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The New Division of Water Resources: Tom Reeder at the NCWRA forum

by Rhett Register

At the N.C. Water Resources Association quarterly luncheon on Sept. 9, Tom Reeder, director of the newly consolidated Division of Water Resources within DENR, presented details of the consolidation and what the next steps are for the Division.

The new division folds the Division of Water Quality in with the Division of Water Resources. Reeder said reasons for the reorganization include: enhancing effectiveness and efficiency, avoiding duplication of effort, gaining economies of scale and integrating water resource management.

He began his presentation with the assertion that the new Division will stress customer service.

"If you come to us today in the Division of Water Resources, and that permit is going to provide economic development to North Carolina, we are going to make issuance of that permit our number-one priority," Reeder said. "I don't think the people of North Carolina should expect anything else from a public sector agency in this economic climate."

Reeder showed the new organization chart for the Division and highlighted some of the major changes.

The **Stormwater Permitting Program**, which handles permitting for industrial, municipal and post-construction stormwater programs, and provides technical assistance to the regulated community, has been moved to the Division of Energy, Mineral and Land Resources.

The **Aquifer Protection and Regional Office Section**, which focuses on the protection and enhancement of the state's groundwater, has added to its purview control of the regional offices. These offices house staff that inspect non-discharge facilities and investigate compliance and pollution incidents.

The **Public Water Supply Section**, which regulates public water systems, will remain the same. Both the Water Treatment Operators Certification Program and the Wastewater Treatment Operators Certification Program have been co-located in the Public Water Supply Section. This is to ensure that these two programs are operated as consistently as possible in the future, Reeder said.

The **Water Permitting Section**, which conducts all NPDES permitting, will lose the regional offices to the Aquifer Protection and Regional Office Section.

Some of the biggest changes came to the **Water Planning Section**. Modeling and basin-wide planning from the two divisions were merged. The goal, Reeder said, is to do more integrated watershed and water resource management where models are looking at water quality and quantity in order to create a single basin-wide plan.

Reeder described the recently reorganized Division of Water Resources and answered questions at the NCWRA forum luncheon.

The consolidation, along with a $2 million budget reduction to the Division, means that 70 positions will be cut from the program, Reeder said.

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Many of those will be the removal of positions that are currently vacant. Much of the remainder, Reeder said, will come from people who have volunteered, or are eligible for full retirement. Reeder anticipates about a dozen people will involuntarily lose their jobs.

After the reorganization, the Division will undergo a program review that will assess all of the Division's programs, policies and rules.

"We're going to look at rules that are conflicting, outdated or unnecessary, and rules that don't really provide any environmental benefit," Reeder said. "By the end of the year, we will have a list that I will submit to the Secretary that proposes rules for repeal, deletion or modification."

To give stakeholder input to the review, the Division has created the Outside Involvement Committee — a group of stakeholders that will provide suggestions for rules that should be modified.

Reeder said he expects changes to come to such contested rules as the Buffer Rules and Isolated Wetlands Rules.

Responding to a question about the threat of EPA revoking DENR's primacy, Reeder replied:

> "EPA is on my back about a lot of standards — particularly updating metals standards and nutrient criteria. One of the approaches I am taking is to look at what other states have done. I would like to see what they did to satisfy EPA and then maybe we can learn how we can do what EPA wants us to do without causing a lot of disruption to the regulated community."

Asked about why the Stormwater Permitting Program was moved to DEMLR, Reeder said that Assistant Secretary for the Environment, Mitch Gillespie, saw a lot of similarities between the stormwater programs and the sedimentation and erosion control program within DEMLR. The reasons for the move, he said, are similar to those given for consolidation of DWQ and DWR.

The North Carolina Water Resources Association holds quarterly luncheons with guest speakers presenting a variety of water resources topics. Luncheons are open to members and non-members alike. To learn more about more about the association, visit: ncwra.org.

Long-time WRRI News editor, Jeri Gray, retires

In June, Jeri Gray retired from her position as newsletter editor at WRRI for the second time. Gray first retired in 2003 when she left to help take care of her grandchildren. In 2008, she returned on a part-time basis to write and edit *WRRI News*. In total, she has worked in various positions with WRRI, including Assistant Director for Information and Communications, for 22 years.

