



gosa news

Groton Open Space Association News, Spring 2015, Volume 4, No. 1

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A Letter from the President, Joan Smith

Dear GOSA members and friends,

Bobcats, bunnies and bluebirds: these are just a few of the 50 wildlife species which will thrive among the young forests, forest openings, forest edges and old fields that GOSA has expanded at each of its properties. This type of shrubby habitat provides a diversity of cover and food for wildlife not found in closed-canopy forests. Over a thousand shrubs and native plants have been planted at Candlewood Ridge: blueberries, winterberries, raspberries, blackberries, inkberries, native grasses, dogwoods, beach plums, roses and others. Next fall, patches of tree canopy at Candlewood Ridge will be opened up, permitting sunlight to reach the forest floor to reinvigorate the forest and encourage new growth.



Joan explains the importance of shrubby habitat at Candlewood Ridge to Pfizer volunteers.

GOSA's anticipated acquisition of Avery Farm in late spring will add 305 acres of farmland and wildlife habitat to create a block of more than 400 contiguous protected acres. Volunteers have worked hundreds of hours fundraising and writing grants to acquire the property and to fund a stewardship endowment for Avery Farm. Financial support from several foundations, over 400 individuals, and the State of CT Department of Energy and Environmental Protection Open Space and Watershed Land Acquisition grant program (\$611,000) has been gratefully received. It takes time, money and a community to save land, and thankfully our community responded resoundingly.

It is always sad to lose a friend who cares about the environment. Marty Young passed away in February. She served as a GOSA board member from 2003 - 2011, and as stewardship chair for The Merritt Family Forest. Her expertise as a landscape designer, advocacy for protection of wildlife habitat, introduction of native plant species and initiation of a meadow restoration program made a difference. We are grateful for her contributions. She will be missed.

Cutler Middle School student Andie Steele has contributed another outstanding article to this edition of GOSA News. We are glad to have young people like Andie become engaged in writing about our beautiful places. We encourage more readers of all ages to share their stories too!

Joan Smith



GOSA News supports the mission and purpose of the Groton Open Space Association by publishing electronic newsletters that inform the public of past, present and future GOSA activities and threats to the health of open space. **GOSA News** also serves as a [link to the GOSA website](#) for additional information and as a link to other key sites. Our mission is to inform and inspire the public to become actively involved. We welcome letters to the editor. Letters should be sent with the writer's name, address and daytime phone number via e-mail to: gosamail@gmail.com.



GOSA Mission and Purpose To work to promote conservation, environmental preservation, open space and recreational areas in Southeastern Connecticut. To educate the public about the value of open space, conservation and environmental preservation. To enlist public support and funding to promote, acquire or maintain open space for public use, alone or in cooperation with local, state or federal agencies, or with other nonprofit organizations. GOSA is a nonprofit tax exempt organization under IRS Section 501(c)(3).

GOSA News Staff

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Membership

To join, send a check to GOSA and include your name, address and e-mail. Annual dues are \$10 per year.

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A Snowy Day at Avery Farm

By Andie Steele, student correspondent



Andie Steele, Cutler Middle School student, loves nature, writing, and much more! She and her mother toured Avery Farm on March 1st with Sue Sutherland as their guide.

We approached the farm. Snow was lightly falling all around us. To our right, there was a fawn galloping across the woods. To our left was more forest. Inside the gates of this patch of purity, there was a woman walking towards us. She asked us if we wanted to walk around the farm, and we accepted her invitation. We passed four gorgeous stallions and mares trotting around a fenced-in area. I waved to one of them, and it looked at me and appeared to smile.

Our guide told us about the many types of wild life that live on the farm. As we walked by the wetlands, she pointed out a floating patch of land in the middle of the bog, where turtles

like to nest. She also showed us where a rare breed of turtle liked to sit and where beavers swim in the warmer seasons. She explained the various wild plants that grow in warmer months.

I was surprised to learn that there were three types of insect-eating plants, similar to the Venus flytrap, that grow at Avery Farm!

After a while, I was feeling chilly and my hat was soaked with the falling powder. We carefully tiptoed over the icy road back to our car. As we were about to hop in our vehicle, I told her we would come again when the weather was nicer. I can't wait!

Editor's Note: GOSA News welcomes testimonials like Andie's from people of all ages who enjoy visiting places like Haley Farm, Bluff Point, and GOSA-owned properties. Click [here](#) for information on monthly tours of Avery Farm and see page five for information on tours of Candlewood Ridge and Avery Farm on June 7th.



