



A morphotectonic overview of the deforming seaward boundary of the Africa-Europe convergence zone off Algeria, from Oran to Annaba

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Northern Africa represents an actual plate boundary between Africa and Europe where the submarine part was until now ignored in modern deformation models. However, several evidences from historical records, instrumental seismicity and kinematic studies point for a potentially significant ongoing deformation offshore, dramatically evidenced by the May 21, 2003, Mw 6.8 Boumerdès earthquake. Two cruises organized in August-September 2003 and November-December 2005 on board of R/V Le Suroit from IFREMER (MARADJA and MARADJA2, respectively), allowed us to accurately describe the morphology, sea floor reflectivity, and sub-surface structures using high-resolution (EM300) swath bathymetry and backscattering, high resolution (Chirp) echosounder and seismic reflection (6, 24, 72 channels) along the whole margin of Algeria, from Oran (west) to Annaba (East). We present the main active faults and sedimentary unstabilities that we have identified. New features have been recog-

nized, mostly : (1) long cumulative ENE-striking, south-dipping fault scarps found in several places near the foot of the central and eastern margins (especially off NW Algiers, Boumerdes-Dellys, the Greater and Lesser Kabylies, and Annaba), generally extended seaward by several flats and ramps that create large tilted basins and offset the basement below the Messinian salt; (2) slumps and debris flows, apparently in close connection to the thrust segments; and (3) deep canyons and tributaries upslope prolonged by turbidity channels and levees downslope, with strikingly different patterns, apparently depending on the size of drainage domains onland and on the geological origin of the margin (belonging either to the plutonic/metamorphic basement or sedimentary cover of the Internal Zones represented by the Kabylies on land, or to the External Zones of the Tell). We also present evidences for very young small scarps observed in some areas that could be related to historical earthquakes and would therefore help to re-evaluate the level of seismic risk along the Algerian coastline.