

# **Nanoparticles as vectors of other contaminants in estuarine suspended sediments: Natural and real conditions**

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## **Abstract**

Studying the behaviour and danger of nanoparticles (NPs, minerals and amorphous phases) in the estuarine ecosystem is presently incomplete by the lack of measureable description of NPs in the ecological conditions, such as suspended-sediments (SS). In the last years, several works have revealed the toxic consequences of ultra-fine and nanoparticulate compounds on diverse systems, raising apprehensions over the nanocontaminants behaviour and destiny in the numerous ecological partitions. The general objective of the manuscript is to explain the geochemical conditions of the LES (Laguna estuarine system, southern Brazil) suspended sediments covering an area around the main South American coal plant, enhancing the creation of future public policies for environmental recovery projects. Subsequently the discharge of nanoparticles and toxic element (TE) in the ecosystem, NPs react with several constituents of the nature and suffers active alteration progressions. Contamination coming from engineering actions, wastewater, are something identifiable, however when these contaminations are accompanied by other contamination sources (e.g. mining and farming) the work gets defaulted. By combining material about the concentration of TE contaminants and NPs occurrences, this work offers novel visions into contaminant contact and the possible effects of such exposure on estuarine systems in Brazil. The results presented here will be useful for different areas of estuaries around the world.

## **Keywords**

Agricultural soil, Element contamination, Coal power plant, Hotspot identification, Spatial interpolation, Principal Component Analysis

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