



Onshore-offshore morpho-structural pattern of coastal rocky shore in SW Brittany (France): polyphased generation of rocky, shore and exhumed platforms.

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A large granitic submarine and shore platform has been mapped in Western Brittany on 580 km² surfaces with the aid of several high-resolution (<1 m) aerial and marine surveys: topographic and bathymetric LiDAR using Litto3D project (SHOM, IGN, IFREMER) mixed with marine interferometric echosounding sonar (R/V Haliotis) and low depth multibeam echosondeur with high resolution seismic reflection profiles (R/V Thalia). The structural and geomorphological study of this rocky platform allows understanding its formation on time scale between Paleocene to Quaternary.

The marine rocky platform is composed of: (1) a tidal part (shore platform) with a very slight seaward mean slope and a maximal width of about 800 m, (2) a > 5 km-wide and weakly dipping subtidal part, labelled the rocky platform, (3) a rocky external part with varying mean slopes, rocky reefs and sedimentary deposits, corresponding to the continental shelf. The coastal continental domain is characterized by a low elevated (<10 m-high) and severely eroded area, ranging in width between 200 m to about 4 km, and referred to as marine terrace. Its continentward transition with granitic outcrops coincides with a 10 m-high scarp, assumed to represent a paleo-shoreline, hence allowing regarding the marine terrace as a presently exhumed paleo-shore platform.

In order to estimate the timing of the denudation process recorded by the rocky platform during Quaternary, ¹⁰Be cosmogenic nucleides analyses were performed on submarine and offshore granitic samples. On the basis of ¹⁰Be contents, the conceptual evolutionary model applied to the rocky platform implies a polyphased history controlled by continental granitic weathering and high-stand sea level marine erosion. The present-day coastal morphology may be explained by the action of two highstand sea levels since mid-Pleistocene at least, favoring successive eustatic purges of previously weathered granitic rocks. Exposure ages deduced from ¹⁰Be content may be considered as minimum age in the aerial part of the platform (marine terrace), with a rocky platform formation near 166 ± 18 kyrs. Whereas the submarine part of the platform may be considered as inherited, recording several exhumations, with a maximum exposure age of 30.5 ± 3.5 kyrs, acquired during the beginning Last Glacial Maximum on a previously cleaned surface.