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2016 Environmental Innovations: States Pioneer Solutions on Water Infrastructure and Monitoring, Chemical Information, and More December 2016

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INTRODUCTION

State environmental agencies are demonstrating robust leadership through innovative approaches that tackle environmental challenges while facilitating efficient and effective use of resources. By sharing their initiatives, ECOS members can help their state counterparts resolve pressing challenges. ECOS thus works to promote the sharing of member innovations by posting weekly success stories to its website (www.ecos.org) and its newsletter, *ECOSWIRE*, as well as frequent updates on Twitter (@ECOSates). In addition, the association annually presents State Program Innovation Awards for environmental agency practices that can serve as replicable models for other states. In 2016, ECOS was pleased to receive a dozen outstanding nominations, three of which were selected by the ECOS Executive Committee for award recognition at the Fall Meeting in Wheeling, West Virginia.

Two of this year's honorees are creatively protecting their state's water resources. The District of Columbia Department of Energy & Environment is accelerating the installation of green infrastructure through its Stormwater Retention Credit trading market. The program aims to solve the longstanding challenge of runoff by accelerating the installation of green infrastructure through stormwater rules that provide flexibility for regulated development while maximizing protection of waterbodies and incentivizing voluntary retrofits. Meanwhile, the Virginia Department of Environmental Quality is developing a strategy for water protection with a strong science-based approach to evaluating the condition of wetlands. Data collected from the assessment are available in a handy online GIS-based viewer called the Wetland Condition Assessment Tool (WetCAT). Similarly, the Washington State Department of Ecology is leveraging technology to protect its resources. A smartphone app developed and piloted by the state allows emergency responders to access Community Right-to-Know data on what chemicals are stored at a facility and in what quantity. The app already proved vital in responding to a recent wildfire that burned a warehouse containing toxic chemicals.

These innovation awardees and the other nominees are summarized below. ECOS hopes the information in this report will encourage its members to adopt, adapt, or collaborate on initiatives. The association looks forward to continuing the tradition of advancing innovation in 2017.

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ECOS Innovation and Productivity Committee Chair John Mitchell of Kansas (far left) and Vice Chair Misael Cabrera of Arizona (far right) with 2016 State Program Innovation Award recipients (left to right) David Paylor of Virginia, Maia Bellon of Washington State, and Brian Van Wye (representing Tommy Wells) of the District of Columbia.

WINNER'S CIRCLE

District of Columbia's Stormwater Retention Credit Trading Market

Description of Initiative:

Managing stormwater runoff is a challenge for cities nationwide. When it rains in urban areas such as the District of Columbia, stormwater runs off rooftops, parking lots, and other impervious surfaces into streams and rivers with powerful erosive force and laden with pollutants, severely degrading waterbodies. The District of Columbia's Stormwater Retention Credit (SRC) Trading Program aims to solve this long-standing urban challenge by encouraging the installation of green infrastructure through strong, innovative stormwater regulations that provide flexibility for regulated development and maximize protection for waterbodies. In addition, credit trading leverages private investment to maximize community benefits.

Green infrastructure, like green roofs, rain gardens, and other industry-accepted best practices, absorbs and reduces stormwater runoff, but the cost can be significant. The estimated cost to retrofit the District's impervious areas with green infrastructure is more than \$7 billion. However, only approximately \$10 million in public funding is available each year for green infrastructure. While developing an innovative approach to improve stormwater management in the city, the District recognized that tweaking stormwater regulations to allow credit trading would encourage the private sector to install green infrastructure at a rate much faster than government funding alone could achieve.

The premise of the SRC program is that credits may be generated by voluntary installation of green infrastructure – and those credits may be sold on the open market to project developers as a way for them to achieve their stormwater regulatory requirements. Project developers are permitted to achieve up to half of their runoff-reduction (“retention”) requirement offsite by purchasing SRCs generated by green infrastructure voluntarily installed elsewhere in the city.

