Study of the 3-D circulation in the Ligurian Sea during the Haven disaster

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During April 1991 the Haven tanker discharged accidentally 15,000 tons of crude iranian oil in the Ligurian Sea. During the activity related to the monitoring of the spill effects on living resources a large amount of data where gathered, using different platforms and sensors; AVHRR, TM, SPOT, Daedalus, shipborne IR Radiometer, Pyrgeometer, CTD, Current meters. Those data contributed to the definition of the circulation current field during the accident. Numerical experiments were carried on for the simulation of the circulation pattern, oil spill dispersion, weathering of the oil and sinking. The general cyclonic circulation existing in the Ligurian Sea was influenced by wind forcing, which was responsible of small scale instabilities evolving in a rather complex eddy structures. Numerical experiments were able to describe the importance of the topography on the circulation, as well as the vertical density structure. The numerical model adopted was semi-emplicit, allowing a large time step. Model simulation was validated by a comparison with the time evolution of the thermal features observable in a time series of AVHRR images. In situ radiometer measurements allowed the geophysical validation of AVHRR satellite data in case of presence of oil.