



Analysis and interpretation of marine/continental terraces in the central coast of Asturias (NW Spain)

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This study presents the geographical distribution and topographical features analysis of several marine/continental terraces located in a sector between Nalón estuary and Cape Peñas region (central coast of Asturias, N Spain). Significant flat raised surfaces appear as outstanding landscape features of the Cantabrian coast. They exhibit north facing low gradient slopes ($< 5^\circ$) until the cliff shoreline and the borders are defined by the pre-littoral mountains to the south. These surfaces have a width of no more than 5 km and occasionally may be thinly mantled by many alluvial clastic deposits, very scarce aeolian sands and gravel and/or sand beach deposits.

Several studies have shown the importance of these terraces, which are recognized by the preservation of a variable number of levels of flat raised and staggered irregularly surfaces. These surfaces have been used to quantify rates of rock uplift processes.

GIS and quantitative analysis of the relief are applied to the recognition and delineation of terraces. Altimetry information comes from the Digital Elevation Model (DEM) Digital (cell size 5 m). The use of slope Digital Slopes Model (DSM) combined with digital lithology layers and hypsometric method allowed us to identify two main new surfaces at altitudes ranging from 75 to 135 m and 85 to 180 m respectively. Levels of surfaces recognized in previous studies may be correlated with this elevations. They are separated by a huge geologic structure (Ventaniella Fault). Thus, two NW-SE direction landward edge of terrace (shoreline angle) was identified. This feature enables correlate these surface or the old knickpoint (foot of the slope) if the terrace has a continental origin.

Initial morphology of these terraces has been modified by landscape erosion much more those developed on limestones. Therefore, just a few areas are preserved where flat surfaces are developed in Paleozoic materials (NO) better in siliciclastic rocks. The remaining areas are modelled in the lowest resistance lithology like Permo-triassic rocks. Therefore, using classic techniques as fieldwork and phointerpretation is not discriminatory.