Because regulated development is projected to occur on about 1 percent of the District’s land annually and 43 percent of the District is impervious, there are ample opportunities for SRC-generating green infrastructure throughout the city. Also, while the traditional regulatory approach requires large green infrastructure on regulated sites, trading encourages smaller scale and more dispersed green infrastructure across the city, which retains volume from a greater area, resulting in more total runoff captured, including more of the dirtiest “first flush” volume. The SRC program also incentivizes green infrastructure in areas with low land value that happen to drain to the District’s smaller streams that are especially vulnerable to stormwater runoff. This green infrastructure also benefits the District’s rivers, into which the streams flow, and it concentrates air quality, aesthetic, and urban heat island benefits in less affluent communities with lower land values.

Results to Date:

Developers have praised the flexibility afforded by SRC trading, and environmental advocates are optimistic. The stormwater retention performance requirements in the regulations took effect in 2014. To date, 27 sites are going through the permitting process and have opted to achieve some retention off site. Two sites have completed construction, the point when regulatory compliance begins, and have opted to use SRCs. Seven sites currently have SRCs for sale on the market, with two trades completed, generating \$45,000.

In addition, the market has leveraged private investment. Most notably, Prudential Financial has invested \$1.7M to install green infrastructure in the District. This venture with The Nature Conservancy and Encourage Capita will prevent millions of gallons of stormwater runoff from polluting waterbodies in the nation’s capital. The Nature Conservancy describes SRC trading as a model for addressing stormwater issues nationally, and the program has also been recognized by the United Nations. For more information, please visit doee.dc.gov/src.

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Virginia's Wetland Monitoring and Assessment Program

Description of Initiative:

Virginia has approximately one million acres of wetlands. An estimated 75 percent of these acres are palustrine vegetated wetlands, and the remaining 25 percent are estuarine wetlands. Virginia is believed to have lost about 40 percent of its original complement of pre-colonial wetlands.

A study of wetland trends in Southeastern Virginia for 1994-2000 showed a net loss of 2,100 acres (1.3 percent). The actual loss of vegetated wetlands was even higher, but offset by a gain in pond and open water area. The loss of palustrine wetlands was primarily due to conversion to uplands, while estuarine wetlands were lost through conversion to open water. Major causes of wetland loss in Virginia include conversion to other land cover types, ecosystem service modifications associated with climate change, hydrologic alterations, invasive species, fragmentation by development, crop fields, roads, fences, berms, and eliminated ecosystem services, notably habitat and water quality.

The Virginia Department of Environmental Quality (DEQ) and the Virginia Institute for Marine Science have developed a robust, science-based Wetland Monitoring and Assessment Strategy for evaluating the condition of wetlands in the Commonwealth. The overarching goal of Virginia's strategy is to devise a long-term implementation plan for a wetland monitoring and assessment program that protects the physical, chemical, and biological integrity of the Commonwealth's water resources, including wetlands. In order to accomplish this goal, it is critical to first know the status of wetland resources in Virginia, in terms of location and extent of wetlands in each watershed, and have a general knowledge of the quality of these wetland resources. Second, the functions of wetland resources impacted through the permitting program must be accurately evaluated to determine those functions to be replaced through compensatory mitigation. It is also important to assess the degree to which the required compensatory mitigation is performing in relation to those impacted functions.

The assessment method is a multi-service model that involves three levels of data collection. The method characterizes the capacity of the wetland to provide water quality and habitat services using remotely sensed data. The model application produces a relative score for each wetland for each service. The scores are then refined and calibrated by site visits to randomly selected wetlands. The relationship between structure and function is validated by intensive study of ecological service endpoints.

Results to Date:

The data collected from the assessment has been compiled into an online GIS-based wetland data viewer identified as the Wetland Condition Assessment Tool (WetCAT). WetCAT can be used to evaluate wetland condition over time, make better permitting decisions relative to cumulative impacts, avoid and minimize wetland loss, evaluate performance of compensatory wetland mitigation in replacing wetland acreage and function, and evaluate the effectiveness of the regulatory program.

Virginia's wetland monitoring and assessment program is being implemented by funds awarded through U.S. EPA's Wetland Program Development Grants to continue these efforts. DEQ has received nine grant awards from EPA for this initiative, and Virginia is recognized as one of five states leading this initiative nationally.

