Sound UPDATE
Newsletter of the Long Island Sound Study - Fall 2012

What are toxic contaminants and pathogens and why do they matter in the estuary?

By Sarah Deonarine

Nancy Balcom

Seafood such as oysters, clams, and sea scallops are among the local products available to Connecticut and New York consumers.

Toxic contaminants and pathogens enter the Sound from a variety of pathways and have a number of environmental and human health effects. Toxic contaminants and pathogens can move through the food web and concentrate in fish and shellfish tissues. When humans and other predators consume contaminated fish and shellfish, there is the potential for health problems, such as neurological damage and low fertility rates.

Toxic contaminants in the Sound include so-called "legacy" contaminants that stem from the Sound's manufacturing history (see page 3) or contaminants that are still released from current manufacturing plants, sewage treatment plants, improper disposal, chemical spills, and other anthropogenic sources. Examples of toxins in the Sound include heavy metals, DDT (dichlorodiphenyltrichloroethane) and PCBs (polychlorinated biphenyls). A once popular pesticide, DDT, was shown to have human health and environmental side-effects and was, subsequently, banned in 1972. PCBs are manufactured organic compounds used in industry that have the potential for causing neurological and reproductive problems. The use of PCBs was banned in 1979, but they still show up in fish tissues. Despite its persistence in the environment, recent research, funded by the Long Island Sound Study and conducted by NYSDEC, with help from CTDEEP, has shown that levels are decreasing in fish tissues. Fish consumption advisories were recently revised pursuant to these findings (see page 4).

Scientists are also learning about new biological toxins that have emerged in the Sound ecosystem, such as red tides, caused by the proliferation of certain species of microscopic plants, known as phytoplankton. These harmful algal blooms can produce large amounts of a potentially deadly neurotoxin, state agencies closed shellfish beds in Long Island Sound for fear of human health risks associated with shellfish consumption (see page 2).

Pathogens are harmful bacteria and viruses that cause diseases, sometimes naturally occurring, that can enter a Sound ecosystem from practices on land. Elevated levels of pathogens in the environment close beaches for swimming and shellfish beds for harvesting, which can have negative economic impacts. Increased development in a watershed also leads to increases in both toxic contamination and pathogens in the estuary.

Pathogens are found in human and animal waste. Pet waste, for example, that is inappropriately disposed of in storm drains or is left on the ground and then washes into Sound tributaries during rain events, is one source of pathogens, as is waste from local birds and other wildlife. In parts of New York City and Connecticut, localities

Continued on page 4.

Toxics and Pathogens Issue

Sound Update provides readers with news about the Sound and the Long Island Sound Study.

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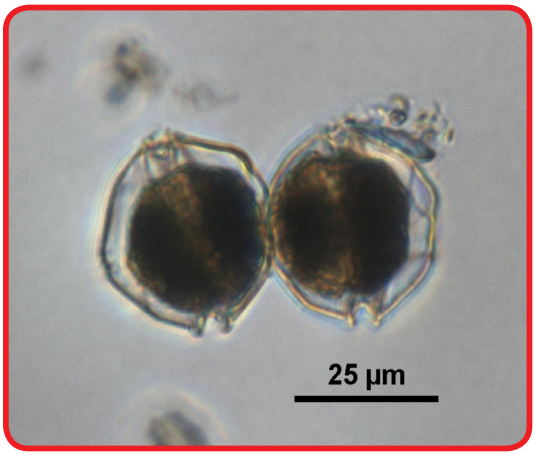
Pathogen and toxic contamination in Long Island Sound

This issue of *Sound Update* focuses on pathogen and toxic contamination in the Sound. These contaminants can threaten public health and negatively impact the economy. See the back of the cover to learn how you can help reduce contaminants in Long Island Sound.

Continued expansion of biotoxin closures of Long Island Sound shellfish bed

By Chris Gobler, PhD



Theresa Hattenrath-Lehmann

Alexandrium **cells** can accumulate in shellfish tissues, causing state agencies to close affected fisheries.

Microalgae known as dinoflagellates are a common component of marine ecosystems. Since they contain a reddish pigment, elevated densities of these dinoflagellates can turn waters red, hence they are sometimes referred to as "red tides." A decade ago the words "red tide" would invoke images of marine environments far to the north or south of Long Island Sound (LIS), such as the Gulf of Maine or the Gulf of Mexico.