Come to GOSA's 19th Annual
Haley Farm

Cleanup, Greenup Day!

Bring loppers, work gloves, drinking water and
liberate a tree!

Haley Farm State Park

Saturday, April 25, 2015
(Rain date, April 26)

9 am - 2 pm

We supply some hand tools and lunch!

Supported in part by *The Last Green Valley*





Sidney's Corner

By Sidney Van Zandt with Liz Raisbeck

Fall-Winter 2014-15

It's been a tough winter to get out onto the GOSA properties, but Sandy and I did manage to have a wonderful snowshoe on the Sheep Farm on Feb 20 where we got a good picture of the waterfall completely frozen over and covered with snow.



Photo by Sidney Van Zandt

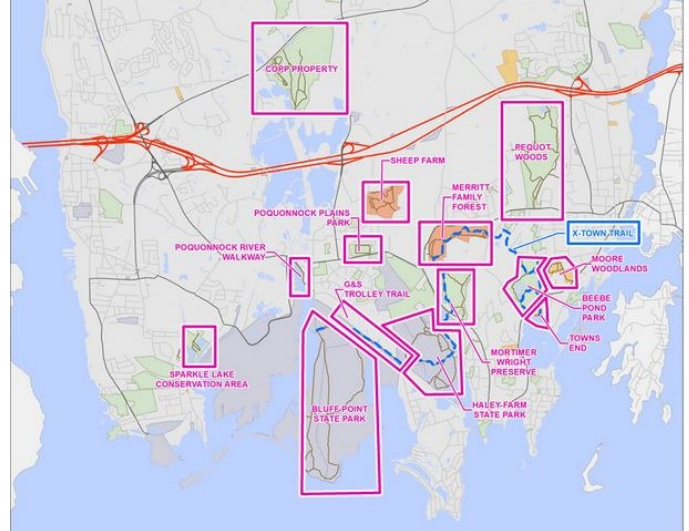


Sandy and Sidney snowshoeing at the Sheep Farm in February. Photo by Sue Sutherland

Indoor Projects

I've been working on indoor winter projects, particularly helping the Town of Groton's excellent new GIS Coordinator, Jenna Gosseling, to up-grade all the town's trail maps. To see them, go to Groton's terrific new [Interactive Guide to Hiking Trails](#), a great resource for outdoor enthusiasts in the area. See an image (not hyperlinked) of the interactive map at right.

Each boxed Trail System provides both interactive and downloadable trail maps as well as GPX waypoints - which can be downloaded and copied onto your GPS device so you can utilize waypoints and tracks as you hike. If, for example, you would like to learn more about hiking on the Sheep Farm, click on the above Interactive Guide link, then click on the Sheep Farm box. The page that comes up will contain a description of the property, trail facts, trail uses, an image gallery and a detailed interactive map. Hope to see you on the X-Town hike in June!



Left: Rob Klee, CT DEEP commissioner, Joan Smith and Sidney Van Zandt pose for a selfie. Our founder and vice president testified for parks and open space at the capitol!

Connecticut Friends of State Parks held a lobby day at the state capitol, which I attended representing GOSA. Open space groups from all over the state filled a corridor in the Connecticut Legislative Office Building with tables of information about their parks and open space, and buttonholed members of the legislature on the importance of preserving open space for both our well-being and our economic benefit.



National Trails Day

X-Town Hike on June 6
GOSA Hikes on June 7



June 6, 2015 is the American Hiking Society's National Trails Day®, the country's largest celebration of trails. National Trails Day events will take place in every state across the country and will include hikes, biking and paddling trips, birdwatching, geocaching, gear demonstrations, stewardship projects and more.

In Groton, National Trails Day is celebrated for the entire weekend of June 6-7! Three wonderful walks in Groton will feature coastal views, forests, meadows, streams and wildlife sure to delight your eye. Please join us.



X-Town Hike Saturday, June 6, 9:30 a.m. to 1:00 p.m.

We will meet at 9:30 a.m. at the Bluff Point State Park parking lot for registration. Please get there a little early.

This five-to-six-mile walk on public trails will begin at the Poquonnock River and continue through the Haley Farm and across Rte. 215 to the town-owned Mortimer Wright Preserve. From there, the walk will pass through the GOSA's Merritt Family Forest and on to the town-owned Beebe Pond Park, Avalonia Land Conservancy's Moore Woodlands, and "Town's End" at Beebe Cove. Click [here](#) for a X-town map.

