NTHMP Mapping and Modeling Sub-Committee Meeting
Thursday 15 February 2024 10:00-11:00 AKDT

Participants: Alex Dolcimascolo, Daniel Eungard, and Corina Allen, Washington Geological Survey; Christopher Moore, NOAA PMEL/NCTR; Nate Wood and Stephanie Ross, USGS; Kwok Fai Cheung, University of Hawaii; Summer Ohlendorf, Bohyun Bahng, Kimberly Hutchinson, and Dave Snider, NTWC; Hannah Rabinowitz, FEMA Region 10; Kelly Carignan, NCEI; Elena Suleimani & Dmitry Nicolski, Alaska Earthquake Center; Annie Sheehan, FEMA NRI Team; Rick Wilson, CA Geological Survey; Carrie Garrison-Laney, WA Sea Grant/ NOAA Center for Tsunami Research; Chip Guard, Tropical Weather Sciences, MMS Rep for Guam and the CNMI; Jon Allan, Oregon Dept of Geology & Mineral Industries; Mike Crop, Oregon Department of Emergency Management; Kelsey Yamanaka, Hawaii Emergency Management Agency; Stephan Grilli; Liz Vanacore; Ian Morrison (NWS HI, acting NTHMP administrator/vice Sears), Greg Schoor, NWS Marine, Tropical, and Tsunami Branch Chief

AGENDA

1. Welcome

   First time attendee introductions: Ian Morrison (NWS HI, acting NTHMP administrator/vice Sears); Greg Schoor, NWS; Kim Hutchinson (NTWC Duty Scientist); Anne Sheehan, FEMA

2. NCEI DEM Development update (Lead: Kelly C) Link to slides
   - 2.1. Kelly has an action item to provide WA and OR with a list of most recent lidar collections available NOW for the Columbia River area.
   - 2.2. If she hears a status update from USACE on the lidar, she will pass on ASAP
   - 2.3. There is a Puget Sound DEM that extends into Canada available from Ocean Networks Canada: request from them if interested
   - 2.4. It was recognized that MMS has not had an open call for DEM requests from the states recently to make a new priority list
     - 2.4.1. info about boundaries needed for each area requested
     - 2.4.2. will aim to put the prioritized list on website after the call for ideas is over
   - 2.5. Most recent most recent DEM development request list for NTHMP:

WA south coast Willapa bay to Columbia River	Willapa on hold for USACE NCMP lidar
CA Santa Cruz	completed 10/2023
Puget Sound, WA including SJI gap	Southern and Central regions completed, Northern region including SJI in process
Columbia River, OR and WA	CY23, high priority?
SE AK communities : Gustavus	CY23
Nome	re

3. Powell Center update (Lead: Stephanie)
    3.1. 6th meeting held last month on crustal faults and outer rise. Not sure if the work will make the ASCE7 update
    3.2. Cascadia: working on inclusion into logic tree
    3.3. Alaska report almost done
    3.4. Pacific report almost done, work on Middle America trench remaining
    3.5. Caribbean PTHA has begun
    3.6. Landslide and volcano sources will hopefully be the focus of upcoming meeting
        3.6.1.1. Katy Barnhart & Pat Lynett may organize a workshop on landslide tsunami sources, and this meeting could piggyback on that. Scope of that unclear, likely subaerial focus
        3.6.1.2. Lot of work remaining on volcano sources

4. MMS-sponsored/supported grant requests
    4.1. $15,000 for any NTHMP partner to supply tsunami data to a national tsunami database (NRI)
    4.2. $30,000 for California to write common code to translate tsunami data grids to VR-acceptable formats
    4.3. the group confirmed that recently, subcommittee-endorsed tasks have not counted towards their individual state/territory's requests

5. NRI overview/path forward (Casey Zuzak from FEMA)
    5.1. Team has been working with Nate W. to collect and format available data
    5.2. Laid out "phases" of work/goals
        5.2.1. Phase 2: expansion of Hazus to East Coast, needs to happen before they can do loss estimates
        5.2.2. Phase 3 (eventually): include harbors, etc. Currently no capacity to do this
    5.3. Planned NRI update schedule: unlikely to be more frequent than every 18-24 months. Next one anticipated late 2024-early 2025 time frame
    5.4. Source frequency/recurrence information: we need estimates by ~April, and Powell Center work won't be sufficient for this. Plan to consult with Nico Luco of USGS. NRI uses their probabilistic earthquake hazard data. Some NTHMP-relevant sources may not make it into NRI due to lack of recurrence info.
    5.5. Will follow-up in another meeting in 2-3 weeks
6. New Business:
7. Old Business:
    7.1. Alex Dolcimascolo to share Maritime Guidance document with Jon Allen and Rick Wilson to review and finalize feedback by the Annual Summer Meeting

