



Evaluating Vulnerability of Coastal Ecosystems & Communities Using Long-term Data Sets

Why this project?

Climate change poses major threats to our nation's estuaries. Changes in sea level, shifts in salinity and pH, changes in air and water temperature, and alterations in precipitation could result in the potential loss of habitats and associated species, as well as adverse impacts to local economies, development, and infrastructure. In order to improve the resiliency of these important ecosystems and the communities that rely on them, we must strengthen our understanding of climate variability and develop adaptation strategies that address the major climate change threats.

To develop sound adaptation strategies, decision-makers must understand (1) which resources are most likely to be affected by climate change and (2) what options are available for improving their resilience. Vulnerability assessments are a key tool for developing this understanding, and they provide the necessary information for creating effective adaptation strategies.

What's happening?

The Mission-Aransas National Estuarine Research Reserve is collaborating with Texas Sea Grant to conduct a vulnerability assessment of the Reserve and its surrounding communities. The Reserve is an ideal location to conduct this type of vulnerability analysis because it is situated in an area that is already exposed to episodic changes in climate and is forecasted to see increases in the frequency and duration of these episodic changes. The Reserve is also



Vulnerability assessments will help resource managers make decisions about important species, such as the endangered Whooping Crane.

fortunate to have access to a variety of long-term datasets that will allow researchers to adequately assess vulnerability. The Mission-Aransas Reserve will partner with federal and state agencies, local governments, universities, and non-profits to gather data and thoroughly assess the vulnerability of the Mission-Aransas Reserve ecosystems and local communities to climate change.

Project Goals

The proposed project will:

1. Synthesize and analyze long-term datasets from the Mission-Aransas Reserve and partner organizations to understand the sensitivity of Reserve habitats and species to climate variables.
2. Assess the vulnerability of a subset of Reserve habitats and species to future climate change using relevant data, tools, and expert input.
3. Characterize the human communities of the Mission-Aransas Reserve watershed using the most recent census data and use the results to assess social vulnerability of local communities to potential climate change hazards.

The results from this study will provide resource managers and local officials with the information they need to protect estuarine ecosystems, as well as humans. They will be able to choose appropriate management measures that promote estuarine resilience, incorporate climate change in management plans, and prioritize agency investments.



The human communities surrounding the Mission-Aransas Reserve are also at risk from climate change. They will be forced to deal with hazards, such as more frequent droughts, hurricane force winds, coastal flooding, and sea level rise.

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