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Washington's First-of-its-Kind App Warns Emergency Responders

Description of Initiative:

In June 2015, fierce winds swept embers from a raging wildfire outside of Wenatchee, Washington, into a commercial area, igniting material first at a recycling center, then at a nearby fruit packing plant. The blaze soon threatened tanks holding thousands of pounds of ammonia and other toxic chemicals. When staff of the Washington Department of Ecology (Ecology) spill response unit were called in, they brought a new tool to the scene: their cell phones.

Just before the Wenatchee wildfire broke out, Ecology's Hazardous Waste and Toxics Reduction program began piloting a new smartphone app that allows emergency responders to access data on what chemicals are stored at a facility and in what quantity. Knowing what chemicals are onsite allows first responders – both Ecology's own spill teams and local police and firefighters – to choose the right safety gear and take steps to protect themselves and nearby residents. Ecology already collects this information under the federal Emergency Planning and Community Right to Know Act, or EPCRA, on behalf of the State Emergency Response Commission. The commission requested Ecology's help in making the information available on cell phones. Until now, the information was kept in paper records or on computer spreadsheets, and responders needed to request the latest data from Ecology to get updates.

The "Washington State EPCRA" app is the first mobile app Ecology has produced – and the first EPCRA mobile app available in the entire country. Along with information on the chemicals themselves, the app provides directions, gives responders access to facility contacts, and provides other information.

Ecology makes the app available for Android and Apple phones. Although the app itself is free and available in the official app stores, downloading the emergency data requires an access key from Ecology to ensure the tool is used by authorized emergency responders.

Results to Date:

- App downloaded 430 times by Washington responders to date;
- Reports from responders involved in the Wenatchee wildfire that this data was vital in responding to the event; and
- Several inquiries from other states interested in developing their own EPCRA apps.

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EMERGENCY RESPONSE INNOVATIONS

District of Columbia's Environmental Emergency Response Program

Description of Initiative:

In September 2012, the District of Columbia Department of Energy & Environment (DOEE) developed an Environmental Emergency Response Program after identifying the need to enhance the District's ability to prepare for and respond to environmental emergencies. For years, DOEE responded to environmental emergencies by sending inspectors that were available to respond to the emergency situation at the time. Since the response was primarily based on inspector availability, inspectors were often limited. Emergency requests were also received by different administrations within DOEE, with no clear procedure on how requests should be handled. Given these inefficiencies, the agency recognized the need for an overarching program that could address environmental emergencies in a more effective and methodical manner.

Since the implementation of the Environmental Emergency Response Program, several key challenges have been resolved. First, the program developed a system to handle pollution complaints through a triage process. The system involves an assessment of the complaints received via numerous electronic and telephone sources, noting which could be resolved quickly or required assignment of a particular priority level.

Second, the program enhanced the working relationship with District first responders by increasing joint multi-agency investigations of environmental crimes. When an environmental complaint is received, the program alerts key members within DOEE, Fire and Emergency Services, the Metropolitan Police Department, and the Department of Public Works to ensure proper emergency response, investigation, and remediation. This procedure has significantly improved hazardous materials response capabilities for the District government as a whole.

Third, the program created a seven-person Emergency Response Team that serves as the District's "state" hazardous materials team to support existing hazardous materials response resources from city and federal agencies and provides an environmental health component to the city's hazardous materials and weapons of mass destruction response capabilities. This seven-person team, consisting of personnel from DOEE's Air Quality, Water Quality, and Toxic Substance Divisions, has been trained and receives ongoing professional development as needed to serve in this role.

Finally, in addition to environmental emergency response, the program provides support for emergency preparedness, planning, and training for a wide variety of disasters for the District.

Results to Date:

Since its implementation in late 2012, the Environmental Emergency Response Program has responded to a total of 462 emergencies, including oil spills, chemical leaks, and homeland security events. Prior to this program, there was no mechanism in place to track such events. As the program became more established, DOEE applied for and successfully secured grant funding and donations of equipment to outfit environmental emergency responders. In addition, DOEE has acquired an emergency vehicle and trailer to respond to environmental emergencies in an efficient manner.