Next Meeting : Tuesday, February 27, 11:00AM-1:00PM PT; NRI focused

***Grant deadline extended until March 2, 2024.**

September 19, 2024
Meeting notes

Attendees: Alex Dolcimascolo, Elizabeth Vanacore, Summer Ohlendorf - NOAA Federal

AK: Dmitry Nicolsky Elena Suleimani, Anthony Picasso; WA: Daniel Eungard; CA: Rick Wilson, Nick Graehl; HI: Kwok Fai Cheung, Ethan Maglione- HIEMA; CNMI: Mario Kaipat (briefly); Gulf: Juan Horrillo; E. Coast: Stephan Grilli; USVI: Roy Watlington; NCEI: Elliot Lim - NOAA Affiliate, Kelly Carignan - NOAA Affiliate Kelly Stroker - NOAA Federal Nicolas Arcos - NOAA Federal NWS: Corina Allen - NOAA Federal Sarah Rogowski - NOAA Federal; USGS: Nathan Wood, Stephanie Ross; FEMA: Anne Sheehan

- Introductions
    - Round table: Stating of MMS projects funded
- California
    - Debris products guidance document
    - Database of products for Crescent City using Heat map approach
    - VR evacuation modeling (Pat Lynnett headset)
    -
- Washington
    - Maritime study for a port
    - 2 ped walk maps
    - FEMA CTP Grant: PTHA for Washington State (3 years)
- Oregon
    - Offline
- Alaska
    - Technical report and inundation maps for community including landslide source
    - Continue mapping for 4 communities
- Hawaii
    - Final year to develop 105 year tsunami scenario for harbors (DTOP to use to prioritize mitigation plans)
    - Potential Impacts of Local tsunamis
- Guam
    - Offline
    -
- CNMI
    - Mario joined late but dropped back off
- USVI
    - New Exercises/playbooks/workbooks MES
    - Develop EMWIN Capability
    - Not MMS funded : NRI contributions/statistics
- PR

    - PTHA into Maps (Needs MMS guidance!)
    - Ped analysis for 2 more municipalities
- American Samoa
    - Offline
- East Coast
    - HAZUS and loss estimations
    - Two high resolution maps based on extreme sources
    - NRI formatting results
    - Landslide PTHA is done via extension this year
- Gulf Coast
    - Need to find rep (Juan is retired→mentor replacement)
    - Juan emeritus status for NTHMP
- Great Lakes
    - **Offline**

☐ **TO DO: MAKE FORM ON PROJECTS**

- ☐ **-What projects for MMS were funded?**
- ☐ **- What MMS projects would you like funding to do?**

- Powell Center PTHA update
    - Get slides from S. Ross
- Landslide PTHA update
    -
- DEM discussion with NCEI

NTHMP Funded	Status
Puget Sound including San Juan Islands gap to Vancouver Island and Point Roberts	Completed Spring 2024
Columbia River, OR and WA	Completed August 2024
Gustavus, Alaska	Gustavus completed May 2024
Nome to Northwestern Bering Sea (4 nested DEMs)	Nome to Western Bering Sea ***in progress***
West Coast Washington State (updates with new NCMP bathytopo lidar)	Next in queue

Western Alaska, ***extents TBD***	New area selection as of 7/2024
Non-NTHMP Funded	
West Coast Coastal Relief Model	Completion due end of Sept.
(from north of Monterey Bay, CA to Florence, OR at 1 second resolution)	
120.75 - 127.00 degrees W longitude and 37.00 - 40.25 degrees	

