

How well do GCMs represent present climate characteristics in Southern South America?



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The outputs of the new generation of global circulation models (GCMs) are available for different climate-related studies through the WCRP CMIP5. Dynamical and statistical downscaling are examples of these studies. The objective of this study is to evaluate the GCMs skills to simulate regional patterns, temporal variations and distribution of climate variables in order to assess their representation of the observed climate in Southern South America.

Data and Methodology

Surface Variables

• Gridded maximum and minimum temperatures from Tencer et al 2011.

Circulation Variables

• Daily mean sea level pressure (SLP) and air temperature at 850 hPa (T850) fields, corresponding to the NCEP-DOE Reanalysis II

Models

• Daily outputs from the Historical Experiment of WCRP CMIP5: 2 m maximum and minimum temperatures in Southern La Plata basin, air temperature at 850hPa and sea level pressure fields in the Southern South America Region. 15 Models.

The comparison between reanalyses and GCMs was performed by means of analysis of distributions, Taylor diagrams and unrotated principal component analysis.

Region of Study

Red: Southern La Plata Basin

NE: Northeastern Argentina

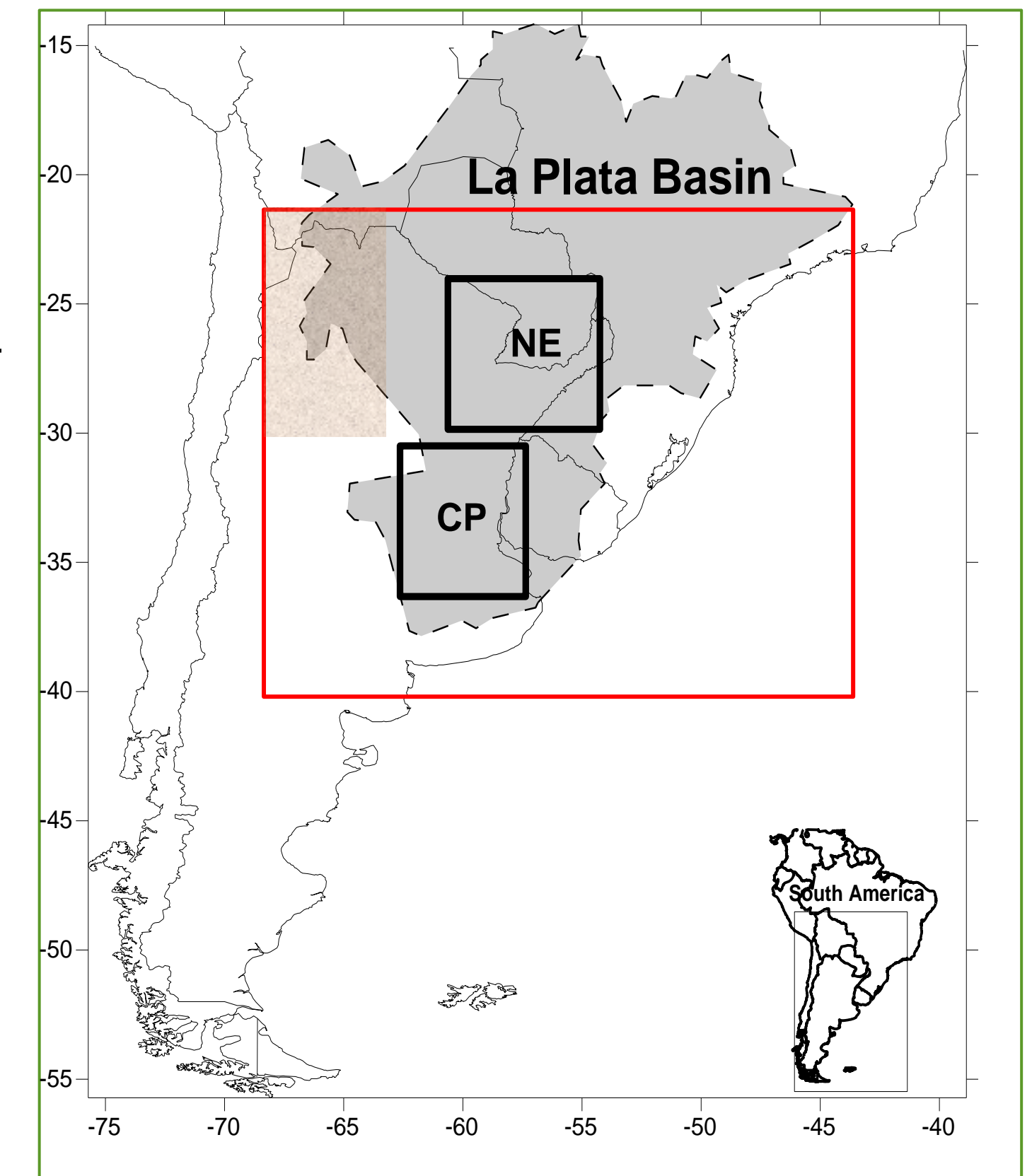
CP: Central Pampas

Brown Box: extracted for statistical metrics

Seasons

Austral Winter (JJA) and

