

# CLEARSCAPES



*A Newsletter of the Center for Land Use Education and Research at the University of Connecticut.*

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## Tools & Technology

### N-Sink Online Tool: A New Way of Looking at Nitrogen Pollution

CLEAR and our partners have developed an online tool that helps land owners and land use decision makers better understand the direct connection between their land and nitrogen (N) pollution in coastal waters. The tool, called “N-Sink,” is the result of a multi-year collaboration of CLEAR with the [University of Rhode Island Coastal Institute](#) and the [EPA Atlantic Coastal Environmental Sciences Division Laboratory](#) in Narragansett, Rhode Island.

Nitrogen (N) pollution is a big threat to water quality, especially in coastal areas like Long Island Sound. Excess nutrients like N can fuel algal blooms that rob the waters of oxygen, directly harm marine life, and damage habitat. As a result, much attention has been paid to N pollution by the scientific community,



including the development of many models designed to explore the transport and fate of N in our coastal watersheds. Most of these models focus on N “loadings,” i.e., estimating

the amount of N being put into the system from sources like agricultural and lawn practices, septic systems, and atmospheric deposition from acid rain. Thus the focus is on what

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CLEAR provides information, education and assistance to land use decision makers, in support of balancing growth and natural resource protection.



Water



Land & Climate



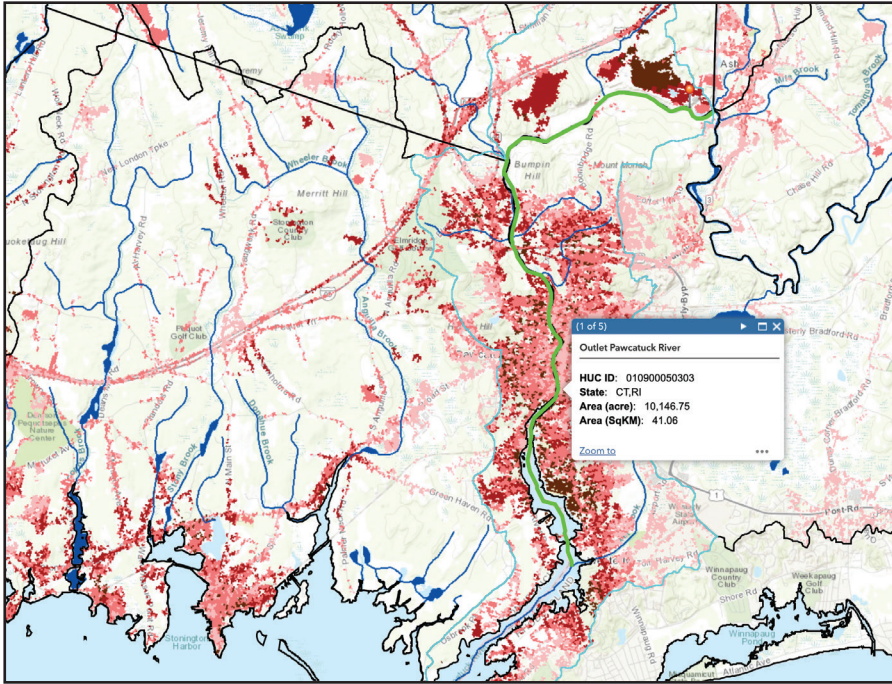
Mapping



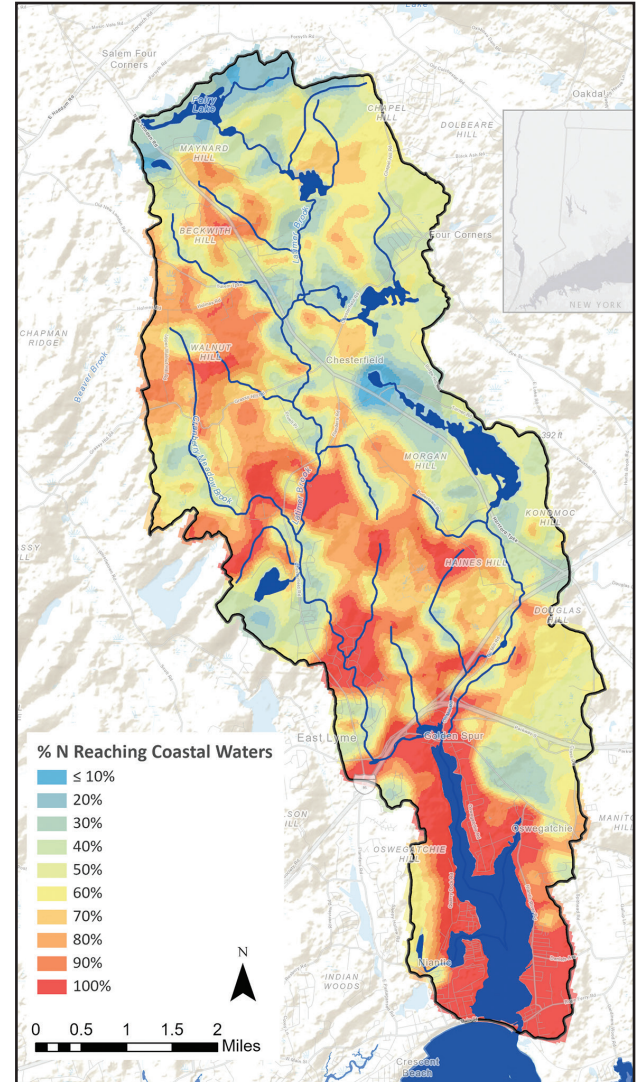
STEM

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The N-Sink Transport Index map (right) shows “hot spots” within a watershed where N is likely to be efficiently transported to the coast. Shown is the Niantic River watershed. (Map, above) The particle tracking tool (shown is the lower Pawcatuck River) allows users to click on a point within a watershed and, within seconds, generate its flow path to the coast and get an estimate of how much N (relatively speaking) will be delivered.



the total load of N is to the receiving water body, and what the impacts to that water body might be.