The success of the program has been recognized by both U.S. EPA and the U.S. Coast Guard for its enhanced response capabilities and activities. A prime example of the program's success was the ability to quickly respond to and prevent a 3,000 gallon oil spill from reaching environmentally sensitive areas of the Anacostia River earlier this year. Likewise this year, the program responded to ensure the proper control of a petroleum substance from entering the drinking water of a District neighborhood. Many other examples and success stories are available.

In order to protect the people and environment of the District of Columbia, DOEE has adopted a program that is "mission-ready" for environmental emergencies at all times. When prevention measures fail, or people commit crimes against the environment, the program – in partnership with key emergency responders across the District and federal government – helps ensure that a prompt and professional response is deployed to protect the people and environment of the District.

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AIR INNOVATIONS

New Hampshire's Cookies & Climate Change

Description of Initiative:

The New Hampshire Department of Environmental Services (NHDES) recognizes that climate change is real, serious, and primarily caused by human activities – and that New Hampshire residents are experiencing its effects. Climate change is different from the environmental challenges of the past in that its causes are pervasive throughout our daily life and global economy, and its impacts ripple through the Earth's atmospheric, oceanic, and terrestrial systems at all scales. Addressing such a challenge requires 21st century environmental agencies to fully transform from siloed management structures to integrated teams capable of responding to evolving conditions and opportunities. Recognizing this need, NHDES has actively been engaged in such a transition since 2010, and the result has been a transformation in how the agency views climate change and how staff are networked across disciplines.

In late 2010, NHDES issued a strategic plan that called for incorporation of climate change considerations into the agency's programs and activities. While a few of the agency's bureaus began tackling this challenge in 2011, most didn't have the resources for a new initiative, many were unclear as to whether the science of climate change was settled, and others were unsure how to begin. In 2012, one bureau conducted a reorganization using climate change as a lens through which to view its work -- an effort that led to the development of a systematic process that NHDES used to obtain funding from the U.S. Department of Energy in 2013. The grant not only supported staff time to evaluate three additional bureaus, but also supported a series of meetings that explored the opportunities and barriers to incorporating considerations of climate change department-wide.

The meetings, referred to as "Cookies & Climate Change" due to the provision of homemade baked good by staff, occurred on five separate occasions between the summer of 2013 and the winter of 2015 with the assistance of trained external facilitators. The conversations brought together the agency's senior leadership, bureau administrators, and the staff most directly affected by climate change. At each meeting, the Commissioner and Assistant Commissioner not only welcomed the 50 attendees, but also emphasized that the science of climate is clear, that change is already happening, and that NHDES must actively address it. Further, they joined the three division directors as participants spread among the small breakout discussion groups.

The breakout groups were a mix of managers and staff from across the agency, intended to foster a shared understanding of the opportunities and barriers related to climate change, to develop a path forward determined by staff, and to allow staff from across the agency to get to know one another and make connections. At the end of the session, each of the groups shared their takeaways. Each reported similar – if not identical – questions, concerns, needs, and opportunities. Subsequent conversations continued to mix leadership and staff and explore the opportunities and barriers further. With each conversation months apart, the department was able to explore these ideas and concepts more deeply and, in doing so, develop a plan to systematically incorporate climate change considerations within and among all programs.

Results to Date:

During the meetings, staff indicated that in order for the agency to be successful in addressing the causes and impacts of climate change, they would need: 1) clear and sustained direction from senior leadership; 2) staff support to facilitate their own review process; and 3) ongoing education. While these resources were provided in the months following the last meeting, the impact of the conversations themselves has been transformative. At the end of the five conversations, climate change was no longer a niche issue, restricted to a small group of staff in the air division. With the leadership from the Commissioner and Assistant Commissioner, it was clear to managers at all levels that this was not a “flavor of the month” and was to be considered across all areas of our work. With this commitment made clear, new climate champions emerged, empowered to explore alternatives and push the boundaries in both infrastructure and natural systems. Each of the more than 20 bureaus identified a climate change lead staffer to work with a central climate coordinator, and within a short time more than 600 possible actions were identified. The agency is in the process of refining these down to a plan due to be presented in 2016.

