



All at Sea?

Synergies between past & present coastal processes & ecology

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Abstracts

Organisers: Dr D. B. Ryves, Professor N. J. Anderson & Dr P. Wood.

Co-organisers: Dr A. R. Bicket, J. P. Lewis, S. Little.

Correspondence: allatsealboro@gmail.com

***Posidonia oceanica* trough time: evolution, management and eco-services valuation**

Rovere, A., Montefalcone, M., Vassallo, P., Paoli, C., Vacchi, M., Morri, C. Bianchi, C.N., Firpo, M., Albertelli, G., & Fabiano, M.

DipTeRis, Università degli Studi di Genova, Corso Europa 26, 16132 Genoa, Italy

Alessio.Rovere@unige.it

The endemic *Posidonia oceanica* (L.) Delile is the most abundant seagrass in the Mediterranean Sea, where it forms extensive meadows from the surface down to 40 m depth and plays major ecological roles for coastal ecosystems and generates important services for coastal population. *P. oceanica* is the only seagrass able to build a “matte”, a monumental construction resulting from horizontal and vertical growth of rhizomes with entangled roots and entrapped sediment. Geomorphology of the coast is influenced by *P. oceanica* meadows that damp the swell and form an obstacle to the movement of sediments on the bottom. Meadows contribute to water oxygenation, keeping the ecosystem healthy. These functions affect the quality of beaches, which play an economic role due to their touristic exploitation. As a consequence, *P. oceanica* holds an ecological value not necessarily perceived by society and ascribed by economy. Regression of *P. oceanica* meadows, due to both natural and human effects, has been surely accelerating in recent decades. In the Ligurian Sea, for instance, nearly 30% of the original meadow surface area has been lost in the 1960s, during the period of rapid urban and industrial development occurred along the Ligurian coast. The health and occurrence of *P. oceanica* meadows along the coastline, and their change over time, can be seen as one of the “reading keys” of the evolution of soft coasts: the diachronic cartography represents an important tool for measuring temporal changes in term of percentage gain or loss of meadow extension. Superimposed to long term changes, *P. oceanica* is believed to have had its climatic optimum around 6000±2750 years BP, and some cores from the Ligurian Sea showed that rests of *P. oceanica* can be found in different stratigraphic positions, suggesting that long-term evolution of a meadow comprises periods of natural expansion and regression. As the evolution of *P. oceanica* is considered to play a significant role inside coastal systems, and the long term one can be seen as function of climatic change trough the Holocene, understanding and quantifying the ecosystem services that are presently related to *P. oceanica* is crucial. In this contribution we apply a multidisciplinary approach to evaluate long (centuries) and short (decades) term evolution of *P. oceanica* in the Ligurian Sea, linking them to its value in terms of ecosystem services and functions.

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