Since 2006, red tides have become annual occurrences in LIS waters with the associated consequences going far beyond discolored water. Specifically, red tides in LIS have been caused by the toxic dinoflagellate *Alexandrium*, which produces saxitoxin. Shellfish such as clams, oysters, and mussels accumulate saxitoxin in their tissues by filter feeding in regions with high densities of *Alexandrium*. In humans, high levels of saxitoxin can cause paralytic shellfish poisoning, or PSP. In order to protect the public, state health agencies close shellfish beds subject to *Alexandrium* blooms from harvest. In fact, this particular dinoflagellate is potent enough to cause PSP events at low cell densities that do not even discolor LIS waters. More recently NY has expanded their fishing closures to include carnivorous gastropods such as conchs (whelks), which feed on saxitoxin contaminated shellfish and subsequently accumulate these toxins in their tissues as well.

The saxitoxin produced by *Alexandrium* is a neurotoxin that can bind in mammalian sodium channels, causing PSP. Human symptoms of PSP include tingling, fatigue, weakness, paralysis, and even death. Because of the serious human health threat posed by PSP, the US Food and Drug Administration has established a standard of 80 micrograms of saxitoxin per 100 grams of shellfish tissue. Shellfish with saxitoxin concentrations above this standard are unfit for human consumption necessitating the closure for shellfish beds. Shellfish with these levels were first recorded in LIS in 2006 when the New York State Department of Environmental Conservation (NYSDEC) detected elevated levels of saxitoxin in mussels collected from Northport Bay, NY. While these toxins were not detected in 2007, during every year since then (2008 – 2012) more than 7,200 acres of shellfish beds across all of Huntington and Northport Bays were closed to shellfishing by the NYSDEC due to PSP contamination of bivalves, sometimes with saxitoxin levels of more than 1,000 micrograms per 100 grams of shellfish tissue an order of magnitude above the closure limit.

Recent research by the Gobler laboratory at Stony Brook University has revealed multiple factors that have contributed to the recurrence and intensification of PSP events in LIS. Dinoflagellates are known to form cysts, or seeds, that lie on the seafloor and await ideal conditions to form red tides. While low densities of *Alexandrium* cysts can be found in most LIS sediments, Northport Bay has witnessed an order of magnitude increase in the densities of cysts in its sediments during the past five years, which means that there is a cyst population that can continually re-seed Northport Bay each year to cause these toxic *Alexandrium* blooms. Research has also demonstrated that enhanced nitrogen loading from wastewater sources such as sewage treatment plants, septic tanks, and cesspools promotes the intensification of *Alexandrium* blooms. The region that experiences the most intense blooms in LIS, Northport Harbor, receives discharges from a sewage treatment plant as well as discharges of groundwater that is enriched with nitrogen from septic tanks and cesspools. Another factor that is important in bloom occurrence is physical circulation of water or, more specifically, the lack of circulation, which can not only allow *Alexandrium* cells to accumulate as they grow but also prevent the flushing of these nitrogen-rich waters that fuel these blooms.

Karen Graulich

Water samples that will be tested for *Alexandrium* cells are filtered by Stony Brook University graduate students, Ryan Wallace and Theresa Hattenrath-Lehmann.

In 2012, Northport was not the only site in Long Island Sound to experience a PSP event. During April, a bloom of *Alexandrium* in Mattituck Inlet and Creek, in Mattituck, NY, caused shellfish in this region to accumulate levels of saxitoxin over the FDA regulatory limit. On April 3, 2012, this region, which encompasses ~100 acres of shellfishing grounds, was closed by the NYSDEC and it remained closed through the month. This was the first ever PSP shellfish bed closure in Mattituck and only the second location to be closed due to PSP on Long Island Sound. This finding suggests that PSP is expanding in NY and in Long Island Sound. Further evidence of this PSP expansion was found in Shinnecock Bay and Sag Harbor Cove, NY, which were closed for the second and first time ever, respectively, in the spring of 2012. Given that *Alexandrium* cells have been detected at more than 40 sites across the NY and CT coastlines of LIS from Little Neck Bay, NY, to the Mystic Harbor, CT, there exists the potential for *Alexandrium* blooms to continue to expand in the future.