At 1 to 1:30 p.m. a bus will meet us for our return to Bluff Point. The hike is of medium difficulty and moderately paced. Bring your own snacks and drinks. In the event of heavy rain, the hike will be canceled. Solar toilets are available at Bluff Point and Haley Farm.



For **questions or registration information**, contact Sidney Van Zandt, 860-572-5715, or svanzandt3@aol.com. *Please, no dogs.*

Sponsored by Connecticut Forest & Park Association, GOSA, Avalonia Land Conservancy, and the Town of Groton Parks and Recreation Department.

Sheep Farm and Fort Hill Brook Sunday, June 8, 10:00 a.m. - 12:00 p.m.



Meander through the forests and fields of this historic farm, visiting the old dam site and lovely waterfall on Fort Hill Brook. Moderate to easy trails. Family friendly. Click [here](#) for Sheep Farm map.



Meet leader Sidney Van Zandt at 10:00 am at 245/255 Hazelnut Hill Road (on the right up the hill from the Pequot Health Center entrance). Rain or shine. **Pre-registration is recommended.** For questions and to register, call Sidney F. Van Zandt 860-572-5715, svanzandt3@aol.com. *Please, no dogs.* Sponsored by the Groton Open Space Association

Candlewood Ridge and the Avery Farm Sunday, June 7, 2:00 to 4:00 p.m.

Explore GOSA's newest acquisitions in north Groton and Ledyard. Botanist Whitney Adams and Joan Smith will lead an educational tour showcasing GOSA's recent habitat restoration project on Avery Farm and Candlewood Ridge. More than 1100 native trees, shrubs, grasses and forbs have been planted; we will visit a powerline corridor, managed for wildlife habitat, and see denning caves, rock formations, and explore a forest featuring a mountain laurel understory. Moderate difficulty, approximately 2.5 miles.



Meet at the southern gate of Lambtown Road Extension, immediately north of the Ledyard/Groton border. Approach from Route 184 in Groton, heading north on Groton's Lambtown Road. Use 245 Lambtown Road Ext., Ledyard as an address for your GPS device. **Reservation required.** For questions or registration information, call Joan Smith at 860-536-9811. *Please, no dogs.* Sponsored by the Groton Open Space Association



Trouble Looming for Open Space

A most troubling development affecting our local and state parks has emerged in recent weeks. Governor Malloy's annual budget for 2015-16, which he has recently sent to the legislature, takes a meat axe to funding for our parks. If these proposed cuts are not rolled back there will be little to no future money for open space acquisition, deep cuts to park maintenance, and the dismemberment of the Council on Environmental Quality.

Among the many cuts proposed is \$2 million from the state parks budget of \$12 million. Cuts in recent years have already left the parks with a bare bones budget. With nothing left to cut, worst hit will be the seasonal summer staff, which is likely to be reduced to about 180 from 550, forcing some parks to close. The governor also proposes cutting \$13 million in 2015 from the Community Investment Fund with a further \$27 million cut proposed for 2016, basically zeroing it out. This is the fund that has enabled us to purchase the Merritt Family Farm, the Sheep Farm, Candlewood Ridge and Avery Farm. It would be a tragedy of enor-

mous proportions if this fund is no longer available to protect land, water and wildlife in Connecticut.

Also on the chopping block is the state Council on Environmental Quality, a crucial state watchdog on environmental issues for the state that is effective because of its independence. The governor proposes moving the CEQ into the Office of Legislative Management, where it is likely to lose its clout and perhaps even its staff.





*Groton Open Space
Association
Gala
&
Silent Auction*

Thursday April 23, 2015 (6-9 pm)
Mystic Marriott
 Seated Dinner & Cash Bar
\$65 per person (\$30 tax deductible)
Reservations required by Friday, April 10th
 Tables for 10 can be reserved (see insert)
 Use enclosed reply card to RSVP*
*RSVP early as the event has sold out the last two years

[Click on the bird above for more Gala information on GOSA's website](#)

An Interview with Jonathan Reiner, Groton's New Town Planner

By Liz Raisbeck

Why did you become a planner?

As an undergraduate, I took an environmental class at URI that opened my eyes to the environmental movement. I had focused on political science and coastal zone management policy and knew I wanted to do something in coastal or land use policy to apply what I was learning in the real world.

