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# The Fifth National Climate Assessment: Key Findings and Recommendations for Coastal Cities

## Introduction

On November 14, 2023, the [U.S. Global Change Research Program](#) released the [Fifth National Climate Assessment \(NCA5\)](#). The report is the latest in a series of congressionally mandated and comprehensive scientific evaluations of how climate change is and will continue affecting the country. Our understanding of climate impacts has advanced significantly since the publication of the last [assessment](#) in 2018, enabling more informed and more specific climate action from policymakers. NCA5 also provides insights into what is still needed for the U.S. to reach a more just and sustainable future.

Key findings from NCA5 can help U.S. coastal cities ground local climate action in actionable and up-to-date science, and more effectively address climate risks.

# Key Findings

1

**Risks from extreme and compounding events are increasing due to unprecedented changes in our climate.**

Today, the earth is on average about 2°F (1.1°C) warmer than pre-industrial levels, and is projected to reach about 5.4°F (3°C) of warming by 2100 if current emission trends continue. Risks from extreme weather and climate events, such as hurricanes and heatwaves,<sup>1</sup> are becoming more frequent and severe as global temperatures rise. In the 1980s, the U.S. experienced one billion-dollar disaster every 4 months on average,<sup>2</sup> but now, one occurs every three weeks. Climate change is also intensifying compound events—climate hazards occurring simultaneously or consecutively in the same area. In coastal zones, these hazards include heavy rainfall, high winds, high ground water, and elevated ocean water levels. Extreme and compounding events make climate preparedness more difficult, straining communities and resources across the U.S.

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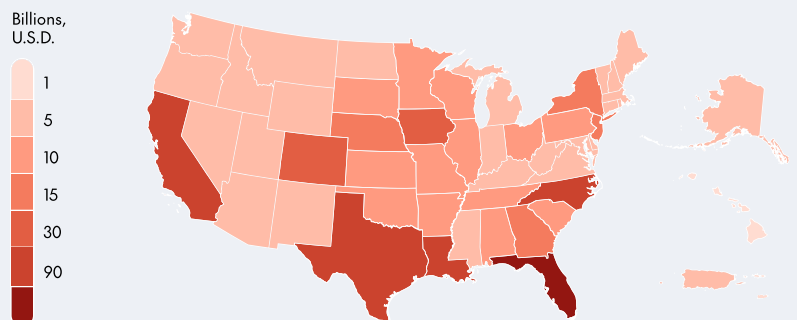
**Climate change is driving rapid sea level rise, with the U.S. experiencing it at a significantly faster rate than the global average.**

Over the last century, sea level rise along the U.S. coast was approximately 11 inches, higher than the global mean sea level rise of 6.7 inches. Alarming, the U.S. is projected to experience an additional 10- to 12-inch increase on average, over the next 30 years. The Gulf and Atlantic coasts have observed higher rates of sea level rise than other regions, and are bracing for even greater increases. Under the highest emissions scenario, the U.S. could see 3.5 to 7 feet of sea level rise by 2100 relative to 2020. Sea level rise can also cause floods and high tides to reach further inland, converting land to open water and expanding the reach of hurricanes and storms. The effects of climate change are already disastrous—38 hurricanes between 2021 and 2022 caused 6,200 fatalities and \$1 trillion in losses—and coastal flooding is expected to be 5 to 10 times more frequent by 2050.

<sup>1</sup> According to NCA5: “Areas that were historically redlined—a practice in which lenders deprived services to communities, often based on their racial or ethnic makeup—continue to be deprived of equitable access to environmental amenities like urban green spaces that reduce exposure to climate impacts. These neighborhoods can be as much as 12°F hotter during a heatwave than nearby wealthier neighborhoods.”

<sup>2</sup> All values have been adjusted for inflation in 2022 dollars.

## DAMAGES BY STATE FROM BILLION-DOLLAR DISASTERS (2018–22)



Graphic adapted from NCA5 (Figure 1.4).

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### **The impacts of climate change have far-reaching and cascading consequences in coastal areas, especially for overburdened communities.**

The combination of extreme weather events and rising seas puts homes, properties, and critical infrastructure at risk of disruption, damage, and permanent inundation, while also driving displacement and new migration patterns. Coastal counties and communities across the U.S. are home to 123 million people—40% of the total population. By 2100, up to 13.1 million people could be displaced by sea level rise.. In addition, saltwater intrusion will further threaten the water supplies of coastal residents and the coastal ecosystems that they depend on. Because of structural inequities, neighborhoods that are predominantly Black and Brown are disproportionately exposed to coastal and inland flooding, and also have the most limited access to resilient housing, flood infrastructure, and urban green spaces that could protect them from climate impacts.

