

CS-137 DISTRIBUTION IN LAGOON ENVIRONMENT OF NORTHERN ADRIATIC AFTER CHERNOBYL ACCIDENT

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In 1991 the authors undertook a long-term program for monitoring environmental radioactivity in the Northern Adriatic, in order to evaluate the post-Chernobyl diffusion of artificial radionuclides in areas close to coasts and lagoons between Grado and Punta Tagliamento. This program involves periodic sampling of surface sediments and algae taken during different seasons. The main aims of this study were: 1) measurement of the post-Chernobyl radiocaesium distribution in the lagoon and coastal environment of the region Friuli-Venezia Giulia; 2) evaluation of the grain-size distribution effect on radiocaesium absorption in sediments; 3) the correlation of radiocaesium distribution between sediments and algae.

The first results of this work, which derive from the analysis of the Cs-137 concentration in sediment samples collected in 1991 (GIOVANI *et al.*, 1992; GIOVANI *et al.*, 1994a), allowed us to discern four different areas in the selected environment: 1) river mouth with the highest detected values; 2) lagoons; 3) marine area close to lagoon inlets with the lowest concentrations; 4) external marine area also with high values.

Figure 1 shows the distribution of Cs-137 concentrations in surface sediments in 1992. In this case it is also possible to delineate the same areas that have been previously identified. Samples collected along the Cormor river and in front of one portion of Marano lagoon during 1992 give further information about the radiocaesium distribution in this type of environment. The river samples are the most contaminated of all, while those samples collected far from the coast show low Cs-137 activities.

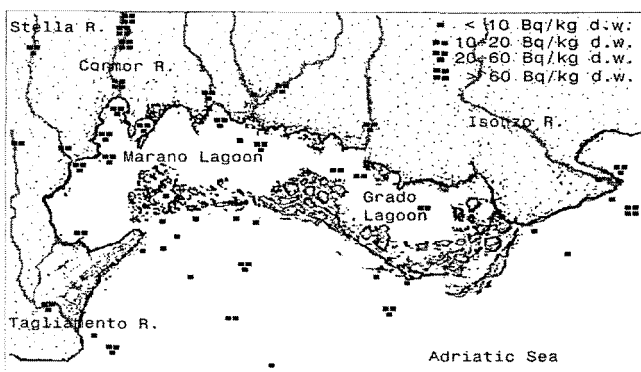


Figure 1. Cs-137 distribution in sediments (Bq/kg d.w.) in November 1992.

Cs-137 concentrations in surface sediments collected in 1991, 1992 and 1993 versus the silt-clay fraction percentage (diameter > 63 μ m) are shown in Fig.2. It is noted that where the silt-clay fraction percentage is high, the concentration is also high. In order to investigate the correlation between algae and the sediment Cs-137 content, the genus *Ulva* was chosen because of its abundance in the sampling area. Cs-137 concentration in *Ulva* samples and Cs-137 in sediments in 1991 showed a significantly positive correlation ($r = 0.880$; $p < 0.1\%$) (GIOVANI *et al.*, 1994b).

The significance of the correlation between Cs-137 content in algae and in sediments confirms the role of this kind of organism as a biological indicator of radiocontamination as well as for conventional pollutants.

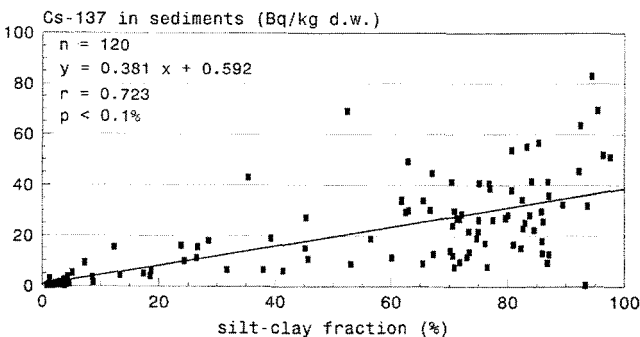


Figure 2. Cs-137 concentration vs grain-size in sediments of 1991, 1992 and 1993 samplings. (% of the fraction > 63 μ m).

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