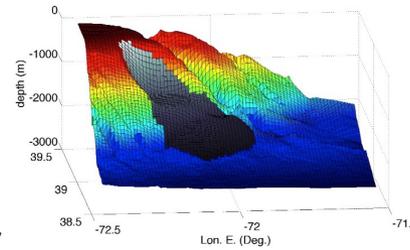
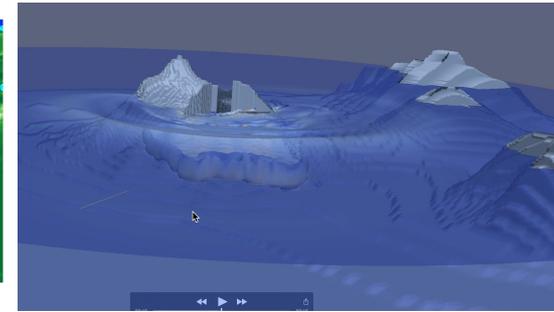
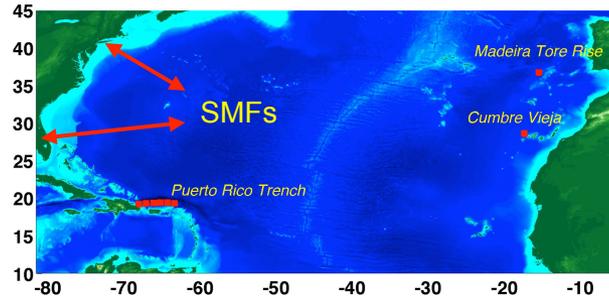
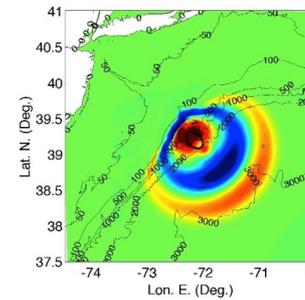




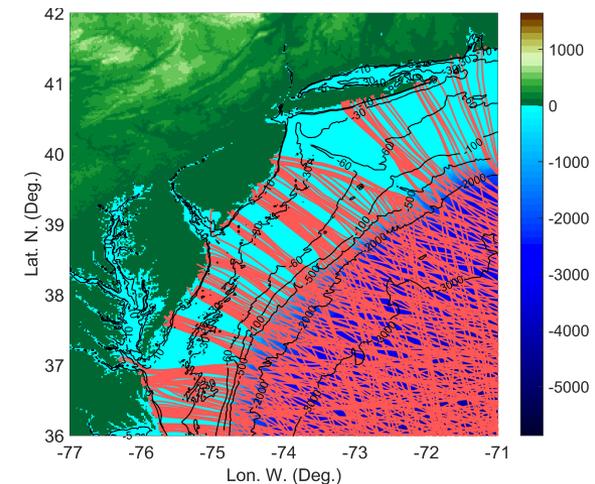
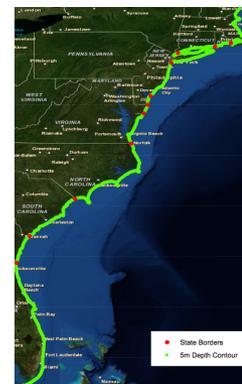
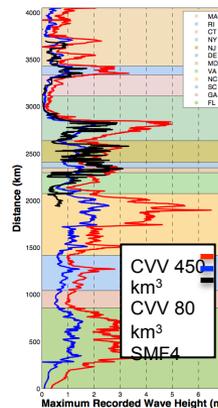
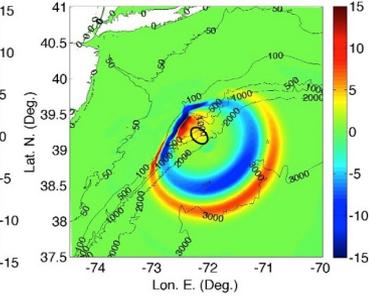
- Developed/modeled (PMT) *tsunami sources* for USEC (seismic, volcanic collapse, submarine mass failure)
- Evaluated effect of *SMF kinematics and rheology* on inundation
- Gradually developed and disseminated *tsunami inundation maps and maritime products* for USEC (envelopes of multiple events)
- Evaluated effects of *tsunami-tide interactions* on inundation in major estuaries (Chesapeake Bay and Hudson River)
- Assessed *effect of wide shelf* and bottom friction on tsunami inundation (focusing-dissipation effects)
- Took lead role in organizing 2 NTHMP *workshops* (inundation and landslide)