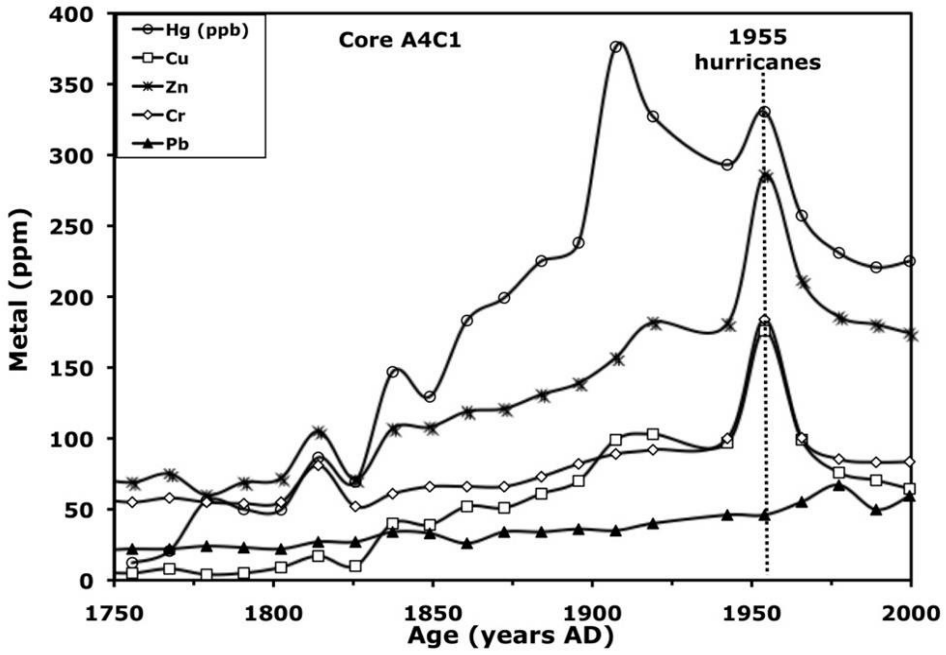
Gobler is a professor at the School of Marine and Atmospheric Sciences at Stony Brook University in Stony Brook, NY.

Long Island Sound in the 21st century: Cleaner but some problems linger

By Johan Varekamp, PhD

Long Island Sound (LIS) is surrounded by New York and New England states that were at the heart of the industrial revolution in the 1800s and 1900s. Today, more than 9 million people live in the watersheds that drain into LIS. As expected, many of the waste materials from those industries and from society have accumulated in the Sound and its sediment. A major artery of pollution was the Housatonic River where much of the US brass industry was active until the mid-1900s. During low water flow, the Housatonic River turned blue green in the 1950s from all the dissolved copper. As a result, the sediments in the mouth of the Housatonic River and adjacent delta in LIS are loaded with copper, zinc, and chromium from the metal industries in the uplands.

The Danbury hatmaking industry, where mercury nitrate was used to make felt from beaver and rabbit fur, added mercury to this mix. The sediment in the coastal marshes and in the Sound, itself, are enriched with this "hatting" mercury. The hatmaking industry of Norwalk, CT, also discharged mercury into the Sound, leaving the sediment of central and western LIS strongly contaminated with this toxin. Most of these industries have disappeared by now, which, together with much more stringent discharge rules, have diminished the influx of metals from rivers into the Sound by orders of magnitude.



Heavy metals such as mercury (Hg), copper (Cu), zinc (Zn), chronium (Cr), and lead (Pb) concentrations have decreased in recent years according to core samples that researchers have collected. The graph above shows the concentration of these metals over the past 350 years (ppm = parts permillion and ppb = parts per billion).

Wastewater treatment plants are still a source of metals, and some areas in western LIS show strong metal enrichments from the major wastewater treatment plants along the East River (NYC) and western LIS. These enrichments are also enhanced by the deposition of predominantly fine-grained material, which tends to be metal enriched compared to more sandy sediments. Some of the harbor areas next to the larger cities in Connecticut also have metal-rich sediment from local industrial sources.

During major hurricanes and extended wet periods, floods can mobilize many of these legacy pollutants that are stored in the watershed by carrying plumes of heavily polluted sediment into the Sound. The floods of the mid-1950s caused small metal enrichment spikes in the sedimentary record because of this remobilization of heavily polluted sediment, and future hurricanes will continue that trend. Nonetheless, metal concentrations in sediment cores from LIS show convincingly that the concentrations of many of the metallic pollutants have decreased significantly over the last half century.

