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Exploring Long Island Sound - Issues and Opportunities

SPOTLIGHTED COASTAL RESOURCE: Coastal Embayments are Affected by Nitrogen

You see them everywhere along Connecticut's coast but you probably don't even realize how important they are. Coastal embayments--those bodies of water with an open connection to the sea, such as tidal rivers, bays, lagoons, and coves--are highly productive resources. At first glance, it's obvious that these protected locations are perfect for boating, swimming, fishing, and other passive recreational activities. Some embayments provide deep-water access and navigational corridors for commercial and industrial waterfront uses.

OCTOBER/NOVEMBER 2017
No. 56

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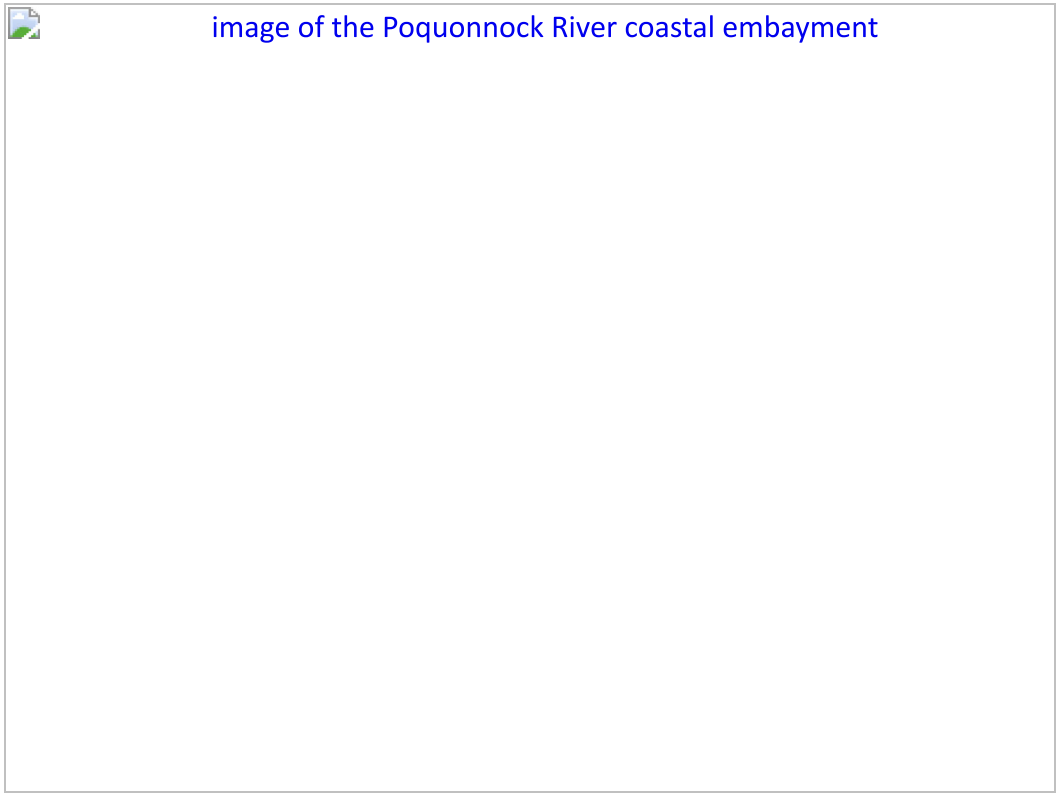


The Poquonnock River meeting Long Island Sound at Bluff Point in Groton
Photo Credit: DEEP LWRD

But if you look a little "deeper," you'll see that coastal embayments are the ultimate multi-taskers. They p rovide significant habitat for shellfish, finfish, and waterfowl. They serve as spawning and feeding grounds for commercially important finfish, and some are essential biological corridors for anadromous fish like American shad (grow and mature in saltwater and migrate to freshwater to spawn) and catadramous fish like the American eel (grow and mature in freshwater and migrate to saltwater to spawn). Embayments can provide nursery grounds, shelter, and refuge for various aquatic species, and are a vital food source for many marine organisms. Some embayments along the eastern portion of Long Island Sound supply sheltered areas where highly productive eelgrass flats or beds of other submerged aquatic vegetation can grow.

Coastal embayments are "estuarine" environments. That means that the salt concentration in the water from Long Island Sound is diluted by freshwater discharged from the upland into the embayment.

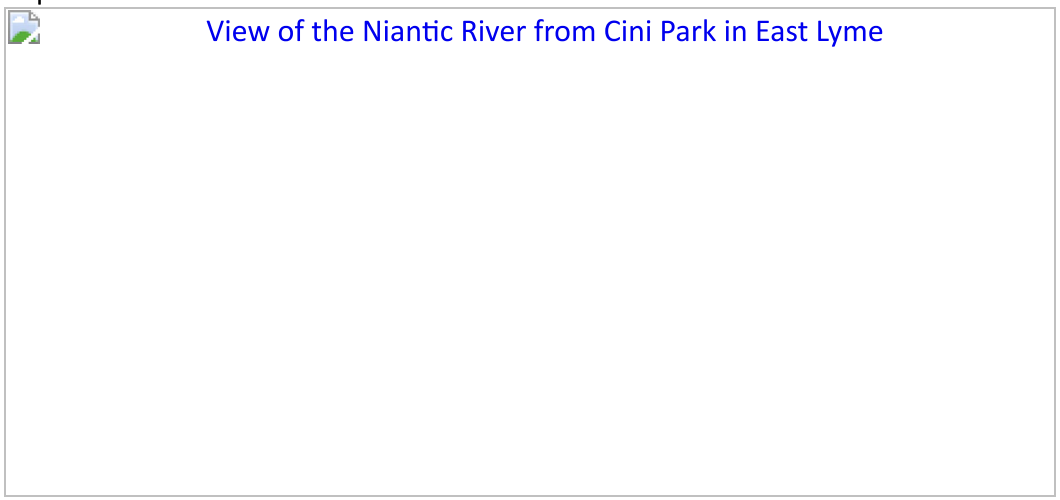
First Impressions

Sharing the "First Impressions" that Make an Environmental Difference

According to Erik Eckl, the founder of Water Words that Work, his market research shows that there is a common

Turns out, those freshwater inputs from the upland do more than dilute salinity.

