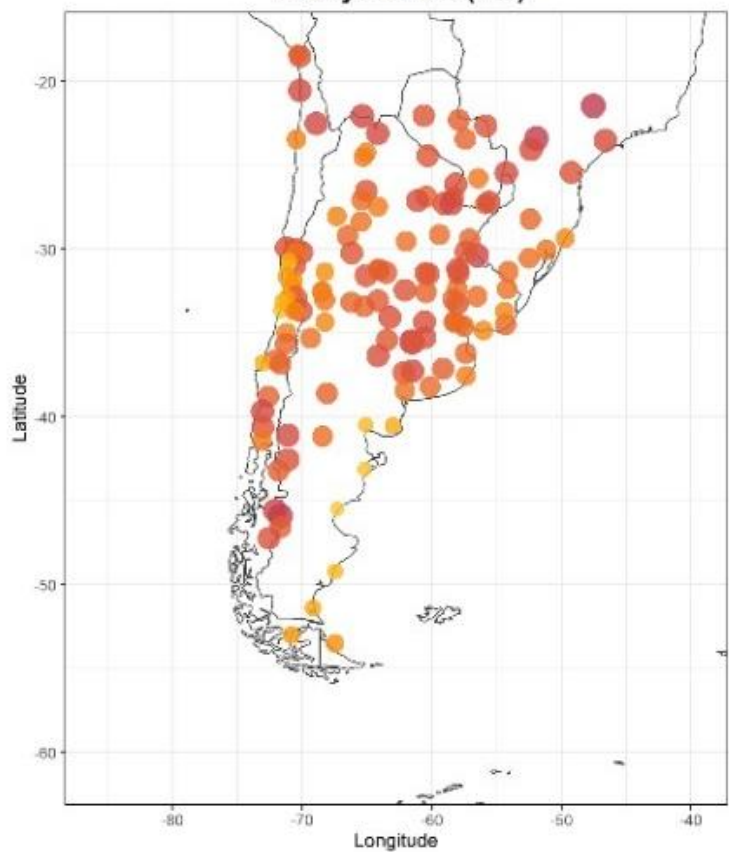# MATILDE RUSTICUCCI

- PROFESSOR UNIVERSITY OF BUENOS AIRES, ARGENTINA

  - DEPARTMENT OF ATMOSPHERE AND OCEAN SCIENCES.

- IPCC

  - AR6 WG2 *CENTRAL AND SOUTH AMERICA REGIONAL CHAPTER.*

    - AR5 WG1 CLA IN *OBSERVATIONS: ATMOSPHERE AND SURFACE* AND SYNTHESIS REPORT

    - AR4 WG1 LA IN *OBSERVATIONS: SURFACE AND ATMOSPHERIC CLIMATE CHANGE AND* SYNTHESIS REPORT

    - SREX REVIEW EDITOR

- WCRP

  - EXPLAINING AND PREDICTING EARTH SYSTEM CHANGE LIGHTHOUSE ACTIVITY.

    - ASSESSMENT OF CURRENT AND FUTURE HAZARDS

Main research fields

- Climatology of South America, focused particularly on extreme events; Heat waves variability.
- Climate impact on human health;
- Seasonal forecast of extreme temperature events.
- Climate change and long term variability in observed and modelled extreme compound events.
- Evaluation of climate models; Projections of extremes
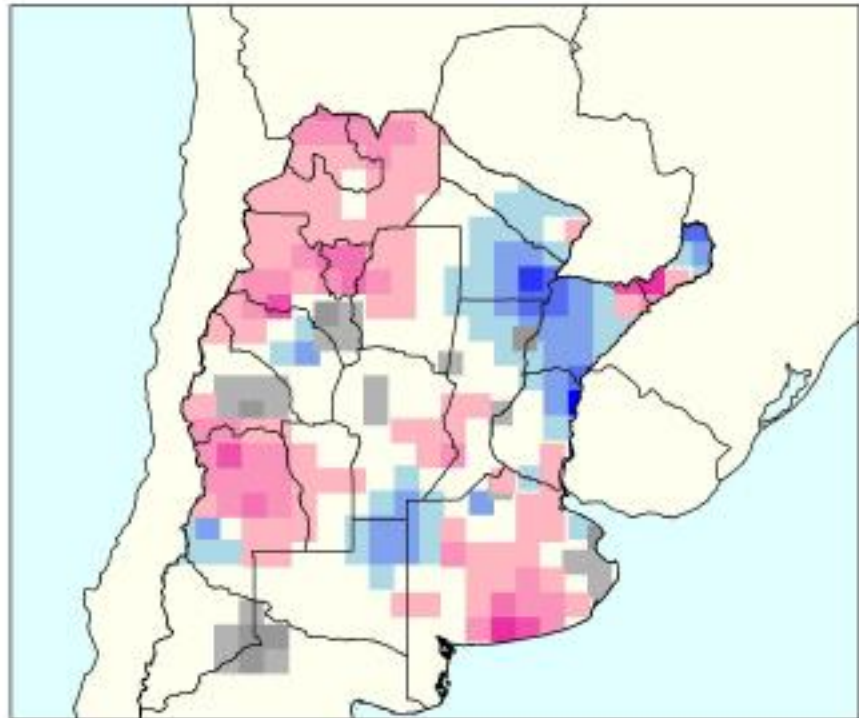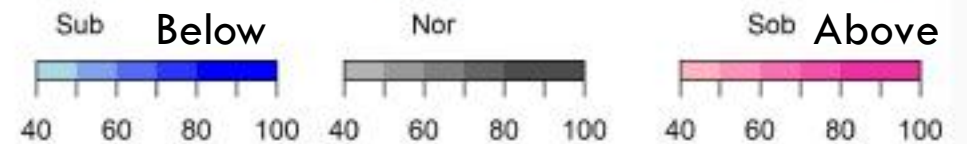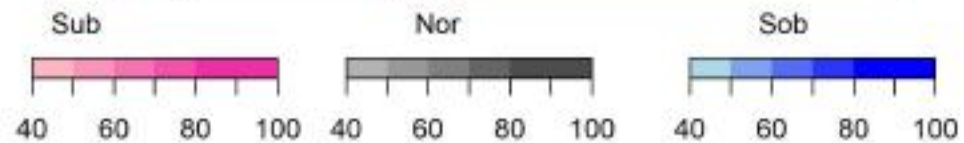
- **Data consistency and quality.**

