Meeting Notes

Mapping and Modeling Subcommittee Meeting

Monday 19 August 2019 8:40-2:50

Location: Bennett Federal Building, Room 2402

125 State Street, Salt Lake City, Utah

08:40 - 08:50 Agenda Overview

08:50 - 10:05 2019 Annual Work Plan (1:15)

Overview

Item-by-Item documentation of status (Completed / Incomplete / In Progress…)

1. Tsunami Source Database (Lead: California) (15-min)
2. Maritime Guidance (Lead: California) (15)
3. Hazard Assessment Gap Analysis (MMS) (15)
4. Currents Modeling Criteria (MMS) (15)
5. Mapping & Modeling Guidance Update (MMS) (15)

10:05 - 10:15 Break

10:15 - 12:00 2019 Annual Work Plan (Cont.) 1:45

6. Sediment Transport Guidance (Lead: East Coast) (30-min)
7. *HAZUS Guidance (Oregon)- addressed later in proposals*
8. Landslide Modeling Guidance (Lead: East Coast) (15)
9. Powell Center (Lead: USGS) (15)
10. NCEI DEM Development (Lead: NCEI) (15)
11. MeteoTsunami Guidance (Lead: Gulf Coast) (15)

12:00 – 1300 Lunch

13:00 – 14:00 Subcommittee Workload & Structure

14:00 - 14:20 Proposals for MMS-endorsed projects in NTHMP Grant year 2020.

Brief ‘around-the-room’ description or list of planned NTHMP Grant Fy20 projects

14:40 – 14:50 Wrap-up and Adjorn

Powell Center Discussion - Stephanie Ross

Provided overview of Powell Center source meetings (3 to date). Each of the workshops brings experts to discuss developing approach for producing a suite of tsunami sources for use in tsunami evacuation and mitigation efforts.

First workshop (April 2018) focused on developing overall approach for developing PTHA sources, which is centered on first defining a logic tree of all sources, used to organize the earthquake (or landslide) source information and as input to the probabilistic assessment. Developed the initial parameter list for three cases for subduction zone fault earthquakes, for crystal fault earthquakes and for landslides. Goal was also to develop a list of potential participants for ensuing workshops, which are refined with each ensuing workshop. Report from the first workshop was completed and is now available.

Second workshop was on Alaska sources (October 2018). Report is underway with several sections already written. Those include sections on paleo seismic and paleo tsunami, evidence of recurrence, scaling laws, shallow slip, segmentation model, and how the results will be used. Timeline for completing this report is unclear due to everyone's schedule. Working on trying to Hong Kie Thio funding to do the PTHA portion.

Workshop three (May 2019) was on Caribbean sources and Eastern Gulf Coast sources. Report from that is in very early stages. Paper on landslide logic tree is being developed by Stephan Grilli and others

The fourth workshop is on Pacific sources excluding Alaska and Cascadia. Scheduled for Spring 2020. Currently trying to figure out what are the important sources that need to be looked at, and what can be accomplished in a week. Noted that the group originally thought Alaska was complicated… then East Coast/Gulf Coast/Caribbean workshop covered an even larger complex area, and now transitioning to the whole Pacific – challenging given scale and number of sources.

A separate Powell Center group is evaluating sources for the Cascadia subduction zone. A couple of exploratory workshops have already been held. This effort is being spearheaded by Lydia S, Rob Witter and Janet ?. Timeline for a future Cascadia source workshop is looking like FY 2021.

General discussion followed on Cascadia Rising and which source model could be used.

JA: noted that there has been some recent work by Kelin Wong and his students that provides refinements to the original Oregon Cascadia source models developed in 2009-2013. Evaluated a variety of scenarios (splay, buried rupture, and slip to trench). Splay yielded the most conservative results.

DEM Development - Kelly

Provided overview of NCEI role on DEM development. Group has been developing tsunami DEMs now for ~10 years focusing on those regions identified by the MMS to support modeling efforts. Current DEM development limited to about 4 grids/year, with the priority areas defined by the MMS.

Compile new bathy/topo each year from the research/obs community.

For calendar year 2019, focusing on three areas: Alaska (already completed), eastern Gulf Coast (Florida), WA outer coast and OR. WA is delayed because they are awaiting lidar to be fully processed. These new DEMs or DEM updates will be completed by the end of the year (may slip for WA coast due to data availability).

