Sponges akin to redwoods of the sea crowding out corals on Florida reefs

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I n the absence of coral on Florida's ailing reefs, a titan of the sea is taking over: giant barrel sponges.

Big as a bathtub, the redwoods of the reef can live for centuries and grow to 6 feet in diameter. For a healthy reef, a single sponge can provide plentiful housing and dependable sanitation, with a menagerie of marine life finding food and shelter inside a cavernous barrel that also filters huge volumes of seawater.

But after a widespread coral die-off in the 1970s and '80s, a significant increase in sponges threatens to collapse the foundation of the complex ecosystem, a new study has found.

The research, published in the *Journal of Experimental Marine Biology and Ecology* in August, found that over 12 years, sponges off Conch Key increased by 122 percent, taking up 39 percent more reef. In some areas, the number of baby sponges increased by 600 percent.

"If they're all that there is, the reefs will flatten out and decay," said study co-author Joseph Pawlik, a marine biologist at the University of North Carolina, Wilmington. "As long as they're holding the space - and they can live hundreds of years - they won't give that space up to the coral."

While researchers only documented the rise in the Florida Keys, Pawlik said he has seen the spread all over the Caribbean, from Belize to

Tobago.

"We think the exact same thing is happening everywhere in the Caribbean," he said.

While bad news, Pawlik said there is an upside. The sponges suck in huge amounts of water, filtering out carbon and sending it back into the sediment. In an increasingly carbon-rich atmosphere, that's a good thing.

"They provide a place for baby fish and shrimp and baby lobsters, all the things important for fishermen," he said.

But they also take up space where young coral, if water conditions are good, could grow.

In the 1990s, Pawlik said researchers at the Aquarius underwater research station south of Islamorada began noticing the sponges turning white. Some completely fell apart. So in 2000, Pawlik started monitoring the sponges, mapping out 12 16-acre plots.

Over time, the sponges had begun crowding out seaweed, which had spread after bleaching wiped out about 90 percent of the reef tract. So that was a good thing. But between 2006 and 2012, the number of sponges began to rise, likely because of the absence of hurricanes, which can easily topple the big sponges even at 30 feet deep where they live.

If acidity in oceans continue to rise under climate change predictions, coral with their vulnerable limestone skeleton, will likely die. The sponges, with a glass skeleton, so far appear unaffected by increasing acidity, he said.

"It's better than what we had, which is seaweed. But coral is better than sponge," Pawlik said. "It's still a matter of things being out of whack."