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Environmental monitoring techniques and wave energy potential assessment: an integrated approach for planning marine energy conversion schemes in the northern Tyrrhenian sea, Italy

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This work proposes a multidisciplinary approach in which wave power potential maps are used as baseline for the application of environmental monitoring techniques identified through the use of a Database for Environmental Monitoring Techniques and Equipment (DEMTE), derived in the frame of the project "Marine Renewables Infrastructure Network for Emerging Energy Technologies" (Marinet – FP7). This approach aims to standardize the monitoring of the marine environment in the event of installation, operation and decommissioning of Marine Energy Conversion Systems. The database has been obtained through the collection of techniques and instrumentation available among the partners of the consortium, in relation with all environmental marine compounds potentially affected by any impacts.
Furthermore in order to plan marine energy conversion schemes, the wave potential was assessed at regional and local scales using the numerical modelling downscaling methodology. The regional scale lead to the elaboration of the Italian Wave Power Atlas, while the local scale lead to the definition of nearshore hot spots useful for the planning of devices installation along the Latium coast.
The present work focus in the application of environmental monitoring techniques identified in the DEMTE, in correspondence of the hotspot derived from the wave potential maps with particular reference to the biological interaction of the devices and the management of the marine space. The obtained results are the bases for the development of standardized procedures which aims to an effective application of marine environmental monitoring techniques during the installation, operation and decommissioning of Marine Energy Conversion Systems. The present work gives a consistent contribution to overcome non-technological barriers in the concession procedures, as far as the protection of the marine environment is of concern.