Are these "old pollutants" still a threat to the LIS biota and ultimately to consumers of the fish and shellfish of the Sound? The heavy metals copper and zinc are fairly well buried in the sediment and not likely to be remobilized by chemical processes. The carbon-rich sediment of the Sound creates a reducing environment in the sediment pore waters, which leads to the reduction of sea water sulfate into sulfide and precipitation of iron-sulfide minerals. These sulfides may co-precipitate some of the lead, zinc, copper, and even mercury, but not chromium. Once locked up in the sulfides, these metals are rather immobile and unlikely to be bioavailable. If the sediment is stirred up, for example during dredging or pipeline constructions across the Sound, the sulfides may be exposed to open seawater, where the sulfide mineral may oxidize and release its toxic burden once more.

The fate of legacy mercury is more complex. Inorganic mercury is strongly bound to organic matter and fine-grained iron rich oxides, but bacterial reactions can still access part of this stored mercury. Inorganic mercury is not as toxic as its organic compounds and the bacterial reactions produce methylated mercury compounds (monomethyl-Hg and dimethyl-Hg) that are very bioavailable. The main pathway of environmental mercury to humans is through this methylated mercury after uptake in the ecosystem, ending up in some of the larger fish species at elevated concentrations (up to 1 ppm mercury based on wet weight of fish tissue), whereas the USEPA considers 0.3 ppm mercury as a safe cutoff value. Most shellfish do not take up mercury in large amounts and small fish have much lower mercury concentrations as well. A detailed study of modern mercury cycling in LIS showed some surprising results: inorganic oxidized mercury in the water column can be reduced to elemental dissolved mercury, which can exchange with the atmosphere. This means that mercury that originally was supplied to LIS from point sources may be end up being recycled as elemental mercury vapor in the atmosphere and fall out again. The flux of mercury from atmospheric deposition is about 30 percent of this elemental mercury evasion flux, making LIS an incubator of active pollutant mercury. Some of the mercury in the Sound will thus never find a final resting place but remains a mobile contaminant.

Varekamp is a professor in the Earth and Environmental Sciences Department at Wesleyan University in Middletown, CT.

Continued from page 1.

have one system to transport both household sewage and rainwater from storm drains for treatment by the sewage treatment plant. During heavy rains, these pipes can become overburdened and the mixture of rainwater and sewage is sent directly into the environment, completely bypassing a treatment system. This is commonly referred to as a "CSO" or combined sewage overflow. Pathogens can also enter the Sound from boat holding tanks and on-site waterwater treatment systems such as cesspools and septic tanks that are functioning improperly.

Despite the difficulties faced, there have been improvements. EPA tracks industrial discharges of chemicals and maintains the Toxics Release Inventory (TRI). This inventory has shown a significant decline (more than 90%) in chemical discharges since the late 1980s. Additionally, the NOAA-conducted "Mussel Watch" program, which monitors the levels of chemical and heavy metal contamination in blue mussel tissue, has also demonstrated a decline at several NY sites along the Sound.

To reduce the amount of pathogens, the entire Sound has been designated as a vessel waste no discharge zone (see page 6) and cities with CSOs are implementing plans to decrease untreated discharges, protecting the estuary from these sources of pathogens. And, as we learn more, people are becoming more aware of how their actions impact the health of the Sound and, ultimately, the health of everyone. For information on what you can do to help human and environmental health, see the back cover of this issue.

Deonarine is the NY Long Island Sound Study Coordinator with NYSDEC in East Seatauket, NY.

Enjoying de fruits de mer… safely

By Nancy Balcom

One of the benefits of living near Long Island Sound is the availability of locally caught or produced seafood, such as oysters, clams, striped bass, blackfish, flounder, and blue crabs. Recreational fishermen, commercial fishermen, and shell fishermen ply the waters of the Sound daily to retrieve its bounty.

Seafood is a source of top-quality protein, contains all nine essential amino acids, and is highly digestible. It is a source of important minerals such as calcium and vitamins like niacin, B12, and B6. Depending, of course, on how you coat it or what you douse it with, seafood is typically low in fat, cholesterol, and sodium. Fish oils found in oilier species like herring, salmon, and tuna, contain large amounts of highly unsaturated fatty acids, known as omega-3 fatty acids, that humans require and can only get through their diet. Omega-3 fatty acids have been associated with cardiovascular improvements and a decreased risk of heart attacks, as well as with positive effects on the neurobehavioral development of children born to mothers that consume fish high in omega-3s during pregnancy.

