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## **Exploratory functional data analysis applied to environmental chlorophyll bio monitoring data**

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Modern science has had interest in establishing approaches for defining patterns present in environmental data measurements, especially in remote sensing investigation. In the Atlantic Ocean, only the phytoplankton of the northern hemisphere has been (and remains to be) investigated, mainly from collections made with remote sensing. This is so because most of the newest orbital sensors, responsible for bio monitoring, are maintained by governmental weather agencies of northern hemisphere countries only. In this paper, it is suggested applying exploratory functional data analysis (FDA) to investigate the relationships between chlorophyll-a concentrations and conditions at the sea surface in the Tropical South Atlantic Ocean and their variability over recent years. FDA is a relatively new branch in statistics. Data measurements of smooth processes over time may come from a process naturally described as functional. In this study the case of functional data presenting spatial dependence is focused on. FDA was applied to check more than 850 time series chlorophyll-a and sea surface temperature data and to help to identify important statistical patterns in both datasets. Results allow us to conclude that phytoplankton bio-dynamics functions response is influenced by several physical boundary conditions such as area, temperature and coastal effects. Finally, this paper attempts to make a contribution to oceanographic implications on global change effects in this important ecological habitat.

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