

Hurricanes remind us sand is not a renewable resource

October 18 2018, by Chrystian Tejedor



Credit: Florida International University

Beachside communities beginning to rebuild after two catastrophic hurricane impacts on the United States, they should ask whether beach nourishment offers enough protection from erosion and flooding.



Hurricane Michael recently struck Florida's panhandle as a devastating category 4 storm packing 155mph winds. Barely a month earlier, Hurricane Florence flooded North Carolina when the category 1 storm slowly washed over that state on Sept. 14. In either case, these hurricanes changed coastlines as beaches and dunes were overrun by waves, or in some cases, completely eroded.

Typically, recovery plans call for large-scale beach nourishment and dune construction to protect areas behind the beach from future erosion and flooding. A study by Florida International University coastal geologist Randall Parkinson suggests this practice will become even costlier and more controversial as the availability of sand dwindles.

"Sand is not a renewable resource," Parkinson said. "When sand is eroded from the beach during a storm, it typically accumulates in offshore areas as a very thin layer that can't be dredge again to construct a new <u>beach</u> or dune."

An increase in the rate of <u>sea level rise</u> and the threat of more powerful, slow-moving hurricanes will drive up the demand for sand. With companies already spending more to harvest sand in deeper waters farther off shore, the cost of sand could rise even higher.

In Florida's panhandle alone, Parkinson's study found that nourishment costs rose from about \$5 million annually in the 1990s to more than \$10 million in the 2000s. Depending on sea level rise, the cost to nourish beaches for the next 84 years just in the panhandle could one day exceed \$72 million per year.

To make matters worse, data from the panhandle shows offshore sand deposits might be darker than the fine grains of lighter colored <u>sand</u> favored by tourists and locals alike.



As coastal communities in Florida and around the world rebuild after disasters, Parkinson said they will be faced with difficult decisions regarding the function of future coastal construction projects.

"I think these recent events remind us all that the coastal zone is a really high-risk area that is going to become even more vulnerable flooding and erosion as the climate changes," Parkinson said. "We need to be thinking of Plan B before the next big one arrives."

His research was published in the academic journal *Estuarine*, *Coastal* and *Shelf Science*.

More information: Randall W. Parkinson et al. Beach nourishment is not a sustainable strategy to mitigate climate change, *Estuarine, Coastal and Shelf Science* (2018). DOI: 10.1016/j.ecss.2018.07.011

Provided by Florida International University

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