Opinion | Francis Wilkinson, Columnist

Sanibel Island's Last Stand Against Rising Seas

In an era of climate change and storm surges, the future of barrier islands — in Florida and elsewhere — is grim.

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Sanibel Island: So picturesque, but for how long? *Photographer: DANIEL SLIM/AFP*

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A short video taken this spring on a barrier island in North Carolina followed a narrative arc made familiar by nature programs. First, an oceanfront house buckled on its spindly pilings, like an antelope folding in the jaws of a lion. Then the dismembering began. The sea thrashed the structure with the

mindless intensity of an apex predator tearing into the haunches of a helpless prey. It splintered the second-floor deck. It lunged at the first floor and tore away a meaty chunk, leaving the room upstairs suspended above the void. Then the sea ripped the house entirely from the sand, launching it sloshing into the surf. When the feast was over, flotsam from the carcass drifted along a 14-mile stretch of Atlantic Coast.

In an era of climate change and rapidly rising seas, a barrier island is akin to an exhausted, encircled antelope. Of course, houses along the shore have been vulnerable to a voracious sea since long before carbon began branding the wreckage. But the ocean's volume, appetite and reach are growing. I traveled last month to Sanibel Island, on the Gulf Coast of Florida, to get a sense of how a barrier island in the hurricane zone confronts that peril.

Florida is especially vulnerable to rising seas, overheated water and a super-charged tropical atmosphere. Miami gets attention because it's a large and glamorous city in the eye of the storm. But other places are arguably more at risk. According to a study by First Street Foundation, Cape Coral, Florida, just north of Fort Myers and a few miles landward from Sanibel, is the city most vulnerable to flood in the entire U.S. The city is famous for its slapdash development, a midcentury frenzy of dredge-and-fill that annihilated marsh and mangroves on the way to creating 400 miles of man-made canals.



Cape Coral is not Sanibel. *Photographer: Francis Wilkinson*

Sanibel is the regional counterpoint to that sunny paragon of reckless real estate – a Florida Gallant to Cape Coral's Goofus. "Sanibel has a really different vibe from anywhere else in Southwest Florida," said James Douglass, a biologist and expert in sea grasses at Florida Gulf Coast University in Fort Myers.

While Cape Coral's angular shoreline is hardened by concrete sea walls, Sanibel works to bolster a "living shoreline" bequeathed by nature. It wields a unique set of social and natural defenses to help it fend off relentless pressure from both real estate developers and a rising sea.

It's unclear, however, how much conscientious environmental stewardship can do. It just might not be possible to ride out this soggy century on a barrier island in Florida. Sea level rise, combined with storm surges jacked up by warmer water, high tides and more powerful storms, may simply be more than any one spit of sand can withstand.

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Sanibel, which bills itself "a barrier island sanctuary," is methodically working to prolong its existence. It's a famously comfortable one. In 2010, the Wall Street Journal cited Sanibel as one of the best places to have a second home. "We are really fortunate to have a citizenry that is, one, really well engaged, and, two, well educated," said Holly Milbrandt, the city's director of natural resources. "You are constantly meeting CEOs."

Indeed, Sanibel, which is overwhelmingly White and a magnet for retirees, is a nesting ground for wealth. With only about 7,000 year-round residents, and about 7,500 units of housing, the approximate market value of the island's real estate is $6.3 billion, according to city data.

All that is threatened by the sea, which along this stretch of the Gulf Coast has been rising a little more than three millimeters per year. "I mean, three millimeters per year. It doesn't sound like a lot," said James Evans, who was the city's director of natural resources before becoming the CEO of the Sanibel-Captiva Conservation Foundation. "It will catch up with us."

The pace, of course, is picking up as the target date for reducing carbon in the atmosphere perpetually recedes. According to the National Oceanic and Atmospheric Administration, the "intermediate scenario" for sea rise in nearby Fort Myers predicts an increase of 1.44 feet by 2060. That estimate does not factor in high-water incidents resulting from storms or unusually high tides.

Sanibel's neighborhood is already problematic. In 2018, when the Florida Panhandle was hit by Hurricane Michael, a Category 5, U.S. Geological Survey sensors in Mexico Beach registered water levels 15 to 19 feet above mean sea level. Waves hitting Mexico Beach from the Gulf rose even higher, smashing into second floors. More than three dozen died; much of the town was destroyed.

Projecting a similar surge onto Sanibel, which is about 12 miles long and 3 miles wide, is a grim exercise. On an island that peaks at a little over four feet above sea level, even an additional foot of sea rise poses a menace.

