

# North Carolina Faces Chronic Inundation

In North Carolina and all along the US coastline, many cities and towns will experience high-tide flooding within the next few decades that will be chronic and extensive enough to force difficult choices. Because this persistent flooding can render neighborhoods, commercial districts, industrial zones, and recreational and other areas unusable, communities will face either major coastal defense investments or the prospect of retreat from affected places. The Union of Concerned Scientists (UCS) has identified hundreds of US communities at risk of this disruptive flooding as well as how much time remains before the flooding becomes chronic. UCS also recommends how to use this time wisely.

## “Chronic Inundation”

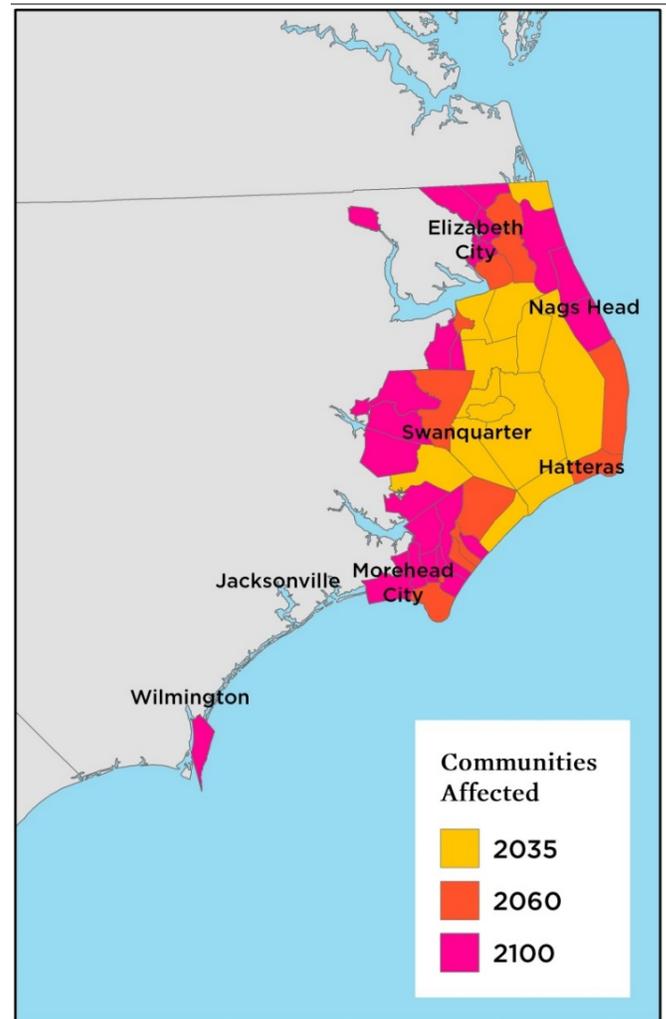
UCS analyzed the exposure of coastal communities to chronic flooding under three different sea level rise scenarios developed for the 2014 National Climate Assessment: intermediate-low (“low”), intermediate-high (“intermediate”), and highest (“high”) (see [www.ucsusa.org/RisingSeasHitHome](http://www.ucsusa.org/RisingSeasHitHome) for detailed information).

This analysis assumes that a community (defined as a US Census county subdivision) faces “chronic inundation” when high tide floods 10 percent or more of its usable, non-wetland area at least 26 times per year or, on average, every other week. Some cities, such as Annapolis, Maryland, and Miami Beach, Florida, currently experience flooding less extensive than this but are already investing heavily to cope with it.

UCS has identified 13 North Carolina communities that will face such chronic inundation by 2035 and a further 36 by 2100, given the intermediate sea level rise scenario. In the high scenario, a total of 43 communities would experience chronic inundation by 2060 and a total of 63 by century’s end. Many of these communities are home to people who have limited resources to move or adapt.

