

# Spatial and temporal evolution of the Le Danois Contourite Depositional System, Southern Bay of Biscay

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More understanding about palaeoceanographic processes and their resulting sedimentary products is necessary mainly due to the increasing interest in these deposits for palaeoclimate reconstruction and for the hydrocarbon industry. Because contourite deposits have not been studied as much as, for example, turbidite deposits, more studies are recently being conducted on them. The principal aim of these studies is to reconstruct the sedimentary architecture of contourite deposits, taking in account for their sedimentary evolution and their palaeoceanographic drivers.

Taking these objectives in mind, research will be performed on the Le Danois Contourite Depositional System (CDS), located in the Bay of Biscay, on the Cantabrian continental margin and constrained in the intra-slope basin, between the Asturias shelf and the Le Danois Bank, between 400 and 1500m water depth (Ercilla *et al.*, 2008). A CDS contains depositional (drifts and sediment waves) and erosive (moats) features that are genetically linked and originate due to the working of bottom currents. The Le Danois CDS was first described by Van Rooij *et al.* (2010), indicating it is the only CDS within mid-water depths in the Bay of Biscay. It is thus an ideal recorder of palaeoceanographic change in this area.

The seismic data used for this research, were acquired during RCMG survey ST1117 in the Bay of Biscay on board of R/V Belgica. The high resolution single channel reflection seismic profiling was performed with a SIG sparker source. CTD measurements, using a Seacat SBE-19 Plus deep-water CTD profiler of the MUMM, were acquired as well.

Visualization, study and interpretation of the single channel seismic records will be made with the aid of the 'The Kingdom Suite' software. Seismic sequences, units and/or subunits, each bounded by seismic discontinuities, can be discerned in the data. These discontinuities have been formed by climatic, sea-level and palaeoceanographic changes in the Mediterranean Outflow Water (Van Rooij *et al.*, 2010; Hernandez-Molina *et al.*, 2011). A relative stratigraphy, based upon stacking of sediments can be made, whereas fine-tuning of the chronology can be done by comparing the deposits and stacking sequences with the well-studied CDS in the Gulf in Cadiz (Hernandez-Molina *et al.*, 2006).

The main purpose of this MSc thesis is to investigate the influence of the Mediterranean Outflow Water and its bottom current flow on sedimentation in the region and to reconstruct the palaeoceanographic evolution of the Le Danois Contourite Depositional System.

## References

- Van Rooij D., J. Iglesias, F.J. Hernández-Molina, G. Ercilla, M. Gomez-Ballesteros, D. Casas, E. Llave, A. De Hauwere, S.G. Gil, J. Acosta and J.-P. Henriot. 2010. The Le Danois Contourite Depositional System: interactions between the Mediterranean outflow water and the upper Cantabrian slope (North Iberian margin). *Marine Geology* 274:1-20.
- Ercilla G., D. Casas, F. Estrada, J.T. Vázquez, J. Iglesias, M. García, M. Gómez, J. Acosta, J. Gallart, and A. Maestro-González. 2008. Morphosedimentary features and recent depositional architectural model of the Cantabrian continental margin. *Marine Geology* 247:61-83.
- Hernandez-Molina F.J., E. Llave, D.A.V. Stow, M. Garcia, L. Somoza, J.T. Vazquez, F.J. Lobo, A. Maestro, V.D. del Rio, R. Leon, T. Medialdea and J. Gardner. 2006. The contourite depositional system of the Gulf of Cadiz: a sedimentary model related to the bottom current activity of the Mediterranean outflow water and its interaction with the continental margin. *Deep-Sea Research Part II-Topical Studies in Oceanography* 53 (11-13):1420-1463.
- Hernández-Molina F., N. Serra, D. Stow, E. Llave, G. Ercilla and D. Van Rooij. 2011. Along-slope oceanographic processes and sedimentary products around the Iberian margin. *Geo-Marine Letters* 31:1-27.