



# Rising Sea Levels and Coastal Erosion

## Policy Options to Help Communities Adapt

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Thermal expansion of the world's oceans and the inflow of freshwater from glaciers as a result of global warming have contributed to a rise in average sea levels during the 20th century. What's more, research suggests that sea level rises are projected to experience greater increases in the years to come.

Along with the changes to marine and coastal natural resources, coastal communities are on the front lines for experiencing the effects of sea level rise, including inundation, coastal erosion, flooding, and saltwater intrusion. These climate change impacts will occur in dense and already stressed environments. Specifically, counties within coastal watersheds, excluding Alaska, contain close to 53 percent of the U.S.

population but represent only 17 percent of the total area of the country.

Coastal erosion is expected to threaten a large number of existing properties in the coming decades. Many of these structures are presently armored with seawalls or other hard barriers that disrupt sediment flows to the shore. Although all landowners will probably fight to keep their properties and their rights to protect them, society faces an important question regarding whether and when a property should be abandoned. In some cases, the answer might be never, especially if it is a unique or high value structure, such as a cultural heritage site. Regardless, public policies must be adopted to enhance the resilience of these communities to the impacts of



climate change. Below are several options to consider.

**Disaster insurance:** State and federal governments could reduce the amount or type of disaster insurance available to existing coastal landowners to decrease incentives to invest in refurbishing and strengthening seawalls over time. The National Flood Insurance Program (NFIP) insures high risk properties from flood damage. NFIP policyholders are, in some circumstances, required to adopt building practices to reduce flood risk or are required to do so after filing multiple claims. To reduce the likelihood that property owners in high flood risk areas will pursue maladaptive actions in the future, the federal government could tighten standards for new NFIP policies or even stop issuing policies altogether to certain regions.

**Armaments and setbacks:** Private insurers could also respond to increasing risk to homes and business due to climate change by increasing homeowner rates in anticipation of the damages. In this case, government intervention in the market might be needed for the prohibition of insurance discounts to landowners who reduce their risks through maladaptive practices, such as building larger sea armaments. Some level of government intervention seems warranted because neither insurance companies nor homeowners are likely to internalize the societal costs associated with seawalls and similar structures, including the increase in erosion, the decreased ability of wetlands to adapt to changing conditions, and interference with public access to the coast.

In the case of future development, states have instituted a range of policies for adapting to anticipated erosion without the use of expensive and environmentally damaging barriers. These include bans on armoring

and setbacks, which prohibit development seaward beyond a predetermined boundary. One potential issue with the use of setbacks is that once the water level reaches the setback, there is, in essence, an implicit contract that landowners will be able to build seawalls to protect their homes.

**Rolling easements:** A more flexible approach than seawalls and setbacks, which is tailored toward the dynamic nature of coastal erosion, has been pioneered and successfully defended in the courts by the state of Texas. Rolling easements are intended to induce property owners to yield to advancing shorelines or wetlands. This type of easement prevents property owners from holding back the sea and moves or “rolls” with the rising seas. The advantages of a rolling easement include (1) the lack of disturbance of sedimentation transport; (2) the potential for wetlands and other tidal habitat to migrate unimpeded; and (3) continued public access to the shore.

**Abandonment:** Although abandonment or the strategic retreat from a place is a politically difficult position to take, with many potential distributional and social justice consequences, the question of if and when to retreat needs to be in the forefront of the dialogue on adaptation policies. This is true for decisions regarding coastal habitat restoration in the face of sea level rise, habitat protections, and development in highly vulnerable locations such as barrier islands. If abandonment is not included as a feasible option, cost-effective adaptation policies will remain elusive.

#### FURTHER READING

Kling, David, and James N. Sanchirico. 2009. *An Adaptation Portfolio for the United States Coastal and Marine Environment*. Washington, DC: Resources for the Future.