Second Workshop on Regional Climate Modeling and Extreme Events over South America

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Further information:
http://indico.ictp.it/event/8636/
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CLIMATE SIMULATION OVER SOUTH-SOUTHEASTERN BRAZIL FROM 1981 TO 2000

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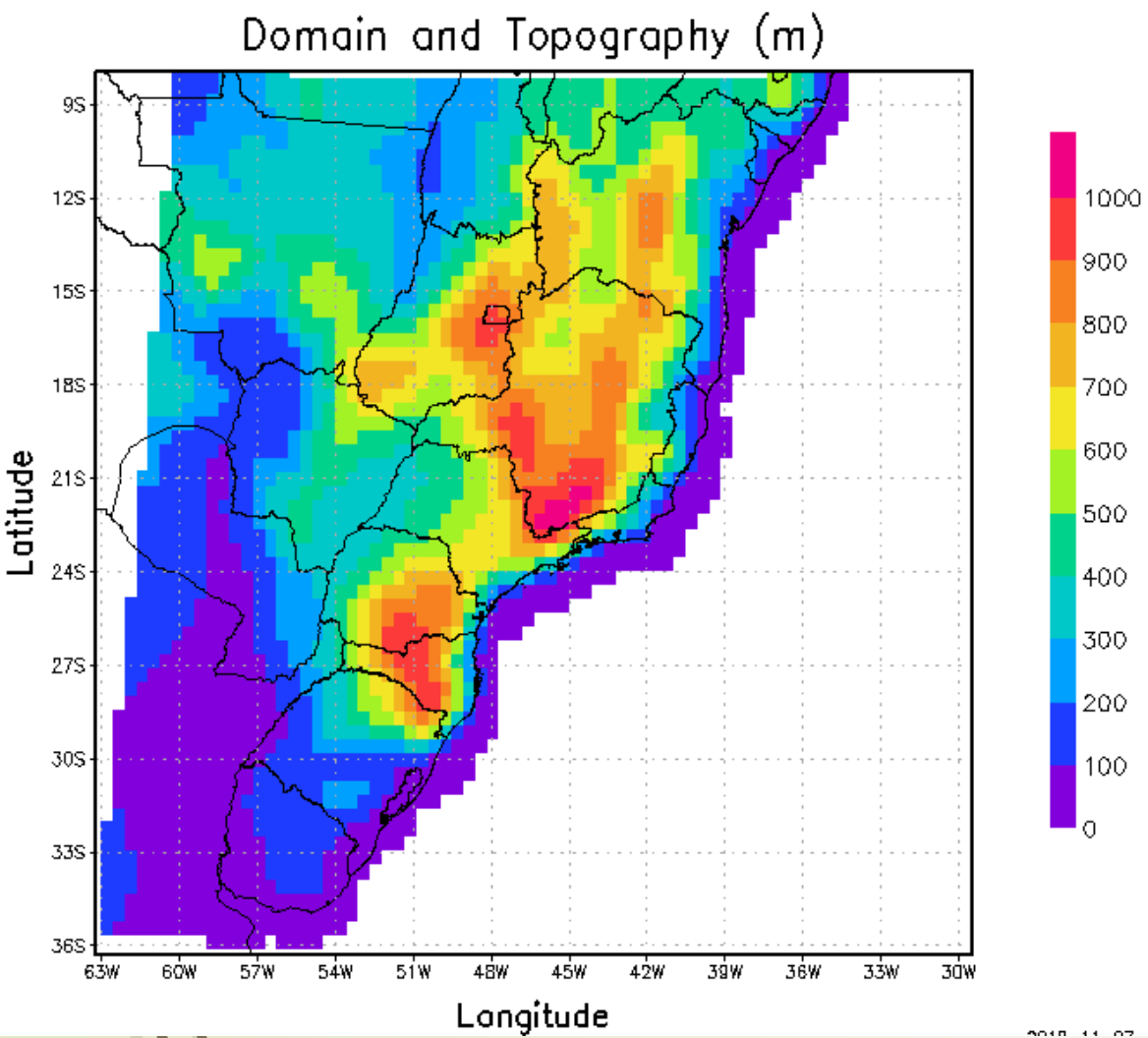
Objectives

- Evaluate **climate simulation** over South-Southeastern (SSE) Brazil from 1981 to 2000, using RegCM version 4.7.
- Analyze **model's sensitivity** in relation to main ENSO events.
- Improve our experience **in regional modeling** with RegCM.

- **Motivation**: upgrade the knowledge about the **model's skill** to capture different climate configurations.

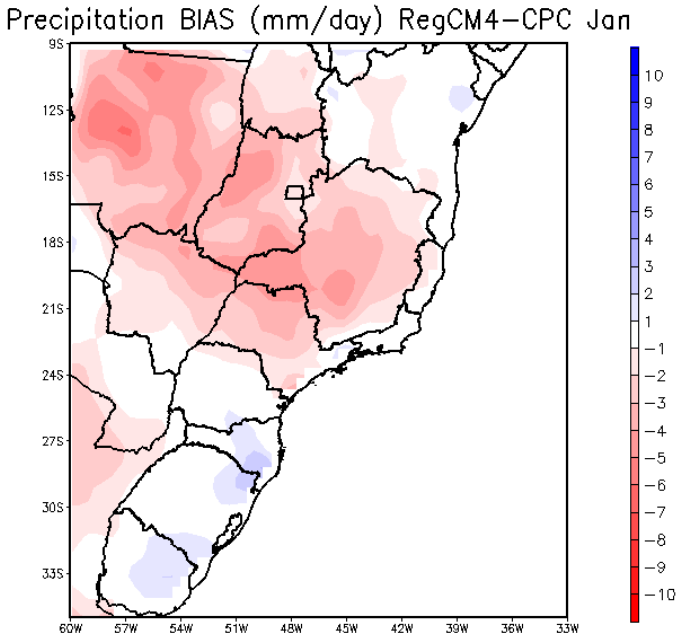
Experiment Design

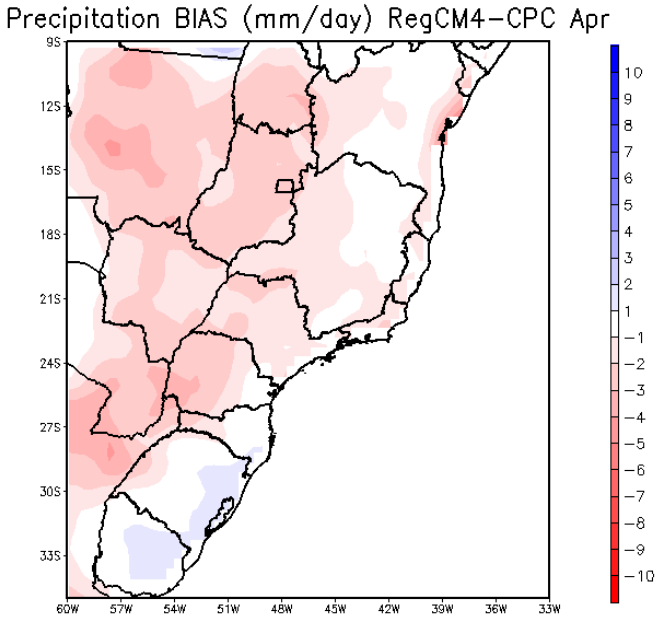


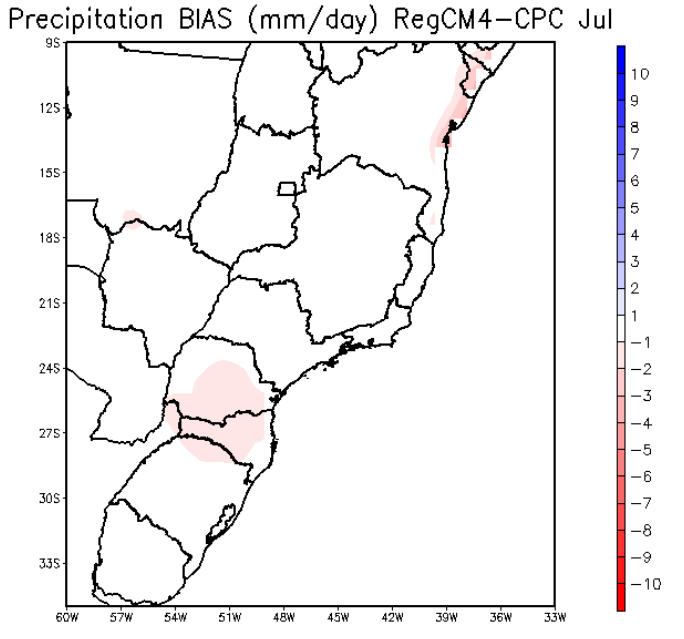
- RegCM, version 4.7
- **64 x 64** points in Lat and Lon
- Horizontal resolution: **50 km** / Time-step: **150 s**
- Rotated Mercator (Davies, 1976)
- Initial and Boundary conditions from
  - Era-Interim (Simmons et al., 2007) from 1980 to 2000
- Results from **1981 to 2000** for **S-SE Brazil**
- **Convection scheme**:
  - MIT-Emmanuel (Emmanuel and Zivkovic, 1999)
- **Land model**: BATS (Dai et al., 2003)
- Model **validation** against CPC Precipitation