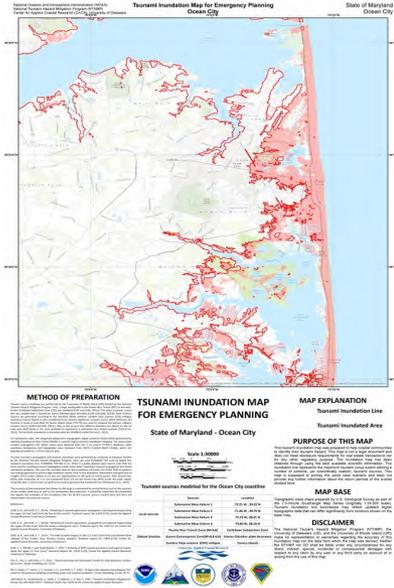
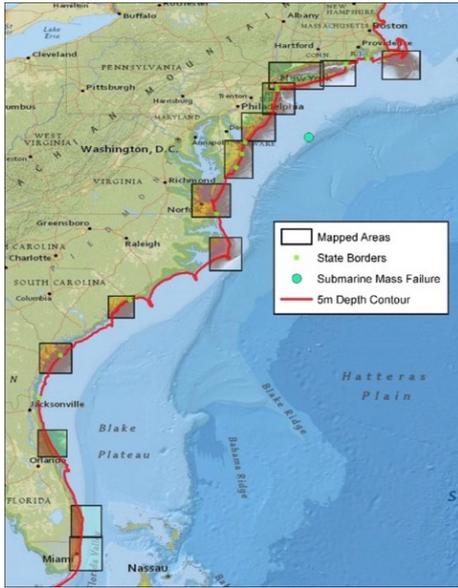


Rigid slump

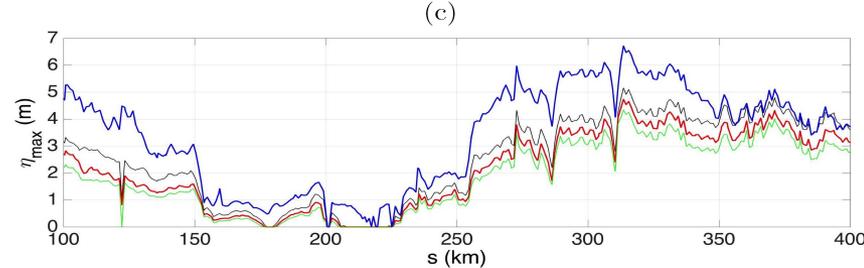
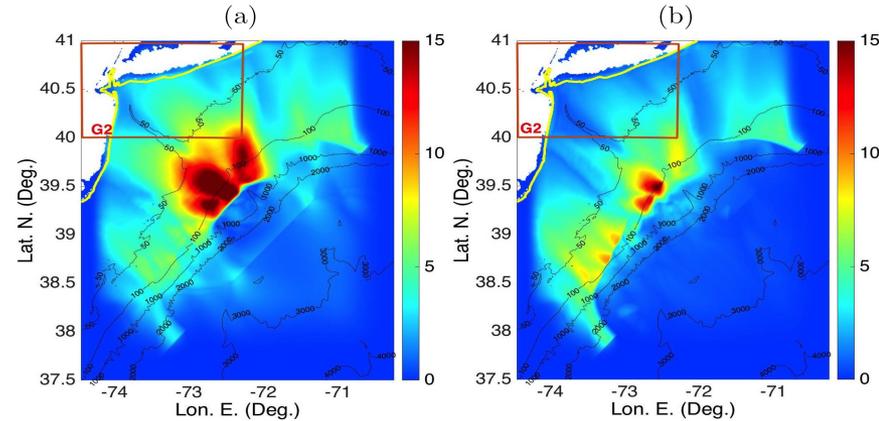


Deforming slide

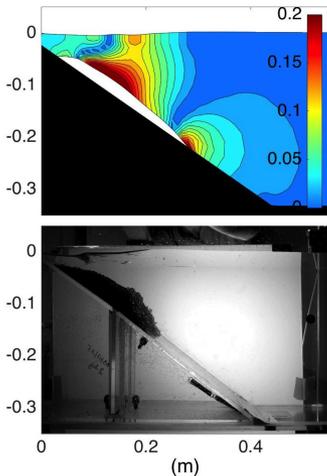




- Started developing a methodology for simulating *meteo-tsunamis*



- Continued producing *tsunami inundation maps* for USEC based on multiple near-and far-field tsunami sources



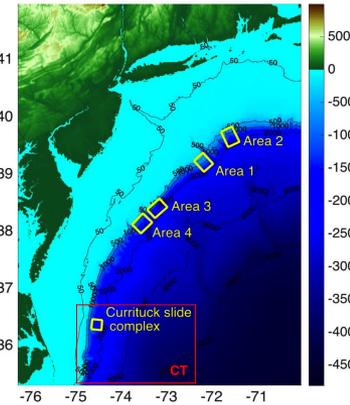
Organized NTHMP-MMS *Landslide tsunami model validation and benchmarking workshop* [Experiments/modeling for benchmark #4].

