IGPP Virtual Seminar Series

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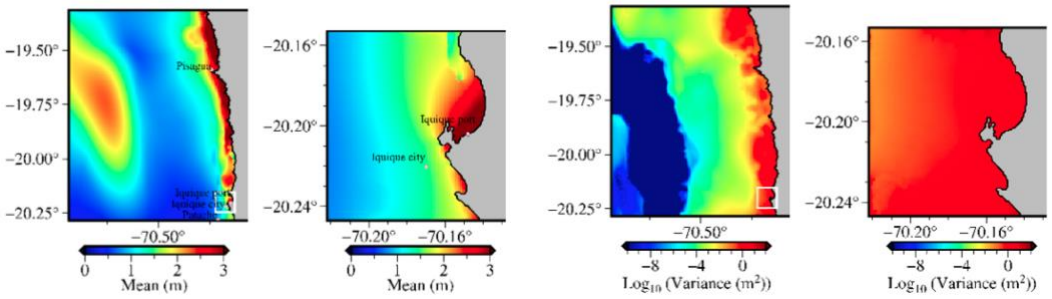
On the making of Probabilistic Tsunami Hazard Assessments (PTHA)

Date: Tuesday, May 18, 2021
Time: 12:00 pm, Pacific Time
Host: El Knappe (eknappe@ucsd.edu – if you have questions)
Zoom link (password = hazard): click here to join meeting
Meeting ID: 962 2826 1254
Because this meeting will be recorded, please make sure that you are comfortable with it before registering

In the last 15 years, Probabilistic Tsunami Hazard Assessments/Analyses (PTHA) have gained recognition as a powerful approach to quantify the risk of life and property loss in coastal areas due to tsunamis. While the PTHA method is straightforward, various sources of uncertainty need to be investigated before we attempt a standardization for coastal engineering studies. The uncertainty sources include our imperfect knowledge of the mechanism and occurrence of tsunamigenic sources, the seafloor geometry and the interaction of tsunamis with other physical processes modifying water levels. Furthermore, more sophisticated models may be needed for certain tsunamigenic sources and for a better simulation of the tsunami genesis and inundation.

In this talk, we present new studies developed with colleagues from IGPP and institutions from United States, Singapore and Chile. First, we explore the impact of bathymetry uncertainties in tsunami propagation models. Due to the partial coverage of shipboard bathymetric soundings, errors in water depth estimates may lead to significant errors in tsunami simulations. The tsunami errors are investigated and interesting results are found. Second, we present a new study addressing the impact of Climate-change-driven sea level rise in PTHA studies. For this, we developed a new mathematical model based on a non-stationary Poisson process. Relevant questions about the impact of sea level rise in PTHA results can now be answered.

Impact of the uncertainty of SRTM+ V2 bathymetry model on the 2014 Iquique tsunami simulation. Mean and variance of tsunami maximum elevation are shown for two regions.



Probability of inundation of Hong Kong in 100 years due to tsunamis generated in the Manila Subduction Zone