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The anticipated spatial loss of microtidal beaches in the next 100 years due to sea level rise.

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The anticipated sea level rise is expected to influence on a global scale the earth coast in the near future and it is considered to be a main factor related to coastal retreat, with beach zones being among the most vulnerable coastal landforms. Records for the period 1890-1990 have shown that sea level has already risen by 18cm (min: +10cm, max: +25cm), while the projected to 2100 sea level rise has estimated to be 20 to 50cm (IPCC, 2007). It has to be highlighted that a small rise of few tens of meters would cause shoreline retreat of a few to tens meters in the case of low lying coasts, i.e. beach zones (e.g. Bruun 1962, Nichol and Letherman, 1995, Ciavola and Corbau, 2002). Within the concept of climate change, sea level rise could also being related, in regional scale, to changes of meteorological factors such as intensity, duration and direction of the onshore blowing winds, variation in atmospheric pressure. In the microtidal Greek waters temporary changes in sea level exceeds the 1 m (HHS, 2004) This work investigates the impact of sea level rise to sixteen beach zones along the Greek coast. More specifically, shoreline retreat has been estimated for time periods of 10, 20, 50 and 100 years for the corresponding sea level rise of 0,038, 0,076m, 0,19m and 0,38m, according to the A1B scenario of IPCC (2007) and utilizing Dean's (1991) equation; the latter includes in the calculations both the effects of the anticipated sea level rise and the associated storm surge The appropriate morphodynamic and sedimentological data used for the estimation of beach retreat has been deduced from field measurements. Finally, the percentage of the sub-aerial area lost for each beach zone, under investigation, has been estimated.
The results show that coastline retreat follows a liner increase in the case of eleven out of the 16 beach zones, for a time period of 100 years. Santava beach zone (inner Messiniakos Gulf) undergoes most of erosion in the first period of 20 years, meeting a new state of equilibrium when land loss reaches the 68.67% of its initial width. Similarly, the beach zones of Ag. Petros (Isl. Andros), Korission Lagoon (Isl. Corfu), Marathon bay (Attica) and Alfios river delta (west Peloponnese) a reduced rate of retreat after the first 50 years, attaining a new state of equilibrium but when already have lost more than 85% of their current width.

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