

Coastal Ecosystems and Climate

Project Title: Humboldt Bay National Wildlife Refuge Sea-level rise modeling/Coastal ecosystem response to climate change

Headline Title (2-5 words): Coastal Ecosystems and Climate

Brief Summary (Abstract): In 2011, the NPLCC funded a project looking at ecological response to sea-level rise and storms within seven tidal marshes at Humboldt Bay National Wildlife Refuge. This project was part of a larger USGS Western Ecological Research Center program on Coastal Ecosystems Response to Climate Change, studying tidal marshes throughout the Pacific Coast. It provided a bottom-up example of a local approach to evaluating sea level rise. The project produced raw data and elevation and vegetation maps that are important tools managers can use to monitor ecosystem response. In 2013, the NPLCC again provided funding to Dr. Takekawa to disseminate sea-level rise research findings to coastal managers for implementation into long-term management and planning.

Project Location: California, Oregon, Washington

Partners: USGS Western Ecological Research Center, Oregon State University

Background: Climate change scenarios typically address top-down global scale changes; thus, few are easily interpretable to local land managers or contain a vertical resolution that is useful at the local level for planning climate change adaptation strategies. These studies are directed at a bottom-up local approach to evaluating sea-level rise effects and provide information and data sets useful in assessing local responses. Due to budget cuts, land managers have limited ability to travel to large meetings, reducing their ability to access recent climate studies and the need for scientist to conduct project outreach and support has increased.

Project Goals:

1. Develop high-resolution digital elevation models, monitor water levels and tidal cycles to assess flooding and extreme water events, inventory vegetation, and determine and quantify the impacts of sea-level rise and storms on marsh wildlife species.
2. Disseminate site-specific baseline data and modeling results, reveal coast-wide trends, and identify additional data gaps.
3. Identify and discuss how local scale climate science results may be incorporated into habitat conservation management, planning documents, and climate change adaptation strategies.
4. Recruit stakeholder involvement in developing a decision-making tool (Envision) to incorporate climate change projections into management decisions.

Strategy Goals Implemented: 1.1, 3.1, 3.2, 4.1, 4.2, 5.2, 5.3

Climate Impacts Addressed: Sea-level rise

Status of Project Implementation (Timeline, Milestones, Next Steps): Phase 1 (Humboldt Bay data collection and modeling) Completed and Phase 2 (dissemination of information) in progress with an end date of December 31, 2015.

Project Outcomes:

Phase 1 Outcomes - Baseline data collected and elevation models on the effects of sea-level rise and extreme storms on coastal marshes completed

Phase 2 Expected outcomes -

1. Convene managers, biologists, Tribes, and other important decision makers and partners in our research areas.
2. Host in-person workshops with managers and stakeholders in our coastal study site areas.
3. Work with managers and stakeholders to incorporate project results into climate change adaptation strategies and management decisions.

Funding Sources: North Pacific LCC for the described work with leveraged financial resources from the California LCC, the Southwest and Northwest Climate Science Centers for other sites that are part of this larger project.

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Photos/Attachments: Attached photo "Takekawa4.jpg"

Photo/Figure Credits (do we have permission to print): USGS WERC, yes permission to print

Suggested Photo Caption: Tidal monitoring was used to evaluate sea-level rise effects