



## **High-resolution seafloor imagery and sediment sampling off Algeria (from Oran to Dellys) show evidence of canyon floor erosion and recent landslides**

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Recent works offshore the northern African margin highlighted the active nature of the Algerian margin, confirmed by strong seismicity. The leg 1 of MARADJA2-SAMRA cruise in Autumn 2005 reoccupied some selected sites where EM300 swath bathymetry and seafloor imagery had been acquired during a previous campaign in 2003. The goals of this cruise were to better understand the origin of the 21/05/2003 Boumerdes earthquake (M 6.8), whose epicenter was at sea, and to study in detail the impact of submarine landslides and turbidity currents generated by the earthquake that caused the rupture of several submarine cables over an area of more than 150 km off central Algeria.

We used a high-resolution deep-towed side scan sonar system developed by Ifremer (SAR, système acoustique rémorqué) with two transducers emitting at 180 kHz, providing a resolution of less than 1 m. A new Ultra Short Baseline positioning system allowed an excellent superposition of new SAR data with the previous survey. Furthermore, we completed the dataset with sediment cores and *in situ* pore pressure measurements via piezometers.

SAR dives (825 km in total) had two main goals: 1) to identify meter-scale seafloor escarpments linked to faults interpreted to be active based on the 2003 cruise; and 2)

to identify areas of recent sediment deformation and instability at the seafloor, including landslide scars and areas of submarine erosion originated by turbidites. The very high resolution SAR images showed with unprecedented detail the floor of submarine canyons and submarine valleys showing longitudinal furrows, gravel wave fields and slided blocks from the sides. Fresh-looking sediment failures of up to 5 km in width were imaged at several locations at the base of slope offshore central and western Algeria. In the area of the El Marsa deep sea fan, a field of spectacular sediment waves with an amplitude of 80 m and a spacing of several km showed clear evidence of avalanching on the lee sides.

Relevant targets have been sampled with a total of 19 kullenberg and 20 interface cores in order to: a) define the lithology of the seafloor; b) obtain undisturbed samples for the measurement of physical and geotechnical properties of the sediment in areas of instability to understand the mechanics of sediment deformation processes; c) obtain the datation of the most recent deposits from catastrophic events (turbidites, submarine landslides).

Two piezometers coupled with Ocean Bottom Seismometers are at the seafloor near a landslide to quantify the pore pressure generated by the earthquakes and will stay there until early 2007; short-term dissipation measurements with piezometers in the vicinity gave encouraging results. Four other OBS have been deployed in the area offshore central Algeria to monitor the seismicity of the area.