Tell us about the work you did at North Kingstown, your most recent job before Groton

In North Kingstown I tried to step back and look at the big picture of development. The traditional model of development is that all land, unless protected, will be developed at some point in time. That is not the best way of growing a town, either environmentally or economically. We looked at where our future growth and development should be located in town, and what land we should protect, rather than just planning project by project. We developed different types of higher density mixed-use zoning, to revitalize our commercially developed corridors that already had infrastructure in place. This in turn would steer development away from our rural open areas and help preserve farms, forest, and open space. This was a key strategy in making sure the town kept its rural as well as urban character. Development in those outlying areas usually cost the town more than we would make up in taxes. North Kingstown was the first municipality in Rhode Island to adopt Transfer of Development Rights (TDR) to help achieve our long-term goals.

Tell us about that – what do you mean by TDR?

Under Transfer of Development Rights, a private landowner in a more rural area would sell the development rights for his land rather than the land itself. An in-town developer with land in a downtown commercial or mixed-use area buys the development rights from the rural landowner, basically catching the development potential from that rural land and applying it to his in-town property, enabling the in-town developer to increase the density of his development beyond what was previously allowed and at

the same time preserving the more rural open space. The rural landowner puts a permanent conservation easement held by the town on his property in return for selling the development rights. The land can still be used for agriculture, forestry or other open space uses. The rural landowner has made money and kept his land; the developer makes more money by developing at a higher density.



Jonathan Reiner at Haley Farm
Selfie by Jonathan Reiner

How successful were you in establishing this program?

An unfortunate thing is that just as we were getting this program off the ground, the market crashed. We had numerous land owners in the more rural areas tell us they wanted to sell their development rights to the town. As I was leaving I had one large commercial developer who needed transfer of development rights for his project to be implemented.

How does North Kingstown fund such a program?

Some of it came from the town, which spent a substantial amount of money preserving open space, over \$4,000,000, in town bond funding during my time in N. Kingstown. We were also competitive in getting grants, well over double that amount for farmland and open space protection from state and federal grant programs because we had a reputation of getting things done and not just doing another study that sat on the shelf.

What inspired you to leave?

I had been there for nine years and felt that I had done what I could. Of course I could do more, and I set in motion some very interesting projects as I was leaving. But I was looking for a new challenge. Groton attracted me because it's very similar to N. Kingstown in that it has rural, suburban, urban and coastal pieces, which I'm really interested in—particularly how the coast interacts with the rest of the community. We have the infrastructure here—we have a lot of open space which is absolutely gorgeous and a great plus for Groton—but there is a feeling that a lot still needs to happen. I sense a need for change. People are focusing on how to bring business here, how to diversify our business, and still keep the town attractive.

How are you going to involve the community in thinking about the future?



Source: <http://www.jamescitycountyva.gov/jccplans/tdr.html>

Fortunately, we're in the process of updating the Plan of Conservation and Development (POCD), which needs to be finalized. I've been working with the Planning Commission to get feedback on the draft, and once we have a draft we will get public comment on it. I'm also working with the Town Council to do a town-wide marketing analysis. The POCD will guide us on what the town would like for development, but the market analysis will tell us what are the real market demands for the area—the actual needs for housing, business, etc. That's where vision meets the real world. We are also going to do an audit of our zoning regulations to see where we need to make changes so that our regulations are compatible with our vision and help us to accomplish our goals.

What does that review of the regulations consist of?

We'll hire an outside consultant, an expert in zoning, and work with a subcommittee made up from the town zoning and planning committees, the council, and some business people. We want to get input into our existing rules: what's working, what's not, and what do the public and developers perceive needs changing. If people aren't happy with the existing pattern of growth and development, then it's up to us to change the regs as needed.

Did you do a process like this in N. Kingstown?

Over a much longer period of time, yes, and we didn't do it as cleanly as we'll do it here. We did the market analysis late in my tenure and I wish we had done it earlier.

Could you expand on your statement that it costs a town more to have development in the undeveloped parts of town than to put development near existing development?

There have been a lot of studies on the cost-benefit ratios of development. People want development but they don't want their taxes to be astronomical. When we look at how growth happens, traditionally it has turned your green areas—forests and farms—into houses. But the reality is that after putting in roads, sewer lines, and schools to meet the new housing demand, the town can't recoup its investment. Eventually that infrastructure—the roads and sewers—will break down, and the cost of replacement is astronomical. It's more than what those houses are paying in taxes.

If that same growth happened in our village areas—on smaller lots, going vertical instead of horizontal, and providing a variety of housing types of 1-, 2-, 3-bedroom units—it will keep our young professionals, older populations, and families here. Land developed at higher densities brings in more tax revenue per acre than your lower density development patterns. It also makes infrastructure like parks, bike paths, sidewalks and the like more cost effective on a per person basis in those high-density areas.

