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San Juan Bay Estuary Program Assesses Vulnerability and Targets Adaptation Measures

The Puerto Rico Climate Change Council brought together numerous experts in 2010 to assess potential climate impacts and vulnerability in Puerto Rico's State of the Climate Report. Among numerous climate risks, the report details several climate threats to the San Juan Bay Estuary Program, one of 28 National Estuary Programs (NEPs) from around the country. Active members of the Puerto Rico Climate Changes Council, the San Juan Bay Estuary Program (SJBEP) decided to follow-up the report with a risk determination and vulnerability assessment for the San Juan Bay estuary. SJBEP worked with the EPA's Climate Ready Estuary Program to undertake a comprehensive vulnerability assessment and identify adaptation strategies. SJBEP used the EPA's Being Prepared for Climate Change Workbook process to catalog climate related vulnerabilities through community workshops, stakeholder meetings, and exercises.

In order to better understand climate concerns and experiences, SJBEP engaged the environmental justice communities that live and work around the bay through workshops and on-site discussions. The completed vulnerability assessment better prepares the San Juan Bay Estuary Program to undertake action to adapt to a changing climate. The report represents a first step for the SJBEP. The vulnerability assessment will help inform the development of a future adaptation plan that identifies appropriate adaptation strategies. Meanwhile, the vulnerability assessment has encouraged the estuary program to pursue measures to improve the resiliency of coastal wetlands and coral reefs.

- Puerto Rico Climate Change Council  <<https://pr-ccc.org/>>
- State of the Climate Report  <<https://www.pr-ccc.org/en/publications/estado-del-clima-de-puerto-rico-2014-2021-2/>>

How Did They Do It?	Applicable EPA Tools
<p>Conducted vulnerability assessment with extensive stakeholder engagement process</p> <ul style="list-style-type: none"> • Developed a Climate Projection Scenario using the Climate Ready Estuaries Workbook. • Identified and engage vulnerable communities through community workshops and in-person discussions. • Analyzed the likelihood and magnitude of climate threats including extreme weather, sea level rise, erosion, and loss of coastal barriers such as mangroves and coral reefs. 	<p>Being Prepared For Climate Change Workbook helps develop a vulnerability assessment and risk-based climate change adaptation plan to reduce the most pressing risks.</p> <p>Being Prepared For Climate Change Workbook https://epa.gov/cre/being-prepared-climate-change-workbook-developing-risk-based-adaptation-plans</p>
<p>Identified highest likelihood and highest consequence risks for non-point and point source pollution</p> <ul style="list-style-type: none"> • Documented top climate risks of concern and identified the timeframe for impact. • Some climate risks were identified as already occurring, examples of this were point source sewage overflows, and non-point source issues such as increased runoff, septic system failures, and greater erosion and sedimentation from sea level rise. • Recognized that other climate affects posed longer-term risk including an increase in harmful algal bloom outbreaks and greater infiltration into sewers due to a higher water table. 	<p>EPA Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) can help users create climate scenarios and assess the coupled effects of climate and land-use change on water quality.</p> <p>Better Assessment Science Integrating Point and Nonpoint Sources (BASINS)</p>



How Did They Do It?	Applicable EPA Tools
<p>Used this information to inform management plans and implement resiliency measures</p> <ul style="list-style-type: none"> San Juan Bay Estuary program incorporated climate risks within the recent 2013 draft update to the Comprehensive Conservation and Management Plan. (Spanish only). The program is continuing to promote actions such as using artificial reefs and mangrove plantings to help restore the estuary and increase resilience to future conditions. 	<p>Synthesis of Adaptation Options for Coastal Areas Guidebook can assist in identifying adaptation options to protect coastal areas from storm surge and inundation concerns.</p> <p>Synthesis of Adaptation Options for Coastal Areas Guidebook <https://epa.gov/cre/synthesis-adaptation-options-coastal-areas></p>

Similar Cases and More Information

San Juan utilized climate projections to determine the threat likelihood and vulnerability of climate risks. To see another example of how a coastal community assessed downscaled vulnerability to potential climate threats view the Southwest Florida Salt Marsh Vulnerability and Adaptation Plan. Many coastal communities in the pacific islands and elsewhere may also have to deal with other challenges including saltwater intrusion and sea level rise; for another coastal sea level rise case, view MD SLAMM Model. To learn more about how another coastal community water utility adapted to saltwater intrusion and potential water quantity considerations, see how Tampa Bay Water diversified their source water to promote resiliency to current and future conditions.

- Southwest Florida Salt Marsh Vulnerability and Adaptation Plan <<https://epa.gov/arc-x/southwest-florida-assesses-salt-marsh-vulnerability-sea-level-rise>>
- MD SLAMM Model <<https://epa.gov/arc-x/maryland-analyzes-coastal-wetlands-susceptibility-climate-change>>
- Tampa Bay Water <<https://epa.gov/arc-x/tampa-bay-diversifies-water-sources-reduce-climate-risk>>

References

- Assessing a Tropical Estuary's Climate Change Risks  <<https://toolkit.climate.gov/case-studies/assessing-tropical-estuaries-climate-change-risks>>
- Puerto Rico Climate Change Council  <<https://pr-ccc.org/>>
- EPA Climate Ready Estuaries Partner Projects <<https://epa.gov/cre/climate-ready-estuaries-partner-projects>>
- Reclaiming and Renewing a Tropical Watershed, San Juan Bay Estuary Program <<https://epa.gov/nep/protecting-and-restoring-habitat-living-resources>>

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