The Florida work is a collaboration with NOAA CSC (Coastal ACT) to develop a tiling scheme of DEMs for the US that can be more easily maintained and updated as needed. Basically, all of Florida has now been completed with this tiling scheme as well as Puerto Rico and US Virgin Islands. Scheduled for 2020 work on DEMs in the Florida Panhandle, Alabama, Mississippi, Chesapeake Bay, Louisiana and Texas.

Looking for guidance from MMS for new DEM development work for calendar year 2020. Areas that have previously expressed interest for new DEM development include Puerto Rico and Guam; both are dependent on new LIDAR data availability.

Requesting guidance from MMS for calendar year 2020 for new DEMs. MMS partner states need to be thinking about this now. Will discuss further at the next MMS meeting with the aim of defining the next group of areas for DEM development by December 2019.

Noted also that all data is available online and comes with a technical report.

General discussion ensued on the vertical datums available for the DEMs as WA had heard that NCEI would not be producing DEMs at MHW. Kelly confirmed MHW is still available and noted that they can convert to any datum as needed (straight forward process).

Source Database – Rick Wilson

Source Information				Evacuation Use	Logic Tree/PTHA Status and Use						
Region	Source/Segment Name	Source Type	Source Discussed at Powell Center	Reliability of Source Characterization for Evacuation Planning (A=good, B=mod, C=low)	Basic Logic Tree Attributes Designated	Source Triggering/ Recurrence Information	Work Group Logic Tree Weighting	Completed Logic Tree - Info can be coded	Probabilistic Character-ization - Outputs for slip distributions	Availability for Modeling/ Planning - Packing and comprehension by users	Information Needs/Comments
Alaska/Aleutians	Prince William Sound	SZ	10/2018	A	10/2018	10/2018	10/2018	2020	2020	2020	PTHA logic trees from AECOM exist; USGS collecting additional paleo. Info
Alaska/Aleutians	Kodiak	SZ	10/2018	A	10/2018	10/2018	10/2018	2020	2020	2020	PTHA logic trees from AECOM exist; USGS collecting additional paleo. info
Alaska/Aleutians	unsegmented rupture	SZ	10/2018	A	10/2018	10/2018	10/2018	2020	2020	2020	PTHA logic trees from AECOM exist; USGS collecting additional paleo. info
Alaska/Aleutians	Eastern Aleutians	SZ	10/2018	A	10/2018	10/2018	10/2018	2020	2020	2020	PTHA logic trees from AECOM exist; USGS collecting additional paleo. info
Alaska/Aleutians	Central Aleutians	SZ	10/2018	A	10/2018	10/2018	10/2018	2020	2020	2020	PTHA logic trees from AECOM exist; USGS collecting additional paleo. info
Alaska/Aleutians	Western Aleutians	SZ	10/2018	A	10/2018	10/2018	10/2018	2020	2020	2020	PTHA logic trees from AECOM exist; USGS collecting additional paleo. info
Cascadia	Southern Cascadia	SZ	TBD	B							OR has recurrence logic tree; PTHA logic trees from AECOM exist; work by other Powell group
Cascadia	Full Rupture	SZ	TBD	A							OR has recurrence logic tree; PTHA logic trees from AECOM exist; work by other Powell group
East Coast	Northern Region	LS	05/2019	B	05/2019	2020	2020	2021	2021	2021	East Coast to collect more information
East Coast	Southern Region	LS	05/2019	B	05/2019	2020	2020	2021	2021	2021	East Coast to collect more information
Gulf Coast	Western Region	LS	05/2019	B	05/2019	2020	2020	2021	2021	2021	Gulf Coast to collect more information
Gulf Coast	Eastern Region	LS	05/2019	B	05/2019	2020	2020	2021	2021	2021	Gulf Coast to collect more information
Puerto Rico/USVI	PR Trench	SZ	05/2019	B	05/2019	2020	2020	2021	2021	2021	PTHA logic trees from AECOM and AIR exist
Puerto Rico	Muertos Trough	SZ	05/2019	C	05/2019	2020	2020	2021	2021	2021	PTHA logic trees from AECOM and AIR exist
Puerto Rico	landslide sources	LS	05/2019	C	05/2019	2020	2020	2021	2021	2021	
Puerto Rico	interplate faults	IPF	05/2019	C	05/2019	2020	2020	2021	2021	2021	PTHA logic trees from AECOM and AIR exist
East Atlantic	Cumbre Vieja	LS	05/2019	C	2020?	2020?	2021?	2021?	2021?	2021?	Discussed but not a primary focus of the Powell WG
East Atlantic	1755 Lisbon	SZ	05/2019	C	2020?	2020?	2021?	2021?	2021?	2021?	Discussed but not a primary focus of the Powell WG

CA has been working on compiling a source database now for a couple of years… focus has shifted slightly due to the Powell Center source workshops, where they are addressing a lot of the sources.

