

# CHEMICAL AND RADIOCHEMICAL CHARACTERIZATION OF TOTAL ATMOSPHERIC DEPOSITIONS IN VENICE LAGOON

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Atmospheric depositions play a relevant role in the environmental cycling of chemical substances. Their contribution may be especially crucial in heavily industrialised areas, where stack and diffused emissions may distinctively contaminate the atmosphere with well-known environmental consequences. Among the possible effects, <sup>210</sup>Pb emitted from coal-fired power plants may significantly affect the natural atmospheric <sup>210</sup>Pb flux, therefore disturbing its use in radiochronological reconstruction of the sedimentary history of the local environment.

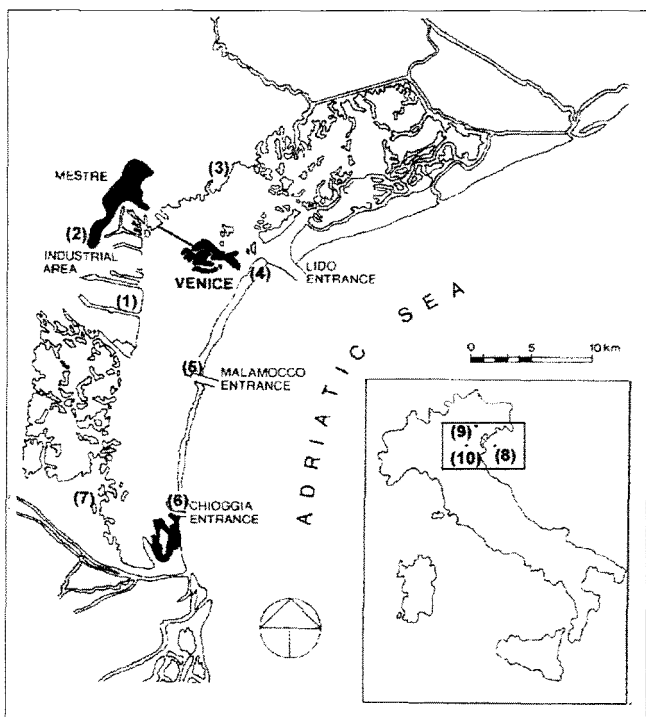
Since the use of the <sup>210</sup>Pb technique is of basic importance for the evaluation of the dynamic aspects of pollution, it follows that a detailed knowledge of all the atmospheric inputs, together with recent environmental modifications of the catchment area, are required for a correct model application.

In this work, chemical (main species and trace elements) and radiochemical data from total atmospheric depositions over the Venice Lagoon are presented. While the whole area is currently the subject of extensive and detailed investigations as regards the hydrological system and inflows, data concerning atmospheric inputs are still fairly limited, with the exception of the local air monitoring network which includes only classical gaseous pollutants.

Samples were collected at 7 stations within the lagoon area including the industrialised area and the major urban settlements of Venice, Mestre and Chioggia. In addition, samples from 3 other sites outside the lagoon area, but lying within approximately 20 km from the main town, were obtained for analysis. In Fig. 1, the study area and sampling stations are shown.

Mean annual fluxes, determined for the period April 1989 - March 1990, for some chemical and radiochemical species are reported in Table 1. The deposition of chemical species from the atmosphere appears to be mainly dominated by precipitation scavenging. Total N, P and S fluxes are representative of a typical heavily urbanized area; in particular, data from station (1) highlight the local effects of industrial activity. However the values observed for <sup>210</sup>Pb are in a range already observed at this latitude; this allows excluding, at least in first approximation, significant contributions from the large coal-fired power plant located near station (1).

Fig.1. Lagoon of Venice and sampling stations (1-10)



Tab.1 Total deposition observed in the Lagoon stations

	Station (1)	Stations (2-7)
Rain (mm)	621	498-637
Dry dep.(g m <sup>-2</sup> yV)	82	11.3-18.3
Total N (g m <sup>-2</sup> yV)	4.4	1.3-2.1
Total P (g m <sup>-2</sup> y <sup>-1</sup> )	1.9	0.05-0.33
Total S as SO <sub>2</sub> (g m <sup>-2</sup> y <sup>-1</sup> )	19	2.9-4.4

\* n.s.= unsupported <sup>210</sup>Pb