



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

Coastal Field Data Collection Program Surge & Wave Island Modeling Studies (SWIMS)

Issue Island coasts and populations are extremely vulnerable to tropical storms, but existing methodologies for analyzing hurricane/typhoon waves were developed for mainland coasts. Islands have special concerns such as adjacent deep water, very large incident storm waves, and fringing coral reefs. Coastal inundation calculation methodologies for island coasts have not received attention commensurate with the importance and complexity of the processes.

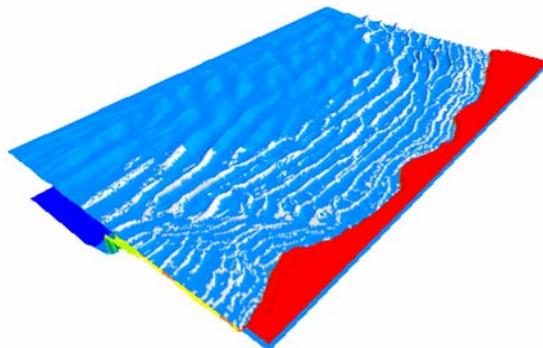


Research Approach Develop, improve, link, and validate the next generation models to realistically represent island wave and inundation processes. The models include a range of fidelities to meet needs ranging from emergency planning to project design. Perform physical model studies on wave transformation, setup, and runup on steep bathymetry and fringing reefs to improve understanding of the processes. Apply Pacific Islands Land-Ocean Typhoon Experiment (PILOT) field measurements and SWIMS laboratory data to validate models and modeling system. Package models for practical application by Districts and local entities.

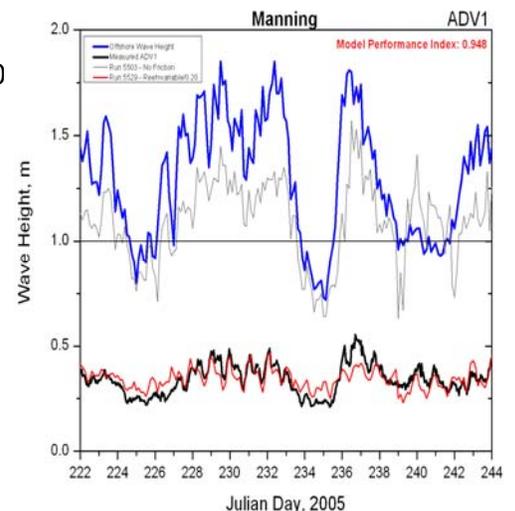
Labs/others involved Pacific Ocean Division, Honolulu District, Jacksonville District, University of Hawaii, University of Michigan, Texas A&M University.

Final Products Final products include: a modeling package for hurricane/typhoon wave and inundation modeling, documented data sets, user's guides, and research reports and papers. <http://chl.erdc.usace.army.mil/swims>

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BOUSS-2D modeling of wave transformation on Oahu North Shore (Demirbilek and Nwogu 2007)



STWAVE modeling of wave dissipation, southeast Oahu reef (Cialone et al. 2007)