

What can Charleston and other coastal cities teach South Florida about sea-level rise?

March 28 2024, by Bill Kearney, Miami Herald



Credit: Pixabay/CC0 Public Domain

South Florida is considered one of the most at-risk areas of the U.S. when it comes to sea-level rise. But what can the region learn from other areas facing similar challenges?

[At the Aspen Ideas: Climate summit](#), which was held March 11–13 in Miami Beach, experts from cities that have been battered by climate change and sea-level rise—Charleston, South Carolina; New York City; and New Orleans, Louisiana—gathered to share their experiences and offer a road map of sorts for South Florida.

One of America's most climate-vulnerable cities is also one of its oldest. Charleston, which is 350 years old and surrounded by marshes, has the largest historic district in the nation, and pulls in 8 million tourists a year.

Swaths of the historic district sit at about 2 feet above sea level or less, and Dale Morris, the chief resilience officer of Charleston, said during the [panel discussion](#) that the city is planning for 14 inches of sea-level rise by 2050.

"If we're not careful, by 2050 major flood events will happen two or three times a month," Morris said. "Charleston will not survive. It's as simple as that."

Morris said that 71% of their major flood events in the last century have occurred since 2015. And the city's minor flood events have gradually ramped up from a handful per year in the 1970s to dozens per year in the 1990s to 89 in 2019 and 72 in 2022.

To survive, the city is working with the Army Corps of Engineers to create perimeter protection around the central peninsula, where the historic district is. It'll cost \$1.3 billion, with the city paying 35%.

Morris' sea-level rise lessons have to do with how to deal with the Army Corps of Engineers. He said their mantra has traditionally been "highest benefit for the lowest cost." This can result in blunt plans that to many seem downright ugly.

Case in point: the 2020 Army Corps proposal to build six miles of slab-like seawall, ranging from one to 13 feet tall, in front of and through parts of Miami. The wall would have left some neighborhoods on the flood side of storm surge. Miamians were up in arms, and now a hybrid plan incorporating green infrastructure is brewing.

Morris said the Corps was merely following cost efficiency orders from Congress. But that's changing. In 2021, the Corp had to start considering "comprehensive benefits" of natural and nature-based features, and also social effects and environmental justice.

The point is, cities have to pay close attention, and have the proper bandwidth. "If you're going to engage the Corps and innovate with the Corps," he said, "you have to have the staff to do so."

"Within the constructs of the Army Corps of Engineers process, these things can be done. You just have to demand that they do it. We have to show them how to do this."

The original Corps plan for Charleston has a utilitarian vertical seawall that looked more like a concrete cage hemming the city in.

"You can do better with the Army Corps of Engineers if you push them," he said.

Charleston's alternative design shows restored marshes and oyster beds in the harbor, then a series of steps with landscaping leading up to an elevated promenade. It's the same height as a vertical sea wall would be, and offers the same protection, but it's essentially an elevated park with ecosystem benefits.

"When we move into the design phase," he said, "we are going to set the alignment. We are going to set how beautiful it is, how people access it.

That may cost a little more, but that's OK. But you can't wish it into existence, you have to be very intentional about the design with the Army Corps. So that's what we're doing."

Lessons from New Orleans

New Orleans, much of which sits below sea level, has had its share of natural disasters, and in turn its share of learning how to recover. Panelist LaToya Cantrell, mayor of New Orleans, said that enrolling the community in recovery is crucial.

She said that when Category 4 Hurricane Ida hit New Orleans in 2021, the recovery spawned bright ideas that are in the works today. Sections of the city lost power for three weeks. Restaurants had food, but it spoiled and they couldn't feed anyone.

"Instead of all this food going bad, they came up with a concept: Let's make sure that our restaurants are outfitted with solar power so they can operate when the lights go out and feed the community. They become a resilience hub," she said.

So far, the nonprofit Feed the Second Line has converted four restaurants to solar, with five more "coming soon."

There's also an effort to establish churches and other faith-based buildings to have power for lighting when the lights go out in an area. "Residents can see themselves in the response," Cantrell said. "They can see that they are valued."

Cantrell also said resiliency creates jobs. "Resilience efforts will create thousands over the next five years. We want to make sure the residents of New Orleans are connected to those jobs."

Shellfish solutions

Peter Malinowski, executive director of the Billion Oyster Project, was another panelist. His nonprofit restores New York Harbor's once-resplendent underwater landscape by cultivating oyster beds that filter the water and kneecap wave- and storm-surge energy.

No one is claiming oysters are going to save New York City from [sea-level rise](#), said Malinowski, but they're more beneficial than you might think. "There are places where oyster reefs can play a vital role in breaking the waves and protecting the shore from extreme weather events."

He points to the award-winning Living Breakwaters Project, which uses green infrastructure that adapts to climate change to protect the south shore of Staten Island. The area was hammered, and residents died, during 2012's Superstorm Sandy.

Unlike a typical breakwater, which amounts to a pile of rocks, the Living Breakwater has shallow tidal pools, and fingers that gradually taper into deeper water, creating multiple habitat realms for marine food chains—hatchling fish, lobsters, larger fish, seals. The Billion Oyster Project planted oysters strategically throughout, giving schoolkids and participants a sense of ownership, but also creating reefs that actually grow over time.

The oyster reefs not only filter water, they also grow, creating a larger breakwater, whereas human-made walls degrade and fall apart over time.

The panel ended with Morris noting that, "Stoics will tell you that change is the only thing that is constant in life. And what do humans resist the most? Change. The problem is, we're going to need bad events to motivate us."

In a following panel, novelist Jenny Offill offered up a different perspective, and quoted another writer, Paul Kingsnorth: "The end of the world as we know it is not the end of the world full stop."

2024 Miami Herald. Distributed by Tribune Content Agency, LLC.

Citation: What can Charleston and other coastal cities teach South Florida about sea-level rise? (2024, March 28) retrieved 28 April 2024 from <https://phys.org/news/2024-03-charleston-coastal-cities-south-florida.html>

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.