"When a storm comes through, the king tides, the storm events, that adds tidal input on top of that foot," said James Evans. "So I would even argue that at a foot of sea level rise, this island may be uninhabitable."

Yet the city is not investing in vast sea walls or calling upon the U.S. Army Corps of Engineers to erect the kind of multi-billion-dollar barrier systems that the Corps has proposed along the Texas coast and the South Jersey shore. Instead, Sanibel is doing what it has long done, and what sets it apart from most of Florida's development-mad coast: It is trying to enlist nature in its defense.

"Sanibel has a comprehensive land-use plan that is based on natural systems, where it puts wildlife and wildlife habitat at the top of the hierarchy of values," said Evans. "As a result, between the Sanibel-Captiva Conservation Foundation, Ding Darling National Wildlife Refuge and the city of Sanibel, we've been able to preserve more than 70% of the entire land mass of Sanibel for conservation." With no homes or infrastructure in conservation areas, the stakes of a deluge are lower, and the management of the problem is easier. "When you look at the threats of climate change and sea level rise on our community," Evans said, "you've taken all of that area, 70% of the island, out of harm's way."

In effect, Sanibel is trusting that shrewd land-use decisions made in the 20th century will improve its prospects for survival in the 21st. Like most barrier islands, Sanibel's greatest sea-rise threat comes from the bay side. Wave energy from the Gulf can – and one day will– produce catastrophic damage. When saltwater accompanying a hurricane swept over the island in 1926, it effectively ended agriculture on Sanibel. But it's the slow, steady intrusion of water rising from the bay that threatens to engulf the island.

Much of Sanibel's bay side consists of wetlands where development is prohibited. That's where the 5,200-acre J.N. Ding Darling National Wildlife Refuge is mostly located. A cartoonist and conservationist who served in Franklin Roosevelt's administration, Darling later helped found the National Wildlife Federation. His former home, "Fish House," on Captiva, Sanibel's sister island to the north, is a local icon.

Darling's conservation efforts were crucial to securing open land. His preservation campaign was aided significantly by inconvenience: Until the first causeway from the mainland was constructed in 1963, Sanibel was accessible only by ferry. Once a causeway was in place, however, developers moved to exploit some of Florida's most alluring beaches. Had their efforts not been impeded, Sanibel would no doubt present a typical Florida post card – beachfront high-rises strung together by asphalt and shopping.

Instead, the city successfully countered the invasion, incorporating in 1974 to chart its own fate. Old-school Republican leaders such as Porter Goss, the town mayor who went on to serve in Congress and led the Central Intelligence Agency under President George H.W. Bush, were anything but laissez-faire about local development. Marrying an ethic of conservation to the self-interest of Not In My Backyard, they thwarted big development, eschewed national chain stores and rebuffed decades of political pressure from the county and state. "We have to remain vigilant because we are continuing to see development pressure come from Lee County, which is the county that we belong to here in Southwest Florida," Evans said. "I mean, the development pressure is unrelenting."

A key to the island's ecological victory was the Sanibel Plan. Adopted in 1976, two years after Sanibel incorporated, the plan essentially blocked Lee County from controlling development on the island. County zoning and development standards would've allowed some 30,000 residential units, with scant regard for environmental consequences. The Sanibel plan sought to cap residential units at 7,800, though the ceiling was later lifted to 9,000, partly in response to lawsuits.



Seashells by the seashore on Sanibel. *Photographer: DANIEL SLIM/AFP*

The consequences are visible everywhere. Instead of strands of beachfront towers, two-story construction predominates, with most buildings enshrouded by lush vegetation at a respectful remove from the beach. While limiting development, the plan also sought to safeguard water quality, preserve sensitive environmental areas and limit roads and sprawl. Two decades later, after several revisions to the plan, the city recommitted itself to environmental preservation with a vision statement and an explicit "hierarchy of values." It promised to "sustain ecological balance and preserve and restore natural settings for residents, visitors and wildlife" and called on "the coordinated vigilance of residents, government and private enterprise" to protect the island's natural beauty and ecology.

> Sanibel is and shall remain a barrier island sanctuary, one in which a diverse population lives in harmony with the Island's wildlife and natural habitats. The Sanibel community must be vigilant in the protection and enhancement of its sanctuary characteristics. The City of Sanibel will resist

> pressures to accommodate increased development and redevelopment that is inconsistent with the Sanibel Plan, including this Vision Statement.

