



Analyses of Highs and Lows tracks in South Atlantic from 1950-2000

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Abstract: From the correlations of Highs features, surface of Azores Highs and Trade Winds, this study permit to evaluate the intensity of the relationships between these majors elements of North Atlantic Climate.

1- DATA and METHOD.

The data are extracted from NCEP-NCAR Reanalysis (cdc.noaa.gov/cgi-bin/njphnc/Datasets). The computations were done using the free statistical package R, (<http://cran.r-project.org>).

Working from National Center for Environmental Prediction-National Center of Atmospheric Research, Sea Level Pressure daily records from 01/01/1950 to 12/31/2000, we have retraced, using a method developed by A. Favre, A. Gershunov (2003, 2006) the trajectories of the Highs.

This method is divided into two successive automated stages:

- Recognition of the maxima of pressure on each map, concerning each day of the period,
- Connections between the different maxima during their movement, At all the measures of time (synoptic, seasonal, annual, for the whole period) with some of their characteristics: latitude (genesis, lysis, mean), longitude (genesis, lysis, mean), pressure (max, min, mean), speed of displacement, distance, duration, surface.

These Data Bases represent the variability of Highsand Lows tracks along the period (time series).

After analysing variations of Highs and Lows tracks we showing here two potential axis of researches from these data bases:

- Working from a method developped in Pommier, Leroux (2004) we establish an index for different time series which could help for prediction.
- Working from pressure and temperature evolution of the Antartic Peninsula (which is very popular into the climatic change debat), we analyse the links between Lows tracks.

2- RESULTS AND INTERPRETATIONS.

Highs and Lows monthly cycles:

For Lows: frequency, duration, distance, latitudes and speed are higher during winter months and weaker during summer months and pressure are lower during winter. For Highs : frequency, pressure, duration, latitudes, distance and speed are higher during winter months and weaker during summer months.

Highs and Lows time series:

Lows are more frequent, deeper, go southward since 1970

Highs are more frequent, have higher pressure, go northward since 1970

South Atlantic Dynamic Index:

Figure 1. seasonal and annual indices

Highs and Lows and Antartic Peninsula:

Figure 2. Temperature from NCEP-NCAR SLP from NCEP-NCAR

In this Region Lows are more frequent, deeper and go further south, so they transport faster some «hotter» air into the Peninsula. Result: temperature increase and pressure decrease. This dynamic have great impact on ice shelves.

3-CONCLUSIONS.

This analyse allows to better understand the climate variability over the south Atlantic region at surface level and it can be a very usefull axis of researches for climatic change debat.

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