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### **Climate mitigation and adaptation is happening across the U.S., but there is much more to be done.**

U.S. emissions peaked in 2007 and have since declined due to enhanced energy efficiency. Since 2018, state-level mitigation actions have also increased by 83%, and 169 cities have set emissions reduction targets. However, the country is still not close to meeting its national reduction goals and international commitments. To achieve the President's goal of a net zero economy by mid-century (the 2050s to the 2070s), the U.S. will need to cut emissions by 6% per year on average. Yet, from 2005 to 2019, our emissions decreased by less than 1% per year. Even if ambitious decarbonization efforts are achieved, climate impacts will continue to intensify over the next decade. This makes adaptation critical: without such efforts, coastal areas could experience up to \$146 billion in property losses by 2090 and negative impacts to communities' health and safety. While the number of state- and city-level adaptation plans and actions have increased by 32% since 2018, this growth is overshadowed by underinvestment and inequitable resource distribution. In 2019 and 2020, global investments in climate adaptation totaled only \$55 billion, compared to \$659 billion for mitigation. Further, most adaptation efforts to date have been incremental, focused on near-term or temporary solutions (such as elevating individual homes), rather than systems-scale changes (like updating zoning regulations to deter development in risky areas).

# Policy Recommendations

## 1 Accelerate transformative adaptation, with a focus on nature-based solutions and planned relocation.

Drawing on NCA5, here’s what Urban Ocean Lab (UOL) thinks U.S. coastal cities should be doing right now to enhance their climate readiness and resilience.

Scaling up current practices will not be enough to adapt to the growing frequency, severity, and complexity of climate impacts. For coastal cities, rising seas and storms will transform coastlines. NCA5 underscores that transformative adaptation—intentional and proactive shifts in systems, practices, and values to redress the root causes of climate vulnerability and inequalities—is “our best hope” to retain a balance between coastal ecosystems and the communities that inhabit them. In response to rising seas, NCA5 emphasizes nature-based solutions and planned relocation as critical adaptation strategies for coastal communities.

### To advance transformative adaptation, UOL recommends that coastal cities:

- Reduce reliance on traditionally engineered gray infrastructure (like seawalls and levees) by streamlining and facilitating permitting for projects that integrate nature-based solutions (such as living shorelines, floodplain restoration, greenways, stormwater parks, and bioswales).
- Include affordable, climate-resilient housing in upland areas in municipal master plans, hazard mitigation plans, and climate action plans.
- Prevent future development on and prioritize both ecological protection and restoration of high-flood-risk parcels through climate-smart zoning and land use planning.
- Develop anti-displacement laws to prevent climate gentrification and pricing lower-income communities out of climate-resilient neighborhoods.



*Hunter's Point South Park in New York City is a stormwater park containing a living shoreline. Photos by [Daniel Prostack](#) (CC BY-SA 4.0).*

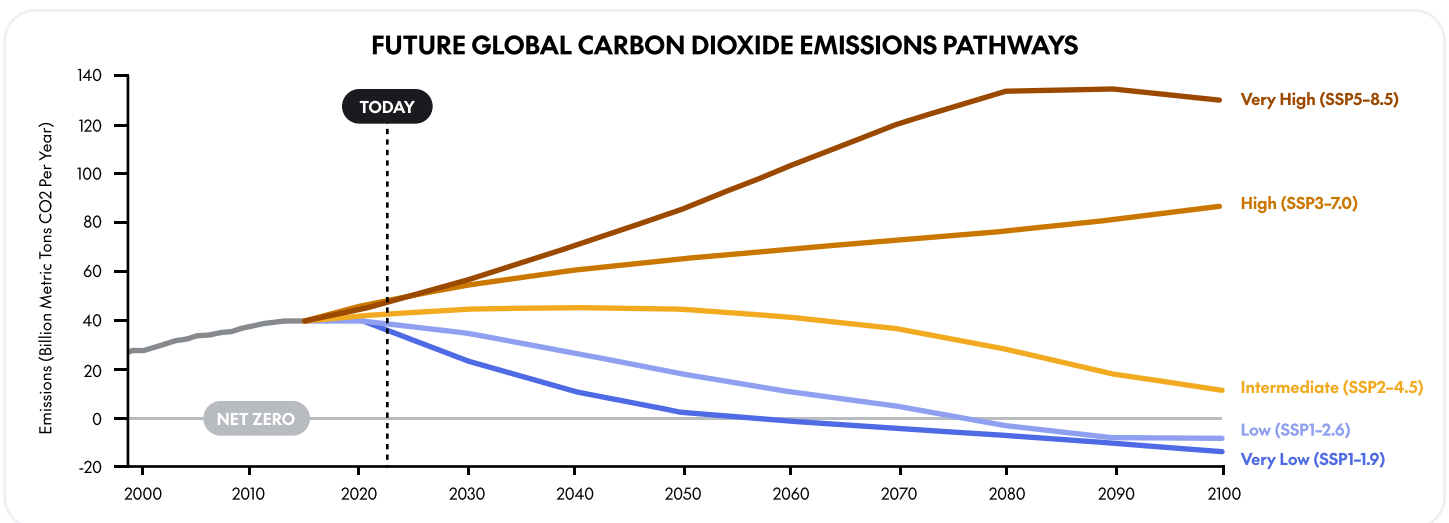
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**Swiftly reduce carbon emissions using existing solutions, while also advancing ocean-based mitigation measures, to achieve net zero.**

