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CONTINENTAL SHELF AND SLOPE GEOMORPHOLOGY: MARINE SLUMPING INDUCED BY HYPERPYCNAL FLOWS (SARDINIAN SOUTHERN CONTINENTAL MARGIN)

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Study area is located on southern Sardinian continental margin whose structural setting is the result of the superimposition of two successive deformational regimes. The oldest refers to a compressive geodynamic occurred during the Oligocene - Miocene, contemporary to the Sardinia – Corsica microplate rotation. While, the most recent is associated with the phase of rifting Tyrrhenian, relative to a distensive tectonics. Morphostructural characters who control the southern Campidano affect the structure of the continental shelf in front.

In fact, the southern part of the Sardinian rift, with the superimposed Campidano graben structure continues at sea within the Cagliari gulf, both at the continental shelf level than in the deeper part. The continental shelf reaches a maximum width of about 2 Km and is characterized by sub planar morphology with a slightly steep ground (about 3-4 %). In this area the morphology show important tectonic features that follow the main regional tectonic . In particular the western shelf edge is oriented parallel to an important tectonic feature N130°, resulting in a steep (>40°) fault wall exposure. Along the southern edge, has been studied an area characterized by the short distance between the shelf edge and the coastline (d< 1000m). Occurring a important phenomena of mud-flow and debris-flow onshore, the turbidity can get to the shelf edge and trigger gravitative movements to overload. By putting so the coastal environment life at risk of abnormal waves. Here, there is the Rio Geremeas, characterized by a steep river equilibrium profile (L = 15 km, H 900 m) that, in the event of extreme rainfall could generate to mud flows / debris flow resulting hyperpycnal flows at sea. Similar event happened in October 2008 in Rio San Girolamo on the western edge of the Campidano Graben and to Giampilieri/Scaletta Zanclea (Sicily) October 2009.

The geomorphology of the slope is characterized by submarine canyon and several tributary channels, inside of them are landslides. Inside Foxi canyon's headscarp a retrogressive evolution have been detected bedforms characterized by a wave length of dozen of meters and a height of several meters, with the ridge lines arranged approximately perpendicular to maximum slope, this bedforms are called "crescent-shaped bedforms". These forms are generated by the erosion and deposition repetition due to the load of gravitative sedimentary flows.

