Geophysical Research Abstracts
Vol. 19, EGU2017-4148-1, 2017
EGU General Assembly 2017

Paleotsunami deposits along the coast of Egypt correlate with historical earthquake records of eastern Mediterranean

Asem Salama (1,2), Mustapha Meghraoui (1), Mohamed El Gabry (2), Said Maouche (3), Hesham Hussein (2), and Ibrahim Korrat (4)

(1) Institut de Physique du Globe, CNRS - UMR7516, Strasbourg, France (salama@unistra.fr), (2) NRIAG, 11421 Helwan, Egypt, (3) CRAAG, Dept. of Geophysics, Bouzareah-Algiers, Algeria,, (4) Mansoura University, Mansoura, Egypt

Tsunami deposits are investigated along the Mediterranean coast of Egypt in the framework of the EC-Funded ASTARTE project (Assessment, Strategy And Risk Reduction for Tsunamis in Europe - FP7-ENV2013 6.4-3, Grant 603839) and the French-Egyptian IMHOTEP project. The study area located west of Alexandria is selected according to historical earthquakes and related inundation events as recorded in archives. Field investigations include: 1) Coastal geomorphology along estuaries, wedge-protected and dune-protected lagunas, and terrace-platforms as potential sites for paleotsunami and boulder records, and 2) Investigations of paleotsunamis deposits and their spatial distribution using trenching and coring. In addition of 10 trenches (1.5-m-depth) and 16 (1 to 2.5-m-depth) core descriptions with detailed logging and Xrays, data collection includes geochemical analysis, magnetic susceptibility and radiocarbon dating necessary for the identification of tsunamis records. In stratigraphic successions of low energy marine and alluvial deposits, mixed sand, gravel and broken shells are interpreted as catastrophic layers correlated with tsunami deposits. The two selected sites at Kefret Saber ∼32-km west of Marsa-Matruh city and ∼10 km northwest of El Alamein village are inner lagunas protected by 2 to 40-m-high dunes parallel to the shoreline. A total of 50 samples of organic deposits and charcoal fragments were collected from both sites, among which 20 samples have been dated. Dated charcoal in deposits above and below the catastrophic layers lead us to correlate them with the 24 June 1870 (Mw 7.5), 8 August 1303 (Mw ∼8) and 21 July 365 (Mw 8 – 8.5), major earthquakes that generated tsunamis with the inundation of Alexandria harbor. Major tsunamigenic seismic sources being along the Hellenic subduction zone and Cyprus arc, our study of paleotsunami deposits and their distribution along the Egyptian coast will help in a better constraint of the size and recurrence of tsunamis, and their propagation over the east Mediterranean regions.