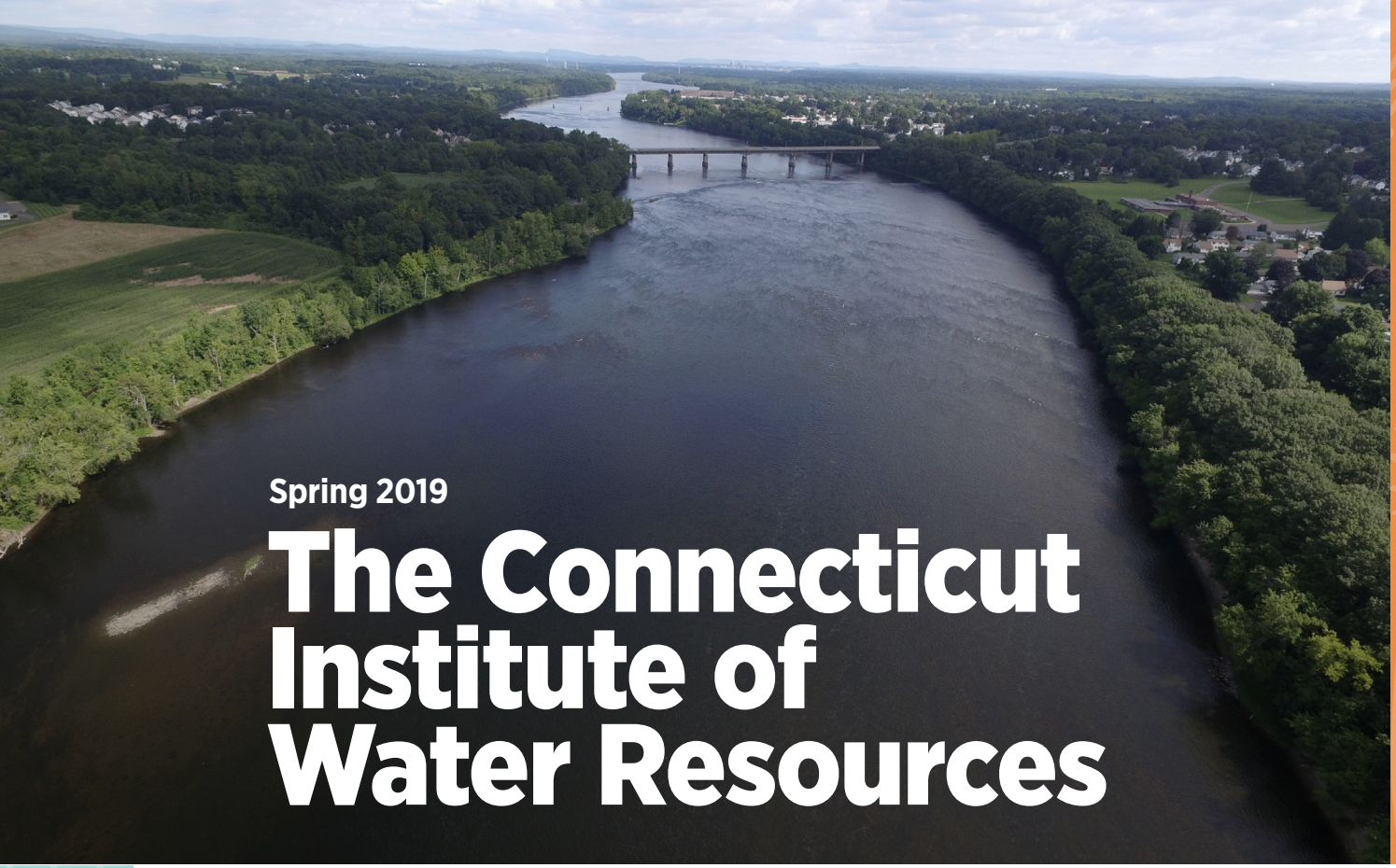

Spring 2019

The Connecticut Institute of Water Resources

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WHO WE ARE AND WHAT WE DO

In a state like Connecticut where water seems plentiful, it is easy to take water for granted. As long as clean water comes out of the tap, water issues may not rise to the top of our list of concerns. Although we do have plentiful water for the most part, there are still many reasons to keep water in mind. Who wants to take their kids to the beach in the summer and find that the beach was closed due to high bacteria levels in the water? Or who wants to have their water heater fail due to high salt in their well? And how do we know that we will have enough water to supply the state if we have another severe drought, like we did just 2 years ago?

