

Workshop IODP-Italia “Lo stato delle proposte di perforazione nell’area mediterranea”
Scientific Drilling in the Mediterranean Sea
Roma, 15-16 gennaio 2018

Abstract

Le perforazioni scientifiche mediterranee nella storia recente

PROMESS Drilling

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Abstract

The EC funded project PROMESS 1 (PROfiles across MEditerranean Sedimentary Systems, Dec. 2002-May 2006) was part of a large Europe-US research programme of studies of continental margins “from source to sink” and it has been the first attempt to achieve scientific drilling on continental shelves and slopes in the Mediterranean Sea, following a ODP standard. The PROMESS 1 scientific consortium encompassed 11 partners from eleven institutions (IFREMER, CNR-IGM, BGS, GGA, USAL, UBO, UNBR, UB, CNRS, CSIC, UniLyon) of five countries (France, Italy, Germany, Spain and UK). PROMESS 1 served also as test for the use of a “Mission Specific Platforms”, as European contribution to the future Integrated Ocean Drilling Programme. PROMESS 1 was designed for sampling long sections (50-300 m) and to gather in situ measurements of shelf and upper slope sedimentary sequences deposited during the last 500 kyr, at water depth of 50-300 m. The general objective of PROMESS was to obtain comprehensive transects across two Deltaic Margins in the NW Mediterranean Sea (the Rhone and Catalan-Languedocian river system) and in the Adriatic (the Po and Apennine river system). These two areas commanded (and still do it) exceptional interests including their high sedimentation rates and the good sequence preservation.

Great attention was paid to the technical preparation of the cruise (call and selection of tender, site surveying, safety and environmental issues), in order to demonstrate the feasibility of conducting scientific-driven projects with vessels usually employed by the industry. The operation at sea took place on the G/V Bavenit, owned by the Russian company AMIGE and operated by FUGRO Engineers BV (24 June to 25 July 2004). Two sites were drilled for each deltaic system, one at shallow depth (57-102 m water depth), and the other at deeper depth (185-297 m w.d.). For safety issues, pilot holes (holes drilled with no recovery and following specific safety procedures) had to be drilled at 3 of the 4 sites. In total, 570 m of excellent quality cores were collected, together with 280 m of geotechnical tests, 500 m of γ -ray downhole logging data and 210 m of a full suite of downhole logging measurements. After the cruise, all cores and data were shipped to Brest for the sampling party. Sub-samples were shipped to various partners laboratories for a full suite of multiproxy analysis. The sediment cores are stored at the IODP core repository in Bremen (Germany).

The Italian participation to the PROMESS project involved the former ISMAR-CNR and focused on the study of the Adriatic holes (PRAD1-2 and PRAD2-4 at 185 and 55 m w.d., respectively) drilled on the western Adriatic Sea. The multiproxy approach carried out on the Adriatic sites included visual description, MSCL data, magnetic properties, geochemical analysis ($\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ on carbonates, alkenones), micro- and macropaleontology (foraminifera, calcareous nannoplankton, ostracods, mollusks), sedimentology (grain size). Although the successful drilling in the two areas was the main challenge of the project,





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PROMESS 1 provided new insights among which, regarding the Adriatic sites (namely PRAD1-2), the record of four Milankovitch cycles during the last 400 kyrs well correlatable with other deep Mediterranean records (Piva et al., 2008a, b) along with the unexpected presence of sapropel deposits at such shallow depths. The Adriatic sediment cores were studied also after the end of PROMESS 1 (e.g. Ridente et al., 2009; Maselli et al., 2011), improving tephra chronology for the Central Mediterranean region (Bourne et al. 2010, 2016) and contributing to the development of projects granted also by oil companies. For instance, PRAD1-2 provided an unprecedented detail for the Last Glacial Maximum in Adriatic in terms of chronostratigraphic framework and paleoenvironmental reconstruction to unravel margin-scale sediment progradations at sub-Milankovian cyclicity (Pellegrini et al., 2017).

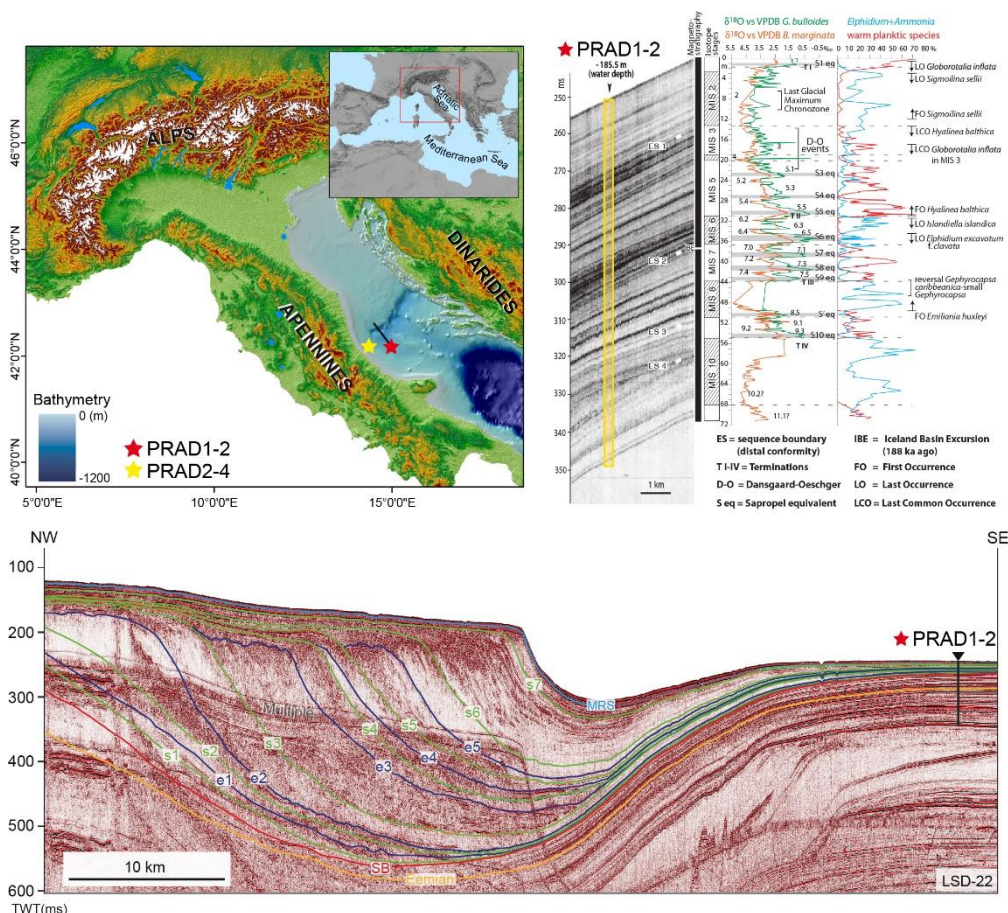
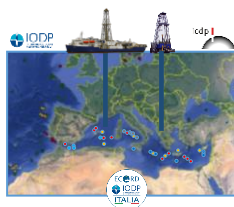


Fig. Digital elevation model for the Adriatic basin and location of the PROMESS 1 boreholes (PRAD1-2 and PRAD 2-4) and detail of seismic section and stratigraphy of the PRAD1-2 (after Ridente et al., 2009). Multichannel seismic profile with PRAD1-2 and the main stratigraphic surfaces of the late Pleistocene succession (Pellegrini et al., 2017).





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