

Water observatories as supporting tools to climate change adaptation in coastal ecosystems

M. Rodrigues; A. Cravo; A.B. Fortunato; A. Oliveira; R. Martins; J. Jacob; J. Rogeiro; A. Rosa; D. Santos; P. Freire; A. Azevedo

Climate change, such as sea level rise, represents a major threat to the world's coastal systems, via potential increases in salinity, acceleration in the nutrients cycling and disruption of aquatic ecosystems.

Water observatories can support both the daily and the long-term management of coastal ecosystems by integrating historical and real-time observations, forecasts, scenarios analysis and indicators in comprehensive web-portals. These tools allow anticipating events of contamination, the continuous surveillance of coastal zones and the implementation and tuning of management plans, thus supporting the emergency response and climate change adaptation.

In this study we demonstrate the applicability of the water observatories by deploying two systems, regarding the understanding of the biogeochemical buffering capacity of the Tagus estuary and of the Ria Formosa relative to climate change.

The comprehensive web-portal that integrates the information of these water observatories includes:

- i) historical data from 1980 to present from physical, chemical and biological variables (e.g. salinity, water temperature, chlorophyll-a, dissolved oxygen and nutrients);
- ii) online observations of the water quality from an in-situ probe;
- iii) daily forecasts of water levels, currents, salinity, temperature and a set of biogeochemical variables deployed with the numerical model SCHISM;
- iv) the analysis of the biogeochemical buffering capacity of each system under present conditions and for projected scenarios of climate change (e.g. sea level rise);
- v) a set of indicators that allow the continuous assessment of the physical and trophic conditions.