Project n. 037110

NEAREST

"Integrated observations from NEAR shore sourcES of Tsunamis: towards an early warning system"

Instrument: STREP

Thematic priority: 1.1.6.3 GOCE (GlObal Change and Ecosystems)

D3: REPORT ON SITE CHARACTERIZATION AND SELECTION FOR THE DEPLOYMENT OF THE DEEP SEA PLATFORM

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Project Co founded By the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination level		
PU	Public	X
PP	Restricted to other programme participants (including Commission Services)	
RE	Restricted to a gruop specified by the Consortium (including Commission Services	
CO	Confidential, only for members of the Consortium (including Commission Services)	

D3 – Selection of the area for the deployment of GEOSTAR

The selection of the area for the deployment of GEOSTAR was based on the study of the following available geophysical database of the Gulf o Cadiz: all available academic and accessible industry multi-channel seismic lines (figure 1), multibeam bathymetry and side-scan sonar.

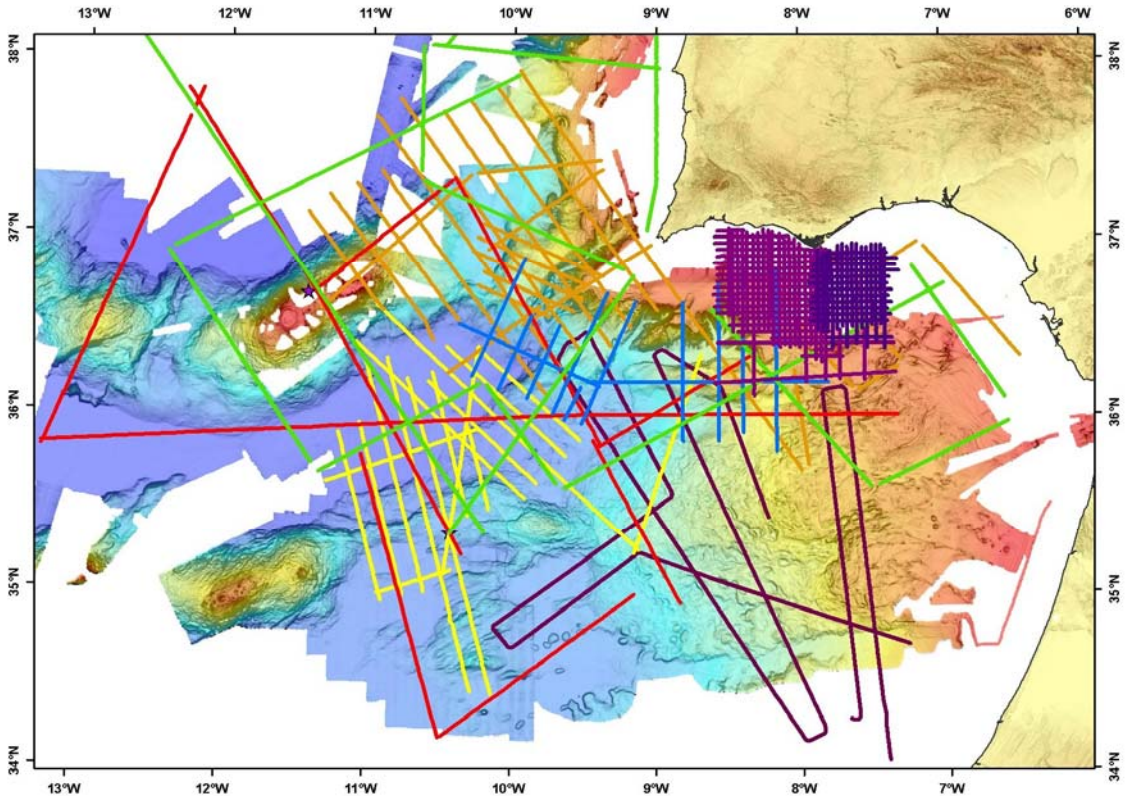

Figure 1- Multibeam bathymetry of the Gulf of Cadiz study area and location of the inspected multi-channel seismic profiles.

Because the GEOSTAR should be located within the early warning range with respect to the Portuguese and Spanish coasts, three areas were antecipated for detailed study: i) the Portimão Bank, ii) the Marquês de Pombal plateau and iii) the Sagres plateau.

