Asst. Professor of Biological Sciences leverages university proximity to the ocean for research on Macroalgae

By RUDI HEMPE
CELS News Editor & Reporter

Except for some gardeners who swear it helps their plants grow, seaweed does not have many fans.

Beach-goers don't like it when they are swimming, boaters find it troublesome in shallow waters and fishermen say it fouls their gear.

But to Dr. Carol Thornber, seaweed, or more properly macroalgae, is pretty fascinating stuff, so much so that she and her research assistants are kept constantly busy researching it.

Thornber, assistant professor of biological sciences, only arrived at URI three years ago but already she is heavily involved in studies involving Narragansett Bay and an area on Cape Cod.

Thornber arrived here just after the infamous "fish kill" that took place in Greenwich Cove. At first lawn chemical runoff was blamed for the thousands of tiny fish that washed up on the shores of the cove. But later that theory was discarded. It is now suspected that somehow the oxygen was depleted in the cove's waters. What caused the depletion is still not known but one theory is that there was an algae "bloom."

Such things fascinate Thornber who has her bachelor's in biology from Stanford and her doctorate from the University of California at Santa Barbara.

Before coming to Rhode Island, one of the phenomena she studied in California was an invasive kelp.

The vast majority of macroalgae grow attached to rocks; in the U.S. the rockiest coasts are on the West Coast and the Northeast. Since she has family in New Jersey and Boston, she felt most fortunate to land a position at URI.

Thornber calls herself a macroalgal ecologist. 'I'm interested in how organisms interact with each other and the environment."

Her very descriptive website states "I believe in employing a suite of different techniques in my research, including theoretical modeling, field and laboratory manipulations and biogeographical comparisons."

Dr.Carol Thornber (right) has plenty of helpers in her lab studying macroalgae, including Emily Field, a marine biology major.

Seaweeds cannot actively move to escape herbivores. Thus to survive, macroalgae must use different mechanisms to avoid being consumed. "They may be chemically or morphologically defended…they may be nutrient-poor…or they may grow rapidly…" she explains on her site.

In the field, Thornber has been working in East Harbor lagoon, part of the Cape Cod National Seashore. Many years ago the shallow lagoon was open to the ocean and then was largely closed off by some construction. Now the culverts have been widened, increasing the flow into the lagoon once again and one of the results is a population boom of macroalgae, some of which is floating. Nearby residents are complaining about the seaweed and Thornber has had a student researcher, Patrick Lyons working on the problem for the last two summers. Lyons, who will be going to grad school this fall, devised chambers made out of PVC pipe that allowed him to measure seaweed growth rates. It will be some time before all the data can be analyzed.

Thornber also has eight field sites in Greenwich Cove where macroalgae are studied under grants from several agencies including the URI Research Office and the state Department of Environmental Management.

The fish kill there was caused by low oxygen levels in the water but the big Additional research sites that Thornber has are off the Bay Campus shore and off Brenton Point.

To do all this research, Thornber has three graduate students and several undergrads.

One interesting experiment is being done with snails in containers in which two different types of macroalgae are placed. The researchers found that in some cases where the algae is being eaten (there are holes in the seaweed are evidence) the algae's mass actually increases. That in turn indicates that when the algae are being eaten, there may be a chemical trigger that makes them grow.

With all the projects she has under way, Thornber has no fear she will ever run out of research opportunities now that she is at URI.

"This university is ideal because it is so close to the ocean. It's so convenient for field trips. There aren't many universities this close to a coastline," says Thornber who adds the Bay Campus is another valuable asset for her work.

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question is why, says Thornber.

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