



## **Deriving earthquake history of the Knidos Fault Zone, SW Turkey, using cosmogenic $^{36}\text{Cl}$ surface exposure dating of the fault scarp.**

Cengiz Yildirim (1), Murat Ersen Aksoy (2), Mehmet Akif Sarikaya (1), Okan Tuysuz (1), S.Can Genc (1), Mustafa Ertekin Doksanalti (3), Sefa Sahin (1), Lucilla Benedetti (4), Jim Tesson (3), and Aster Team (4)

(1) Eurasia Institute of Earth Sciences, Istanbul Technical University, Istanbul, Turkey (cyildirim@itu.edu.tr), (2) Department of Geology Engineering, Mugla Sitki Kocman University, Mugla, Turkey (ersenaksoy@mu.edu.tr), (3) Department of Archeology, Selcuk University, Konya, Turkey (ertekin96@yahoo.com), (4) European Centre for Research and Education in Environmental Geosciences (CEREGE),(benedetti@cerege.fr)

Formation of bedrock fault scarps in extensional provinces is a result of large and successive earthquakes that ruptured the surface several times. Extraction of seismic history of such faults is critical to understand the recurrence intervals and the magnitude of paleo-earthquakes and to better constrain the regional seismic hazard. Knidos on the Datca Peninsula (SW Turkey) is one of the largest cities of the antique times and sits on a terraced hill slope formed by en-echelon W-SW oriented normal faults. The Datça Peninsula constitutes the southern boundary of the Gulf of Gökova, one of the largest grabens developed on the southernmost part of the Western Anatolian Extensional Province. Our investigation relies on cosmogenic  $^{36}\text{Cl}$  surface exposure dating of limestone faults scarps. This method is a powerful tool to reconstruct the seismic history of normal faults (e.g. Schlagenhauf et al 2010, Benedetti et al. 2013). We focus on one of the most prominent fault scarp (hereinafter Mezarlık Fault) of the Knidos fault zone cutting through the antique Knidos city. We collected 128 pieces of tablet size (10x20cm) 3-cm thick samples along the fault dip and opened 4 conventional paleoseismic trenches at the base of the fault scarp. Our  $^{36}\text{Cl}$  concentration profile indicates that 3 to 4 seismic events ruptured the Mezarlık Fault since Last Glacial Maximum (LGM). The results from the paleoseismic trenching are also compatible with  $^{36}\text{Cl}$  results, indicating 3 or 4 seismic events that disturbed the colluvium deposited at the base of the scarp. Here we will present implications for the seismic history and the derived slip-rate of the Mezarlık Fault based on those results. This project is supported by The Scientific and Technological Research Council of Turkey (TUBITAK, Grant number: 113Y436) and it was conducted with the Decision of the Council of Ministers with No. 2013/5387 on the date 30.09.2013 and was done with the permission of Knidos Presidency of excavation in accordance with the scope of Knidos Excavation and Research carried out on behalf of Selcuk University and Ministry of Culture and Tourism.