As sea level rises, the chronically inundated area in each affected community expands. In the high scenario, Nags Head and Hatteras would experience roughly 11 and 14 percent, respectively, of their land area chronically inundated within the next 30 years (2045); but those areas grow to about 19 percent of Nags Head and 28 percent of Hatteras by 2060. For a list of

**FIGURE 1. North Carolina Communities Facing Chronic Inundation in The Intermediate Scenario.** Because large proportions of Beaufort, Morehead City, and other North Carolina communities are located inland and at higher elevations, they do not reach the 10 percent threshold of chronic inundation until late century. However, many of their low-lying neighborhoods will face chronic inundation decades sooner, driving important local changes. Tidal flooding in Beaufort and Morehead City already disrupts daily life for businesses and residents today.

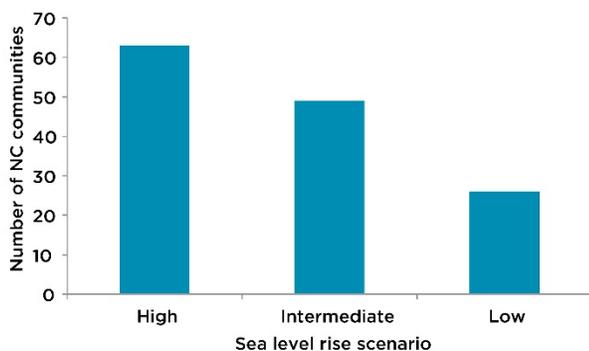


all inundated communities in North Carolina, visit [www.ucsusa.org/RisingSeasStateData](http://www.ucsusa.org/RisingSeasStateData).

## A Chance for Some North Carolina Communities to Avoid Chronic Inundation

UCS used the low scenario as a proxy for sea level rise associated with a warming of about 1.8°C and found that curtailing future warming and sea level rise could spare 10 or more North Carolina communities from chronic inundation by 2060 and 23 to 37 communities from chronic inundation by the end of the century. The Paris Climate Agreement, ratified by most countries in November 2016 (although the Trump administration has announced US withdrawal), aims to limit future warming to 2°C or less above preindustrial levels through large-scale reductions in global warming emissions.

FIGURE 2. **Number of Chronically-Inundated Communities In North Carolina In 2100 Under Three Scenarios.**



### Response Time: How to Use It Wisely

The limited time before chronic inundation sets in must be used to plan and prepare using a science-based approach that helps communities understand their risks, assess their choices, and implement adaptation plans while prioritizing equitable

outcomes. Three categories of policy response are critical:

- **Halting or phasing out current policies that perpetuate risky coastal development.** We need to update flood risk maps using the latest climate science, limit development in flood-prone areas, safeguard flood-protective natural ecosystems, reform flood insurance premiums, and update building codes and infrastructure plans to reflect the latest projections of sea level rise.

- **Enhancing existing policy frameworks.** Current disaster response and predisaster investments—including FEMA’s Hazard Mitigation Grant Program, predisaster mitigation grants, Flood Mitigation Assistance, and the Public and Individual Assistance Programs—must be adequately funded and must also take account of climate projections and emphasize advance actions to limit the impacts of flooding. We need to preserve existing budgets and increase investment in flood-risk mapping and flood-proofing measures, protection of natural ecosystems, large-scale home buyout programs, and implementation of robust flood-risk management standards and building codes. Other agencies that play important roles in our nation’s flood response (e.g., HUD, USACE, USDA, DOI, and DOT) must also be adequately resourced.

- **Creating bold new policies and measures adequate for the scale of coastal risks.** Pioneering, well-funded programs will be needed to assist, for example, with retreat and relocation from chronically inundated areas. New economic opportunities and infrastructure investments will be required in the safer locations to which people and businesses relocate. Policies must be designed to preserve natural ecosystems and cherished aspects of cultural heritage. And innovative governance models that enable effective decisionmaking amidst challenging tradeoffs will also be essential.

Coordinated action by households, local and state leadership, and businesses is required. Federal resources and policymakers’ decisions will help determine whether coastal communities are resilient and continue to thrive. And even as the Trump administration seeks to withdraw from the Paris Agreement, we must work at state and local levels and with other nations to cut global warming emissions aggressively in order to help slow the pace of sea level rise.

## Union of Concerned Scientists

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