Geophysical Research Abstracts
Vol. 18, EGU2016-17029, 2016
EGU General Assembly 2016

Changes in Wave Climate from a Multi-model Global Statistical projection approach.

Paula Camus, Melisa Menendez, Jorge Perez, and Inigo Losada
FUND. INSTUTO HIDRAULICA AMBIENTAL, Santander, Spain (menendezm@unican.es)

Despite their outstanding relevance in coastal impacts related to climate change (i.e. inundation, global beach erosion), ensemble products of global wave climate projections from the new Representative Concentration Pathways (RCPs) described by the IPCC are rather limited. This work shows a global study of changes in wave climate under several scenarios in which a new statistical method is applied.

The method is based on the statistical relationship between meteorological conditions over the geographical area of wave generation (predictor) and the resulting wave characteristics for a particular location (predictand). The atmospheric input variables used in the statistical method are sea level pressure anomalies and gradients over the spatial and time scales information characterized by ESTELA maps (Perez et al. 2014). ESTELA provides a characterization of the area of wave influence of any particular ocean location worldwide, which includes contour lines of wave energy and isochrones of travel time in that area. Principal components is then applied over the sea level pressure information of the ESTELA region in order to define a multi-regression statistical model based on several data mining techniques.

Once the multi-regression technique is defined and validated from historical information of atmospheric reanalysis (predictor) and wave hindcast (predictand) this method has been applied by using more than 35 Global Climate Models from CMIP5 to estimate changes in several parameters of the sea state (e.g. significant wave height, peak period) at seasonal and annual scale during the last decades of 21st century. The uncertainty of the estimated wave climate changes in the ensemble is also provided and discussed.