



MAPPING OF OFFSHORE WIND CLIMATE AND SITE CONDITIONS FOR THE BALTIC SEA WITHIN LATVIAN TERRITORIAL WATERS

L. Lizuma, A. Teilands, I. Meirans

*Institute of Physical Research and Biomechanics
Artillerijas str. 40, LV-1009 Riga – Latvia*

S. Rupainis

*Rezekne Higher Education Institution
Atbrivosanas str. 90, LV-460 Rezekne – Latvia*

ABSTRACT

The growing demand for renewable energy leads to the need for wind farms located in regions with cost-effective wind resources. The reliable prediction of wind resources and environmental conditions at offshore sites is crucial for planning and selecting the location for wind farms.

The paper describes the assessment and mapping of wind climate and environmental conditions of the study region domain extending from 56.03N 20.2E to 57.22N 21.33E. Maps of wind resources and environmental conditions are the primary method used for presenting the offshore wind resources as well as site conditions data. A GIS database was chosen to house the offshore resources data because the datasets have a significant spatial component. The visualization of the geospatial data is created using Google Maps platform. The maps datasets consists of gridded 1) climatological information on wind speed and direction, air temperature, air pressure, wind power potential at 10-m, 80m, 90m and 100m height; 2) oceanographical information on water temperature, height and direction of sea waves, speed and direction of currents, ice conditions; 3) geological data on bathymetry and sea sediments. The horizontal resolution of the database grid cells is 5 km by 5 km. All the component datasets are spatially referenced to the same spatial base allowing rapid indexing of the different datasets to each other. A database user may compare information from different datasets in the same geographic location. The GIS database also allows portions of a dataset to be quickly updated as new information becomes available.

Keywords: wind resources assessment, wind maps, Baltic Sea, GIS