N-Sink uses a different approach that shifts the focus to the land within the watershed, rather than the receiving waters. The end result is a series of maps that help to provide specific geographic focus on which areas in the watershed are at the most risk for sending N to the coast (see figure). To do this, N-Sink uses particle tracking technology in concert with stream network data that includes information on nitrogen “sinks”—areas in the landscape that help to remove N from the system, like wetlands, riparian areas, lakes, and ponds. Depending on the sinks that it encounters along its journey to the coast, a unit of N could have very different fates, and

thus very different impacts on water quality. For instance, a pound of N in one area of the watershed could be transported almost entirely to the coast, while another pound of N, applied just a short distance away, could take a different pathway through the stream network that results in the removal of a significant amount of N via sinks.

“One contribution of N-Sink is that it focuses on critical sink areas like wetlands and riparian corridors, which will hopefully lead to intensified efforts to protect or even restore these areas,” says CLEAR Director Chet Arnold. “Also, since the geographic specificity of N-Sink ties any location in the watershed to its likelihood of contributing N pollution,

we think it can be useful both for land use planners when determining future uses, and land owners when discussing management practices on land already in use.”

The CLEAR team has created a state-of-the-art interactive N-Sink application where you can explore maps and information for the 76 coastal watersheds of Connecticut and Rhode Island. N-Sink was funded by a grant from the EPA Office of Research and Development, Award #83680001. ●

Find it all on the N-Sink website: [clear.uconn.edu/projects/nsink](http://clear.uconn.edu/projects/nsink).



### Climate Team Wins College Award

The CLEAR-CT Sea Grant Climate Team of Juliana Barrett and Bruce Hyde won the 2021 UConn College of Agriculture, Health and Natural Resources Award for Excellence in Engagement. This is for their longstanding—and outstanding—work with both the Climate Adaptation Academy and the Climate Corps. Congrats, Bruce and Juliana!