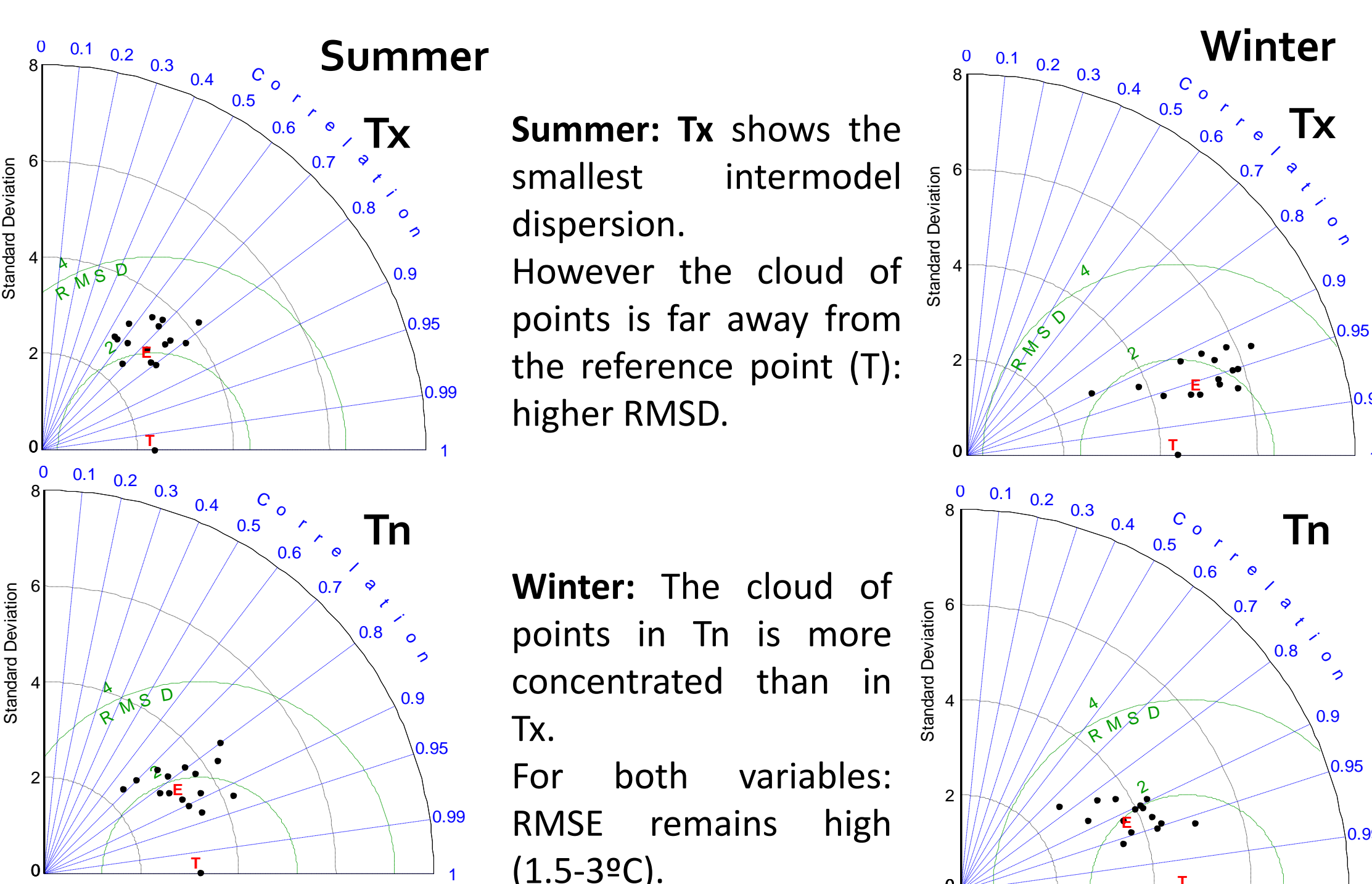
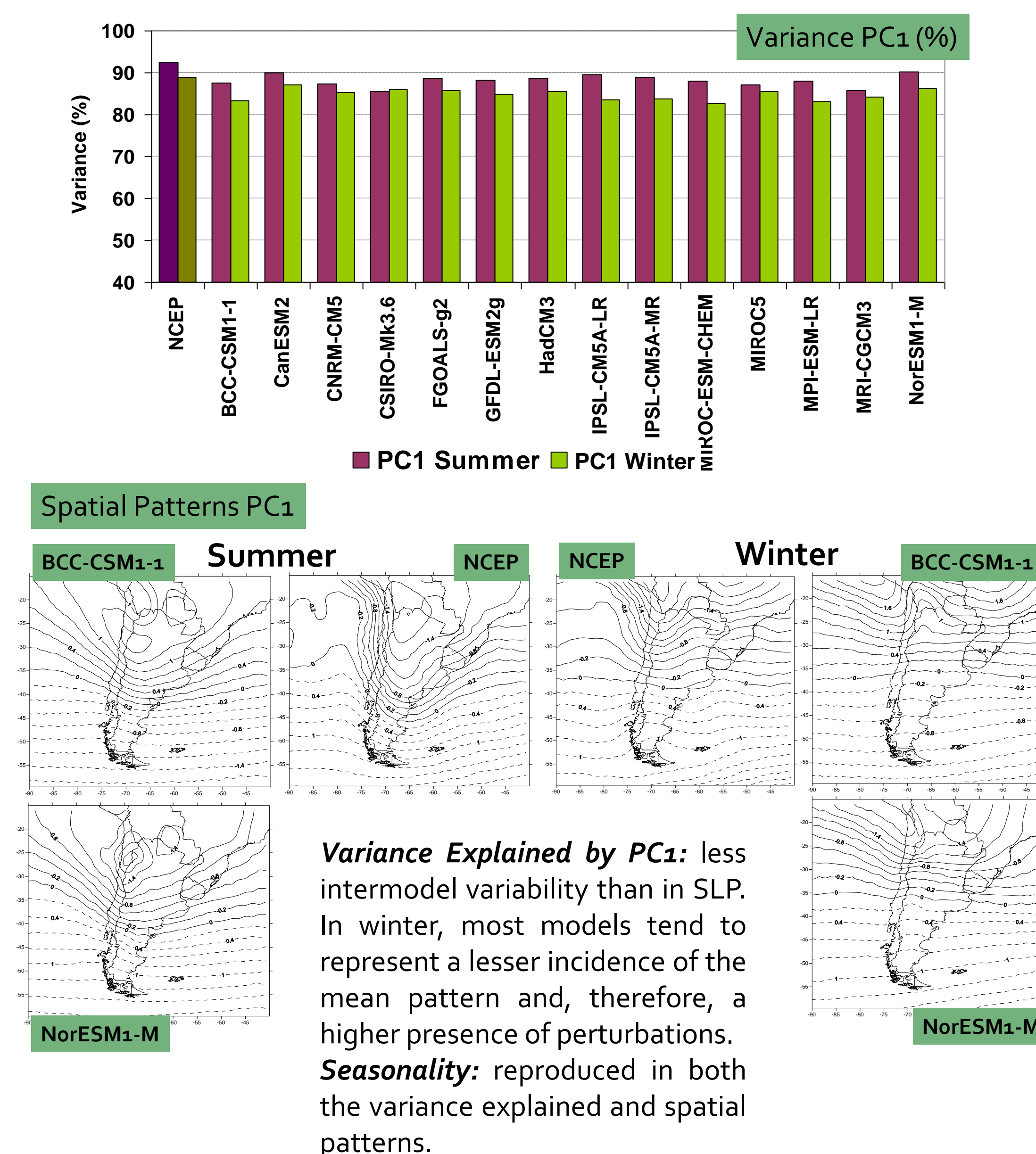
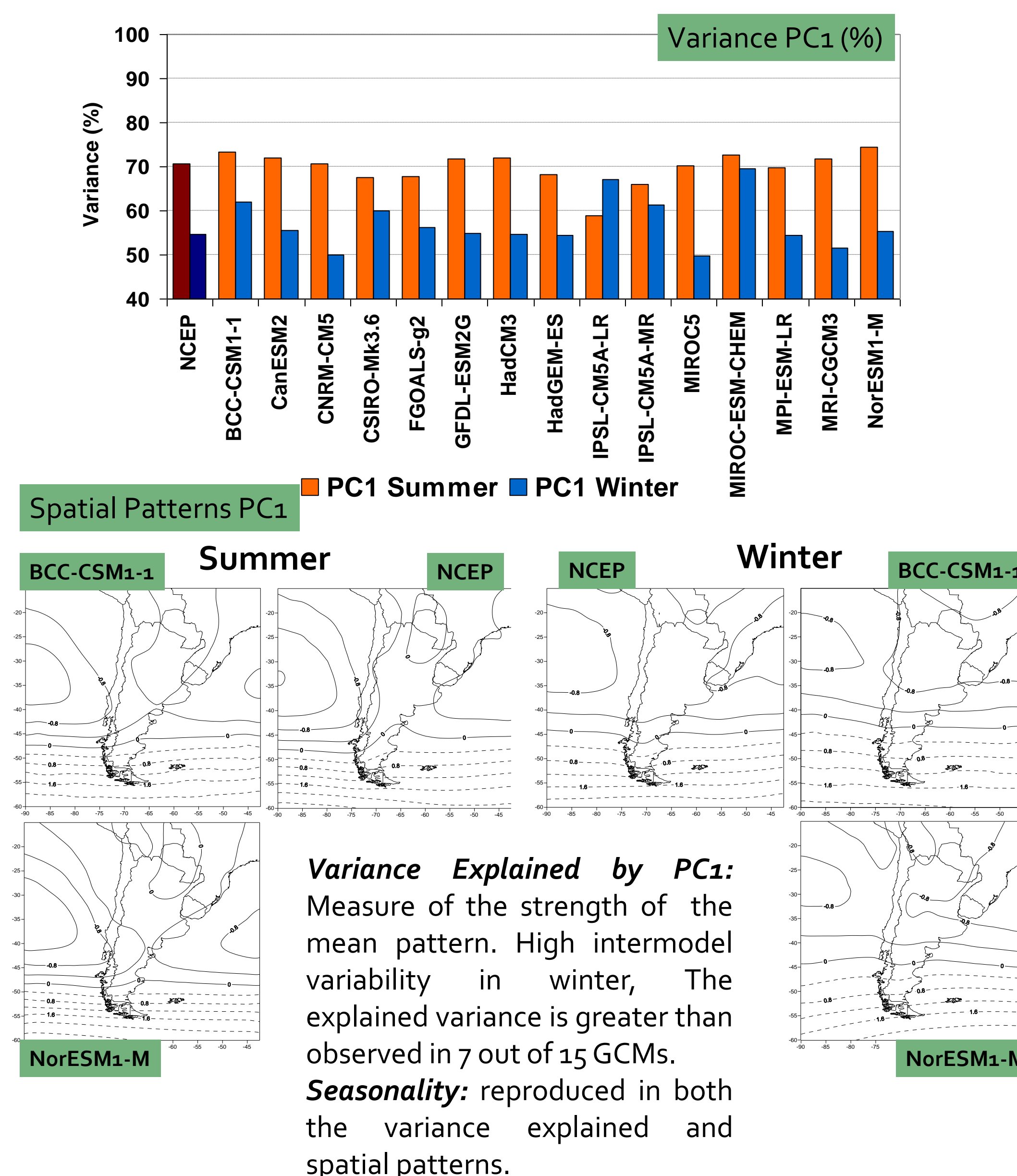
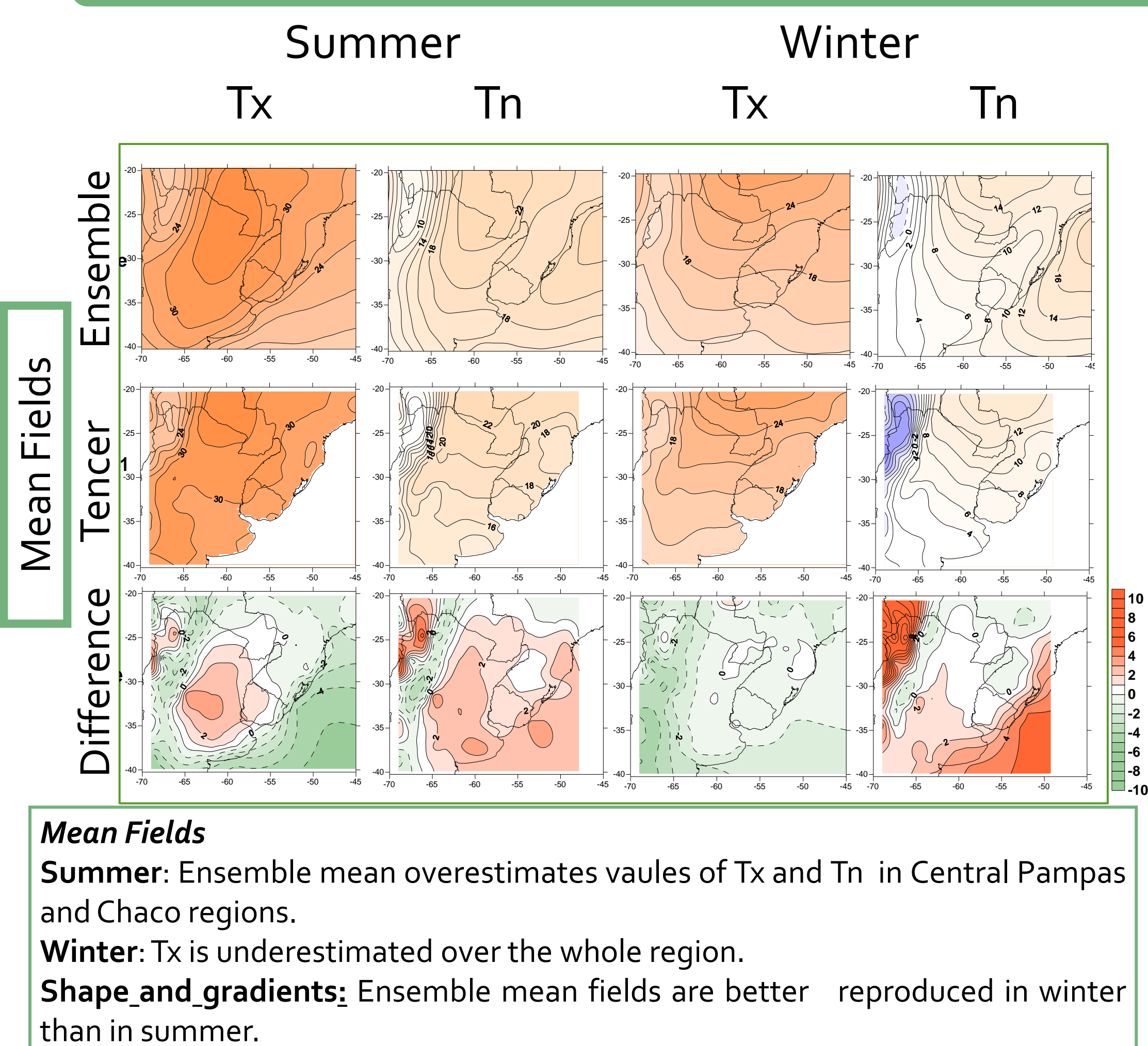
Summer (DJF)



Tx and Tn

SLP

T850



Distributions

Mean values: High inter-model dispersion.

Standard deviations and ranges: Overestimation - very extreme values

Unrealistic extreme values