Do you have a sense of the housing stock that we need?

I believe a market analysis will show that there's very little housing for our seniors. We also need attractive one- and two-bedroom apartments at a full range of pricing for young professionals and singles. The demographics of our region are changing substantially, and our development patterns need to match what is needed. We have a lot of single family homes. Business needs a workforce and also shoppers, so we need to have attractive, affordable housing stock across the age spectrum to keep people and to bring business to Groton.

What does our open space contribute to Groton?

Open space is a great thing to have—publicly owned, privately owned, for recreation and some to just look at because it's beautiful. Open space leads to high quality of life for people; it could be a great tourism asset if we let people know that these areas are available for access. The Town of Groton has a great web page that shows people where they can go for hiking, mountain biking, or to check out kayaking and canoeing spots. That does a lot for the character and wellbeing of a town and attracts business. It signals that the quality of life is really good here. When businesses are looking to locate, they're looking for a high quality of life. Open space is a key part of that and having walkable, attractive villages like Mystic is also important. We should be looking to replicate these types of development patterns in our older commercial areas, around the town hall, and in downtown Groton, for example. The town brings in a lot more tax revenue per acre versus service costs when you re-develop compact, high density areas where critical services already exist.

What are the biggest challenges and opportunities here?

One of my biggest challenges is that people want quick results. It takes a long time for these flowers to bloom. We have to change our way of regulating and working with the business community. We want development to happen in Groton, not everywhere, but in the areas that make the most sense for the Town. What's our vision? If we don't know what we want, how can we expect developers to know what we want? Rewriting those regs will take some time. Another challenge is asking the public to have patience. It's going to take a few years to get these key changes in place.

Opportunities? We have tremendous opportunities. We have an abundant, excellent water supply for business, sewer infrastructure, a great school system, the open space is fantastic, a beautiful coastline. You can get to a lot of places in a very short drive from Groton. We have great assets, and we just need to let people and developers know about them ... and I think they will come.

About the Author: Liz Raisbeck is retired from a 25-year career in Washington, D.C. as an environmental policy advocate for National Audubon Society, National Parks Conservation Assn. and other national environmental organizations.

Got Barberry? Get Rid of It!

By Liz Raisbeck

My grandmother had a short Japanese barberry (*Berberis thunbergii*) hedge along the street in New Rochelle when I was a little girl. I remember how pretty the red foliage was in the fall and I would make little collections of the bright red berries.



It turns out that barberry is one of those pretty but foreign garden shrubs that can go invasive in the forest, and that is exactly what it has done in much of Connecticut. The state has declared *Berberis thunbergii* to be "one of the most destructive invasive plants in CT" and eradication of the plant to be of "highest priority."

It would be bad enough that barberry chokes out native plants in the forest understory, but recently scientists have discovered a connection between barberry bushes and Lyme disease. The University of Connecticut and the state Agricultural Experiment Station (AES) report that forests infested with barberry have a much higher black-legged tick (deer tick) population than forests free of barberry. Deer ticks are the principal carrier of Lyme disease and other diseases. Barberry creates a perfect cover for white-footed mice and micro-climate for young ticks: it leafs out early in the spring, earlier than other native shrubs, and creates a mid-to lower-level canopy which retains the humidity needed for young ticks.

This connection between barberry and Lyme would be less problematic if a tick lived its entire life in a barberry thicket. They don't. The ticks first feed on white-footed mice in the barberry thicket and next they seek out host number two – commonly white-tailed deer. Fortunately for the ticks, Japanese barberry grows to a height that allows them easy access to passing deer. Ticks climb barberry stems where they hitch a ride on passing deer. Deer stroll from woodlands to yards and gardens, bringing their tiny passengers along for the ride.

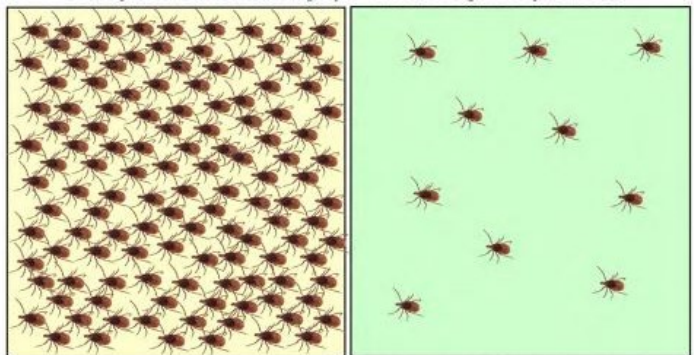


An excellent [UConn/AES bulletin](#) gives detailed directions on how to get rid of barberry. It is not easy. The bulletin advises a combination of mechanical removal and propane torching or herbicide. It takes at least two treatments or more to kill a bush, depending on its size.

