



Storminess interannual variability and Coastal Hazards over the southwestern Spanish coast: Links to large scale atmospheric forcing.

T. A. Plomaritis (1), J. Benavente (1), L. Del Rio (1), and I. Laiz (2)

(1) University of Cadiz, Earth Science, Puerto Real, Spain (haris.plomaritis@uca.es), (2) Instituto de Ciencias Marinas de Andalucía, Consejo Superior de Investigaciones Científicas, Campus Rio San Pedro s&n, 11510 Puerto Real, Cadiz, Spain

In the context of increased coastal hazards through storminess variability, the danger of coastal damages and/or morphological changes is related to the sum of mean sea level conditions, storm surge and maximum wave height and run up values. In order to better understand the physical processes that cause the interannual variability of the above parameters a reanalysis record (HIPOCAS) of the last 44 years was used. The HIPOCAS time-series was validated with real wind, wave and sea-level data using linear and vector correlation methods. In the present work changes in the duration, frequency, chronology and approach direction of the Atlantic storms over the Spanish Gulf of Cadiz (SW Iberian Peninsula) were identified by computing various storm characteristics such as maximum wave height, total energy per storm and storm groupiness. The obtained time-series were compared with large-scale atmospheric indices such as the North Atlantic Oscillation (NAO) and the East Atlantic pattern (EA). The results show a good correlation between negative NAO values and increased storminess over the entire Gulf of Cadiz. Furthermore, negative NAO values were correlated with high mean sea level values and consistent westerly and south westerly wind events, indicating higher probability of coastal risks. The above results are compared with recent coastal inundations events that took place over the last winter season in the province of Cadiz.