US Army Corps of Engineers
Engineer Research and Development Center

# Stochastic Forcing for Coastal Structure Design: Guidance Update

## Need

Existing coastal structure design guidance is out of date:

- Existing USACE guidance is 20 years old and not consistent across varied structure and functional categories;
- Need prescriptive guidance;
- Need to be consistent with risk-based planning guidance and modern stochastic approaches/hazard data like the Coastal Hazards System; and
- Design/assessment must reflect real risk.

This R&D will advance coastal structure stochastic science and engineering technologies and develop standardized prescriptive design/methods.

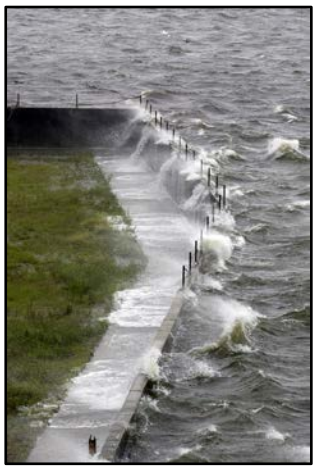
U.S. Air Force Base, Lajes, breakwater before (left) and after (right) repair

## Approach

Recent advances in multi-parameter joint probabilistic coastal hazards analysis have been promoted by regional stochastic hazards analysis within the USACE. The Coastal Hazards System, post-Katrina LACPR and parallel FEMA FIS studies, North Atlantic Coast Comprehensive Study Great Lakes FEMA FIS, Coastal Texas Study, Sabine to Galveston Study, and many more projects since 2006 have advanced coastal storm hazards understanding and techniques. Storm hazard total uncertainty has been quantified with significantly increased accuracy. At the same time, life-cycle and reliability-based assessment techniques and computational tools have advanced in products like StormSim. Finally, worldwide stochastic coastal structure design and assessment techniques have advanced dramatically in the last 20 years.

## Outcomes

The primary products from this R&D will be updated design guidance and companion updates to the StormSim suite of software tools. In addition, web-based guidance, design tools, and training will be implemented.



IHNC overtopping during Hurricane Gustav

Design-level wave overtopping of Lajes breakwater

Offshore breakwaters

## More Information

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