

Miami is one of USA's top hot spots for climate change

Wendy Koch USA TODAY

Miami and other parts of south Florida, where streets routinely flood at lunar high tides, comprise one of the nation's most vulnerable hot spots for climate change.

"It's remarkable. We get calls from people asking: 'It didn't rain so why is my street underwater?'" says Broward County Commissioner Kristin Jacobs, noting the region's decades-old system to drain water is now causing it to bubble back up.

"I have a photo of a man swimming — doing the backstroke — in his cul de sac," she says, adding that 30% of her county — just north of Miami — is 5 feet or fewer above sea level.

Jacobs attended the White House's release Tuesday of the National Climate Assessment, a massive study by scientists that finds rising temperatures are already affecting the United States. It notes climate impacts vary by region and says Miami — along with New Orleans, Tampa, Charleston, S.C., and Virginia Beach — is most at risk for sea-level rise.

As the Earth's temperature warms, so do the seas, because warmer water takes up more room than cooler water. Globally, sea level has risen about 8 inches since reliable record-keeping began in 1880 and is most likely to rise another 1 to 4 feet — and possibly even 6 feet — by 2100, the report says.

That's bad news for the highly-developed coasts of Florida's southern tip, where land is flat, low-lying and swampy. It relies on a mostly gravity-fed system of canals to drain the marshes, but there's not much incline to let gravity do its work.

"The underlying rock is limestone, which allows groundwater to seep in," says Leonard Berry, director of Florida Atlantic University's Center for Environmental Studies, noting he's seen even swanky cars like Lamborghinis flooded. He says the porous bedrock makes it difficult to build a sea wall that will keep out saltwater intrusion, because such a barrier would have to go down at least 60 feet.

"Trillions of dollars of investments...are going to be vulnerable," Berry says, especially since the region is prone to hurricanes that can bring storm surges made worse by sea level rise.

The region also has a disproportionate share of elderly residents, many ironically drawn to Florida for its balmy weather, says Vicki Arroyo, executive director of the Washington, D.C.-based Georgetown Climate Center. She says the elderly, more susceptible in heat waves and less apt to relocate in storms, were hardest hit when Hurricane Katrina hit New Orleans in 2005.

Even a sea-level rise of 6 inches will be costly in South Florida. "That will happen in the next two to three decades," says Ben Strauss of Climate Central, a Princeton-based non-profit group that used federal data to create its Surging Seas database. The region's most likely rise in sea level will range between 5 and 13 inches by 2040 and between 7 and 20 inches by 2050, according to projections by the National Oceanic and Atmospheric Administration (NOAA) based on tidal data in Key West.

So by mid-century, Strauss says there's at least a 78% chance of severe flooding of at least 2 feet above the high-tide line.

Sea levels are rising more quickly in other places, notably Virginia's Norfolk area, but Strauss says South Florida is so vulnerable because of its topography, population and pricey infrastructure. His group ranks Miami-Dade and Broward as the two U.S. counties with the most residents living on land less than 4 feet above the local high tide.

In fact, Miami has the dubious honor of ranking first among cities worldwide for number of residents, 4.8 million, at risk of coastal flooding by 2070, according to a 2012 report by the Paris-based Organization for Economic Cooperation and Development, an international group.

Berry says a sea-level rise of a few inches might not do much elsewhere, but a 2011 study by his university found it could overwhelm the area's flood-control systems that are often more than 50 years old. The study expects more saltwater will seep into underground sources of drinking water, forcing cities to abandon wells near the ocean and drill new ones.

To prepare for such problems, the region's four counties — Miami-Dade, Broward, Monroe and Palm Beach — banded together in 2010 to form the Southeast Florida Regional Climate Change Compact, which has agreed to dozens of mitigation measures.