Clean Up Sound and Harbor: One Community's Solution to Water Quality Issues

by Tristan Kading

Clean Up Sound and Harbors (CUSH) is a grassroots environmental organization that operates out of Stonington, Connecticut, with a mission to improve the quality of the local waters.

"You know, our bacteria counts have not been too good for this site, so don't get any of that water in your mouth!" Claire Gavin shouted to me from the shore. I had taken it upon myself, as a plucky and enthusiastic young grad student, to dive in and manually collect the sediment core when the remote mechanism failed. The sight that greeted me underwater was disturbing. I knew that less than a mile away, the sea floor teemed with macroalgae and crabs, but this was another world. The shallow cove's bottom was littered with the husks of dead invertebrates and covered in a dark, rich muck that appeared to have undergone only the most minimal remineralization following emission from the abundant local waterfowl. This was a body of water that needed some TLC, and, luckily, an organization had been formed with the health of Stonington's coastal waters in mind.

Clean Up Sound and Harbors (CUSH) is a grassroots environmental organization that operates out of Stonington, Connecticut, with a mission to improve the quality of the local waters. CUSH was founded in 2007 by Stonington author Gracelyn Guyol, with the express purpose of monitoring water quality using accepted scientific techniques and raising public awareness about local watershed conservation. CUSH began by monitoring water quality in Stonington Harbor and Wequetequock Cove under the guidance of URI Watershed Watch, a volunteer organization with over 25 years' experience assisting local monitoring groups. As the years passed, the scope of the monitoring program expanded to include sites between the Pawcatuck and Mystic Rivers, with special emphasis on Wequetequock and Pequotsepos Coves. This effort has led to the recent release of a six-year report that represents the single most comprehensive anthology of publicly available water-quality data in Stonington history – and this is just the baseline study!

Volunteers who monitor the coves start their days at the whim of the sun and the moon, as sampling is timed to the tidal heartbeat of the estuary. The many hardy CUSH volunteers, after being trained and scheduled by volunteer coordinator Sally Cogan, head out before 5 AM to brave swarms of gnats intent on exploring eyes and noses. Weather, currents, and yards of swamp do not deter these intrepid sample collectors. Dataset consistency is paramount. It's not all pain, though. Who could complain about watching the sun rise over the water on a cool summer morning? Or canoeing among duck families, with osprey soaring overhead? Or motoring past bright egrets spaced at precise intervals along the shoreline? The company is good, too, as volunteers come from diverse walks of life but share a common passion for the water. Gavin recalls that once, after sampling from a dock at the mouth of the Mystic River in an intense rainstorm, she thought to herself, "Now, that was fun?"

After collection, the samples are sent for analysis to URI Watershed Watch or another certified university or contract laboratory. The data are then collated and the sites scored for water quality according to an Aquatic Health Index (AHI) developed by the Buzzards Bay Coalition of Massachusetts and the Salt Pond Coalition of Rhode Island. The higher the score, the better the water quality. Each sampling site is assessed on four criteria: summer average oxygen saturation, dissolved inorganic nitrogen, total organic nitrogen, and chlorophyll-a content. Taken together, these scores gauge the ability of the tested water to sustain a healthy ecosystem. What has emerged from these analyses is a picture of widely varying water quality over a very short geographic range.

The AHI scores for Stonington Harbor stand head and shoulders above the rest of the region's waters, and remain high throughout the summer despite high levels of nonpoint source inorganic nitrogen (a problem common to most estuaries in developed regions). Many citizens of Stonington Borough have adopted CUSH's recommendations for low-impact lawn care and clean boating, helping to ensure a sunny future for Stonington Harbor. Among the efforts in the area, CUSH helped to establish a boat sewage pumpout station in the Harbor — good news for bathers and divers at the popular DuBois Beach.