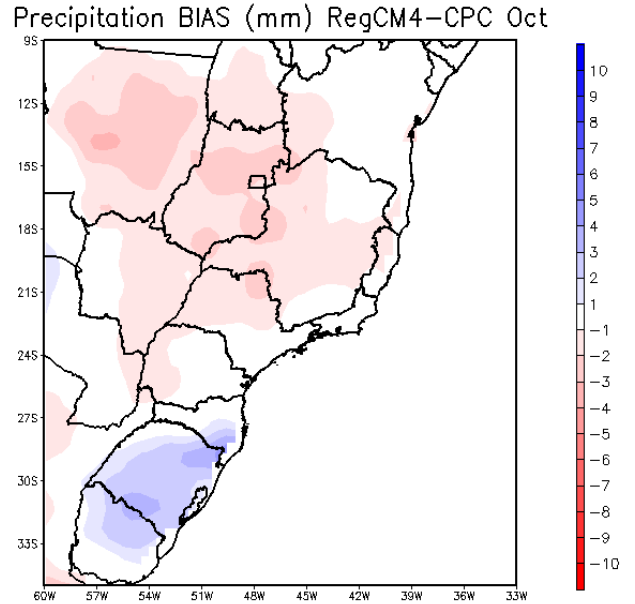
Results

Monthly Mean Precipitation



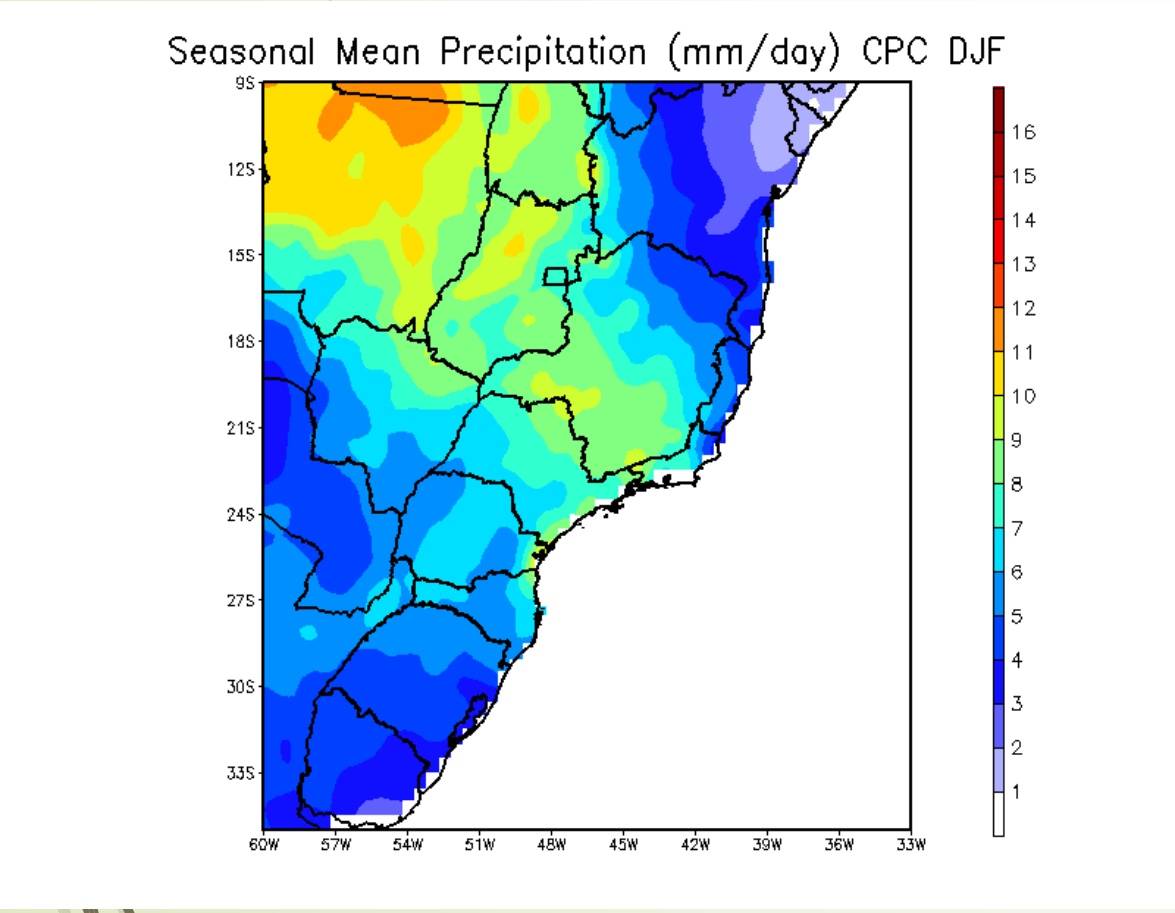


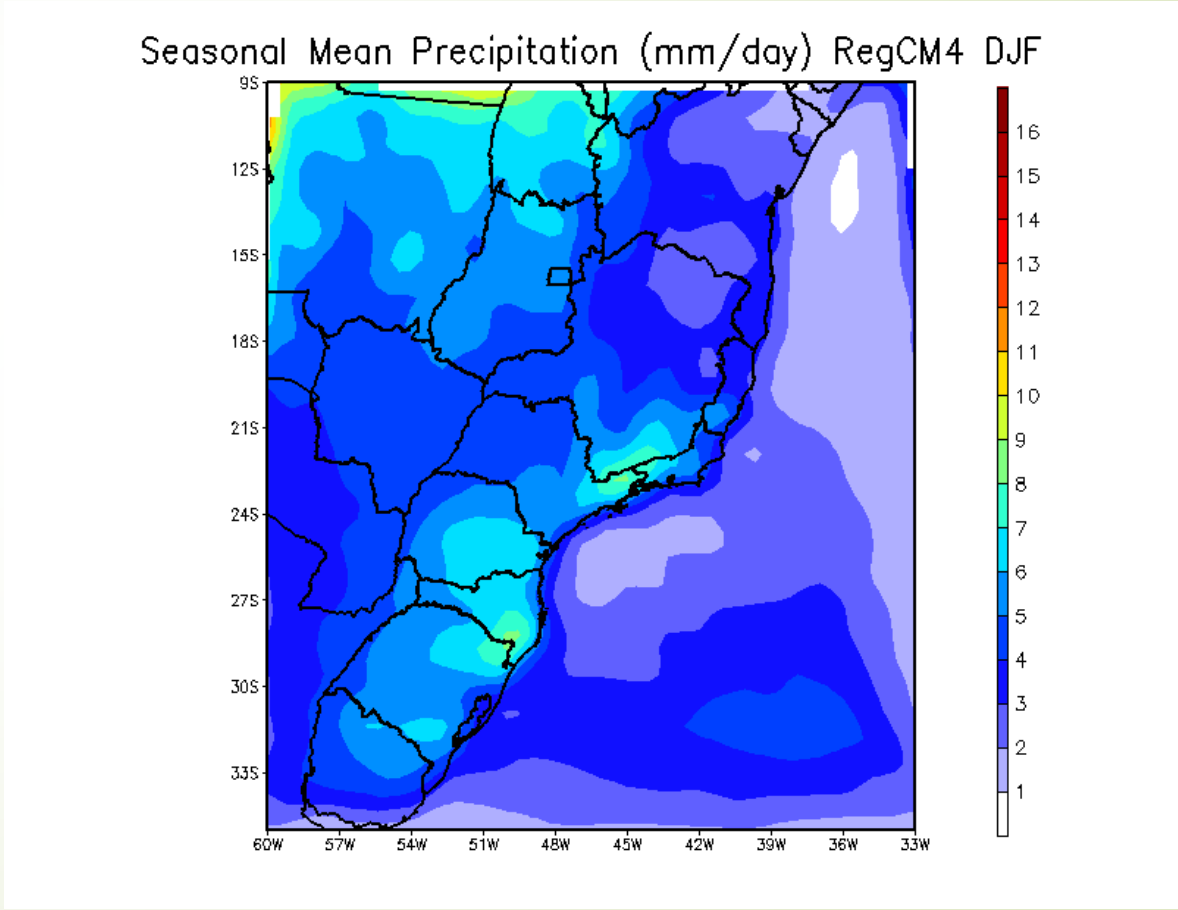




Results

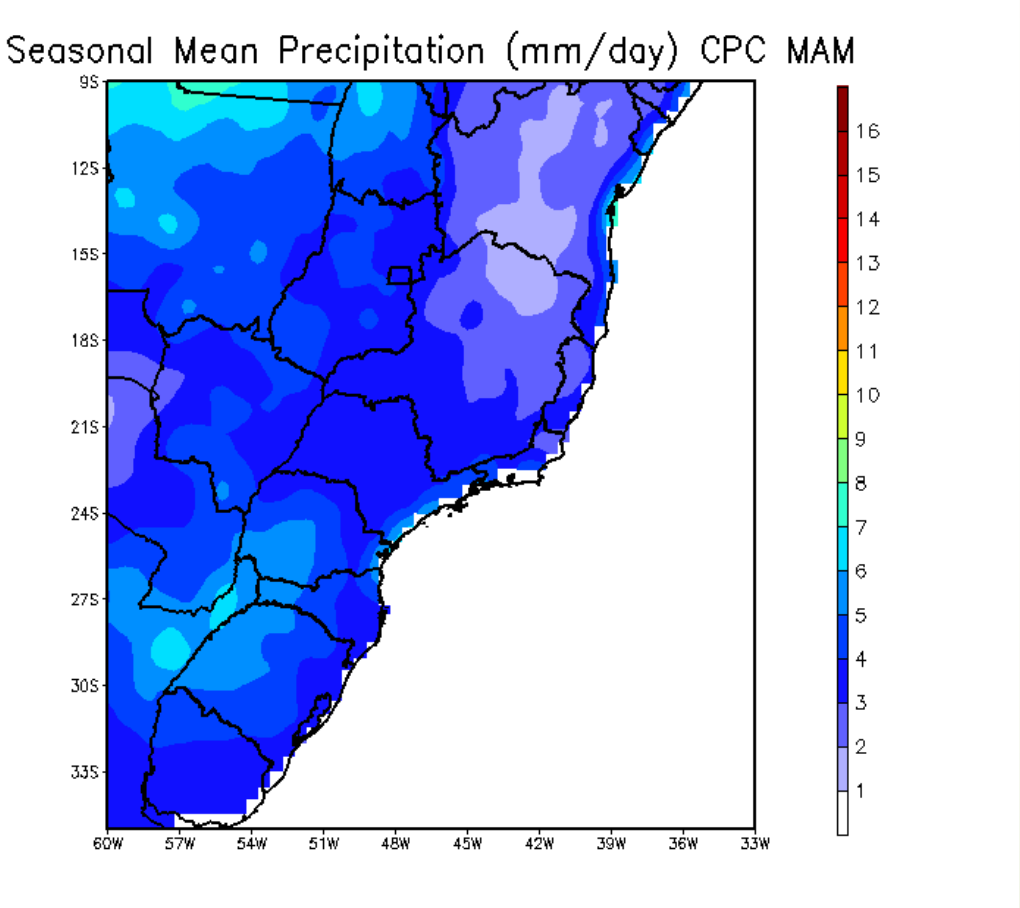