Fish consumption advisories

For seafood caught in Connecticut waters, visit www.ct.gov/dph and search for "fish consumption advisory"

For seafood caught in New York waters, visit http://www.dec.ny.gov/outdoor/7736.html

Nancy Balcom

A commercial fisherman unloads iced fish, which will appear in local and regional seafood markets.

The most recent dietary guidelines issued by the US Departments of Agriculture and Human Health and Services recommend increasing the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry. They also recommend that pregnant and breastfeeding women consume 8 to 12 ounces of seafood per week from a variety of sources. For more information, see www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/PolicyDoc/PolicyDoc.pdf.

While enjoying the health benefits of a diet that includes a variety of seafood products, consumers need to be cognizant that eating certain species has inherent risks, particularly for those people included in what are considered "high-risk" populations. Women who are pregnant or nursing, children, and anyone with compromised health should pay particular attention to the sources and types of fish or shellfish they eat. How do you know what is safe to eat? The first rule of thumb is to follow the old adage, "Variety is the spice of life." Avoid eating the same kind of seafood all the time - mix it up by trying new kinds of fish or shellfish. The same principle could be applied to any kind of food. Second, follow the guidance issued by every state and the federal government in the form of fish consumption advisories. These advisories help consumers make good decisions by indicating which fish carry health risks, such as high levels of mercury or other contaminants, and by recommending how much, if any, can be safely consumed, how often, and by whom. The advisories relate to specific species and/or specific waterbodies, and may also include guidance on seafood commonly purchased in stores.

A diet that includes a variety of fish and shellfish has definite health benefits, so eat more and more often! However, because certain types of seafood, from Long Island Sound or elsewhere, have associated risks that outweigh any health benefits, particularly for high-risk consumers, be sure to follow the guidance provided in fish consumption advisories to help you make the best decisions for yourself and your family.

Balcom is the Associate Director of Connecticut Sea Grant in Groton, CT.

Naturally-occurring bacteria threat in the Sound

By Kristin DeRosia-Banick

A number of states, including New York and New Jersey, faced illness outbreaks related to shellfish consumption during the summer of 2012. These outbreaks were caused by elevated levels of *Vibrio parahaemolyticus* in shellfish, a marine bacterium that is always present in the marine environment, but not typically at levels that are harmful. These elevated levels were a consequence of the early spring and extremely warm water temperatures this year in many parts of the country. Consumers can be exposed to these disease-causing bacteria by eating raw or undercooked shellfish, including oysters, clams, lobster, and crab, or through cross-contamination. The Centers for Disease Control has reported a 115% increase in the incidence of illnesses caused by Vibrio bacteria between 1996 and 2010. This increase includes wound and systemic infections related to contact with contaminated seawater in addition to foodborne illnesses.

The symptoms of *V. parahaemolyticus* infection include diarrhea, stomach cramps, nausea, vomiting, headache, fever, and chills. The symptoms usually appear 12-24 hours after eating contaminated shellfish and can last two to seven days. *Vibrio* infections can be life threatening for immune-compromised people or those with chronic liver disease, individuals who regularly take antacids, heart or diabetes medication, or those who have recently had antibiotic or cancer treatments. *V. parahaemolyticus* can also cause an infection of the skin when an open wound is exposed to warm seawater. Consumers who think they might have become ill from eating raw or undercooked shellfish should consult with their health care providers for appropriate follow-up and treatment.

Naturally occurring bacteria such as *Vibrio* present a challenge for regulators. The Connecticut Department of Agriculture's Bureau of Aquaculture is the shellfish authority for the state and performs standard bacteriological seawater and shellfish tissue analysis using fecal coliform bacteria as an indicator for classification of shellfish growing areas. Traditional indicators such as fecal coliform, used to identify the presence of sewage contamination, do not correlate to levels of *Vibrio* in the growing areas. This is because *Vibrio* bacteria occur naturally in the estuarine environment and, unlike fecal coliforms, they are not introduced via pollution sources such as storm water runoff or sewage.

