Oral | Symbol H (Human Geosciences) | H-DS Disaster geosciences

# [H-DS27_1AM1]Tsunami and its Forecast

Convener:*Yutaka Hayashi(Meteorological Research Institute), Erick Mas(International Research Institute of Disaster Science), Toshitaka Baba(Japan Agency for Marine-Earth Science and Technology), Chair:Erick Mas(International Research Institute of Disaster Science), Masami Okada(Meteorological Research Institute)

Thu. May 1, 2014 9:00 AM - 10:45 AM 418 (4F)

This session discusses issues related to improving real-time and long-term prediction accuracy of tsunami, which include such as a better understanding of tsunami dynamics, new real-time tsunami observing systems deployed in the open ocean and coastal waters, methodologies of more rapid and accurate prediction during tsunami emergencies, more extensive and accurate inundation maps, and long-term tsunami potential forecast.

10:30 AM - 10:45 AM

# [HDS27-P07_PG]Simulation of tsunami inundation from future megathrust earthquake scenarios of Central Peru

3-min talk in an oral session

*Erick MAS[1], Bruno ADRIANO[2], Nelson PULIDO[3], Shunichi KOSHIMURA[1] (1.International Research Institute of Disaster Science, IRIDeS, Tohoku University, 2.Graduate School of Engineering, Tohoku University, 3.National Research Institute for Earth Science and Disaster Prevention, NIED)

Keywords:megathrust earthquake, megatsunami, numerical simulation, tsunami Peru, scenarios

Great tsunami events like the 2011 Great East Japan Earthquake and Tsunami might occur around the world in the future. In particular at areas of the Pacific Rim or the Andaman Sea as history has confirmed. In this study we will focus on the central coast of Peru on the western Pacific. The earthquake history of Peru accounts for many devastating tsunami disasters in the past (1555, 1586, 1609, 1630, 1655, 1678, 1687, 1746). The potential damage to national infrastructure exposed in Callao and Lima could yield to a heavy economical breakdown in Peru. It is of great importance to assess and estimate the future tsunami inundation scenarios in order to grasp the extent of possible damage and the severity of it. Consequently, this study evaluates the tsunami hazard and the related features of inundation at the central coast areas of Peru based on possible megathrust earthquakes.The source model we used in this study (Mw = 8.90) was obtained from results of the interseismic coupling distribution in subduction areas using GPS monitoring data as well as historical earthquake recurrence information (Pulido et al., 2011). This slip model was used to generate twelve additional slip scenarios for strong ground motion simulation, by adding spatially correlated short-wavelength slip heterogeneities (Pulido et al., 2012).Here, we used these thirteen scenarios to evaluate the tsunami hazard of Callao area in Peru. From results of strong ground motion simulations Pulido et al. (2012) reported that the slip scenario with the deepest along strike slip average (Mw = 8.86) was the worst case scenario for strong ground motion in Lima-Callao area. On the other hand, in this study the slip model with the largest peak slip (Mw = 8.87) yielded the highest tsunami inundation and maximum velocity near shore. Such differences on maximum scenarios for peak ground acceleration and tsunami height reveals the importance of a comprehensive assessment of earthquake and tsunami hazard in order to provide plausible worst case scenarios of strong ground motion and tsunami inundation.

**Acknowledgments**This study was carried out under the framework of the SATREPS project "Enhancement of Earthquake and Tsunami Disaster Mitigation Technology in Peru, project sponsored by the Japan

International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST). Our appreciation goes to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), National Research Institute for Earth Science and Disaster Prevention (NIED) and the International Research Institute of Disaster Science (IRIDeS), Tohoku University for their support.**References**Pulido, N., Tavera, H., Aguilar, Z., Chlieh, M., Calderon, D., Sekiguchi, T., Nakai, S., and Yamazaki, F. (2012). Estimation of slip scenarios of mega-thrust earthquakes and strong motion simulations for Central Andes , Peru realizations (poster S33A-2505). In *American Geoscience Union Fall Meeting 2012*, number section III, pages 1?2, San Francisco, California, USA.Pulido, N., Tavera, H., Perfettini, H., Chlieh, M., Aguilar, Z., Aoi, S., Nakai, S., and Yamazaki, F. (2011). Estimation of Slip Scenarios for Megathrust Earthquakes: A Case Study for Peru. In *4th IASPEI/IAEE International Symposium*, pages 1?6, Santa Barbara, CA, USA.