



## CO-EVOLVE

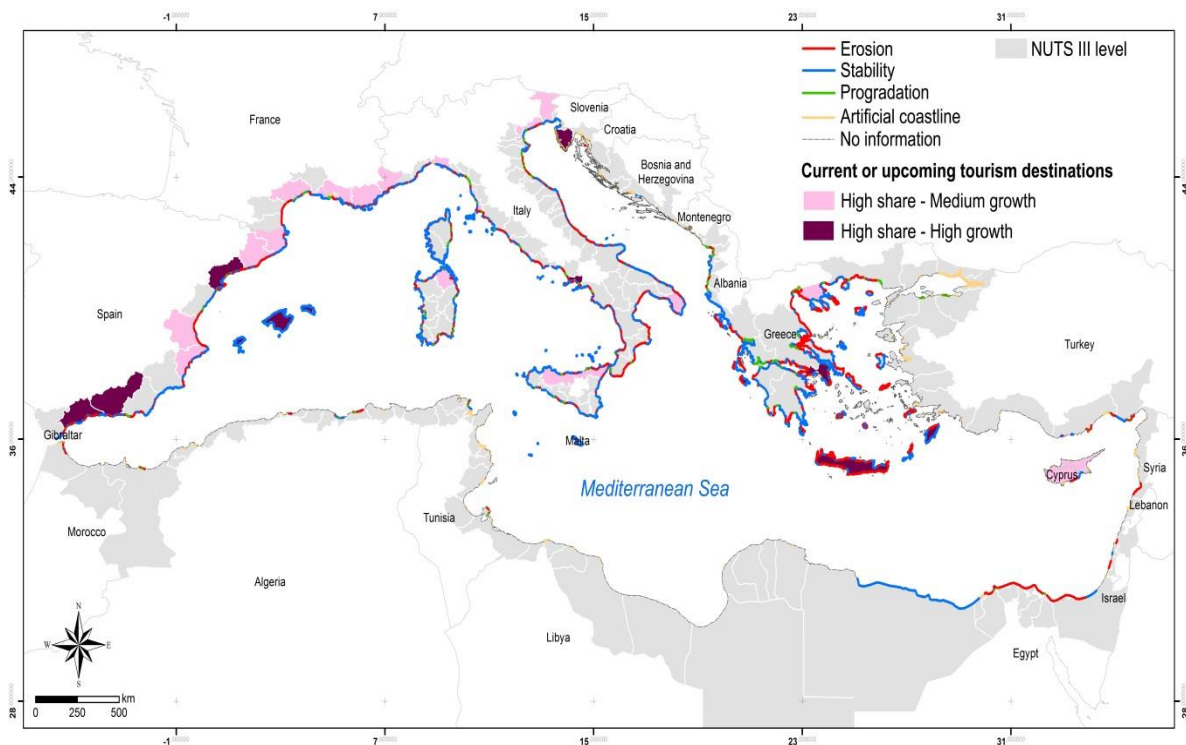
*Promoting the co-evolution of human activities and natural systems for the development of sustainable coastal and maritime tourism*

# FACTSHEET #2

## Climate change impacts on Mediterranean touristic coasts

### SUMMARY:

*Mediterranean coasts are highly threatened by erosion and flooding, which endanger the beach-based tourism causing land loss and serious damages to human settlements and activities. These processes are largely enhanced by human actions and worsened by the ongoing effects of climate change, including sea-level rise mainly due to global warming. In the future, the impacts of climate change could be devastating to coastal areas if no adaptation strategies are applied.*



The Mediterranean coasts are very attractive for a wide range of human activities. Over the last decades, they have undergone intense development, mainly due to the growing role of tourism, maritime trade, and energy industry, and, to a lesser extent, to agriculture and fishing. This situation has favoured a rapid urbanisation that has been responsible for negative impacts and a remarkable irreversible reshaping of the littorals. At present, climate change is worsening this condition by causing modifications on both weather and hydrodynamic processes (e.g., sea-level rise, storm surges, heavy rains, and high tides).

The analysis of the driving natural and anthropogenic forcings occurring along the coasts, in relation to their geomorphological and lithological characteristics and in a global climate change perspective, provides a complete overview of the morphodynamics behaviour and vulnerability of the littorals.

Coastal erosion and flooding are two major threats to the beach-based tourism as they cause land loss and serious damages to social and economic activities and human infrastructures. Their impact largely depends on the combined effects of rising sea levels and storm surges, particularly devastating on coastal urban areas and low-lying territories.

	Total length (km)	No data (%)	Erosion (%)	Progradation (%)	Stability (%)	Artificial coastline (%)
Mediterranean coast	46441	44	29	5	52	14
European Mediterranean coast	35346	35	30	5	55	10
Non-European Mediterranean coast	11095	78	28	6	28	38

*Percentages of Mediterranean coast subjected to erosion and progradation or under stable conditions.*

The main driving forcing behind coastal retreat is the wave-shore interaction, reinforced by human impacts. Erosion can cause the complete disappearance of beaches and the instability of coastal slopes. On low-lying areas, it is responsible for a progressive narrowing of

the littorals, thus increasing their exposition to storm-induced hazards and, in particular, to the risk of flooding. Therefore, erosion reduces the available beach surface for tourism and can have adverse effects on human settlements located in the backshore, damage or destroy nature reserves and archaeological sites, and cause the depletion of environmental resources. In coastal cliffs, the rate of erosion may accelerate owing to the destabilisation induced by the presence of infrastructures (e.g. roads, railways) or increased load over the underlying rock (e.g. buildings). Slumps and rockfalls may represent a danger to local population and tourists, endangering both housing and hotels located on the cliffs and local swimmers.

Flooding mainly produces disappearance of beaches and inundation of human settlements. At present, storm waves are the main responsible for temporary flooding (in particular, coastal flash floods) in low-lying coastal areas, but, in the future, these territories could be permanently inundated owing to the foreseen sea-level rise, also enhanced by an increase in high tides.

Consequently, the knowledge of the present conditions of the littorals and the identification of possible responses to different relative sea-level rise scenarios and future climate change trends are crucial to preserve and protect these areas and to support correct coastal zone management plans.



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