USE OF SEDIMENTS AND SOILS FOR ASSESSMENT OF ENVIRONMENTAL POLLUTION

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The study of the distribution of metals in sediments and soils is very important from the point of view of environmental pollution. Sediments concentrate metals in aquatic systems, and represents a relevant contamination monitor. Sepetiba bay - The contamination of Zn in Sepetiba Bay (Rio de Janeiro) was estimated from sixty bottom sediment samples. A geostatistical tool was used to identify the Zn concentration structure spatial dependence. By using the Gaussian Model with Matérn correlation function, accurate predictions of Zn concentrations were obtained. This study indicates that Zn is moving toward the ocean. The Zn values obtained showed that almost the whole bay presents concentrations higher than the background values for the studied area. Guanabara Bay - located at Rio de Janeiro, is an example of an impacted coastal environment due to the high incoming of urban effluents. Foraminifers are microorganisms within the Kingdom Protoctista used as bioindicators in coastal zones. Four sediment cores from Guanabara bay were sampled in areas with different levels of pollution. The samples were analysed by instrumental neutron activation analysis (INAA) to determine trace elements. *Ammonia* and *Elphidium* were dominants in sediment cores with high concentration of Zn and Fe. On the other hand, *Ammonia* showed less concentrations when Co levels were higher. In all cores analysed azoic ranges were observed, which may be associated to metal contamination.

Ilha Anchieta - The geochemical behavior of the elements As, Cr, Fe and Zn in sediments from three different rivers from Parque Estadual da Ilha Anchieta, a well preserved ecosystem in the northern coast of São Paulo, was studied. Total concentrations of the elements were determined by INAA. These levels were compared with values found in sediments from other ecosystems in the same region and with reference values and showed background levels.

Ilha Grande - Sediment cores from a remote area, the Biological Reserve of Praia do Sul, Ilha Grande, Rio de Janeiro, Brazil, were analysed. The results indicate that the peat bog core present a slight surface enrichment that can be attributed to atmospheric inputs. In the mangrove core, no significant increase in concentration could be detected in the surface sediments (except for Zn) confirming the suitability of the peat bog core as a tracer for atmospheric inputs Fernando de Noronha - Viração Lagoon is a small lake located at Fernando de Noronha Archipelago, 20 meters above sea level. Two sediment cores were collected in this lagoon. The sedimentation rate and age of the sediments were determined using the ^{210}Pb dating method. Trace and rare earths elements were determined by INAA. Their concentrations were compared to those reported for NASC. Enrichment factors were evaluated, using the composition of the surrounding rock as a normalizer. Billings Reservoir, Rio Grande Reservoir, SP-Four sediment cores were collected and INAA was used for multielemental analysis, CV-AAS for total mercury determination and ^{210}Pb were determined by radiochemical method.

In 2004, new samples were collected to monitor the reservoir´s bottom sediment contamination levels related to heavy metals and other trace elements. These results will be compared with those obtained before and values from Environmental Canada. Meio Lake - Pantanal-Using radiometric measurements and INAA analysis, the radioactive ^{210}Pb and trace elements concentrations were determined in three sediment cores collected in 2001 at Meio Lake, Pantanal da Nhecolândia, MS. The objectives were to verify possible changes in a natural ecosystem that has been affected. The majority of the elements and rare earths analyzed showed concentrations lower when compared with shale and earth crust values.

Antarctic region - The activities of the Brazilian Antarctic Program are based at "Comandante Ferraz" Antarctic Station (EACF). The purpose of this project is to assess the content of heavy metals and other elements of interest in bottom sediments. Major, trace and rare earth elements were determined in 15 samples by using INAA and total mercury by CV-AAS technique. The results obtained for the elemental concentration in the sediment samples are quite uniform and correspond to the natural levels of the region.

Soils: Surface abrasion of automobile catalytic converters release Pt, Pd and Rh into the environment adsorbed on small particles. In Brazil, the automobile catalytic converters have been used since 1996, and contain mainly Pd and Rh. The distribution of Pt, Pd and Rh in soils adjacent to a major road in São Paulo, Brazil (SP 348), are presented. Sampling was made at 4 sites with varying traffic volumes and driving styles (stop/start vs. constant speed). HR-ICP-MS with NiS fire assay collection and Te coprecipitation was used as analytical procedure. The results indicate that the PGE concentrations in roadside soil are directly influenced by traffic conditions and distance, which characterizes their catalytic converter origin. Pt, Pd and Rh contents range between 0.3-17 ng g-1, 1.1-58 ng g-1 and 0.07-8.2 ng g^{-1} respectively. This is the first study to assess traffic derived Pt, Pd and Rh deposition in Brazil.