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The GOLD project - Drilling in the Western Mediterranean Sea

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Reports of Magellan Series Workshops

Workshop on the GOLD project: drilling in the Western Mediterranean Sea, October 19-22, Banyuls-sur-Mer, France.

Convenors : Marina Rabineau, (LDO, IUEM-CNRS-UBO), Daniel Aslanian, (IFREMER), Christian Gorini (Istep, UPMC), Karine Alain (LM2E, IUEM-CNRS-UBO)

A workshop on the GOLD project sponsored by the European Science Foundation (ESF) through the Magellan Workshop Series, EDROME-Ifremer, INSU-CNRS and ActionMarges Consortium (Total-BRGM-Ifremer-IFP-INSU) has been held on 19th-22nd October 2010 in l'Observatoire Océanologique de Banyuls-sur-mer, FRANCE (http://www.ifremer.fr/drogm/colloques/gold_project_banyuls). Despite a general strike in France, 57 out of the 60 registered scientists arrived in Banyuls, from twelve countries, to discuss the opportunity, challenges and scientific outcomes to drill deep holes in the Gulf of Lion. Scientists from 5 international oil companies were also present.

The "GOLD" IODP Project aims to recover the complete history of the Gulf of Lion (25-30 Ma) with a specific focus on Global Climate and Sea-level Changes, Extreme Events, Margin formation, Natural Resources and the Deep Biosphere using dedicated drilling Platform (MSP, Joides and Chikyu). It should be emphasized that no academic drillings dealing with pre-5million years exist in the Mediterranean Sea.

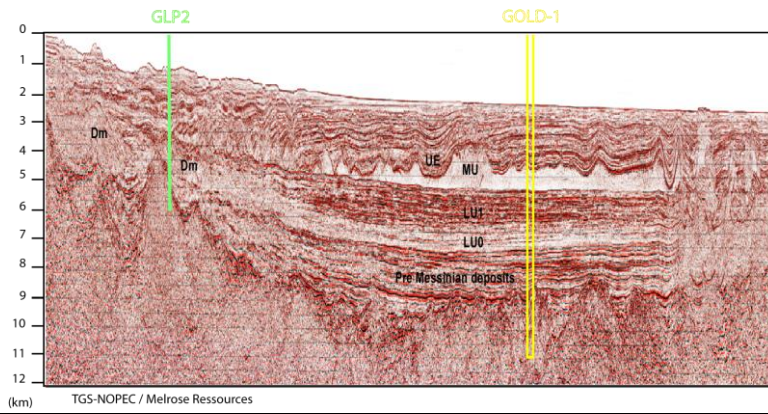
During the course of the three days a series of talks and posters focused on these topics were presented. All non-confidential presentations are available online (<http://www.congres.upmc.fr/gold/>).

Discussions were held in two subgroups dealing with different drillings. The **GOLD-1** project, located at the toe of the continental slope (2400 m water depth), that aims to drill below the thick salt layer using the Chikyu Vessel and the **GOLD-2** project on the shelf (30-120 m water depth) that aims to drill the Pliocene-pleistocene with a MSP platform. During the course of the discussion it appeared that GOLD-1 project was more mature than the GOLD-2 project, the consensus was to submit two separate but parallel proposals.

The position of the GOLD-1 drilling is the only place in the Gulf of Lion where the sedimentary column is fully complete (without major erosion and hiatuses). This enables the very high-resolution record of climate variations over 23 Ma within the 7.7 km of strata. The borehole would reach the substratum in a key area with a thin crust which precise nature is still a problem. The site is also characterized by the presence of evaporite and a 1 km-thick halite-rich layer corresponding to the Messinian salinity crisis, an extreme event representing a unique crisis in Earth history. The drillsite is located sufficiently far from the shelf and slope to be saved from the Messinian outstanding erosional event, and also free from salt faulting and salt diapirs that deform deposits. The site is particularly appropriate to address the questions of dispersal/evolution and of life's tolerance to environmental extremes and habitability since extreme conditions, such as high P, high T°, salt layers and particular organic matter content all prevail at the GOLD site. A general discussion on the best drilling strategy to reach the overall goals was held on the second day. The possibility to create of a public-private consortium was also held on the last day. A Field trip of half-a-day was also organised and conducted by G. Clauzon, J-P. Suc and J-L Rubino in the nearby Roussillon basin.

Topic discussions enabled to identify key unanswered questions of global interest to be adressed in the IODP proposal, as reported in the full report posted online (www.esf.org/magellan). All participants were willing to go ahead with the project. We also decided to keep the four main scientific themes because the objectives of the GOLD-1 drilling program are diverse but complementary and fully relevant to the science targeted in the new drilling program.

Some key points were decided to organize the **future of the project**. (1) The final objective is to submit an IODP proposal for the New IODP Program 1st October 2011. (2) Marina Rabineau (France), Junichiro Kuroda (Japan) and Andre Droxler (USA) were defined as international leaders for the project. A Steering Committee was also defined. (3) We decided to organize a new workshop in Tokyo, focused on the GOLD-1 ultra deep drilling, to better involve the "Asian" community. We therefore submitted a proposal to IODP-MI to hold a new Workshop in Tokyo in 2011.



Position of the proposed GOLD drilling on seismic profile, at 2400 m water depth, 7.7 km of sédiments with 1 km of salt (transparent layer MU on profile) down to the crust record 30 Ma of high resolution earth history.