



Coastal erosion and accretion rates in Greece

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Erosion threatens many coastal regions of Greece. Anthropogenic changes of landforms such as coastal roads built on even narrow beaches, sand mining for construction, poor design of coastal structures that interfere with sediment, and dams without sediment bypasses have significantly reduced beach widths. We present erosion rates for different beaches, some of which are in sensitive ecosystems, otherwise "protected" by local and EU ordinances.

By comparing inferences of beach widths in varying intervals from 1933 to 2006, we infer that the construction of dams in Acheloos river in western Greece, built in a faraonic attempt to partially divert its flows to eastern Greece, this is responsible for up to 20m/year erosion rates observed in certain locales in the Acheloos delta. More characteristic erosion rates in the region are $\sim 2\text{m/year}$. By contrast, there appears rapid accretion of up to 4m/year in the beaches around the Nestos delta in northern Greece (Papadopoulos, 2009). In beaches that are not near large river deltas, erosion rates range from 0.5m/year to 1m/year. While we have not done comprehensive comparisons among coastlines with different levels of coastal development, it does appear that rapid coastal development correlates well with erosion rates.

The underlying problem is the complete lack of any semblance of coastal zone management in Greece and substandard design of coastal structures, which are often sited without any measurements of waves and currents offshore (Synolakis et al, 2008). Beach maintenance remains an exotic concept for most local authorities, who invariably prefer to build hard coastal structures to "protect" versus nourish, siting lack of experience with nourishment and "environmental" concerns. In certain cases, choices are dictated by costs, the larger the cost the easier the project gets approved by regulatory authorities, hence the preference for concrete or rubble structures. We conclude that, unless urgent salvage measures are initiated to protect the coastal zone and educate government and local authorities on sustainable management, several beaches will disappear within the next two decades.

References

Papadopoulos, C., 2009, Comparative assessment of coastal erosion in the regions of north Amvrakikos gulf, Acheloos delta, Nestos delta, Kos, Limnos, and Kitros, Diploma Thesis, Technical University of Crete, Chanea, Greece, 130 p. (In greek).

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