Cantidad de eventos de MaxTHW (1977-2018)
15-day-window (WS)

Seasonal Statistical Forecast
TN10   TX90

(April May June)

http://pronosticosextremos.at.fcen.uba.ar/

Summer seasonal predictability of warm days in Argentina: statistical model approach,
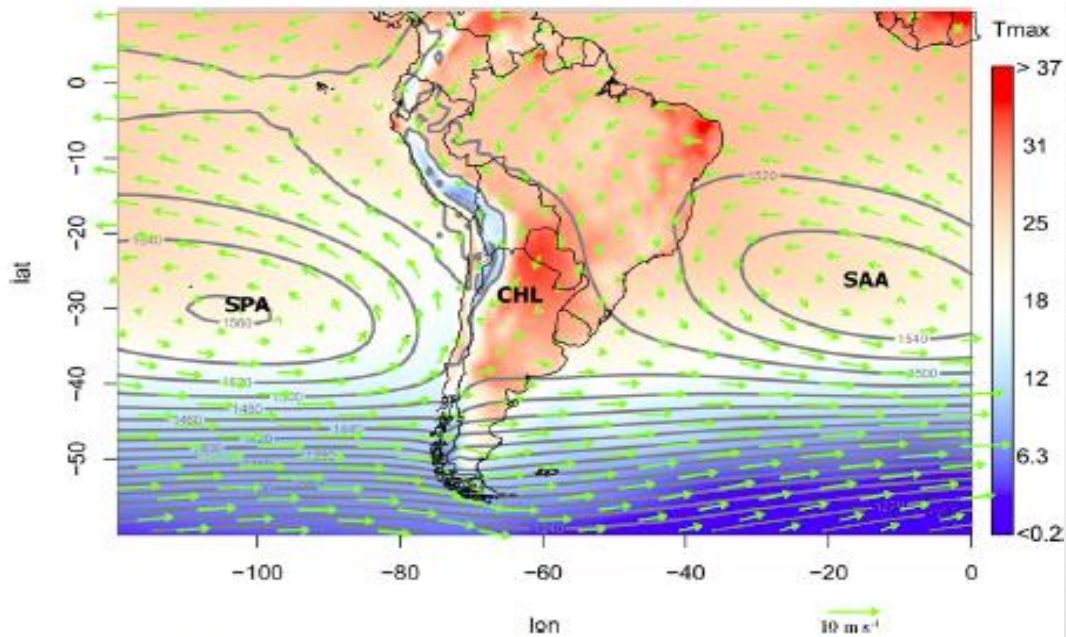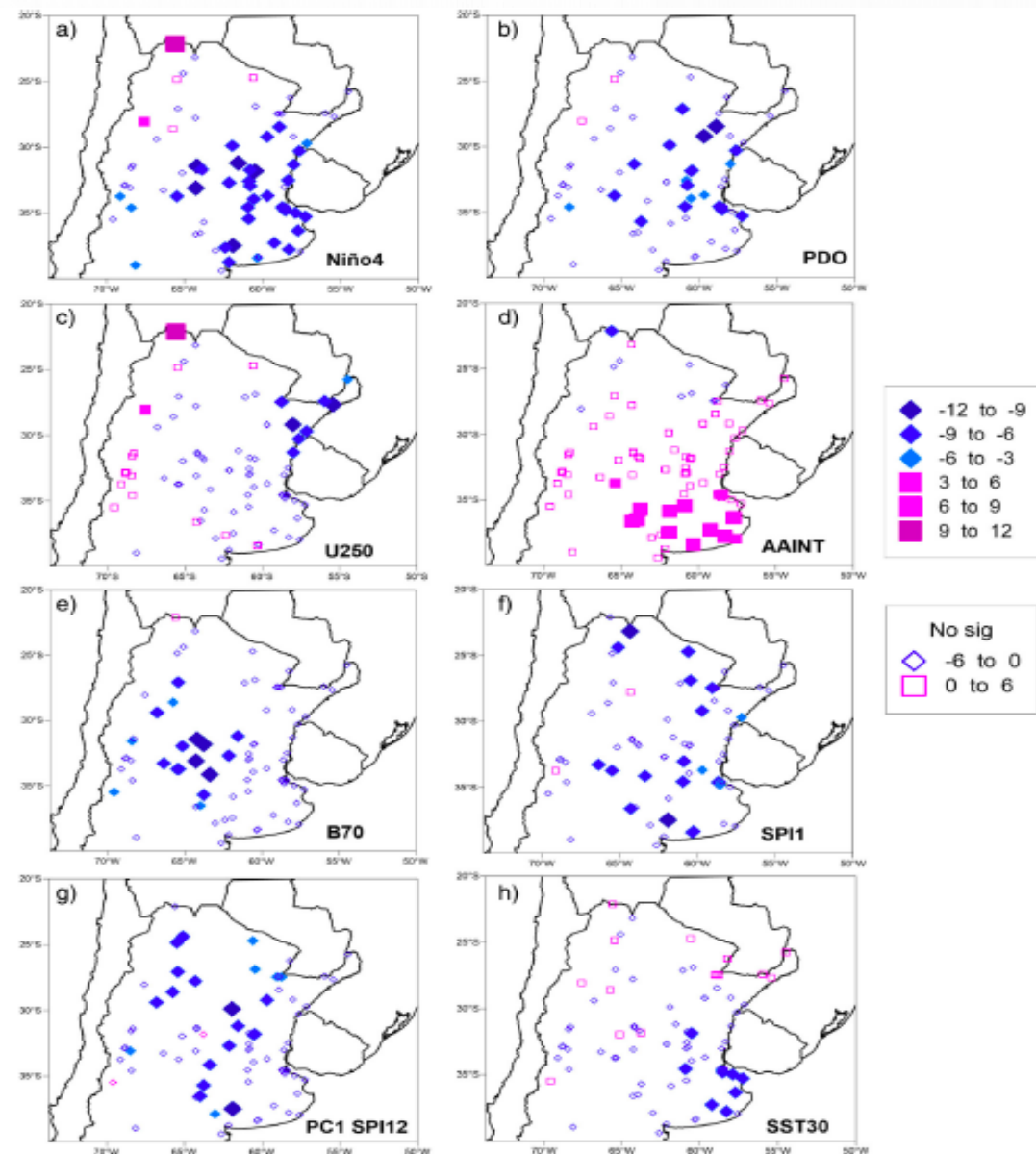
Fig. 1 Basic low-level atmospheric circulation features in the austral summer season (left): the summer mean maximum temperature is shaded, the contours are the seasonally averaged 850-hPa geopotential height, and the arrows are the 850-hPa vector wind, from the ERA-Interim.

