

## NTHMP MMS meeting 24 November 2020

### Participants:

J. Allan, K. Carrigan, K.F. Cheung, P. Chu, A. Dolcimascolo, D. Eungard, C. Garrison-Laney, K. Gately, V. Huerfano, J. Horrillo, J. Kirby, E. Lutu-McMoore, S. Ross, I. Sears, K. Stroker, R. Wilson, R. Watlington.

### Topics covered:

1. FY21 proposal development/MMS endorsements
2. DEM needs for FY21
3. DEM guidance (brief overview, Jon A)
4. DEM grid development/grid registration (Kelly C)
5. Meteotsunami guidance (completed, Juan H)
6. MMS guidance on mapping/modeling (various minor updates, All)

### (1) FY21 proposal development/MMS endorsements

Three ideas were presented to the MMS that are being planned for inclusion in the FY2021 funding cycle. These include:

Grilli, Horillo, Lynett – Develop a guidance document (& matlab tools) that outlines the methodology for developing a landslide logic tree (LLT) that would span US States and Territories. Goal is to evaluate the branches of a LLT and possibly begin to populate portions of it where data is available. Such an effort would allow for the shift away from deterministic sources to probabilistic modeling. Recognize that branches and parameters will vary from region to region (needs to account for different sources and types e.g. sub-aerial and sub-aqueous landslides, volcanoes, seismicity etc.), such that there is no one size fits all. In addition to the guidance document, the team would aim to produce a peer-reviewed journal article.

**Concept supported by MMS.**

**Action item:** A white paper will be developed by Grilli, Horillo and Lynett over the next several weeks and circulated to the MMS for review and further discussion.

R. Wilson – Proposing a workshop on tsunami debris modeling; likely to fall under both MMS and MRWG. Initial thinking was that some lessons learned might evolve from the ongoing sediment transport working group. However, J. Kirby indicated probably not as the science is still not there. Based on this, the activity would focus on evaluating the science for modeling debris movement. A later workshop could then be developed to perform benchmarking to evaluate models.

**Concept supported by MMS.**

**Action item:** A white paper will be developed by R. Wilson over the next several weeks and circulated to the MMS for review and further discussion.

J. Kirby – Proposing a phase 2 workshop to extend on the initial phase 1 sediment transport workshop. Purpose of the 2<sup>nd</sup> workshop is to evaluate sediment transport model benchmarking, generate a technical report summarizing model results, outcomes and next steps. Consolidate the report into a peer-review article. Location TBD.

**Concept supported by MMS.**

**Action item:** This is an ongoing MMS supported activity.

## **(2) DEM Needs for CY21**

### East Coast

J. Kirby – interested in knowing status of DEMs from Cape Cod up through Gulf of Maine. Noted that this was not an immediate need but will be soon.

K. Carrigan: noted lots of data out there with DEMs developed under the Coastal Act. However, data quality/availability decreases ~Gulf of Maine/Canada. Noted that they would like to see the model DEM extended north.

J. Allan: suggested we include in the request for CY21 and re-evaluated further once all sites are assessed.

### Washington

D. Eungard – Had requested DEM development for strait of JdF (~Neah Bay) to Port Townsend in CY20. High priority site for next year.

### Oregon

J. Allan – Requesting DEM updates for the southern Oregon coast/Northern California. Planning on maritime modeling of Brookings Harbor area.

### California

R. Wilson – Requesting DEM updates to south San Francisco bay, near the airport.

### Puerto Rico

V. Huerfano – Had previously requested DEM updates to PR in CY20, but dependent on lidar availability. Noted January Mw6.4 earthquake had changed the geomorphology of parts of the coast. Have any of these changes been captured by new lidar or other means?

**Action item:** J. Allan to circulate the above requests to the group (along with DEM guidance doc) and seek any additional input.

## **(3) DEM Guidance**

J. Allan: provided a brief overview of the DEM guidance document. Essentially complete for now. Components include process for requesting DEMs, DEM review loop and time frame, and archiving. Noted that when state/territory modelers make major modifications to DEMs after sign-off with NCEI, should wherever possible include appropriate documentation. Future topic for evaluation is what constitutes a 3 arc sec, 1/3 arc sec, or 1/9 arc sec grid (i.e. data density over what spatial area).

## **(4) Grid Development/Grid Registration**

K. Carrigan – provided an overview of changes that are being rolled out at NCEI for grid development/grid registration; relates to development of new DEMs. So far this has been implemented on the East Coast where Coastal Act modelers had requested that new DEMs be cell registered. This is different from what has been done in the past.

Additional notes from Kelly: For NCEI DEMs, both cell and grid registered DEM values are derived by "averaging" of nearby elevation measurements. The only real difference between the two is the georeferencing of each individual DEM cell's footprint. When we create a DEM with exactly the same input West/East/South/North coordinates, the grid registered and cell registered cells will be offset from each other a half cell in both the N/S and E/W direction, and the grid registered DEM will have an extra row/column than the cell registered DEM. Since each DEM cell will cover different areas in space for each registration, the DEM values will be slightly different from one another. So neither grid or cell registered versions are more or less accurate when it comes to NCEI DEMs. However, it's when you convert between these DEM formats directly, i.e., convert a grid registered DEM directly to a cell registered DEM or vice versa, that introduces additional averaging and smooths the DEM.

