access links to conference websites,
see the Calendar at NEIWPC's website (www.neiwpc.org/calendar.asp).*

Contributions to *IWR* are welcome and appreciated. Please submit articles or story ideas to: Stephen Hochbrunn, *IWR* Editor
E-mail: shochbrunn@neiwpc.org ♦ Phone: 978/323-7929, ext. 235



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