In the U.S., about half of the country’s emissions come from our 10 largest cities and top 5% of the most affluent non-urban areas. Projections suggest that increasing population, development, and wealth in cities will continue to drive up emissions unless significant mitigation actions are taken. NCA5 states that the U.S. can make dramatic cuts by leveraging existing mitigation measures, such as optimizing energy efficiency and harnessing solar power. However, achieving net zero will require adopting ocean-based mitigation measures, which can provide about 35% of the greenhouse gas reductions required to meet international commitments by 2050.

**To cut carbon and other greenhouse gas emissions, UOL recommends that coastal cities:**

- Support the expansion of responsible, justly sourced offshore wind energy by facilitating community-based planning opportunities, hosting workforce development programs, and advancing the development of supporting industries and infrastructure.
- Promote port electrification, along with low-carbon and carbon-free methods for transportation and shipping.
- Expand regenerative ocean farming and other low-emission and restorative aquatic food industries.
- Conserve and restore blue carbon ecosystems (such as mangroves, coastal wetlands, and seagrasses), which can sequester enough carbon to offset about 3% of global emissions per year.



Adapted from NCA5 (Figure 1.7), this graphic illustrates five potential outcomes for global CO<sub>2</sub> emissions, from Very Low to Very High. SSPs are Shared Socioeconomic Pathways.

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**Implement climate actions that prioritize equity to achieve long-term resilience.**

Climate action in the U.S. has been largely inequitable, concentrated in wealthier, whiter, and more populated cities and communities. Clean energy plans and coastal adaptation strategies that do not center equity can create or worsen risks and inequalities. Relocation policies that fail to consider local histories of redlining and urban renewal can also perpetuate cycles of displacement for communities of color. Ocean climate action should embody the principles of the Ocean Justice Platform to provide for healthy and prospering coastal communities for all.<sup>3</sup>

**To advance climate justice and long-term resilience, UOL recommends that coastal cities:**

- Engage residents in participatory decision-making and develop meaningful partnerships with communities to provide opportunities for shared leadership.
- Develop policies to limit pollution generated by coastal industries, and clean up legacy pollutants that disproportionately impact local communities.
- Commit adequate resources to fund emergency management, and expand community capacity for adaptation planning and disaster preparedness.
- Promote an inclusive coastal economy by protecting Indigenous use rights in coastal ecosystems, utilizing just transition frameworks to safeguard the job security of energy workers,<sup>4</sup> and protecting working waterfronts to ensure equitable access to ocean resources.

<sup>3</sup> See [oceanjusticeforum.info](https://oceanjusticeforum.info) for the full platform.

<sup>4</sup> NCA5 defines a just transition as “a set of principles, processes and practices that aim to ensure that no people, workers, places, sectors, countries, or regions are left behind in the transition from a high-carbon to a low-carbon economy.”



*Demonstrator supporting a just transition at the 2023 Climate March in New York City. Photo © Alex Miller.*

# Conclusion

NCA5 provides U.S. coastal cities with robust and reliable data on climate risks and projections that underscore the critical need to act now to mitigate and adapt to the impacts of climate change.

Currently, coastal cities have the opportunity to apply for historic ocean climate funding through grant programs provided by the Inflation Reduction Act and the Infrastructure Investment and Jobs Act. UOL has published a guidebook to assist cities in accessing these funding opportunities. In conjunction with the release of NCA5, the White House also announced additional funding of \$6 billion aimed at enhancing climate resilience nationwide. This includes grant programs available to coastal cities and communities to help reduce their flood risks, improve infrastructure, invest in conservation efforts, and advance environmental justice.

Cities must rapidly shift to transformative adaptation, reduce their greenhouse gas emissions, and prioritize equity-centered approaches to climate action.

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