The Portimão Bank was discarded based on the existence of numerous active mass wasting structures and active salt tectonics, presently piercing through the Cenozoic cover; these structures are well depicted on seafloor bathymetry and MCS (Zitellini et al., 2004).

The Marquês de Pombal plateau has two major landslides (Gràcia et al., 2003 and Terrinha et al., 2003) and many evidences of very recent mass wasting deposits at the foot of the scarp (Gràcia et al., 2006). Furthermore, Gràcia (pers. comm.) has identified, based on deep towed side scan images, kilometre scale blocks of disrupted seafloor sediments that are on unstable position on top of this plateau. For these reasons this location was also abandoned.

The Sagres plateau was the chosen site (figure 2). Despite the fact of being located nearby tectonically active structures (figure 3) and also other stuctures that display gravity instability (fig. 4), the top of the plateau displays a confined smooth surface with very low dips, within which the GEOSTAR could be deployed (figure 4). Furthermore, the mapping of the gravity instability structures is fairly defined outside the chosen area for deployement (figure 4).

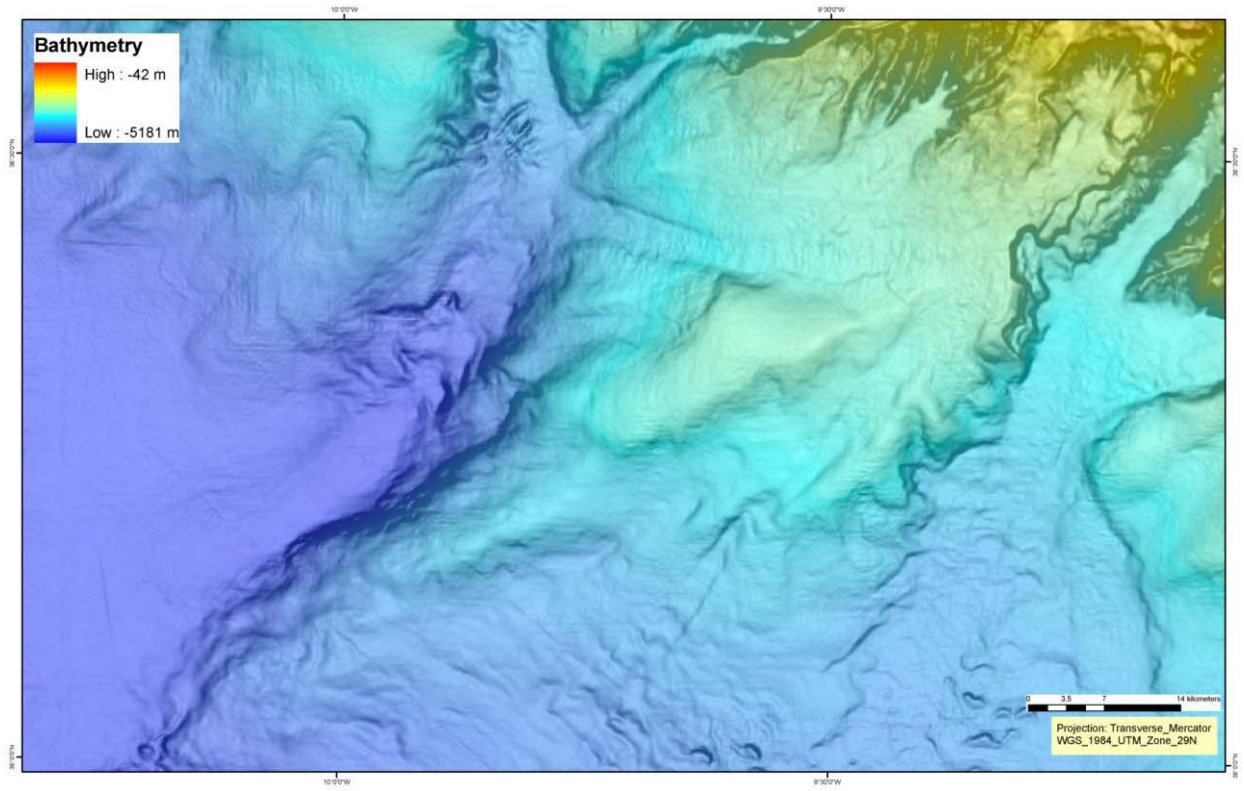

Figure 2- The Sagres plateau imaged on the SWIM multibeam bathymetry.