Additional methods of testing for naturally-occurring bacteria are becoming increasingly necessary to ensure that shellfish continue to be a safe food source. Advances in molecular technologies have recently allowed shellfish control authorities to apply polymerase chain reaction (PCR) techniques to the identification and enumeration of naturally occurring marine bacteria such as Vibrio.

The Bureau of Aquaculture intends to apply these new technologies to Connecticut shellfish growing areas to develop a better understanding of *Vibrio* levels and their correlation to a variety of environmental parameters such as depth, salinity, and temperature. The data will be used to provide management recommendations to commercial shellfish harvesters, enabling companies to continue harvesting safely even during periods when elevated levels of the bacteria exist in specific areas.

The state of Connecticut took proactive measures in response to the unfolding *Vibrio* situation. The Bureau of Aquaculture instituted innovative management practices to prevent *Vibrio* illness outbreaks from occurring. These measures included a mandatory educational seminar in March for licensed shell stock harvesters and dealers, testing for *Vibrio* in commercial shellfish growing areas, and closing to harvest those areas which showed elevated levels of the bacteria. The bureau collaborated with commercial shellfish growers to establish *Vibrio* control plans for their operations to prevent proliferation of this bacteria and related illnesses, while allowing harvesters to continue working safely. To date, there has been no outbreak of *Vibrio* illness related to shellfish harvested in Connecticut.

The Bureau of Aquaculture continues to monitor shellfish growing areas for *Vibrio* as we head into the fall, and expects to see a decline in levels as water temperatures begin to decrease. By working cooperatively with harvesters, we strive to stay ahead of emerging public health threats such as *Vibrio* bacteria and to keep shellfish consumers safe while enjoying the bounty of Long Island Sound.

DeRosia-Banick is an Environmental Analyst II for the State of CT Department of Agriculture Bureau of Aquaculture in Milford, CT.

What can you do to protect yourself from illness caused by *Vibrio* bacteria?

Guidance for Shellfish Consumers:

- Consumers should only purchase shellfish from reputable dealers who have good practices for handling and refrigerating shellfish.
- Shellfish should be stored at temperatures below 45°F until consumed.
- Shellfish should be cooked to an internal temperature of 145° F for at least 15 seconds to kill the bacteria. The practice of steaming shellfish just enough to cause the shells to open is not long enough to kill *Vibrio* bacteria.

Guidance for Recreational Shellfish Harvesters:

- Individuals who harvest shellfish recreationally should harvest only from permitted areas.
- Call your local authority to check the current status of areas before harvesting.
- Never harvest from a closed area.
- During the months of concern, anyone harvesting shellfish recreationally should bring a cooler and immediately place harvested shellfish on ice.

Find additional recommendations for harvest and proper handling of shellfish by visiting www.ctgrown.gov/aquaculture and clicking the "Recreational Shellfish Harvesting and *Vibrio*" link.

Jessica. Jones, Research Microbiologist FDA Gulf Coast Seafood Lab

Shellfish tissue samples are tested for *Vibrio* bacteria at the FDA laboratory at Dauphin Island, Alabama.

Long Island Sound is now a No Discharge Zone

By Ann Rodney

A "No Discharge Zone" (NDZ) is a designated body of water in which the discharge of treated and untreated boat sewage is prohibited. As of 2011, all of the waters within Long Island Sound were designated as a NDZ.

Boat sewage discharged from boats may degrade water quality by introducing pathogens, nutrients, and chemicals into the marine environment. Pathogens may include viruses and bacteria that can cause diseases in people in contact with the water and result in beach closures and shellfish bed contamination. Nutrients are necessary for the growth of both microscopic and larger plants such as seaweeds and eelgrass. However, when nutrients become too abundant they stimulate algae blooms that may lead to the loss of eelgrass and depletion of oxygen in water (called hypoxia). Hypoxia can stress and even kill fish and other aquatic animals. Chemical products associated with marine sanitation systems can be toxic to marine and estuarine life and could pose a problem in areas where boats congregate and where there is little tidal flushing. Pathogens, nutrients, and toxics are some of the top priorities for the Long Island Sound Study.

CT Department of Energy and Environmental Protection

This "No Discharge" sign located at the entrance of a CT harbor provides helpful information about contacting a pump-out and is helpful to boaters adjusting to the new regulations.

