RELATIONSHIP BETWEEN SEA REGIONS WITH HIGH THERMAL VARIABILITY AND WILDFIRES FROM 1981 TO 2008

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1. ABSTRACT

A temporal coverage of 27 years is currently available at the new version of the OISST (NOAA Optimum Interpolation Sea Surface Temperature Analysis) database. Such period is appropriate to get information about different climate oscillations, such as El Niño-Southern Oscillation (ENSO) and North Atlantic Oscillation (NAO).

Among the diversity of Sea Surface Temperature (SST) analysis products which are now being processed under the GODAE (Global Ocean Data Assimilation Experiment) High-Resolution SST Pilot Project (GHRSST-PP) guidelines, the OISST v.2 product presents the most suitable technical characteristics for this study, which are: a daily SST and SST anomalies dataset, with a 0.25º grid resolution of global coverage, obtained by optimum interpolation of Pathfinder AVHRR (Advanced Very High Resolution Radiometer) data, error reduction due to presence of ice and clouds, enhanced temporal smoothing techniques and satellite bias correction from in situ data.

In the present study, the daily global SST anomalies are analyzed in order to define and characterize sea regions according to their thermal behaviour through the years 1981 to 2008. The methodology used is based on Principal Component Analysis (PCA), clustering and statistical techniques of image classification. The resulting sea regions with highest annual and inter-annual SST variability, as well as highest thermal anomaly level, are used to analyze, by means of the observation of SST and, eventually, other climate variables fluctuations, their possible connection with continental processes, such as drought and wildfires. The correlation analysis of SST inter-annual variations of major sea regions with highest thermal variability and their response expected in major fire regimes includes a multiple correlation analysis. For the multi-temporal analysis of these connections, major sea regions seasons are established, as well as fire seasons in northern and southern hemispheres. Different aspects are to be contrasted with the sea regions SST history: the increase/decrease of total area burned at a large scale, and changes in spatial patterns of burned area.

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