CA also focused on maritime planning.

Source database goal is to develop a spreadsheet/database to organize all sources (i.e. bring everybody into the same playing field) to see what everybody's using:

- to help with the accuracy and the consistency for each of our states and at the federal level.
- try to produce more consistency between states (Pacific/Gulf/Atlantic etc)

Work is continuing on the database/spreadsheet… currently in spreadsheet form. Hoping to include where applicable images, references, KML data, and any other geospatial information for those sources.

Focused on three different source types: subduction zones, crustal faults and landslides.

Developed suite of definitions (Rick to share). Would appreciate review from the MMS on the descriptions.

Hoping to eventually include metadata for everybody's source data.

Hoping to eventually include the probabilistic sources. Had initial discussions with Kelly and others about some other database system that could be used to integrate all these data.

General discussion on Cascadia sources…Oregon ran some 33 simulations, including south coast ruptures. These 33 were based on an initial larger suite of runs characterized using a logic tree approach.

Discussion on logic trees, Rick noted the basic logic tree attributes for a lot of the sources have been broadly agreed upon, including rankings of importance. Progress has been good for the Alaska solutions, East Coast, Gulf Coast and Caribbean.

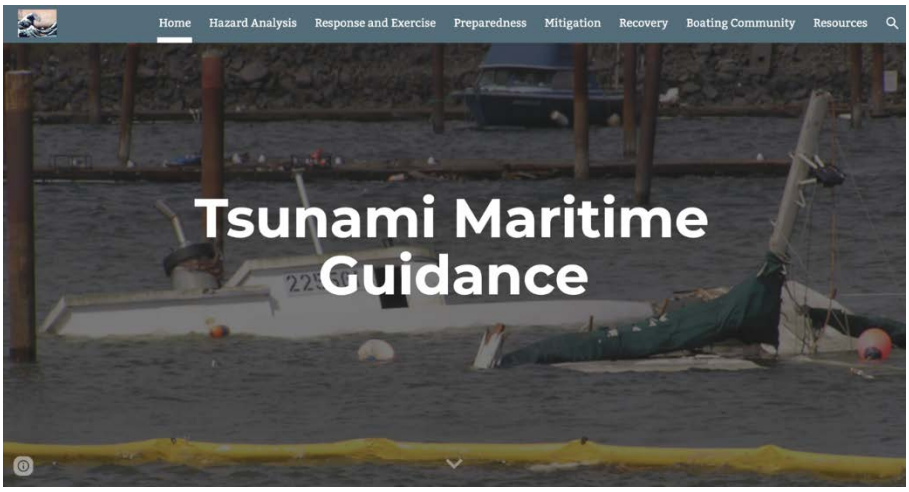
Noted that the last three columns of the source spreadsheet, reflects completed logictree, probabilistic characterization, and the availability of that information for modeling and planning.

Work on the source table is ongoing.

Still need to have a borad discussion about what event(s) to use for evacuation modeling…e.g. maximum of maximums, 10,000-yr event, 5000-yr or something else. Tied to risk

Noted that a broader discussion still needs to be had about eventually having some sort of product out of the Powell Center source database. Realistically, this about 3-5 years away… ie. Next steps.

Maritime Guidance & Criteria – Rick Wilson



Goal: Provide resources to maritime communities to plan and prepare for tsunami hazard posed to harbors, ports, and waterways that are socially and economically important.

Document about 1/2 - 2/3 complete. Decided to put a web site together. Primarily for EMS, harbor operators, and coast guard. Links to maritime products are included. Much of it is California based so far, but may expand to other states eventually.

