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# Energy resource mapping at the framework of MARINA PLATFORM project

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In a progressively evolving operational and research environment, the establishment of equitable and transparent criteria for the evaluation of multipurpose platforms for marine renewable energy is of significant importance. Within this framework the Atmospheric Modeling and Weather Forecasting Group of the University of Athens participates, with 16 other research groups, companies, operational and technology centers from twelve European countries in the new project Marine Renewable Integrated Application Platform (MARINA). The project comes under the 7th Framework Program for R&D of the European Union.

The main objective is to support the development of deep water structures that can exploit the energy from wind, wave, tidal and ocean current energy sources and, in particular, the system integration and cost reduction. Both targets can be effectively pursuit by combining offshore wind with other Marine Renewable Energy technologies with wave energy keeping a fundamental role. These tools will be further used to produce realizations of multipurpose renewable energy platforms validated by advanced modeling and tank-testing at reduced scale. These will be brought to the level of preliminary engineering designs with estimates for energy output, material sizes and weights, platform dimensions, component specifications and other relevant factors.

One of the main components of this work is the development of a combined wind-wave-current resource atlas. The combined atlas will be developed using state of the art modeling and remote sensing techniques, utilizing Numerical Weather Prediction (NWP) and Regional Ocean Models together with advanced data assimilation techniques.

Some first results of this work focusing mainly on the wind field and wave analysis being performed at the area of the Atlantic European coastline will be presented. The atmospheric parameters required for the wind power estimation (e.g. wind speed, turbulence, atmospheric pressure) at the area of interest are provided by the regional atmospheric modeling system SKIRON. The fine horizontal grid of the model configuration (5km x 5km) allows the detailed description of the atmospheric fields and the provision of highly resolved atmospheric data as input parameters for the wave simulations.

The latest version of the wave model WAM is utilized at the same resolution for the simulation of wave fields. The model provides a number of integrated wave parameters crucial for the wave power estimation as well as full wave spectra at specific preselected locations.