

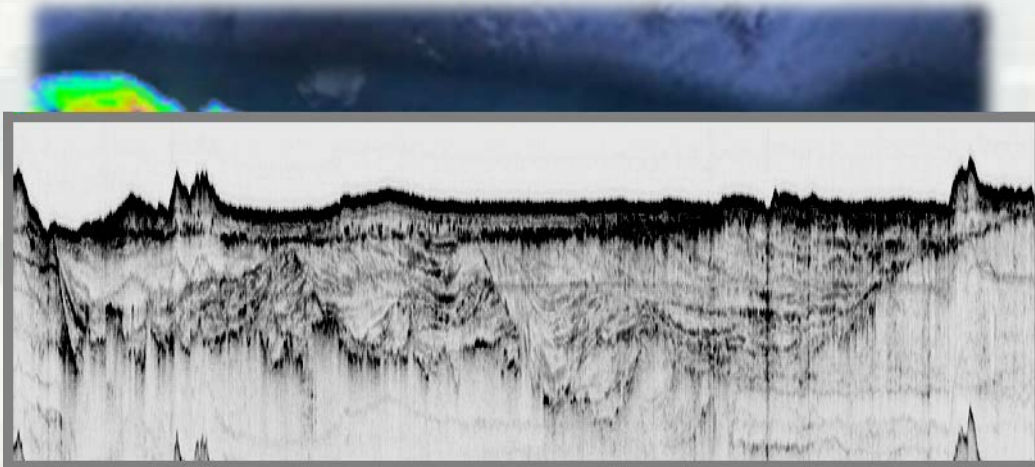
# FY17 RSM IPR

## Improve CMS' Capability to Optimize Beneficial Use Placement Activities via the Inclusion of Alongshore Variable Sand Thickness, San Juan and Condado, Puerto Rico

Heidi M. Wadman & Jesse E. McNinch: ERDC-CHL; Kelly R. Legault: SAJ

### **BLUF:**

1. Does the volume of transport-relevant sediment (sand) vary in the alongshore direction?
  - A. Is this variation significant enough to impact shoreline stability?
2. Can natural variations in alongshore sand volume be incorporated into CMS and used to improve nourishment efforts?
  - A. What is the minimum critical volume of sediment necessary to:
    - I. Stabilize the beach at San Juan/Condado?
    - II. Allow it to be in dynamic equilibrium with the forcing environment?



### **Approach**

1. CHIRP Sub-Bottom Mapping
2. CMS Modeling



### **Objectives/Challenges**

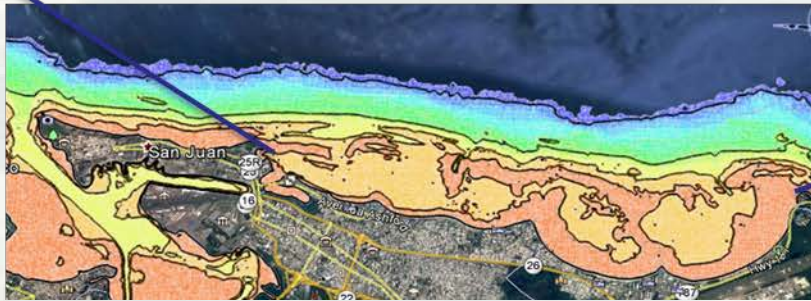
- Map the volume of nearshore sand alongshore within the Condado nearshore using integrated chirp and sidescan sonar (FY17)
- Incorporate sediment variability into CMS (FY17-18)
- Compare nourishment strategy derived from CMS using: (1) consistent alongshore sand volumes; (2) alongshore-variable sand volumes (FY17-18)



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### Leveraging/Collaborative Opportunities (UPR):

- vessel support (survey and catamaran)
- instruments (current & wave meters)
- CARICOOS boundary condition support
- CMS modeling support
- Oceanographic data analysis
- Co-authoring manuscripts/reports



### PDT Members

Dr. Heidi Wadman, ERDC-CHL

Dr. Jesse McNinch, ERDC-CHL

Dr. Kelly Legault, SAJ

Dr. Alfredo Torruella, UPR-San Juan

### Stakeholders and Partners

Ms. Ashleigh Fountain, SAJ

Dr. Miguel Canals, UPR-Mayaguez

Dr. Sylvia Rodriguez, UPR-Mayaguez

Mr. Ernesto Diaz, DNER



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## Accomplishments/Deliverables

### Lessons Learned/Actions-construction

- Portable chirp catamaran designed and constructed.
- All equipment prepared for shipment.
- Field study planned for May 31-Jun 13, 2017.



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## What is working? Ups? Success?

Successful field test of new sled and trailer...

Ready for June!

Opportunity to collaborate with SAJ (San Juan harbor borrow site – sediment volume and characterization)



## What is not working? Downs? Issues?

- Shipping was more expensive than anticipated (*will try to leverage support from related projects*)
- Change in travel regulations ~13 days from departure (*from "OCONUS" to "OCONUS with 45-day notice"*)
- Puerto Rico declared bankruptcy and UPR students are on-strike... so the immediate collaboration is more challenging with respect to:
  - *logistical support (changes shipping and move/demove options)*
  - *concurrent hydrodynamic sampling (might have only previous data for CMS)*



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### How is this project benefiting the USACE and Nation:

Potential to reduce costs for nourishment projects by more accurately determining the:

- (1) minimum volume of sediment needed to stabilize the beach
- (2) optimal placement strategy to reduce sediment loss
- (3) reduce deleterious effects of nourishment being lost and/or transported to fragile environments.

Collaborate with SAJ & UPR on San Juan Harbor Study:

- (1) Determine the volume of sediment available for borrowing from shoaled regions in San Juan Harbor
- (2) Characterize the nature of the sediment to be borrowed.