Some of GOSA's properties are heavily infested with barberry, particularly the Merritt Family Forest which probably has at least 500 plants. It seems to prefer wet areas, but can also be found scattered throughout the forest. The Sheep Farm has a fair amount too. A good volunteer project this summer would be a barberry eradication expedition on GOSA properties.

So, please don't plant barberry in your yard, and if you already have it, get rid of it!* Native species such as winterberry, bayberry, and inkberry have many of the same attributes of Japanese barberry without the plant's invasive proclivities.

Density of ticks with *Borrelia burgdorferi*, the causal agent of Lyme disease



Barberry-infested forest– 120 ticks per acre; forest without barberry, 10 ticks per acre.

Source: [Japanese Barberry Control Methods](#), Feb. 2013 Bulletin.

Is The Grass Always Greener? Assessing Lawn Care Practices Of Connecticut Residents

By Syma Ebbin with help of students¹ in Agriculture and Resource Economics 3434 Fall 2014

Although I love to garden, I'm not one of those people who care about their lawn. I can spend an entire weekend rooting around and weeding my vegetable and flower gardens, but I must admit I have NEVER weeded my lawn. Never! I actually admire the little blue violets, veronica, speedwell, gill-over-the-ground and other broad-leaved interlopers. All right, perhaps I don't love the bright yellow dandelions that grow in it – but that is only because they clash with my aesthetic sensibilities. I also admit to having never fertilized my lawn and, perhaps sheepishly, note that I have yelled at my husband for broadcasting grass seed near my flower garden. That grass is a formidable weed in its own right.



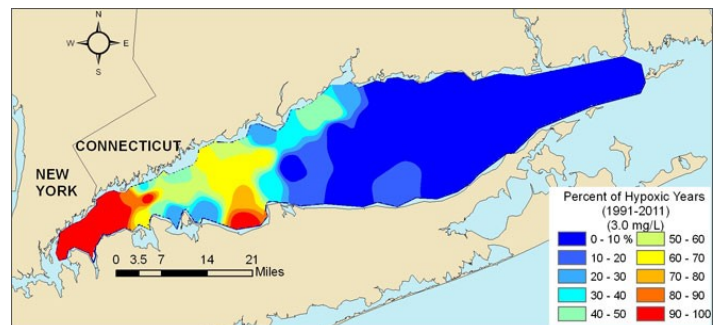
organisms consume the phytoplankton and oxygen in a process called eutrophication. In severe cases, the low oxygen level—technically called hypoxia when the level of DO falls below 3.5 mg/l—can harm, even kill, aquatic animals, and is a cause of “dead zones,” which are found in marine waters throughout the world. In addition to these ecological impacts, data from the National Oceanic and Atmospheric Administration shows that nutrient pollution has significant negative economic impacts as well, estimated to cause over \$100 million each year in losses due to reduced values of commercial and recreational fisheries, tourism, and real estate, as well as public health costs.

But I must face facts. Many among us, perhaps even most, are lawn lovers—people who love nurturing their lawns and who luxuriate in their grassy green perfection. The U.S. has between 30 and 40 million acres of lawn which generate about \$40 billion in annual spending. And so, as we all heave a collective sigh of relief that the mounds of snow that amassed this winter have disappeared and our bedraggled lawn is finally visible, I know some of you are chomping at the bit to show your lawn a little love. This appears to be an opportune time to discuss the impacts of said lawn-love on the waters of Long Island Sound.

Lawn love requires regular mowing, raking, watering, and more to the point of this discussion, utilizing a combination of chemicals: fertilizers and pesticides, to obtain the richest, greenest monoculture of grass possible. It is these chemical amendments that are most problematic in degrading water quality. And in this article I'm going to zero in on the use of fertilizer. Fertilizer seems like a good thing when you're envisioning lying in lawn chairs, sipping cocktails and enjoying your lush lawn amid the warm winds of summer. But when propelled by rain, wind, and even snow, that mobilized fertilizer can feed the wrong type of plants in places far beyond your yard.