- **Precipitation Seasonal Climatology (Austral Summer – DJF)**

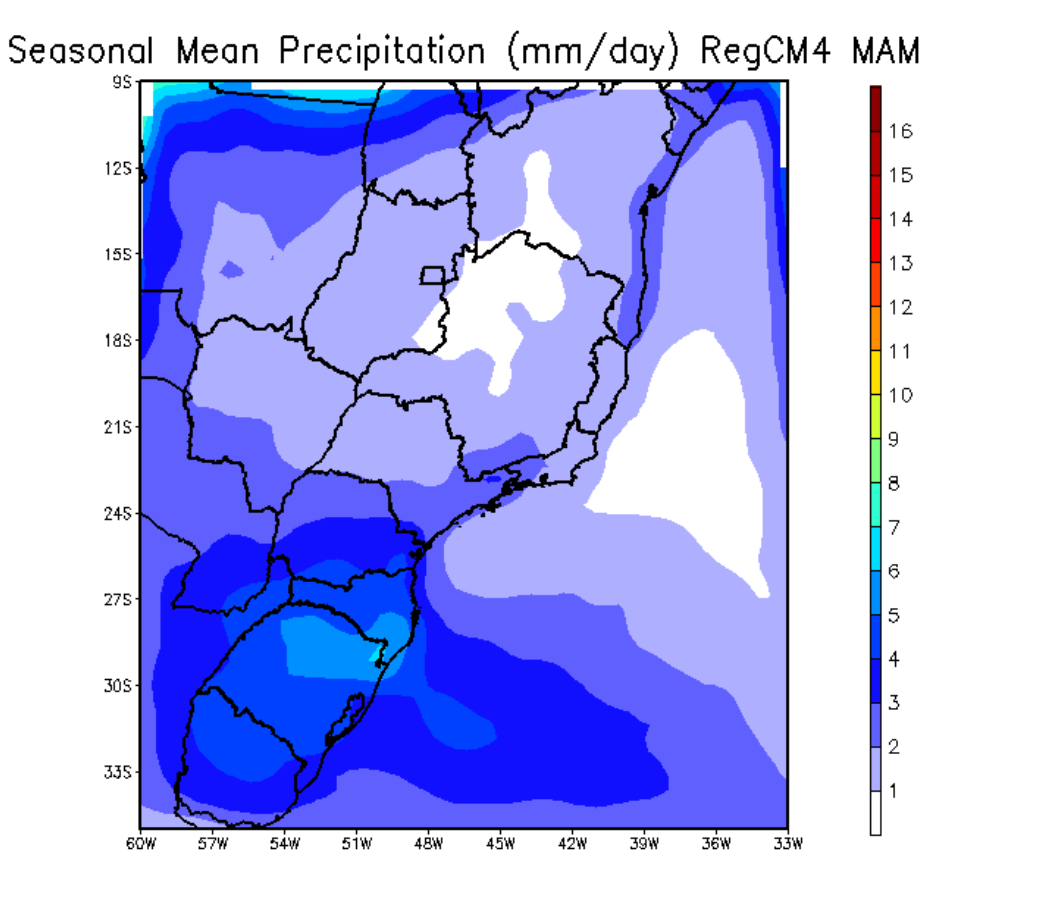




Results

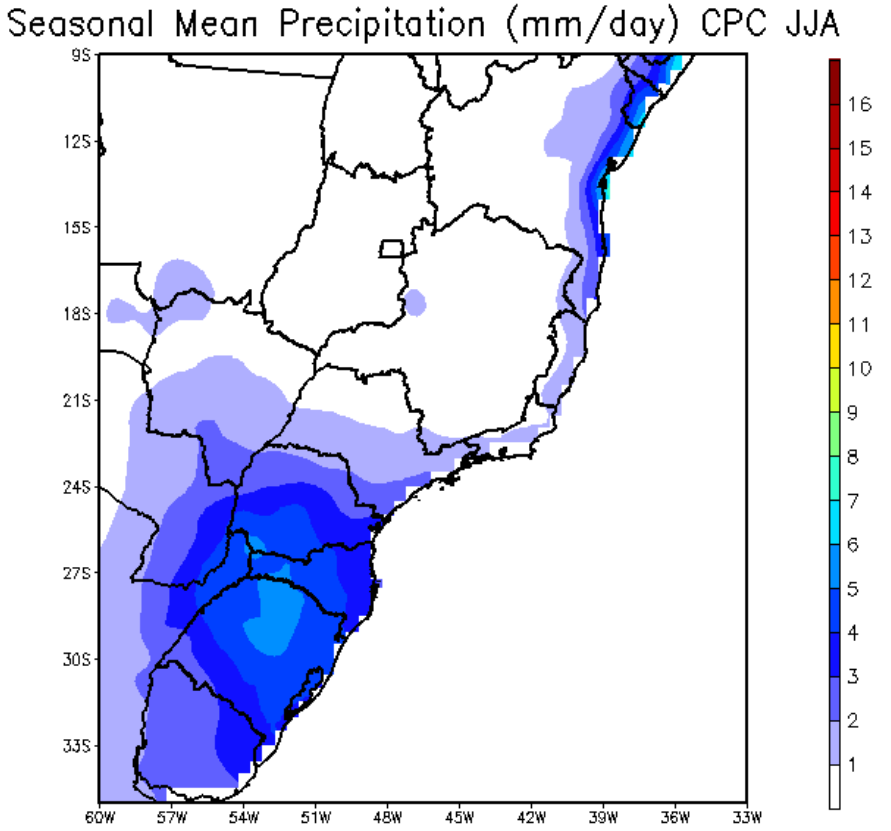
- **Precipitation Seasonal Climatology (Austral Autumn – MAM)**