Gray started as a part-time writer/editor for WRRI in 1986 and moved

up to full time in 1988. She edited the newsletter and took on the task of editing research reports.

"Some of the researchers did not like it one bit," Gray says of her efforts to copyedit the reports. "They hated my nitpicking."

Though they may have argued, Gray always saw researchers as a key audience for the newsletter.

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New Environmental Management Commission sworn in

Veteran and new members of the EMC take the oath of office during the first meeting since state law reorganized the commission.

On Thursday, Sept. 12, a new Environmental Management Commission met for the first time.

Recent session law altered the commission, which is responsible for adopting rules for the "protection, preservation and enhancement of the state's air and water resources." The number of seats on the commission was reduced from 19 to 15.

Five commissioners from the previous EMC were reappointed: Benne Hutson, Steve Keen, Kevin Martin, Clyde "Butch" Smith, Jr. and Steve Tedder. Hutson, an environmental lawyer with McGuireWoods, was appointed as chairman.

The eight new commissioners are: David Anderson, Gerard "Jerry" Carroll, Charlie Carter, Tommy Craven, E.O. Ferrell, Manning "Bill" Puette, Dr. Bob Rubin and Julie Wilsey. Two positions have yet to be appointed.

After being sworn in, the group was quickly brought up to speed with overview presentations by DENR division directors as well as by Jennie Hauser, legal counsel for the commission.

Commission members also heard presentations on two upcoming issues. Tom Fransen, from the Division of Water Resources, described regulations involved with transfer of water between river basins. He informed the group that Union County has filed an interbasin transfer notice of intent and that the commission will be the group that makes the final decision on the permit. Dianne Reid, also from the Division of Water Resources, presented on the status of the North Carolina Nutrient Criteria Development Plan. The plan serves to meet the state's commitment, under the Clean Water Act, to developing a nutrient plan of action with the U.S. Environmental Protection Agency.

The commission, which meets six times a year, also had two action items. It approved a request to proceed to public hearing on the Triennial Review of Surface Water Quality Standards and voted to listen to the hearing officer's report on the revision of Arsenic Acceptable Ambient Levels (AAL) for air quality at the next meeting.

For more information on the Environmental Management Commission, including meeting times and minutes, visit: http://portal.ncdenr.org/web/emc/

Jeri Gray *continued from page 2*

"I tried to provide information that I thought people needed," Gray says. "University researchers particularly were in the forefront of my mind."

When Gray began as editor of WRRI News, few media outlets covered the Environmental Management Commission meetings even though the group is responsible for adopting water quality, air quality and water resource rules for the state. Gray started attending the meetings and reporting on them for the newsletter.

"I frequently consulted Jeri for her wisdom and experience on North Carolina water issues," says Ken Reckhow, professor emeritus in the Duke University Nicholas School of the Environment and WRRI director from 1996 to 2004.

During her tenure, the newsletter expanded from 4 to 10 and sometimes as many as 20 pages. It included coverage of commission meetings, state and federal legislation, developments in water science and technology and frequently contained in-depth feature stories on North Carolina water and environmental issues.

"By reading Jeri's work over the years I developed a deep appreciation and respect for her ability to convey research results in a way that was both technically sound and engaging and understandable for all," says David Genereux, WRRI's Associate Director for Research. "Her writing shows a strong commitment to water resources, and also to quality and to her craft as a writer, that's something I love about it!"

In retirement, Gray hopes to spend more time with her grandchildren, visit the Blue Ridge Mountains where she was born, and continue with her volunteer activities. She is also contemplating a few writing projects including a book on landmark environmental cases in North Carolina.

From bubble plumes to mechanical mixers: Machines to improve water quality in lakes

The ratification of Senate Bill 515 (Jordan Lake Water Quality Act) postpones the implementation of some of the Jordan Lake Rules for nutrient management and calls for a 24-month demonstration project to evaluate technologies that might improve water quality in Jordan Lake.

This article looks at some of the machines available for in-lake water quality treatment.

The problem is well known. Nutrients promote the growth of nuisance algae. Blooms may release toxins, can stress water treatment facilities and may lower dissolved oxygen levels as they decompose.

