



Mineralogical Composition of Suspended and Bottom sediments in the Adjacent Shelf of the Nazaré Canyon-Portugal

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A general hydrographic and nephelometric survey, under spring (May 2004) and winter (October 2003 and November 2004) conditions were conducted, in the framework of EUSTRATAFORM project. In addition bottom superficial sediments were undertaken and two moorings (1600, 3200m) with sediment traps were maintained in the canyon system. The compositional study of fine fraction (<63 µm) by DRX was performed in suspended (nepheloid layers) and bottom sediments (1cm) in order to identify both sources and preferential pathways. The fine fraction (<63 µm) mineralogical composition determined in non-oriented powder bottom samples, show a complex association of minerals. Phyllosilicates (mica/illite, chlorite and kaolinite) quartz, K-feldspar, plagioclase, opal C/CT, anidrite, calcite, and dolomite; amphibole, aragonite, siderite and pyrite are the most common accessory minerals. The dominant mineral is calcite with an average content of 27% (min: 3%, max: 74%), followed by mica/illite (average:15%, min:3%, max:36%), by quartz, (average 14%, min:6, max:35), calco-sodic (average 13%, min:2%, max:33%) and potassium feldspars (average 13%, min:3%, max:26%). Other carbonates, are mainly dolomite (average 5%, min:1%, max:28%) and aragonite that are also present in smaller proportions. The mineralogical composition of turbid layers reveals a greater importance of phyllosilicates (principally mica/illite and kaolinite) in suspension (average near bottom is 87%) with the correspondent decrease of carbonates, quartz, and feldspars. Some mineralogical ratios were constructed in order to a better understanding of the sedimentary processes acting in these systems namely: preferential areas of deposition/erosion (resuspension) and identification of major sedimentary sources to the Nazaré canyon system.