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Coastal hazard along Surrentine Peninsula and Capri Island, southern Italy

T. De Pippo (1), C. Donadio (1), M. Pennetta (1), C. Petrosino (1), F. Terlizzi (1), A. Valente (2) and C. Vecchione (1)

1. Dipartimento di Scienze della Terra, Università di Napoli Federico II, Italia
2. Dipartimento di Studi Geologici ed Ambientali, Università del Sannio, Italia

Coasts along Surrentina Peninsula and Capri Island in southern Italy are characterized by steep (usually >30%, and often vertical) and rocky slopes. These coasts are subjected to different rates of recession in terms of time and space. In the present landscape two kind of rocky coasts with associated characteristic erosional forms prevail: the sloping shore platform (Sunamura type-A platforms) and plunging cliff. Subordinately, other types of rocky coasts exist, but their profiles are no referable to a simple model, because of the interaction of geomorphic processes, at present no more active. The structural discontinuity and weathering of the limestones and tuffs, forming the cliffs, make them similar to the mechanical behaviour of soft rocks. Thus such coastal stretches have a great propensity to erode: this is not limited to cliffs near the sea, but also extends to the upper slope, that is often subjected to mass movements. These latter are mainly rockfalls and wedge failure in limestone, and toppling in tuff. Flows of loose superficial terrain moving in steep and narrow valleys is also recorded. The probability of these mass-movements increases usually during winter time. This may be explained by the greater intensity of the processes which affected the cliffs, such as the strong wave action at its base and the large amount of rain which penetrates the weathered rocks at the top or along the cliff. The occurrence of mass movements speeds up cliff recession and cause the accumulation of large amounts of debris at the cliff base. The action of currents, induced by waves, can be removed this deposits at the base of the cliff, thus it is again exposed to erosion and easily retreat. But in some case the supply of debris exceeds the capacity of removal at the base of the cliff due to marine processes, so the rate of retreating clearly decreases. In addition to natural geomorphic processes human activity sometimes contribute to accelerate cliff recession.

For instance, coastal engineering structures leads to the modification of the littoral drift and to removal of protective beach at the base of the cliffs as well as residences on cliff tops increase the weight and cause the failure of the slope. These environmental features, closely connected between them, determine a high degree geomorphological hazard in a well-known coastal zone for tourist purposes. Anthropogenic activity and settlements develop in this complex coastal dynamic system are often affected by significant damages.