



## **Composition of organic matter from prodeltaic sediments during extreme events (Rhône prodelta, France): signature of flood events**

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The Rhône River is the major source of freshwater and terrigenous material to the Mediterranean basin. The Rhône prodelta is characterised by high deposition rates and efficient transformation of sedimentary organics, as is typical for River-dominated Ocean Margins.

Yet, despite the obvious importance of prodeltas, the mechanisms governing the fate of organic carbon in these dynamic environments are not fully understood. For instance, the importance of short-term variability in organic matter biogeochemistry is not quantitatively assessed. Part of this variability can be easily explained by the observation that fluvial input is not constant over time, alternating between periods of flood and low river-discharge conditions. However, in spite of the importance of flood events for the delivery of riverine sediments and organic matter to the coastal environment, little is known on the influence of these extreme events on the composition of organic matter in prodeltaic sediments.

The multi-disciplinary program « Climate and Human-induced Alterations in Carbon Cycling at the River-sea connection » (CHACCRA) was designed to study the fate of nutrients and organic matter delivered by the Rhône River in the prodelta and its adjacent shelf. The opportunity to study the impact of flood deposits on the Rhône prodelta and adjacent shelf occurred in June 2008, when the Rhône river experienced a major flood event. 14 sediment cores were collected in the prodelta area in order to describe the distribution and composition of the organic matter along the main sediment dispersal system during the flood event. Stations were subsequently revisited in December 2008, one month after the occurrence of a wintry flood event. Down core profiles of bulk parameters (grain size, total nitrogen and organic carbon) were realised to investigate the distribution and location of the flood deposit. In addition, molecular-level proxies (pigments, fatty acids, total and bioavailable amino acids) were used to assess short scale variability in the origin, quality and state of degradation of the organic matter in the sediments. The influence of the flood events on the composition of sedimentary organic matter in the Rhône prodelta and the adjacent shelf will be discussed.