



An Alternative Method to Project Wind Patterns

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Wind energy is one of the major clean and sustainable energy sources. Beside its various advantages, wind energy has a downside that its performance cannot be projected very accurately in the long-term. In this study, we offer an alternative method which can be used to determine the best location to install a wind turbine in a large area aiming maximum energy performance in the long run. For this purpose, a regional climate model (i.e. RegCM4.4) is combined with a software called Winds on Critical Streamline Surfaces (WOCSS) in order to identify wind patterns for any domains even in a changing climate. As a special case, Çanakkale region is examined due to the terrain profile having both coastal and mountainous features. WOCSS program was run twice for each month in the sample years in a double nested fashion, using the provisional RegCM4.4 wind data between years 2020 and 2040. Modified version of WOCSS provides terrain following flow surfaces and by processing those data, it makes a wind profile output for certain heights specified by the user. The computational time of WOCSS is also in reasonable range. Considering the lack of alternative methods for long-term wind performance projection, the model used in this study is a very good way for obtaining quick indications for wind performance taking the impact of the terrain effects into account.

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