



## **Seafloor and sub-seafloor characters of mass wasting processes in the Gulf of Cadiz**

**C. Lo Iacono** (1), E. Grácia (1), S. Diez (1), A. Vizcaino (1), R. Bartolomé (1), J.J. Dañoibeitia (1), P. Terrinha (2), N. Zitellini (3)

(1) Unitat Tecnologia Marina - UTM, CMIMA-CSIC, Barcelona, Spain, (2) Instituto Geológico e Mineiro, Dpto. Geologia Marinha, Alfragide, Portugal, (3) ISMAR, CNR, Bologna, Italy

(loiacono@utm.csic.es)

The Gulf of Cadiz is located in the SW margin of the Iberian Peninsula, hosting the convergent boundary between the European and African Plates. The area is characterized by the presence of several active thrusts and strike-slip faults accommodating present-day deformation. The significant seismic activity of the area is considered to be the source of the largest events in Western Europe, such as the 1755 Lisbon Earthquake and Tsunami (Mw 8.5) and 1969 Horseshoe Earthquake (Mw 8.0). Associated with active faulting, slope failures have been previously observed. In this study, swath-bathymetry, acoustic backscatter, high-resolution and multi-channel seismic reflection profiles and sediment cores allowed us to present an overview of all submarine mass movements identified within the Gulf of Cadiz. Results present a wide variety of Plio-Quaternary mass wasting features such as gully-incised retrogressive slope failures, amphitheatre headscarps along submarine canyons, mass slides and gravity flows, recognized at different depths and shaping both slope and abyssal plain domains. Most of the observed mass movements are complex features composed by polycyclic debris flows (Portimao slide), rotational and translational landslides (S-Gorringe slide, Marques de Pombal slide) and rock avalanche (N-Gorringe avalanche). Geomorphologic parameters of landslides (i.e. surface, gradients, height drop, run-out distance) were measured and catalogued on the basis of the swath-bathymetry whereas a detailed characterization of the deposits involved in the gravitational processes (i.e. area,

volume, age) was carried out on the basis of seismic profiles and core data. The occurrence of oversteepened slopes and earthquake activity were recognized as the most likely mechanisms to trigger the observed mass transport deposits. A strong relationship between landslides and tectonic activity is evidenced, as in the case of the Marques de Pombal Slide. The geomorphologic characters and the depth of distribution of most of the observed mass failures suggest a little contribution of landslides in tsunami generation along the SW Iberian Margin. Nevertheless, submarine landslides have important implications in defining seismic hazard models, as synchronous widespread turbidite deposits are a proxy for paleo-earthquakes, and may also contribute in assess the potential tsunami hazard along the coasts of the Southern Iberian Peninsula. We acknowledge funding from the Spanish national Project EVENT (CGL2006-12861-C02-02) and European Commission FPVI STREP Project NEAREST (037110). This presentation has been made possible thanks to the support from the European Science Foundation (ESF) under the EUROCORES Programme EUROMARGINS, through contract No.ERAS-CT-2003-980409 of the European Commission, DG Research, FP6.