



## **Impact of salt tectonics on the Pliocene series of the Rhône deep-sea fan, Gulf of Lions, Western Mediterranean Sea**

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The Rhône Deep-sea fan, the largest Pliocene-Quaternary deep-water clastic system offshore the Gulf of Lions-Western Mediterranean Sea, is significantly affected by salt tectonics. However, the impact of salt-related structures on the Pliocene sedimentary organization of the fan was never studied. Our study aims to assess the influence of salt tectonics on the sedimentary architecture of the fan during the Pliocene. The study is based on seismic and chronostratigraphic interpretation of multichannel seismic profiles and boreholes. The isopach map shows that the thicker Pliocene sequence is found in the deep basin and that this depositional system converges to the present-day rhodanian canyons (the Petit-Rhône and the Marti canyons). This connection suggests that these canyons were the main feeders of siliciclastic sediments to the deep basin during the Pliocene. Conjugated analysis of salt-structural and Pliocene isopach maps reveals that thickness variations of the Pliocene series was controlled by syn- and post-depositional deformations, associated with the movement of the salt layer. Syn-depositional (Pliocene) halokinesis was the main mechanism responsible for the turbidite organization as a series of isolated depocenters. Diapirism created an irregular morphology that generated accommodation space between salt pillows and domes, resulting in the deposition of a distal turbiditic system as isolated main depocenters. Locally, subsidence of the Pliocene cover into the salt evacuation horizon was also a

syn-depositional mechanism that controlled the sediment architecture, as reflected by the abrupt thickening of the Pliocene series around the present-day -2200m isobath, along the Catalano-Languedocian margin. Post-depositional (Quaternary) mechanism of differential sedimentary loading has also affected locally the present-day sedimentary distribution by post-depositional stretching and compaction of the Pliocene sequence. Finally, the Pliocene and Quaternary isopach maps also show changes in the depocenters location of deep sedimentary systems during the Pliocene and the Quaternary. The main depocenters developed during the Pliocene are located in the distal part of the basin, while the Quaternary ones are tectonically-controlled and located in the proximal margin.