The Corps of Engineers and Coastal Storm Risk Management In Puerto Rico

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AGENDA

- USACE: Coastal Storm Risk Management Program
- Jacksonville District Coastal Experience
- CSRM in Puerto Rico
  - Why
  - How
    - Policy and Budget
    - Puerto Rico’s path forward
  - What
    - Adapting for a Resilient Future
    - Systems Approach
    - Redundancy
    - Environment

http://www.corpsclimate.us/docs
JACKSONVILLE DISTRICT MISSION: Deliver value to the Nation by anticipating needs and collaboratively engineering solutions that support national security, energize our economy, and increase resiliency.
DID YOU KNOW?
Jacksonville District has the largest shore protection program in the Nation and constructs more than 30% of the Nation’s total shore protection projects including more than 125 miles of shoreline.

Jacksonville Program

Authorized Projects

Jacksonville Civil Works Boundary
BUILDING STRONG
LEARNING ORGANIZATION

Resilience

PREPARE

RESIST

ADAPT

RECOVER

With Project: located close to point of landfall

Without Project: 30 miles away from landfall
Centers of Expertise

- Coastal Planning
- Engineering Research & Design Center
  - Coastal Hydraulics Lab
- Institute for Water Resources
- Marine Design
- Survey Engineering and Mapping
- Photogrammetric Mapping
- Curation/Mgmt Archeological Collections
- Environmental and Munitions
- Hydrologic Design
- Rapid Response HTRW
Puerto Rico Islands Vulnerable to Hurricanes

Sea-level Rise

Socio-economic Considerations

Environmental Resources at Risk
Critical Infrastructure at Risk

Cultural Resources at Risk

Sand Mining

Recreation at Risk
Why?: Reduce risk to Infrastructure
Why?: Storm response

Ft Pierce Beach, FL post Sandy restoration 100% Federal cost
Why?: Economics

Dade County Beach Erosion Control Project
Before and After
How: Corps Planning Process

- A formalized process that determines, details, and coordinates recommended Federal involvement
- NED Plan: Maximizes national economic development benefits, consistent with protecting the nation’s environment, in accordance with national environmental statutes, executive orders, and Federal planning requirements
Benefits of the Corps Planning Process

- Sponsor input throughout the process
- Thorough investigation of the problem and determines Federal solution that COE can support
- Determines Federal funding
- Public coordination and consensus building
- Utilizes Corps expertise
- Can streamline permitting process
- Can provide for multi-year funding
**Puerto Rico Coastal Comprehensive Study Request**

WRRDA 2014 Section 2014

- One of only 17 studies nationwide
- Needs WRDA authorization
- Requires Federal Funding
- Will identify vulnerabilities and potentially authorize solutions

Recent & Ongoing Federal Coastal Actions:

- The Department of Natural and Environmental Resources (DNER) of Puerto Rico is herein responding to the notice published by the Department of Defense - U.S. Army Corps of Engineers, requesting proposals for non-federal interests for feasibility studies and modifications to authorized USACE water resources development projects or feasibility studies. This notice was published in the Federal Register Vol 79 No. 156 (August 5, 2014) request proposals to be included in the Annual Report to be issued in February 2016.

The DNER is highly interested in assessing island-wide coastal and beach erosion and formulating storm damage reduction strategies which could include beach nourishment or the implementation of other appropriate energy conservation measures. To this effect, DNER would act as the main sponsor with support from each municipality where project development would be implemented. There are 32 coastal municipalities in Puerto Rico.

Specific interests:

1. Non-Federal sponsors: DNER
2. New feasibility study and USACE's planning assistance to assess island-wide coastal and beach erosion for Puerto Rico.
3. The purpose of the proposed feasibility study and USACE’s planning assistance is to assess island-wide coastal erosion. DNER is currently assessing beach erosion trends and identifying coastal communities at risk. However, planning assistance from the USACE is required in order to (1) identify beach-wide areas where beneficial use of dredge material could enable beach nourishment; (2) conduct benefit-cost analyses of project and economic assessments; and (3) evaluate cost estimates to address the specific erosion problems, such as beach nourishment, wave energy dissipation or in some cases, planned retreat of infrastructure. The first phases of this initiative would be to identify funding for seawall coastal projects.
4. Estimate the total cost $4.1 million dollars over a period of three years (Based on previous work conducted by the U.S. Army Corps of Engineers in other States).
Puerto Rico
Regional Sediment Management Study

Figure 1. San Juan RSM Conceptual Sediment Budget

Conceptual Cells A—H, Punta Salinas to Loiza
Rincon Harbor Investigation

**Authority:** Planning Assistance to States

**Cost to Puerto Rico:** $0

**Completed:** July 2015

**Purpose:**
1. Potential historic erosive effects of dredging the marina basin
2. Potential effects if the marina basin entrance is re-opened
3. Alternatives for beneficial use of dredged material
4. Alternatives for safe boat access if the marina basin is not re-opened
Loiza Continuing Authorities project: Emergency shoreline protection

Continuing Authorities Program
(CAP) Section 14
Emergency Shoreline Protection

Expedited Feasibility
Expedited Construction
Max $10M

Will need further review under Comprehensive Study
Topo-bathy Lidar coverage
What’s next

In preparation for the Comprehensive Study:

- Gain regional understanding of the coastal systems
  - Develop list of potential projects
- Develop short term/long term goals
- Investigate funding for University collaboration
- Look for renewable sediment sources
- Conduct outreach on benefits of shore protection
  - Puerto Rico Tourism Council
  - DNER
- Continue coordination meetings
  - Outreach to organizations such as ASBPA to help Develop a master plan for Puerto Rico’s coastal program
- CERB August 2016 – USACE Coastal Generals board of National Coastal experts
PEOPLE AND TEAMWORK MAKE IT POSSIBLE

