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Distribution of morphological cells in the southern littoral of Sicily (Italy)

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A geomorphologic approach, combined with GIS spatial analysis, was used to investigate a 90 Km long coastal sector in Southern Sicily, Italy. Applied methodology allowed the determination of coastal erosion/accretion areas, general sediment circulation patterns and littoral cell distribution. The investigated littoral is recording important coastal erosion problems, mainly linked to the construction of ports and harbours. Such structures, as well as natural headlands, divide the littoral in morphological cells.
Most important artificial limits are observed in correspondence with the ports and harbours of Scoglitti, Punta Secca, Donnalucata and Pozzallo and a haulage zone at Marina di Ragusa.
Scoglitti, Punta Secca, Marina di Ragusa and Donnalucata structures work as „transit“ limits which generate accretion on the west side parts and erosion on the east side parts. Pozzallo port works as a „convergent” limit because it records accretion at both sides.
Most important natural structures are observed at Punta Zafaglione, P. Braccetto and Cava d'Aliga and they work as convergent, divergent and transit limits. Free limits also exist but their location changes according to wave approaching characteristics.
The knowledge of littoral cell distribution acquires a great importance in the investigated littoral for the management of coastal erosion processes, which may be mitigated by the installation of by-passing systems in ports and harbours.