

# ResourceCODE : Hindcast data and tools for offshore renewable energy development

The ResourceCODE development Group<sup>1</sup>

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## ABSTRACT

Resource mapping is essential for the planning of the deployment of Offshore Renewable Energy converters. A proper characterization of the environmental forcing enables optimization of energy extraction and a more accurate assessment of the structural loading, hence contributing to ensuring reliability and survivability of devices at a given production site.

ResourceCODE provides a full suite of tools to support ocean energy analytics, elaborated to underpin design and operational decisions for ORE deployments, associated with a comprehensive hindcast database of high-resolution ocean energy resource parameters for European waters.

The ResourceCODE model configuration is based on a high-resolution unstructured grid extending from the south of Spain to the Faeroe Islands and from the western Irish continental shelf to the Baltic Sea. Forcing winds are extracted from the ERA5 database while the currents and water levels are recomposed from a database of harmonics of tidal currents (MARS and FES2014).

Running WaveWatch III® using this configuration, a 28-year metocean database covering the [1993-2020] period with an hourly time step was produced.

The associated ResourceCODE Marine Data Toolbox provides an advanced suite of tools to support ocean energy analytics. This toolbox provides developers with a set of standard functions for time series descriptive statistics, resource assessment and operations planning, including a capacity for comparison with collocated in-situ measurement datasets. A set of advanced statistical modelling tools enables the capacity for developers to conduct the assessment necessary to reduce uncertainty in expected environmental conditions and de-risk investment in future technology design.

The opensource services offered in the ResourceCODE Marine Data Toolbox will be accessed through an online platform.

***keywords*—Hindcast database, Statistics, Analytical tools.**

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