Sanibel's undeveloped, ecologically vibrant land may buy the island time. Expansive marshes attenuate wave energy, reducing erosion to the land. They can also expand through accretion if conditions are right, increasing the buffer zone. Fewer roads on the island lead to heavier traffic, but with more land unpaved, the island can better absorb excess rainfall or storm surge. And every beachfront tower that the town refused to permit is now a safety and environmental burden that Sanibel doesn't bear.

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On May 20, the City of Sanibel held its 2022 Hurricane Seminar at the Big Arts Center, the kind of commodious public gathering and performance space that only a very affluent small town could will into existence. The seminar, which was attended by about 100 residents and featured public officials from both city and county, was a good example of the murky political consensus that has emerged in Florida in response to climate change.

The first rule of that consensus is to avoid, whenever possible, the phrase "climate change." In a pinch, you can tacitly acknowledge that climate change is having real-world effects, and that those effects require real-world responses. But you must not acknowledge that climate change has known causes, or suggest that those root causes should in any way be addressed.

Dave Roberts, the city's weather consultant, spoke about intense storms. The reasons for such storms, he averred, were beyond his meteorological ken, and perhaps beyond human understanding. Lee County Public Safety-Emergency Management Director Sandra Tapfumaneyi shared a remarkable statistic: In the five years since 2017, she said, there have been more Category 4 and 5 hurricanes than there were in the previous 53 years. As to the cause of this robust new hurricane manufacture? Tapfumaneyi didn't venture a guess.

In two hours of presentations on hurricanes, in a county where 300,000 people were evacuated in 2017 in advance of Hurricane Irma, not a single speaker joined the words “climate” and “change” together. It’s not a coincidence. Under Florida’s previous governor (and current U.S. senator) Rick Scott, the state government’s refusal to acknowledge climate change was near total. Current Florida Governor Ron DeSantis is a MAGA culture warrior who treats the causes of climate change as a mystery. But DeSantis doesn’t ignore the effects; he has provided more funds for localities to deal with the consequences of That Which Must Not Be Named.

A study released earlier this year by Freddie Mac found that Florida homes exposed to sea level rise were selling at a 2.8% discount compared to homes that are not exposed. Flood insurance rates are rising, as they are in other coastal areas, and one Florida insurance agent told CBS News that some lenders were considering curtailing the issue of 30-year mortgages in South Florida.

Federal flood insurance is capped at $250,000, far below the value of a typical Sanibel home, which Zillow pegs at around $1.3 million. Sanibel insurance agent Chris Heidrick told me that a million dollars of flood insurance for a home on the Gulf generally costs around $5,000 to $7,000. Sea rise doesn’t influence the price much, he says, in part because insurers “look backward, not forward,” for the data they use to set rates. In any case, Heidrick credits Florida’s pervasive troubles with insurance fraud, more than climate threats, for driving some insurers to leave the state altogether.

Like pretty much everyone else in government, Holly Milbrandt, Sanibel’s natural resources director, avoids talking about climate change directly. But her office, which employs five biologists including Milbrandt, focuses much of its energy on mitigating climate effects. Sanibel just finished applying for a new round of state funding. “For the past two years, the governor has allotted significant dollars to resiliency planning,” she said.

Without a sizable reduction in global carbon emissions, however, there’s a limit to what public works on Sanibel can achieve. If accelerated sea rise is inexorable, Sanibel will face problems that neither local government nor civic groups can resolve. “You can go to the NOAA website and use all their

great tools to see what's going to happen with one foot of sea level rise, two foot, and the answer is never good for a barrier island," Milbrandt said. "It's a challenge. But I think we try to position ourselves just to say, there's a lot we can do. We're not just going to throw up our hands."

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Sanibel's salvation? *Photographer: Francis Wilkinson*

It's hard to be a long-term optimist about the compounding threat that sea rise and storm surge pose to Sanibel and other barrier islands. But it's nonetheless impressive to see the island's response. Much like the Sanibel Plan that safeguarded the island against overdevelopment, there is a game plan for defending it against the sea. I spent a few hours on a hot, sunny day in May touring the island with James Evans, who has been working on Sanibel's coastal defenses for two decades.

"In some areas where we have high wave action and pressure on the bay side, we're actually losing some mangroves," Evans said.

Where mangroves are abundant and healthy, they approximate a lush coastal jungle. One of the most striking stretches of Sanibel is Bowman's Beach, a broad, white, generous, public beach facing the Gulf. To get to Bowman's you take a wooden bridge across Clam Bayou, which is shrouded by mangroves on all sides. While Evans and I walked across, a sizable snook leaped out of the water. The mangroves here, sheltered from the force of water and wind, are robust.

