

---

# PIALASSA BAIONA LAGOON - ITALY

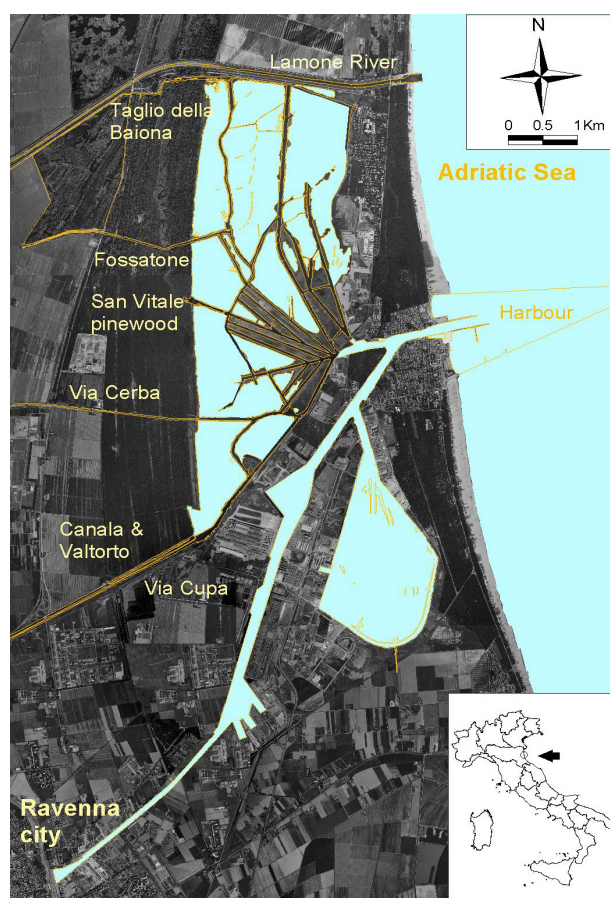
---

Ponti, M., Abbiati, M.

*Dipartimento di Biologia Evoluzionistica Sperimentale,*

*Centro Interdipartimentale di Ricerca per le Scienze Ambientali in Ravenna, Università di Bologna, Italy*

The Pialassa Baiona is a lagoon located along the northern Adriatic Italian coast, between Ravenna harbour and the mouth of Lamone River (44.4673° - 44.5293° N 012.2375° - 012.2705° E, European Datum 1950; Fig. 1).



**Figure 1:** *Pialassa Baiona lagoon and its neighborhoods (Source:AIMA).*

Artificial embankments divide the lagoon into several shallow water ponds connected by channels (Fig. 2). Adjustable dams control water exchange of some ponds. The inner channels converge in a main channel connected to the sea through the shipway Candiano Channel (Ravenna harbour). Altogether the area is 11.8 km<sup>2</sup>, including the embankments. The average depth varies from 0.5 m in the shallow areas to 3 m in the channels with a tidal range variable from 0.3 to 1 m, excluding extreme events. The tides cause large variations in the water levels and vast shallow area emerge

during low tides. On average, the total water volume is estimated in approximately  $8.9 \times 10^6 \text{ m}^3$ , equally shared between ponds and channels.

The climate of the region is Mediterranean with a continental influence. Precipitation is approximately 600 mm per year, with late spring and autumn peaks. The lagoon receives freshwater inputs from five main channels (Figure 1). “Taglio della Baiona” and “Fossatone” collect the water released from the wet woodland “Punte Alberete” originated from Lamone River. “Via Cerba”, “Canala – Valtorto” and “Via Cupa” drain a watershed of 264 km<sup>2</sup>, including urban (9%) and agricultural (87%) areas. Pumping stations controls the water flow in two channels. Furthermore, the lagoon receives freshwater inputs from treatment plants of urban and industrial wastewater and also saltwater inputs from two power plants that draw water as coolant from the Candiano Channel to the lagoon. Sewages treatment facilities and power plants are located in the last part of Via Cupa channel and along the south side of the lagoon.



