A Tsunami Forecast Model for Midway Atoll
Peer Review Report

General Comments	Action (Accepted/Rejected)	Author(s) Response
The study seems to account for impacts from various directions and magnitude of sources.	Accepted	The synthetic scenarios were used to test the stability of the inundation model.
It was important to update the digital topographic data to updated lidar to determine the actual impacts to and island series that has little elevation change when dealing with large wave impacts to infrastructure and lives.	Accepted	Accurate Digital Elevation Model (DEM) is one of the important elements in providing an accurate forecast.
From an Emergency Management perspective it's important to see the visual impact and wave series information to better educate to mitigate risk and save lives when living in a remote area.	Accepted	The author agrees with this comment. That is why the tsunami forecast tool developed by NOAA Center for Tsunami Research provides the predicted tsunami time series at the tide gauge location, maximum tsunami wave amplitude distribution, inundation extent, and animation. For mitigating risks, a separate hazard assessment study will be required.
Overall good report. Main edits are some style suggestions and grammatical corrections.		
Would like more discussion of historical event results.	Accepted	Discussion added.
Missing discussion and figures for the synthetic medium and small events.	Accepted	Figures added for the medium and small events. Did not elaborate much since it did not have any impact on Midway Atoll.
Specific Comments	**Action (Accepted/Rejected)**	**Author(s) Response**
Felt the more discussion on the impact of the reef surrounding the island and the wave impacts and results was not well discussed in the text.	Accepted	I agree that the impact on the reef was not well discussed in the report. The primary objective of the report was to document how the inundation model was developed, which

		included testing for stability and validation with historical gauge data. Study on the impact of surrounding reef requires a separate project for a thorough hazard assessment study.
Since only one tidal gauge exists on the island explanation of the impact that has on the modeling.	Accepted	Due to the location of the tide gauge, the data obtained will not necessarily represent the tsunami impact for the entire coast in the inundation model. The data at the tide gauge is used to validate the inundation model. When a forecast is made during an event, the values at the tide gauge provide a prediction of the incoming the tsunami amplitude for information on how it will affect the coast within its locality or inside the harbor. Impacts along the coast within the inundation model will require a real-time simulation.
Sect 1 - 2nd paragraph: There are two redundant mentions of how Midway got its name. Maybe delete the first	Accepted	
Sect 1 - 3rd para: Split the second sentence into two: " …population of fish and wildlife. The data gathered are critical…."	Accepted	
Sect 2 - 2nd para: "….in limited instances, internally." Internally to what? Explicitly state that you mean NCTR.	Accepted	
Sect 3 - Last sentence: I would say "…a set of three high-resolution 'reference' grids are constructed….", instead of models. Maybe introduce the "forecast model" term here too.	Accepted	
Sect 3.1 First sentence: Change to "Midway Atoll is composed of three islands that are enclosed inside a coral reef with an approximate six mile diameter." 1st para: You use "This is depicted in Figure 5..." to start two sentences….sort of repetitive.		Text revisions were made to this report section after this review was done, and these comments no longer apply.

2nd para, last sentence: break this into two sentences, each with the reason we need this model: a) to protect Midway from a tsunami. b) Midway as an early warning for the US west coast. Can you provide more detail about where things are on Midway? Where are the housing areas, or economic centers, or runways, or sensitive structures? Are they in areas where they are in danger of inundation?		
Sect 3.2 - 1st para, 1st sentence: change is to was. 1st para, last sentence: “Based on NGDC’s database….” sounds awkward to me. Maybe instead “According to NGDC’s database….” 2nd para, 1st sent. Split into two sentences, and change the “Other than” phrase: “In addition to the 1953 Kamchatka event, a number of tsunamis have affected the Midway Islands. Fortunately the impacts of these have been minimal.” 2nd para, 2nd + 3rd sentences are sort of repetitive, but I’m not coming up with a smooth way to combine them. Should you discuss the location of the tide gauge prior to 1989? I guess you don’t use any historical events before then so maybe it’s not important.		Text revisions were made to this report section after this review was done, and these comments no longer apply.
Sect 3.3 - 1st para, 3rd sentence: At first I was going to complain about the “model”/”were” mismatch, but maybe the sentence should just	Accepted	

be re-written as: “Both the reference and forecast model grid elevations were extracted directly from the digital elevation model developed by NGDC.” 2nd para, 1st sent: delete “both” There are two versions of Table 2 in the table document. Same info, but different formatting. Can you add some detail about the model development process to this section? What kind of smoothing did you have to apply? Did you encounter issues with instabilities?		
Sect 4.1 - Last sent: add an “a” to “…to NCTR is still working on tsunami source.”	Accepted	
Sect 4.2 - 5th sent: change to “…were generated from groups of twenty unit sources…” Seems clearer to me, but is a small issue I guess. Add some text as to why the 0 Mw events are used for testing? We know, but some readers may wonder.	Accepted	
Sect 4.3 - 1st para: Add more discussion of specific historical events/results? Where are the largest wave heights seen? Is any inundation observed? 2nd para: Describe the inundations in more detail. How high are the wave heights? Are any occupied areas effected? There isn’t any discussion of the 7.5 and 0 Mw sets of events. No figures either.		Text revisions were made to this report section after this review was done, and these comments no longer apply.
Figures – Fig 1. Label Hawaii in the figure also? It gets a bit lost in the green island/blue ocean color scheme. And change caption: “Location of Midway Islands in relation to Hawaii.”	Accepted	Figure 1. added the Label for Hawaii

Figures – Fig 3 caption is confusing. How about: “Depth contour plot of the Midway islands focusing on the shallower regions. Black contours represent 100, 50, 25, and 10 meter water depth; red is 5 meters and magenta is the 1 meter contour.” Fig 4. Same sort of caption reworking. Fix Fig. 5 caption – doesn’t mention the topography map you included in 5a…an older version? Also change first photo to photos. And I’m guessing lest should be left. Figure 7 Re-crop so that the tide gauge location is more central? Fig 8: “…created by the National …..” Fig 9d: What are the triangle and rectangle “land” spots north of Sand and East Islands? Are there real or some sort of artifacts? They aren’t in the NGDC DEM or FM maps. Figures 64-67 “…a better comparison of which source region…”		Figures were added/restructured after this review was done, and these comments no longer apply.