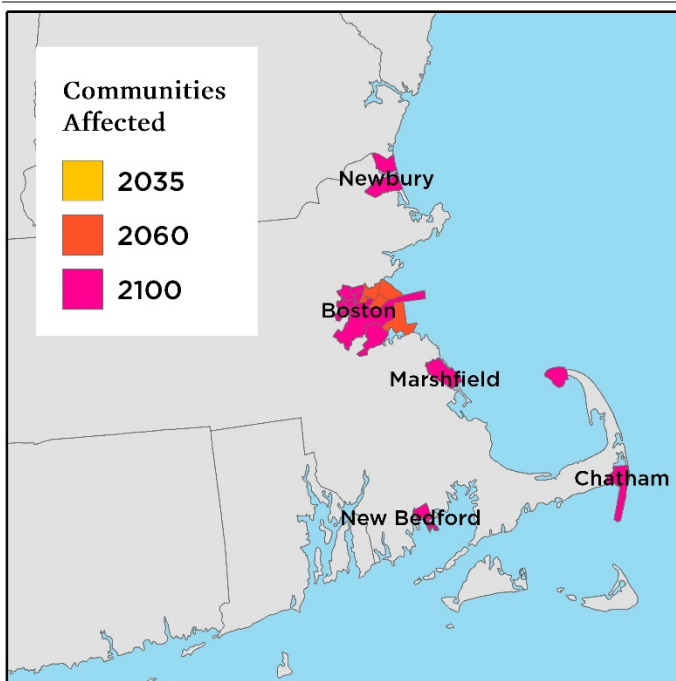


Massachusetts Faces Chronic Inundation

In Massachusetts 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.

FIGURE 1. Massachusetts Communities Facing Chronic Inundation in The Intermediate Scenario. More than 30 percent of usable land in Cambridge, Chelsea, Hull, and Revere would be chronically inundated by 2100 and roughly 15 percent in Boston.



“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 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 five Massachusetts communities that will face such chronic inundation by 2060 and a further 13 by 2100, given the intermediate sea level rise scenario. In the high scenario, those same five communities become chronically inundated much sooner, within the next 30 years (2045) and a further 23 by 2100.

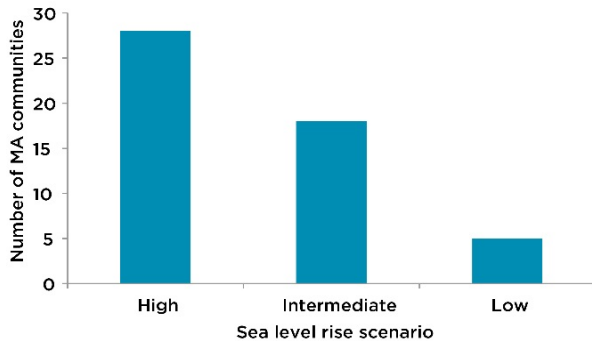
As sea level rises, the chronically inundated area in each affected community expands. In the high scenario, Chelsea and Revere, two working-class towns on the outskirts of Boston, would experience roughly 11 and 14 percent, respectively, of their land area chronically inundated within the next 30 years (2045); by 2060, those areas grow to roughly 20 percent of Revere and 30 percent of Chelsea. These and other affected Massachusetts communities are home to people who have limited resources to move or adapt. For a list of all inundated communities in Massachusetts, visit www.ucsusa.org/RisingSeasStateData.

A Chance for Some Massachusetts 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 five or more Massachusetts communities—including Boston and Cambridge—from chronic inundation by 2060 and 13 to 23

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 Massachusetts 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

FIND THIS DOCUMENT ONLINE: www.ucsusa.org/RisingSeasHitHome

The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet’s most pressing problems. Joining with citizens across the country, we combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

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