

# Pacific Islands Climate Change Cooperative



## Sea level rise in the main Hawaiian Islands: mapping impacts on native coastal plants and cultural sites

Modelers of global climate change impacts anticipate sea level rise of about 1 meter by the year 2100, and Pacific island communities are likely to feel these impacts acutely. Researchers from the USGS Pacific Islands Ecosystem Research Center are mapping sites along the coastline of the main Hawaiian Islands, excluding Ni‘ihau, to identify areas that are most vulnerable to increasing sea levels and to propose adaptive measures that could lessen the impacts.

### Few coastal and lowland plant communities in Hawai‘i remain intact

Due to extensive development and invasive species, few high quality native plant communities remain on the Hawaiian coast, and those that persist provide important habitat to seabirds, shorebirds, and invertebrates. They are also the last remaining homes for several listed endangered plant species.

Over long periods of time, the Earth’s seas have risen and dropped, and coastal plant communities have adapted by “migrating” upslope and downslope with the slowly changing water levels. However, sea level over the past 20 years is rising at an annual rate nearly twice that of the preceding 80 years, and will keep accelerating. This rapid rate, combined with barriers such as roads, buildings or geology, can make it difficult for coastal species to migrate upslope as sea level rises. Many Hawaiian cultural sites are found in remote coastal areas as well, and these are highly vulnerable to sea level rise since they

are fixed in place.

### Mapping the vulnerability of species, communities and cultural resources

With support from the [Pacific Islands Climate Change Cooperative](#), USGS researchers are combining vegetation data from over 150 coastal records with further surveys to assess the portion of the main Hawaiian Islands coastline that still contains native plant communities. They are capturing information on species, diversity, disturbance and other factors. To map the prospects for upslope movement, the team will use US Army Corps of Engineers elevation data based on LiDAR, a remote sensing method that allows highly accurate mapping of terrain height.

This project involves collaborating with the State Historic Preservation Division to determine the location of cultural sites that

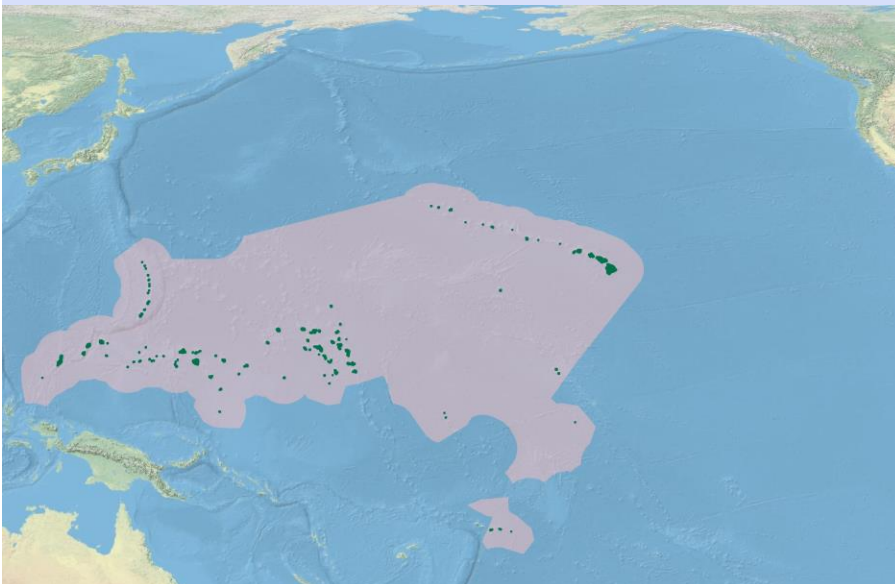


occur in important areas of native coastal habitat. The relative vulnerability of both natural and cultural sites to gradual sea level rise and abrupt inundation from surf will be analyzed with the goal of identifying not only the causes of vulnerability but also potential options for adaptation. These could include relocation of roads or other development that blocks coastal migration, or transplanting of vegetation to less vulnerable sites.

For more details about this project, visit the PICCC projects page: [piccc.net/our-projects](http://piccc.net/our-projects).



The map below depicts the PICCC geography, which includes Hawai‘i, American Sāmoa, Guam, the Northern Mariana Islands, the Marshall Islands, the Federated States of Micronesia, Palau and 4 Marine National Monuments.



## Principal Investigator

James Jacobi

[Pacific Island Ecosystem Research Center](#), US Geological Survey

## Partners

[US Army Corps of Engineers](#)

[Hawai‘i State Historic Preservation Division](#)

The Pacific Islands Climate Change Cooperative (PICCC) was established in 2009 to assist those who manage native species, island ecosystems, and key cultural resources in adapting their management to climate change for the continuing benefit of the people of the Pacific Islands. The PICCC provides a range of services and tools to help managers in Hawai‘i, the Mariana Islands, American Sāmoa, and other Pacific Island groups make informed decisions for conservation of natural and cultural resources including climate models at the scale of islands and archipelagos, ecological response models, and implementation and monitoring strategies for island species, resources, and communities. Our goal is to help managers reach explicit biological and cultural conservation objectives in the face of climate change and ongoing threats such as fire, land conversion, and invasive species.

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Banner photo of taro and Mo‘omomi Beach, Molokai by Starr Environmental, Flickr; Fish pond at Kaloko-Honokōhau, National Park Svc