Aside from this, thermal stratification during warm months limits mixing in the lake, creating a zone of less dense, warmer water atop a cooler, denser layer. Mixing from wind cannot move oxygenated surface waters through the thermocline, and bottom waters become oxygen depleted. Under anoxic conditions, metals such as manganese and iron become chemically available, and hydrogen sulfide gas bubbles up from anaerobic bacteria in the sediment. When this happens, taste and odor problems occur and water treatment costs rise.

One way to address these problems is to use machines to mix the lake. Mixing circulates oxygen-rich water from the surface to deeper waters. Introduction of oxygen at depth oxidizes metals and neutralizes anaerobic bacteria, thus removing some of the conditions that may cause taste and odor problems. Mechanically oxygenating waters using bubble diffusers or mixing chambers performs a similar function. Mixing also makes conditions inhospitable for cyanobacteria that thrive in nutrient-rich, quiescent waters.

Machines built to address water quality problems in the waterbody can be grouped into two categories. Aerators use bubbles to aerate or mix waters. Mechanical mixers mix water using some combination of motors and blades.

Aerators

Aerators inject air or oxygen into the water to raise dissolved oxygen levels or to mix waters. The most common system of this type consists of a pump connected to an array of perforated tubes on the lake bottom. If the intent is to increase dissolved oxygen but maintain thermal stratification — for example, to protect cold-water species — then the bubbles are made small enough so that they dissolve before penetrating the thermocline. If the intent is to mix the lake and break up thermal stratification, large plumes of bubbles are released. These push water from depth up through the thermocline and force mixing with surface waters.

Another type of aerator is a mixing chamber. This can be suspended just above the lake bottom or be external to the waterbody. In both cases, air or pure oxygen is pumped into the chamber and mixed with water then discharged. When placed in the lake, this is typically used to aerate the hypolimnion, or bottom layer of a thermally stratified lake, and to preserve stratification.

A variation is a mixing chamber external to the waterbody, which aerates a side stream that is then discharged back into the waterbody.

Mechanical Mixers

Like aerators, mechanical mixers also can be used to mix a single layer or break down stratification. They can mix the surface layer, called the epilimnion in a thermally stratified lake, or the entire water column. Because they float on the surface, the machines cannot aerate the hypolimnion while preserving stratification. These devices typically move water either by pulling it up from below or pushing it down from the surface using an impellor. Both of these actions cause circular mixing cells either within a layer or throughout the water column.

Below are two types of water-circulating machines that have been proposed for use in Jordan Lake:

A SolarBee deployed for in-lake mixing. (Photo courtesy Medora Inc.)

1. SolarBee

SolarBees fall under the mechanical mixer category. They float on the surface and consist of pontoon floats, solar panels, an impellor, an adjustable intake hose, batteries and a distribution plate.

The solar-powered water circulators can be configured to mix waters either in the epilimnion or throughout the water column.

Epilimnetic circulation is used to suppress cyanobacteria. According to the manufacturer's website, by mixing waters, a single unit, configured for epilimnetic circulation can suppress cyanobacteria for approximately 35

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Bubble plumes *continued from page 4*

acres. By extending the intake hose below the thermocline, SolarBees also can be configured to break down stratification.

A two-page detailed description in the Appropriations Act of 2013 does not mention SolarBees specifically but seems to specify their use for the Jordan Lake Nutrient Mitigation Demonstration Project. Description of the demonstration project seems to call for the epilimnetic configuration with the aim of reducing problem algae such as cyanobacteria. The state budget dedicates $1.35 million to the project, which will begin in spring 2014.

ResMix unit being prepared for placement. (Photo courtesy WEARS Australia)

2. ResMix

The towns of Cary and Apex are exploring the use of mechanical mixers to improve the quality of raw water drawn from Jordan Lake into the Cary Apex Water Treatment Facility (CAWTF). Variability in water levels in the lake, due to weather conditions and discharges by the dam, often force the CAWTF to draw from oxygen-depleted waters near the lake bottom. As described above, these conditions cause taste and odor problems in waters drawn from that region.