According to a 2015 study conducted by Dr. Jamie Vaudrey at the University of Connecticut, coastal embayments are affected by nitrogen loading from upland sources, experiencing that first onslaught of nutrients making their way toward Long Island Sound . As such, these waterbodies can be a first alert in identifying sources of water quality problems before the open waters of Long Island Sound are impacted.



The Niantic River is a coastal embayment included
in Dr. Jamie Vadurey's nitrogen study
Photo Credit: DEEP LWRD

Dr. Vaudrey's research predicts the potential for an embayment to exhibit or trend toward "eutrophication" or eutrophic conditions, such as excessive algae growth or loss of eelgrass or tidal wetlands. Reducing nitrogen to these threatened waterbodies can ward off undesirable conditions within the embayment and beyond. Her study also estimates the nitrogen loading in 116 coastal embayments in Connecticut and New York, and identifies potential sources of nitrogen for each embayment. The main culprits? Fertilizers and onsite wastewater systems (septic systems).

In these days of limited resources, the findings of Dr. Vaudrey's embayment research will help DEEP develop appropriate management strategies and deploy them in the embayments that need them most.

progression among people who consider themselves to be "environmentalists." It starts with a "first impression" or experience that then makes them take a first environmental step. This step is usually then followed by a greater environmental awareness and a behavior change, and ultimately results in a "big step," such as choosing an environmental career.

This column features the "First Impression" that set someone on his or her path to environmentalism. We hope *Sound Outlook* readers will relate to these "First Impressions" and recall their own experiences that led them to appreciate and care about Long Island Sound.

This month, we highlight the First Impression of Alicia Mozian, Conservation Director for the Town of Westport, member of the Long Island Sound Blue Plan Advisory Committee, and recipient of a 2017 National Wetlands Award from the Environmental Law Institute:

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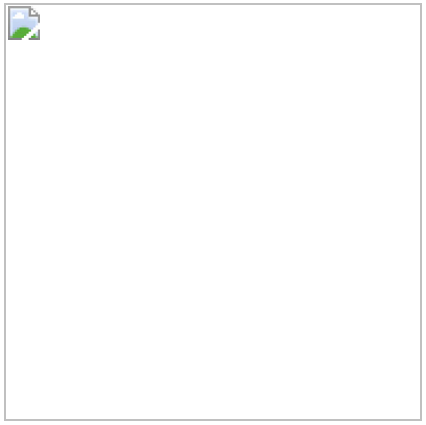
Connecticut's Second Generation Nitrogen Strategy

Regular readers of *Sound Outlook* are well aware of the important role that nitrogen plays in the overall health of Long Island Sound. Nitrogen is a nutrient that acts like a fertilizer when it's in the water, causing algae and phytoplankton to bloom and grow. When algae dies, the process of decomposition uses up dissolved oxygen in the water. If there's too much algae decomposing and taking up oxygen from the water, that leaves behind too little oxygen for aquatic life. This condition is known as hypoxia (dissolved oxygen concentrations less than 3.0 mg/l). Some species like fish can swim away from hypoxic water to find oxygen-rich water, but other species like clams and crabs can't move away, and end up stressed...or worse.



It is really no surprise that Alicia Mozian works in Westport's Conservation office; the concept of conservation has long been a recurring theme in her life. Her "First Impression" came about as a result of her early years growing up in Lancaster, PA which exposed her to Amish farm country and the experiences associated with living in a farming community:

I grew up in the city of Lancaster but it was surrounded by Amish farms, so you didn't have to drive very far to smell manure or tobacco drying. My mom would go to the farmers market downtown every single week to buy meat and produce. So when my family moved to Connecticut when I was in the fourth grade, the idea of her going to the grocery store to buy this stuff was weird--"How

