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An integrated approach for marine renewable energy siting

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The EU is facing the necessity to the decarbonisation of the energy system supporting Ocean Energy Technology development.
Infact Europe has a significant ocean energy resource which could contribute to create a new industry meeting blue growth strategy.
Beyond the problems of technological development and installation due to the harsh marine environment, another important problem is the choice of the installation sites due both to the conflict between different uses and to the environmental compatibility and the protection of the precious coastal ecosystems.
We tried to face these problems creating an instrument to support marine coastal management: the Sea-Use-Map.
This work presents the design of the Sea-Use Map of the Italian seas aimed to characterize different values and uses of the marine resource, useful to explore further marine uses, such as suitable sites for energy production, marine culture, etc. Clean electricity production from wave and coastal currents is one of the most challenging development in applied marine sciences. Italy, with his more than 7000 km of coasts, could be one of the leading country in the market of marine renewable energy. For this reason the creation of an integrated GIS database, in which all the information are conveyed in a georeferenced system, is a necessary tool to identify suitable sites. The Sea-Use Map (SUM) of Italy is a key database, in which coastal uses are integrated with environmental data (bathymetry, waves, currents, fauna, flora, etc.). A further integration between data and numerical model simulations allowed to define the most promising and environmentally
acceptable areas for such resource exploitation. One of the output is the energetic potential along the Italian coasts. This work presents a pilot application study in the coastal area between Capo Linaro and Tarquinia, Northern Tyrrhenian Sea, Italy.