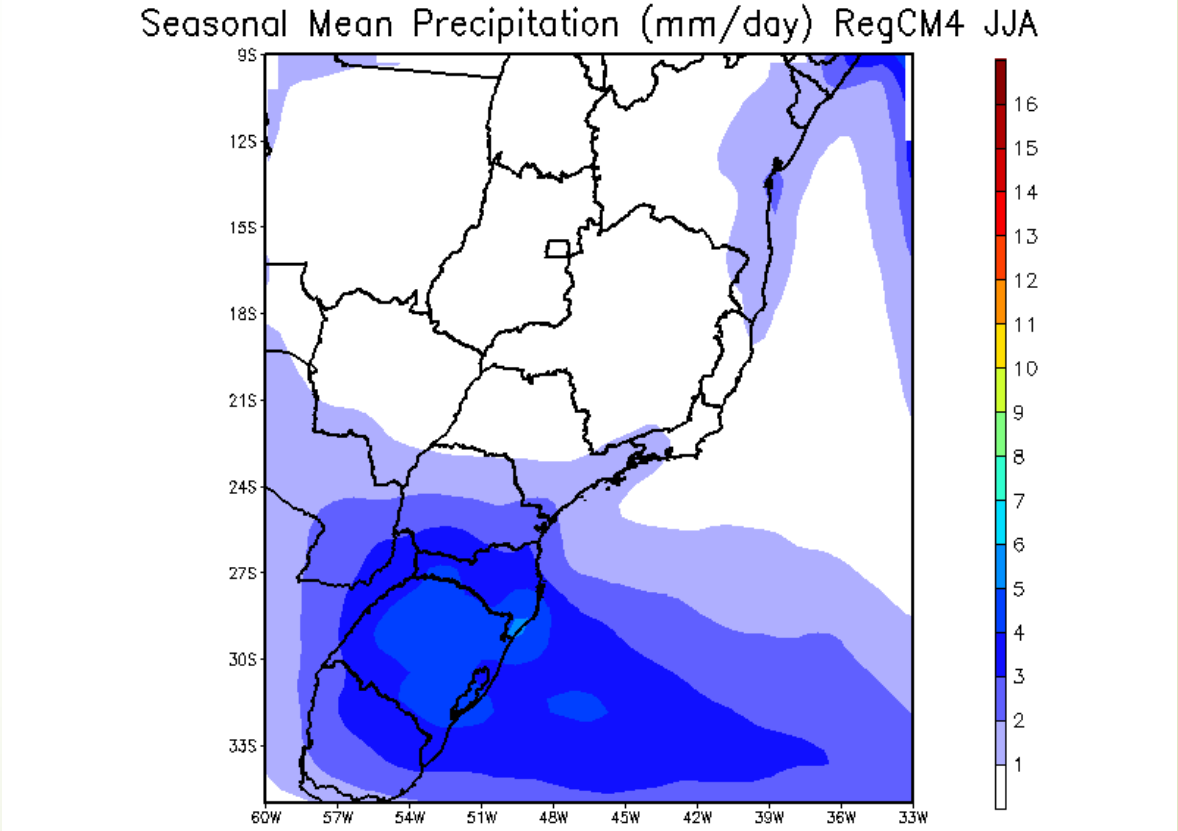




Results

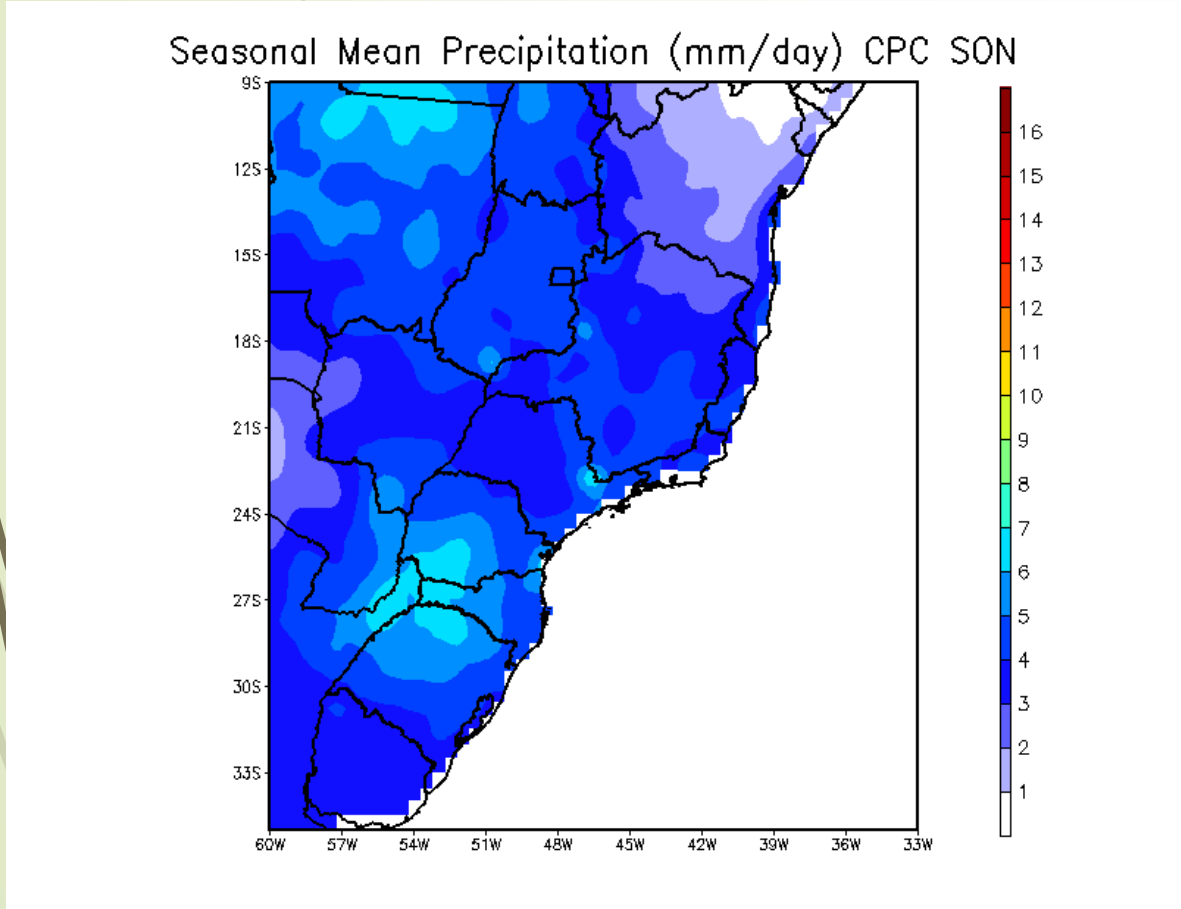
- **Precipitation Seasonal Climatology (Austral Winter – JJA)**

