Investigation on Dissolved and Suspended Heavy Metals of the Dese River (Venice Lagoon)

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Rivers and channels of the Venice Lagoon drainage basin collect heavy metals from industrial, agricultural and municipal sources. They successively discharge in the lagoon in correspondence of the estuarine shallow-water areas, where both water chemical-physical behaviour and circulation are often quite difficult to evaluate because of the presence of numerous tidal channels and the complexity of the morphology.

Starting from a general investigation on the yearly pollutant load variations of the eight main tributaries (BERNARDI *et al.*, 1986), a representative test-area for the study of the behaviour of discharged heavy metals was chosen in correspondence of the estuarine system of the Cona Marsh (BERNARDI *et al.*, 1988). This marsh (Fig.1) is directly interested by the Dese River and for its hydrodynamical and water chemical-physical characteristics - is one of the more complex sub-areas in the Venice Lagoon.

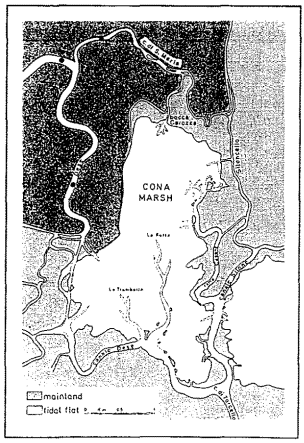

Fig .1 Map of the Cona Marsh.

During the last five years, field measurements were done to evaluate and study the extent and behaviour of water pollution in the marsh. Numerous samples were collected and analyzed for their heavy metals content by P.I.X.E. This multielemental technique (CECCHI *et al.*, 1987) permits to analyse both particulate and dissolved metals through the preparation of suitable thin "targets" from the samples and their exposition to 1.8 MeV proton beam.

Because of the key-role of suspended particles (with diameter up to about 8 microns) in both transport and accumulation in the sediment of this area (GHERMANDI *et al.*, 1991; ZONTA *et al.*, (a) will be published), the filtration through the usual 0.4 microns pore size filter is not adequately descriptive for this kind of study and often produces filtered samples with a very low concentration of some heavy metals. Therefore, aliquotes of sample are submitted to two filtration steps (poly-carbonate 8 and 0.4 microns membranes) and are analyzed both in the sampling state and after each separation. To improve the maintainance of the filter nominal pore size and to reduce filtration time avoiding the clogging, a filtration system was realized, tested (ZONTA *et al.*, (b) will be published) and patented.

On April 1991 an intense sampling scheme was followed, collecting at different depths water samples in three stations (indicated in Fig.1), following the tidal excursion. Samples were filtered twice as aformentioned and the water behaviour was observed during the sampling. Results obtained are presented, showing the occurrence of scavenging, flocculation and resuspension processes. Some insight on the role of water circulation in the marsh are proposed and underlined the need for future research activities.

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