## Program Updates

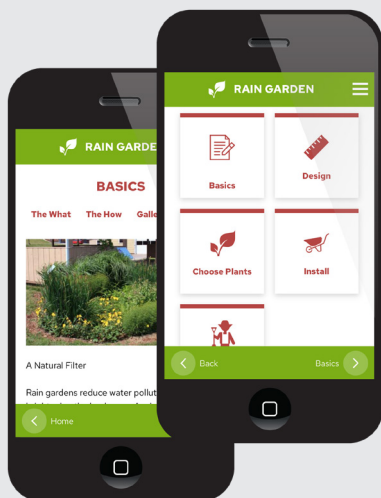
### Land Use and Climate

- ▶ The [Climate Adaptation Academy](#), a partnership of CLEAR and the Connecticut Sea Grant College Program, held a virtual conference on *Managed Retreat in the Age of Climate Change* in November that was attended by over 100 people. Check out the [agenda and presentations!](#)
- ▶ CLEAR is working on a partnership with CT DEEP on creating an online training center for Connecticut land use officials, where both CLEAR offerings (such as the Land Use Academy modules) and CT DEEP courses (such as Inland Wetlands and Aquifer Protection) will be available in one convenient (virtual) place. We hope to have this up and running by the early summer.
- ▶ Speaking of one-stop shopping, a detailed summary of the Connecticut's Changing Landscape project was published this summer in the Journal Land. [30 Years of Land Cover Change in Connecticut, USA: A Case Study of Long-Term Research, Dissemination of Results, and Their Use in Land Use Planning and Natural Resource Conservation](#) reviews both research results, and our efforts to get the information out to the public. And of course, there is always the [interactive mapping site](#).



## Rain Garden App

The NEMO program has redesigned and released a new version of the [award-winning Rain Garden mobile app](#). The app walks you through how to site, size, install and maintain a rain garden—and can be used in 21 states! The biggest improvement is that the app is now web-based, so no more fusing around with the Google or Apple app stores. It just works on all devices—smartphones, tablets, and desktops—regardless of operating system. To start using the app just visit [rgapp.nemo.uconn.edu](http://rgapp.nemo.uconn.edu). To get a guided tour of how to use it, view our conveniently brief [30-minute webinar](#).



# Program Updates

## Stormwater

- ▶ A [December Disconnection Workshop series](#) of three related webinars was held by CLEAR's NEMO Program, which provides information and training for the state's General Stormwater ("MS4") Permit communities with support from CT DEEP. The webinars averaged over 100 people per session and took a moderately deep dive into the world of Low Impact Development (LID) stormwater "retrofit" practices to disconnect existing impervious cover.
- ▶ The MS4 support program also launched a [newsletter](#) containing timely information on MS4 requirements, deadlines, and resources.
- ▶ Thanks to a grant from the [Long Island Sound Futures Fund \(NFWF\)](#), of the National Fish and Wildlife Federation, CLEAR will be reprising its [Summer Stormwater Corps](#) program, based on a 2018 pilot also funded by NFWF. UConn undergrads in Natural Resources, Landscape Architecture, and Environmental Engineering majors will apply for summer jobs to be trained and then hit the streets (and parking lots) looking for opportunities where LID practices could be used to disconnect impervious surfaces.



Statewide, 1-meter resolution land cover map.



### Welcome.... Qian Lei-Parent!

CLEAR welcomes Qian (Rachel) Lei-Parent as a full time Research Associate. Rachel had been working on-and-off with CLEAR for about a year, during and after the final stages of getting her PhD in GIS and Remote Sensing from UConn's Department of Natural Resources and the Environment. But now it's official! Dr. Lei-Parent's expertise in image analysis and remotely-sensed land cover, in combination with her skills in GIS and GIS programming languages, are a perfect match for CLEAR. In fact, she has already made herself an invaluable part of several projects, including being the developer of the new N-Sink online tool that is the front page article of this issue. With Rachel, we are adding even more geospatial horsepower to our already super-charged Mapping team!