The CT IWR is part of a national network of 54 state and territory water institutes created by the Federal Water Resources Research Act of 1964. Our mission is focused on all aspects of Connecticut's water resources, which includes use, preservation, and proper management. Why is this important? It means that CT IWR is addressing the most pressing water issues in our state. Every institute receives funds annually from the United States Geological Survey (around $92,000). A small amount is used for staff support, but the majority of funds are given out to support research on critical water issues every year through a competitive process. In addition to helping address these critical water issues, the grants help support training of undergraduate and graduate students to work in water-related fields, and provide support for early career water resources scientists.

Photo credit: Tyler Carlson

CTIWR Institute of Water Resources

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WHO WE ARE

The CT IWR is headed by Director Michael Dietz Ph.D. with assistance by Associate Director Mr. James Hurd M.S. Dr. Dietz is an Associate Extension Educator at UConn, and also is a joint faculty member in the Department of Natural Resources and the Environment. He has a background in water resources with a focus on green stormwater infrastructure techniques, and took over as Director in January 2018. Mr. Hurd is a Research Associate in the Department of Natural Resources and the Environment. He has a background in natural resources, specializing in geospatial technology, and has served as CT IWR Associate Director since August 2012. An advisory board comprised of members who represent the main water resources constituency groups in the state help to guide our activities and select research projects for funding.

Questions and comments can be directed to the Director at MICHAEL.DIETZ@UCONN.EDU

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MESSAGE FROM THE DIRECTOR

Growing up here in Connecticut, water shaped my childhood. I spent countless days fishing, swimming, and relaxing near the streams and ponds near my house, or on Long Island Sound. Those memories of spending time with family, or simply finding some solitude around water, were what fueled my passion to study water for my formal education. My work centers on addressing water quality issues in the state to ensure that our waters are even better for future generations. One of my goals as Director of the CT IWR is to help citizens of the State understand the current issues related to water.

So what are some of the critical water issues in the State right now?

Sewage treatment plant upgrades help to keep waters of the Long Island Sound safe for swimming. Director's daughter and friend enjoy the waves on a hot summer day.

BEACH CLOSURES FROM COMBINED SEWER OVERFLOWS

In most of our older cities in the eastern half of the United States, the drainage systems were built so that stormwater runoff from roads and buildings was directed into the same pipes as the sewage. In the early days this helped to flush the sewer systems and keep them functioning. Now, sewage is treated in municipal waste water treatment facilities, where solids and contaminants are removed, and the cleaned water is sanitized before discharging it into local waters. In cities with combined sewer systems, when it isn't raining, the treatment facilities do a pretty good job of cleaning the water. However, during periods of heavy rain, the system can't handle all of the excess water, and at designed overflow points, a blend of raw sewage and stormwater is discharged untreated into local waters. This is why there are beach closures after heavy summer rains; any public beach is required to test waters for bacteria to make sure it is safe for swimming, and if levels are above a certain threshold, swimming is not allowed.

Most of Connecticut's cities are required by the U.S. Environmental Protection Agency to deal with this issue. Many have begun separating the sewer and stormwater systems, but this is a mammoth and costly undertaking. The Metropolitan District Commission (MDC) which provides drinking water to and treats waste water from the greater Hartford area is currently constructing large storage tunnels under the city to temporarily store combined sewer flow. The wastewater will then be sent to the treatment plant slowly, after the storm passes, so waste can be appropriately treated. There have also been major upgrades to waste water treatment plants in recent years.

Reducing the amount of stormwater entering the combined systems also will help to reduce the chances of overflows. Even in areas without combined systems, stormwater runoff is a major problem for Connecticut's streams, rivers, lakes, and ultimately Long Island Sound. You may think that you can't help solve an issue like this, but in reality you can. There are lots of ways that you can help to reduce stormwater runoff from your property – check out these resources: NEMO.UCONN.EDU/RAINGARDENS and CTIWR.UCONN.EDU/RESIDENTIAL.