**Figure 2:** *View of Pialassa Baiona lagoon (picture by Biserni)*

The lagoon is characterised by large areas of muddy bottoms with variable clay/silt proportion and organic matter contents. Sandy sediments are abundant close to the relict dunes. The dunes are covered with halophile vegetation of *Salicornia* sp. and *Arthrocnemum* sp.. Embankments are covered with halophile herbaceous vegetation such as *Agropyron pungens*, with submerged meadows of *Ruppia cirrhosa* and *Potamogeton pectinatus*.

There are reedbeds of *Phragmites australis*, marginal areas with *Juncus maritimus* and *J. acutus* wet meadows (Corbetta, 1990; Corticelli *et al.*, 1999). A pinewood stretches all along the western edge of the lagoon. The most abundant species in the phytoplankton is the diatom *Skeletonema costatum*. Diatoms prevail from autumn to spring while the abundance of dinoflagellates rises in summer. Occasionally blooms of diatoms or cyanobacterias occur. The lagoon is affected by anthropogenic eutrophication, which causes extensive growth of seaweeds, especially the chlorophyceans *Ulva* sp., *Enteromorpha* sp. and the rhodophyceans *Gracilaria* sp.. Macroalgal growth and phytoplankton blooms are responsible for the events of anoxia and dystrophy that occasionally occur in summer (Boni, 1990).

Prevalent human activities in the area include recreational and professional fishing, mollusc harvesting (mainly of the Manila clam, *Tapes philippinarum*; Fig. 3), hunting, hiking and canoeing.



**Figure 3:** Fishing activities in the lagoon.

**LaguNet** (<http://www.dsa.unipr.it/lagunet/>) is a scientific observational network studying the fluxes of nutrients and other contaminants from lagoon catchments to the near coastal environment. The objectives of LaguNet are to support and encourage co-operation of research groups studying lagoons, wetlands and saltmarsh systems situated along the Italian coast and to evaluate the application of the LOICZ (Land Ocean Interactions in Coastal Zones, a core project of IGBP) biogeochemical flux model and typology classification to such sites.

The methodology has been applied by LOICZ to approximately 170 coastal environments worldwide; it is based on a mass balance approach and provides important information on the flux of

nutrients and ecosystem functions; the approach used is applicable to a majority of coastal ecosystems with data that are normally available from conventional monitoring campaigns. In this way it is possible to compare and to group aquatic systems having different characteristics based on properties related to biogeochemical cycles and to the ecosystem functions that result from these processes.



**Figure 4:** LaguNet sites around the Italian peninsular.

On the basis of this experience and considering the paucity of LOICZ sites in the Mediterranean and Southern Europe it was decided to apply this methodology to a series of Italian coastal environments where sufficient data are available (Fig. 4).

### Contact Persons

Massimo Ponti, Marco Abbiati  
Scienze Ambientali - Ravenna  
Via Tombesi Dall'Ova 55  
48100 Ravenna  
Italy  
E-mail: [ponti@ambra.unibo.it](mailto:ponti@ambra.unibo.it); [abbiati@ambra.unibo.it](mailto:abbiati@ambra.unibo.it)

### References.

- Boni, L. 1990 Macro e microalghe nelle zone salmastre dell'Emilia-Romagna. Pages 107-121 in: Corbetta, F. (ed) *Aspetti naturalistici delle zone umide salmastre dell'Emilia-Romagna*. Regione Emilia-Romagna, Bologna, 274.
- Corbetta, F. 1990 Flora e vegetazione delle zone umide salmastre dell'Emilia-Romagna. Pages 71-105 in: Corbetta, F. (ed) *Aspetti naturalistici delle zone umide salmastre dell'Emilia-Romagna*. Regione Emilia-Romagna, Bologna, 274.
- Corticelli, S., Piccoli, F. and Merloni, N. 1999 Carta della Vegetazione del Parco Regionale del Delta del Po. Servizio Cartografico e Geologico, Regione Emilia-Romagna, Bologna.