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Is the Grass Always Greener? Assessing Lawn Care Practices of Connecticut Residents


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Is the Grass Always Greener? Assessing Lawn Care Practices of Connecticut Residents

by Syma Ebbin

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Although I love to garden, I'm not one of those people who cares 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.

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 US has between 30 and 40 million acres of lawn which generates 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. 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 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 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 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 (<http://stateofthecoast.noaa.gov/hypoxia/impacts.html>).

Nutrient pollution is actually one of the top water pollutants in the US and a primary cause of impaired water quality nationwide. Nutrients are only one type of a broad class of pollution called nonpoint source pollution, which includes all the diffuse pollutants generated collectively through our daily actions, carried in runoff, and which end up in our fresh and saltwater bodies. These include various nutrients and organic wastes, together called biostimulants, as well as oil, toxins, pathogens, plastics, sediments, among other compounds.

The Clean Water Act of 1972 (CWA) aimed to make all US waterways fishable and swimmable by 1985. The CWA 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



Sediment-laden waters spewing from the Connecticut River after Tropical Storm Irene in August 2011 create a striking demonstration of the movement of non-point source pollutants from land to Long Island Sound. (Source: NASA; <http://earthobservatory.nasa.gov>)



A grassy swale and pervious pavers at the Jordan Cove subdivision, built using low impact development techniques

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 accomplishment, despite the Environmental Protection Agency (EPA) requirement that states develop a Total Maximum Daily Load (TMDL) for each nonpoint source pollutant that reaches an impaired water body.

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

The Sound is fed by several large rivers: the Connecticut River is the largest source, contributing approximately 75 percent 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 that cover the landscape with impervious ones like roads and buildings which collect polluted runoff and send it quickly via storm drains into the Sound.

Another part of the story is our love affair with lawns. UConn's Center for Landuse Education and Research (CLEAR) data shows the incremental increase of both types of land cover in Connecticut over the past decades, increasing by 2.9 and 1.5 percent of the state's land area respectively (<http://clear.uconn.edu/projects/landscape/statewide.htm>).

Scientists have developed nitrogen-loading models (NLM) which seek to understand and predict the process of eutrophication in Long Island Sound and its embayments. Jamie Vaudrey, a researcher at UConn's Department of Marine Sciences, is assessing eutrophication and nitrogen inputs in 50 embayments. To this end, she is employing the nitrogen model 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. So in the fall of 2014, the students in my Environmental and Resource Policy class at Avery Point UConn helped develop and conducted a survey to assess lawn care practices and quantify the use of fertilizer among residents of Connecticut. I invited my neighbors to complete the survey as well.

By the end of the semester, 116 individuals, representing 41 unique municipalities, including several

village subdivisions had completed the survey. Ninety-eight percent of the individuals surveyed had a lawn or garden where they lived which was maintained by household members (81 percent), landscaping services, or both. The NLM uses data specifically from residents who live within 200 meters of a fresh or saltwater body, so a spatial analysis was conducted. Thirty-one percent interviewed lived within 200 meters of saltwater and 47 percent lived within 200 meters of freshwater.

Overall, about half of all those interviewed (51 percent) do fertilize their lawns, either by themselves or with the help of a lawn service. Of those living near saltwater, this dipped to 44 percent, of which 19 percent used a lawn service. This situation differed for residents near freshwater where 59 percent fertilized and only 11 percent used a lawn service. Additionally, the size of the fertilized lawn area differed markedly between the saltwater and freshwater residents. Saltwater residents tended to have smaller fertilized lawns, 43 percent ranged from 200-500 sq. ft., 25 percent were 500-1000 and only 19 percent were over 1000 sq. ft. Freshwater residents had larger fertilized lawns on average, with the largest number fertilizing lawns greater than 1000 sq. ft. (34 percent), 31 percent fertilized 500-1000 sq. ft., 28 percent fertilized 200-500 sq. ft. Connecticut residents living near saltwater have smaller lawns, are less likely to fertilize these lawns and more likely to use the help of a lawn service compared to their freshwater counterparts.

Regular soil testing was conducted by only 10 percent of respondents and 82 percent had never had it tested. When needed, a standard fertilizer application is about one pound of nitrogen for every 1000 sq. ft. of lawn. Chemically derived fertilizers (as opposed to slow-release or organic) were favored and most (80 percent) followed the application

directions on the fertilizer bag, while 8 percent added more, and 12 percent added less. The most common schedule for lawn fertilizing was two to three times a year (32 percent), but some fertilized more frequently: every month or two (11 percent) or weekly (2 percent). Some residents even fertilize their lawns monthly but the most common months to fertilize were April (64 percent), May (41 percent), June (38 percent), July, August and September were tied at about 25 percent each. 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, pesticides, 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 2006 study conducted by researchers at Stony Brook University. Our data was supplied to Jamie Vaudrey, who commented that the data will help refine understandings of eutrophication in the Sound and its embayments and is planning to include it in future modeling efforts. There is also interest in the results 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.

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 in the spring, and you'll have a cleaner Long Island Sound to play in this summer and next.

ABOUT THE AUTHOR:

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What constitutes safe lawn love?



- Develop healthy soil
- Choose grasses suited to your climate (around here that includes varieties of fine fescues)
- 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
- 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, 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
- Welcome weeds like clover which add nitrogen to the soil through their symbiotic bacterial nitrogen-fixing friends
- Reduce the size of your lawn
- Leave unmowed or shrubby buffer zones, especially adjacent to waterbodies.