CT IWR-FUNDED RESEARCH: Dr. Karl Guillard at UConn (project: Nitrogen and Phosphorus Leaching from Compost-Amended Lawns) and **Dr. Ashley Helton at UConn** (Integrating Fine-Scale Field Measurements with Regional Groundwater Models to Predict Legacy Nitrogen Transport in Long Island Sound Watersheds) have recently performed research addressing nitrogen issues in the state. Although these projects do not have final reports yet, they should be available soon at the IWR website.

LONG ISLAND SOUND – A HEALTHY PLACE TO SWIM AND FISH?

The Long Island Sound is an extremely valuable resource for residents of Connecticut. Perhaps you like to swim or boat in its waters, eat fresh fish or shellfish from its depths, or just enjoy the view. No matter how you enjoy it, the health of the Sound depends on how well the millions of people who live near it or in its watershed manage their wastes.

Do you live in a watershed? Yes! We all do. A watershed is simply an area of land that drains to a point, typically a stream or river. A watershed for a small stream might be only a few acres, whereas a watershed for a large river like the Connecticut River reaches all the way up into Canada! Our public drinking water supply watersheds are the areas of land that surround our reservoirs in the state, and these have special protections. Undisturbed forests and soils in these watersheds help to provide clean, safe drinking water for the residents. This "ecosystem service" is provided for free, although some researchers have attempted to quantify its monetary value. It is critical that we protect these areas from excessive development, as that can cause problems with water quality.

DIRECTOR AND FRIENDS ENJOY A DAY OF FISHING ON THE SOUND.

The two largest sources of nutrients to the Sound are sewage treatment facilities and stormwater runoff from developed areas. When too much nitrogen enters the Sound, it leads to algae blooms and low dissolved oxygen levels, which are harmful to fish and shellfish. As noted above, recent upgrades to waste water treatment facilities in Connecticut and New York have greatly improved the water quality of the Sound. However, stormwater runoff is still an issue in the western sound and in local bays everywhere. High bacteria levels in stormwater runoff contribute to beach and shellfish bed closures. Check the resources above to reduce your stormwater "footprint".

You can also reduce the amount of nitrogen and bacteria that you contribute to the sound by following guidelines on appropriate lawn fertilization and septic system maintenance: CTIWR.UCONN.EDU/RESIDENTIAL/INDEX.HTM

Learn more about research, restoration and outreach efforts to protect Long Island Sound by the Long Island Sound Study and the Connecticut Sea Grant Program, SEAGRANT.UCONN.EDU

To learn more about the overall health of the Long Island Sound, click here: CTENVIRONMENT.ORG/WP-CONTENT/UPLOADS/2018/09/REPORTCARD2018-BESTVIEW.PDF

IMPACT OF ROAD SALT ON DRINKING WATER

We all like to have safe roads and sidewalks to travel on during the winter months, but it is becoming clear that the products we are using for winter deicing are having negative effects on our waters, plants, and aquatic life. Lots of researchers are coming to the same conclusion: as we have steadily increased our application of road salt since the 1940s, we are finding that levels of sodium and chloride in our groundwater and surface waters have been increasing as well. This has a wide range of effects on plants, soils, aquatic life, and even humans. Since dissolved road salt travels so easily through soil, our public and private drinking water supply wells are vulnerable to contamination. If you have your own well and you haven't had your water tested in a while, it is a good idea to do this. There are labs in the state that can do a standard potability test: CTIWR.UCONN.EDU/RESIDENTIAL/INDEX.HTM. While you are doing a test, it isn't a bad idea to check for bacteria too. Check with the labs on how to obtain a proper sample.

Although there are some alternative products available, some of them like calcium chloride or magnesium chloride also contain chlorides, which still travel easily downstream. Others like beet juice or brewing byproducts are used as coatings on salt to help it stick to the road better, but they can't melt ice on their own, and they aren't practical to use for broad applications. For the foreseeable future, salt will still be the most cost-effective deicer by far, so the only way to address this issue is to cut down on the over application of salt.