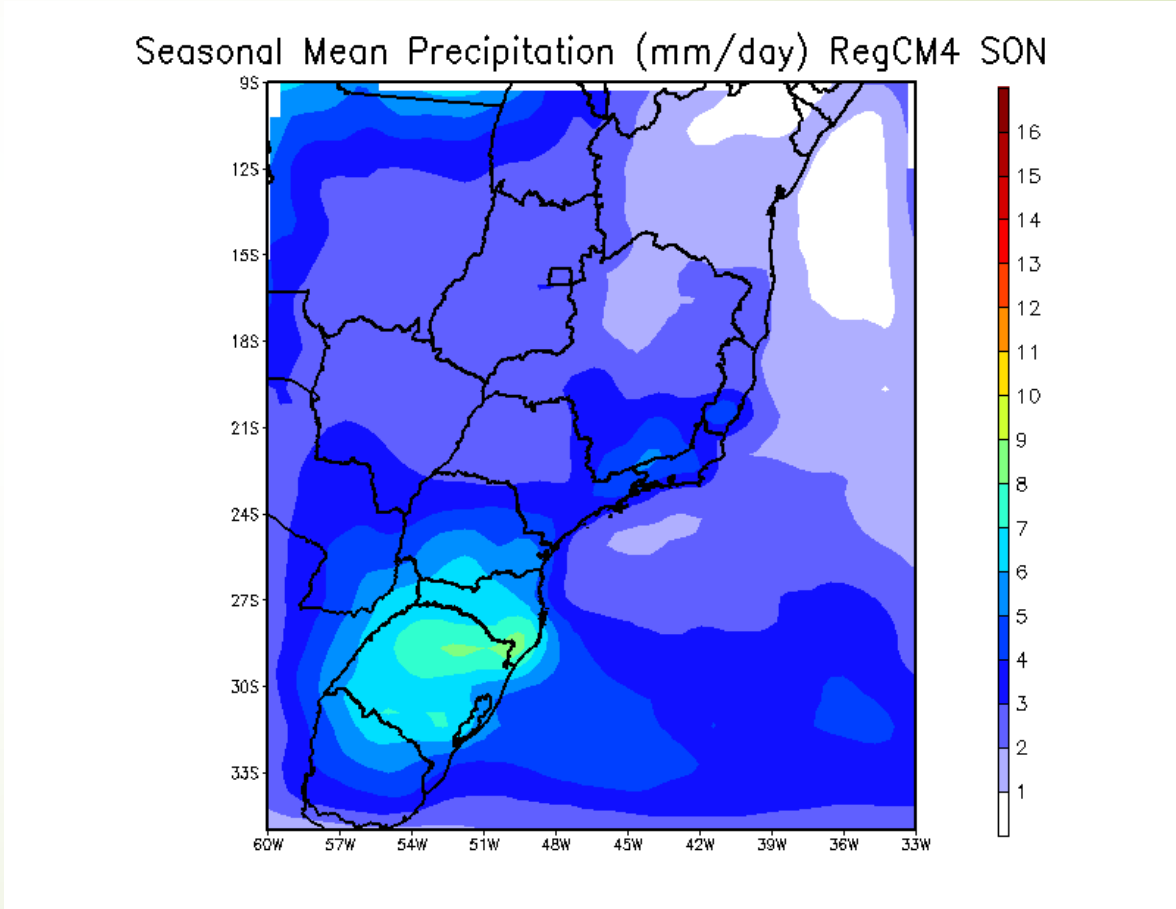




Results

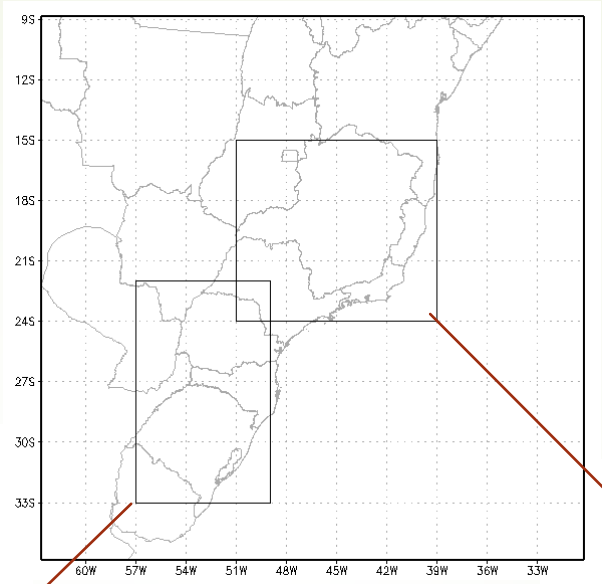
- **Precipitation Seasonal Climatology (Austral Spring – SON)**

