

Environmental analysis of the sediments in the beaches of the Gulf of Palermo (Italy)

Vincenzo Liguori and Giorgio Manno

Dipartimento di ingegneria Civile, Ambientale, Aerospaziale, dei Materiali (DICAM), Università degli Studi di Palermo, 90128 Palermo, Italy (vincenzo.liguori@unipa.it; giorgio.manno@unipa.it)

The gulf of Palermo is long about 30 km and the coast is closed between two headlands, Monte Gallo Cape (western side) and Zafferano Cape (east side). The continental shelf is linked with the abyssal plan by an high slope and the depth is included between 50 m and 1500 m.

The shape of the Palermo gulf is the answer of both the natural forces and human activity. Nevertheless the coastal morphologies reproduce the geological setting of this area. The coast is divided in two morphotypes, low and rocky coast and beaches. Respectively composed by compact limestone and calcareous incoherent sediment with common sandy granulometry. The beaches, compressively long 11,46 km, are different in lengths, amplitude and lithological types (30% sandy and 70 % sandy-pebbly).

In order to study the coastal evolution it is important to define all the coastal dynamics. The coastal evolution is actually the result of complex and intertwined action of both natural and/or anthropic processes. Nowday in the gulf of Palermo these processes exist and in some case they already triggered erosive phenomena. The westernmost beaches is the famous Mondello beach, it is made of pale sand and with sloping very low. This section of coast as other similar beaches (Arenella, Romagnolo and Acqua dei Corsari) has gone through remarkable dynamic phenomena. More precisely between 1976 and 1992 the beach (known as Arenella beach), beyond the Palermo harbor, advanced its shoreline position. Going further west along the coast one can find a landfill, partially collapsed and eroded by the impact of sea storms, that contributes to the coastal advancement from West towards East. At Romagnolo coast zone the beach has advanced because of the debris coming from local landfills, instead the Acqua dei Corsari beach (pebbles and sand) has been going through various fluctuations with a general trend towards advancement due to the longitudinal sediment transport.

The study analyze the nature of sediments that made the beaches of the Palermo. The coast was once high made of limestone from Mount Pellegrino (in the western side), while in the east side (Romagnolo) it was a low coast made of calcarenite. Nowadays, pebbly deposits originated by the dismantling of local landfills operated by the sea and by the distribution of these deposits from west towards east along the coast because of the predominant current (going from West to East) can be found.

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