Difference fields between DJF TX90 for years when the predictors exceeded the second tercile and the same for years when the index was lower e first tercile [% of days] for a El Niño 4, b PDO, c U250, d AAINT, e B70, f SPI1, g PC1 SPI12 and h SST30. Significant level 5%

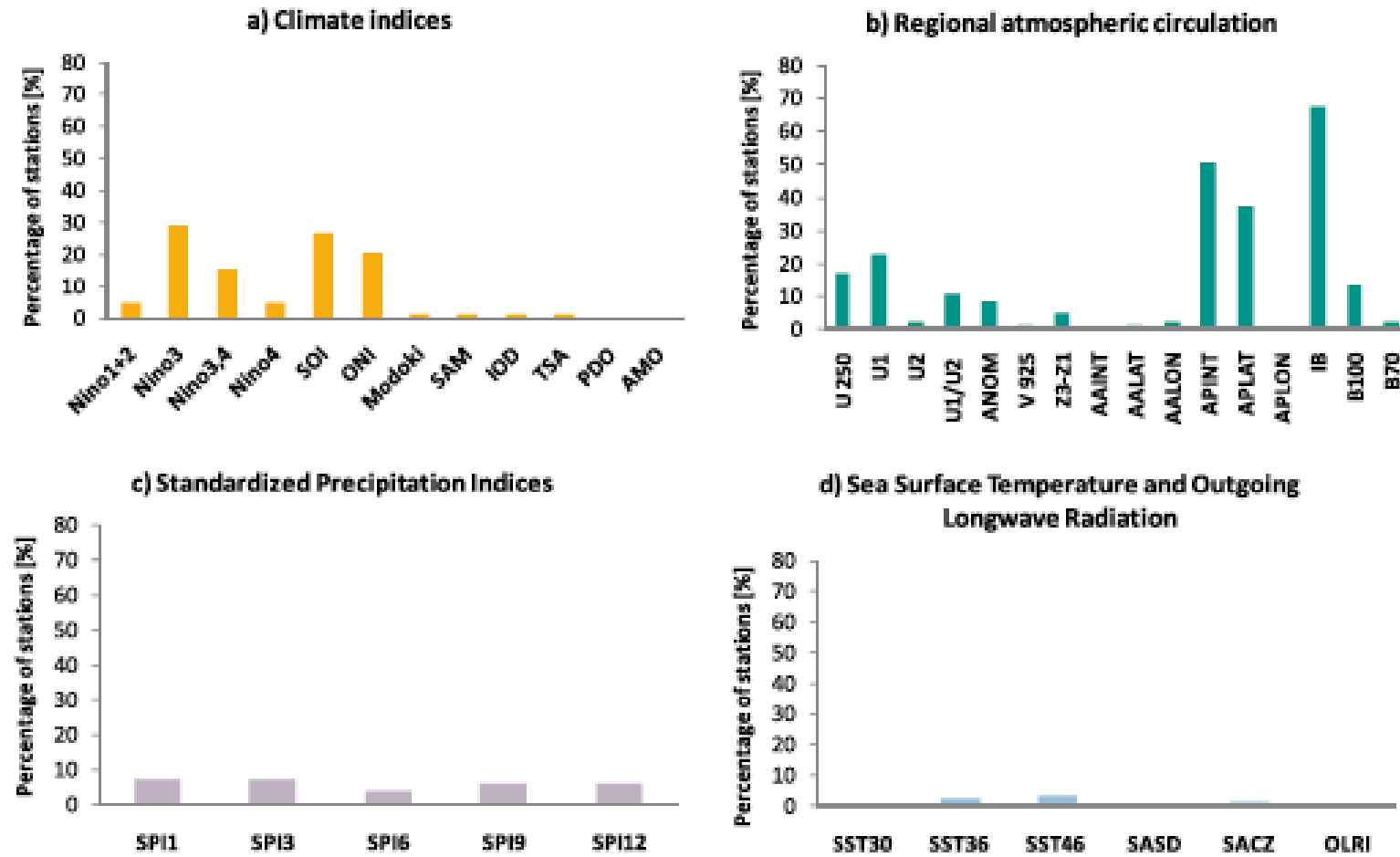# Variability and Predictability of winter Cold Nights in Argentina,

Fig. 5. Percentage of stations significantly correlated at 95% confidence level. The correlations were calculated between the different candidates to predictors in May and subsequent JJA TN10 in the 1970–2015 period. a) Climate indices, b) Regional atmospheric circulation c) Standardized Precipitation Indices d) Sea Surface Temperature and Outgoing Longwave Radiation.

Precipitation deficits influence on seasonal predictability of summer warm days in argentina.

