



## **Morphodynamics of the Coastal Landscape and Environmental Aspects of Palude of Torre Flavia (Northern Latium- Italy)**

Rossana Raffi (1), Lina Davoli (1), Maurizio Alessio Baldassarre (2), Piero Bellotti (2), Maddalena Biancone (1), Gianfranco Calise (2), Letizia Di Bella (1), Maurizio D'Orefice (3), Virgilio Frezza (1), and Claudia Tarragoni (2)

(1) Sapienza University of Rome, Earth Sciences, Italy (rossana.raffi@uniroma1.it), (2) Member of Italian Association of Physical Geography and Geomorphology (AIGEO), (3) ISPRA-Italian Institute for Environmental Protection and Research - Department for the Geological Survey of Italy

The “Palude di Torre Flavia” (40 ha) is a marsh situated along the Tyrrhenian coastline, 40 km north of Rome. This biotope is the remnant of a larger heterogeneous littoral wetland area, extended until 1960-1970 for about 100 ha. The coastal evolution has been investigated by means of DEM based on airborne high resolution LiDAR data, several aerial photographs, topographic maps, bathymetric profiles and wind climate. Nowadays, this area is undergoing a very severe coastal erosion of the beach and coastal dune which protect the marsh. The coastal erosion is in a very advanced stage so that the bottom of the marsh, usually overburden by sand dune, is outcropping at the ground surface. Since the mid-1950's the shoreline dynamics showed an erosive process. Starting from the 1970's the beach erosion became more intense and widespread. Over the last twenty years coastal dynamics has also changed due to the construction of sea defences nearby Torre Flavia. From 2011 to 2017 the shoreline shows a tendency to stability. The first results identify the most vulnerable beach in the northern part and at risk of flooding of the wetland behind. The morphodynamics of the shore, characterized by microtidal range, is mainly driven by dominant winds and waves approaching from W and SW, which produce a longshore current flowing to North.

This study is also focused on the paleo-environmental evolution of this coastal belt during the late Holocene. Two 5 meters-deep cores, actually in progress, will provide data for the evolutionary reconstruction of the wetland, while chemical, physical and microfaunal analyses will be used for the environmental characterization of both beach and wetland. For this purpose two surveys, the former in March and the latter in September, were carried out, collecting water and sediment samples. In this preliminary phase, grainsize and microfaunal data resulting from the first expedition will be presented. The sediment is almost exclusively sandy (mainly medium and fine sand) and well-sorted. Between the shoreline and -2.5 m there is a limited increase in Mz northward. The sediment at -5 and -7.5 m is commonly richer in silt but with significant local exceptions. Total (dead and living specimens) microfaunal data regarding the beach area show a typical infralittoral foraminiferal assemblage dominated by *Ammonia* spp. and miliolids. Some differences, linked to a different substrate, consist of an increasing of ephiphitic taxa like *Elphidium* spp., *Planorbulina mediterranea*, *Miniacina miniacaea* and *Lobatula lobatula*. Finer grain sizes are characterized by the smallest amount of foraminifera while the coarser sediment sizes contain a more abundant living assemblage and broken tests. The wetland is characterized by the almost complete absence of foraminifera probably due to the lower salinity. Emphasis must be placed on the presence of few rare specimens of *Lagenammina* cf. *fusiformis*, *Crobostronoides jeffreysi* and diatoms in the samples closer to the beach. All of the samples are characterized by ostracods (mainly *Candona* spp.) and rare fragments of gasteropods.

This work has been carried out in the framework of the Working Group “Coastal Morphodynamics” of AIGEO.