PURPOSE:

1) Satisfy the requirement of the FY2013-2017 NTHMP Strategic Plan for the Mapping and Modeling Subcommittee to develop and run a benchmarking workshop to evaluate the numerical tsunami modeling of currents.

2) Verify the accuracy/adequacy of current models for use by NOAA and NTHMP partners to help produce accurate and consistent maritime and other hazard reduction products.
In 2011, less than one month after devastating Tohoku-oki event, NTHMP partners (states, territories, feds) participated in inundation modeling benchmarking workshop in Galveston, Texas.

Fulfilled a requirement by the 2006 Tsunami Warning and Education Act to “use inundation models that meet a standard of accuracy defined by the Administration (NOAA) to improve the quality and extent of inundation mapping”

436 page report completed in 2012 summarized the workshop and verified the adequacy of numerical model platforms tested.
Expected Goals and Outcomes from Workshop

Goals:

• Compare current predictions from various tsunami propagation models.

• Establish “community standards” for accuracy/adequacy for use, and verify current models meet those standards.

• Determine if benchmarks can be improved.

Outcomes:

• Determine accuracy/adequacy of current models for use on NTHMP products.

• Establish group to write a report summarizing the benchmarks, the workshop, and model verification process.

• Follow up on benchmark improvements.
SHALLOW-WATER FLOW AROUND MODEL CONICAL ISLANDS OF SMALL SIDE SLOPE. II: SUBMERGED

By Peter M. Lloyd¹ and Peter K. Stansby²

Abstract: Experiments have been conducted on islands used in the tests have side slopes with a steady, subcritical free stream showing the island apex was relatively small. Flow important in producing this unsteady wake became less vigorous and eventually stopped, side slope exerting relatively little influence which used a rigid top plate to produce it. Pictures of the surface flow patterns produced (2D) and three-dimensional (3D) shallow-water been run for comparison with the laboratory provides a severe test for the models. All submerged island wakes their mode of generation.

FIG. 3. Schematic View of PTV Setup
Benchmark 2: Hilo Harbor (Tohoku data)
Benchmark 4: Seaside, OR
lab experiment

- A single long-period wave propagates over a combination of linear slopes and onto a model of the town of Seaside, Oregon.

- Main objective: provide a comparison of calculated momentum flux, velocity and inundation depth with measured data at B1, B4, B6 and B9 gauges.

- For simulation the wave was generated by forcing the boundary condition on the left side of domain.
Benchmark 5: Solitary wave runup on a shelf with a conical island

Lynett – experiment at OSU
Overview of Datasets – Benchmark 1
name1='Knight';
name2='Nicolsky';
name3='Yalciner';
name4='Arcas';
name5='Tolkova';
name6='Leveque';
name7='Li';
name8='Macias';
name9='Lynett';
name10='Kirby';
name11='Roeber';
name12='Yoshiki_Yefei';
name13='Pampell';
name14='Zhang';
Overview of Datasets – Benchmark 2
**Benchmark #2**

This is a field dataset, recording the Japan 2011 tsunami in Hilo Harbor, Hawaii. While modelers will of course aim to achieve the best agreement with the measured data, this is not the primary goal of this exercise. Here, we aim to understand the importance of model resolution and numerics on the prediction of tidal currents:

- What level of precision can we expect from a model with regard to modeling currents on real bathymetry?
- Will a model converge with respect to speed predictions and model resolution?
- What is the variation across different models, using the same wave forcing, resolution, and bottom friction?
Analysis approach here will follow closely the discussion during the workshop

3) Inter-model 2D surface comparisons
   • Create mean and variation surfaces from the maximum speed data provided by each modeler for the three different resolutions
Overview of Datasets – Benchmark #2

Analysis approach here will follow closely the discussion during the workshop

3) Inter-model 2D surface comparisons
   • Examine resolution dependence, both locally and in the spatially-average sense
   • Examine numerical scheme and model physics dependence, focusing on the areas of high inter-model standard deviation

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name13='Pampell';
name14='Zhang';
Overview of Report

• Summary report / journal paper is at about the 50% mark
• Complete draft probably not ready to be circulated in late July / early August
• The authorship of the journal paper is going to be large; internal revisions and comments may take a few weeks

Inter-Model Analysis of Tsunami-Induced Coastal Currents

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