

## **A geological study of bottom sediments from Passo Real and Capingüi reservoirs, Rio Grande do Sul, Brazil.**

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In Southern Brazil excessive use of fertilizers in agriculture leads to large inputs of nitrogen and phosphorus to dam reservoirs. These nutrients, counted as key-elements in eutrophication processes, deeply decrease the quality of water. The intense weathering, associated with over-erosion related to land uses factors, contributes to topsoil loss and related desertification. The finer particles, where nutritional and metal elements are preferentially adsorbed, accumulate in the bottom of reservoirs. If economically feasible, the removal of superficial nutrient-rich sediments and its recovering for agriculture, may solve problems such as (1) the useful lifespan of dam reservoirs, (2) the water quality and (3) the scarcity of soils in some eroded regions. Bottom sediments of the Passo Real and Capingüi reservoirs were subjected to mineralogical, chemical and physical studies to test their fertility. The geology of drainage basins, mainly composed of tholeiitic basalts associated with acid/ intermediate volcanic rocks explains (1) the major contribution of fine-grained material (2) clay fraction dominated by kaolinite and oxides/ hydroxides of Fe/Al, (3) medium values of organic matter and nitrogen, (4) high levels of total and soluble potassium. Due to the crystal structure of its components, the metal micronutrients and phosphorus are strongly retained, giving low contents of its soluble forms and medium values for cationic exchange capacity. Although these values are not so high as values found in other systems in Portugal, they are far higher than soils collected in the drainage area, which confirms the suitability of these reservoir sediments as additives for poor quality soils.