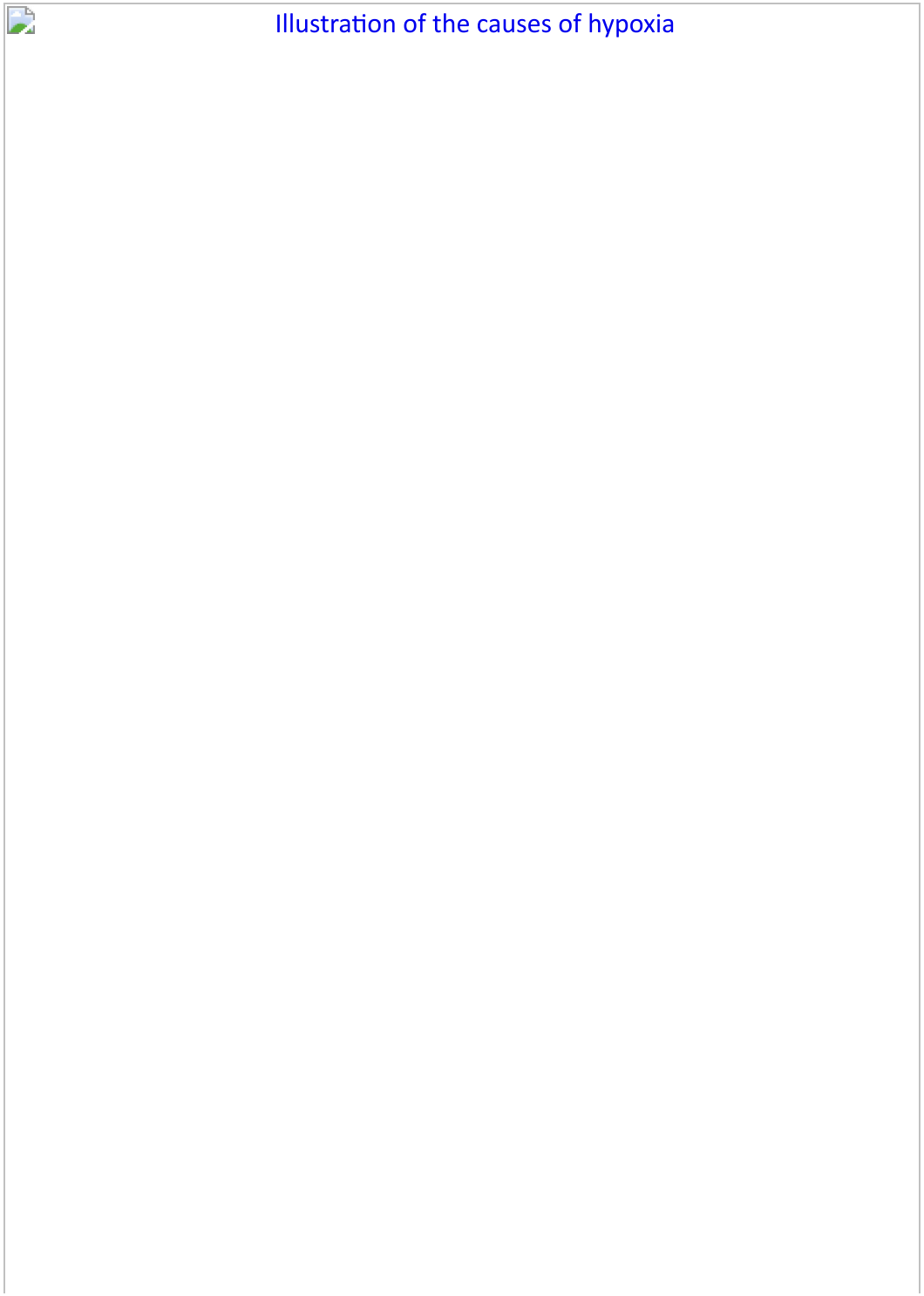


Illustration of the causes of hypoxia

come you're not going to the farm?" So I've always had that sensibility in my head.

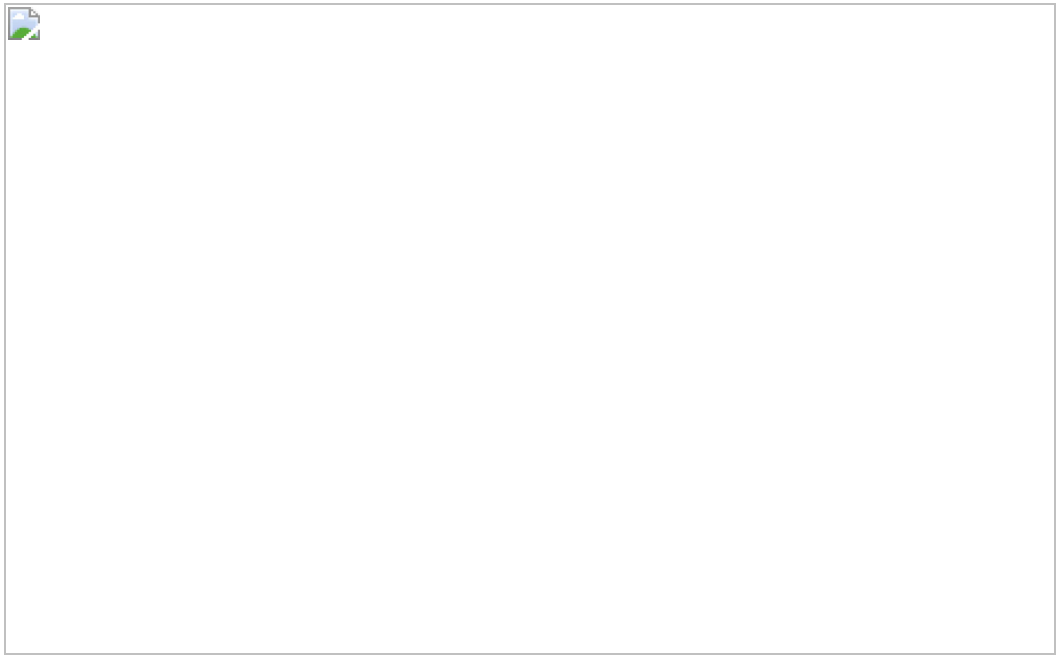
Alicia's formative years came at a time of environmental awareness on a grand scale, coinciding with the first Earth Day and the "energy crisis" of the early 1970's. Her father's reminders to turn off the lights when she left the room--"What, do you own stock in the electric company?!"--instilled energy conservation principles. T he energy crisis also affected one of Alicia's family's favorite holiday pastimes, driving around neighborhoods to see the holiday lights:

We would drive up to Hartford to see the lights and there were hardly any lights on. And I remember being disappointed and blaming it all on the energy crisis.