Int. J. Of climatology, in press Collazo, S, M Barrucand, M Rusticucci. (2021)
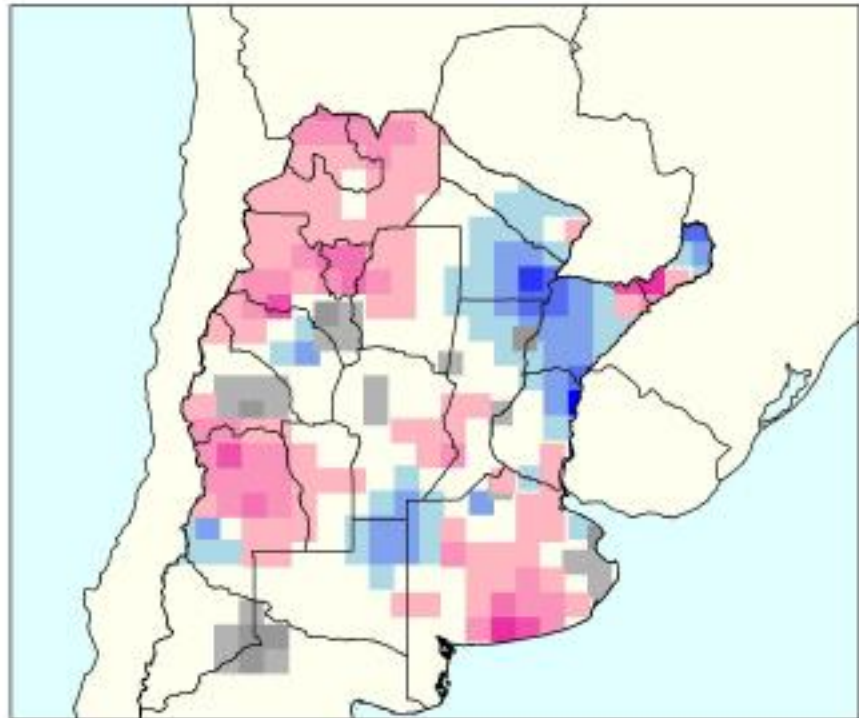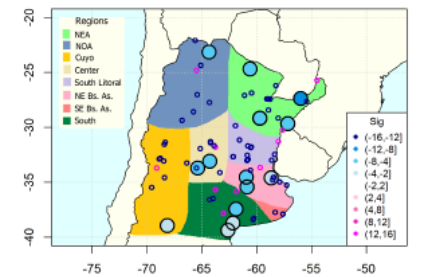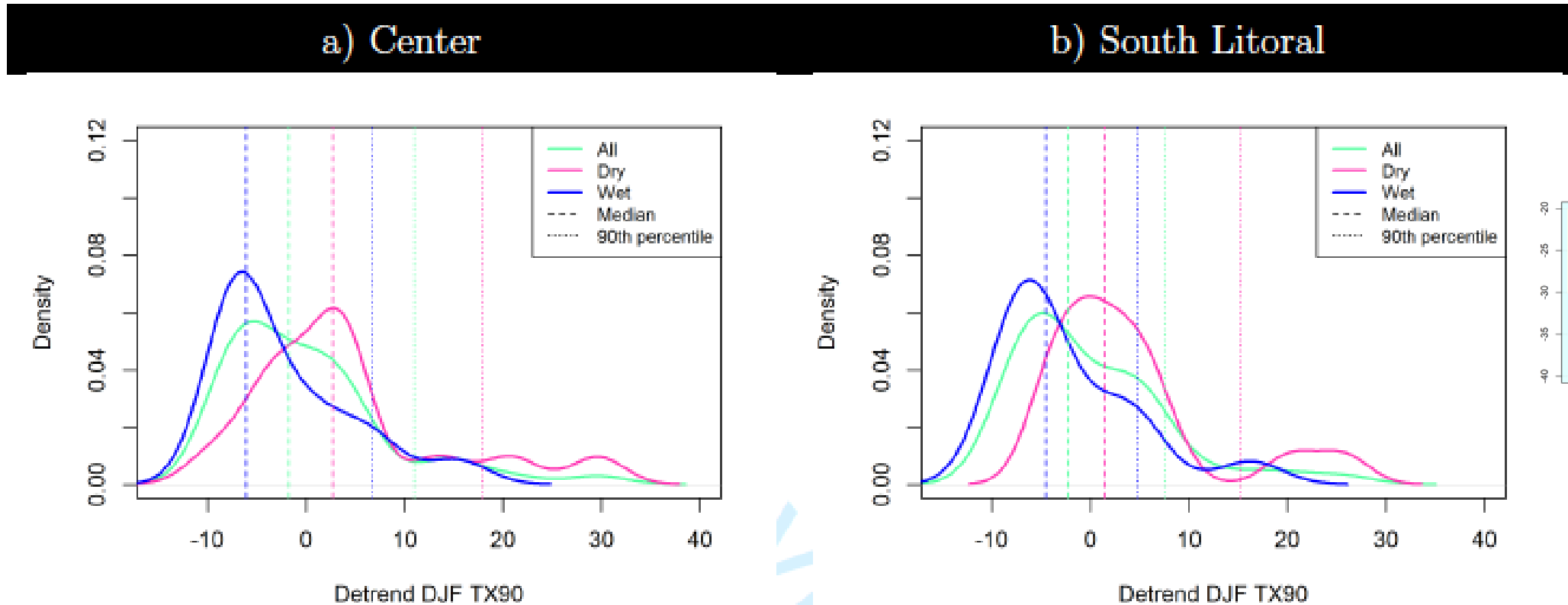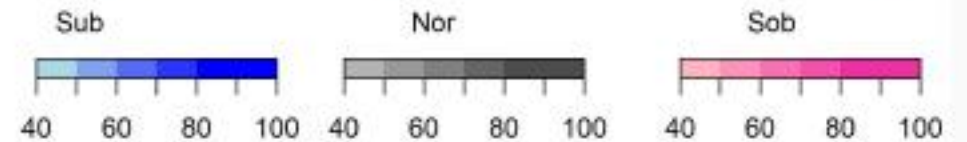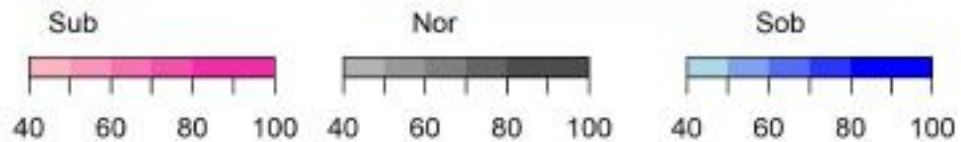

Figure 3: Relative frequency distribution of DJF TX90 for all, dry and wet years, including indication of median (3 vertical dashed lines) and 90th percentile values (3 vertical dotted lines). Classification of dry/wet years according to PC1 SPI1.

