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Multi-scale swath mapping of the Mediterranean Sea

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Various processes (tectonic, sedimentary, fluid vents, magmatic) active on the sea floor of the Mediterranean Sea have been particularly well imaged by swath bathymetry recorded either from sea surface swath systems, or by multibeam equipments operated a few tens of metres above the sea bed.

- Recently (early 2008) the CIESM Marine Geosciences Committee and Ifremer Mapping Office have jointly published the first synthesis map of the Mediterranean Sea (DTM at 500 m spacing), at 1/3000 000 scale; this map which results from the compilation of swath data recorded on large areas of the Mediterranean by various national Research Oceanographic and Hydrographic Institutions illustrates details of many margin segments, and particularly well the imprints of salt tectonic and sedimentary processes on the present day sea bed. The three accretion wedges, which result from the subduction of the African plate beneath Europe in the eastern Mediterranean basins, the Calabrian Arc, the Mediterranean Ridge and the Cyprus Arc respectively, characterized by intense deformation and important fluid venting processes, are now almost entirely mapped.

- Very precise near bottom geomorphological mapping have also been performed on selected specific targets such as mud volcanoes, pockmark fields, sedimentary scars, using swath systems operated a few tens meters (50 – 70 m) above the sea floor either by autonomous vehicle (AUV) or by remotely operated systems (ROV). The results

have allowed to produce, on a few square kilometres, maps at 1m spacing DTM. The acquisition of such high-resolution seafloor bathymetry and acoustic imagery maps fills the gaps in scale between multi-beam data recorded from the sea surface and *in situ* and video observations from submersibles and ROVs. The availability of high-resolution seafloor imagery is not only valuable to better characterize the geomorphological environment but contributes for geological and biological sampling strategies and therefore for better knowledge on various deep sea ecosystems.

The recurrent acquisition of high-resolution seafloor imagery, with bathymetry and backscatter grids $<$ 1metre, opens new perspectives for temporal monitoring of these systems in order to assess their functioning and potentially associated geo-hazards.