One school experience in particular played a big role in Alicia's "First Step" and brought about her first real behavior change:

When I was in the sixth grade, one of the secretaries in the principal's office had a daughter who was a senior in high school, and she came to our classroom

Hypoxia (low oxygen) caused by nutrients
Illustration modified from EPA National Condition Report IV, April 2012



The percentage of time the dissolved oxygen in the bottom waters of Long Island Sound fell below 3.0 mg/l between 1994 and 2016. The western portion of the Sound has experienced hypoxia more frequently over this time period
Map Credit: CT DEEP

Connecticut DEEP has long understood the need to reduce hypoxia in Long Island Sound and has made great efforts to reduce nitrogen inputs. In 2001, the states of Connecticut and New York adopted a Total Maximum Daily Load (TMDL) for nitrogen as approved by the United States Environmental Protection Agency (EPA). A TMDL is like a "pollution diet" for a waterbody; it establishes the maximum load of a specific pollutant that a waterbody can naturally use and still be healthy, and it limits certain amounts of the pollutant that can be discharged from both point sources (e.g., wastewater treatment plants) and nonpoint sources (e.g., septic systems, fertilizer runoff, stormwater runoff).

In order to reduce nitrogen levels enough to improve dissolved oxygen

and gave us tips on how we could be more conservation-minded. One of the tips was to turn off the water when you're brushing your teeth, and to this day, ever since she taught me that, I've taken that to heart.

Alicia also recalls a camping trip she took with a friend's church group when she was in high school as leaving a big impression on her:

There were these really cool 30-something church youth group leaders who brought us camping on Cape Cod. It was the first time I went camping, and we slept out under the stars, no tents. I just remember seeing all the stars and it was so cool.

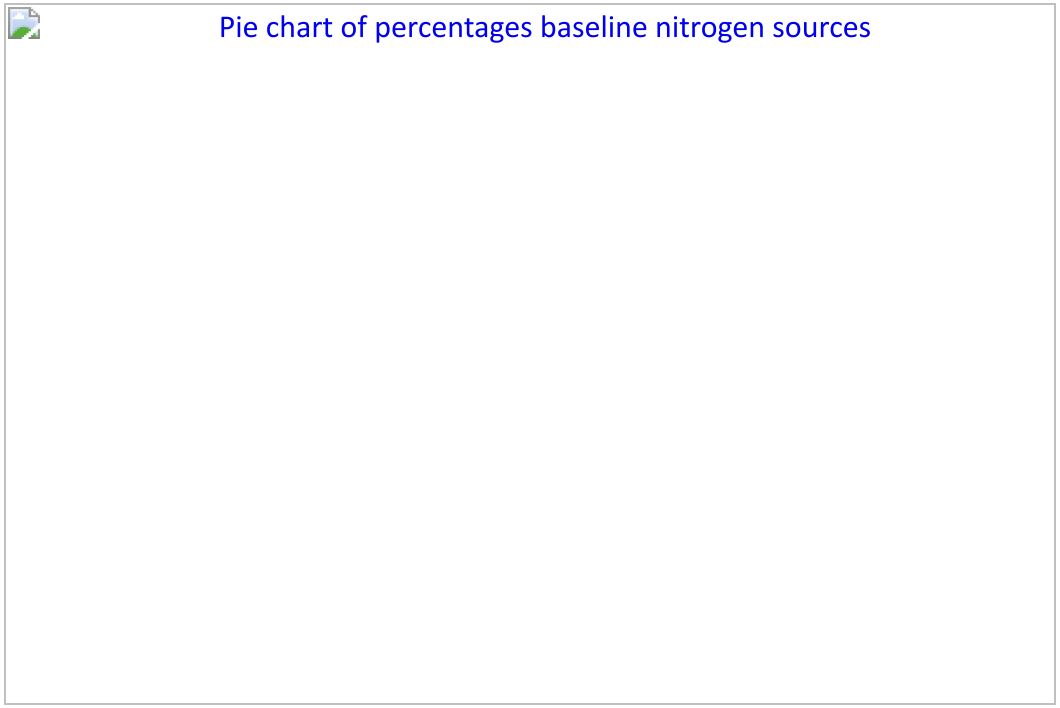
These experiences led Alicia to consider an environmental field of study in college:

My father wanted me to be an accountant and my mom wanted me to enter the health field, but they both just wanted me to be able to earn a living. But I didn't want to "sit behind a desk" so I decided to learn about what I loved, and I loved

concentrations, the Long Island Sound Nitrogen TMDL established a 58.5 percent nitrogen reduction target from the baseline levels recorded in the early 1990s, to be attained by 2017.

Data from wastewater treatment plants in Connecticut show that TMDL nitrogen reduction goals were being meet as of 2014, and nitrogen discharges from these plants remain below the 2014 target goal. The baseline contribution of nitrogen to Long Island Sound was 54 percent of the total contribution, and it is currently down to 30 percent thanks to nitrogen-reduction upgrades at wastewater treatment plants and Connecticut's ground-breaking Nitrogen Credit Exchange Program.

However, the percentage contribution from "urban" sources of nitrogen (e.g., stormwater runoff and septic systems) has increased to 33 percent. This increase can be attributed to the state experiencing more development since the baseline contribution was measured, and the overall decrease in point source loading:



being outside. I went to Nasson College in Sanford, Maine and majored in environmental studies with minor in biology. E nvironmental studies was more people-oriented than environmental science and included planning and policy.

