

Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Understanding the Historical and Potential Future Effects of Climate Change on Water-Dependent Cultural and Natural Resources in West Hawaii

Discipline: Interdisciplinary
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 9/1/2010 - 12/31/2012
Funding Amount: \$71,270

Investigators and Agency Representative:

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Project Abstract: Kaloko-Honokohau National Historical Park (KAHO) was established in 1978 with a mission to preserve, interpret, and perpetuate traditional native Hawaiian activities and culture. KAHO contains more than 150 anchialine pools, two large Hawaiian fishponds with associated wetlands, and a coral reef, all of which are fed by groundwater originating upslope. Because Native Hawaiians depend on the mixture of unique marine and terrestrial water features contained within the park, these resources are vital to the integrity of the Park's mission. These resources are also critical to the health and survival of six federally registered species. At this time, the effects of existing environmental stressors such as alien plant and animal species, and increasing urban development of the lands surrounding the Park are difficult to distinguish from the effects of a changing climate.

Climate driven changes to the Park's water resources may adversely impact cultural uses of water and biota including candidate, threatened, and endangered species in the coral reef ecosystem, fishponds, and anchialine pools. Determining the effects of historical and future climate change on precipitation, temperature and secondarily on the amount of freshwater available for recharge is essential to managing and protecting vital water resources in KAHO. We will analyze precipitation and temperature records to determine historical variability and to identify climate trends already affecting freshwater recharge. We will also utilize an existing groundwater model to distinguish changes in freshwater recharge and the salinity of Park water resources due to climate influences from the effects of groundwater pumping. The results from this study will fill an important gap in the defense of water quality and quantity in KAHO. The Park will be better able to manage and protect valuable cultural and natural resources with this new information about the impact of climate change on regional freshwater recharge.

Outcomes with Completion Dates:

1. First Progress Report due May 31, 2011.
2. Completion Report due by December 31, 2011.
3. Article submitted for journal publication due by September 30, 2012.
4. Interpretive Products due by September 30, 2012.

Keywords: Colorado State University, Kaloko-Honokohau National Historical Park, climate change, water resources, impacts, natural resources, cultural resources