What can you do? If you use salt at home, use it sparingly. For home use, often an abrasive such as sand is enough to prevent slips and falls. The biggest usage of salt is by municipal public works, the State Department of Transportation, and private contractors. There are currently efforts underway here in Connecticut to have a certification program for salt applicators, based on the "Green Snow Pro" program developed in New Hampshire. The program trains applicators about the impacts of salt, and how to apply it more efficiently. You can encourage your municipality to attend a Green Snow Pro training here in CT; check the Connecticut Technology Transfer Center website to see when the training is offered: T2CENTER.UCONN.EDU/

CT IWR-funded research: Several researchers have done work on this topic over the last several years: Drs. Beth Lawrence and Gary Robbins from UConn (project: Quantifying Road Salt Impacts on Forested Wetland Structure and Function in Eastern Connecticut), Drs. Michael Dietz and Gary Robbins (project: Investigation of Bedrock Well Contamination by Uranium, Radium and Radon Resulting from Deicing Salt Exchange), and Drs. Ashley Helton and Tracy Rittenhouse (project: Effects of Road Salts on Ephemeral Wetland Ecosystems). Summary reports may be available for these projects – check the IWR website.

ENSURING A CLEAN WATER FUTURE – STATE WATER PLAN

With so much water here in Connecticut, why do we need a water plan? In order to ensure that we continue to have sufficient water for citizens of the state and other species that depend on it, we need to plan for the future. In 2015 the State Water Planning Council was tasked with developing a State Water Plan for Connecticut. Many different branches of state government, along with citizens like you, were involved in the planning efforts. Eight goals were established for the plan:

1. **Provide reliable and resilient supply for all uses**
2. **Promote public health and quality of life with high quality water**
3. **Protect the environment**
4. **Mange water cost-effectively for all users**
5. **Develop an implementable plan**
6. **Prepare for an uncertain future climate**
7. **Use science and data to recommend action**
8. **Involve Connecticut citizens in water management**

Although the legislature did not vote to implement the Plan last year, former Governor Dannel Malloy signed an executive order directing the State Water Planning Council to "immediately implement" the Plan. There was some controversy over a statement in the Plan designating Connecticut's waters as a "public trust", meaning that they belong to the citizens of the State. There currently are bills under consideration in the House and the Senate (S.B. 111, H.B. 6261) regarding this language.

Many other states have implemented water plans, and the goals set forth for Connecticut's plan are consistent with those set by other states. The CT IWR will continue to follow this process and will provide updates on progress in upcoming newsletters.

Stormwater

Perhaps you noticed "stormwater" mentioned several times in this newsletter…there is good reason for this: stormwater runoff, or the water that runs off impervious surfaces such as roads and buildings after a rain storm, can cause lots of problems. This type of runoff is collected in catch basins, and in areas without a combined sewer system, it is sent directly to the nearest surface water body. This runoff can pick up pollutants along the way, and the can negatively impact the quality of our local waters, and ultimately Long Island Sound. UConn's Nonpoint Education for Municipal Officials (NEMO) program has been working with Connecticut's municipalities for more than 30 years to address this issue; check out some of the resources available at NEMO.UCONN.EDU.

ALUMNI HIGHLIGHT

DAVID ROSA, PH.D.

– Born in Naugatuck, CT
– Bachelor's degree in Natural Resources from the University of Vermont in 2006 Master's degree in Natural Resources and the Environment, UConn, 2013
– Ph.D. in Natural Resources and the Environment, UConn, 2017

Dave Rosa was working for the Connecticut Department of Energy and Environmental Protection in 2011 when he learned about a CT IWR-funded project with Jack Clausen and Michael Dietz at UConn. The project involved using computer modeling and monitoring data from another project to predict performance of low impact development features.

"I supplemented this funding by working as a Graduate Assistant for the undergraduate capstone course offered in the department. The research and course work I completed during my master's degree provided me with invaluable analytical and technical writing skills. The resulting peer reviewed journal article has been cited 75 times according to Google Scholar as of the time of this writing," says Rosa.

This is just the kind of training that the CT IWR hopes to provide, through administering grants to researchers around the state. Dave continued on for his Ph.D. with Jack Clausen, which he completed in 2017. He now works in the Watershed Management Division of the Agency of Natural Resources in Vermont, where he puts the modeling skills he learned at UConn to work.

The full report on Dave's work can be found here: CTIWR.UCONN.EDU/DIGITAL_REPORTS/FY2011/B-231-CTIWR-DIETZ.PDF

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