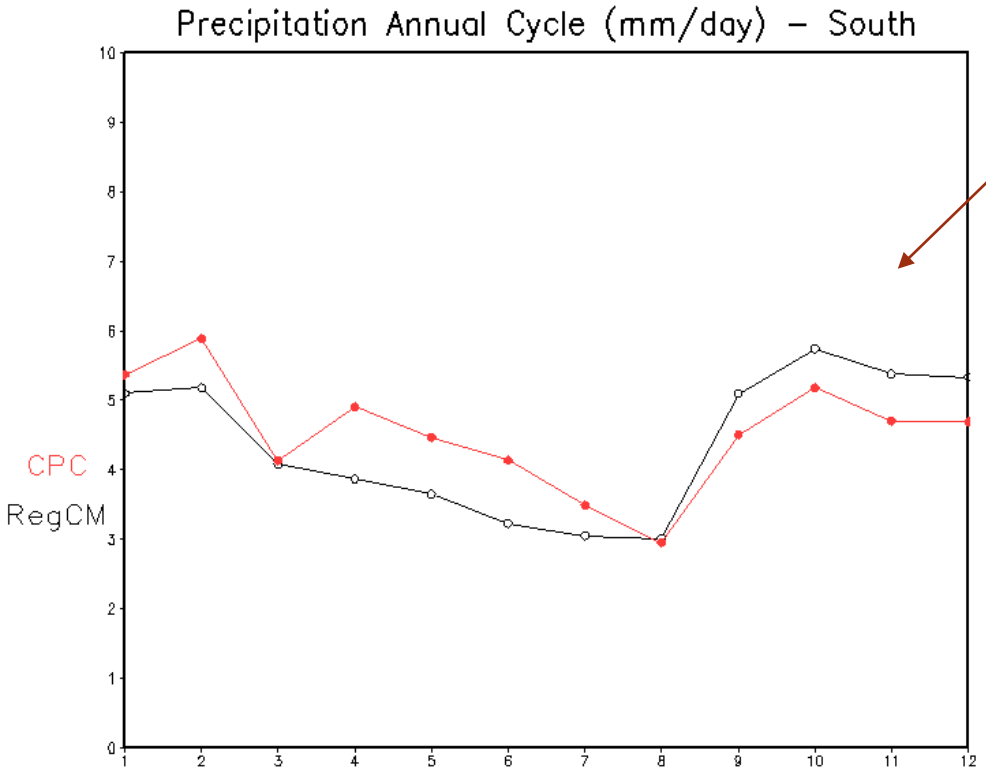


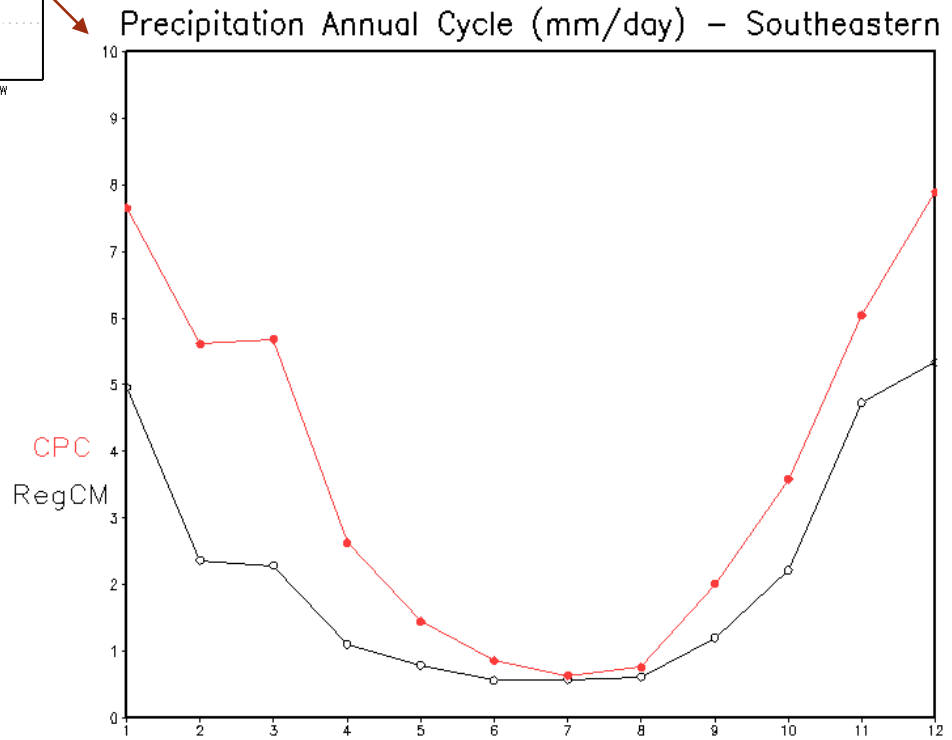


Results

- **Precipitation Annual Cycle**

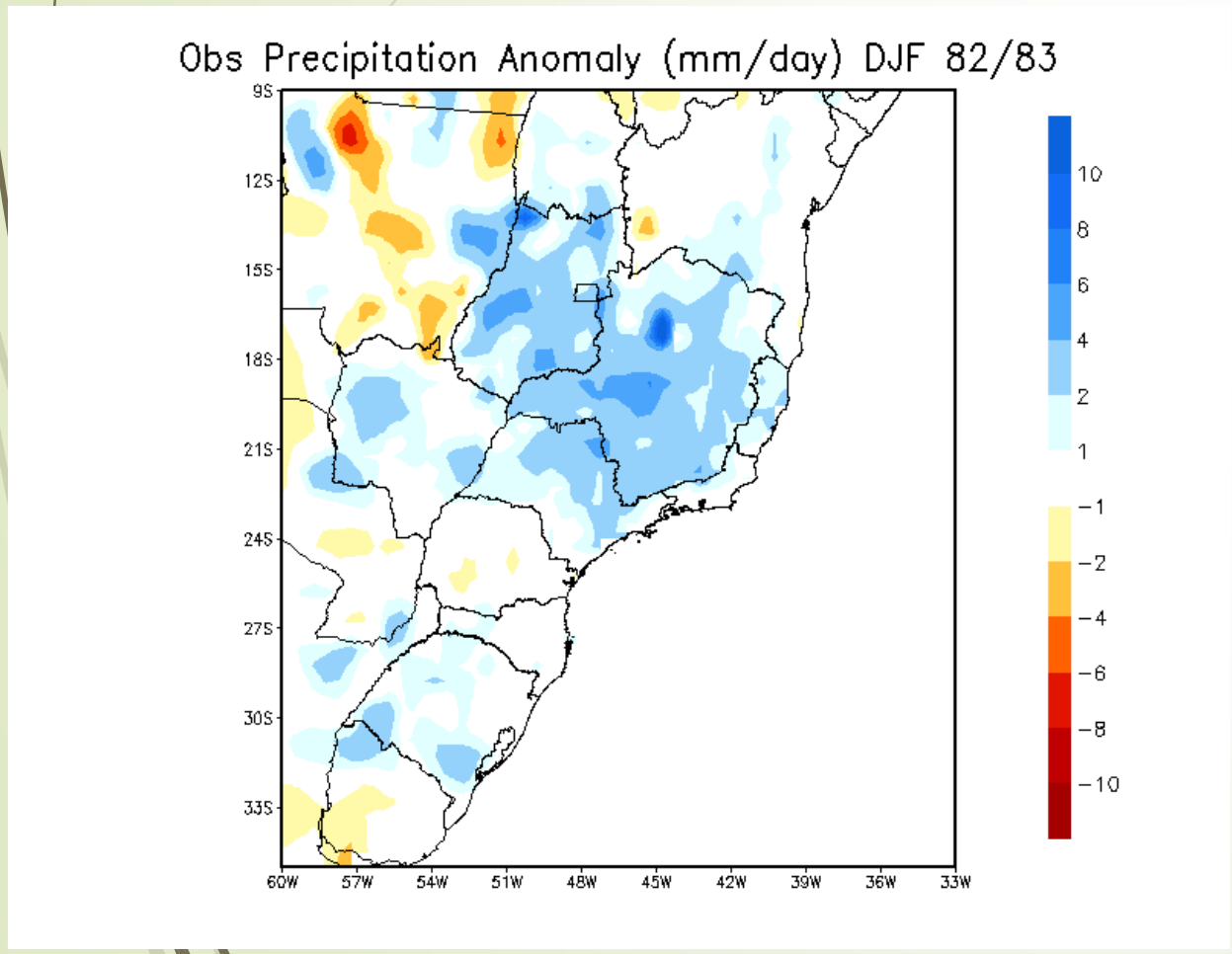


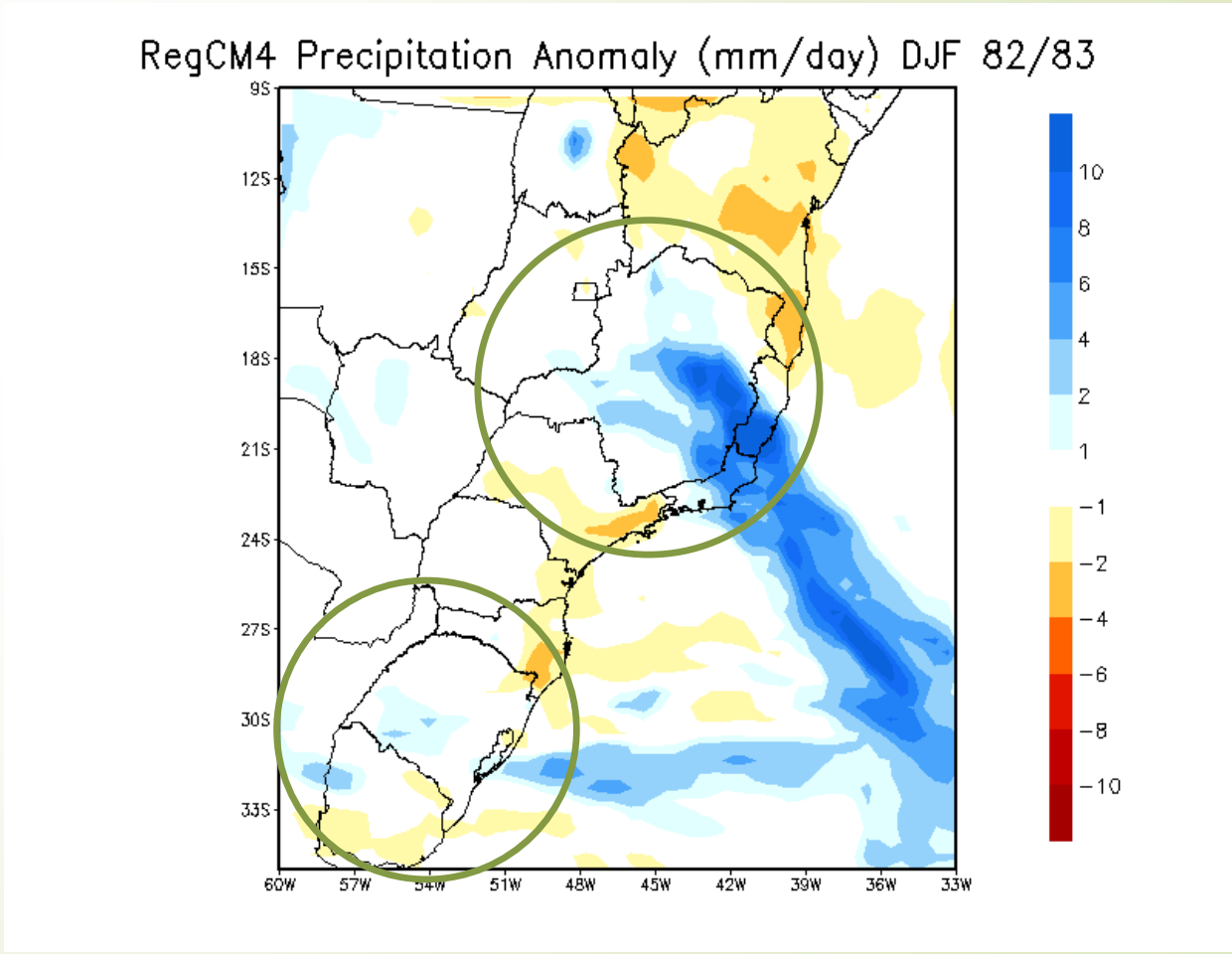




Results

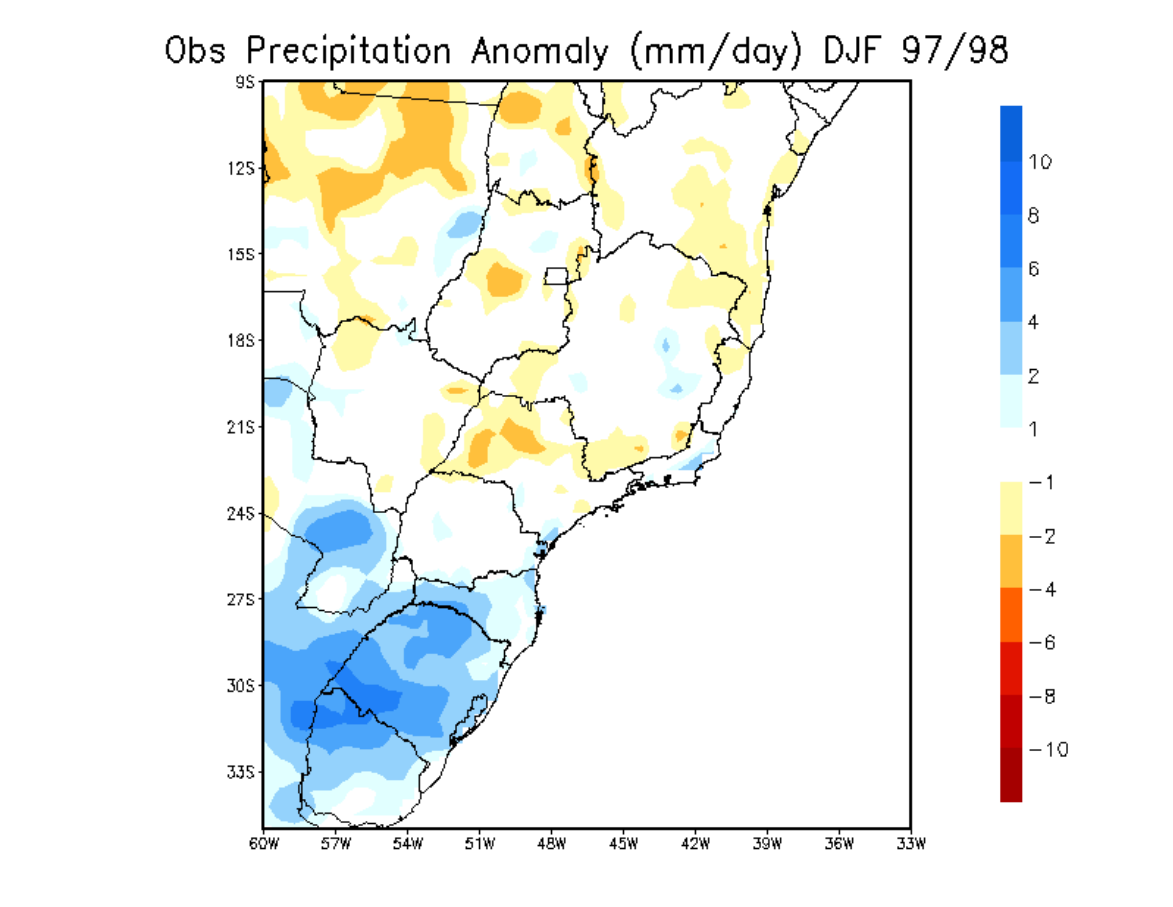
- El Niño Events (1982-1983)