To raise oxygen levels at the bottom of the lake and throughout the water column, the towns are asking for approval from the U.S. Army Corps of Engineers to deploy a ResMix floating circulation system. Manufactured by WEARS in Australia, the system uses impellors to slowly circulate oxygen-rich surface water from the surface to the deepest parts of the lake.

According to the Army Corps' Finding of No Significant Impact and environmental assessment for the project, the aeration system would consist of two floating platforms located approximately 100 feet apart and approximately 2,500 feet from CAWTF water intakes. Each platform would have two 15-feet diameter aeration units located approximately 12 feet apart from each other. Each aerator would be equipped with a 7.5 horsepower (hp) electric motor driven by a variable frequency drive.

Other components of the system would include a connecting walkway between the two aeration units, aeration pumps, a standing platform, baffle curtains, anchoring cables, anchoring concrete blocks, and a power supply.

Rather than mixing a single layer, ResMix circulators destratify large sections of the lake. The goal is to mix the entire water column so that oxygenated water can be drawn from any of the intakes.

Project managers believe that the system will raise dissolved oxygen levels for part of the lake but are not sure how much of the lake would be affected. USGS will monitor water column stratification, chemical quality, and algae characteristics before and after the project to determine the extent of its effects.

The estimated cost of the project is $2.54 million, which includes $0.5 million for the USGS monitoring and evaluation. Without the mixers, the Cary Public Works and Utilities Department estimates that water treatment plant improvements would be needed that could cost between $6.9 and $15.3 million.

If approved, the system could be installed as early as the latter part of 2014.

A mechanical future?

There is significant debate about what role machines like these could have in addressing water quality problems in Jordan Lake. The two upcoming installations — the SolarBee demonstration project in the Haw River and Morgan Creek arms and the CAWTF ResMix system deployment near the US 64 Bridge and Farrington Road — are designed to address specific problems in specific areas. To what extent machines could be incorporated into large-scale treatment of the lake is unknown.

None of the machines described above would lower nutrient levels in the water. Instead, they might address the effects of those nutrients. Questions have been raised about the downstream fate of the nutrient-rich waters leaving the lake.

The U.S. Environmental Protection Agency has also stated that using in-lake "technological solutions" without requiring pollution reductions upstream is "generally inconsistent" with the Clean Water Act. Because of these and other concerns, it seems that if machines do have a future in improving water quality in Jordan Lake, it will be as one part of a multi-tiered approach.

Hudnell presents on Jordan Lake; SolarBees

On Sept. 4, Dr. Kenneth Hudnell gave a presentation at UNC – Chapel Hill's Michael Hooker Research Center entitled, "The Jordan Lake Controversy: Toxigenic Cyanobacteria, Nutrients, Quiescent Water and a Systems Approach to Restoration."

Hudnell is vice president and director of science at Medora Inc., the company that makes and installs SolarBee lake circulator systems.

He is also adjunct associate professor in the college of Environmental Sciences and Engineering at UNC – Chapel Hill.

Hudnell advocates a "systems approach" to improving water quality in Jordan Lake. He describes the approach as one that includes both watershed and waterbody management.

Watershed management, Hudnell says, reduces inputs while waterbody management treats water quality using in-lake measures. Hudnell refers to waterbody management as a pillar of the Clean Water Act with point-source and nonpoint-source rules being the other two.

"We need to add that third pillar of protection — waterbody management — where we treat the impaired waterbody and give it that therapy it needs to reduce stress and repair biochemical processes," Hudnell says.

Hudnell spent 23 years as a neurotoxicologist at the U.S. Environmental Protection Agency where he studied the human health effects caused by exposures to environmental pollutants. Accordingly, his presentation gave an in-depth description of cyanobacteria, their toxins and the mechanisms by which they affect humans.

Throughout the presentation, Hudnell referred to maps generated by Blue Water Satellite Inc., that appear to show inputs of phosphorus into Jordan Lake and resulting chlorophyll-a concentrations. He says that cyanobacteria have a unique signature that the satellites can pick up and quantify. Many of the chlorophyll-a concentrations in the lake, he says, appear to be coming from cyanobacteria.

Jordan Lake is listed on North Carolina's 303(d) list for impaired waters because of chlorophyll-a, turbidity and pH water quality standards violations. Removing cyanobacteria, Hudnell says, will address these violations as well as reduce the threat from cyanotoxins.