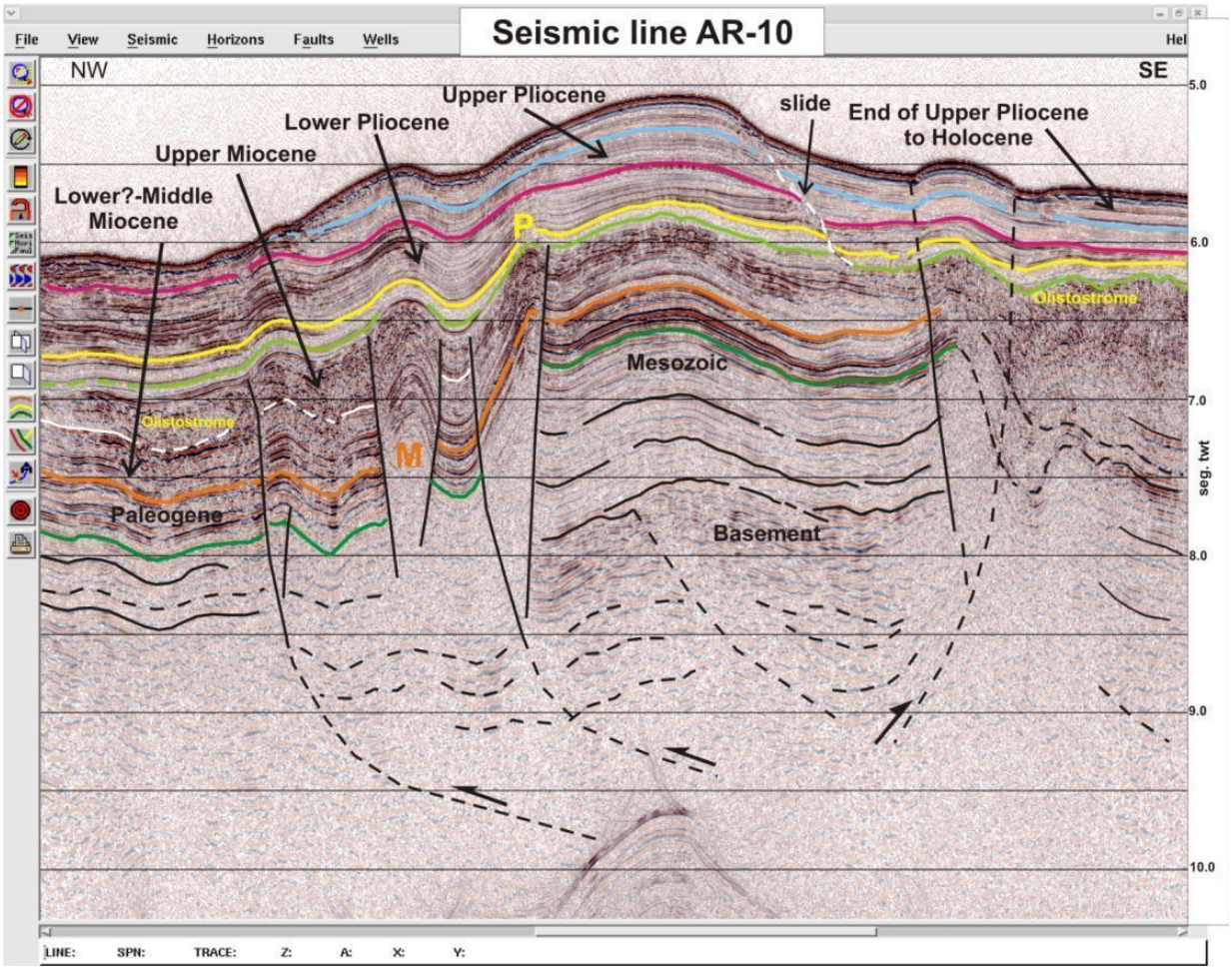

Figure 3- Multi channel seismic profile AR92-10 with stratigraphic callibration and structural interpretation.

