

Pacific Islands Climate Change Cooperative



Maui field monitoring stations invaluable for analyzing climate change across a wide range of ecosystems

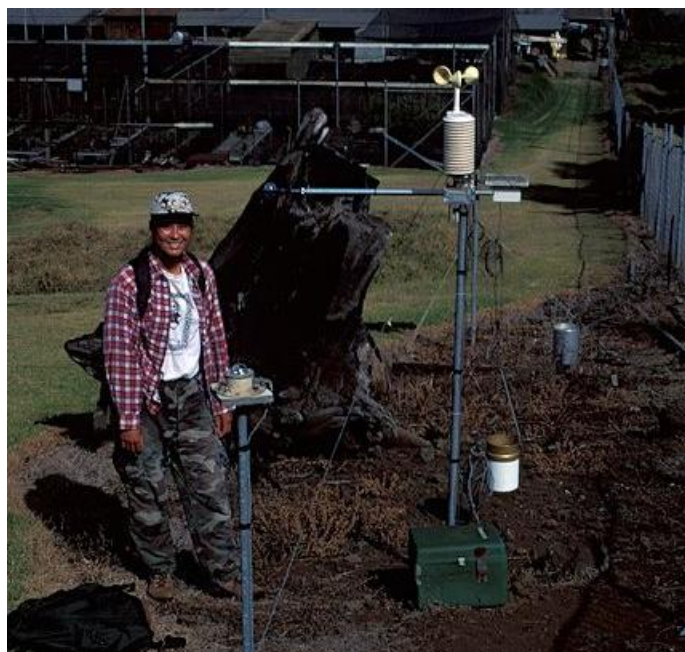
Hawai'i has in place a network of sophisticated climate monitoring stations that have been providing invaluable data for tracking and assessing climatic changes. Known as the [HaleNet system](#), it is located on Maui's highest mountain, Haleakala, and is unique in Hawai'i for its coverage of highly diverse environments, the range of different climate variables monitored, and its detailed (hourly) and long-term (22 years) record.

Scientists know that terrestrial ecosystems, water supply, and agriculture are highly sensitive to changes in temperature and precipitation on tropical islands such as Hawai'i. During the past three decades, the state has experienced rapid increases in temperature, particularly at high elevations where they threaten fragile montane ecosystems. Rainfall has been declining for the past century, and recent decades have been particularly dry, contributing to a long-term decline in the base flow of streams (i.e., the flow that is not related to recent rainfall). HaleNet is recognized as a unique resource for research on how climate is affecting water resources and terrestrial ecosystems in Hawai'i.

The value of maintaining and improving climate monitoring has increased

Resource managers recognize the importance of time series data to study past behavior and help forecast future changes. They also recognize that for data to be useful, they must be for a sufficient period and gathered

in a standardized fashion. The longer the time invested in a good set of times series data, the greater the potential for loss becomes if that system is not properly maintained.



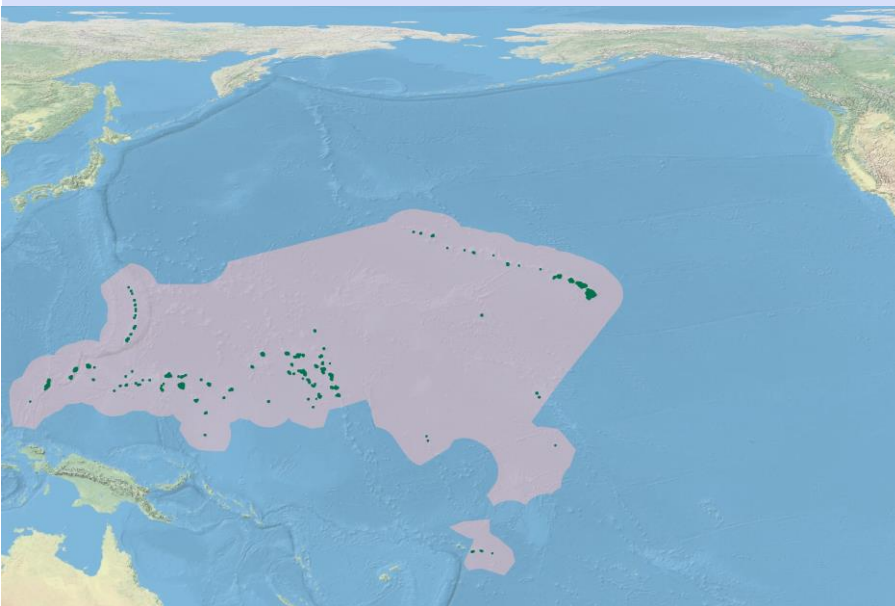
HaleNet data supports many objectives

Halenet data are indispensable to many research objectives that are key to natural resource stewardship on Hawai'i, including:

- Improved knowledge of how climate affects Hawai'i across elevations and exposures, facilitating scientific modeling and supporting management actions.
- Evaluation of the influence of trade wind patterns on climate and ecosystems of high mountains.
- Detection of trends in climate, including variables such as solar radiation, humidity, and wind -- all of which can influence vegetation.
- Estimates of the patterns and trends in evapotranspiration (the movement of moisture from plants and surface waters into the air), which is a critical factor that could exacerbate or mitigate the effects of changes in rainfall.
- Investigations of past climates in Hawai'i, essential to a long-term understanding of climate change.
- Collection of detailed climate information for Haleakalā National Park to aid in predicting the responses of both native and invasive species to climate variability and climate change. For example, an analysis of HaleNet data supported the conclusion that climate variations are contributing to a decline in the Haleakalā silversword, a spectacular, and endangered, native plant species.

For more details about this project, visit the PICCC projects page: 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

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Project Partners

[Haleakalā National Park](#), National Park Service

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

[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 HaleNet station by Starr Environmental on Flickr