Geophysical Research Abstracts
Vol. 14, EGU2012-9712-2, 2012
EGU General Assembly 2012

Coupling of remote sensing, climate and hydrologic data for assessing coastline changes in R. Sperchios estuary (Maliakos Gulf, Greece).

N. Stathopoulos (1), E. Vasileiou (1), E. Charou (2), A. Perrakis (2), A. Kallioras (1), D. Rozos (1), and M. Stefouli (3)

(1) National Technical University of Athens, School of Mining Engineering, Section of Geological Sciences, Zografou, Greece (nstath@metal.ntua.gr, elvas@metal.ntua.gr, kallioras@metal.ntua.gr, rozos@metal.ntua.gr), (2) National Center for Scientific Research – Demokritos, Institute of Informatics and Telecommunications, Computational Intelligence Laboratory, 153 10, Agia Paraskevi, Athens Greece (exarou@iit.demokritos.gr , perrakisandreas3@gmail.com), (3) Institute of Geology and Mineral Exploration, IGME building Olympic Village-Acharnai, 136 77, Greece (stefouli@igme.gr)

Sperchios river basin covers an area of 2116 km^2, with an average altitude of approximately 810 m, while the river is recharged by many streams of permanent and periodic flow. The high gradients which are present within approximately 2/3 of the total length of the river course form a rather mountainous topography -streamy, with crucial flooding peaks and very intense sediment loads yield-. On the contrary, within the last downstream part of its course, the river is transformed gradually into a lowland relief, where cases of severe flooding have been observed and reported. The river discharges in Maliakos Gulf and the basin's extent at the exit is 1830 km^2, while the average altitude is 626 m. The deltaic alluvial part of the valley covers an area of approximately 200 km^2 with a highly increasing formation rate during the last 150-200 years; estimated at 130 acres annually.
Water balance calculations involved the interpretation of hydrological data, whereas for the area of main scientific focus -adjacent to the coastal zone- the surface water volume is found 1026.8 hm^3 while the evapotranspiration is about 72% of the rainfall. The average value of the river's sediment load yield was estimated by using and cross-referencing various methods.
The aim of this research is the monitoring and assessment of coastline changes within the coastal deltaic part of a typical Mediterranean hydrological basin, by coupling remote sensing techniques with available hydrological and climate data.
Remotely sensed data are widely used for land cover and/or coastline change detections. In this study, multitemporal Landsat images were the main source of information. A 30 year time series of the Landsat images from past archives were obtained and interpreted. Classification of the various land cover types within the area of interest and the subsequent delineation of the coastline was performed using unsupervised classification techniques. High resolution (approximately 0.5m) ortho-photos available through the WMS service of the Greek Cadastral Agency have been also used to acquire information and verify the results obtained from the analysis of Landsat data. The available ortho-photos were linked with a GIS system, acting as basemaps on which several data were overlaid in order to identify changes. The results were proved satisfactory in terms of effectively projecting and evaluating relevant observed coastline and land cover changes and trends.