

Climatic and environmental variations during the last 130 ka; Investigations from sedimentary record on the Rhône deltaic margin (Gulf of Lions, NW Mediterranean)

GWÉNAËL JOUET^{1,2}, MATTHIEU GAUDIN², MARIA-ANGELA BASSETTI^{1,2}, SERGE BERNE², MARINA RABINEAU¹, BERNARD DENNIELOU², FRANCISCO JAVIER SIERRA³, JOSÉ ABEL FLORES³ & MARCO TAVIANI⁴.

¹Univ. Brest-CNRS, Lab. UMR6538 Domaines Oceaniques, IUEM Plouzane, France, (gjouet@ifremer.fr).

²IFREMER, Géosciences Marines, Lab. Environnements Sédimentaires, Plouzané, France.

³Universidad de Salamanca, Departamento de Geología, Salamanca, Spain.

⁴ISMAR-CNR, Bologna, Italy.

The Rhône deltaic margin (NW Mediterranean) was under the influence of a very high sedimentation flux during the last climatic cycle, because of the vicinity of major fluvial systems that fed the outer shelf during the glacial period and the inner shelf during the deglacial period. The two areas provide a complete sedimentary record of depositional events from 130 cal. kyr BP to present. This sequence represents the sedimentary expression of the glacial/interglacial cycle (100 kyr cyclicity) within the Late Quaternary succession [1]. New detailed morphological, sedimentological and palaeoenvironmental data including radiocarbon dates allow us to propose a scenario for the evolution of these critical areas. In particular, the correlation between the two Promess boreholes GL1 and GL2 on the outer shelf confirms and better constrains the chronology and paleoenvironmental reconstruction based on previous shallow cores. The two boreholes are tied using seismic reflections as time-lines. Other proxies (nanofossils, physical properties, grain-size analysis...) allow us to refine these correlations. On the outer shelf these Promess cores provide, for the last climatic cycle a cross-shore evolution from the sandy shoreface to the muddy offshore.

The last sequence at the shelf edge was formed by forced regression during the sea-level fall between MIS 3 and MIS 2, topped at the inner shelf by the last deglacial wedge (MIS 1). It can be sub-divided into several prograding units indicating that relative sea-level changes control the general pattern of the deposits. But eustatism was punctuated by periods of increased fall or slow-down, or even stillstand. Similarly, the sea-level rise was marked by steps, during which wave-cut terraces were formed. Otherwise, the sediment fluxes seem to be the

key parameter that controls the formation and the preservation of the palaeoshorelines. Increasing fluxes occurred at the transition between cold and warmer climatic period as it has been shown by stratigraphic simulations for the Younger Dryas – Preboreal period on the Rhône prodeltaic lobes.

In addition, the multi-proxy study of the Promess cores evidence several cold events corresponding to Heinrich events (H2 to H6) with increasing of *Neogloboquadrina pachyderma sinistra* abundance during Glacial [2]. They might be related to periods of increased northwesterly winds favouring the transport of coarser sediment at the shelf edge, in relation with deep water cascading. Such variability in sedimentation could be at the origin of several packages of amplitude anomalies on very high resolution seismic data that can be tracked both in the Bourcart-Herault interfluvium and in the adjacent Bourcart canyon head.

REFERENCES

- [1] Rabineau, M., 2001. Un modèle géométrique et stratigraphique des séquences de dépôts quaternaires de la plateforme du Golfe du Lion : enregistrement des cycles glacioeustatiques de 100 000 ans. *Thèse de Doctorat, Université de Rennes-1 and IFREMER*, 392 +70 pp. (2 vols), <http://www.ifremer.fr/docelec>.
- [2] Sierra, F.J., Flores, J.A., Pérez-Folgado, M.; González-Mora, B.; Bárcena, M. A.; Dennielou, B.; Berné, S., 2006. Condensed Layers and Sea Level Changes in the Gulf of Lions during the Last Climatic Cycles (Data from Promess1, Borehole PRGL1-4). *Geophysical Research Abstracts*, Vol. 8, 09028, 2006. SRef-ID: 1607-7962/gra/EGU06-A-09028 © European Geosciences Union 2006.