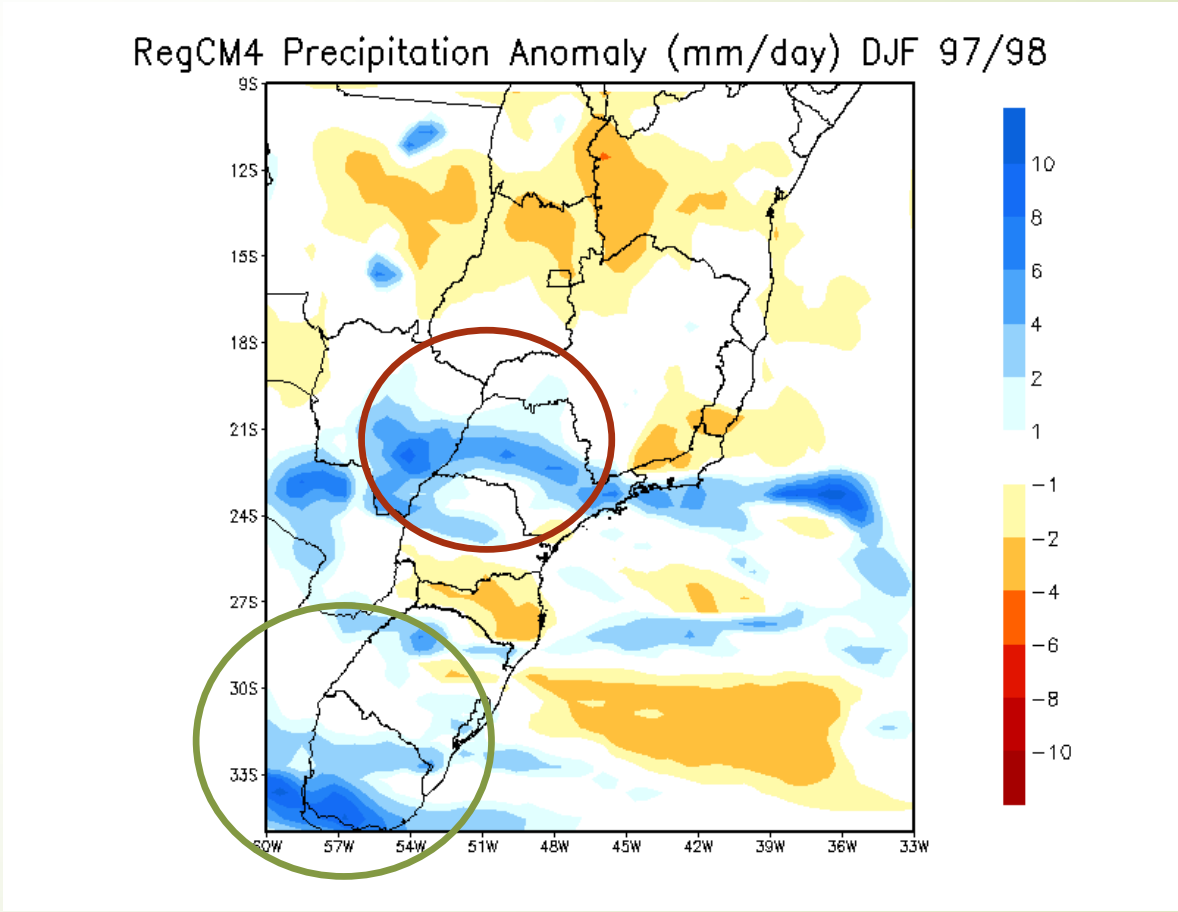




Results

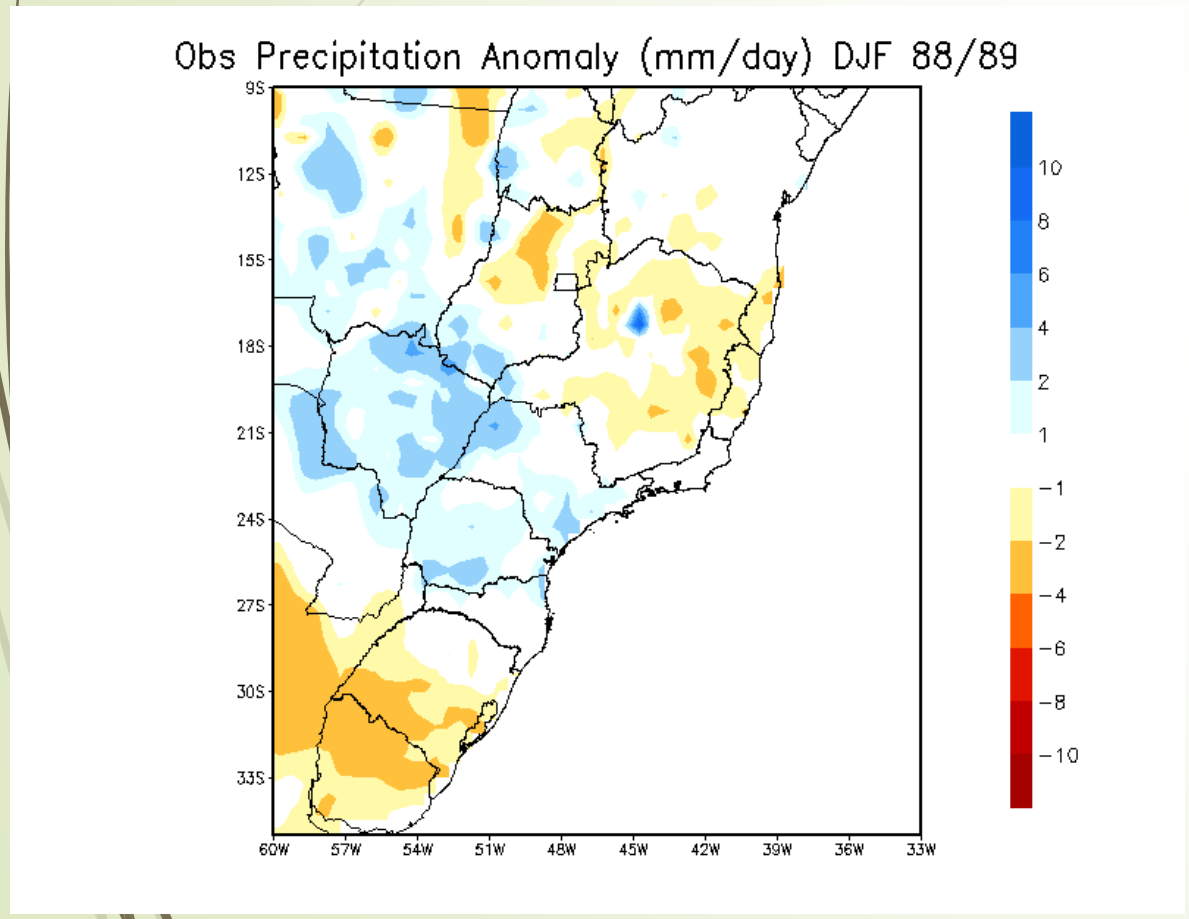
- El Niño Events (1997-1998)

