



Puerto Rico Coastal Storm Risk Management Study



Environmental Considerations

National Environmental Policy Act (NEPA)

NEPA is a Federal law enacted in 1969. As required by NEPA, the Corps will evaluate potential environmental effects of the array of alternatives and recommended plan to the human environment.

Cultural Resources

The Corps will conduct archeological analysis to assess any potential cultural resources within the reduced study scope.

Analysis to Identify Species of Concern & Sensitive Habitats

The Corps will conduct: 1) Coordination with applicable environmental regulatory agencies; 2) Avoid and minimize effects to the maximum extent practicable.



The Puerto Rico Coastal Storm Risk Management Study is authorized under Section 204 of the Flood Control Act of 1970, Public Law 91-611, and funding for the study was appropriated as part of the Bipartisan Budget Act of 2018 (PL 115-123). This study will evaluate alternatives to potentially reduce hurricane and storm damages to public infrastructure, residential buildings, and commercial buildings. The Puerto Rico Department of Natural and Environmental Resources (DNER) is the non-Federal sponsor for the project.



Condado

Ocean Park

Isla Verde

Carolina

Rincón

Mayaguez - PR 102

Humacao - Hwy 3

Initial Study Area

12 Municipality Coastlines (Identified by the Non Federal Sponsor - DNER)



Initial Study Areas Assessed, were reduced to less than 15 miles for a focused project

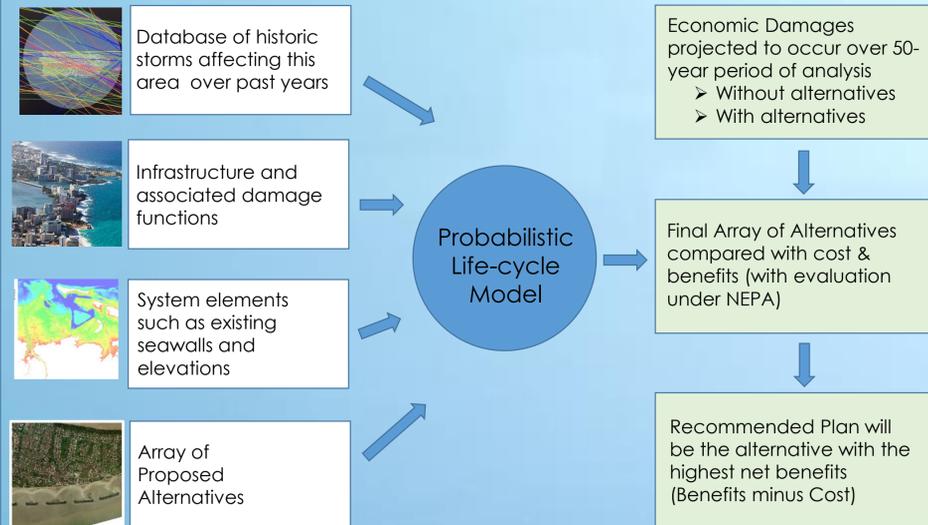
Preliminary Scoping Results



*TIER 1: Alternatives formulation requires extensive modeling
**TIER 2: Low cost alternatives without requiring modeling

Planning & Engineering

Once the study area scope is reduced, an array of alternatives will be assessed and modeled to determine the alternative which best addresses the primary study objective to reduce coastal storm damages.



The alternatives could include but are not limited to stand alone or combinations of soft structures (beach and dune), hard structures (breakwaters/reefs, perched beach, seawalls, rock revetment, groins), and non-structural alternatives (Acquisition of land and structures).



Criteria which Indicate Federal Interest

USACE uses four accounts (Principles, 1983), which are used to track benefit categories. In this case, they were used to see which reaches had the most potential to support Federal projects, known as Federal Interest.

National Economic Development (NED)

✓ This account displays changes in the economic value of goods and services. This category is used for economic justification of Federal Interest. Benefits of damage reduction must be greater than the cost to implement the project; the benefit to cost ratio (BCR) must be greater than 1. Dense infrastructure or critical infrastructure over a large area is a primary indicator of strong economic justification.

COASTAL STORM RISK MANAGEMENT (CSRM) KEY FORMULAS

BENEFITS

Primary: Storm damage reduction

Incidental: Recreation

COSTS

- Cost of alternative over a 50 year period of Federal participation
- Associated costs

$$\text{CSRM BENEFITS} = \frac{\text{ESTIMATED \$ DAMAGES WITHOUT PROJECT}}{\text{ESTIMATED \$ DAMAGES WITH PROJECT}} > 1$$

Environmental Quality (EQ)

✓ This account displays nonmonetary effects on significant natural and cultural resources. This screening considered areas that show potential to maintain or increase environmental benefits (sea turtles, improve reef or increase reefs, mangroves, etc).

Other Social Effects (OSE)

✓ This account registers plan effects from perspectives that are relevant to the planning process, but are not relevant in the other three accounts. This screening included consideration of aspects of each area related to public safety, maintenance of recreation, and other social effects.

Regional Economic Development (RED)

✓ This account registers changes in the distribution of regional economic activity. This screening considered reaches that had potential for temporary or permanent growth in local economy.

Estimated Study Schedule

