LONG-TERM DYNAMICS OF HYPOXIA AND ANOXIA IN THE EMILIA ROMAGNA COASTAL ZONE (NORTHERN ADRIATIC SEA)

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The Northern Adriatic is a continental shelf area characterised by highly variable freshwater discharges and production events. Here, hypoxia and anoxia have occurred both in offshore areas and in coastal waters, at least since the beginning of 1900. Despite several biogeochemical studies are available, long-term analysis of their recurrence, triggering mechanisms and impact on marine environment may provide a tool for a better understanding of present evolution of this ecosystem. For this reason, a compilation of the information contained in the scientific literature on the occurrence on decadal scales of hypoxia and anoxia in the North Adriatic has been done, focusing in particular on the Emilia Romagna coastal zone.

Time series of Po River discharges and meteorological data (air temperature, precipitation, wind intensity and direction) were analysed, together with oceanographic conditions, as triggering factors for this phenomenon in the area of interest. The occurrence of plankton blooms was also reported and evaluated.

The characteristics of hypo-anoxic events in terms of extension, duration and diffusion were collected in order to distinguish local vs. regional events, short-lived vs. long-lasting events, and to evaluate space and temporal evolutionary trends. This analysis was carried out through the reconstruction of time series of bottom dissolved O2 distribution for the period 1982-2005 and by comparison with reported observations on the field. On this base, latitudinal diffusion of events was studied, as well as possible exchanges between coastal and offshore waters.

Finally, the analysis of this historical dataset suggests an increase in short-lived events, located in shallow waters, but often repeated during the year, which cause a continuous stress on the pelagic and benthic habitats. This temporal trends may be related to regional changes of the climatic conditions, which include an higher frequency of irregular seasonal cycles.