



This photo taken by a drone shows a portion of the oyster beds in Ash Creek. Photo courtesy of Chandi Witharana

DRONE TECHNOLOGY could help advance shellfish restoration efforts

Tessa Getchis of Connecticut Sea Grant, left, Kristin DeRosia-Banick formerly of the state Department of Agriculture-Bureau of Aquaculture and Clinton Shellfish Commission Chairman Wayne Church survey a natural oyster bed in Clinton in the summer of 2021. Photo: Judy Benson



First, find where the oysters are living now. Then start building on the existing populations.

That's the premise behind one of the keystone efforts to conserve and restore the state's natural oyster beds—valued highly for their ecosystem services.

“We surveyed 67 intertidal sites in 2021, and there are plans to continue that work,” said Tessa Getchis, aquaculture extension specialist at Connecticut Sea Grant.

The surveys thus far were done on foot, with Getchis and members of the state Bureau of Aquaculture led by town officials or members of local shellfish commissions to known locations of wild and public oyster beds. They photographed, collected data and assessed the overall condition of each. Ultimately, they used this information to create the first map of Connecticut's natural oyster beds in more than 100 years.

But the map is still a work in progress, with more sites to survey. There are areas that are inaccessible by foot, Getchis said. Many other beds are tucked along small meandering streams hidden behind marshes, or hug mud flats that would swallow up anything heavier than a seagull. Even areas like Ash Creek in Fairfield that may seem easy to reach have many sections that aren't.

The survey team is hoping cameras mounted on drones can be used to complete the picture.

“We want to understand if we can use drone technology to survey areas that are inaccessible by foot, and also to provide other measurements that aren't readily conducted on other surveys, such as the vertical relief and spatial coverage of the reef,” said Alissa Dragan, supervising environmental analyst at the state Department of Agriculture's Bureau of Aquaculture. In other words, drones could be used to collect data that could be used to determine the depth and surface dimensions of a reef, then estimate the number of oysters, in areas that can't be reached by on-the-ground techniques.

“What the use of drones would do is help expand coverage to areas we cannot access due to trespassing on private property, mud, railroad tracks, or any barrier to physically getting to a site,” Dragan said. “We might also be able to use drones to find hidden pockets of oysters that we were unaware of and potentially be able to get some underwater footage.”

In December, Zofia Baumann and Chandi Witharana, respectively professors in UConn’s departments of Marine Sciences and Natural Resources and the Environment, oversaw a drone flight over Ash Creek piloted by NRE doctoral student Durga Joshi. They wanted to learn whether this technology would help increase spatial coverage of the surveys and create more accurate maps. Though the area they surveyed wasn’t large—a nearby airport limited their flight path—the trial revealed that drones could be a very useful tool in shellfish restoration.

“We were able to visually document how extensive the reef was,” said Baumann. “During my previous visit to the site, I could see only a small portion of it. I had no idea how far the reef stretches, and the drone images revealed that. We are lucky here in Connecticut to have these intertidal reefs and to conserve them we must document them meticulously.

“We need to know what is there to protect it,” she added.

Baumann and Witharana are hoping to use the information gathered in this trial run to find funding and partners for a thorough drone survey of Connecticut’s intertidal oyster reefs. Such a survey could be a key addition to the *Connecticut Shellfish Restoration Guide*, an instruction manual being created by a statewide committee, Baumann said. She also hopes the drone images will be of use to local volunteers who understand the value of healthy shellfish populations.

“We will share these with the shellfish commission members in Fairfield so they can use the images in advocating for oyster conservation there,” Baumann said. “I think anyone who views the drone images will be blown away. The reefs in Ash Creek are simply stunning and the oysters there are doing incredible work in maintaining a healthy ecosystem.”

—Judy Benson



Drones equipped with cameras can help advance shellfish restoration efforts. Photo: Chandi Witharana



Eel grass, seaweed and slipper shells make up the wrack line at Harkness Memorial State Park in Waterford. Photo: Judy Benson

What's in our names?

What are wrack lines? The word wrack is a term for various kinds of seaweed, and wrack lines are the collections of organic matter (sea grass, shells, feathers, seaweed and other debris) that are deposited on shore by high tides. More generally, wrack lines are where the sea meets the land.

With our magazine *Wrack Lines*, we tell stories about the intersection of the land, sea and Connecticut Sea Grant. So what is Connecticut Sea Grant? One of 34 Sea Grant programs across the country, it helps residents make the most of our coastal resources and inland waterways.

It addresses the challenges that come with living by the water or within the Long Island Sound watershed, in a state with 332 miles of shoreline and three major tidal rivers. This NOAA-state partnership based at UConn’s Avery Point campus works with aquaculture farmers, fishermen and seafood purveyors to help their businesses prosper.

It funds research essential to understanding and managing our changing coastal and inland environments. It provides communities and local leaders with the information they need to make better land and shoreline decisions that result in more resilient communities and healthier watersheds. It educates students as well as teachers and adults of all ages about the marine environment.

Connected to experts and residents who live, work and recreate in the Sound and its watershed, it brings diverse interests together around a common purpose of working for mutually beneficial solutions to problems.

Small in staff but big in impact, Connecticut Sea Grant is like a pilot boat that navigates the way for large vessels toward safe harbors. Since 1988, Connecticut Sea Grant has supported “Science Serving the Connecticut Coast.”

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