



## Flood characterization in Rhône prodelta sediments

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Measurements on twin cores (RHSKS58 and RHSKS25) collected during the Rhosos cruise (2008) on the Rhone prodelta allowed to correlate specific sedimentary beds with historical floods of the Rhône River (1671AD-1986AD) using  $^{137}\text{Cs}$  and  $^{206}\text{Pb}/^{207}\text{Pb}$  and large occurrence of freshwater ostracods of fluvial origin (Fanget, 2013 ; Fanget et al. 2013). Interpretation of short half-time radio-isotopes ( $^{210}\text{Pb}$ s), grain-size measurements with high-frequency sampling steps, together with the analysis of thin sections on indurated sediments and the measurement of major chemical elements using X-ray fluorescence (XRF) allowed to accurately characterize these flood beds. A few measurements of organic carbon and  $\delta^{13}\text{C}$  have also been made.

Major floods are characterized by grain-size variations that can either show a classical hyperpycnal sequence (with successive coarsening-up and fining-up units) or a classical turbidite sequence (fining-up trend). In any case, floods are characterized by an enrichment in quartz grains, a decrease in  $\delta^{13}\text{C}$  values and an increase in organic matter content correlated with higher proportion of plant fragments. This testifies for a sudden continental input. Typical hyperpycnal sequences have been correlated with the change in daily discharge at the Rhône River mouth for floods between 1920 and 2000. These sequences are correlated with chemical elements that characterize a detrital input (high  $\text{Ti}/\text{Ca}$ ,  $\text{Si}/\text{Ca}$ ). The classical turbidites could result either from the distal transformation of hyperpycnal flows, from the rapid progradation of mouth bars, or more simply from the settling of turbulent clouds generated by prodelta slope failures during period of high sediment accumulation rates.

Additional clay-rich beds could be correlated to the particle fall-out from hypopycnal plumes during low-magnitude floods.

Fanget, A.-S. (2013). Enregistrements des changements rapides de l'environnement et du climat dans les sédiments holocènes du Golfe du Lion (NW Méditerranée). Thèse, Univ. Perpignan, 365 p.

Fanget, A.-S. , Bassetti, M.-A., Arnaud, M., Chiffolleau, J.-F., Cossa, D., Goineau, A., Fontanier C., Buscail, R., Jouet, G., Maillet, G.M., Negri, A., Dennielou, B., Berné, S. (2013). Historical evolution and extreme climate events during the last 400 years on the Rhone prodelta (NW Mediterranean). *Marine Geology*, 346, 375-391.