Although the college was very small, several professors proved to be worthy mentors for Alicia. One in particular was the Town of Sanford's municipal planner, and his coursework exposed Alicia to cartography, land use planning, and environmental impact assessment . Another professor taught classes in terrestrial ecology and remote sensing, while a third taught oceanography and ecology:

One professor had this little 2-seater plane, and we would fly over an area with a camera mounted to the outside of the window and take stereoscopic photos. Then we developed a management plan for the area we had flown over. We climbed up Mount Washington for terrestrial ecology. We did a four-year independent study at Parsons Beach in Kennebunk next to the Rachel Carson National Wildlife Refuge, taking beach profiles at seven different stands every two weeks, even

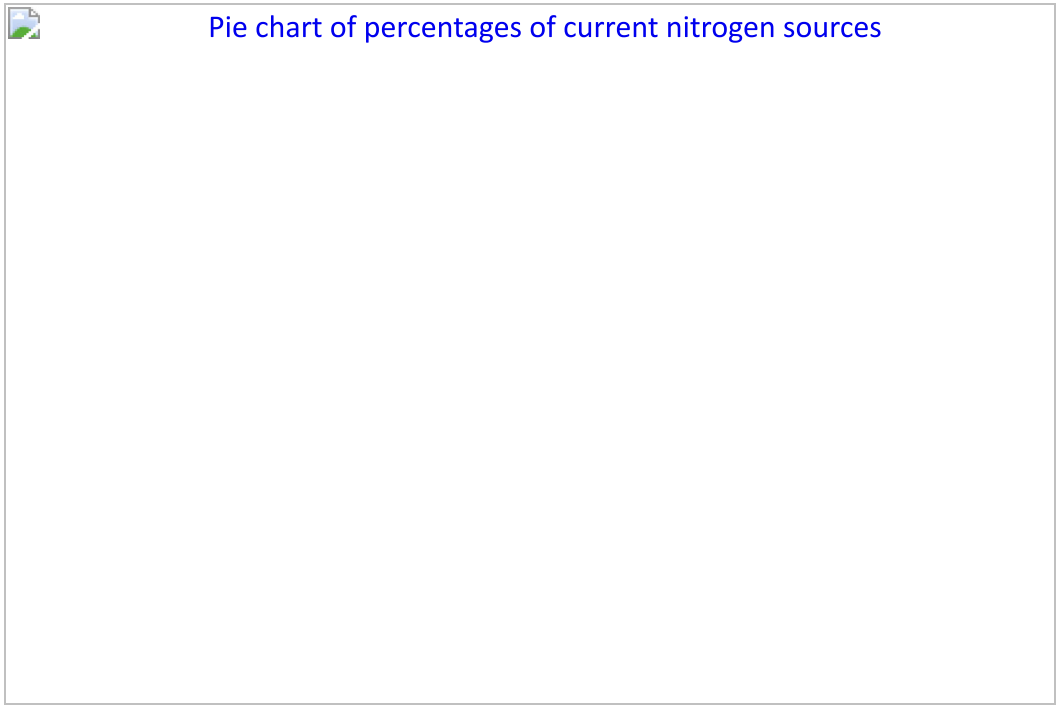


Chart Source: CT DEEP

To address this increased contribution from developed areas (urban contribution), the DEEP is supplementing its TMDL-based point source priorities with a Second Generation Nitrogen Strategy to focus nitrogen reduction efforts on nonpoint sources/stormwater and in priority embayments , while continuing to develop TMDLs as appropriate and make cost-effective improvements at wastewater treatment plants.

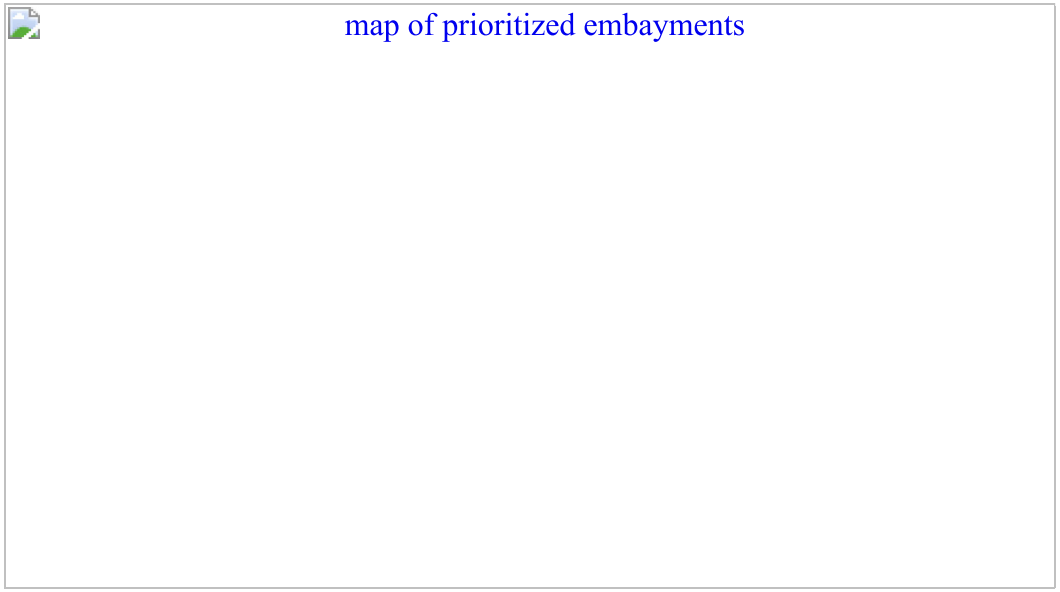
DEEP has identified the first wave of priority watersheds and embayments that warrant additional nitrogen reduction efforts within the next five years, based on a number of factors including the findings of a study of nitrogen loading to local embayments conducted by Dr. Jamie Vaudrey at the University of Connecticut. DEEP is also conducting special studies to (1) develop nitrogen guidelines for the Niantic River Estuary and (2) evaluate the nitrogen load from onsite wastewater treatment systems (septic systems).