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PERMITTING INNOVATIONS

Nebraska’s Online Permitting Programs

Description of Initiative:

Nebraska Governor Pete Rickett’s challenge to state agencies to better utilize information technology to improve effectiveness of state government and improve responsiveness to constituents prompted the Nebraska Department of Environmental Quality (NDEQ) to emphasize the ongoing effort to streamline permitting processes. NDEQ had identified the National Pollutant Discharge Elimination System (NPDES) construction stormwater permit program and the Air Quality state construction permit programs as areas where reliance on an online permitting process could better utilize NDEQ resources and reduce the time required for eligible applicants to go through permitting.

The construction stormwater and Air Quality construction permitting programs require significant staff resources. Prior to the conversion to the online process, the construction stormwater program required approximately 1.5 full-time staff equivalents (FTEs) to administer it. The online system, on the other hand, will be administered with under 0.5 FTEs. The Air Quality program estimates that up to 25 percent of all construction permit applications submitted could be handled by the online state general construction permitting program.

The construction stormwater program also involves the Nebraska Game and Parks Commission as an integral part of the permitting process. Previously, paper applications had to be routed through, and approved by, the commission. With the online process, the commission's approval is routinely received electronically on the same day – and saves commission staff considerable time.

A major component of both permitting efforts is the reliance on the applicant to provide information in a more meaningful manner to NDEQ. In the case of the Air Quality general construction permit program, the applicant must respond to between 10 and 14 yes/no questions. Based on the applicant's responses, NDEQ is able to determine if coverage under a general construction permit can be granted.

To date, the Air Quality Program has developed general construction permits for the following source categories: aggregate processing, emergency engines, hot-mix asphalt plants, and concrete batch plants. Additional source categories, including incinerators and surface coating operations, are in development. It should be noted the online program is not applicable to Prevention of Significant Deterioration or Title V facilities.

Results to Date:

The first full month of accepting construction stormwater general permits was December 2015. Twenty-six permits were received that month. On average, it took one day from the receipt of application to the notification that the facility was covered. Previously it took about 14 days to go through this process. A total of 416 applications for construction stormwater permits have been received in 2016; again, permits have been issued in an average of one day. Facilities are still allowed to submit paper copies of the applications, but of the 416 applications received, only 44 were submitted in paper form.

April was the first month in which requests for coverage were received under the Air Quality general construction permit program. Requests have been received from facilities with emergency engines, aggregate processing, and a hot-mix asphalt plant. The facilities were notified that they were covered by the general permits within days of making application. Previously reviewing and issuing these permits would have required four to eight months.

NDEQ continues to examine permitting programs in an effort to save time for both the agency and the regulated community and welcomes opportunities to discuss the possibilities.

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WASTE AND CHEMICAL INNOVATIONS

New Hampshire's Hazardous Waste Coordinator Certification Program

Description of Initiative:

The traditional approach of obtaining environmental compliance through inspection and enforcement has proven to be an effective tool yet is not a complete solution. There are too many facilities in need of inspection to be reached with existing compliance staffing levels. Facilities receive inadequate exposure to the regulations because of this lack of contact with regulators and because their own resources are also limited. Facilities that may become knowledgeable of the rules often lose staff to turnover, and they are once again left uninformed of the rules that apply to them. Furthermore, the standard "command-and-control" approach to inspection and enforcement has created an enduring attitude of fear and distrust between regulators and the business community.

The New Hampshire Department of Environmental Services (NHDES) Hazardous Waste Coordinator Certification (HWCC) Program, initiated in 2003, is designed to supplement these shortcomings by providing a sustainable forum for educating and certifying generators in the state's hazardous waste rules. The program requires all of New Hampshire's larger hazardous waste generators to have on staff, at the facility where the hazardous waste is generated, a Hazardous Waste Coordinator (HWC) who is certified annually. This training and certification is provided directly by the state regulators, delivering timely information and interpretations "from the horse's mouth" rather than diluted through third-party private consultants. Whereas this training and certification is an annual requirement, it provides NHDES regular interaction with the regulated community and the opportunity to continually provide more in-depth training, as well as address problem areas observed by inspectors, all with minimal NHDES staffing commitments.