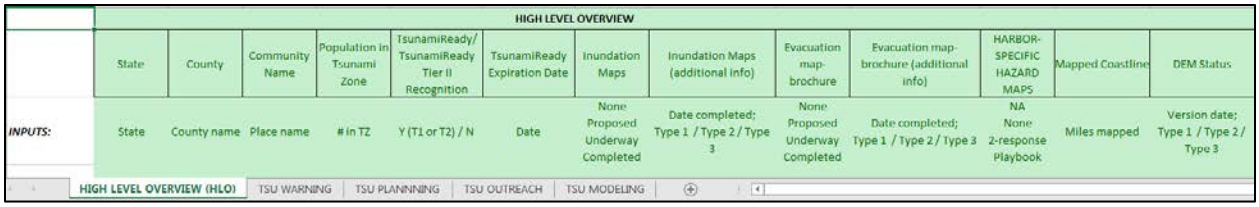
There is a section of the web site for all vessel captains and recreational boaters. Whole web site is intended to be publicly available.

Maybe should change the tabs to be targeted to different types of users.

Website for the website is https://sites.google.com/view/tsunami-maritime-guidance/home

MMS members asked to review the site and provide comments to Rick.

Gap Spreadsheet – Jon Allan



	HIGH LEVEL OVERVIEW												
	State	County	Community Name	Population in Tsunami Zone	TsunamiReady/ TsunamiReady Tier II Recognition	TsunamiReady Expiration Date	Inundation Maps	Inundation Maps (additional info)	Evacuation map-brochure	Evacuation map-brochure (additional info)	HARBOR-SPECIFIC HAZARD MAPS	Mapped Coastline	DEM Status
INPUTS:	State	County name	Place name	# in TZ	Y (T1 or T2) / N	Date	None Proposed Underway Completed	Date completed; Type 1 / Type 2 / Type 3	None Proposed Underway Completed	Date completed; Type 1 / Type 2 / Type 3	NA None 2-response Playbook	Miles mapped	Version date; Type 1 / Type 2 / Type 3

HIGH LEVEL OVERVIEW (HLO) | TSU WARNING | TSU PLANNNING | TSU OUTREACH | TSU MODELING

This task was identified as a need several years ago. Rick and Dimitry developed an initial concept spreadsheet identifying various themes (e.g. brochures completed, TsunamiReady communities, maritime modeling completed, sources, sirens etc).

A concept spreadsheet was presented to MES/MMS recently at the San Diego meeting. Push back from a number of the EMs. Main concern was sensitivity about the types of information that was in the spreadsheet that could be shared, as well as confusion on terminology and parameters. Wanted a deeper dive into the overall goals of this exercise.

Outcome… established a 'Gap Analysis' working group to address these concerns. Formed earlier this year. Initial discussion focused on the purpose behind the types of information that could/should be shared. EMs expressed concern over how this information might be used and by whom… e.g. Congress, NOAA management, states etc.

Group agreed there was a need to develop effectively two products:

1) High level overview information that could assist NOAA. Info would be community based, focused on parameters like distance of coastline mapped, TsunamiReady communities, tsunami brochures etc. from which metrics could be extrapolated. Such info could be useful when developing proposals and demonstrating to NOAA specific needs.
2) State specific information that reflects a deeper dive into what is happening within each state/territory.

Consensus from the group on this approach. One concern that was raised with the overall approach was the level of effort required to populate the spreadsheet. For some, this may require a bit of effort initially to populate the spreadsheet. However, once completed the lift to maintain is low.

A modified spreadsheet has been developed consisting of 5 tabs: High level overview, Tsunami Warning, Education & Outreach, Mapping and Modeling. The first would provide generalized metrics on the status of tsunami prep that would be most relevant to NOAA. The remainder would be used by the states to track their own prep progress.

High level info included county/community names, population, TsunamiReady (Fundamental and Tier II, including dates), inundation maps, DEM quality (coarse to high res) used in the modeling, completed evacuation maps, maritime evacuation planning.

General discussion on defining terms used followed e.g. what is meant by community etc.

JA noted that guidance doc would accompany this that would provide some assistance.

Next three sections of the spreadsheet focused on state specific needs/interest.

Tsunami warning tab: focused only on sirens… whether they are operational, decommissioned, activated locally, activated centrally, etc.

Tsunami Planning tab: Needs quite a bit of work, especially guidance from MES. May include evacuation modeling, risk assessments, evacuation plans, California expressed interest in documenting numbers of tsunami evacuation signs, state regulatory lines, ASCE 2500 year line being developed for the west coast, recovery plans.

Tsunami Outreach tab: Needs guidance from MES. May include outreach events/activities (dates), workshops, exercises.

Tsunami Modeling tab: Needs quite a bit of work, especially guidance from MMS. Focused on sources, modeling status, sources, characteristics about distant vs local sources, landslides, historical data etc.

