

Blue crabs control population of a marine snail that damages marsh grass *Crab decline may affect coastal marshes*

Tidal salt marshes act as nurseries for many commercially important species, such as crabs, shrimp and fish.

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A researcher is exploring a previously unknown connection between blue crabs and salt marshes that suggests the decline in blue crabs is contributing to the loss of coastal marshes.

"No sky is falling, but this is a yellow light for caution," said Brian Silliman, a Brown University doctoral student who began his research on Hog Island off Virginia's Eastern Shore two years ago and is working on a barrier island off Georgia this summer.

Simply put, Silliman says blue crabs control the populations of a marine snail that damages marsh grass as it feeds.

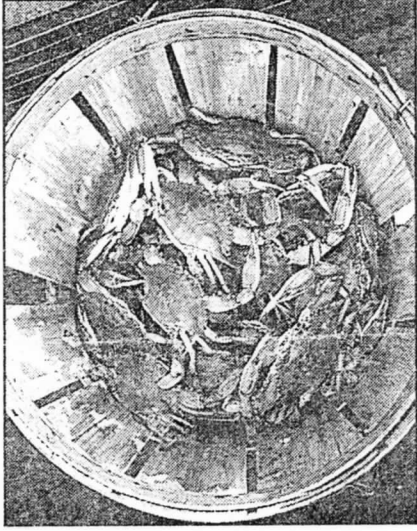
"No one has looked at this linkage before," he said.

In places where he built wire barriers to exclude crabs and protect the salt marsh periwinkle, Silliman said the results were dramatic.

"Within six to 12 months they completely whack that grass," he said of the periwinkles.

The paper by Silliman and co-author Mark Bertness exploring the connection among crabs, periwinkle and the plant, salt marsh cordgrass, was published last week in the Proceedings of the National Academy of Sciences.

Tidal salt marshes are among the world's most productive grasslands and act as nurser-



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A Brown University researcher is exploring a previously unknown connection between blue crabs and the health of marsh grasses.

ies for many commercially important species, such as crabs, shrimp and fish.

The numbers of crabs have dropped 40 percent to 80 percent along the Southeastern and Gulf coasts, Silliman said. The decline in crabs and marsh acreage is especially a coincidence in Louisiana, where Silliman has also conducted research.

The rising sea level and subsidence of the Earth's surface is considered the biggest threat to Louisiana marshes, yet Silliman says the crab-periwinkle balance may contribute.

Salt marsh cordgrass, which periwinkles damage, is the only plant dying in the Gulf Coast marshes, Silliman said. "There are snails all over the place. . . It suggests that snails at least are playing a role."

While studying at the University of Virginia two years ago, Silliman demonstrated

how unchecked populations of periwinkles could denude cordgrass in test plots on Hog Island.

Silliman, 29, is studying the role of predators on periwinkles on Georgia's Sapelo Island as he continues his research at Brown.

In one exercise, he used strong adhesive to tether snails to bits of fishing line so they couldn't climb out of reach of crabs. "Strikingly, 98 percent were eaten," the National Academy of Sciences article says, primarily by blue crabs.

But, in a series of 1-square-meter wire cages that excluded predators from cordgrass, the protected snails would destroy the vegetation over time, he said.

Blue crabs aren't the only predator of periwinkles — diamond-backed terrapins and some other species of crabs feed on them, too. But Silliman said blue crabs are the most abundant animal that feeds upon periwinkles in marshes.

No one is worried that blue crabs may become extinct, but their population losses in the Chesapeake Bay have prompted Virginia and Maryland to tighten catch regulations in hopes of cutting fishing pressure by 15 percent by next year.

Rom Lipcius, a Virginia Institute of Marine Science crab specialist, said he finds Silliman's study intriguing but said it is too soon to draw conclusions based on what happens in small test plots.

Silliman said he plans to expand the study by gathering long-term population data on periwinkles and studying bigger patches of the marsh landscape in Louisiana.

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Crab Decline May Affect Coastal Marshes

Article questions

1. Where is this research being conducted?
2. What is the connection between crabs and coastal marshes?
3. Why are tidal salt marshes important?
4. By how much have crab populations dropped along the Southeastern and Gulf coasts?
5. What are the biggest threats to Louisiana marshes?
6. What are some other predators of periwinkles?