

Artificial Habitat Mapping in Adriatic Sea

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Abstract : The hydroacoustic technology is an efficient tool to study the sea environment: the most recent advancement in artificial habitat mapping involves acoustic systems to investigate fish abundance, distribution and behavior in specific areas. Along with a detailed high-coverage bathymetric mapping of the seabed, the high-frequency Multibeam Echosounder (MBES) offers the potential of detecting fine-scale distribution of fish aggregation, combining its ability to detect at the same time the seafloor and the water column. Surveying fish schools distribution around artificial structures, MBES allows to evaluate how their presence modifies the biological natural habitat overtime in terms of fish attraction and abundance. In the last years, artificial habitat mapping experiences have been carried out by CNR-ISMAR in the Adriatic sea: fish assemblages aggregating at offshore gas platforms and artificial reefs have been systematically monitored employing different kinds of methodologies. This work focuses on two case studies: a gas extraction platform founded at 80 meters of depth in the central Adriatic sea, 30 miles far from the coast of Ancona, and the concrete and steel artificial reef of Senigallia, deployed by CNR-ISMAR about 1.2 miles offshore at a depth of 11.2 m . Relating the MBES data (metrical dimensions of fish assemblages, shape, depth, density etc.) with the results coming from other methodologies, such as experimental fishing surveys and underwater video camera, it has been possible to investigate the biological assemblage attracted by artificial structures hypothesizing which species populate the investigated area and their spatial dislocation from these artificial structures. Processing MBES bathymetric and water column data, 3D virtual scenes of the artificial habitats have been created, receiving an intuitive-looking depiction of their state and allowing overtime to evaluate their change in terms of dimensional characteristics and depth fish schools' disposition. These MBES surveys play a leading part in the general multi-year programs carried out by CNR-ISMAR with the aim to assess potential biological changes linked to human activities on.

Keywords : artificial habitat mapping, fish assemblages, hydroacoustic technology, multibeam echosounder

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