Coastal Storm Modeling Tools

Presented to COASTAL Act Interagency Working Group

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Research and Development

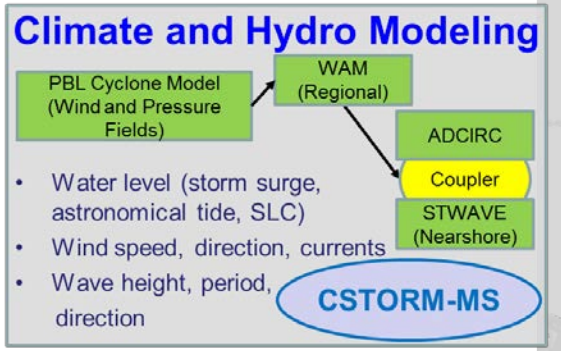
OVERVIEW

ERDC-CHL has high-fidelity models for coastal storm and hydrology modeling

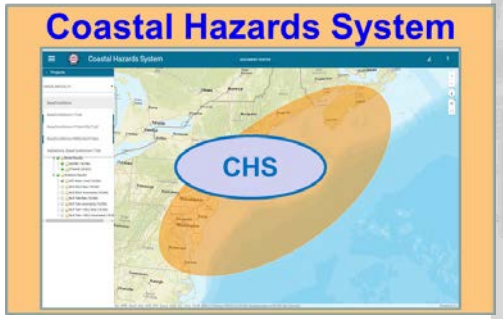
- ✓ Coastal Storm Modeling System (CSTORM-MS): tropical & extratropical coastal storm surge, wind, waves, tide, currents; 2D and 3D; wetting and drying
- ✓ Coastal Hazards System (CHS): Pre-calculated storm databases
- ✓ Hydrology (GSSHA): overland & stream flow, groundwater, vadose zone, storm and tile drains, wetlands, erosion, constituent transport

Coupling of Coastal & Hydrology models is an area of active R&D and have been demonstrated for several applications

CSTORM-MS: High-fidelity modeling



CHS: Database of Calculations



GSSHA: Advanced Hydrologic Model

FY18 EMERGENCY SUPPLEMENTAL APPROPRIATION

- **Public Law 115-123, Bipartisan Act of 2018 (enacted 9 Feb 2018)**
- **Investigations ➔ $135M, 38 Study Activities**
  - Initiate and/or Complete Current/Future Auth Studies, 100% Fed
  - $75M for HIM Impacted States + Up to $60M for Other Impacted States
- **Construction ➔ $15.1B, 58 Projects (32 Ongoing; 26 Not-ongoing)**
  - $15B to Construct FRM Projects
  - $10.4B for HIM Impacted States; $4.6B for Other Impacted States
- **Mississippi Rivers & Tributaries ➔ $770M, 12 Projects (Channels/Levees)**
  - $370M for Short-term Emergencies (10 Projects); $400M for Long-term FRM projects (2 Projects)
- **Operations & Maintenance ➔ $608M, 66 Projects (Emergency Repairs)**
  - Dredge Fed Nav Channels and Repair Damages
- **Flood Control & Coastal Emergencies ➔ $810M, 81 Projects (Emergency Repairs)**
  - Includes Auth Shore Protection Projects to Full Project Profile at Full Federal Expense

***** Innovation Opportunity *****

New technology identified to expedite project execution and improve project, community, and national infrastructure resilience

- Structural Materials
- Soil Enhancement
- Self Sensing/Self Healing
- Natural & Nature-Based
- Health Monitoring
- Construction & Repair
- Coating Technologies

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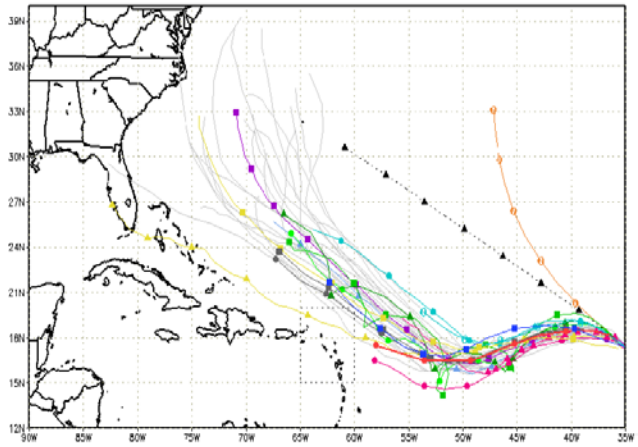
SOUTH ATLANTIC COASTAL COMPREHENSIVE STUDY

Identify risks and vulnerabilities to populated areas, areas of concentrated economic development, and environmental resources due to increased hurricane and storm damage as a result of sea level rise.



2018 Supplemental Appropriation following Hurricanes Irma and Maria

CHS Applications:

- Storm surge, waves, inundation modeling in PR, USVI, and Gulf Coast east of Louisiana.
- Inland and coastal modeling linkages.

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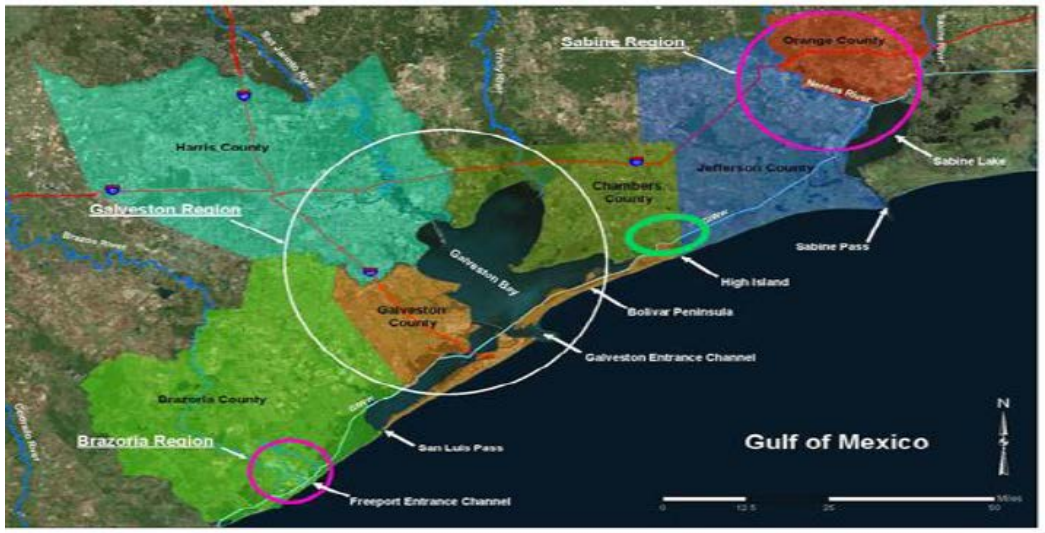
SABINE PASS TO GALVESTON PROJECT

Coastal Storm Risk Reduction Systems in Freeport and Port Arthur, TX, to include levee raises and extensions, and replacement of I-walls with T-walls. Also includes construction of 27 miles of new levees and flood walls, 7 new pump stations, 56 drainage structures, and 32 closure gates, in Orange County, TX



CHS Applications:

- Total Watershed Decision Support to be demonstrated at Freeport and Port Arthur.
- ADCIRC and GSSHA models to be applied, along with fragility curves for levees and flood control structures.

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