

Title of STSM: Impact of Offshore Wind farms on the wave climate

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Resume:

The objective of this STSM was to investigate the impact and effect of Offshore Wind Farms (OWFs), as renewable marine energy systems, on landscape characters (waves and coast), landscape quality, and consequently the leisure activities that take place there, such as surfing and other sea activities concerning the public. The subject is of high scientific interest and of high public concern, and the corresponding investigation contributes to the sustainable deployment of offshore wind turbines, considering also socio-environmental criteria. The Host institution was recently contacted by the Surf Rider Association because the impact of OWFs on the local wave field is a growing concern in the surfing community. In order to provide this community with precise and technically sound answers, the impact of an OWF was numerically investigated during this STSM.

The activities carried out during the STSM took place in two phases:

(i) First, a review was made on the existing numerical modeling techniques for offshore wind and wave farms with reference to corresponding case studies. The data that was concentrated led to the selection of the numerical method which was applied in the second phase for the investigation of a particular OWF.

(ii) Following, the effect of an OWF consisting of fixed bottom offshore wind turbines on the surrounding wave field was numerically investigated under the action of both regular and irregular waves, according to the objectives of the STSM. This phase also included training on the numerical framework Nemoh which was used for the numerical model.

This STSM contributes to the better understanding of the effect of OWFs and other marine RE systems on the landscape quality, and of their public acceptance. The results offer a valuable asset to the database formed by the COST Action RELY, as task of Working Group1 in particular, concerning offshore wind energy exploitation.

A paper with the results of this STSM, titled “Impact of Fixed Bottom Offshore Wind Farms on the Surrounding Wave Field”, has been accepted for oral presentation and inclusion in the proceedings of the 26th Annual International Ocean and Polar Engineering (ISOPE) Conference held in Rhodes, Greece, June 26–July 2, 2016.