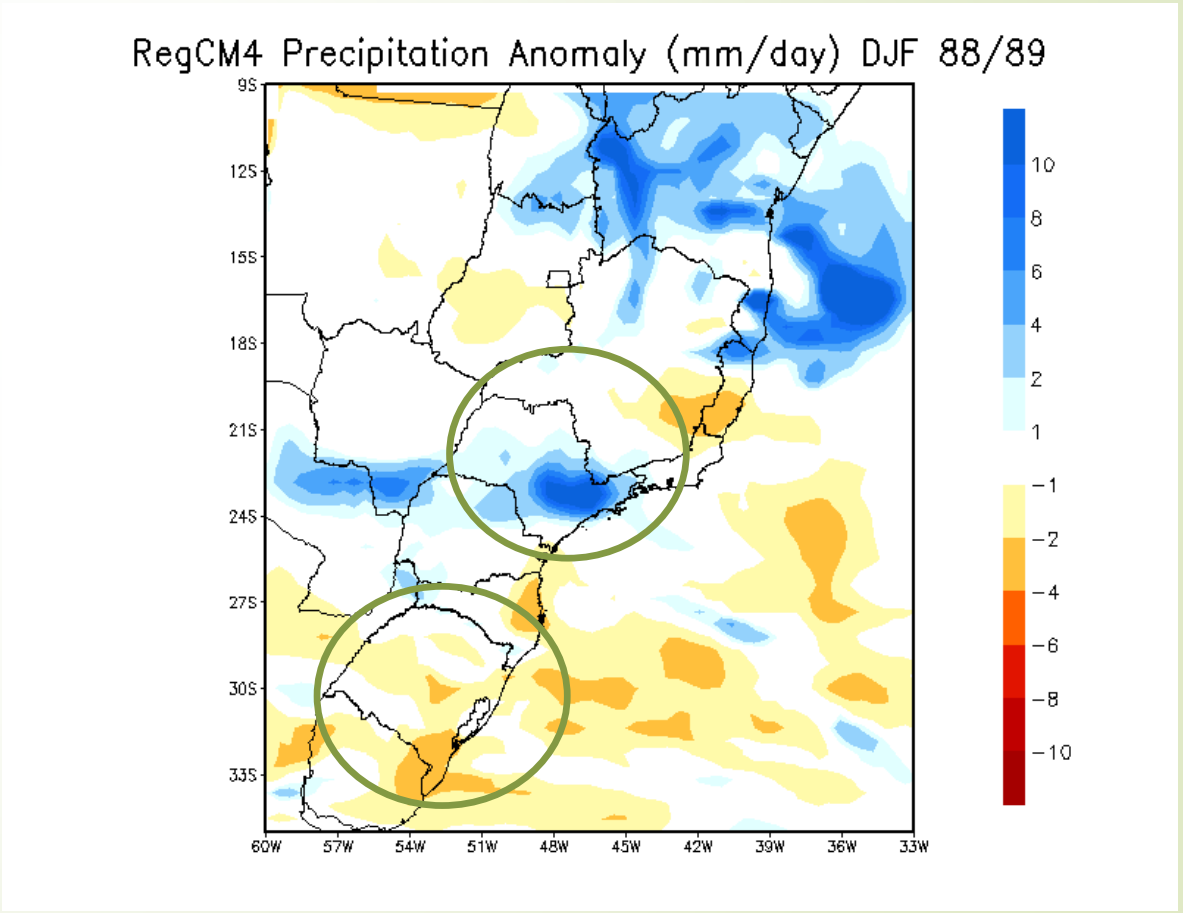




Results

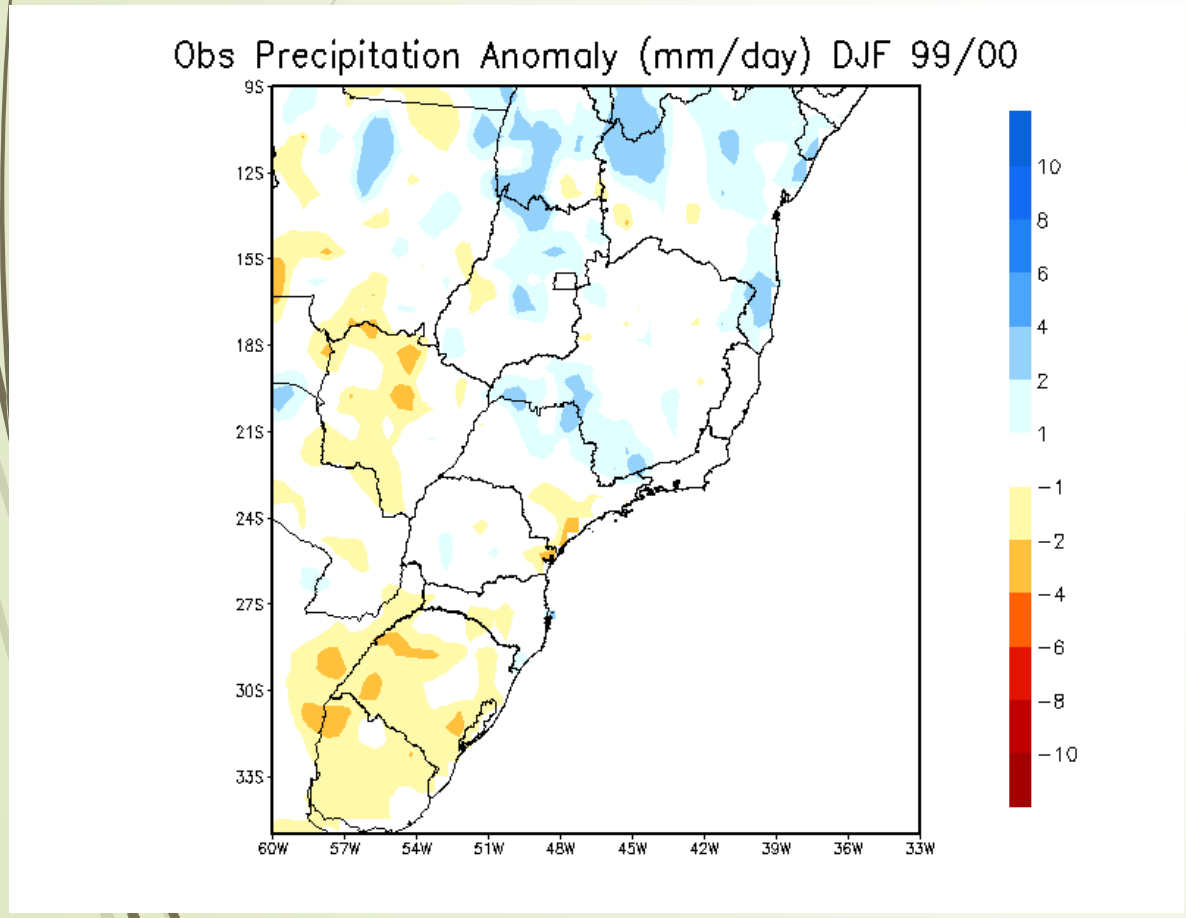
- La Niña Events (1988-1989)

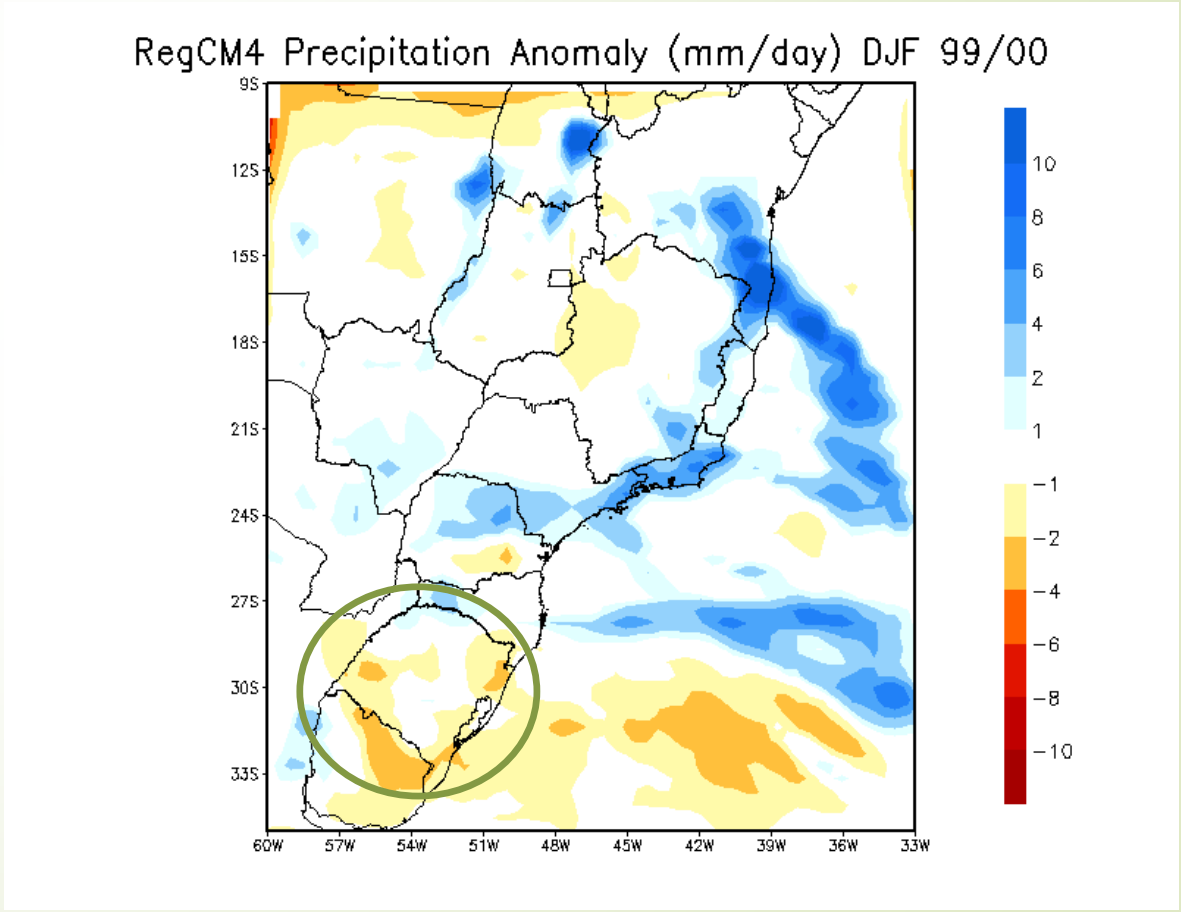




Results

- **La Niña Events (1999-2000)**





Conclusions

- ✓ Seasonal and annual cycle for sub-tropical region were well represented by RegCM.
- ✓ Model underestimated summer precipitation over SACZ influenced region.
- ✓ El Niño signals were captured over Southern region. Over Southeastern region, only 82/83 El Niño was correctly simulated.
- ✓ RegCM simulations captured expected dry anomalies during La Niña events over Southern Brazil.
- ✓ Future simulations should explore other parametrizations schemes, initial and boundary conditions and ocean coupling.

Thank you!