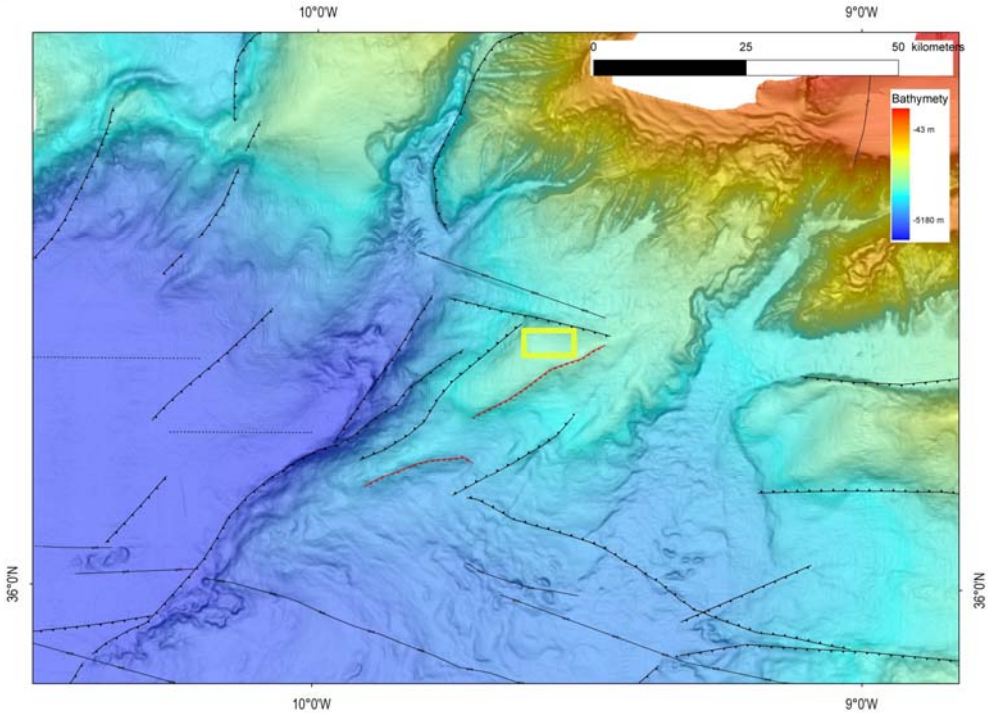

Figure 4- Structural map of the Sagres plateau. Faults in black are thrusts and strike-slip faults. Faults in red are extensional faults due to gravity instability. The yellow rectangle marks the area recommended for deployement.

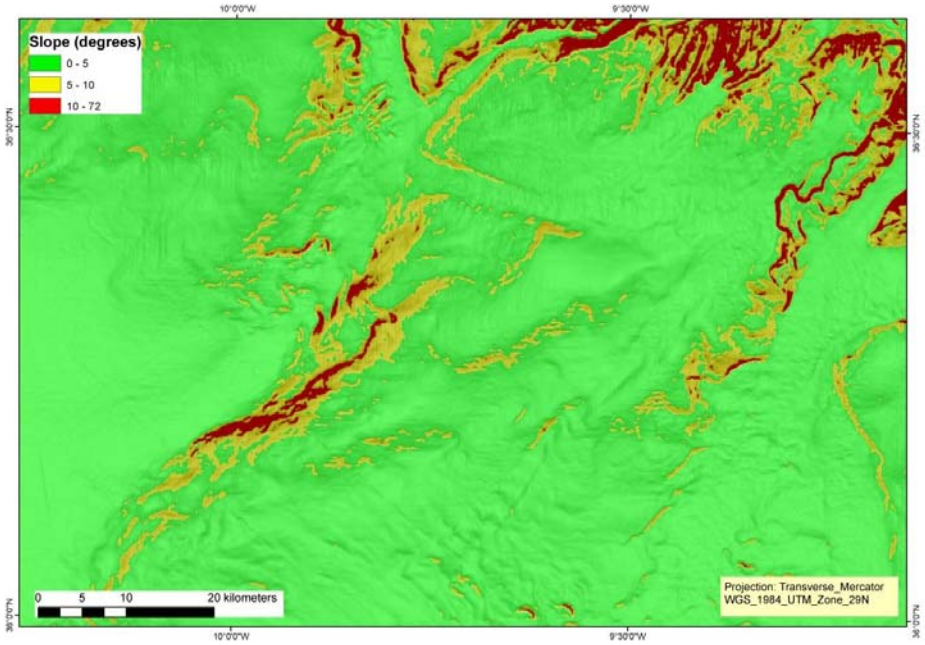

Figure 5- Map of slopes of the Sagres plateau.