



Coastal environment: historical and continuous monitoring

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The monitoring is a tool providing essential data to study the process dynamic. The formation and transformation of coastal environment involve physical, chemical, geological and biological processes. The knowledge of the littoral systems and marine seafloor therefore requires a multidisciplinary approach. Since the phenomena observation occurs in a short period of time it requires the use of high quality data acquired with high accuracy and suitable processing procedures. This knowledge considerable increased during the past 50 years closely following significant progress in the methods of investigation at sea and laboratory. In addition seafloor exploration is deeply rooted in History.

A sector actually subject to control results the coastal zone for its position as transition component between continental and marine environments with closely connected natural and human actions. Certainly these activities are important in the time to develop the technologies suited for the knowledge and to increase different protection, prevention, intervention and management tools. In this context the Istituto Idrografico della Marina (Hydrographic Institute of Italian Navy - I.I.M.) is a precursor because since its foundation (in 1872) it contributed to the monitoring activities related to charting and navigation, including hydrologic surveying, seafloor measurements and in consequence the landward limit, the shoreline. The coastal area is certainly the most changeable sector either natural or socio-economic causes. This is the most dynamic environment, subject both to marine (waves and currents) and continental (river and ice) actions, and continuously changing the intended use for the increase of industrial, commercial, recreation and the need for new structures to support. The coast has more recently taken on a growing value determined by some processes, including erosion and retreat are evidence of a transformation of which, however, undermine the system and impoverishing the existing one.

The constant monitoring activities of I.I.M. are the production of nautical paper charts and electronic navigational charts (ENC) together other specialised nautical charts and publications to aid safe navigation, the processing of the oldest data from analogical to digital and the care preservation in the archives of all hydrographic survey information. This process is occurred according to an international recognized standard, such as to allow a continuous improvement of all acquired data, even if with more advanced tools and technologies for the development of cartography in constant update both in content and in restitution.

In this research the archives infrastructure is used to conduct hydrographic data collection and processing to follow the secular variation and its evolution of the shoreline and coastal seafloor. A key element in monitoring these changes, both of the sub-aerial and submarine beach, is the determination of the shoreline and restitution as the coastline, which already includes the definition of its complexity, in a time period that must be long enough. We present some examples of the Italian littoral evolution with evident changes of coastal morphology in support of present monitoring.