



## **Analysis and modeling of contourite drifts and contour currents off promontories in the Italian Seas (Mediterranean Sea)**

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The complex relationship between currents flowing around capes and their related contourite deposits (i.e. marine sediments deposited and/or reworked by the persistent action of bottom currents) is still an interesting and debated topic, both from a sedimentologic and oceanographic perspective. We analyze here contourite drifts located at intermediate depths off promontories in the southern Tyrrhenian and in the southern Adriatic Sea. The comparison between bathymetric-stratigraphic data and numerical, tank and analytic results, allows us to investigate the occurrence of contourite deposits around capes. We found that the presence of turbulence, and thus, of erosive conditions for sediments in the lee-side of a cape, can be detected by using dimensionless numbers related to cape dimension and ocean current features.

We, moreover, analyze the additional sedimentary processes caused by seafloor unevenness offshore the cape such as local topographic depressions by applying the classical conservation of potential vorticity. The resulting effect is a steady cyclonic circulation over the depression that affects contourite deposition. We show that the application of the potential vorticity conservation provides a simple theoretical tool for the understanding of complex relations among ocean current, seafloor morphologies, and sedimentary processes. This work can be seen as a new approach to bridge the gap between marine sedimentology and physical oceanography.