

Relationship between Atmospheric Circulation, SST anomalies and ENSO events in the Southwestern Atlantic ocean

D. Severov (1), C. Mechoso (2) and V. Pshennikov (1)

(1) Facultad de Ciencias, Universidad de la República, Iguá 4225, 11400 Montevideo, Uruguay (seva@fcien.edu.uy) (2) Department of Atmospheric Sciences, University of California, Los Angeles 405 Hilgard Avenue, CA 90095-1565 USA

The propose of this paper is to study the relationship between atmospheric circulation and sea surface temperatures (SST) anomalies variability in periods previous to ENSO events, for 1951-2000. Daily data of sea level pressure (SLP) reanalysis in the Southern Hemisphere from Climate Diagnostic Center were analyzed. Displacement of atmospheric centers of SLP at medium and high latitudes in the southern hemisphere were analyzed for Atlantic and Pacific oceans. SST anomalies in Southwestern (SW) Atlantic from Kaplan data set at 8 points in Brazil-Malvinas Confluence (BMC) system were used. The previous results published by authors, which are used in this study are: SST anomalies variability shows that decrease of the negative SST anomalies at the Malvinas current in April and the preservation of its trend until October suggested as a precursor of El Niño; during the same period, decrease of the SST anomalies at cold water pass of the BMC is suggested as a precursor La Niña. In order to determine the cause of SST anomalies variability in the BMC for ENSO events the meridional components of wind flow were analyzed using the SLP fields. The predominant types of atmospheric circulation according to the southern or northern components of wind in the SW Atlantic in previous the winter period of ENSO events year were compared with SST anomalies variability. The principal cause of the strengthening of the Malvinas current during an El Niño year is displacement of the southern Pacific anticyclone center towards the Strait of Drake. The weakening of the Malvinas current during La Niña years occurs when the southern Atlantic anticyclone is displaced to the South American continent. During neutral years no clear patterns were observed. The atmospheric circulation patterns in the winter period during 50 years of El Niño and La Niña events are suggested.