Geophysical Research Abstracts
Vol. 20, EGU2018-19227-1, 2018
EGU General Assembly 2018

Sedimentary Paleotsunami Records from the Lagoons along the Southern Coasts of Turkey

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The historical records mention 17 damaging tsunamis during the last 2500 years in the Eastern Mediterranean. However, the number of researches presenting complete and continuous sedimentary records of past tsunamis in the region has been highly limited. In order to investigate paleotsunami chronology in the Eastern Mediterranean, a Marie Sklodowska-Curie project titled “Towards a paleotsunami chronology in the southern Aegean and Levantine seas, Eastern Mediterranean (EASTMED-PALEOTSUNAMI)” was initiated in June 2016. Within the scope of the project, sediment cores having lengths of 3.5-4.5 m were collected from six lagoon systems located on the south and southwest coasts of Turkey to reveal the sedimentary sequences for the Late Holocene. The physical and geochemical methods to reveal the traces left by intense sea water inundation during tsunamis include; radiocarbon dating, magnetic susceptibility (MS), high-resolution micro-XRF scanning (ITRAX), and X-ray radiography. According to the preliminary results, we were able to reveal 1400 and 3200 years-long sedimentary records from Demre and Ölüdeniz lagoons, respectively. The historical tsunamis in AD 1609, 1303 and 148 (only in Ölüdeniz) are observed as distinct anomalies in both lagoons. The anomalies are characterized by higher MS values and enrichments of Ti, Fe, K, Rb elements, which imply that the biogenic and/or chemical fraction of the sediments was suddenly diluted during tsunamis; hence the terrestrial fraction seems to get dominant. Although being less distinct than the anomalies due to AD 1609, 1303 and 148 tsunamis, similar geochemical anomalies were observed in the Ölüdeniz record around AD 1020, 750, 450, BC 50, 250, 480, 710, 960 and 1180. Another important observation from the preliminary results is that the cores collected around 150-200 m away from the sand bars of the lagoons provide well developed geochemical anomalies; however, the anomalies becomes vague or extinct in the cores collected around 500-750 m from the sand bars. It seems that the southern coasts of Turkey have been hit by a tsunami every 200-300 years. In the coming months, this interpretation will be refined by the results from the other four target lagoons of the project.