Seasonal Statistical Forecast
TN10   TX90

(April May June)

http://pronosticosextremos.at.fcen.uba.ar/

Atmospheric circulation influence on temperature and precipitation individual and compound daily extreme events: Spatial variability and trends over southern South America.
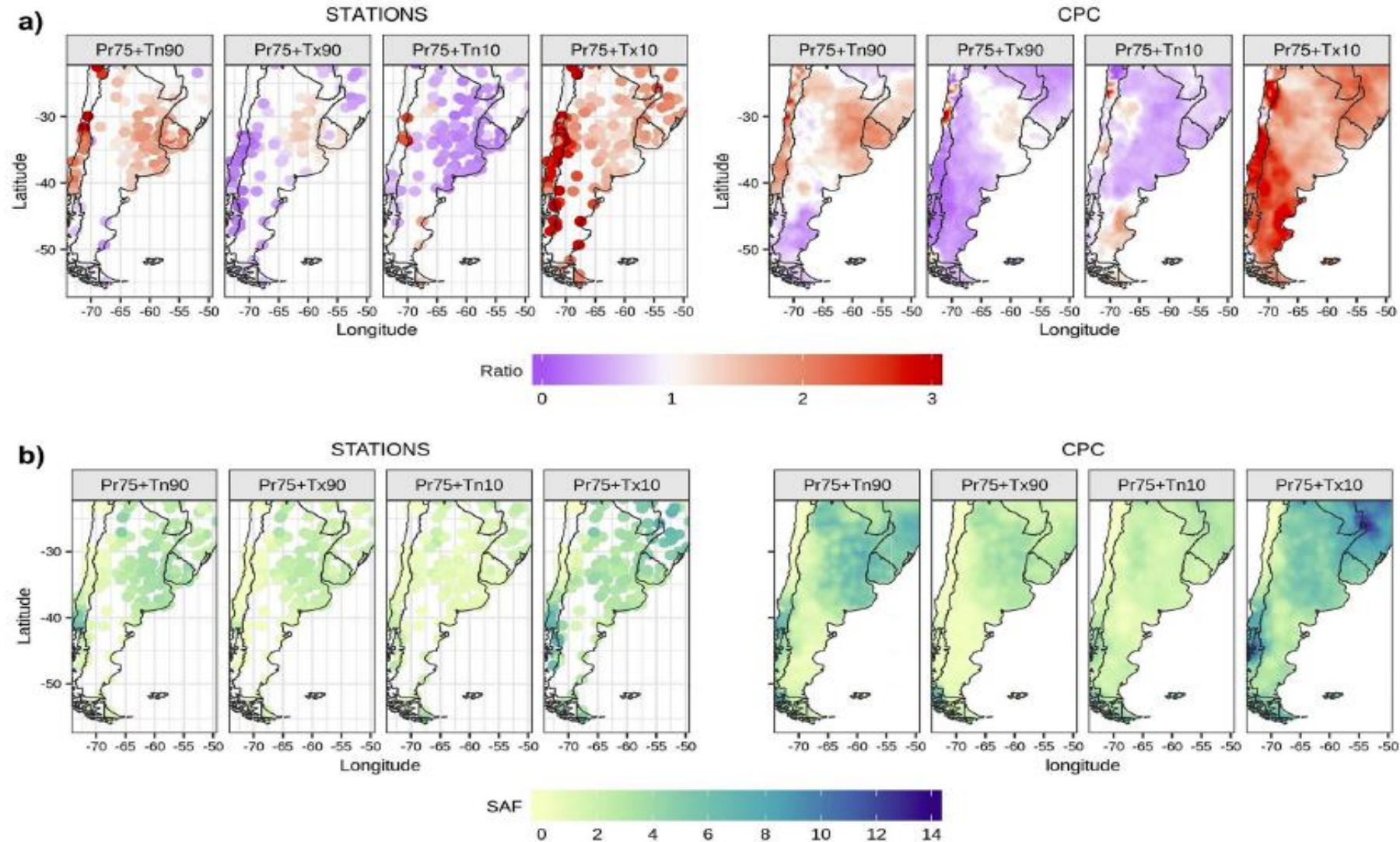
Fig. 2. a) Ratios between conditional and expected probabilities of extreme events over SSA for the warm season. On the left (right) panel, stations (CPC) results are shown. Filled symbols on stations indicate a significant relationship at the 5% level; b) seasonal average frequencies of each compound event (SAF) for the warm season (expressed as the average number of events).