Results to Date:

To assess the value of the program, in 2015 NHDES partnered with Dr. Sarah Stafford, Professor of Economics and Director of the Public Policy Program at the College of William and Mary in Virginia. Dr. Stafford and her research team designed a project to measure the program's ability to achieve regulatory compliance and reduce barriers between government and the regulated community. The project used statistical analysis of an online survey of 1,684 former attendees of the HWCC program. From this survey the team found that 15% of attendees reduced their hazardous waste generation enough to reclassify to a less-regulated category. Whereas the ultimate goal in hazardous waste regulation is to reduce the creation of wastes, this statistic is highly encouraging. Additionally, 76 percent of the trainees believe the probability of having a violation decreased after certification, indicating their confidence in the effectiveness of the training. The research further showed that 94 percent of trainees believe the training increased the likelihood they would contact hazardous waste regulators to get any questions answered. A nearly equal number of trainees (91 percent) believe the training also increased the likelihood of seeking compliance help from regulators of other media (e.g., water, air). This statistic illustrates that by creating familiarity with regulators and improving communication, the HWCC Program has a broad impact in promoting compliance in not just hazardous waste management, but also in other programs.

The shift in the relationship between NHDES and the regulated community is further illustrated by attendance records. While roughly 325 facilities are required to have a HWC on-staff, annual program attendance is at 1,025 individuals, and continues to consistently grow at 3 percent per year. Of those, nearly 20 percent of attendees are exempt small generators that pursue certification proactively to prepare for the possibility of one day increasing their generator size. These data suggest that the HWCC Program is helping to remove barriers of silence and fear between business and government, promoting a new paradigm of communication, cooperation, and compliance.

For more information, see:

<http://des.nh.gov/organization/divisions/waste/hwcb/hwcs/hwccp/index.htm>.

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Washington's Quick Chemical Assessment Tool

Description of Initiative:

The Quick Chemical Assessment Tool (QCAT) is a simplified chemical hazard assessment tool developed by the Washington Department of Ecology to provide a streamlined method to evaluate potential toxic chemical hazards. Using a rigorous method to perform these comparisons allows an organization to assess chemical ingredients on a level playing field and to look for safer alternatives.

The QCAT is based on Clean Production Action's GreenScreen for Safer Chemicals, which itself builds off of U.S. EPA's Design for the Environment's chemical hazard assessment process. QCAT uses a more limited set of potential hazards and a more focused dataset than the comprehensive GreenScreen system. This makes it easier to master and quicker to complete. Some large companies have used the QCAT as an initial screening tool to narrow their choices before diving into a more in-depth chemical analysis. QCAT is particularly good at identifying chemicals that should be avoided.

Despite being simplified, the QCAT still offers a thorough, effective look at nine hazard endpoints in four categories:

1. Carcinogenic, mutagenic and reproductive toxics:
2. Acute mammalian toxics:
3. Acute aquatic toxics: and
4. Persistent and bioaccumulative toxics.

Ecology makes the QCAT methodology available for free on its website and offers regular trainings that have been attended by occupational health and safety managers, environmental compliance specialists, product development staff, and chemists and toxicologists from a number of large international companies. These trainings – typically offered as one-day workshops – give participants a working knowledge of the QCAT system, and also serve as a general introduction to the science of chemical hazard assessment.

Ecology is training all of its pollution prevention specialists to conduct QCATs for the businesses they work with.

Completed QCATs, whether done by Ecology or other authoritative sources, are posted to the Interstate Chemicals Clearinghouse Chemical Hazard Assessment Database, allowing others to learn from and build on our experience.

Results to date:

- Eight QCAT workshops and webinars held;
- More than 200 attendees at QCAT workshops and webinars; and
- 10 QCATs completed and posted to the Interstate Chemicals Clearinghouse database.

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Washington's Protecting Children's Health through Product Testing

Description of Initiative:

A shiny necklace sold with a girls' dress should be pretty, not poisonous. Product testing by the Washington Department of Ecology is helping ensure that jewelry and other everyday products are safe for kids, adults, and the environment.

In March 2016, the Washington Department of Ecology tested 159 pieces of jewelry intended to be worn by children. In four girls' necklaces, the testing revealed the toxic heavy metal cadmium at levels up to 97 percent, while another necklace contained 5 percent lead.