- Yearly report: Refer to email sent by Jon Allan on 9/5/2025 (if you did not get the email please let me know). Please send your state/territory 1-page summary to Jon by 10/18/224
- NRI technical report update: The NTHMP Review Period for the NRI Technical Report will be from 9/23-10-4. It will be very important to review this report and provide feedback to Anne Sheehan and the rest of the FEMA NRI team
- New business/ Old Business
    - Additional meetings for specific topics?
        - Daniel Eungard Requests: 1) Discussion on updates to the model validation document and ASCE use of it.
        - 2) Discussion on cartographic and graphical standards and best practices for mapping
        - Liz: PTHA discussion
        - Cycling of Co-Chairs

MMS Subcommittee Agenda

Wednesday, July 24

Morning Session 1 (8:30-10:00AM)

- **NCEI DEM Priorities** (Co-Chair Lead; 15 minutes)
    - Capacity for 2 DEMs
    -
- **Maritime Guidance Document Final Update** CA/OR/WA/ Co-chairs; 10 minutes)
    - Document link
- **Powell Center Update** (USGS Lead; 15 minutes)
- **Wave Arrival Tiger Team** (Washington Lead; 10 minutes)
- **ASCE Code Changes + Model Validation** (Washington Lead; 10 minutes)
- **Landslide PTHA update** (East Coast/Gulf Coast; 10 minutes)
- **MMS Public Relations** (Co-Chair Lead; 15 minutes)

Morning Session 2 (10:15-12:00PM)

- **MMS input for Collaborative Efforts Forum** (Co-Chair Lead; 1 hour 30 minutes)
    - Are we aware of each group's work plan? Can we review or comment on those work plans?
    - Do we know where there may be overlap and the potential for collaboration?
    - How are we able to discover strengths across the various groups that can be applied to the program and its mission?
    - How are the work plans being created?
    - Is our current structure helping or hindering our collaborative efforts?
- **Other MMS Logistics/Topics**
    - C grid development (CA)

NTHMP MMS meeting

American Samoa, July 24, 2024

DEM NCEI requests (2 this year will be done).

- Stefan: let's consider Aleutian chain DEM. Charlie Manderville (AK volcanologist) says any of the many volcanoes can cause tsunami… let's map volcanoes. We have a lack of accurate bathymetry for underwater volcanoes, even though we have good enough for seismic sources. West of Cook Inlet, Gulf of AK (Unimak Island to trench).
    - Elena: there has been a plan for several years. 1946 would be a priority because Fai is modeling and needs this source (Unimak Island region).
    - No need for 5-meter… maybe just 3 arcsecond
    - John Allen has 15 arcsecond for this region, from a variety of sources. Let's ask NCEI what's possible
- Elena's request: Gustavus and Nome (requested March 27-Alaska)
- No other requests (OR, WA, PR all good)
- John: Tools for DEM development work
- Nate: Mike Fishler (3dot? Redep?) has money for terrestrial DEM data collection. Elena: Barry Eakins developed algorithm for combining diverse data into a grid. Chip: clear water data? Yes, coastal LiDAR and low-tide.
- Ask NCEI about future plans and updating DEMs over time + where things are going. Specific topic for future MMS Meeting.

Guidelines and Best practices – Maritime communities (John Allen's/Rick Wilson's work). Section 1 done, hazard analysis, modeling mapping, resolution reqs, products to create. Comment period done, change suggestions included, ready to pass to MES WG for education and outreach portion. Agenda email July 11th has link to this document.

- Q: should we wait for MES comments or separate out Education into a separate document?
    - If separate, work with NTHMP leadership to host on NTHMP website.
- Section 1 & 2 are provided from CA as a web site, but we have a need to review every 7 years. Needs to be in sync. Alex can share the link out through email.
- Update California's 2-pager with details within the finalized Section 1 of document

Powell Center update: Stephanie (PPT presentation)

- Not a USGS product: collaboration – Dep of Conservation, AFRL, etc.
- Powell C serves as a catalyst for innovation…
- Goal: increase coordination devel tsunami sources, increase consistency in planning
- Core group
- NOTE: USGS doesn't have a tsunami program. Powell provides funding.
- State/territories agree on process. Logic tree includes defensible ideas and apply weights.