Attribution and projections of temperature extreme trends in South America based on CMIP5 models.
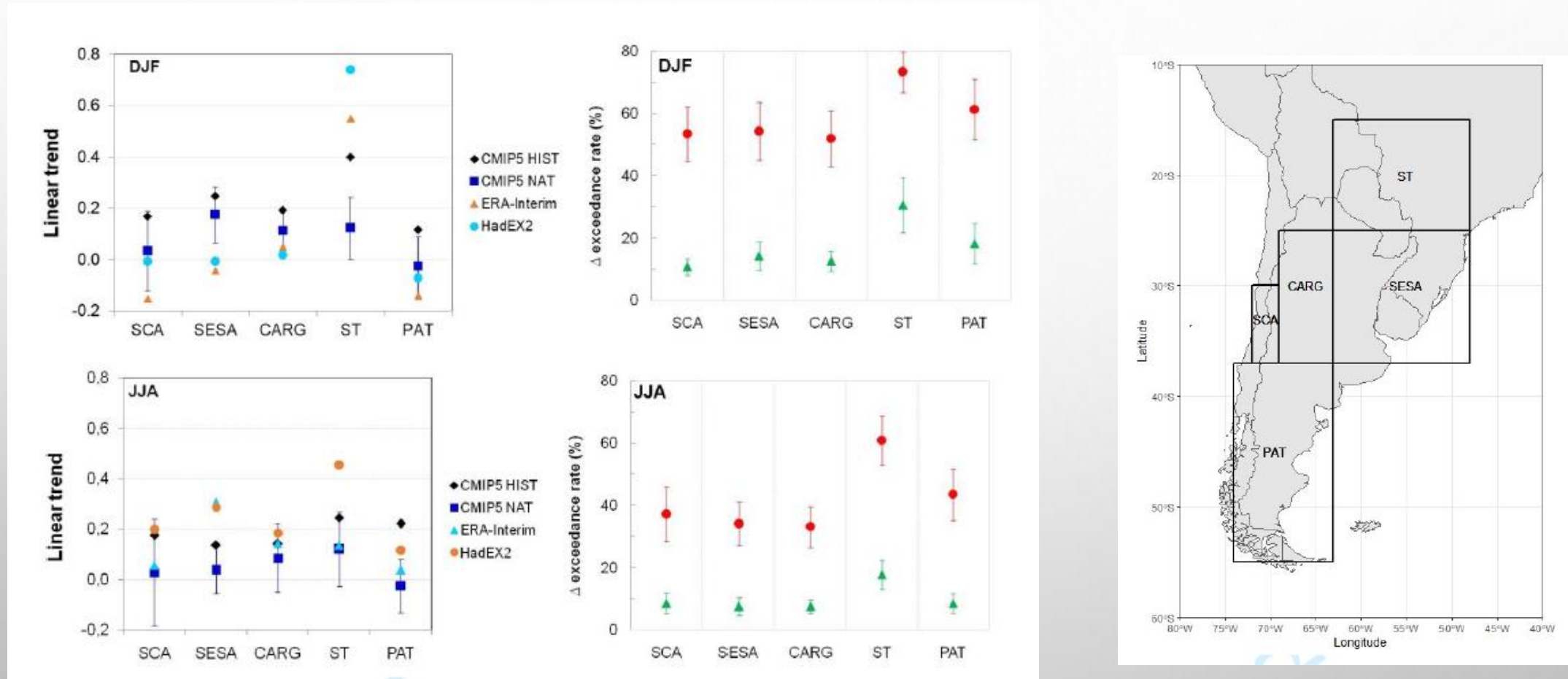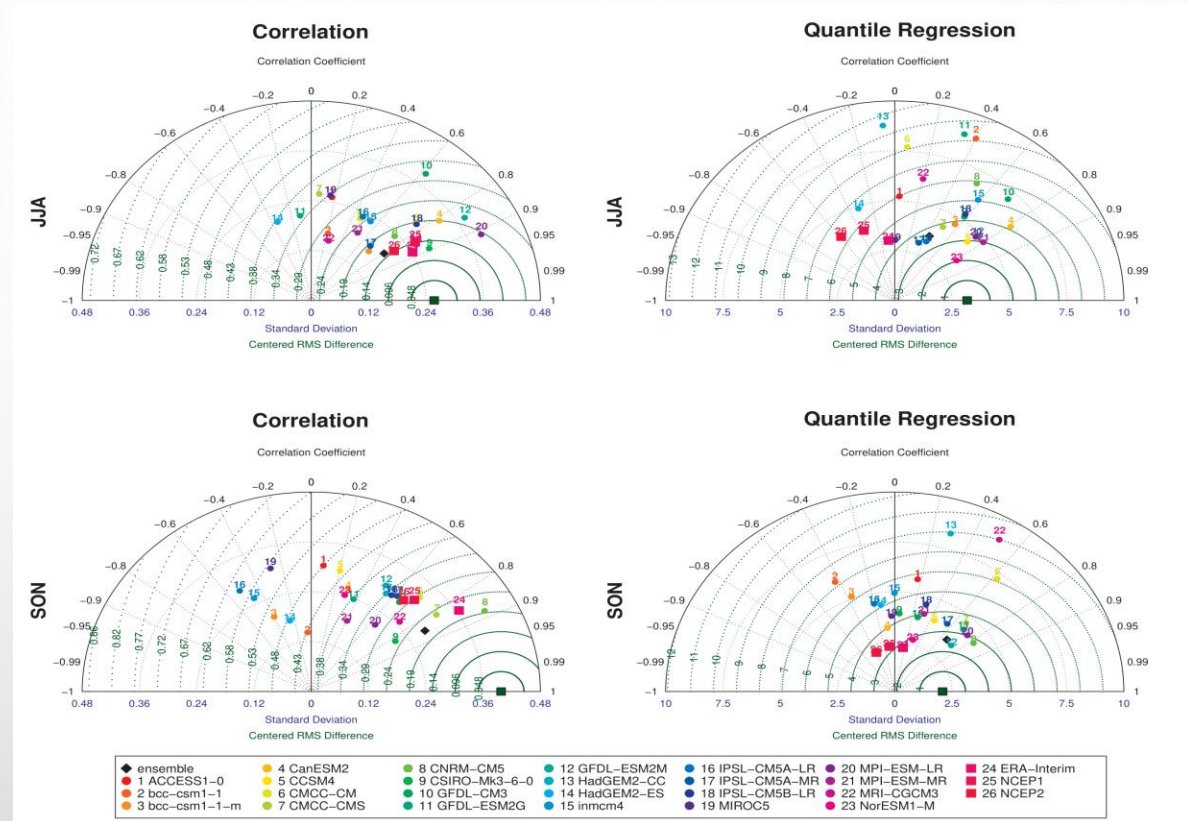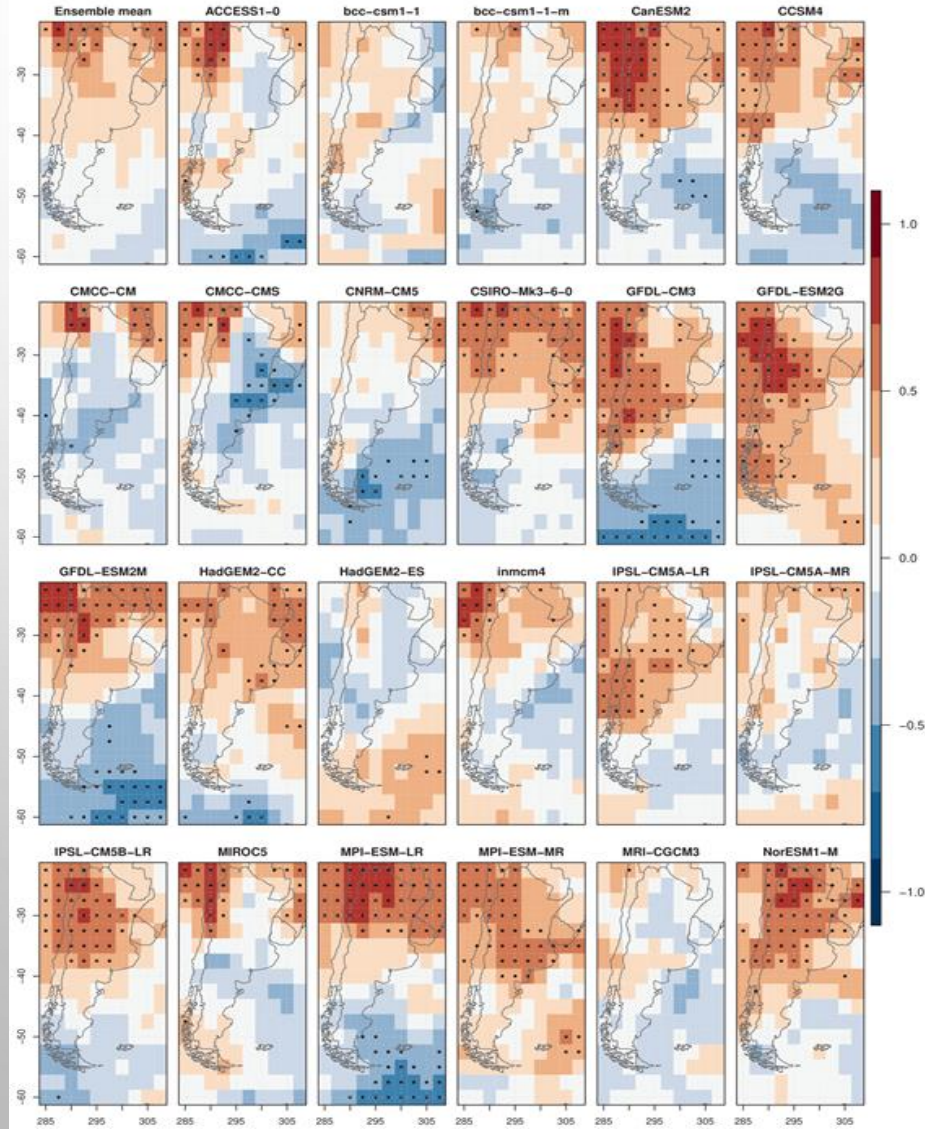
First column: Linear trends for the period 1980-2005 for TN90 index from HadEX2 observational dataset (light blue), the ERA-Interim reanalysis (orange), the historical experiment (black) and the natural experiment (blue) ensembles. Vertical blue bars indicate the standard deviation of the natural experiment. Second column: Projected mean regional differences for mid-term (2021-2040, green) and long-term (2081-2100, red) relative to the period 1986-2005. Upper row: December-January- February; lower row: June-July-August