Further, DEEP has partnered with the University of Connecticut's Nonpoint Education for Municipal Officials (NEMO) program to conduct outreach focused on

during the summer. The Mousam River estuary outlets to the ocean at this beach. We then mapped the beach profiles over the 4 years to sees if it was a seasonally dominated or storm-dominated system.

After Alicia graduated from Nasson College, she moved to Colorado for four years to be with her brother who was working near Aspen as a landscape architect. She had hoped this would be her "Big Step" of working in the environmental field, but things didn't quite work out that way. She did a stint as a maid and a manager at a garden center, eventually becoming the master gardener for the town of Snommass Village. She volunteered weekly at the Aspen Center for Environmental Studies (ACES) as a nature guide, leading people through the wildlife sanctuary. She also worked for one spring in Moab, Utah to help a colleague from ACES establish the Canyonlands Field Institute. Through it all, she tried to keep her hand in some kind of environmental work, but she couldn't land an environmental career:

I couldn't get a "real job"-- everyone who had one didn't



DEEP Priority Embayments

nitrogen reduction in coastal communities to help foster local solutions. NEMO and DEEP held three regional workshops in August of 2017 that touched on the results of Dr. Vaurey's study, described DEEP's Second Generation Nitrogen Strategy, and sparked discussion of future opportunities for all partners to address nitrogen locally. A companion Nitrogen Reduction webpage has also been developed by NEMO that contains:

- links to a webinar conducted by Dr. Jamie Vaudrey on her nitrogen embayment research and a webinar detailing the DEEP's Second Generation Nitrogen Strategy;
- an interactive map that shows the sources of nitrogen to Connecticut embayments that were identified by Dr. Vaudrey's research; and
- information on fertilizers, stormwater, and septic systems that can be used by municipal officials to conduct outreach in their community.

As efforts progress, Connecticut DEEP's Second Generation Nitrogen Strategy will be a continued commitment to restoring water quality in Long Island Sound that will benefit all generations to come.

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It's NFL Season: No Fertilizing Lawns!

want to give it up!

Alicia decided to move back to Connecticut, and in 1986 answered an ad in the paper for a planning aid position with the Town of Westport. Her college professors had opened Alicia's eyes to the co-mingling of municipal land use, coastal processes, conservation, and ecology, so she knew exactly what the job would entail.

In 1988 Alicia switched to a job in the Conservation Department, but moved back to the Planning and Zoning Department in 1993 when she decided to pursue her masters degree at Antioch University in Keene, NH. A position as a part-time zoning officer allowed her to attend class one day a week. Alicia would leave Connecticut on Thursdays nights, drive to Keene, sleep on a high school friend's couch, and go to class on Fridays and some weekends. She majored in resource management and administration, and her program's requirements included gaining 600 hours of practicum experience and completing a masters project. Alicia had a great idea: blend her program requirements and course work with the needs of

Dr. Jamie Vaudrey's embayment nitrogen study found that fertilizer contributes 23 percent of the total nitrogen to Long Island Sound's coastal embayments. Lawns within 200 yards of these embayments can have a significant impact on water quality, and the closer a lawn is to the embayment, the more likely it is that nitrogen will get into the water. If a lot of fertilizer is washing off into the water, it can cause excess algae to grow. That algae eventually dies, and the process of decomposing uses up the oxygen in the water, leading to hypoxia.

Most lawn care experts agree that fertilizing your lawn more than twice a year, especially during the mid-summer, is wasteful and doesn't provide any significant benefit. The best times to apply fertilizers are after spring green-up and **no later than October 15th**. Since that second date is well into the National Football League's season, here's an easy way to remember: "NFL" means No Fertilizing Lawns!

Most fertilizer-related water quality problems come from human error. Some of the more common "Personal Fouls" associated with fertilizer application include:

- ***False start***: applying fertilizer too early or too late in the year when the plants just can't take-up any nutrients;
- ***Encroachment***: accidentally applying fertilizer onto hard surfaces adjacent to the lawn, like driveways and sidewalks, where it does no good and just gets washed away;
- ***Clipping***: gathering and disposing of lawn clippings rather than leaving them on the lawn where they can act as a natural fertilizer, reducing the need for more added nitrogen by 25% -40%;
- ***Intentional Grounding***: applying too much fertilizer to the ground in the misguided belief that more product will result in a greener, healthier lawn; and
- ***Roughing the Passer***: applying excess fertilizer to soil that really doesn't need it.

The good news is, these penalties can be waived, and we can help keep fertilizers out of coastal embayments and Long Island Sound! Remember these rules of NFL season and you'll score every time:

1. Don't apply fertilizer if you don't need to. How do you know if you need to fertilize? Contact the UConn Soil Testing Lab to perform a soil test to

the Town of Westport:

The Zoning Department administered the floodplain regulations and the Community Rating System (CRS) programs of the National Flood Insurance Program (NFIP). So that became the focus of my practicum, to get the Town of Westport enrolled in the CRS and write a repetitive loss plan, which led to a hazard mitigation plan, which then ultimately led to my masters paper on the problems facing local officials in administering the NFIP. Every single class I took I directly related to my work.