Sediment Transport Workshop Discussion – Stephan Grilli

Stephan: East coast has a lot of barrier islands. Will use FY19 funding for further east coast tsunami modeling. Erosion needs to be accounted for when modeling the inundation area. Ocean City and Atlantic City have been mapped. Sediment transport models used for determining coastal morphology change. Model can accommodate erodible and non-erodible areas. With erosion included inundation impacts are much greater. Plans to re-do the mapping taking sediment transport into account.

Possible workshop next year to discuss to develop best practices, and maybe a follow up workshop to discuss benchmarking. Need to get proposals in before December.

Modeling comparing subsidence vs non-subsidence? Yes, can be done. East coast has greater barrier islands vs west coast.

Timing: Working with Ed Fratto on 5-year plan. Will release models as they are developed.

Dmitry on phone: How do you take into account the nature of the type of sand? Stephan: Characteristics of the sand is taken into account. Sampling can add to the accuracy of the modeling.

Jon: Next step would be to put together a small group to determine next best steps.

Landslide Modeling Guidance (Lead: East Coast):

Stephan: Proceedings were developed from previous workshop. Would like to have documents hosted on the NTHMP web site. Guidelines are needed for landslide modeling such as benchmarking standards, i.e., dispersion. Best practices should also be followed to ensure the most accurate landslide modeling. Guidance to be circulated to the MMS for comment. Comments are to be provided by mid-September.

Mike: How do we get to an actual capability? Grilli: Outcome will be looked at probabilistically. Return periods and travel time. Kara: would need some kind of sensor system to detect landslide has occurred. Natural warning signs are sometimes the only clue.

MeteoTsunami Guidance (Lead: Gulf Coast):

Juan: Has developed a suite of mapping sources in the gulf. Inundation mapping is well established for several areas. Still in the early stages of developing meteotsunami modeling for the Gulf. Four regions identified in gulf that are subject to MTs. Kara: Can DART reading be incorporated? Juan: Yes but not significant.

Hurricane Harvey test cases were run. Philip: MTs during hurricanes are not significant compared to overall storm impacts.

MT modeling guidelines have been drafted. Philip: Climatology has been developed for Great Lakes and EC, and may be applied to gulf, but would need some tweaking.

Subcommittee Workload and Structures – General Discussion:

Corina: Why this initiative? MES looking to alleviate some workload within subcommittees.

Challenges: Schedule conflicts, funding constraints.

Hold NTHMP along with AGU? Maybe hold a workshop instead of the entire NTHMP on a non-tsunami day at AGU. (Rocky note: this is infeasible.)

Pacific Caucus similar to Island Caucus? Not enough leaders, time needed for additional caucus. Could be addressed by additional conference calls, etc. Could make things more split and could be dilutive. Any subgroup should be task-focused and not necessarily geographic.

1-year trial? Where should limited resources be applied?

Not enough people participating in non-face to face meetings initiatives.

Limited time for members to manage workload. Prioritize activities?

Too many activities can become unmanageable.

More open free-flowing meetings? Seemed to work well in San Diego meeting.

Additional local EM and NWS WCM participation beyond meeting invites? Funding off the top of NTHMP? (Rocky note: NOAA employees such as WCMs cannot use NOAA funds intended for state financial assistance.) Would reduce available funding to NTHMP partners.

NTHMP steep learning curve. Mentoring program? Could be complicated and expensive, but a page with introductory info. Primer, acronyms, etc.

Marie to put Google doc up for suggesting mode.

Proposals for MMS-endorsed projects in NTHMP Grant year 2020;

Brief 'around-the-room' description or list of planned NTHMP Grant FY20 projects.

Sediment Transport:

Workshop? Philip sediment transport modeling is very mature, would this be tsunami-specific?

Stephan: Yes, would be. First workshop would solicit input from outside entities and then set up a benchmarking workshop. Rick: Would be best to demonstrate the benefit to address the hazard.

Stephan: Would like to fund students and foreign experts. Stephan will set up a workgroup.

Maritime:

Rick: Maritime initiative would be about 10-15K additional funds.

No objections

HAZUS – Oregon:

Jonathan: Guidance document? Could be headed up by Jonathan. Would be about 20-40K.

Customer? Local communities.

SIMS – Washington:

General discussion about issue relating to the absence of SIMs for Puget Sound area. Critical need by WA EMs. Unclear who funds this development. Recommended that this be brought up with the NOAA leadership team as well as in discussions about advisory discussion on Tuesday.