Mangroves are not an aesthetic concern on Sanibel – they're an existential one. Mangroves, which include dozens of species of a coastal plant that never strays far from the equator, are a beautiful mess, a chaotic tangle of roots and leaves and branches that rise in odd formations and topple over one another on the shoreline. They also dissipate energy from the ebb and flow of tides and the pulse of waves. Mangrove forests attract fish and smaller organisms that enrich estuaries. Crucially for Sanibel, they also collect sediment around their roots, which helps shorelines hold their own against the sea.

Sanibel is trying to fight erosion through accretion. "Accretion can outpace sea level rise in healthy coastal habitats," James Douglass, the biologist at Florida Gulf Coast University, told me. "These coastal habitats like oyster reefs and the mangroves, they pile up on top of each other year after year – at least they do in a healthy environment. They can actually move the coastline outward as long as the sea level rise is not too fast. So there's sort of a horse race between the rate that sea level is rising, and the rate that these coastal habitats are able to build up the shoreline."

That's the logic behind "living shoreline" projects. Concrete sea walls and other hard barriers may hold back the sea for a time, but they don't absorb wave energy, which ricochets elsewhere, often resulting in a trade of erosion in one place for another. And eventually they crumble. Living shorelines try to beat the sea at its own game – enlarging the shoreline just as the sea works to shrink it.

A recent study by the Nature Conservancy and other researchers found that mangroves were a significant factor in protecting property during Hurricane Irma in 2017. According to the study, more than 626,000 people living

behind mangrove forests in Florida experienced reduced flooding. Mangroves averted an estimated $1.5 billion in surge-related flood damage, representing savings of around 25% in counties protected by mangroves.

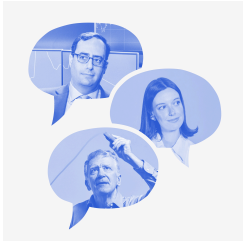
“The flood reduction benefits of mangroves are sizeable enough to inform habitat restoration priorities and nature-based risk reduction strategies,” the researchers wrote.

Evans showed me a mangrove restoration project along Woodring Road, on the north side of the island. Winter cold fronts from the Northeast batter this shore, which is opposite St. James City, another Florida city facing a rising risk of drowning. Before erosion, mangroves stretched 10 to 20 feet from the shore. Now, a few red mangroves were struggling for survival. Overwhelmed by the joint force of wind and water, they were almost capsized, roots exposed. A construction crew working on the restoration had closed the adjacent road, which has become increasingly subject to flooding as the mangroves retreat.



Foreground: James Evans. Background: A “living shoreline” project. *Photographer: Francis Wilkinson*

"We've been able to do some significant mangrove restoration projects on the island where we've actually been able to reestablish the mangroves," Evans said. On one stretch of restored shoreline we visited, mangroves are expanding and sand is accumulating.



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It's not always easy. On another part of the island, Evans and I visited a stretch of wet sand with a few desolate, dying mangroves sticking out of buried planters. Had the project succeeded, the mangroves would have overgrown their planters and become entangled with their neighbors, growing a natural barrier to bolster the shore. But here, most of their kin had already perished, leaving behind empty planters still visible underwater.

No one is giving up. Plans are already under way to place beach-ball sized spheres off the shore to blunt the force of waves and wake, then try once again to cultivate mangroves. It's a case of trial and error, against a ticking clock.

Sanibel is enormously fortunate in many ways. It has a freshwater marsh in its center, adding to its biodiversity. It has healthy dunes on some beaches. It has a sewer system, reducing risks associated with storm damage. Unlike other islands stretching up Florida's Gulf Coast, Sanibel is mostly oriented east to west, instead of north to south, dramatically reducing erosion on the Gulf side while also showering its Gulf beaches with shells. The shells do more than attract tourists; pulverized by waves, they build up the beaches where they land. Meanwhile, Sanibel's neighbor across a tiny bridge to the north, Captiva, does periodic beach replenishment to fight erosion on its Gulf beaches. Much of that sand washes down to Sanibel, padding its beaches for free.

Sanibel has impressive resources, expertise and a fighting spirit. What's unknown is how much time it has before the sea overtakes its defenses.

"I do have hope and confidence that we can put in place some measures that will extend that amount of time," Holly Milbrandt told me. But Sanibel's local efforts are countered by a global phenomenon of rising temperatures and seas. "You know, with no efforts at the local level, at the state level, at the national level, even globally, to really tackle the causes, I just – I don't know how we're going to not experience significant change," Milbrandt said. Sooner or later, she added, "It's gonna look different."

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