THANK YOU
DIVERSE USACE PORTFOLIO | CRITICAL MISSION

USACE GOALS

- Support National Security
- Transform Civil Works
- Reduce Disaster Risks
- Prepare for Tomorrow

- One quarter of Nation’s hydropower
- 299 deep draft harbors (17)
- 627 shallow draft harbors (20)
- 400 miles of coastal storm risk management (137)
- 11,000 miles inland waterways (900 miles)
- 276 locks (6)
- 383 major lakes & reservoirs (720 square mile Lake Okeechobee)
- Emergency operations
- Regulatory responsibilities
- 4340 recreation areas (10)
- 376 million visitors/year (6.2 million)

(#) = Jacksonville District Responsibility

U.S. Ports/Waterways Convey > 2B Tons Commerce
Foreign Trade Creates > $160B Tax Revenues
Cumulative Flood Damage Prevented >$419B
Defining Resilience:

**Engineering (USACE)**
- System’s ability to anticipate, resist, recover, & adapt
- Achieves functional performance under the stress of disturbances through time

**Ecological (Walker Et Al. 2004)**
- System’s capacity to absorb disturbance & reorganize while undergoing change
- Retains essentially the same function, structure, identity, & feedbacks

**Community (Carri 2013)**
- Ability to anticipate risk, limit impact, & bounce back rapidly
- Grows via survival, adaptability, & evolution, in the face of turbulent change

Resilience Increased:
- Less loss of functionality
- Faster recovery time

Concept courtesy of North Atlantic Division
ADAPT: HEALTHY SYSTEMS

Regional Sediment Management

Construction FY15
- Kings Bay/Nassau County
- Jacksonville Harbor/Duval County
- St Augustine Inlet/Vilano Beach
- Ponce Inlet/Volusia County
- Tampa/ Egmont Key
- Jacksonville Harbor/Mile Point (ECO)

Designed FY15/Construction FY16
- Ft. Myers Inlet/Ft. Myers Beach
- Palm Beach Harbor/Town of Palm Beach
- Kings Bay/Nassau County

SEDIMENT BUDGET EXAMPLE
(St. Augustine)

http://rsm.usace.army.mil/
ADAPT: REDUNDANCY
Protection with Structures, Dunes, Vegetation, Berms

All new studies incorporate redundancy:

- Sarasota County, Lido Key
- Flagler County
- St. Johns County
- St. Lucie County

Dade County Breakwaters
ADAPT: ENVIRONMENT
Healthy Sustainable Projects
Depend on Healthy Systems

FY15 Focus:
- Turbidity and fate of fines
- Turtles and windows
- RSM: Keeping sediment in the system
- Hardground monitoring and mitigation

http://www.usace.army.mil/Missions/Environmental/EnvironmentalOperatingPrinciples.aspx
Sea level rise/climate change: Jacksonville District leader nationally

- ER-1100-2-8162 (Incorporating Sea-level Changes in Civil Works Programs)
- ETL-1100-2-1 (Procedures to Evaluate Sea-level Change: Impacts, Responses, & Adaptation)

FCCE rules are evolving: adequate versus pre-storm condition

- SAJ is on the National Rule Development Team

SMART Planning: No more shelved studies (SMART= Specific, Measurable, Attainable, Risk Informed, Timely)
PREPARE: CONSTRUCTION & STUDIES

CONSTRUCTION FY15

- Sarasota County, Venice (complete)
- Ft. Pierce (complete)
- RSM placement: Nassau County, Duval County, Volusia County, Egmont Key, St. Johns County

CONSTRUCTION FY16

- Dade County
- Duval County
- Brevard County mitigation
- RSM placement

ONGOING STUDIES:

- St. Johns County
- St. Lucie County
- Ft. Pierce
- Lee County, Gasparilla
- Palm Beach County, Jupiter-Carlin
Programmatic Updates

- Project life extensions updates
- Authority/Appropriations pending:
  - Study authorizations: Puerto Rico coastline; South Atlantic Division/Jacksonville District Comprehensive Coastal Study
  - Construction authorization needed: Flagler County
  - New Start study appropriation: Collier County, Longboat Key
  - New Start construction appropriation: Sarasota County, Lido Key
What’s next

- Gain regional understanding of the coastal systems
  - Develop list of potential projects
- Develop short term/long term goals
- Determine appropriate types of studies and seek study authority and appropriations.
  - RSM proposal for San Juan harbor submitted
- Investigate funding for University collaboration
- Explore linkages with Navigation dredging
- Look for renewable sediment sources
- Conduct outreach on benefits of shore protection
- Continue coordination meetings
  - Outreach to Florida organizations to help
- Develop a master plan for Puerto Rico’s coastal program
PEOPLE AND TEAMWORK MAKE IT POSSIBLE

THANK YOU
- Egmont Key: silt, fate of fines
- St. Johns County/Vilano Beach O&M nearshore placement & nearshore berms
- Lido Key RSM/coordination: combination of structures/nourishment/modeling/renewable inlet borrow areas
SUMMARY

- Passion
- Collaboration
- Adaptation
- Innovation
- Efficiency
- Resiliency

It didn't look right fading the two images into each other so I tried an animation. If you have better pictures, I can change those out Monday morning.
Critical habitat for Staghorn and Elkhorn corals
Puerto Rico

Islands Vulnerable to Hurricanes

Sea-level Rise

Socio-economic Considerations

Environmental Resources at Risk
Critical Infrastructure at Risk

Cultural Resources at Risk

Sand Mining

Recreation at Risk