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Analysis of coastal flooding caused by climate change. Case study on beaches in Cadiz and Malaga (Spain)   
  
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**Abstract**

Sea level rise is one of the consequences of climate change. This sea level rise leads to coastal flooding with consequent erosion, and therefore constitutes a threat to coastal systems. Numerous publications have been written dealing with the calculation at different scales (global, regional and local) of sea level rise in natural or anthropogenic environments. The current trend of sea level rise due to climate change (IPCC, 2022; Jigena et al., 2021) shows extensive and potentially catastrophic risks for ecosystems, human populations, built infrastructures and economies in coastal areas (Aguilera-Vidal et al., 2022).

The objective of this study is to explore current and future risks from coastal hazards. It compares the cost-effectiveness of nature-based versus artificial or technological solutions to reduce risks, prevent damage and support adaptation decision-making. Using data from different contrasting specialized reports on climate change (IPCC, 2022), the rise in sea level and wave height have been evaluated for different medium and long-term scenarios. Transverse profiles of different beaches have been taken to subsequently make simulations with all the variables to determine the coastal flooding surface.

The study areas chosen have been the provinces of Cádiz and Malaga, representative of the rest of the Andalusian provinces and with different characteristics (tide, coastal occupation, ...). Several beaches have been taken from these provinces. The study allows the development of a broad methodology that allows easy extrapolation of the models to the rest of the Andalusian coast. Work carried out thanks to the financing of the European Union Next GenerationEU.

**Keywords**

Climate change; Sea level; Waves; Coasts; Flooding; Beaches;

**Biography**

Antonio Contreras de Villar holds a PhD in Engineering and Architecture, a Master's degree in Computational Modelling in Engineering and is a Technical Engineer in Public Works. He is a professor at the University of Cadiz in the Department of Industrial Engineering and Civil Engineering, in the area of ​​Hydraulic Engineering. He is a member of the RNM-912 Research Group “Coastal Engineering”.

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