- 6 meetings so far. Decided on logic-tree process, AASZ, East-Gulf-Carib, Cascadia, Pacific, Crustal Faults.
- Would like another meeting for landslide and volcanic generated tsunami.
    - Gari mayberry … USAID funding for this meeting?
    - Other funding: USGS, NEHRP,NTHMP, CGS, DOGAMI
- Publications: many, including Cascadia – Jay Patton, Crustal Faults, Baoning Wu first draft.
- Int'l Building code, ASCE meeting: Hong Kei, Pat Lynett, etc.
- SZ characterization almost finished; Green's functions almost done (cluster problem)
- Changed from GEBCO to ETOPO22 suggested by OR/WA
- 15 arcsec deep ocean, higher for 100-meter line
- Adjustments to USGS NSHM model and ASCE model
- DOGAMI funded Cascadia work: 3750 faults, 10,000 aleatory sources
- ASCE 7-16 Cascadia logic tree vs Powell logic tree
    - Left side of dashed line is unchanged, right-hand (upper) applied to all branches below, providing 10's of thousands of branches.
    - Q: (Doug) when (recurrence) does Cascadia come in. John: two portions: Cascadia t-shirt sizes, or USGS seismic hazard scaling. Unclear how Hong Kei manages this part of the process. There are some Cascadia ruptures with return periods of 200 years, up to 1,500 years. Less than 200 years will probably be smaller distant events.

- Offshore Cascadia hazard curves for offshore wave height, To-Do for ASCE7-28: make Cascadia and AK trees consistent, finish OR and WA areas, all other inundation areas.
- Tutorials coming after Hong Kei's work is done. Funding: Corina reaching out to Nat'l Seism Hazard Models group. In addition: Hong Kei met with Elena/Dimitry to compare with AK PTHA efforts.
- Chip Guard: attended the Pacific sources Powell Center meeting – excellent work.
- Future: Hong Kei doesn't want to be point on the ASCE 7-34. Maintenance is an issue.
- Liz: PR is linking EQ PSHA sources to tsunami assessments. John: ground motion perhaps needs to be included. Liz, Hong Kei, Stephanie meeting every-other-week. Yong Wei testing out the methods developed by Hong Kei.
- John: MMS should plan for continuity of the Powell Center work. Can use this work to define sources for a site, with probabilities. (All open-source).
- Alex: the source database… who is hosting, NTHMP? NCEI? GitHub? Liz: we need something the public can easily view/access, but control for changes should be in the hands of MMS.

Wave arrival Tiger Team

- 1.5 years ago started. Nate wants arrival on land, TWCs want first offshore fluctuations, CG wants first draw-down.
- Plan is for WG to develop document with standardized definitions and guidance, particularly for model output put into GIS info hub
- See figure on different "first" arrivals … Sometimes large differences between draw-down and arrival

- GitHub repo for code to produce arrival time from models.
- Working with IOC to incorporation into glossary: Liz and Chip on task Team for Tsunami Watch Operations (Caribe reps), meeting every February. Takes two years min for agreement.
- Comparison (figures) from Westport, WA.
- Laura Gable (DOGAMI) speed: current fluctuation. Time above a speed threshold.
- Storing in netCDF – very nice visuals in GIS. Looking at maritime products for WA… coordinating with MES group.
- Nate: how do we present this to the public. What about showing accuracy of the model, too.
- Randy/Loyce developed terms at simulated tide gauges
- COARDS/ISO standard variable names from definitions into netCDF
    - Liz Q: what about real tide gauge data with 1-minute sampling?
    - Alex: nice figure with colored arrival time requires output every 3 seconds.
    - Possible to consider looking at arrival times using more realistic data (aka synthetic and real data differences).
- Elinor: messaging is everything – are we getting our users the information they need? If they see these detailed arrival time plots will they wait to evacuate?
    - Alex: Users have different needs: harbor management may need info to make a call on whether to pull a boat out of the water, etc. We would like to provide a Storymap to explain the product to users.
-

Monte Carlo approach to L(andslide)PTHA (Stefan, Juan, Lynett)

