

Wind Resource And Environment Characteristics In South Coast Of The State Of Rio Grande Do Sul, Brazil

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Abstract

This study presents the result of wind resource and environment characteristics in south coast of Rio Grande do Sul state, near the Taim Ecological Station. The area possesses a variety of habitats, being distinguished by the great extensions of humid areas with typical environment of the region. The study is made by PUCRS in partnership with TREVISA FLORESTAL, company that acts with pinus and eucalypt in the region and is interested in recognizing the wind potential and the environment of the area. To realize this study a meteorological station was installed, including wind speed and wind direction, ambient temperature, and relative humidity. In parallel to the study information of meteorological data of INMET stations near the area has been used.

Key words: Wind resource, Environmental impact.

1. Introduction

The present study has as objective analyze the wind potential and environment characteristics in a region localized in south coast of Rio Grande do Sul state (Figure 1), evaluating the impacts that could be caused to the local ecosystem. This study will last eight months and the paper results correspond to data analysis of 2008, October and November.

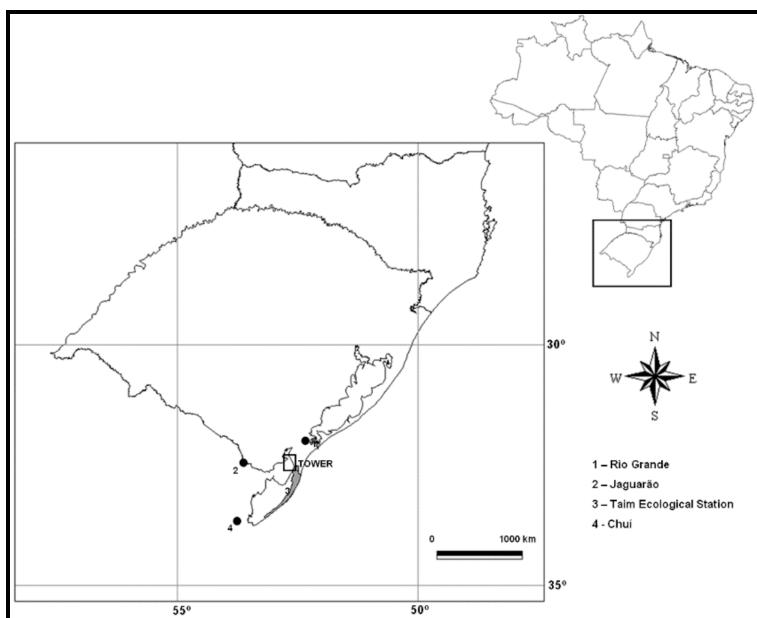


Figure 1 – RS state map showing the specifically study area.

2. Materials And Methods

The study area possess approximately 12,000 hectares, is located in the south Coastal Plain of Rio Grande do Sul state, in Rio Grande city, limited by Taim Ecological Station. This system is composed by: 10m tower height, 02 cup anemometers, 01 direction sensor, 01 sensor of ambient temperature and relative air humidity and 01 data acquisition system (Figure 2). The statistic analysis was made using the program EXCEL 2003.



Figure 2 – View of meteorological tower.

The related data of species occurrence in the area are based on direct observations of birds, night observation of amphibians, and random observations of other vertebrates groups.

3. Results

The study area belongs to the coastal plain of the state, characterizing itself for the dune presence in plain relief and little altimetric variation.

The typical vegetation has sea influence (*restinga*) possessing an important gradient of plants that maintenance the local biodiversity, however part of this area is covered by the cultivation of pinus and eucalypts.

The presented results had been obtained through an average data collected in two first months of meteorological tower functioning. The sample was collected by a data acquisition system in an interval of 10 minutes, totalizing 9723 samples. Figure 3 show that the predominant wind direction is northeast.

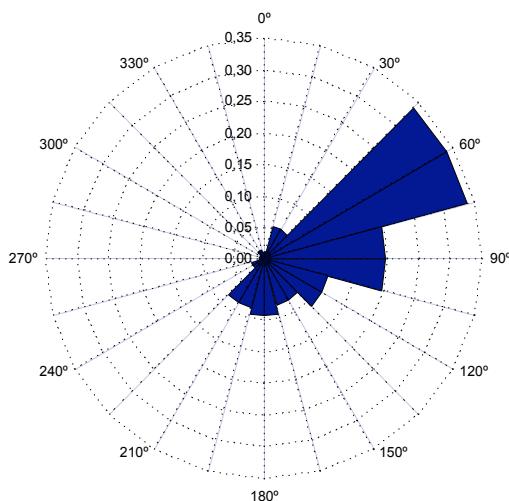


Figure 3 – Predominant Wind direction.