Alicia's graduate school course work in hydrology also helped her work on local water quality issues. She focused on Sasco Brook, a waterbody in Westport that was closed to shellfishing and swimming because of water pollution problems. It was her continued dedication to restoring Sasco Brook that earned her the Environmental Law Institute's wetlands award this year. Sasco Brook is now open to shellfishing, but more work needs to be done.

Since 2000, Alicia has been the Director of Westport's Conservation Department

determine if you need to fertilize and what type of fertilizer you need. Minimize the need to add nutrients to your lawn by leaving grass clippings in place. And if you need to apply fertilizer, never apply more product than the instructions recommend.

2. Don't apply fertilizer where you don't need to. If the soil test determines that you need to fertilize, it will also help determine where you need to apply. Minimize spillage onto hard surfaces, because it won't make the concrete grow and it will just get washed away.
3. Don't apply fertilizer when you don't need to. Your lawn isn't ready to get fed if you fertilize too early in the year before spring green-up and too late in the year after mid-October. Don't apply fertilizer to the lawn before a big rain event either (remember, October is still hurricane season!)--it won't soak in, it'll just get washed away into nearby streams and rivers, and may ultimately end up in coastal embayments and Long Island Sound.
4. Provide these guidelines to your lawn care company, if you use one.

where she performs a multitude of duties. Her to-do list is ambitious and includes land use regulations with Low Impact Development techniques, continued involvement with the Connecticut Association of Conservation and Inland Wetlands Commissions and the Long Island Sound Blue Plan Advisory Committee, and a swimmable Sasco Brook.

Through it all, Alicia has continued to follow her conservation mission, never wandering far from her farm community roots:

I just love the smell of dirt. It brings me back to Lancaster, and making mud pies in the back yard. The smell of manure doesn't bother me. When I visit friends in Lititz, PA which is predominantly Amish, once I smell the manure that's been spread on the fields I think, "Oh, I'm home!"

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Time Out: A family pet enjoys a properly fertilized lawn
Photo Credit: DEEP LWRD

For more information on environmentally friendly lawn and yard care practices, please refer to the following resources:

- UConn NEMO's Minimizing Pollution and Maximizing the Effectiveness of Lawn Fertilizer factsheet
- Long Island Sound Study's Sound Gardening webpage
- DEEP's Organic Lawn Care webpage

Look Out For These Other Upcoming Events!

Blue Plan
Advisory Committee Meeting
December 7, 2017
10:00 am to 12:00 noon
Acton Public Library
60 Old Boston Post Road
Old Saybrook, CT

Long Island Sound Study (LISS)
Committee Meetings

Please be sure to check the Calendar of Events on DEEP's website

November: Harbor seals arrive in LIS from northern New England; winter flounder move into shallower water

December: Bald eagles return to Connecticut for the winter

- Connecticut Chapter of the Northeast Organic Farming Association (NOFA) Organic Land Care webpage

This late into October, your time will be much better spent watching the Giants, Jets, or Patriots game on a Sunday afternoon than applying fertilizer to a lawn that really won't be able to use it. And you can spend the money you save on tailgate snacks instead.

If you're really itching to get out and "tackle" the lawn after the Super Bowl is a distant memory, take a cue from Major League Baseball groundskeepers and wait for spring training...MLB season is for Making Lawns Better!

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Living Shorelines Workshop Registration Open

The Connecticut Institute for Resilience and Climate Adaptation and the Connecticut DEEP invite you to attend a free Living Shorelines workshop on Monday November 20, 2017 at the UConn Avery Point campus in Groton.

This workshop will provide an update about the state of living shorelines in Connecticut, highlight existing projects and research, and overview related permitting processes. Design concepts for both a larger, municipal site and a smaller, residential/land trust site will be explained. These two sites will then be used to run through a mock permit review exercise in small breakout groups with guidance from DEEP environmental analysts. The workshop is designed to provide opportunities to network with fellow practitioners while sharing lessons learned.

Please register for this free workshop by November 10, 2017 since space is limited to 60 participants. Lunch will be provided. Contact Kim Bradley at UConn for more information.

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SPOTLIGHTED COASTAL ACCESS:
Cos Cob Park in Greenwich is a New Addition to the Coastal Access Guide

One of the newest additions to the recently updated Connecticut Coastal Access Guide is Cos Cob Park. A high-powered transformer if ever there was one, this property morphed from a power plant to a stunning waterfront recreation area. Now, the only current you'll experience at the site is the ebb and flow of the tides.

In 1986, the Cos Cob Power Plant--the first power plant constructed to service a railroad--ceased operation. Three years later, the Town of Greenwich purchased the 9.4 acre site from the State of Connecticut for $1.00. The site underwent decades of demolition, remediation, design, and construction, and almost 40 years later Cos Cob Park was opened to the public in 2015.

A view of Long Island Sound from Cos Cob Park_ Greenwich

A magnificent view of Long Island Sound from Cos Cob Park, Greenwich
Photo Credit: DEEP LWRD

The park boasts several amenities including a large pavilion, a multipurpose playing field, playgrounds, picnic areas, a patio with tiered seating, and almost a mile of walkway throughout the site offering sweeping views of Long Island Sound. There is also ample free parking and restrooms are available.

For more information on Cos Cob Park and the more than 300 other places open to the public on Connecticut's coastal waters, please visit the Connecticut Coastal Access Guide.

View of entrance to Cos Cob Park

The entrance to Cos Cob Park--don't be intimidated by the High Voltage danger signs and the overhead wires!
Photo Credit: DEEP LWRD

Purchase of a LIS License Plate Supports the LIS Fund

For information on ordering a Long Island Sound License Plate, call 1-800-CT-SOUND.

