



The Nazare Canyon (W Portugal): Physical processes and sedimentary impacts

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With a length of 230km and extending from depths of 5000m to the coast, the Nazare Canyon is one of the largest submarine canyons of the world. The canyon cuts the entire western Portuguese shelf at 39.5N, showing bottom depths that range from 2000m at the canyon mouth to 50m at the canyon head, just 300m from the shore. The canyon width varies from 2 to 8km, which is about one order of magnitude lower than the internal Rossby radius. A program of observations focusing the Nazare Canyon was recently conducted in the framework of the european project EUROpean STRATA FORMation (EUROSTRATAFORM). The program aimed to identify the dominants physical forcings acting on this canyon, to characterize the canyon dynamics and to evaluate its impacts on the shelf circulation and sedimentary dynamics. As part of this program, two currentmeter moorings were deployed at two locations along the canyon axis, one just offshore the canyon mouth (bottom depth 3300m) and the second one well inside the canyon (bottom depth 1600m). The moorings were maintained almost continuously from November 2002 to September 2004 and provide measurements of currents, temperature, salinity and turbidity at several depths, covering the total water column. Two multidisciplinary surveys were conducted on May and November 2004, both under prevailing upwelling conditions. CTD/nephelometer profiles, covering the area of influence of the canyon, were collected during each survey and complemented with samples for evaluation of suspended particulate matter and nutrients. The data set collected during this program of observations revealed the highly energetic processes that characterises the Nazare Canyon. These include strong and bottom intensified tidal currents, rapid responses to the wind forcing over the shelf, important deep forcing associated with the Mediterranean Water flow and large sediment exportation during storm periods.