Fertilizer contains chemical variations of the primary macronutrients: nitrogen and phosphorus (usually forms of ammonia, ammonium nitrate and phosphates), which play a similar role in aquatic systems as they do in your lawn or garden, helping to boost plant growth. In coastal aquatic systems, the plants being fertilized include phytoplankton, microscopic single-celled floating algae that photosynthesize, and they respond to the presence of fertilizer by rapidly reproducing. This spike in growth, perhaps somewhat unexpectedly, eventually causes severe declines in the water's dissolved oxygen (DO) as bacteria and other

Nutrient pollution² is actually one of the top water pollutants in the U.S. and a primary cause of impaired water quality nationwide. Although the Clean Water Act (CWA) of 1972 aimed to make all U.S. waterways fishable and swimmable by 1985, it has been most effective at reducing discharges coming from point sources, that is the effluent emerging from discrete outlets. However, nonpoint source pollution has proven to be more problematic to control because of its diffuse sources. The 1987 amendments to the CWA required states to develop plans to address nonpoint source pollution but it remains an elusive goal, despite the EPA requirement that states develop a Total Maximum Daily Load (TMDL) for each nonpoint source pollutant that reaches an impaired water body.



Spatial extent of Hypoxia in Long Island Sound (1991 -2011).
Source: CT DEEP

Long Island Sound is overfertilized and suffering from summertime hypoxic conditions, which tend to begin in the western Sound and spread eastward. The genesis of hypoxia in the western Sound is thought to be due to a combination of factors: large concentrations of humans and their associated bodily byproducts—think sewage—some of which is inadequately treated or fed into antiquated drainage systems that spew a stew of sewage and stormwater into or receiving water bodies during storm

events; and the presence of four small but deep basins which trap fine organic sediments that stratify thermally during the summer inhibiting oxygen from the surface from mixing with deeper waters.

Long Island Sound is unique in having two connections to the sea: the East River provides a link to the estuary of the Hudson River, and at the other end of the Sound, the Race is the site of the largest exchange of water. The Sound is also fed by several large rivers: the Connecticut River is the largest source, contributing approximately 75% of the measured freshwater flow, but other rivers, such as the Thames, Housatonic, and Quinnipiac also discharge into the Sound. This combined watershed reaches north into Canada, draining almost 17,000 square miles of urban, industrial and agricultural lands (a number which does not include the watershed area of the Hudson), greatly expanding the geographic reach of the point and non-point contaminants which find their way to the Sound.

The EPA considers the Sound to be an impaired water body due to reduced dissolved oxygen levels and excessive algal blooms. Part of this problem involves the transformation of the porous surfaces of the natural landscape to impervious ones like roads, parking lots and buildings, which collect polluted run-off and send it quickly by storm drain into our waters. Another important part of the story is our love affair with lawns. UConn Center for Land Use Education and Research data shows the incremental but steady increase of impervious surfaces and lawns as a percentage of Connecticut's land cover over the past decades, increasing by 2.9 and 1.5% of the state's land area respectively.



[Satellite image of sediment laden waters of the Connecticut River and LIS on Sept. 2, 2011 following Hurricane Irene.](#)
Source: NASA Earth Observatory

Scientists have developed nitrogen-loading models (NLM) which seek to understand and predict the process of eutrophication in Long Island Sound and its embayments. The Long Island Sound Study funded Dr. Jamie Vaudrey at UConn's Department of Marine Sciences to assess the eutrophication status and nitrogen inputs in 50 embayments. To this end, she is employing the NLM

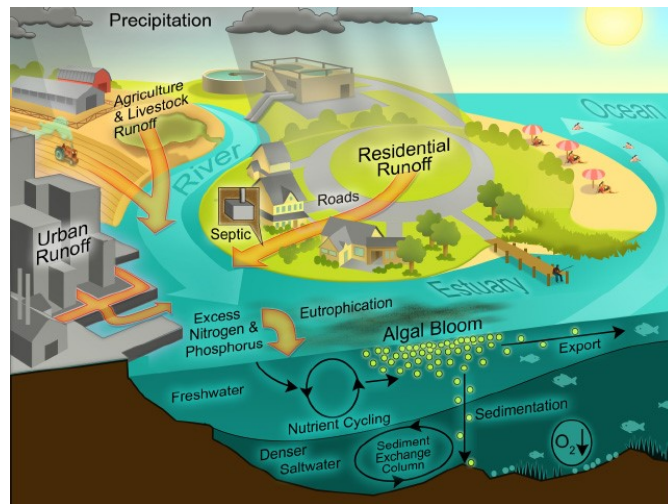


Diagram of the various pathways of nutrient inputs into coastal waters and processes leading to eutrophication and hypoxia. Source: WRI; Image credit, Hans W. Paerl, 2006

which includes three main nitrogen inputs: wastewater, atmospheric deposition and fertilizer applications.

