Coastal Effects

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Key Message 9.1

Coastal Hazards Are Increasing Due to Accelerating Sea Level Rise and Changing Storm Patterns

The severity and risks of coastal hazards across the Nation are increasing (*very likely, high confidence*), driven by accelerating sea level rise and changing storm patterns, resulting in increased flooding, erosion, and rising groundwater tables. Over the next 30 years (2020–2050), coastal sea levels along the contiguous US coasts are expected to rise about 11 inches (28 cm), or as much as the observed rise over the last 100 years (*likely, high confidence*). In response, coastal flooding will occur 5–10 times more often by 2050 than 2020 in most locations, with damaging flooding occurring as often as disruptive "high tide flooding" does now if action is not taken (*very likely, high confidence*).

Key Message 9.2

Coastal Impacts on People and Ecosystems Are Increasing Due to Climate Change

Climate change–driven sea level rise, among other factors, is affecting the resilience of coastal ecosystems and communities (*very likely, high confidence*). The impacts of climate change and human modifications to coastal landscapes, such as seawalls, levees, and urban development, are both limiting the capacity of coastal ecosystems to adapt naturally and are compounding the loss of coastal ecosystem services (*very likely, high confidence*). Proactive strategies are necessary to avoid degraded quality of life in the coastal zone, as the combination of reduced ecosystem services and damage to the built environment from exacerbated coastal hazards increasingly burdens communities, industries, and cultures (*very likely, high confidence*).

Key Message 9.3

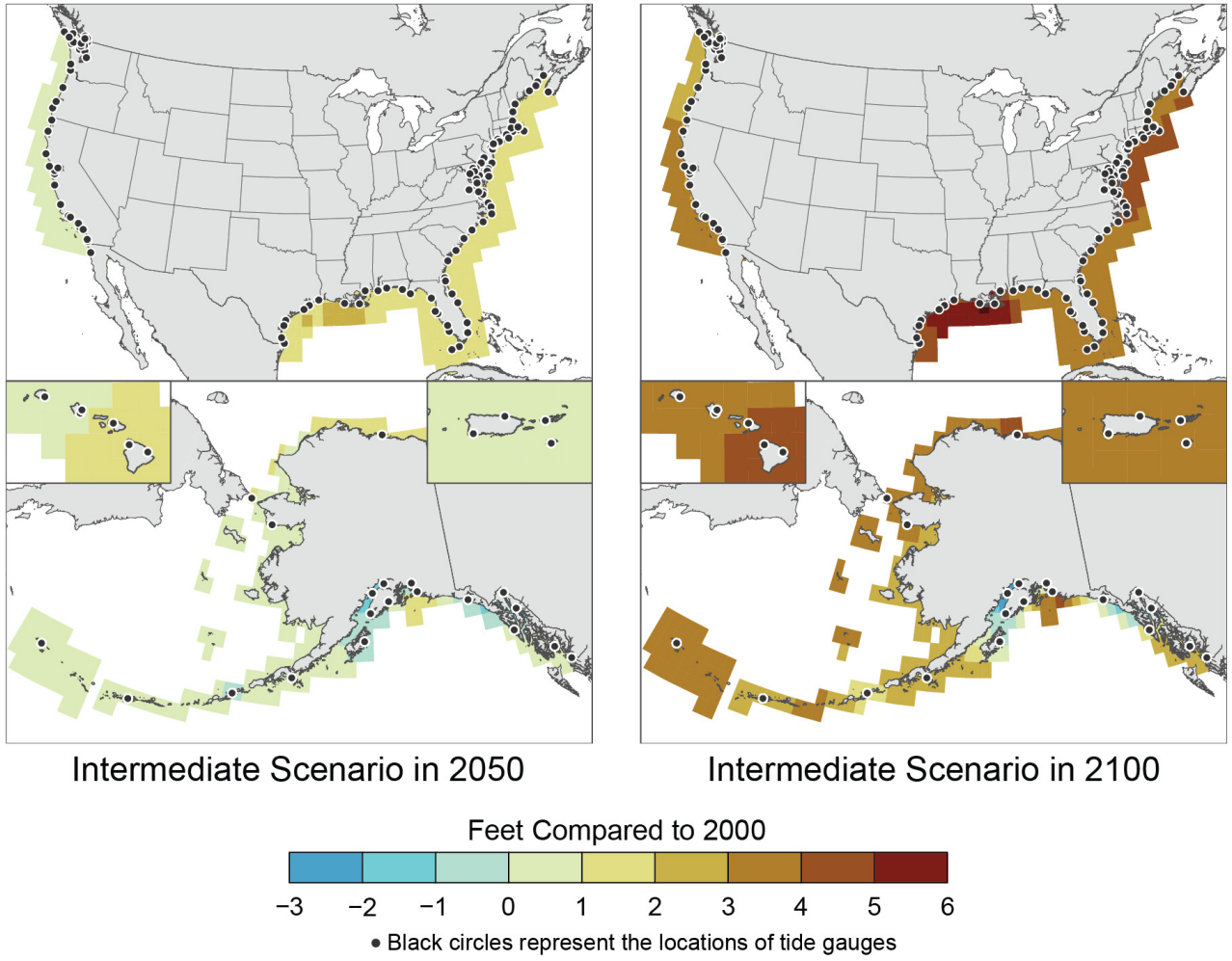
Adaptation Reduces Risk and Provides Additional Benefits for Coastal Communities

Accelerating sea level rise and climate change will transform the coastal landscape, requiring a new paradigm for how we live with, or adapt to, these changes (*high confidence*). Although incremental in nature, nature-based solutions and planned relocation strategies may help communities adapt to increasing coastal hazards if they are community-led and equity-centered (*medium confidence*). Maintaining cultural and economic connections within coastal communities will require equitable transformative adaptation that addresses systemic interconnections between ecosystems, communities, and governance *(medium confidence*).

Projected Sea Level Rise

By 2050 and 2100 under the Intermediate sea level scenario, sea level rise is projected to be higher along the Atlantic versus the Pacific Coast and greatest along the western Gulf Coast.

Figure 9.2. The figure shows relative sea level rise along the US coastlines under the Intermediate sea level scenario of the US Interagency Sea Level Rise Task Force (Sweet et al. 2022) for 2050 (**left**) and 2100 (**right**). Relative sea level rise for the contiguous US is shown on the top, and for Alaska, Hawai'i (left insets), and Puerto Rico (right insets) on the bottom. The black dots along the coastline indicate tide-gauge locations used to characterize past SLR. Characterizing past (and future) SLR for Alaska and the US-Affiliated Pacific Islands is complicated due to tectonic effects that cause both uplift and subsidence. Figure credit: NOAA National Ocean Service. See full chapter for detailed citation.



Recommended Citation
May, C.L., M.S. Osler, H.F. Stockdon, P.L. Barnard, J.A. Callahan, R.C. Collini, C.M. Ferreira, J. Finzi Hart, E.E. Lentz, T.B. Mahoney, W. Sweet, D. Walker, and C.P. Weaver, 2023: Ch. 9. Coastal effects. In: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023.CH9