



## **An ecological approach supporting the management of sea-uses and natural capital in marine coastal areas**

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The purpose of our work is to create a multi-layer map of marine areas and adjacent territories (SeaUseMap), which takes into account both the different sea uses and the value of marine ecosystems, calculated on the basis of services and benefits produced by the different biocenosis.

Marine coastal areas are characterized by the simultaneous presence of ecological conditions favorable to life and, at the same time, they are home to many human activities of particular economic relevance.

Ecological processes occurring in coastal areas are particularly important and when we consider their contribution to the value of the "natural capital" (Costanza et Al. 1997, 2008, 2014), we can observe that this is often higher than the contribution from terrestrial ecosystems.

Our work is done in northern Lazio (Civitavecchia), a highly populated area where many uses of the sea are superimposed: tourism, fisheries, industry, shipping and ports, historical and cultural heritage.

Our goal is to create a tool to support decision-making, where ecosystem values and uses of the sea can be simultaneously represented.

The ecosystem values are calculated based on an analysis of benthic biocoenoses: the basic ecological units that, in the Mediterranean Sea, have been identified, defined, analyzed and used since the 60s (Perez & Picard 1964) to date as a working tool (Boudouresque & Fresi 1976).

Land surface, instead, was analyzed from available maps, produced within the Corine Land Cover project.

Some application examples to support the decision-making are shown, with particular reference to the localization of suitable areas for wave energy production and the esteem of ecological damages generated in case of maritime accidents (e.g., Costa Concordia).

According to Costanza 2008, we have developed our own operational method, which is suitable for this specific case of benefit assessment from benthic communities. In this framework, we base our strategy on the ability of the benthic biocenosis to provide excellent information on ecological processes from which ecosystem benefits arise.