Federal law prohibits the discharge of untreated sewage from boats within all navigable waters of the US, which includes all of Long Island Sound. The Clean Water Act requires vessels with an installed toilet to be equipped with a Coast Guard approved Marine Sanitation Device (MSD) designed to either hold the sewage for shore-side pump-out or to treat the sewage prior to discharging into the water. A NDZ requires that even treated sewage be held for shore-side pump-out.

Find a pump-out site near you!

In Connecticut: Call 1-860-424-3652 or visit http://www.ct.gov/dep/cwp/view.asp?a=2705&q=323710

In New York: Call 1-800-882-9721 or visit http://www.nysefc.org and search for the "Clean Vessel Assistance Program" Web page to find the list of CVAP-funded pumpout stations.

In 1994, CT and NY committed to designating the Long Island Sound as a NDZ. This commitment started the long-term development by both states to build the infrastructure and capacity for boaters to pump out their boat waste shore-side. Long Island Sound will benefit from having a NDZ in place so that boaters in the Sound will only have one set of rules to operate under. This will eliminate confusion regarding boat sewage and eliminates accidental discharge of untreated or inadequately treated waste from poorly maintained or non-functional MSDs. There are public health and water quality benefits for all of the citizens who use Long Island Sound.

For a NDZ to succeed in reducing vessel sewage discharges the necessary infrastructure (pump-out facilities) and institutional framework (education and enforcement) must be in place. The designation of Long Island Sound was a step-by-step process that started in 2003 and was completed in 2011.

CT Department of Energy and Environmental Protection

This responsible boater is pumping out his holding tank, using one of the pumpout boats in Long Island Sound.

The Clean Vessel Act program is a state grant program funded by the US Fish and Wildlife Service that provides grants for the installation, renovation, operation, and maintenance of pump-out facilities. A local entity like a marina, town dock, advocacy group, or yacht club provides 25 percent of the total project cost and the Clean Vessel Act pays for 75 percent. From 2010 to 2013, the states of CT and NY have received well over 2 million dollars for Clean Vessel Act programs.

Pump-out boater education is ongoing and may result in a long-term behavior change similar to the seat belt law. Both NY and CT passed mandatory front seat belt laws in the early 80s and, 30 years, later most drivers buckle up as a habit. In 1995, there were 43 boat pump-out facilities in the Sound. Fifteen years later there are 154 facilities—a four-fold increase in locations around the Sound, with more expected in the future. Pump-out facilities are available to boaters, and boaters are on the front line of advocating and knowing the value of clean water.

Rodney is an Environmental Protection Specialist with USEPA in Boston, MA.

Community-based projects to reduce human-caused toxics and pathogens

The Long Island Sound Futures Fund is a key implementation tool of the Long Island Sound Study. Since 2005, this competitive grants program has invested $8.8 million in 227 projects in communities surrounding the Sound. Many of these projects help reduce toxic contamination and pathogen pollution in the Sound. Below are some of the grants that were funded for the 2012-2013 grant cycle.

Don Riepe

Long Island Sound Futures Fund recipients pose with a giant check at the 2012 celebration.

Engaging Vineyards to Implement Water Quality Improvement
The Cornell Cooperative Extension of Suffolk County, NY will develop a state-of-the-art pest and nutrient management program to be piloted at six wineries aimed at reducing pesticide use and improving ground and surface water quality. It is expected that more than 50 percent of pesticides used by the six participating vineyards will be "low-input." Low-input pesticides are defined as: US Environmental Protection Agency (EPA) Reduced Risk, EPA Minimum Risk, or EPA Bio-pesticide. The impact of the onsite vineyard projects will be magnified through a program of education and outreach to generate broader interest among growers in using Integrated Pest Management Program strategy, and become part of a third-party certification program being developed by Long Island's viticulture industry.

Onsite Septic Training and Certification Program
The Town of Oyster Bay, NY will engage three watershed protection committees representing 34 municipalities along the north shore of Long Island focused on reducing Onsite Wastewater Treatment System (OWTS) discharges to ground water that are causing nitrogen and pathogen water quality problems in Long Island Sound. The project will conduct two training programs and a certification campaign for municipal officials and public and private OWTS professionals with the aim of raising awareness and increasing the capacity to care for and manage OWTS.

