



KAUA'I CLIMATE ADAPTATION PLAN

Sea Level Rise, Coastal Erosion, and Extreme Tides

What is Sea Level Rise?

- As sea levels rise, chronic coastal erosion, passive and annual high wave flooding, and extreme high tides all increase. Global warming causes the sea level to rise due to melting glaciers and ice sheets and expansion of ocean water as it gets warmer.¹ Hawaii'i is particularly vulnerable to SLR, with estimates of future SLR 20-30% higher than estimates for the rest of the world.²
- Coastal erosion occurs when sea level rise, coastal floods, and strong waves wear away the rocks, soil, and sand along the coastline. Currently, over 70% of beaches in the state are in a state of chronic erosion due to SLR³ and shoreline hardening.⁴
- King Tides, our naturally highest tides of the year, now have greater impact due to sea level rise and interaction with severe weather. King Tides now cause more flooding because of SLR and coastal erosion.

1. Frederikse, T., et al. (2020) The causes of sea-level rise since 1900, Nature 584, 393–397, <https://doi.org/10.1038/s41586-020-2591-3>

2. Sweet, W.V., et al. (2017) Global and Regional Sea Level Rise Scenarios for the United States. NOAA Technical Report NOS CO-OPS 083. NOAA/NOS Center for Operational Oceanographic Products and Services

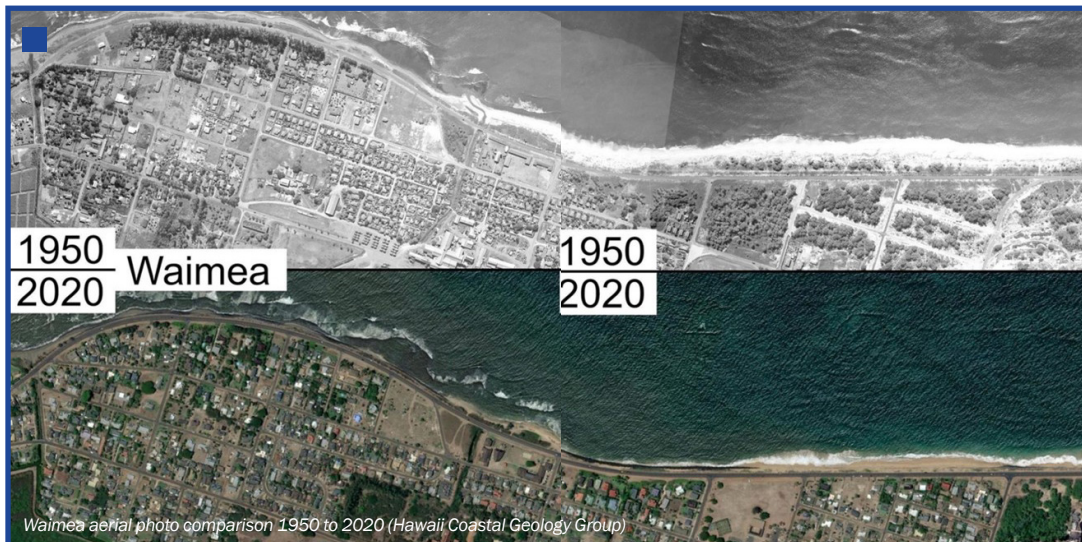
3. Romine, B.M., et al. (2013) Are beach erosion rates and sea-level rise related in Hawaii? Global and Planetary Change, 108: 149-157.

4. Romine, B.M. and Fletcher, C.H. (2012) Armoring on eroding coasts leads to beach narrowing and loss on O'ahu, HI.

6. Yamamoto, J. (2018). Hawaii and Pacific Islands King Tide Project. CC by 4.0. <https://creativecommons.org/licenses/by/4.0/>



Sea Level Rise



King Tide off Wailua (5)

“The golden era of coastal living is over.”

- Dr. Chip Fletcher

Projected Changes and Related Impacts

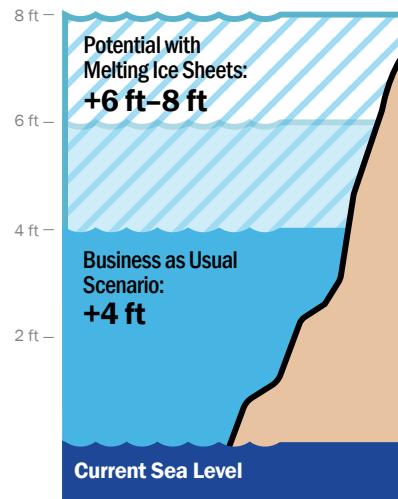
5. Tebaldi, C., et al. (2021) Extreme sea levels at different global warming levels. Nat. Clim. Chang. 11, 746–751. <https://doi.org/10.1038/s41558-021-01127-1>

Projected Change

- At current rates of warming, sea level in Hawai'i is projected to rise up to 4' by the latter half of the century. However, a rise of 6-8' by 2100 and over 15' by 2150 cannot be ruled out, as melting is occurring faster than projected and there remains deep uncertainty regarding the future stability of Earth's ice sheets
- **Extreme sea level events** (when the sea level is very high due to combined storm surge, tides, and waves) will be reached at least once a year by the end of the century⁵

Related Impacts

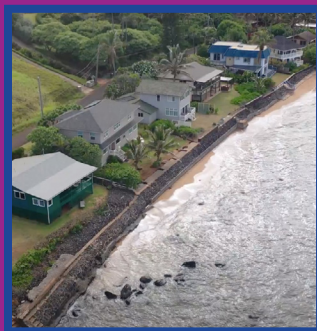
- **Flooding of low-lying elevation areas** due to seasonal wave inundation, coastal erosion, groundwater inundation, and drainage system capacity issues
- **Saltwater intrusion** into fresh water sources
- **Increased damage from storm surge** during tropical cyclones and tsunamis



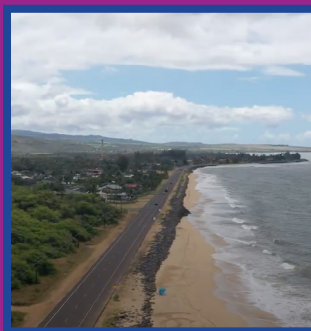
Key Vulnerabilities



Beaches and coastal habitats



Homes and other development on the coast



Coastal roads and highways



Native Hawaiian cultural practices and resources including salt harvesting, fisheries, and burial grounds

How can I get involved?

- Attend an Open House
- Attend a Deep Dive session
- Share a story on the website
- Participate in an online survey
- Contact the Planning Department

Get in Touch

For more information on the Kaua'i Climate Adaptation Plan visit kauaiadaptation.com or scan the code below with your phone.

plankauai@kauai.gov

(808) 241-4050



@plankauai



@kauaiplanning

