

Spring 2020

The Connecticut Institute of Water Resources

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 3 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 \$120,000). 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: John Baumgartel, winner of 2019 IWR photo contest



ABOUT US

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 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

This is (hopefully) the last newsletter composed from home under the shadow of COVID-19. Working completely from home, often trying to facilitate online learning for children (or worse, trying to manage little ones!), has posed challenges for many of us. However, there have been some bright spots: local trail heads have been full of cars, as families try to get outdoors to get some physical activity (keeping that 6 foot distance, of course). This unexpected increase in use of our local natural resources highlights the benefits that our forests and waters provide. Perhaps you have heard about some of the “ecosystem services” that forests and soils provide, by filtering water so that we have clean water to drink. These types of services can be quantified based on how much it would cost if we had to purify water in the same way. However it can be more difficult to quantify the mental benefits of hiking along a river, or simply sitting and listening to the sounds of a babbling brook. It is hard to put a value on these things, but it seems that many of us are being reminded that the natural world provides significant benefits to our well-being. I hope I don’t sound too much like a credit card commercial, but I believe those things are priceless.



Critical water issues in the State

CT IWR BEGINS WELL WATER TESTING CAMPAIGN

In last year's newsletter, we highlighted the importance of getting your drinking water tested if you have your own private well. Although public water system operators are required to test according to strict federal standards, it is the responsibility of private well owners to test their own water. CT IWR was awarded a slight increase in our annual operational funds from the USGS for the current year. We decided to use these funds to cover the costs for approximately 150 homes to have their water tested. All of the available testing slots have been reserved, and laboratory testing has currently been suspended due to COVID-19 restrictions, but testing will resume as soon as possible.

Well users will receive a report of the basic potability parameters. These parameters include contaminants that can impact human health such as nitrate-nitrogen and bacteria, and other things that are also of concern such as sodium, chloride, manganese, and sulfate. For a full list of testing parameters, see this publication from the CT Department of Public Health: <https://portal.ct.gov/DPH/Environmental-Health/Private-Well-Water-Program/Private-Well-Testing>.

Besides providing residents with valuable information about the water their families consume, the results from these samples will be used to help identify statewide trends in potential well water contaminants.

SOURCE: CT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION ([HTTPS://PORTAL.CT.GOV/DEEP/WATER/CONNECTICUTS-WATER-RESOURCES](https://portal.ct.gov/DEEP/WATER/CONNECTICUTS-WATER-RESOURCES))

CT water resources

Water Resources

Connecticut is home to a multitude of water resources. In order to promote use, preservation and management, CT DEEP provides an estimate of how many resources exist in the state.

STREAMS & RIVERS

6,000 miles of streams and rivers flow through Connecticut

LAKES & RESERVOIRS

There are over 2,000 lakes and reservoirs



WETLANDS

450,000 acres of wetlands

LONG ISLAND SOUND

The Long Island Sounds accounts for 600 square miles of estuarine water



For more information visit
www.ctiwr.uconn.edu

CONNECTICUT TAKES A STAND AGAINST “FOREVER CHEMICALS”

WRITTEN BY ALLISON O'DONNELL

If you have not seen the recent movie ‘Dark Waters’ about contamination from forever chemicals, you may not have even heard of them before. Without a degree in chemistry, the names are hard to pronounce, but perfluoroalkyl and polyfluoroalkyl substances (PFAS¹) refer to a large group of man-made chemicals that are used in consumer products and industry. They are used for their resistance to oil, grease, water and heat.

PFAS are extremely hard to break down, both in our bodies and in the environment, which is why they are often called “forever chemicals”. For this reason, they are no longer produced in America, but products containing these chemicals are still used in America.

Linda Birnbaum, Ph.D., former director of the National Institute for Environmental Health Sciences (NIEHS) and the National Toxicology Program (NTP), says that these chemicals are mainly present in fire-extinguishing foam and non-stick frying pans.

While she does not know why these chemicals are just beginning to become a concern, Birnbaum says the EPA’s decision to begin regulating these chemicals is “long overdue.”

“Scientists, including me, were [researching] these chemicals more than 30 years ago,” said Birnbaum. “The discovery of contamination of drinking water supplies for millions of Americans has raised the concern.”

How are people exposed to PFAS?

According to the Agency for Toxic Substances and Disease Registry, PFAS¹ can be consumed by drinking water with small amounts of the substances, or through contact with some of the following consumer products:

- Food packaging materials
- Cleaning products
- Nonstick cookware
- Stain resistant carpet treatments
- Water resistant clothing
- Paints, varnishes, and sealants
- Firefighting foam
- Some cosmetics

The Connecticut Department of Public Health (CT DPH) Section Chief, Lori Mathieu, says that one of the main sources of PFAS is firefighting foam, which will run off into local water sources and can be consumed by local wildlife and humans.

Why should we be concerned?

Birnbaum says that PFAS chemicals have multiple negative health effects associated with exposure in human observational studies. Once consumed, it is difficult to rid our bodies or environment of the chemical.



“FOR STARTERS, THE ACTION PLAN IS A SUCCESS AND WILL ONLY CONTINUE TO BE A SUCCESS IN THE SENSE THAT IT IS HIGHLIGHTING THIS ISSUE IN OUR STATE.”

Mathieu says that, while it is a fairly new topic, the impact of these chemicals on human health and our environment should make this issue a priority. The chemicals have not been classified as a hazardous material, but do have all the properties of one.

These chemicals have been found all over the country, as shown in this PFAS map². Since Oct. 2019, 1,398 contaminated sites have been located around the country.

What is being done?

