

Mangroves on the run find a more northern home

December 18 2019, by Chrystian Tejedor



Credit: Florida International University

The north might no longer be as inhospitable to mangroves as it once was.

Fleeing rising seas in South Florida, mangroves are establishing themselves farther north along Florida's Atlantic and Gulf coasts. Some are thriving in southern Texas and are already approaching Mississippi and Alabama—places where they historically could not withstand the climate, according to a new study from Florida International University.

"Severe freeze events kill them all off," said FIU researcher Sean Charles, the study's author. "In the northern Gulf of Mexico, those freeze events have become a lot less frequent, so the mangroves have expanded."

Increased carbon dioxide in the air traps more heat in the atmosphere, which is making areas farther north warmer. Mangroves are doing so well in these new areas, they're expected to spread all across the coast of the entire Gulf of Mexico in a few decades.

"What we are witnessing is an indicator of climate change, without a doubt," said FIU associate professor John Kominoski, an ecologist who co-authored the study.

There's reason to cheer the mangrove expansion. Because mangroves make denser, woodier material that elevates them off the ground, Charles' study found they are better able to trap carbon than the marsh plants they replace.

When mangroves take root in [larger numbers](#), they can create a wall that blocks sediments piling up on the coastline and they can tamp down storm surge from a hurricane. That might be good for [coastal areas](#) like South Florida—we benefit because trapped debris helps build soil elevation as sea levels rise. But this could pose a problem for [coastal wetlands](#) that rely more on sediment buildup to increase elevation.

Still, coastal wetlands are the most effective ecosystems at removing

[carbon dioxide](#) from the atmosphere and the study's findings suggest [mangrove](#) expansion may increase carbon storage and help wetlands survive sea level rise at least in this area.

"In Texas, mangroves ended up being good in a net sense because of the benefit of carbon storage," Charles said. "In other scenarios that might not be the case."

The study was published in the journal *Ecology*.

Questions still remain about the mangroves' long-term viability in these more northerly regions, Kominoski said. Future studies will examine their resilience in the wake of low-temperature events, droughts, rapid increases in sea level rise and repeated blows from hurricanes.

More information: Sean P. Charles et al. Quantifying how changing mangrove cover affects ecosystem carbon storage in coastal wetlands, *Ecology* (2019). [DOI: 10.1002/ecy.2916](https://doi.org/10.1002/ecy.2916)

Provided by Florida International University

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