Less than two miles from Stonington Harbor lies scenic Wequetequock Cove. Ensconced between a vineyard on one shore and a modern day castle on the other, this embayment would seem an ideal location for spending a summer's day on the water. Don't get your hopes up for

The author (far right) demonstrates the triggering mechanism of a water sampler to (left to right) Fran Pijar, Sally Cogan, and Claire Gavin.

clamming, though, as shellfishing is banned due to high levels of bacterial contamination. CUSH volunteers found this cove to be the most impaired local body of water, with a typical AHI score of 0 (out of 100) for chlorophyll and organic nitrogen status. CUSH, with funding provided by a grant from Connecticut Sea Grant, has investigated several potential culprits. Anguilla Brook is the primary source of freshwater to the cove, and determining the dynamics of its flow and nutrient discharge has taken CUSH volunteers miles north of the coast into the woods and farms of North Stonington. Studying the dynamics of stream flow has shown a connection between rainfall and the level of dissolved oxygen (DO) in the waters of the cove. The multi-year study has shown that light rain tends to increase DO in the cove by increasing freshwater input from the brook, but heavy rains lead to a DO drop off because of nutrient runoff from the watershed. Despite the high nutrient content of Anguilla Brook's waters, its contribution is drowned out during episodic runoff events.

To the west, Pequotsepos Cove lies on the outskirts of downtown Mystic. This cove, while beautiful, is far from its natural state, as it is crisscrossed by both train and auto bridges and the banks consist primarily largely of finished lawns, marinas, and asphalt parking lots. Unsurprisingly, water quality was found to be poor here as well. Thanks to the water sample collection by CUSH volunteers and analysis provided for by a grant from Connecticut Sea Grant, Pequotsepos Cove has been added to the list of Connecticut waters evaluated by the State's Department of Energy and Environmental Protection (DEEP). Finding such poor water quality at Pequotsepos and other sites has led CUSH to encourage citizen involvement where residents can make the biggest difference – in their own yards. Former CUSH president and active member, Fran Hoffman, has built up an information dissemination program on ways to make lawns more Sound friendly. Every homeowner can be a responsible landscaper by eliminating the use of chemical pesticides and fertilizer, diversifying the flora in landscaping with native plant species, and buffering yard edges and stream banks with plants to filter out nutrients before they enter the watershed.

The Mystic River lies at the border of Groton and Stonington and flows through a downtown region that hosts many popular tourist destinations. Robust tidal cycling helps keep the Mystic River fully supportive of fishing and swimming, but the paved urban setting makes these waters particularly vulnerable to degradation. Strong flows keep oxygen content high despite unacceptably high levels of inorganic nitrogen and chlorophyll. Any waterfront development proposed here should take into consideration the impact it will have on nutrient loading from surface runoff, as this particular site lies near the tipping point. Beyond simply monitoring the Mystic River, CUSH has taken direct action to enhance the aesthetic appeal and safety of the waters by leading a fundraising effort that resulted in the removal of a rotten coal barge that once adorned the bank between downtown and the Mystic Seaport. Residents and tourists alike are benefitting from the removal of this environmental hazard!

The work CUSH has done monitoring the water quality in Stonington is substantial. A baseline has been established for future research and stewardship efforts. It is now possible for citizens and government to point to hard data demonstrating where water quality is good and bad, and to determine, from the visceral understanding that comes from interacting with these environments on a daily basis, what works to preserve the ecosystem and what doesn't. Uncontrolled surface runoff has been identified as one of the key factors–along with restricted tidal and freshwater flows--uniting the sites with poor water quality. Luckily, runoff contamination can be mitigated on both a small and large scale—by rain gardens on residential property and by municipal stormwater controls. Best of all, the work of CUSH has led to the establishment of a body of concerned, informed citizens who can better participate in local policy from their involvement in local science.

The 2015 water sampling season will begin under new leadership as Gavin passes the director's torch to retired aerospace engineer, Fran Pijar. For more information about CUSH, to get involved, or to see the six-year report, visit the website at www.cushinc.org.

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