Ecology staff were alarmed by the test results. Cadmium is a toxic heavy metal linked to kidney, bone, and liver disease, and is a known carcinogen. Lead is a potent neurotoxin tied to developmental damage. Neither of these metals belongs in the fragile filigree of a child's necklace, which could break or be chewed on. Ecology worked with manufacturers, retailers, and the U.S. Consumer Product Safety Commission to recall these products. The testing results and recalls drew nationwide attention.

Washington State has been a leader in reducing toxics in consumer products, including work on lead wheel weights, mercury-containing lights, and heavy metals in children's products and consumer packaging. Product testing is an essential part in guiding those efforts and enforcing the law. In 2014, the Washington Legislature provided Ecology with ongoing funding to expand its product testing program, allowing the agency to both check for compliance with existing laws and to investigate emerging toxic concerns.

From direct threats to human health, such as the cadmium necklaces, to persistent environmental toxics, such as the PCBs created as byproducts in pigments and dyes, Ecology's product testing program lets the agency learn more about what goes into the millions of products we all buy. All of the testing results are shared with the public on the agency's website at: <http://ecyapeem/ptdbpublicreporting/>.

Results to date:

- Tested more than 3,000 products;
- Conducted laboratory analysis on more than 11,000 product components;
- Completed more than 20 product studies;

- Carried out state enforcement actions on more than 100 products;
- Referred more than 20 product test results to the U.S. Consumer Product Safety Commission for further action.

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WATER INNOVATIONS

New Hampshire's Salt Applicator Certification Program

Description of Initiative:

Nearly a decade ago, during the initiation of the Interstate 93 widening project in New Hampshire, the state Department of Transportation conducted an environmental impact study, which identified four watersheds as having elevated levels of chloride. The elevated levels were high enough to be harmful to aquatic life and triggered a Total Maximum Daily Load (TMDL) study conducted by the New Hampshire Department of Environmental Services (NHDES), which calculated that a reduction of between 25 and 45 percent salt use was needed in order to meet water quality standards while doubling the number of highway lanes. The TMDL report also revealed that up to 50 percent of the salt load was coming from parking lots, driveways, and private roads.

To help address the over-application of salt, NHDES partnered with the University of New Hampshire (UNH) Technology Transfer Center to create the Green SnowPro training course. The course, which mirrors a similar effort in Minnesota, was designed to educate commercial salt applicators on how to reduce overall salt use while maintaining public safety.

In order to gain a better understanding of the snow and ice management industry, NHDES formed the I-93 Salt Reduction Work Group consisting of state, municipal, and private sector representatives who perform winter maintenance activities within the impaired watersheds. NHDES quickly learned that private companies were using excessive amounts of salt to help reduce their potential exposure to liability in slip and fall lawsuits.

Hearing the liability concerns of these private companies, NHDES began working on legislation that would provide liability protection for these salt application companies and mitigate the risk of using less salt. Legislation was enacted in 2013 which mirrors the liability protections provided to ski areas and includes a requirement that, in order to receive the liability protection, individuals must have taken the Green SnowPro training course and received a Certified Salt Applicator certificate.

Results to Date:

The NHDES salt applicator certificate carries the responsibility of annually reporting salt use to NHDES and attending a refresher training course every two years. The Salt Applicator Certificate has proven valuable to the private contractors as well as their clients and insurance carriers. To date, 650 individuals have become Certified Salt Applicators. This is a first-in-the-nation program that is helping to substantially reduce wintertime road salt usage and improve water quality.

As a way to foster professionalism within the industry, NHDES and UNH partnered to host the first annual New Hampshire Salt Symposium in the fall of 2014, which was attended by more than 110 snow and ice management professionals. Planning is underway now for the third annual event.

The New Hampshire Certified Green SnowPro Program continues to evolve and grow into a stakeholder-driven initiative backed by strategic legislative elements; agency, municipal, private sector, and nonprofit organization partners; and a collaborative desire to reduce chloride impacts to surface waters.

For more information, see: <http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/salt-applicator-certification.htm>.

