

Analysis of climatic variations in Potiguar basin from temporary series and remote sensing techniques.

São Paulo School of Advanced Science on Climate Change:
Scientific basis, adaptation, vulnerability and mitigation

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Introduction

The Northeastern Region is naturally characterized as having high potential for water evaporation due to the enormous availability of solar energy and high temperatures. It is known that the rains of the semi-arid region of the Northeast present enormous spatial and temporal variability. Years of droughts and abundant rains alternate in erratic ways.

Irregular rainfall is a constant obstacle to the development of agricultural activities, and the lack of efficient water storage systems - which are almost always concentrated in the hands of a few - further intensifies social effects. The biophysical characteristics of the surfaces determine the distribution of the energy exchanges, thermal regimes of the soil (GOMES et al., 2013). Bezerra, et al. (2014) shows that algorithms have been proposed for estimation of biophysical parameters in the last decades taking into account the spatial variability of the spectral and energetic components at the surface.

In this context, in recent studies (Giongo et al., 2010; Lier et al., 2010; Bezerra et al., 2011; Oliveira et al., 2012) estimated some biophysical parameters of the surface, including surface albedo, The Normalized Difference Vegetation Index (NDVI) and the surface temperature using the remote sensing technique (BEZERRA, et al., 2014). Due to the importance and lack of field data to monitor spatial-temporal dynamics in semi-arid regions of the Brazilian Northeast, remote sensing research allows understanding the behavior of biophysical parameters in the face of climatic changes and anthropogenic actions.

In view of the above, it could be seen that the study area is under moderate susceptibility to desertification, considering that about 94% of NEB is part of this scenario. The project consists in verifying the climatic variability of the Potiguar basin by analysis of possible contributions of the changes in the occupations and land uses that cause desertification by using multispectral images and remote sensing techniques and, in this way, associate the meteorological data with the Physical environment.

. Already as specific objectives:

- Temporal analysis of desertification in the Potiguar basin;
- Verify eventual changes in the time series of biophysical parameters given the analysis of desertification in the Potiguar basin;
- Perform an analysis of changes in land use and occupation using LULCC techniques and Landsat TM images.

Data and Methodology

The study area is part of the Meso-Cenozoic basins of the equatorial margin. It is located at the eastern end of the Brazilian Equatorial Zone, with an area of approximately 48.000 km², with 40% of the onshore part and 60% of the offshore part. It covers part of the States of Rio Grande do Norte and Ceará, limiting itself to the east with the Alto de Fortaleza and to the west with Alto de Touros as characterized by Bertani et al. (1990).

The methodology used will be by analysis of the data of climatic indexes through software R, of the standardized precipitation index (SPI) and satellite images LANDSAT.

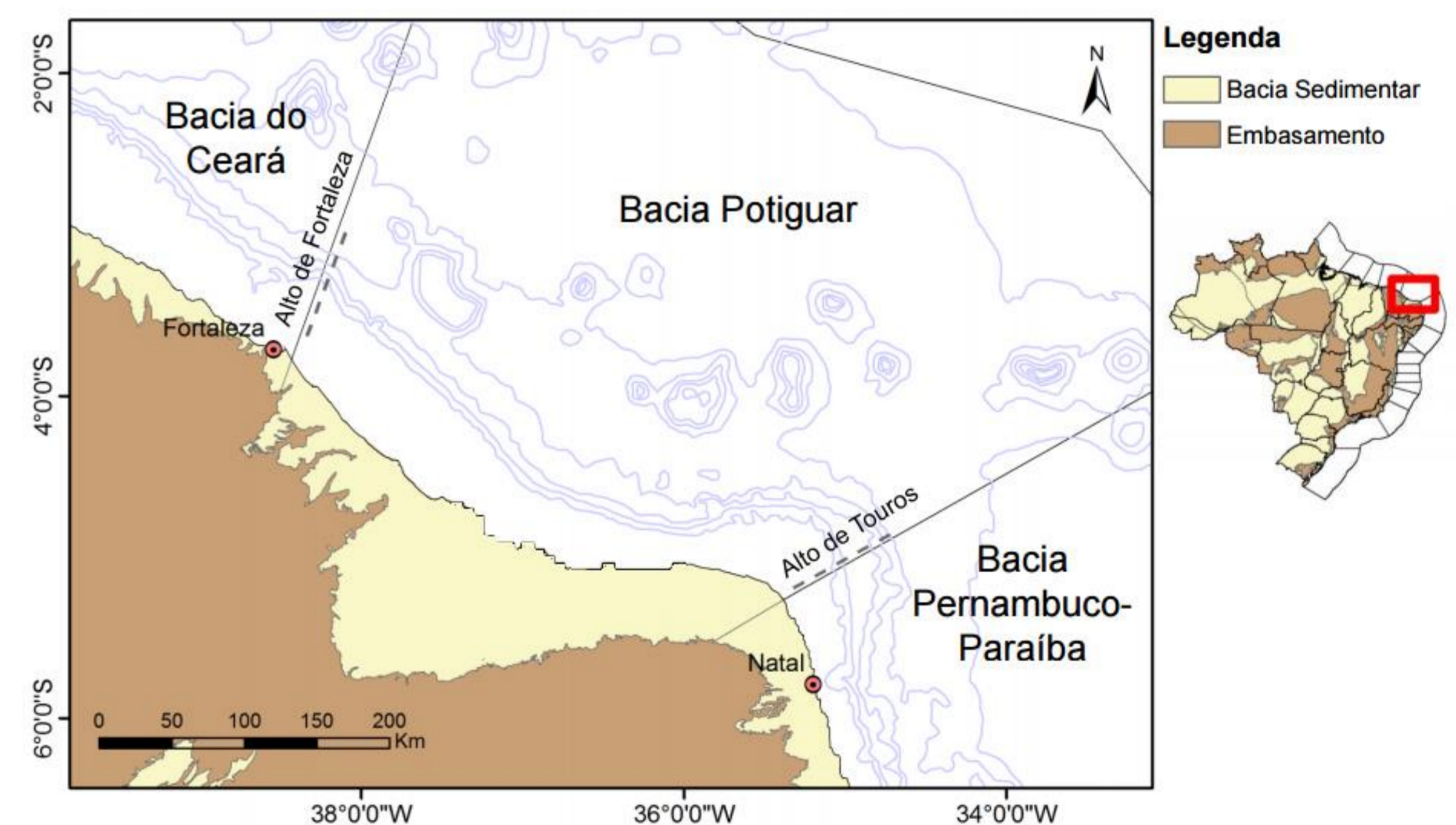
The LANDSAT satellite images can be obtained, free, from the website of the National Institute for Space Research (INPE) and the United States Geological Survey (USGS) EarthExplorer website, which is a tool that provides users with the ability to query, search satellite images, Aerial photographs and cartographic products.

Fig. 1 - Location of the Potiguar Basin in red



Source: Petrobrás (2007) and Nogueira (2014)

Fig. 2 - Approximate map of the Potiguar Basin



Source: Adapted from Petrobrás (2015)

Expected results

As a result, the product of this research is expected to be able to associate the meteorological data with the physical environment and, therefore, that some changes of the use of the ground can provoke alterations in climatic elements at local level.

References

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