



Massive sand beds deposited by dense water cascading in the Bourcart canyon head, Gulf of Lions (northwestern Mediterranean Sea)

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During modern hydrodynamic conditions, the Gulf of Lions continental shelf and slope are under the influence of dense water cascading, wind-induced bottom currents and the geostrophic Northern Current. In order to characterize sedimentary activity at the shelf break, several interface and piston cores were sampled in the Bourcart canyon head and a current meter equipped with temperature and turbidity sensors was moored during the 2003-2004 winter season. Even if the canyon is not connected directly to continental sources since Last Glacial Maximum, the cores show that its head is blanketed by up to 1.5 m of recent sedimentary units mainly composed of muddy medium-grained sand. $^{210}\text{Pb}_{ex.c}$ activity measurements performed in the upper part demonstrated the present day sedimentary activity of the canyon head. Detailed grain-size, X-ray and sediment facies analyses, along with time series of currents and suspended sediment concentration suggest that dense water cascading is the main process allowing the reworking, transport and accumulation of sediments within the canyon head. The deposits called “cascadite” constitute a new type of deposit that differs from other typical slope deposits (turbidites, hyperpycnites, contourites) in terms of flow duration or internal structure. Cascadite characteristics are closely related to shallow water bottom current sand. In addition, dense water cascading can be one of the processes at the origin of recent sedimentation in the western Gulf of Lions basin.