## Program Updates

### Geospatial Tools and Technology

- ▶ Through a partnership between CLEAR and the [NOAA Office of Coastal Management](#), Connecticut is one of the first states in the country to have statewide, 1-meter (!) resolution land cover. There is now an [interactive map of the dataset](#), which was derived from 2016 imagery. Check it out! We are already using the data in several projects related to source (drinking) water areas and watershed health (more on those two projects next issue).
- ▶ CLEAR's Emily Wilson and Qian (Rachel) Lei-Parent are part of UConn's highly innovative and successful covid-19 tracking effort. Using UConn's building and sewer GIS information in conjunction with daily waste water sampling (where the virus shows up early!), Rachel built an internal [data and map "dashboard"](#) so that the decision makers could use daily results to inform decisions on campus, ultimately enabling the University to stay open.
- ▶ CLEAR's Geospatial team, with Cary Chadwick in the lead, has been assisting the [Desegregate Connecticut](#) organization in its efforts to collect and organize local land use zoning data into the statewide [Zoning Atlas](#), the first of its kind in the nation.
- ▶ CT Trail Finder is now live! Led by Emily Wilson, the CLEAR Geospatial team worked with the Center for Community GIS, CT DEEP and CT DOT to create and launch the [Connecticut Trail Finder](#). Similar to trail finder websites in Maine and New Hampshire/Vermont, the site assists locals and visitors alike in finding trails across the state, from accessible walks to strenuous climbs, bike friendly and even water trails! All trail posts are submitted by the Trail Managers themselves, meaning that the information is accurate and current. [Contact CLEAR](#) if you have a trail to add.



A Stormwater Corps team led by Extension's Dave Dickson (second from right) and Amanda Ryan (second from left) examines a public park area for opportunities to install Low Impact Development (LID) practices.

## E-Corps By the Numbers

Our Enrollment Through  
Spring Semester 2021

**281**

Total Enrollment

**186**

Classroom Students

**95**

Practicum Students

**133**

Climate Corps Students

**117**

Brownfields Corps Students

**31**

Stormwater Corps Students

**76**

Community Projects



## Program Updates

### STEM Education and Community Assistance

- ▶ The [UConn Environment Corps \(E-Corps\)](#), which combines undergraduate classwork, service learning, and Extension outreach, now has three flavors: Climate Corps, Brownfields Corps, and Stormwater Corps. With the completion of the Spring 2021 semester, the E-Corps has enrolled 281 students from 17 majors, and completed 76 projects in Connecticut communities. [Learn more on our new website!](#)
- ▶ CLEAR is a partner in the [Natural Resources Conservation Academy](#), which has several programs that provide STEM education for high school students and link them with conservationists to conduct environmental projects in their communities. In 2020 and into 2021, both the [Conservation Training Partnerships](#) and [Conservation Ambassador Program](#) efforts, were, as with all else, thrown into a whirlwind of change by the pandemic, but both have ventured successfully into the virtual world. CLEAR instructors include Cary Chadwick, Dave Dickson, Emily Wilson, Mike Dietz, Chet Arnold, and CLEAR Affiliate Tom Worthley.

CLEARscapes Newsletter • Editor: Chet Arnold • Designer: Kara Bonsack

The UConn Center for Land Use Education and Research (CLEAR) provides information, education and assistance to land use decision makers, in support of balancing growth and natural resource protection. CLEAR is a partnership of the Dept. of Extension and the Dept. of Natural Resources and the Environment at the College of Agriculture, Health and Natural Resources, and the Connecticut Sea Grant College Program. Support for CLEAR comes from UConn and from state and federal grants.

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