After statistical data treatment, we compared the obtained data by meteorological tower with others substations of the Brazilian National Institute of Meteorology (INMET), located in Rio Grande, Jaguarão and Chuí. Figure 4 show the wind speed average of these localities. The wind speed average in the meteorological tower is 6,27 m/s.

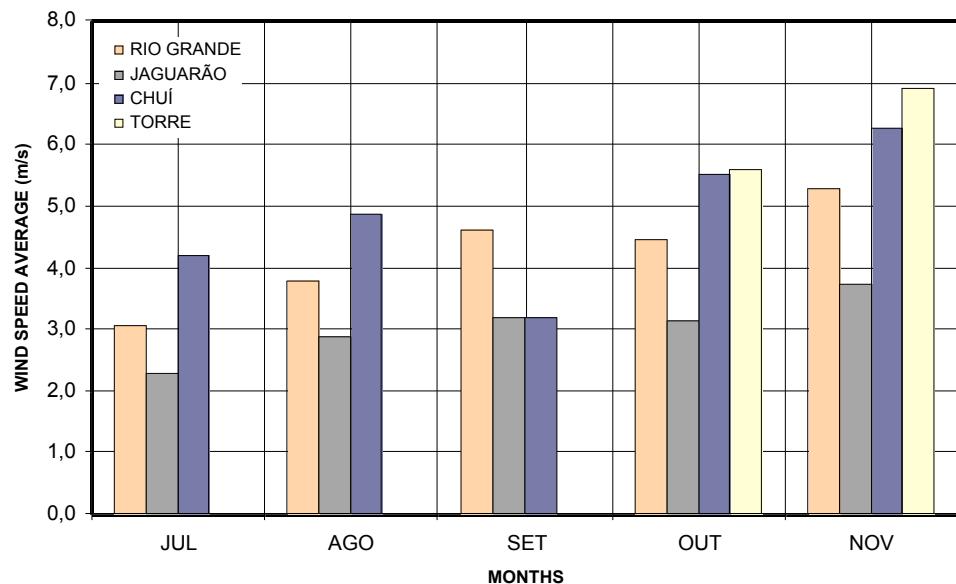


Figure 4 – Monthly wind speed average in 2008.

A sample of daily wind speed behavior in the localities was compared in figure 5.

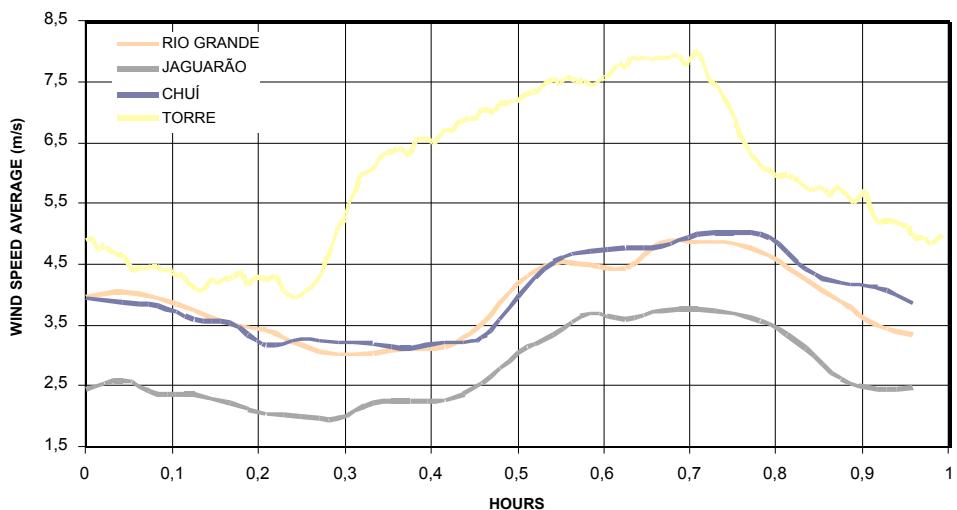


Figure 5 - Daily wind speed in 2008.

In the area had been observed 30 vertebrates species, being these: 21 species of birds, five species of amphibians, one species of testudine, a turtle “tigre d’água” (*Trachemys orbignyi*), one species of alligator, “jacaré do papo amarelo” (*Caiman latirostris*), one species of snake (*Lystrophis orbignyi*), and one mammal species, “capivara” (*Hydrochoerus hydrochaeris*). The figure 6 shows two species found in the area.



(a) “João Grande” (*Ciconia maguaria*)



(b) “Jacaré de papo amarelo” (*Caiman latirostris*)

Figura 6 – Two species found in the area.

4. Conclusions

The results shows that the study area presents a favorable wind energy resource, however is necessary more information about environmental characteristics to verify the impact that wind turbines could cause in this area near an Ecological Station.

References

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