"The goal really is to suppress cyanobacteria," Hudnell says of the SolarBee project. "If you do that, you eliminate the official impairments of high chlorophyll-a, high pH and high turbidity but most important to me is you eliminate any chance of the toxins being there."

Hudnell says that SolarBee mixers preferentially treat for cyanobacteria by mixing the epilimnion, or surface layer, of the lake. This mixing, he says, can suppress cyanobacteria for about 35 acres of water per unit. They do this by pulling water up through the intake, typically placed just above the thermocline, and discharging it as a thin sheet at the surface.

The demonstration project called for by the N.C. General Assembly would place SolarBee units in the Haw River arm and the Morgan Creek arm of Jordan Lake.

Why mixing reduces cyanobacteria is not fully understood, Hudnell says. Possible reasons include that mixing promotes beneficial algae that would otherwise sink. It may also promote zooplankton that, when necessary, eat cyanobacteria. The mixing may damage blue-green algae's buoyancy regulation leaving it exposed on the surface. It may also promote cyanophages, viruses that target blue-green algae, by remixing the non-motile organisms back up to the surface.

During a short question and answer session at the end of the presentation, a number of water professionals and students had questions about, or expressed concerns with, some of the points Hudnell made.

One person asked how effective the machines would be in reducing algae blooms if the Jordan Lake Rules were never implemented.

"Cyanobacteria need two things that we can do something about to predominate. They need high nutrient loads and they need quiescent, stagnant water.

Hudnell spoke about the dangers of cyanobacteria at a recent presentation at UNC – Chapel Hill.

You take away the nutrients, you don't get them. You take away the quiescent stagnant water, you don't get them. Doing both together of course is best. The hope is even with high nutrient levels in Jordan Lake you can suppress cyanobacteria," Hudnell said.

Dr. Ken Reckhow, professor emeritus at Duke University's Nicholas School of the Environment, took issue with Hudnell's assertion that cyanobacteria are dominant in Jordan Lake.

"Cyanobacteria are not dominant in Jordan or Falls Lake. That's based on DENR studies, in situ studies," Reckhow said. "[Also] Blue Water Remote Sensing is very unreliable in these narrow water bodies. It just does not work very well."

Hudnell disagreed. "I have seen a lot of data showing cyanobacteria predominance," he said.

In a follow-up telephone conversation, Mark Vander Borgh, State Biologist in the Division of Water Resources, said that cyanobacteria are the predominant algae in Jordan and other Piedmont lakes but that there are many types, only some of which produce toxins. "Blue green algae is predominant," Vander Borgh said. "But do these produce harmful algal blooms? We have no evidence or documentation that they do."

To read more about SolarBees, visit lakes.medoraco.com

The state budget can be found at www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S402v7.pdf

Israeli water specialist visits Raleigh

WRRI and N.C. State University recently hosted a luncheon for Dr. Noah Galil, Dean of Civil and Environmental Engineering at Technion – Israel Institute of Technology.

Galil, who is past director of the Water Research Institute at Technion, was visiting with scientists and engineers in North Carolina, Georgia and Florida to learn about U.S. advances in water science and to promote the WATEC Israel 2013 water resources conference to be held in October in Tel Aviv.

At the event, Galil gave a presentation on the development of water resources in Israel. Afterwards, water resources researchers from N.C. State University, Duke University and University of North Carolina – Chapel Hill gave brief overviews of their work.

In his presentation, Galil divided Israel's water history into three stages. The first began with the creation of the country and involved the construction of a network of pumps and pipes that move water from the Sea of Galilee south. Referring to the three 35,000 horsepower pumps that were specially made to move water through the system, he quipped, "In many other places in the world, they use water to make electricity. In this case, we use electricity in order to produce water."

Galil credits the health of the system, designed to operate for 50 years and still functioning after more than 60, to an annual system-wide shutdown every February when maintenance and upkeep are performed.

