September 2014

A Tsunami Forecast Model for Newport, Oregon

Author Response to Reviewer provided comments

General Comments

1. Reviewer #1
   'Overall, a good, well written report.'
2. Reviewer #1
   'The report clearly outlines the methodology and, for the most part, the data that was used.'

   Response: The authors appreciate the positive feedback and thank the reviewer for a thorough review of the document.

3. Reviewer #2
   'Please add some discussion on the error or qualify of the DEM used in the models.'

   Response: Please refer to the response provided to Reviewer #1, question #1 in Specific Comments below.

Specific Comments

1. Reviewer #1
   Page 5 of the report mentions the optimization of the forecast models with the data. There is no discussion on what constitutes 'optimization' as part of this process. Some discussion should be included.

   Response: The word 'optimization' in the context of model development is synonymous with 'tsunami forecast model.' Optimization is the process by which the reference model is subsampled and smoothed in order to produce forecasts within operational time requirements during a tsunami event.

   The word 'optimization' has been clarified on page 3 of the text but its usage has been minimized in favor of 'tsunami forecast model.'

2. Reviewer #1
   'Recommend validation of the NGDC grids to ensure any LiDAR used does not reflect only a single return and that a 'bare earth' DEM without vegetation is used. Other NGDC DEMs for the Pacific NW that incorporate LiDAR using a single return have recently been discovered. This issue causes a potential significant, irregular variation in topography that could greatly skew results as the model would use an elevation consistent with the top of a tree as opposed to the ground.'

Response:
The Newport digital elevation model was constructed by the NOAA Center for Tsunami Research in 2004. The digital elevation model later constructed by NGDC in 2008 was not used for development of the Newport tsunami forecast model, as reported in this volume of the development series. The authors verified that the digital elevation, reference, and tsunami forecast models developed for Newport are based solely on data available in 2004 and that topography (LIDAR) data along the coast were removed of vegetation and man-made structures. The authors also confirmed the existence of LIDAR reflection in the 2008 grid constructed by NGDC. Vegetation and man-made structures will be removed from these 2008 topography data should the Newport tsunami forecast model be updated in the future and should these data prove to be the best available at update time.

Two paragraphs discussing validation of the grids used for development of the Newport tsunami forecast model have been added to Section 3.3, page 9. A plot of the difference between the 2004 and 2008 grids is included to show that coastal vegetation accounts for the primary difference in datasets.

2. Reviewer #1
Page 10 of the report states "The predicted time series have maxima of ~1 m, not agreeing as well with the historical data." There is no attempt to explain why this difference occurs other than to note its existence. Was there any attempt to resolve this? If there are allowable tolerances or standard deviations used as a threshold this should be noted.

Response: The reason for the poor agreement between the maxima predicted by the Newport tsunami forecast model and that observed at the tide gauge is now explained in the text; page 12, paragraph 1. The reason provided is as follows:

The location of the Newport tide gauge was moved in 1967, three years after the 1964 Alaska event, so the grid cell from which predictions are extracted is not representative of the 1964 observation. In addition, the NGDC wave amplitude is approximated as ½ wave height (peak to adjacent wave trough).

3. Reviewer #2, Appendix B
'Please update Appendix B'

Response: Appendix B unit source figures and tables were updated.

4. Reviewer #2, Appendix C
'From Table C1, I can see some small differences between model run and SIFT testing, could the author add some specific comments about what are the causes of these differences?'

Response: Differences between model development results and testing through SIFT application reflect MOST model version updates that occurred between development and implementation into SIFT. Explanatory text is provided in Chapter 5, page 17 and in Appendix C.