Association between El Niño and extreme temperatures in southern South America in CMIP5 models. Part 1: model evaluation in the present climate.

CORRELATION BETWEEN MODELED SST IN EL NIÑO 3.4 REGION AND WARM NIGHTS INDEX OF GCMS IN JJA (DOTTED REGIONS INDICATE SIGNIFICANT CORRELATION AT THE 0.05 SIGNIFICANCE LEVEL).

Most of the models were able to adequately simulate the correlations between SST3.4 and TX90p. For TN90p in JJA and SON, several models had acceptable performances, standing out CNRM-CM5, CSIRO-MK3-6-0, HadGEM2-CC, and NorESM1-M. Moreover, we observed that these models were able to simulate the atmospheric circulation and precipitation patterns during ENSO events.

In general, the ensemble-mean has not an outstanding performance or clearly superior performance than an individual model, probably because the ensemble tends to underestimate the variability of both SST3.4 and the extreme indices

Hacia un Observatorio Latinoamericano de clima y salud: Seminario sobre Instrumentos y Metodologías.

Towards a Latin American Observatory on Climate and Health: Seminar on Instruments and Methodologies

Figura 1. Procedencia de los participantes del seminario. (N = número de participantes)

Figura 2. Porcentaje de estudiantes de cada área de formación (biología/meteorología/salud). En el primer recuadro se representa el porcentaje para las estudiantes de sexo femenino, en el segundo los de sexo masculino y en el tercero el porcentaje global
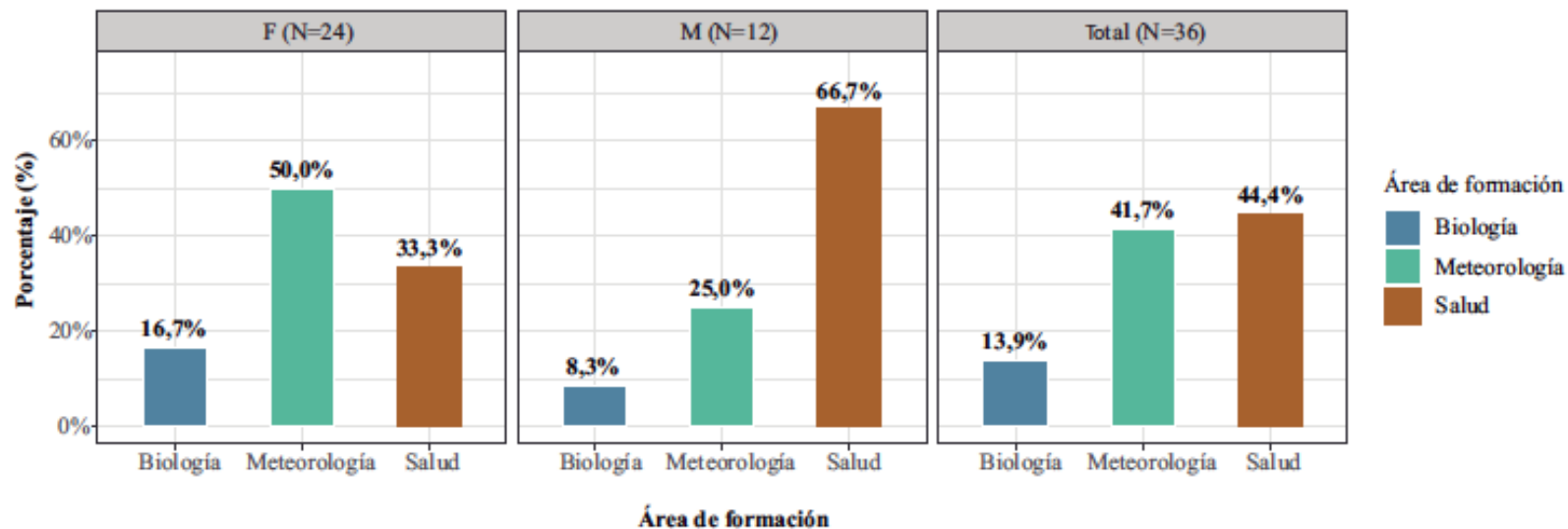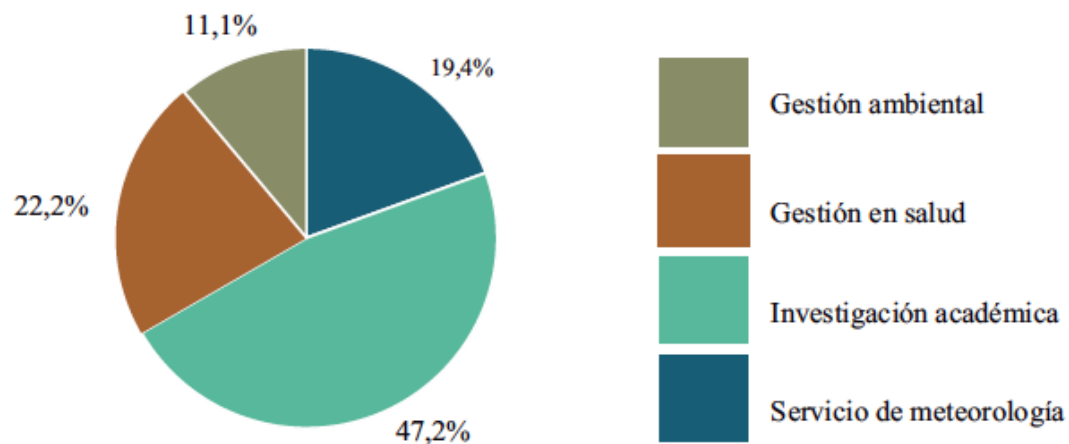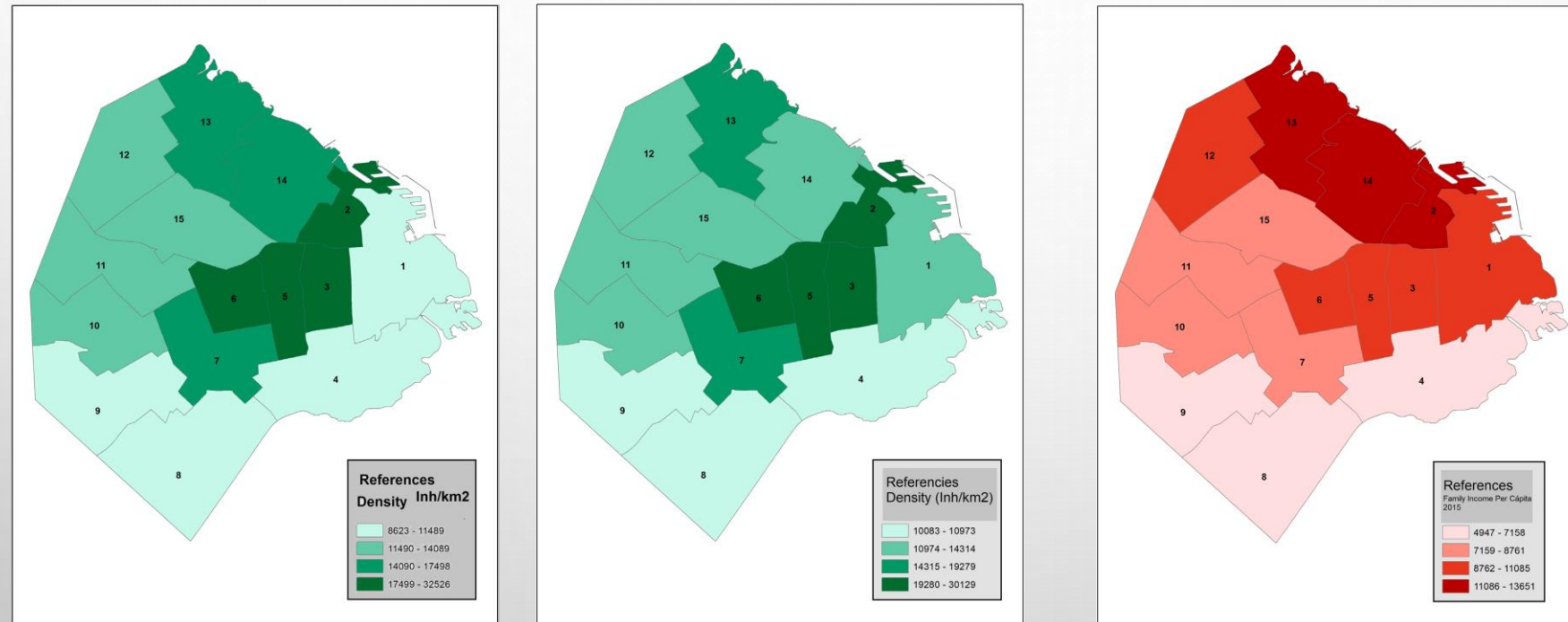

Figura 3. Porcentaje de estudiantes del seminario desempeñandose en distintos ámbitos de inserción laboral (gestión ambiental/gestión en salud/investigación académica/servicio de meteorología)

Climate and Health in Buenos Aires: A Review on Climate Impact on Human Health Studies Between 1995 and 2015.

In this review, seven pieces of research on climate variability and its impact on human health in Buenos Aires City between 1995 and 2015 were evaluated. The review highlighted continuities and ruptures in the methodology, variables, and statistics data of the research, considering their similarities and differences in the period of study and the methodology applied. Contributions, pending issues, and public policies on climate change challenges in the city aimed at improving living conditions were considered.

Six studies contributed evidence on the relationship between climate and health and its impacts on the population; two studies suggested the development of early warning systems and one study is a preliminary approach.