

# Sea level rise: Impacts to property and regional planning solutions

July 29 2020, by Gisele Galoustian

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A new study reveals that urgent action is needed to protect billions of dollars in real estate investment across South Florida due to impacts of sea level rise over the next several decades. Researchers from Florida

Atlantic University's Center for Urban and Environmental Solutions (CUES) in the Charles E. Schmidt College of Science have published a new report, "Protecting South Florida: A Discussion of Sea Level Rise, Property and Regional Planning," to assist local government to respond to sea level rise.

The aim of the report is to cast light on the issue and clarify the alternatives available to South Florida, which embraces the four counties of Monroe, Miami-Dade, Broward and Palm Beach. These counties together generate more than \$337 billion in personal income annually with a combined real property value assessed at more than \$833 billion.

The FAU researchers say that there are a number of choices to protect South Florida from flooding and other climate hazards. However, doing so requires organizing localities for cooperation and starting with accurate and understandable information that can be conveyed to all stakeholders. Although South Florida has forged a Climate Change Compact between localities in the four counties, this is still a voluntary coordinating mechanism that conducts research, not an instrument for establishing enforceable, binding decisions.

"Sea level rise is a unique hazard in this modern age that we have yet to fully realize. All of us have seen, heard and understood news about earthquakes, volcanoes, draughts, forest fires and even pandemics," said Hank Savitch, Ph.D., lead author and an affiliate professor in FAU's CUES in the Department of Urban and Regional Planning. "Sea level rise remains forever with us and continues to advance without an end in sight. Our study highlights the importance of acting now to establish regional governance and policies to prepare South Florida for the inevitability of sea level rise. Acting now will save lives, property, our heritage and future generations."

Using 2000 as the mean for South Florida, sea level is projected to rise

10 to 17 inches by 2040; 21 to 54 inches by 2070; and, 40 to 136 inches by 2110 according to the Southeast Florida Compact. Thus far, projections have increased with each update to their modeling. Every inch of sea level rise brings greater exposure to people and their properties. Once the tide line rises, more assets are covered in its wake. At less than 3 feet above the high tide line, more than 2,000 square miles lie in the flood zone along with an estimated \$145 billion in vanished housing; at 6 feet above that tide line the amount of exposed land jumps to more than 4,000 square miles and \$544 billion in lost property value. Roughly half of the most vulnerable cities, counties or metros are located in Florida. Miami-Dade County leads the crowd. Seven of the 10 at-risk cities in the U.S. also are located in Florida, highlighted again by South Florida (Hialeah, Miami Beach, Plantation, Miramar and Fort Lauderdale).

"This report aims to open a renewed dialog about how local governments across South Florida and the nation can better respond to sea level rise. A stronger regional response is needed to plan for, prepare and invest in infrastructure to address a three-foot rise in sea by 2075," said John L. Renne, Ph.D., co-author, a professor and director of FAU's CUES. "Moreover, the region needs to join efforts in California, London and other regions to become carbon neutral by 2050. Voluntary policies have not worked, thus we need a regional governance structure to better incentivize this reduction in carbon emissions and adapting infrastructure through economic incentives and regulations in order to preserve a future in South Florida for future generations."

FAU's CUES has assembled and curated a collection of web-based planning tools for decision makers and the public (<http://cues.fau.edu/planningtools/>), enabling stakeholders to evaluate sea level rise, urban livability, and quality of life. One key tool is the Sea Level Sketch Planning Tool, developed by the University of Florida's GeoPlan Center (<https://sls.geoplan.ufl.edu>). The tool is specifically

designed to help identify and highlight land and infrastructure that is vulnerable to current and future flooding. Other tools in the CUES collection include material developed by federal agencies such as the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) for evaluating climate impacts on specific assets.

"We still need tools and policies that allow us to adopt resilient infrastructure plans and investments," said Renne. "We should also investigate programs that allow citizens and decision makers to conduct cost-benefit analyses for investment strategies."

A good deal of the ongoing research on sea level rise has focused on Miami-Dade and the Florida Keys. Localities within Miami-Dade have already begun to act, mostly through hard engineering, but other techniques, considered as "blue and green infrastructure," are gradually taking hold. The researchers caution that the Florida Keys seems to be lagging behind its ability to deal with gargantuan problems and, if not enough is done soon enough, the island chain could face an irrevocable pattern of inundation by 2050.

"For most families, their home is the largest single asset they own, and even for renters, housing is their largest expenditure. Protecting those assets is critical to every American family and in South Florida, the risk is no longer theoretical," said Josh Sawislak, AICP, co-author, an affiliate professional at FAU's CUES, principal of Clio Strategies, LLC, and an internationally recognized expert on climate and disaster resilience. "Recent data on increased flood risk to communities in South Florida and across the nation make the discussion of how we protect our communities even more important. To address flood risk, we need to look at land use and governance—how we organize our communities to manage these risks and protect our wealth and homes."

According to FAU's Center for Environmental Studies, 72 percent of Floridians are in favor of teaching climate change in public schools; another 55 percent believe climate change is real and caused by human activity, and almost half (47 percent) are willing to pay \$10 per month to strengthen the state's weather related infrastructure (2019).

"Despite widespread awareness of sea level rise in South Florida, at-risk property continues to be purchased at premium prices and built upon without adequate consideration," said Renne. "There are a number of unanswered questions that we need to address to mitigate or adapt to catastrophic events. One matter is clear, the actions we take now will have a significant impact on the lives of future generations in South Florida."

**More information:** Protecting South Florida: A Discussion of Sea Level Rise, Property and Regional Planning. [science.fau.edu/docs/fau-cues- ... tecting-south-fl.pdf](https://science.fau.edu/docs/fau-cues-...tecting-south-fl.pdf)

Provided by Florida Atlantic University

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