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Climate Change Update:
Tidal Marshes Want to Migrate...Will Property Owners Let Them?

Due to their location at the interface between the upland and coastal waters, tidal marshes are one of the ecosystems that are most susceptible to the effects of climate change, especially sea level rise (SLR). This vulnerability has been detailed in *Sound Outlook*, especially in conjunction with the Sea Level Affecting Marshes Model (SLAMM) that predicts how tidal marshes are expected to migrate in response to SLR. (Please see the October 2014 issue, February 2016 issue, and February 2017 issue of *Sound Outlook* for more information on SLAMM.)


picture of tidal marsh migrating into an upland forest area at Hammonasset State Park

A scenario fit for Shakespeare: the tidal marsh comes to the wood!
Tidal marsh migrating into the upland forest area at Hammonasset Beach State Park
Photo Credit: DEEP

While SLAMM can predict how a marsh will react in a given location under a variety of SLR scenarios, it cannot predict is the willingness of adjacent property owners to allow marshes to migrate landward. But this willingness--or lack thereof--will, perhaps, have the most significant impact on whether or not a marsh will continue to exist in a given location.

To shed light on this issue, Christopher R. Field and Chris S. Elphick from the University of Connecticut and Ashley A. Dayer from Virginia Tech undertook a study aimed at private landowners' willingness to adopt certain conservation strategies that would allow tidal marshes to migrate landward in the face of SLR. Funded by Connecticut Sea Grant and, in part, by the DEEP's Wildlife Restoration and State Wildlife Grant programs, the study focused on tidal marshes because of the significant benefits they provide, and because these resources are already experiencing impacts associated with SLR.

Between February and June 2015, t he researchers surveyed over 1,000 landowners along the Connecticut coast whose property is located within the area that is projected to be tidal marsh by the year 2100. Landowners were asked about their intentions to build seawalls or other shoreline protection within the next 20 years vs. allow water levels to rise naturally, and their willingness to participate in land conservation practices including:

- a conservation easement (a binding agreement with a conservation organization that permanently prevents shoreline protection from taking place on the land while the landowner retains ownership);
- a restrictive covenant (a mutual agreement among neighbors that requires everyone in the neighborhood to allow water levels to rise naturally, creating salt marsh in new locations on the property);
- selling the property (including the house) to a conservation organization for fair market value within the next ten years; and
- transfer ownership of the property (including the house) to a conservation organization in the event of a flood that reduced the total property value by more than 50% of its current value (the conservation organization would be required to pay the pre-flood value at the time of transfer).

The researchers' report, "Landowner behavior can determine the success of conservation strategies for ecosystem migration under sea-level rise," was recently published in the *Proceedings of the National Academy of Sciences*, and t he study results are somewhat mixed.

Almost one quarter of survey respondents--22%--reported being likely or strongly likely to build shoreline protection (seawalls, bulkheads, or revetments) within 20 years, and respondents living closer to marshes were more likely to say that

they would build walls, according to Christopher Field, one of the principal researchers. He sees the proportion of people willing to build seawalls as large enough to potentially be a significant roadblock to large-scale marsh migration. "If that first row of landowners builds walls, even if it's a low percentage of the overall population, marshes will have nowhere to go," said Dr. Field.

Further, a whopping 45% of survey respondents said they were unlikely to participate in any of the conservation agreements identified. Future interest agreements (selling property or transferring ownership after a major flood) were the first choice of 27% of landowners surveyed, followed by outright purchase at 17%. Interestingly, landowners whose homes flooded during Superstorm Sandy were 1.4 times more inclined to sell the property outright. Restrictive covenants were favored by 8% of respondents as their first choice, while merely 3% of landowners would select an easement as their first preferred option. One of the reasons cited by respondents for their unwillingness to enter into easements or sell their land is the concern that they wouldn't receive a fair price from conservation organizations.

Photo of a marsh against a wall

A tidal marsh with its back up against the wall
With a wall barrier and no upland available for migration, this marsh will likely drown when sea level rises
Photo credit: DEEP LWRD

When it comes to the relationship between landowner intentions and the perceived value of tidal marshes, the results are a little surprising. The survey found that landowners who thought marshes were important for providing a home for wildlife were less likely to use shoreline protection and more likely to participate in conservation easements and restrictive covenants.

But landowners who placed greater importance on the protective aspects of marshes (e.g., flooding protection, erosion protection, carbon storage) were not more likely to participate in conservation agreements, and were not less likely to build shoreline protection. This result seems somewhat counter-intuitive, that landowners who understand the protective value of salt marshes would not be more inclined to protect the resource that is, in turn, protecting them.

SLAMM allows DEEP and other partners to target limited marsh conservation resources in areas with the greatest potential to support marshes in the future. This landowner behavior study will be an important supplement to SLAMM results. It can help resource managers and conservation organizations rethink their approach and fine-tune outreach to marsh-front property owners by focusing conservation messaging on those tidal marsh benefits, such as their wildlife habitat value, that most resonate with these landowners. The study's findings about fair price concerns resulting in a low overall desire to participate in conservation practices is also very revealing, according to Dr. Field. "I think the fair price concern is interesting," said Dr. Field, "but now we can have greater confidence that outreach efforts to alleviate those fears would have a significant impact on-the-ground."

Perhaps most importantly, the study underscores the critical need to engage private landowners in meaningful ways that will ultimately encourage them to adopt behaviors that allow marshes to migrate. The life--or death--of the salt marsh depends on it.

Visit the DEEP website at www.ct.gov/deep

Published by the Department of Energy and Environmental Protection, Bureau of Water Protection and Land Reuse.

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