Plan for Decentralized Wastewater Treatment
Peconic Green Growth will address the problems associated with onsite wastewater treatment systems (OWTS) by designing and vetting with interested communities advanced options to treat wastewater in decentralized clustered formations. OWTS, such as cesspools and septic systems, are major sources of non-point source nutrients and other pollutants migrating into the ground and surface waters of the Sound, affecting shellfish and fisheries and the quality of drinking water. The project will consider all options to deal with wastewater failure and nutrient loading, but focus design efforts on clustered systems in established neighborhoods. The project hopes to offer decentralized wastewater clustered systems with enhanced treatment as tools to reduce the impact of OWTS on nitrogen and pathogen loading to Long Island Sound and its creeks.

Manure Digestion on a Dairy Farm to Reduce Nitrogen and Pollution
The Connecticut Farm Bureau Association will upgrade a manure digester to incorporate new technologies that reduce the equivalent of 5,928 pounds of nitrogen and 2,282 pounds of phosphorus from operations of a dairy farm near the Blackberry River, a sub-basin of the Housatonic River. Innovative management of runoff from agricultural operations is an important part of maintaining and improving water quality in Long Island Sound, especially in the Blackberry River sub-basin, where dairy farms located in the northwestern corner of Connecticut are one of the many sources of phosphorus causing cultural eutrophication and consequent low dissolved oxygen levels downstream along the Housatonic River. Freund Farm, a 270-cow dairy farm, now digests dairy manure in a plug flow digester, separates the liquid and solid manure, and then composts the solid manure. While the farm has a Natural Resources Conservation Service Comprehensive Nutrient Management Plan and is in full compliance with a Connecticut Department of Energy and Environmental Protection's Agricultural Waste Management Plan, this project proposes to upgrade their existing manure digester to further reduce nitrogen and phosphorus runoff into waterways.

For more on the other projects that were funded by the 2012-2013 Futures Fund, visit our Home page at www.longislandsoundstudy.net and click on the blue "Futures Fund" box.

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"What Can I Do" to reduce toxics and pathogens?

1 Help stop the drops. Small spills of oil, gasoline, and other pollutants may seem insignificant and difficult to avoid, but the cumulative impact can be quite damaging. By knowing how much fuel your tanks hold, not "topping off", using oil absorbent pads to catch drips, and filling up your boat's gas tanks while the boat is on the trailer, not in the water, you can help reduce the amount of toxic chemicals that are in the Sound. Visit http://www.boatus.com/foundation/cleanwater/drops/ for more information.

2 Electronics, cell phones, and batteries…oh my! These items contain hazardous chemicals and should be properly disposed. There are also many materials in these items that can be recycled. If you have an old computer, printer, or other electronic device, give it to a school, library, or donation center. If these items no longer work, be sure to properly dispose of them. Visit Earth911.com to find a recycling or disposal facility near you.

3 Properly disposing of the hazardous household chemicals. Hazardous substances from products such as paints, motor oil, antifreeze, and pesticides can end up in drinking water and Long Island Sound if they are thrown out with the everyday trash. Never pour unwanted chemicals down the drain, as it may disrupt your septic system or contaminate treatment plant sludge. Visit the EPA's website at http://www.epa.gov/epawaste/conserve/materials/ to determine what materials are hazardous to our environment and health and search Earth911.com to find the collection facility near you for proper disposal.

4 Protect your household by using less chemicals. Many chemicals commonly used around the home are toxic. Reduce the use of household chemicals by selecting less toxic alternatives and using non-toxic substitutes wherever possible. Buy chemicals only in the amount you expect to use and apply them only as directed. Remember, more is not necessarily better.

5 Don't flush those unwanted medicines. Concerns about the safety and environmental risks posed by residents who are not aware of how to properly dispose of medication has prompted some local and state governments and other organizations to initiate drug take-back programs. Visit http://www.takebacknetwork.com/ for more information.

6 The scoop on poop. Obey the law and keep untreated sewage out of all coastal and inland waters (that means using a pump-out station for your boat sanitary waste holding tank).

7 Maintain that septic tank. Improperly maintained septic systems can contaminate ground and surface water with nutrients and pathogens. Be sure to have your septic system inspected every year (not just when it backs up!), pump out your septic system every three to five years, and do not use septic system additives, as some additives may in fact be detrimental to the system and the Sound.

Sound Health 2012, our report on the health of the Sound, will be out next month. Email or call our office if you would like a copy (see bottom of page 7).

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