

CLIMATE VARIABILITY RESEARCH IN URUGUAY AND FUTURE PERSPECTIVES

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Some early studies related with climate variability on precipitation and water vapor variability was done in the región like the paper by J.Jagsich titled "**Régimen hídrico de nuestra atmósfera**" published in the Revista Meteorológica in Montevideo, Uruguay, 1954. Some recent studies made by investigators of Department of Meteorology (Fac.of Science) on Climate Variability and ENSO are:

- **Anomalías de la Precipitación en la Región Sureste de América del Sur (Uruguay) asociadas con el fenómeno de "El Niño - Oscilación Sur" (E.N.O.S.).** III Congreso sobre Meteorología del Hemisferio Sur. Bs.As. Argentina. Noviembre 1989. M.Bidegain y R.M.Caffera.
- **Informe Técnico sobre la Sequía 1988-1989 en Uruguay. Recurrencia de las anomalías negativas de la Precipitación sobre Uruguay.** Fac.Humanidades y Ciencias.1989. M.Bidegain, R.M.Caffera.
- **Comportamiento de la precipitación en la región sureste de América del Sur asociado a los índices de Oscilación Sur (I.O.S.) y El Niño (T.S.M.).** VI Congreso Argentino de Meteorología. Bs.As. Argentina. Setiembre 1991. M. Bidegain, R. M. Caffera, G. Pedrosa.
- **Aspectos de la Variabilidad Climática secular de la Precipitación en Uruguay (Sud América).** I Congreso Iberoamericano de Meteorología y V Congreso Interamericano de Meteorología. Salamanca. España. Setiembre de 1992. M. Bidegain. C. Deshayes.
- **Anomalías de la temperatura en superficie en el sureste de Sudamérica (Uruguay) asociadas al Fenómeno ENSO.** VIII Congreso Latinoamericano e Ibérico de Meteorología. Brasilia.Brasil. Octubre de 1998. Bidegain M., Krecl P.
- **Climate Variability and Agriculture in Argentina and Uruguay: Assesment of ENSO Effects and Perspectives for the Use of Climate Forecast.** Final Report to IAI. Comisión Nacional sobre.Cambio Global. January 2000.

Studies on estimation of Climate Change and its impacts on precipitation and temperature and regional impacts on agriculture and water resources also was done:

- **Evolución y Cambio Climático de la Pradera en Uruguay.** Climate Research. CR. Special. Vol.9 N°1 and 2. 1997. D.Panario, M.Bidegain
- **Performance de los Modelos de Circulación General Climáticos en el Sudeste de América del Sur.** Climate Research. CR. Special. Vol.9 N°1 and 2. 1997. R.Hoftadter, M.Bidegain.

The Department of Meteorology (Universidad de la República) have a new web page where it is possible to find products like: Climatic Normals, Climate Perspectives and general information on weather and climate for Uruguay. The web page address is:

<http://meteorologia.fcien.edu.uy>

One proposal for future climate research between the IAI-CRN- PROSUR is the study of "**Temporal and spatial variability of the water vapor over Uruguay, Paraguay, eastern Argentina and southern Brazil**". The objective is to identify and quantify the factors which explain the fluctuations of fluxes of water vapor over the region and the extreme precipitation events.

This study involves additional research in some climate topics of large and meso scale phenomena:

Large and synoptic scale features:

- ENSO (El Niño - Southern Oscillation) and its teleconnections over the region.
- Sea surface temperature anomalies over the South Atlantic Ocean and its impacts.
- Water vapor regional sources (Pantanal, Atlantic and Pacific Ocean, etc)
- Atmospheric Oscillations (seasonal, intraseasonal, QBO, etc.).

Mesoscale features:

- Water vapor local sources (Río de la Plata, Merim lagoon, etc)
- Sea breeze and its transport of water vapor to coastal regions.
- Soil water vapor content and its transference to atmosphere lower levels mainly during warm season at mesoscale.
- Low level circulation during extreme precipitation regimes

To develop this proposal it is necessary to have access to observational (pluviometric and synoptic) data. Now it is possible to make analysis like wind field and water vapor fields based on reanalysis information from ECMWF and NCEP.

The second step, and due to the lack of observations in the region, is to make simulations of water vapor fluxes and precipitation with some Mesoscale Model (RAMS, MM5, etc) and study the performance of the model to simulate normal conditions and extreme regimes (like maximum precipitation events).