Geophysical Research Abstracts
Vol. 12, EGU2010-10672, 2010
EGU General Assembly 2010

Dense shelf water cascading into the Cap de Creus Canyon: preliminary results from process study simulations

Andrea Bergamasco (1), Mauro Sclavo (1), Sandro Carniel (1), Katrin Schroeder (2), and Pere Puig (3)

(1) CNR-ISMAR, Inst. of Marine Sciences, Venice, Italy (andrea.bergamasco@ismar.cnr.it), (2) CNR-ISMAR, La Spezia, Italy, (3) Institut de Ciències del Mar, CSIC, Barcelona, Spain

The Gulf of Lions is one of the regions in the Mediterranean where dense water formation occurs by open-sea convection process, as well as by dense shelf water cascading when coastal surface waters over the wide shelf become denser than the underlying water masses and cascade downslope until reaching their equilibrium depth.
The intense dense shelf water cascading events occurred in this area of the North-Western Mediterranean Sea in early 2005 contributed to the basin-wide spreading of a deep thermohaline and turbid anomaly. The major volume of dense shelf water formed on the Gulf of Lions shelf was then exported through the Cap de Creus Canyon, at the western edge of the gulf.
Four instrumented sites along the canyon axis have registered these events, allowing to perform some numerical process study simulations of the down-canyon dense water flow. These were carried out using the Regional Ocean Modeling System (ROMS), first on an idealized configuration of a realistic dense plume cascading along a submarine canyon. Given the availability of a high-resolution multibeam bathymetry of the Cap de Creus Canyon (about 10 m resolution), other numerical experiments were then carried out to simulate the flow down a realistic canyon topography.
The poster deals with the preliminary results of these numerical experiments, exploring how the downslope flow can develop into a gravity current cascading event, and the characteristic time scales of such events. In addition, the results can also provide helpful information about the most suitable locations of continuously measuring instruments along the canyon, increasing the probability to detect the main flow of the descending plume.