Going forward, what does this mean for NTHMP modelers? – At the time of initial DEM development, the state/territory will specify their registration preference (i.e. cell reg or grid-cell reg) in order to meet their modeling software needs. What NCEI is trying to avoid is switching/shifting later as this creates errors that become significant in steeper terrain.

**Action item:** J. Allan will include some language about this in the DEM guidance document and will forward additional information from NCEI that describe these changes.

#### **(5) MeteoTsunami Guidance**

Task is now complete. Reviewed by Great Lakes MT scientists and J. Allan.

J. Kirby noted there is a little bit of confusion in the section dealing with the MT definition. Confusing statement over generating mechanisms versus amplification processes. Needs some clarification.

#### **(6) Tsunami Modeling Inundation Guidance Documents Review**

J.Allan – these documents need to be reevaluated every 5 years. This process was initiated in Jan 2019 but was never finalized by the MMS. Requested the group take a look at the documents over the next two weeks and will clean-up/finalize prior to for our next meeting scheduled for January 2021.

*General discussion follows:*

R. Wilson: provided some edits/comments during the MMS meeting.

J. Kirby: Concern over references to 90 m grids. Does anybody use that anymore?

R. Wilson: Noted that CA had used these coarse grids previously, when working with forecast amplitudes provided by the TWC. However, these products were used for evac planning.

J. Allan: Noted that the documents are orientated to tsunami inundation modeling. Previous versions had specifically referred to 90 m, 30 m, 10 m grids. Revised version now refers to model grids as “Type 1 (these are coarse aka >90 m grids), Type 2 (aka ~10 m grids) , Type 3 (higher resolution <10 m grids)”.

J. Allan: Also noted that coarse (Type 1) grids are used in Alaska where good quality data is variable between communities.

S. Grilli: One thing to consider – you may have a coarse resolution DEM of ~90 m, but may still want to develop a tsunami grid with a finer resolution in order to better resolve the wave physics. Whenever possible... a minimum grid of ~30 to 50 m is preferable.

K.F. Cheung: We should still keep 90 m resolution in our guidance. Noted that modeling they did suggest that the derived values are not that far off from ~10 m grid.

J. Allan: So better to produce a finer model grid even if the DEM data resolution is not there?

S. Grilli: You gain something in refining model grid. You gain accuracy in the waves themselves. Nearshore it may make a difference. S. Grilli to add a sentence to the document on this.

J. Allan: Bullet point on adding new sources to the source DB developed by CA. Is this still valid?

R. Wilson: The bullet reference in the document is fine as is. Main point is that the sources should be from MMS members. With respect to the 10-20% factor of safety addition. R. Wilson recommended that this statement should be kept vague (i.e. leave it up to mapper/modeler as they understand their model limitations best).

J. Allan: Will take a stab at revising the language around this.

J. Allan: Third section refers to adding an additional safety buffer (similar to the 10-20% concept discussed previously). Are there any guidelines for doing this?

D. Eungard: Noted that geologic engineers typically use a factor of safety of 30%.

R. Wilson: Best to keep it vague. People know their models the best. Perhaps add a statement that it be left to the mapper/modeler to decide whether to add an additional factor of safety (buffer). For example, would probably want to buffer a 90 m model compared with say a 5 m model.

J. Allan: Finally, we provide specificity on model parameters. One parameter not mentioned is friction. Should it be explicitly described? For example, ASCE is using  $n=0.025$ . Oregon did not use a friction factor when modeling their inundation zones, but is using a variable  $n$  value that is dependent on the landscape in more recent modeling.

S. Grilli: typically uses  $n=0.025$  for friction, which is akin to coarse sand. We could include something on friction in the guidance indicating that it's good practice to use a minimum coefficient for friction. Years ago, his group evaluated the sensitivity of friction across the shelf and found that the modeling results were indeed sensitive to friction, especially across a broad shelf. Best to use site-specific data when available.

**Action item:** MMS to complete their review (use suggesting changes when making edits) of these documents over the next two weeks - **comments due by Dec 11<sup>th</sup>** after which changes will be finalized.

The documents can be found here:

<https://drive.google.com/drive/folders/1v1qVSNQAng7QzR90LtwIsr03vPrPX5kL?usp=sharing>

If you are unable to access the files, please contact Marie.

### **Other Business**

I. Sears: Reminder about the upcoming grants process, which is being streamlined. First round review typically completed by mid-Jan is going away and will be replaced by an abbreviated program review. Guidelines will be forthcoming soon. Purpose of this effort is to provide a broad overview of state/territory plans, from which they can in turn receive feedback from the review team. Proposals will be due ~ late Feb (as before). Also, trying to get final grant details posted sooner on grants.gov.

I. Sears: NOAA leadership is now considering no travel in 2021 (at least through until September).

J. Allan: Thanks to I. Sears for setting up gotomeeting. Nice to see everyone's faces.

J. Allan: My co-chair role is due to expire in January 2021 (2-year rotations). Now is the time to begin thinking about who might be interested in stepping into this role.

S. Ross: is the next MMS meeting January 19? Might be a conflict with a CA tsunami meeting.

**Action item:** J. Allan checked and next MMS meeting is scheduled for January 26<sup>th</sup> @ 11 am PST.