## *SUMMARY*

Sediments are formed at the bottom of water bodies by the deposition of particles from the overlying water. The imbalance of the natural supply of sediment, repeatedly induced by human activities, negative impacts on receiving water bodies, related to both the amount of sediments and with the quality of them. With regard to quality, the tendency of some pollutants to bind to the solid phase, such as heavy metals, promotes their removal from water by sedimentation so that the deposition plays an important role in the maintenance of water quality. However, this effect should not be considered as positive since it involves the accumulation of metals in the sediment and given that are not biodegradable they will remain in the sediment for extended periods of time and may exert adverse on the biological community.

Once in sediment, free metal concentration in the interstitial water will be controlled by various processes (adsorption/desorption, precipitation/dissolution, absorption/mineralization, complexation) and depend on the availability of binding phases and metal affinity for these. In anoxic conditions, the presence of sulfur allows the formation of highly insoluble metal sulphides. This scenario was used by various authors to develop an indicator of the sediment potential toxicity depending on the availability of sulphide, measured as acid volatile sulphide (AVS) to maintain divalent metal, measured as simultaneously extracted metals (SEM), in form of metal sulphides.

In this thesis, new aspects not covered so far, on the sediments of Lake Albufera, a body of water of incalculable ecological value currently presenting hypertrophic state, being far from good ecological potential required by Directive Water Framework. The core part of the thesis is the evaluation of the availability of AVS to keep immobilized metals as metal sulfides. Other important components of sediments have also been determined as the total content of the metals studied (Cd, Cu, Ni, Pb and Zn), the content of organic matter, the fraction of silt, the biochemical oxygen demand or potential ability to release nutrients and metals into the water. The thesis has been structured in two phases, a preliminary phase to study the surface sediments of the lake and its surroundings, and a second phase to study the depth profile of the sediment. The study of sediment profile has been supplemented with the development of a mathematical model that includes the key biochemical processes involving sulphides and metals in sediments.

The results reinforce what is known so far about the quality of the sediments as the high content of organic matter, a high ratio of silt with a great binding capacity metal or heavy metal concentrations ranging from background levels to high concentrations. And extend key aspects such as the availability of AVS to keep the metal precipitated, but with a tendency to decrease, a significant biochemical oxygen demand and nutrient release potential and significantly lower Zn release. The study of vertical profile showed a surface layer of between 20 and 30 cm thick, more contaminated at lake peripheral points. Measured levels of metals may be classified as non-toxic according to AVS-SEM but with a high probability of toxicity, mainly by Ni and Zn, based on the classic sediment quality guidelines.