The Environmental Protection Agency has created an updated action plan³ to monitor these chemicals, as of February 2020. The plan supports federal groundwater cleanup and expands its research efforts into PFAS chemicals and effects. In addition, the EPA’s action plan also intends to inform the public with data and educational programs.

Connecticut’s governor has assembled an interagency task force to create an action plan⁴ specifically targeting PFAS contamination. Connecticut’s Department of Energy and Environmental Protection (CT DEEP) and DPH are co-chairs for the task force, working to enforce the three main objectives outlined in the plan:

- 1** Minimize environmental exposure to PFAS for Connecticut residents,
- 2** Minimize future releases of PFAS to the environment, and
- 3** Identify, assess, and clean up historical releases of PFAS to the environment.

Mathieu says that the mission is to regulate the public water system. In order to effectively do this, the state needs to gain a better idea of the damage. While Connecticut’s PFAS levels did not exceed the EPA advisory levels, it would be ideal to have no levels of these chemicals present.

CT DEEP’s Assistant Director of the Remediation Division, Raymond Frigon, says that the task force is focused on measuring the speed and toxicity at which the chemical pollutes soil and groundwater.

“We are amending the strategy typically employed for environmental investigations,” said Frigon. “We use a conceptual site model; we gather information about how a particular chemical release occurred.”

The governor’s proposed budget⁵ for the upcoming fiscal year (2021) has proposed some “much needed” funding to implement the recommendations of the task force’s action plan, according to Frigon.

“CT DEEP and DPH are very early on in the process. The recommendations of the action plan cannot be implemented overnight,” said Frigon. “For starters, the action plan is a success and will only continue to be a success in the sense that it is highlighting this issue in our state.”

¹ [HTTPS://WWW.ATSDR.CDC.GOV/PFAS/PFAS_FACT_SHEET.HTML](https://www.atsdr.cdc.gov/pfas/pfas_fact_sheet.html)

² [HTTPS://WWW.EWG.ORG/INTERACTIVE-MAPS/2019_PFAS_CONTAMINATION/MAP/](https://www.ewg.org/interactive-maps/2019_pfas_contamination/map/)

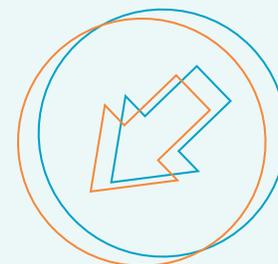
³ [HTTPS://WWW.EPA.GOV/SITES/PRODUCTION/FILES/2020-01/DOCUMENTS/PFAS_ACTION_PLAN_FEB2020.PDF](https://www.epa.gov/sites/production/files/2020-01/documents/pfas_action_plan_feb2020.pdf)

⁴ [HTTPS://PORTAL.CT.GOV/-/MEDIA/OFFICE-OF-THE-GOVERNOR/NEWS/20191101-CT-INTERAGENCY-PFAS-TASK-FORCE-ACTION-PLAN.PDF?LA=EN](https://portal.ct.gov/-/media/office-of-the-governor/news/20191101-ct-interagency-pfas-task-force-action-plan.pdf?la=en)

⁵ [HTTPS://PORTAL.CT.GOV/-/MEDIA/OPM/BUDGET/2020_2021_BIENNIAL_BUDGET/GOVBUD_FY2020-21_FINAL.PDF?LA=EN](https://portal.ct.gov/-/media/opm/budget/2020_2021_biennial_budget/govbud_fy2020-21_final.pdf?la=en)



Photo credit:
Brandon Barzola, runner up
in 2019 IWR photo contest



MEET OUR NEW TEAM MEMBER

Allison O'Donnell recently started working as the Written Communication Specialist for CT IWR. Allison is studying journalism and political science at the University of Connecticut. As a Fairfield County native and nature enthusiast, she often goes to local beaches along the Long Island Sound. Allison says that working for CT IWR provides an outlet to learn about the importance of Connecticut's various water resources and raise public awareness regarding water quality issues in the state.

RESEARCH HIGHLIGHT

MARK URBAN

WRITTEN BY
ALLISON O'DONNELL

VIEW THE VIDEO INTERVIEW
WITH DR. MARK URBAN AT
[HTTP://CTIWR.UCONN.EDU/
RESEARCHERS](http://ctiwr.uconn.edu/researchers)



Forecasting the Resilience of Vernal Pool Ecosystems to Climate-Mediated Hydrological Disruption

In addition to having lots of permanent water bodies, New England is home to many seasonal ponds that dry out during parts of the year. These diverse ecosystems are likely to be affected by climate change, so the CT IWR has funded University of Connecticut's Dr. Mark Urban to research the effects of climate change on these systems.

The ponds in our region are particularly vulnerable to climate change. In addition to higher temperatures, our region is seeing changes in precipitation patterns, including more high-intensity storms and droughts. Species such as dragonflies, frogs and spotted salamanders need the habitat these ponds provide during specific periods in their life cycles.

Since 2019, Urban has been researching how water retention in these temporary ponds changes on a seasonal basis. The goal is to be able to predict how changes in water levels will impact the species that populate these ecosystems.

"The more we know, the more we can do to mitigate these [effects] and protect biodiversity," said Urban. Research has shown that if water levels recede while a species is still reliant on the pond's many resources, they will be left vulnerable to predators. Prediction of water changes gives these scientists enough time to design strategies to protect the at-risk species.

"The hydrology of these ponds is very important because many organisms have a certain time they need to be in the pond in order to develop," said Urban.

Though these small creatures may not seem important, they play a large role in our local environment and Urban says that the impact could be greater than expected.

"It is the disturbances of these food webs that can lead to dramatic changes in the entire system," said Urban. "I think that's a lesson for how climate change will affect many systems that are important for human economy, culture and health."



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