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Integrating Coastal Hazards and Sea Level Rise Resilience in Community Planning

PACIFIC ISLANDS CLIMATE ADAPTATION SCIENCE CENTER

TETRA TECH

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Cover image: Olowalu, Maui, 05-26-2017. Asa Ellison.

High sea-level flooding in Mapunapuna neighborhood on O‘ahu. Hawai‘i Sea Grant King Tides Project.

Land use and development in Hawai‘i is guided by a system of state and county geographic and topical plans, and actions for their implementation. These plans provide vision, guidance, and policies for a range of decisions including infrastructure improvements, land-use planning and permitting, population settlement patterns, and environmental management. As climate change contributes to rising sea levels and more extreme storm impacts, it is critical for our coastal communities to effectively utilize the planning system to address the growing risks they face from coastal hazards.

Hawai‘i is especially vulnerable to coastal hazards and sea level rise because most of the state’s homes, businesses, and critical infrastructure are concentrated on low-lying coastal plains. The evolving science on climate change and sea level rise is pointing to 3 feet or more of sea level rise within this century. Existing problems of chronic erosion and coastal flooding in Hawai‘i will worsen with sea level rise leading to beach loss, damaging homes and infrastructure, and endangering coastal habitat.

> By incorporating the best available science on coastal hazards and sea level rise vulnerabilities into county and community level plans and policies, Hawai‘i will be more resilient to the impacts of chronic flooding and erosion as well as extreme events such as tropical cyclones and tsunami.

Project Description

Over the past decade, Hawai‘i has progressed in recognizing and addressing coastal hazards and the need for adaptation to sea level rise. However, more work still needs to be done to translate broad-scale guidelines and scientific information into action at the local level. This project focuses on developing practical guidelines for incorporating resilience to coastal hazards and sea level rise into county general plans and community plans. In the context of this project, resilience is a community’s ability to adapt and thrive in the face of increasing coastal hazards, climate change impacts, and sea level rise through proactive planning utilizing the best available science.

The guidelines will be based on the best available science on local sea level rise vulnerabilities and build on state-wide initiatives including the Hawai‘i Climate Adaptation Priority Guidelines in the State Planning Act (Act 286, 2012) and the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report under the Hawai‘i Climate Adaptation Initiative (Act 83, 2014). The Sea Level Rise Vulnerability and Adaptation Report includes sea level rise vulnerability map data to support community scale assessments and planning.

A key component of the guidelines will be real world case studies providing examples of how improvements to coastal hazards and sea level rise resilience are implemented through the island and community-level planning processes utilizing best available science, mapping, and planning tools.

Project Outcomes

The goal of this project is to build capacity for state and county agencies to effectively integrate hazards resilience considerations into their community planning efforts. This will result in communities across Hawai‘i that are better prepared to address the growing risks of coastal hazards, climate change, and sea level rise.

King tide flooding at Hanapepe Salt Ponds. Photo credit: Hawai‘i Sea Grant King Tides Project.

The Bigger Picture: Building Resilience to Coastal Hazards and Climate Change in Hawai'i

As an island community where much of the population and infrastructure is concentrated along low-lying shores, Hawai'i is uniquely vulnerable to sea level rise and coastal hazards. Scientists and policy makers are responding to these risks with a variety of innovative projects, plans, and technologies.

The Hawai'i Sea Level Rise Vulnerability and Adaptation Report
In 2014, the Hawai'i State Legislature passed the Hawai'i Climate Adaptation Initiative Act (Act 83, Session Laws of Hawai'i) declaring that climate change poses both an urgent and long-term threat to the state's economy, sustainability, security, and way of life. This legislation created an Interagency Climate Adaptation Committee and called for the development of a statewide Sea Level Rise Vulnerability and Adaptation Report. This report, completed in December 2017, is helping Hawai'i prepare for the impacts of sea level rise and is also intended to serve as a model for future efforts to address other climate-related threats and climate change adaptation priorities, ultimately leading to a Climate Adaptation Plan for the State of Hawai'i. In 2017, the State Legislature passed Act 32 further solidifying Hawai'i's commitment to climate change mitigation and adaptation, and created a Hawai'i Climate Change Mitigation and Adaptation Commission to further the work of the Committee established in 2014. The Report is available at climateadaptation.hawaii.gov.

Hawai'i Sea Level Rise Viewer
This online Viewer incorporates the best available science on sea level rise predictions for Hawai'i including exposure to erosion and coastal inundation. With high-resolution interactive maps, the Viewer serves as a companion digital atlas for the state Sea Level Rise Vulnerability and Adaptation Report. This tool is accessible to communities and decision-makers across Hawai'i, allowing them to visualize and plan for the local impacts of coastal hazards and sea level rise. The Viewer was developed by the Pacific Islands Ocean Observing System under the direction of Hawai'i Sea Grant and the State of Hawai'i with funding from the NOAA 2016 Regional Coastal Resilience Grant and the Hawai'i Department of Land and Natural Resources. The Viewer is available at www.hawaiisealevelriseviewer.org

Resilience-Focused Disaster Reconstruction Planning
With climate change and rising sea levels, Hawai'i is expected to experience more severe impacts from coastal disasters such as hurricanes, tsunami, and extreme high wave events. A critical aspect of community resilience is the ability to build back safer, stronger, smarter, and faster after a damaging disaster. This project works with state and county government to promote resilience-focused recovery practices that enable communities to rebuild quickly while also protecting sensitive environmental and cultural resources, and increasing preparedness for future disasters. This project is under the direction of Hawai'i Sea Grant and the State of Hawai'i with funding from the NOAA 2016 Regional Coastal Resilience Grant and the Hawai'i Department of Land and Natural Resources.

Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas
The Hawai'i State Office of Planning, Coastal Zone Management Program, as part of its implementation of the Ocean Resources Management Plan, is leading this project to facilitate discussion on the feasibility of managed retreat as a strategy for climate change adaptation in Hawai'i. Research on strategic retreat options and lessons learned from communities around the globe will be complied into a background report. The project also explores the potential nexus and additional benefits of a managed retreat framework to provide and enhance public access to the shoreline and state land-use management policies. Stakeholder consultations, local case studies, and a statewide symposium will contribute to a final report on the feasibility of managed retreat in Hawai'i.

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