of trace elements found in livers of males and females were also compared. The method of Neutron Activation Analysis (NAA) was used in these analyses for the determination of Br, Co, Cs, Fe, K, Mg, Mn, Na, Rb, Se and Zn, and Atomic Absorption Spectrometry Method (AAS) for the determination of Cd and Hg in liver samples. In previous studies, elevated concentrations of trace elements such as Cu, Fe, Hg, Mn and Zn were found in livers. In addition to the previous published data, the results for six trace elements (Co, Cs, Fe, Rb, Se and Zn) of five liver samples collected during 2011 were included. The concentrations of Br, Co, Fe, K, Mg, Na and Se found in livers in 2011 remained at similar levels to those obtained in 2006. However, increase in levels of Cd, Cu, Hg, Mn and Zn in 2011 was obtained, probably related to an increase in environmental depositions from anthropogenic sources. Female egrets presented lower levels of Co, Cs, Se and Zn than males. Selenium requires great attention due the differences indicating possible transference to the eggs and Se can be toxic for embryos. Results obtained in this study suggests a continuous monitoring using great egret livers in order to improve the knowledge of temporal trends of contamination in aquatic environments of the SPMR.

TRACE ELEMENTS DETERMINED IN SEDIMENT CORES FROM NHECOLÃNDIA PANTANAL BY INAA

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Pantanal wetland is the world's largest wetland, with an estimated area of about 200 000km^2. This region is an alluvial plain and the Paraguay River and his tributaries run through the wetland due to the low declivity of the plain in the north-south and east-west direction; the water takes almost four months to cross the wetland, forming different ecosystems, such as floodplains, lakes of fresh or saline water, rivers, and others. In the last decades, this area has been affected by human activities, without the suitable planning. The sediment of an aqueous system represents a great source of study, as it is a deposit of solid material, formed by the wind, ice, or water on the surface of the earth and the deposition of organic material from animals that live there. From the sediment chemical analysis in combination with geochemical tools is possible to estimate a probable source of the elements chemistry, whether natural or anthropogenic. Trace elements from different sources tend to accumulate in the sediment fine fraction (silt + clay), and are commonly mobile, what could generate a transference of some metals to the environment. Therefore, the present work analyzed the fine (silt + clay) and the coarse (medium sand + fine sand) fraction of the sediment cores collected in four Salinas from Nhecolãndia Pantanal performing the elementary chemical characterization of these sediment fractions and verify a possible historical impact by anthropogenic sources and also to verify if some element could accumulate in the sand fraction since the sediments from these ponds have a high percentage of the coarse (sand) fraction; instrumental neutron activation analysis technique (INAA) was used in the determination. Four sediment cores were

collected in ponds located at Embrapa farm, $19°33'23.31"S$ and $56°4'57.56"W$ in Nhecol andia Pantanal, Mato Grosso do Sul, using a PVC manual sediment sampler. The cores were slice every $2cm$ and dried at $50°C$; after drying, the samples were ground and homogenized. The elements As, Ba, Ca, Ce, Co, Cr, Cs, Eu, Fe (%), Hf, K (%), La, Lu, Na, Nd, Rb, Sb, Sc, Se, Sm, Ta, Tb, Th, U, Yb, and Zn were determined ($mg\ kg^{-1}$) by Instrumental Neutron Activation Analysis (INAA) and the analysis were performed in the coarse and in the fine fraction of the sediment. The samples and reference material were irradiated for 8h at the IPEN Research Reactor IEA-R1. The element As, Ba and Fe concentrations showed higher values than those of the Upper Continental Crust, UCC, in the fine fraction of the sediment for the studied cores. For the coarse fraction only the elements As, Ba and Hf showed concentrations higher than the UCC values. The majority of the obtained results in the INAA determination for the coarse and fine fraction suggested that there is no expressive effect of the human activities in the region and this particular area until the moment.

P90 BIOACCUMULATION OF POTENTIALLY TOXIC ELEMENTS IN FLOATING AQUATIC MACROPHYTES OF GUARAPIRANGA RESERVOIR, SÃO PAULO

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Macrophytes species play a relevant role in aquatic environments once they incorporate elements that can be a suitable tool for accumulation studies, mainly when it comes to an important and strategic water supply. The main goal of this study was to establish concentration levels of As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Se and Zn in four species of floating aquatic macrophytes samples at three sampling sites along the Guarapiranga Reservoir. For this purpose, five analytical techniques were tested such as Inductively Coupled Plasma Optical Emission Spectrometry (ICP OES), Inductively Coupled Plasma Mass Spectrometry (ICP MS), Graphite Furnace Atomic Absorption Spectrometry (GF AAS), Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry and the multielemental characterization of this matrix was undertaken using Neutron Activation Analysis technique (NAA). The results obtained were compared to reference values for aquatic plants and most of the elements exceeded these values, especially at sampling site 01, which is located near the Embu-Guaãu River flow, the main tributary of the reservoir. In relation to comparison among sampling sites and macrophytes species, One-way Anova in Statistical Package for Social Sciences (SPSS) was performed. Output showed significant differences among sampling sites, but not for macrophytes species. Factor Analysis (FA) with Principal Components (PC) extraction method was performed on data using SPSS software. Output suggested possible common source from the As, Co, Cr, Hg, Ni, Pb and Se elements, which composed PC1. PC2 included Cd, Cu