

Outdated Miami Canals Too Weak For Sea-Level Rise

By PATRICIA SAGASTUME • NOV 14, 2013

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It's been more than half a century since flood-control structures such as dams and canals were constructed throughout Florida. Now, with the impact of sea-level rise on the horizon, many of these structures are becoming fragile barriers to keep floodwaters and tidal surge safely away.

Dr. Jayantha Obeysekera is in charge of assessing short- and long-term responses regarding sea-level rise for the South Florida Water Management District. He examines the canal system in Miami's Little River neighborhood, which separates the river from the ocean.

"We have one of the highest high tides," he says. "Actually the ocean side is higher than the canal side. It's about a foot higher. So I think we have some reasonable range to work with but you have to remember: For South Florida, even inches matter."

There are about 30 decades-old canals in South Florida. When they were designed, it was that thought the difference between storm-water levels on the freshwater side and a tidal surge on the ocean side was about six inches. But during our summer rainy season, when a high tide coincides with a tropical storm, those antiquated canals are in trouble.

"In fact it is happening already that these structures may not function the way they were designed," said Obeysekera.

A big part of the reason lies thousands of miles away, in Greenland, and the polar ice caps where glacial ice melts and breaks apart. It's called calving.

In late September, the Intergovernmental Panel on Climate Change (IPCC) released reports that for the first time considered glacial-ice melt in its calculations about worldwide sea-level rise.

"So it's a complex situation that we need to consider uncertainty projections and the amount of money we have to spend," Obeysekera says.

But canals, levees, dams and pumps only keep floodwater and seawater from mixing on the surface. There's another problem below the ground.

On the edges of the Everglades, saltwater seeping underground is absorbed by the plant life. Professor Douglas Fuller from the University of Miami uses satellite technology to monitor that environmental change.

"The beauty of using the Everglades as kind of a natural laboratory for observation is that there is not a lot of coastal engineering structures that are impeding water flows," he says.

He looked at images collected during a continuous 10-year period. His data showed how mangroves, which thrive in a salt water, are displacing freshwater plants nearly three miles from the shore.

"So what that means, essentially, is that the biomass in those communities is generally going down fairly quickly," Fuller says. "So we're probably going to be seeing more of this problem in the future. It's basically a bad sign, a negative harbinger."