

California's Coastal Erosion

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A commonly overlooked consequence of rising sea levels due to the greenhouse gas effect is severe coastal erosion— a growing threat for California as most of our population lives in coastal cities. This environmental hazard directly harms residents, including countless Berkeley students that work in Silicon Valley or Southern California.

Studies show that 40% of California's beaches are experiencing [long-term \(~120 years\) erosion of -0.2m/year](#), while 66% are experiencing short-term (~25 years) erosion of -0.3m/year. Low-to-moderate relief coasts— coasts with more sediment and lack of hard bedrock— experience more shoreline retreat than high relief coasts, meaning lower elevation coasts are at highest risk for maximum coastal erosion. Geologists, The California Water Board, and oceanographers expect Southern California to experience more extreme erosion, and such damage could deter tourists from visiting famous beaches—potentially harming the tourism economy. Over the next [50-70 years the Northern California](#) wetlands will face staggering loss of biodiversity, and building seawalls would aggravate associated consequences. Most of our nation's commercial and recreational fisheries depend on coastal marshes and wetlands, so this loss in biodiversity would affect the food web and desecrate other ecosystems; in turn, this would [devastate the livelihoods of coastal communities](#).

On top of that, economists predict more [than \\$70 billion dollars in damages](#) in the Bay Area alone, which may exacerbate [existing inequalities](#). Low-income households disproportionately feel the impact of climate change, according to Stanford economists who

overlaid coastal flood maps, building footprints with structural information, and financial instability. The economists highlight the fact that the monetary costs of structural damage doesn't represent the full picture of economic impact amongst these communities, and that we must consider "the value of the goods and services you can no longer purchase because of the [climate] disasters." Low elevation regions in the Bay Area like Union City, Palo Alto, and Santa Clara are at highest risk for most damages. Sea level rise combined with sinking land could put [nearly the entire SFO airport underwater](#), most of Foster City would sink, and Oakland International Airport would hardly be above water.

Floods perpetuated by coastal erosion demand billions in federal emergency funds, dramatically reduce the property value of coastal homes, and the Bay Area would experience worse cases of extreme weather events. Investing in projects that protect existing housing and infrastructure, mitigate floods, and protect wetlands is essential for the future health of our coasts.

Constructing [beach dunes/barrier islands to absorb wave energy](#) and maintain the tourism industry would significantly alleviate the intensity of coastal erosion. These beach dunes are generally separated from the mainland and are essential habitats for seabirds, fish, shellfish, and other wildlife. We can only build such barrier islands around the US Gulf, East Coast, and Outer Banks of North Carolina because active tectonic plate movement around the West Coast prevents long-term formation of such islands. Although these structures successfully reduce storm surge flooding and coastal erosion from rising sea level, human activity is increasing the rate barrier island erosion. Protecting beach dunes, which play a similar role in

reducing coastal erosion, is equally essential, as it protects “[people and their properties from uncontrollable variables](#).”

Experts suggest [creating micro-polders with water-control](#) systems could store flood water and shallowing the coast—using sediment to raise the bottom of the Bay— could further reduce the threat of floods and associated damages. Others suggest [dispersing flood water](#) by constructing jetties, breakwaters, and groins. Strategic underwater and sea-level vegetation could also control some erosion, particularly in areas [with beach landslides](#). Since the tide levels, wave frequency, and more factors vary across each coast, solutions for the West Coast may not work for the East Coast—much less Northern California vs Southern California. Although such efforts and investments could boost the number of environmental and civil engineering jobs, the overall financial burden on local and national governments for fighting the tides is monumental.

The threat of coastal erosion is not theoretical. It is happening to all coasts in the country but is especially brutal in California. One of the best ways we can protect our land, fight the tides, and maintain wetland/coastal biodiversity is by [voting and advocating policies](#) that conduct more research and fund preservation projects, as well as volunteering with coastal preservation organizations.