- Continued assessing *effect of landslide rheology* on coastal tsunami hazard. Example of tsunami generation by SMF in Hudson River Canyon: (a) Max. surface elevation for a rigid slump; (b) or a deforming slide. (c) Max. tsunami elevation at the 5 m isobaths (yellow lines in (a,b)) for the rigid slump (blue) and a few deforming slides of varying rheology (green, red, black)

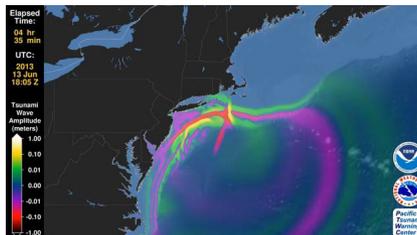


1. Follow-up activities to *the Landslide Tsunami Workshop*, to enhance its value to the community :
 - better assessment of model predictions of velocities and slide geometry; development of a web repository
 - development of new field cases for benchmarking.
2. *Development of estimates of tsunami return periods* : Continue work initiated in FY16 on estimation of return periods of extreme tsunamis from various sources used in inundation mapping with emphasis on landslides and meteo-tsunamis => *Very important for emergency managers*
3. *Reanalysis of selected mapping products based on improved treatment of modeled physics for source description and tsunami propagation* :

- Simulate tsunami generation and coastal impact for near-field SMF events using recently developed models, including a range of modeled rheologies. Siting and parameterization of selected SMFs based on the most recent field data, in collaboration with USGS (see figure).
- Reanalysis and modeling of the Cumbre Vieja Volcano (the USEC dominant event) and of potential volcanic flank collapses in the Atlantic basin, in view of progress in subaerial slide modeling and more realistic/relevant estimate of source parameters and rheology.



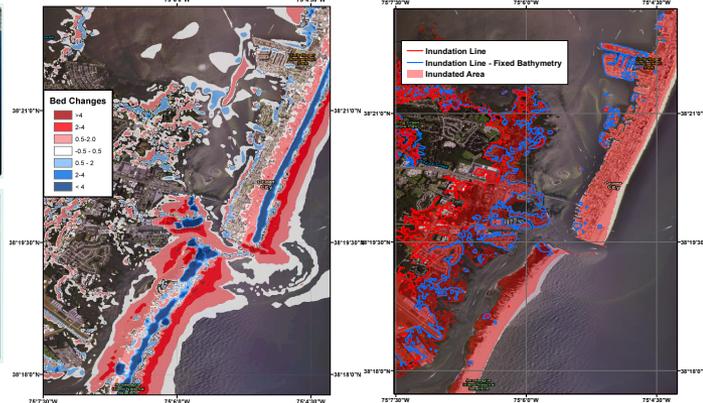
4. *Evaluation of the effects on tsunami hazard of real-time coastal erosion during tsunami impact (see figure).*



Tohoku



Cumbre Vieja (80 km³)



5. *Simulation and evaluation of meteo-tsunami hazard* :

- Estimation of a meteo-tsunami climatology with return periods in the range of 100-200 years for USEC shelf.
- Model validation using observed results such as the 2013 event off of New Jersey (see figures).



- Tsunamis caused by *near-field Submarine Mass Failures* (SMF) sources dominate tsunami inundation/hazard in work to date. We need *guidance from USGS* for SMF siting, parameterization (see conclusions of Boulder workshop 2/16). We are in contact with Jason Chaytor (USGS) but timing is of the essence.
- Paleo-tsunami records are almost non-existent on USEC so it is *difficult to assess return periods* of controlling events, particularly for non-seismic sources (SMS, volcanic collapses). Even a M9 PRT PMT is subject to debate. We again need *guidance from USGS* and other experts (see conclusions of Boulder workshop 2/16)
- We are *collaborating* with Gulf and West Coast partners on landslides, maritime products, and estimation of tsunami elevation in *non-mapped areas* (using hurricane storm surge as a proxy).
- We are *collaborating* with the Alaska partners on the methodology (NHWAVE-FUNWAVE based) used for landside tsunami simulations.
- We have *collaborated* with all interested and active partners (through MMS) to organize the *2017 tsunami landslide model benchmarking workshop*, and continue to work on post-workshop activities.