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Development of a Wind Resource Assessment Framework Using Weather Research and Forecasting (WRF) Model, Python Scripting and Geographic Information Systems

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Abstract : Wind energy is rapidly emerging as the primary source of electricity in the Philippines, although developing an accurate wind resource model is difficult. In this study, Weather Research and Forecasting (WRF) Model, an open source mesoscale Numerical Weather Prediction (NWP) model, was used to produce a 1-year atmospheric simulation with 4 km resolution on the Ilocos Region of the Philippines. The WRF output (netCDF) extracts the annual mean wind speed data using a Python-based Graphical User Interface. Lastly, wind resource assessment was produced using a GIS software. Results of the study showed that it is more flexible to use Python scripts than using other post-processing tools in dealing with netCDF files. Using WRF Model, Python, and Geographic Information Systems, a reliable wind resource map is produced.

Keywords : wind resource assessment, weather research and forecasting (WRF) model, python, GIS software
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