Researchers have a limited understanding of residential applications of fertilizer. Few studies have been conducted and existing estimates vary by location and time. This seemed like a great project for my students to work on. So in the fall of 2014, 14 students in my Environmental and Resource Policy class at Avery Point UConn helped develop and conduct a survey to assess lawn care practices and quantify the use of fertilizer among residents of Connecticut. By the end of the semester, 116 individuals had completed the survey, representing 41 unique municipalities, including several village subdivisions. Ninety-eight percent of the individuals surveyed had a lawn or garden where they lived which was maintained by household members (81%), landscaping services, or jointly by both. The NLM uses data specifically from residents who live within 200 meters of a fresh or saltwater body. So this spatial delineation was explored. Thirty-one percent interviewed lived within 200 meters of saltwater and 47% lived within 200 meters of freshwater.

Overall, about half of all those interviewed (51%) do fertilize their lawns, either by themselves or with the help of a lawn service. This rose to nearly 60% for those living within 200 meters of freshwater and dipped to 44% for those living within 200 meters of salt water. Not surprisingly, the size of lawns near freshwater are much larger than those near saltwater. Regular soil testing was conducted by only 10% of respondents. When needed, a standard fertilizer application is about one pound of nitrogen for every 1000 sq. ft. of lawn. Most noted that they follow the directions on the fertilizer bag (80%), while 8% added more, and 12 % added less. The most common schedule for lawn fertilizing was two to three times a year (32%), but some fertilized more frequently: every month or two (11%) or even weekly (2%). At least some residents fertilize their lawns every month of the year. Some

fertilized their lawn throughout the year, but the most common months to fertilize were April (64%), May (41%), and June (38%), and July, August and September were tied at about 25 % each.

The most commonly used fertilizer was chemically derived (as opposed to slow-release or organic), and the favored brand was Scott's. Most residents leave grass clippings on the lawn. About half water their lawns, the timing of which was mostly dependent on weather. Quite a number used other chemicals on their lawns including herbicides (i.e. Round-up and Preen), pesticides (i.e. Grubex), and lime.

The data we collected showed that Connecticut residents use less fertilizer than residents in other states but more than had been estimated in a previous study conducted by researchers at Stony Brook University in 2006. The data was supplied to Dr. Jamie Vaudrey for incorporation into her model. She found the fertilizer survey data to be very useful and is planning to include it in her future modeling efforts. She believes the data will help refine our understanding of eutrophication in the Sound and its embayments. There is additional interest in the data by individuals who conduct outreach efforts aimed at educating residents about environmentally sound lawn care and ways to improve water quality in Long Island Sound.



UConn students at Jordan Cove development looking at low-impact development techniques in Waterford.

So by now, I can practically hear you asking: what constitutes safer lawn love? Fair question and there are a suite of environmentally sound approaches that will not only keep your lawn looking luxuriant, but also help keep the Sound healthy. The EPA has recommended lawn care practices for individuals who want to encourage both a healthy lawn and environment. (See Recommended Lawn Practices box at right.)

The bottom line is that lawn love can be practiced in ways that don't degrade our streams, lakes and estuaries. So, remember to practice safe lawn love this spring, and we'll all have a cleaner Long Island Sound to play in this summer.

Recommended Lawn Practices



- Develop healthy soil
- Mow high (around 3" or so), often, and with sharp blades
- Water deeply and slowly (without overwatering) but not frequently
- Address thatch buildup
- Get your soil tested and then apply the correct type and amount of fertilizer indicated
- Choose slow-release (also called water insoluble) and organic fertilizers
- Fertilize no more than twice a year and not during times when your lawn appears to be dormant such as the summer and winter
- Don't fertilize when you know a heavy rain is coming and similarly, don't overwater after fertilizing
- Never fertilize impervious surfaces (such as your sidewalk), water bodies or frozen ground
- Use lawn trimmings and compost to enrich your soils
- Reduce your lawn size, and leave unmowed or shrubby buffer zones in areas adjacent to waterbodies
- Welcome weeds like clover which help add nitrogen to the soil though their symbiotic bacterial nitrogen-fixing friends
- Choose the grasses most suited to your climate (around here that might be fine fescues).

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