Galil described the second stage of Israel's water history as focusing on water treatment and reuse. He says lack of water resources and strict environmental regulation forced Israel to pursue novel ways of reusing water. In the 1970s, Israel began to use treated wastewater on "industrial crops" such as cotton. As treatment technologies improved, the country began reusing wastewater for all agriculture. Now, Galil estimates 80 percent of the country's wastewater is reused in agriculture.

Noah Galil, from Technion in Israel, spoke with local water resources researchers.

Galil describes Israel's current water situation as one that increasingly looks to technologies such as desalinization to meet water demand. Of the two billion cubic meters of water the country uses every year, nearly half is supplied by desalinization and reuse, he says.

"The water situation in the area will have to be based more on technology and we cannot rely on Mother Nature," Galil says.

Challenges he mentioned include problems with pharmaceutical contaminants in wastewater as well as disposal of the brine from the desalinization process.

Dr. David Genereux, Associate Director for Research at WRRI, and a professor in the Dept. of Marine, Earth, and Atmospheric Sciences at N.C. State University, asked if deep well injection had been used for disposal of the brine from desalinization. Galil described a pilot project that tested the process but that was eventually deemed a failure. Currently, says Galil, desalinization byproducts are discharged into the Mediterranean Sea. He said that there are studies underway that are looking into the fate of these byproducts and their environmental effects, which is a concern given the closed nature and lack of flushing of the Mediterranean Sea.

Dr. Detlef Knappe, from N.C. State University's Department of Civil, Construction and Environmental Engineering, asked about the high energy costs associated with Israel's water program. Galil responded that methane produced in bioreactors at wastewater treatment facilities and solar technologies are some of the ways Israel offsets costs. He mentioned that newly discovered natural gas deposits in the Mediterranean Sea also have helped to lower the cost of energy.

Dr. Mary Watzin, Dean of the College of Natural Resources at N.C. State University, was interested in what North Carolina could learn from Israel's reuse of nutrients.

"In North Carolina, nutrient contamination of surface waters is a huge problem. Learning from you about how we can adapt technologies for North Carolina would be really useful," Watzin noted.

To this, Galil responded that the most important part is education. "It is a question of longtime education and if the public is able to understand that recycling and reuse is not such a big deal," he said.

The discussion and presentations showed many areas for potential partnership between North Carolina and Israeli water resources researchers. "I intend to share these presentations with my colleagues," Galil said. "I hope that this will develop future collaborations between us."

To learn more about WATEC Israel 2013 visit, www2.kenes.com/watec-israel/pages/home.aspx

Environment-related legislation passed by the N.C. General Assembly

The 2013 Regular Session of the 2013 General Assembly convened on January 9 and adjourned on July 26, 2013. The following is a list of some of the environment-related legislation that passed into law during this session.

S 638 / S.L. 2013-265 North Carolina Farm Act of 2013

An Act to enact the North Carolina Farm Act of 2013 to (1) Limit the liability of North Carolina commodity producers arising from food safety issues related to their products; (2) Limit the liability of farm animal activity sponsors, farm animal professionals, and agritourism operators and clarify that equine recreation where the landowner receives no compensation is subject to the recreational use statute and not the equine activity liability statute; (3) Allow the Commissioner of Agriculture to assess nonmonetary penalties to assess violations when appropriate; (4) Decrease the frequency of the Agricultural Water Use survey; (5) Limit the personally identifying information that the Department of Agriculture and Consumer Services may disclose about its animal health programs; (6) Make conforming changes to the name of the structural pest control and pesticides division and clarify the responsibilities of the division; (7) Amend certain egg labeling requirements; (8) Repeal the interstate pest control compact; (9) Repeal certain cleanliness standards for creameries and dairy facilities that are addressed by the NC Food, Drug, and Cosmetic Act; (10) Change setback distances and burn times for flammable materials resulting from ground clearing activities; (11) Repeal the State sulfur content standards for gasoline; (12) Exempt forestry and silviculture operations from temporary driveway permitting; (13) Allow a farm building that is used for public or private events to maintain its farm building status for the purposes of the State building code; (14) Exempt certain structures from the sprinkler system requirements of the NC building code; (15) Allow retailers to display more than 400 square feet of nursery stock for sale in their parking lots; (16) Expand the agricultural dam exemption to the Dam Safety Act; (17) Allow a landowner to withdraw water for agricultural reasons during water shortage emergencies under certain conditions; (18) Direct the Department of Environmental and Natural Resources and the Department of Transportation to jointly petition the Wilmington District of the US Army Corps of Engineers to allow for greater flexibility and opportunity to perform stream and wetlands mitigation beyond the immediate watershed where development will occur; and (19) Accelerate the sunset date of the Petroleum Displacement Plan as a result of the state having substantially achieved its 20% reduction goal of the use of petroleum products.
http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S638v7.pdf