- MMS funding –

- landslide 1929 Grand Bank,
- Joern Behrens, 2021… Grilli 2009 publications
- Seismicity not necessarily the trigger, slope stability, volume of slide,
- Downslope transects from USGS, slides, slope monitors
- Simulations – collaborations from Bellotti, linear frequency domain
- Unit Sources created (linear) – precalculated unit mass failures
- Palu case 2018: 7-8 main slides x 1000 = 7,000 slides randomized initial conditions
- US East coast testbed. Transects give slope 10km apart, with sediment properties. Only a few drill sites for thickness… based on slope (angle of repose). Lots of uncertainty in thickness estimate.
- Triggered by gravity component with associated return period (?)
- Produces distribution of acceleration as function of return period
- Reverse this… determine “excess probability” for triggering each SMF -> modeled
- Produce for entire US east coastline 3x 15 asec grids “G1, G2, G3”. USGS acceleration maps, thickness. We produce all the slides/slumps with assoc return periods
- 87,000 unit sourtces took 40 days on 3 workstations (Juan?)
- Statistics obtained at the 50-meter “save” points: we get distribution of height with return -> histogram of height to period.
- Assume breaking waves over 40-meters, so ignore. Most arrivals between 10min and 1 hour for large events
- New MPI-Fortran/Matlab hybrid model (Juan), recalc G2 137,000 runs
- ToDo: more de-aggregated PHA for individual events (will work with USGS), look into complex events with triggering at different locations
- Paper draft 85% complet on method/application to G1. Future paper on LPTHA for entire US East Coast

- Q (Liz) what data would you need for USCband?

(DISCUSSION)

- Note that grids are rotated so transects align along y-axis, local maximum downslope direction adjusted probabilistically
- Q: Elena – this is offshore: how high is resolution? 450-meter
- Q: Elena – are the real events documented (besides Grand Banks)

How do we work more efficiently (budget cuts) DISCUSSION

- Do we need more PR … congressional info materials?
- Can we identify projects, work plans to share with each other/MES?
- Where are there overlap and potential for collaboration
- John: maybe the workplan is not the right thing to share. Annual summary report for all NTHMP activities/tasks? Hasn't been on for 3-5 years? (2018). Each sub-committee produces a sub, Sarah would coordinate?
- What metrics? Quantify? NRI results?
- Jessie: lots of data are in the new NRI release (Spring '25)… can we co-brand, co-message, align press releases
- Good way to show the value of the work, but also that the work is not done. Need to reach staffers.
- USGS will also have press release
- AK Cook Inlet is getting lots of press… do we need a website to gather information to promote the program?
- Nate: we need a publication showing where people are most at risk, where we can reduce the most risk with the least cost? Compare investments for tornadoes and hurricanes? These comparisons can be made through the NRI

- Congress? Staffers, or perhaps getting a big media outlet to write an article about tsunami and risk/loss?
- Would you all be willing to be included in an op-ed piece?
- Social media – NTWC Anthony posts great tsunami stuff … community meetings
- Ask Greg/Sarah/Corina about an NTHMP Insta/X/Facebook account? Tik-Tok restriction
- #tsunami and #NTHMP to get coverage
- TsuInfo is not a DOI, and is a lot of work on Stephanie. Can we modernize the website? Can we get a DOI per blog post every time there is an item for an online version of TsuInfo? Approach the TsuInfo committee?
- Liz has access to a Video studio, green screen, editing, etc, through the University. Videos eg YouTube are critical to outreach with modern generations.
- How often do we want to meet: current is 1 in winter 1 in summer… bylaws say every-other-month! If we precede Coordinating Committee then our meeting is cut short (for good or bad).
- **Brainstorm ideas for collaborative projects**
    - Elena would like to collaborate with Stefan on LPTHA
    - Lots of collab between MRPWG and MMS
    - IOOS/NANOOS produces glossy flier to sell science ‘on the Hill’. Flyer as starting point.
    - Do we reach out to SSA AGU to piggy-back on lobbying for funding?
    - Nate: the USGS listens to the Society of State Geologists (lobbying).
    - IOOS drafts stakeholder letters in American Samoa because they have experience in lobbying

- IOOS has a simple trifold flyer for PR; NTHMP may want to consider something similar.
- MMS should coordinate with MES to produce lobby info from NTHMP as a whole.
- Chip G: should we focus on sea-level rise? Nate: it should look at 2070 estimates of SLR locally for every state/territory
- Elinor – need to take uncertainties into account. Particularly when showing results to the public.
- Should we have a talk presented to MMS about COSMOS, etc?
- DoD funding? PR, Guam, and Hawaii have a base, as do others.
- NTHMP should focus not on NOAA funding, but inter-agency, other sources.