

Archaeologists dive into Florida's past and find lessons on adapting to future sea rise

October 12 2023, by Nicolás Rivero, Miami Herald



Credit: Pixabay/CC0 Public Domain

Unlike almost any other archaeologist on earth, Jessi Halligan does her digging underwater.

Halligan, an associate professor of anthropology at Florida State University, studies the first people who came to Florida about 15,000 years ago, when sea levels were 300 feet lower than they are today. These days, many of Florida's oldest settlements, hunting grounds and ceremonial mounds are at the bottom of rivers or the Gulf of Mexico.

Florida is one of the global epicenters for a little-known field called "submerged landscape archaeology." There are only about a dozen full-time scientists working in the field in the U.S. They tend to focus on Florida because the state has lost half its landmass to sea level rise since humans started living here.

Scientists have found evidence of ancient shell mounds as far as 20 miles into the Gulf, one of thousands of preserved archaeological sites hidden under the state's gentle rivers and along the wide, shallow continental shelf that stretches 200 miles off the state's west coast.

The stories that archaeologists like Halligan unearth from the depths offer lessons for modern Floridians who are now facing sea level rise once again.

"Across space and time in human history, water always wins. So we have to learn to accept that and be creative with it," said Halligan. "Flexibility is the watchword. You have to build structures that can move and can bend—or be willing to say goodbye to them."

"For cities like Miami and St. Pete and Jacksonville, that's going to come to a pretty major reckoning," said Morgan Smith, an associate professor of anthropology at the University of Tennessee, Chattanooga who studies underwater sites in the Apalachee Bay in North Florida. "Native peoples had to adapt, and they were able to do it because they had that flexibility in their lifestyle... We're going to have to do it also, and it's going to be a lot more complicated."

Studying artifacts found underwater in Florida has already rewritten the history of human migration in North America. In 2016, Halligan led a team of researchers that found a stone knife buried under 13 feet of sediment at the bottom of the Aucilla River, which drains into Apalachee Bay. It provided evidence that people were living in Florida 14,500 years ago—a millennium earlier than scientists previously assumed the first people arrived in the Americas.

So far, Halligan, Smith, and other scientists have identified about 50 underwater [archaeological sites](#) in Florida. Soon, some of these sites may become the first submerged landscapes to be added to the National Register of Historic Places. But the researchers have only surveyed about 1 percent of the Gulf, and they suspect there are thousands of Florida sites left to find.

"Imagine having a 500 piece jigsaw puzzle and you have like 10 pieces and none of them are corners," said Matthew Newton, an anthropology Ph.D. student at the University of Florida who studies underwater archaeology. "That's archaeology, and that's especially how offshore archaeology is. It's a huge ocean."

Diving into the past

There's something eerie about diving underwater to dig up the remains of ancient homes and hearths.

Last summer, Smith and his team dove in the Gulf of Mexico 15 miles off the coast of Tallahassee, at a site that once served as a campsite. There, on the sandy seafloor, he found a stone spearpoint lying more or less where someone had left it 8,000 years earlier.

"When you take something like that out of the ground, you're all of a sudden slapped in the face with the reality that everything there was dry land, and you're under 20 feet of water right now," he said. "That was a landscape, you know? There were springs and ponds and forests and people hunting and gathering and hanging out and kids running around and dogs barking."

"Then you come up and you look all around you and you can't see land," he said.

The evidence of these ancient landscapes is still down there beneath the sea and sand. Riverbeds and sinkholes that once fed ponds and springs are carved into the limestone, running between humps of stone that were once high ground. Divers will occasionally find a tree stump that marks where a forest once stood. "It's basically like a mirror image of what's on land out there," Smith said.

Things get even stranger in the deep muck of the Aucilla River, where Halligan spends most of her time. The tannic water there is cold and dark with the decomposing remains of foliage rotting in North Florida's cypress swamps. "It's like diving in really dark iced tea most of the year," Halligan said. "Without a dive light it is completely black... You could be teleported into space and you wouldn't know."

Some divers find that unnerving. The water is home to catfish, turtles and alligators, and it's so dark you'd never know if any of them were lurking over your shoulder. But Halligan says the gators have never given her any trouble. "We'll see them swimming on the surface but they tend

to stay away from us," she said.

That leaves Halligan and her colleagues free to sink to the bottom, 30 feet beneath the surface, breathing from long tubes connected to "hookah rig" air compressors on pontoon boats docked near the shore. Then, working by the glow of dive lights, they use hand trowels to carefully excavate the riverbed.

They dig for hours, sinking farther and farther into an underwater hole as much as nine feet deep, the walls of river muck rising above their heads. As they dig, the archaeologists might find stone fragments of ancient tools, the remains of drowned firepits, or the bones and droppings of extinct mammoths, mastodons, bison and paleo-llamas. "You're just down there in the dark, underwater, and you're like, 'This was a landscape that people's feet were on,'" Halligan said. "It is a really unique thing."

Lessons from Florida's flooded history

Just like modern Floridians, ancient people tended to build their homes along the coasts, according to Jessica Cook Hale, a seismic mapping research assistant at the University of Bradford's Submerged Landscapes Research Center.

But as sea levels rose—sometimes gradually, at an average rate of about three feet per century, and sometimes in quick pulses of about a dozen feet per century—ancient Floridians were forced to adapt.

Cook Hale has found evidence of this in the shell mounds native people build along the coast near Apalachee Bay. There are [shell middens](#) on land along the modern coastline—but Cook Hale has also dived on middens as far as five miles off the coast and seen evidence of shell mounds 20 miles off the coast.

"As the coastline encroached, they pulled back," Cook Hale said. "You can sort of follow these shellfish middens from the shore seaward."

Even for hunter-gatherers, that kind of change was disruptive. "The prehistoric people who were adapted to this landscape probably had to reshape their entire decision-making strategy," said Smith. "It was like, 'That hunting ground was dry land and now it's marsh and I can't go there anymore.'"

For modern Floridians, adapting to a changing coastline will be even harder. "People could pick up and move 10,000 years ago," said Cook Hale. "They didn't have a Miami or an I-95 or an I-75 to worry about. So we have a lot more of a challenge to overcome in terms of the rigidity of our coastal infrastructure."

Halligan suggested we could learn from the attitudes of the Floridians who came before us. "They weren't putting billions of dollars into sea walls and concrete and asphalt roads," she said. "Instead they were responding flexibly and saying, 'Okay, well, the world is dynamic. It changes all the time. The coastlines change. We also need to adapt to that.'"

"These lessons are going to be really hard to employ," she added.

Cook Hale sees some parallels between modern Floridians who rebuild beach houses leveled by hurricanes and their ancient predecessors who kept building coastal shell mounds even as they kept getting swallowed up by the sea. "We have ties to the landscape, and those people did, too," she said. "They're meaningful and they're important to us culturally."

Although she agrees that Floridians will eventually have to accept and adapt to [sea level rise](#), Cook Hale said it isn't realistic to expect people to easily give up on their homes—the places where they grew up,

developed their lifestyles and buried their dead.

"When we talk about how to cope with [climate change](#) and [sea level](#) rise, I think it's really important to go beyond just that linear logic," she said. "If you can't appreciate how people may feel attached to their landscape, it's going to be really difficult, I think, as a culture, to respond effectively."

2023 Miami Herald. Distributed by Tribune Content Agency, LLC.

Citation: Archaeologists dive into Florida's past and find lessons on adapting to future sea rise (2023, October 12) retrieved 28 April 2024 from <https://phys.org/news/2023-10-archaeologists-florida-lessons-future-sea.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--