Evaluation of Particulate Matter (PM10) Concentration: A Case Study in Camboriu, Brazil

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The inhalable particulate matter (PM10) is one of the major atmospheric pollutants, which is harmful to human health because it can cause several respiratory diseases. In Brazil, the state of Santa Catarina has one of the largest number of industries and cars per capita. However, does not have a fixed air quality monitoring, and only a few studies in the area. Our goal was to initiate the evaluation of air quality at Camboriú city in relation to PM10 concentration, never done before, and also search for the possible emission sources through winds direction. Moreover, we planned to share our information with the population. Through periodic monitoring, using a High Volume Sampler for PM10 and Excel®, we were able to determinate the concentration of the pollutant from March to December (2016), doing daily collects three times a week, and comparing it with the Brazilian standards and the World Health Organization (WHO) recommendations. To evaluate how the concentrations behaved and the possible emission sources, we use the MatLab® software, in which we put the data to build graphics. The results showed us that PM10 concentrations did not exceed the national parameters. However, there were events where the concentrations exceeded the World Health Organization recommendations, which can lead to health problems from short-term exposure. The majority of the winds came from the northeast, where is an urbanized city and a highway. We planned to expand this project, and investigate if there is any influence of PM10 concentration on hospital admissions for respiratory and cardiovascular diseases.

Awards Won:

American Meteorological Society: Certificate of Honorable Mention