S 76 / S.L. 2013-365 Domestic Energy Jobs Act

An Act to (1) Authorize the Department of Environmental and Natural Resources to issue permits on or after 3/1/2015 for oil and gas exploration and development activities in the State, including the use of horizontal drilling and hydraulic fracturing treatments for that purpose, but prevent those permits from becoming effective until a subsequent act of the General Assembly authorizes those permits to become effective; (2) Direct the Mining and Energy Commission to study the development of a comprehensive environmental permit for oil and gas exploration and development activities using horizontal drilling and hydraulic fracturing treatments; (3) Require the Mining and Energy Commission and the Department of Revenue to study establishment of a tax for the severance of energy minerals from the soil or water of the State in an amount sufficient to cover all costs associated administration of a modern regulatory program for the management of oil and gas exploration and development activities using the processes of horizontal drilling and hydraulic fracturing treatments for that purpose including creation of an emergency fund to protect and preserve the State's natural resources, cultural heritage, and quality of life; (4) Direct the Mining and Energy Commission and other entities to study and issue a recommendation for an impact fee, or dedication or a portion of any severance tax to be imposed, on any oil and gas exploration and development activities using horizontal drilling and hydraulic fracturing treatments that would be sufficient to cover all costs that may reasonably be expected to accrue to local governments as a result of such activities occurring within their jurisdictions; (5) Direct the Mining and Energy Commission, the Department of Environmental and Natural Resources, and the Consumer Protection Division of the Department of Justice to study and issue recommendations for creation of a restitution fund for landowners harmed as a result of an act of fraud, deception, misrepresentation, or knowing omission of material facts; (6) Modify appointments to the Mining and Energy Commission; (7) Modify the Mining and Energy Commission's authority to set "allowables"; (8) Modify provisions associated with the Landmen registry; (9) Clarify bonding requirements associated with oil and gas activities; (10) Assign future revenue from energy exploration development and production of offshore energy resources in order to protect and preserve the State's natural resources, cultural heritage, and quality of life; (11) Encourage the Governor to develop the Regional Interstate Offshore Energy Policy Compact; (12) Amend the Energy Policy Act of 1975 and the Energy Policy Council; and (13) Direct the Medical Care Commission to adopt rules authorizing facilities licensed by the Department of Health and Human Services to use compressed natural gas as an emergency fuel.
http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S76v9.pdf

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H 484 / S.L. 2013-51 Permitting of Wind Energy Facilities
An Act to establish a permitting program for the siting and operation of wind energy facilities.
http://www.ncga.state.nc.us/Sessions/2013/Bills/House/PDF/H484v9.pdf

S 24 / S.L. 2013-25 Construction / Demolition Landfill Siting
An Act to amend the gameland buffer requirement applicable to sanitary landfills for the disposal of construction and demolition debris waste under certain conditions.
http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S24v4.pdf

S 151 Coastal Policy Reform Act
An Act to amend marine fisheries laws; amend the laws governing the construction of terminal groins; and clarify that cities may enforce ordinances within the State's public trust areas.
http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S151v7.pdf

S 515 Jordan Lake Water Quality Act
An Act to delay additional implementation of the Jordan Lake rules and Jordan Lake session laws and provide for alternative implementation of the protection of existing buffers rule.
http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S515v6.pdf

S 341 Amend Interbasin Transfer Law
An Act to establish an expedited process for the modification of interbasin transfer certificates and for the issuance of interbasin transfer certificates in the central coastal plain capacity use area and the coastal area counties and to amend S.L. 2013-50, an Act to promote the provision of regional water and sewer services by transferring ownership and operation of certain public water and sewer systems to a metropolitan water and sewerage district.
http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S341v6.pdf