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Missouri's Lincoln University Wetland Restoration Project

Description of Initiative:

Wetlands play an important role in water quality and filtration, aquifer recharge, flood control, phytoremediation, and biodiversity. To demonstrate the benefits of wetlands, Lincoln University (LU) has restored a 12-acre wetland adjacent to the Moreau River at the LU's George Washington Carver Farm. This project supports a myriad of aquatic, semi-aquatic, and terrestrial plants and animals while demonstrating an alternative use for marginally productive cropland. In addition to the environmental benefits, the wetland also functions as an outdoor classroom for both LU students and the surrounding community, with dozens of educational tours held every year.

A berm was constructed along the Moreau River to contain the water in the wetland, while any existing diversions were removed to allow water to drain from the adjacent uplands. Soil removed from areas of the wetland pool was reused to construct the berm. The wetland will play

an important role in both soil conservation and water quality improvement. In addition to the traditional benefits of a wetland, this particular site also diverts effluent from an adjacent aquaculture facility into the wetland. This provides an excellent opportunity to both reuse the groundwater used by this facility, as well as filter the aquaculture runoff. A water control structure was installed to allow the LU farm manager to raise and lower the water level in the wetland to correspond with seasonal needs.

Results to Date:

Wetland construction is complete and the restoration was a success. In March 2016, LU students from the Department of Agriculture and the Wildlife Club assisted in planting 300 obligate wetland plants. A monitoring station has been installed on site. The parameters monitored include groundwater level, precipitation, air temperature, relative humidity, barometric pressure, wind speed/direction, and solar radiation.

This project was made possible through the collaboration of several entities. Partners assisting LU in the restoration include: the U.S. Department of Agriculture's Natural Resources Conservation Service, Ducks Unlimited, Hamilton Native Outpost, the Missouri Department of Conservation, and Three Rivers Electric Cooperative. U.S. EPA, through the Missouri Department of Natural Resources, has provided partial funding for this project under Section 319 of the Clean Water Act.

A project presentation is available at: <https://dnr.mo.gov/env/wpp/cwforum/docs/051716-presentation-wetland.pdf>.

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New Hampshire's Instream Flow Protection Program

Description of Initiative:

When it comes to managing rivers for water quantity, the key question is, "How much is too little?" This is a particularly vexing issue given the dynamic nature of both stream flows and the demands on those flows. By focusing on a river's flow pattern and applying management to maintain that pattern, the New Hampshire Instream Flow Program has developed the tools needed to provide sustainable water resource protections for people and the ecosystem.

Many attempts have been made around the world to define effective stream flow protection. Management to maintain these protections must be integrated into an existing framework of water supply infrastructure and societal expectations for water availability. Finding acceptable

and effective protection criteria and then equally acceptable and effective management actions has stymied many instream programs.

The New Hampshire program recognizes that river flows vary greatly through the seasons, and native plants and animals have adapted to low summer flows, as well as to the typical spring floods. Therefore, the Instream Flow Program determines the natural patterns of flows specifically for each river, and then works with local water users and dam owners to ensure that these patterns are maintained while water users' needs are met. Management includes reductions in loss and waste, event-specific changes in water use, development of alternate water supplies to cope with low flow conditions, and releases from impoundments to reset the natural stream flow pattern.

Results to Date:

Last spring, after nearly 15 years of work on two rivers in the pilot phase of the program, the New Hampshire Legislature and Governor enacted a bill to expand the Instream Flow Program to cover 16 additional rivers in the state.

Fully implemented, the program will result in rivers that have healthy, balanced ecosystems and robust water supplies for drinking water, business, and other off-stream uses, and which are capable of fully providing for water needs during low-flow conditions. The program brings more water users into the state's water conservation program, resulting in less water being lost or wasted. The program supports water users in developing water sources that are drought-resistant.

Management actions during the first two years of the program's implementation on two pilot rivers have been successful in restoring the stream flow pattern following excessive period of low flows. Water users on those rivers have developed alternate water supplies that meet their needs and reduce stresses on their rivers. The small impacts of the occasional use of releases from the upstream impoundments have been accepted by lake front property owners, and they have recognized the importance of harmonizing their use of the "lake" with the needs of the rivers.

To the Department of Environmental Services' knowledge, no other state has approached the protection of instream flows in this manner, but the New Hampshire approach should be readily transferable to other states. More information can be found at:
www.des.nh.gov/organization/divisions/water/wmb/rivers/instream.

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