S 402 / S.L. 2013-360 Appropriations Act of 2013
An Act to make budget appropriations for current operations of State departments, institutions, and agencies, and for other purposes.
http://www.ncga.state.nc.us/Sessions/2013/Bills/Senate/PDF/S402v7.pdf

H 74 Regulatory Reform Act of 2013
An Act to improve and streamline the regulatory process in order to stimulate job creation, to eliminate unnecessary regulation, to make various other statutory changes, and to amend certain environmental and natural resources laws.
http://www.ncga.state.nc.us/Sessions/2013/Bills/House/PDF/H74v5.pdf

H 480 / S.L. 2013-82 Environmental Permitting Reform
An Act to provide regulatory certainty for North Carolina by requiring the development of minimum design criteria for stormwater permits to guide the Department of Environment and Natural Resources in permit issuance and to reform the permitting process to allow a fast-track permitting process for applications certified by a qualified professional to be in compliance with the minimum design criteria.
http://www.ncga.state.nc.us/Sessions/2013/Bills/House/PDF/H480v5.pdf

Upcoming Events

North CarolinaWater Resources Association

Dec. 9, 2013: Managing Nutrients in the Linear Environment- NCDOT's new Guided Reduction of Excess Environmental Nutrients (GREEN) Program
11: 30 a.m. to 1: 30 p.m. Jane S. McKimmon Center, Raleigh, N.C.

Speakers: Andy McDaniel and Ryan Mullins, NCDOT Highway Stormwater Program

Nutrients and eutrophication are important and high profile issues in North Carolina. In response to these growing concerns, NCDOT is leveraging a variety of its programs into a focused effort to reduce nutrient loading from its road and non-road facilities. Known as the Guided Reduction of Excess Environmental Nutrients, the GREEN Program uses university conducted research to guide the application of stormwater BMP retrofits and other nutrient load reduction measures. This presentation will provide an overview of NCDOT's new GREEN program.

Feb. 10, 2014: Stormwater Control Measures: Research and Implementation in NC
11: 30 a.m. to 1: 30 p.m. Jane S. McKimmon Center, Raleigh, N.C.

Speaker: Bill Hunt, Professor and Extension Specialist, N.C. State Univeristy

Check out the sites below for additional information: **www.ncwra.org**

Mid-Atlantic Stream Restoration Conference

Oct. 30 to Nov. 1, 2013
Renaissance Baltimore Harbor Place

Information at:
midatlanticstream.org

Erosion and Sedimentation Control Planning and Design Workshops

Nov. 6, 2013, at the J.C. Raulston Arboretum, Raleigh, N.C.

Dec. 12, 2013, at the Highland Recreation Center Community Room, Hickory, N.C.

More information available soon at
www.ncsu.edu/wrri/code/events.htm

WRRI 16th Annual Conference and NCWRA Symposium

Where: Jane S. McKimmon Center, Raleigh, N.C.
When: March 19-20, 2014
Website: **go.ncsu.edu/wrriac**

The North Carolina Water Resources Research Institute invites you to submit an abstract for our 16th Annual Conference. The conference highlights the latest water research, management, and policy in North Carolina through a series of concurrent presentations, themed panel discussions, and posters. The conference is again held in conjunction with the NC Water Resources Association's Annual Symposium. This year's symposium, "Local Governments as Keystone Water Resource Managers", will explore the unique and critical role that local governments play in managing water and in shaping the future of our water resources in North Carolina. We will showcase water projects that exemplify leadership and innovation at the local level.

Submit your abstracts for session themes, and oral and poster presentations based on your own work in water resources. Abstract submission is now open. Abstracts are due January 8, 2014 at 5:00 p.m.

Student awards for the NCWRA student poster competition include cash awards for 1st, 2nd, and 3rd place winners, and honorable mentions. The poster session, however, is open to anyone wishing to submit a poster.

Who should attend? Undergraduate and graduate students studying water-related issues; University and corporate researchers; Environmental professionals and non-profit environmental organizations; Representatives from local, state, and federal government agencies; Business and industry professionals with an interest in water-related issues.

To be notified by email of important dates and reminders for the conference, please subscribe to the WRRI-News listserv.