

São Paulo School of Advanced Science on Ocean Interdisciplinary Research and Governance

The Recent Hydrometeorological Drought in the Northeast Brazil: the Impacts of the Pacific and Atlantic Oceans

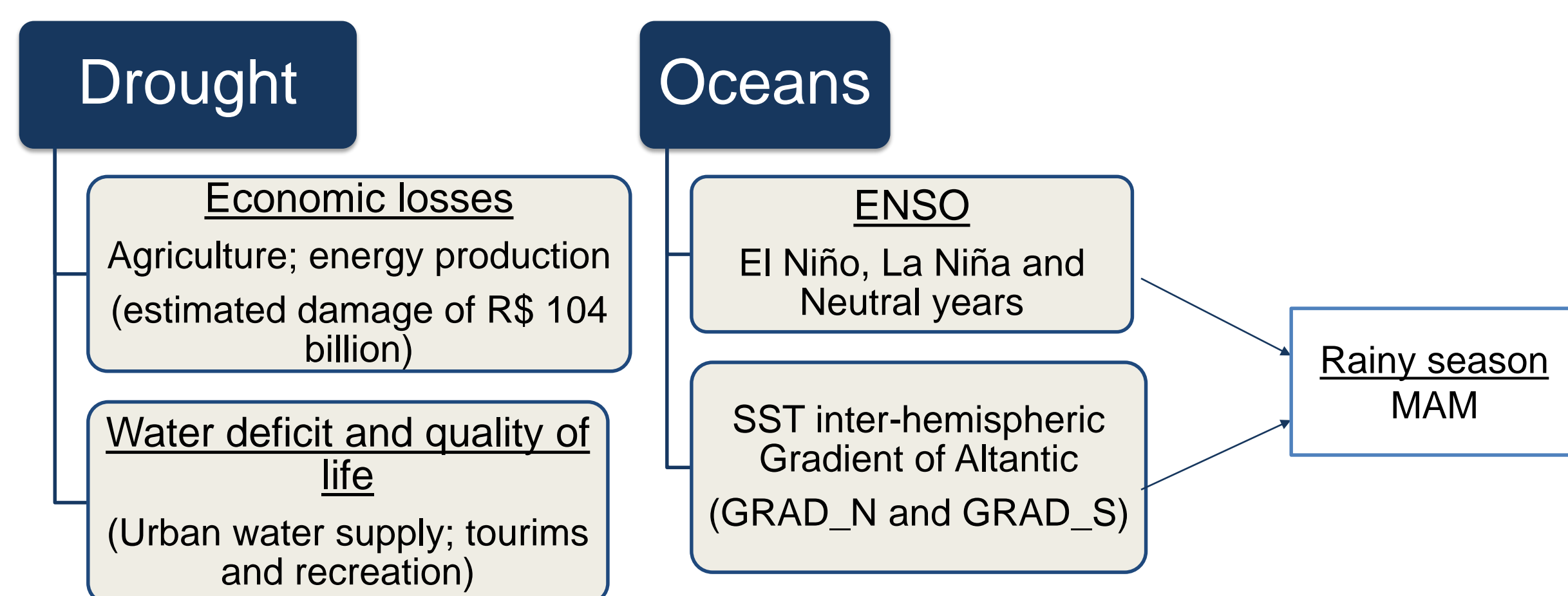
Felipe Jeferson de Medeiros¹, Cristiano Prestrelo de Oliveira²

1. Master degree student at Graduate Program in Climatic Sciences – Federal University of Rio Grande do Norte, Natal-RN, Brazil.

2. PhD in Meteorology. Supervisor in Atmospheric and Climatic Science Department – Federal University of Rio Grande do Norte, Natal-RN, Brazil.

* felipetkd_@hotmail.com

1. INTRODUCTION



The aim of the present work is: identify the oceanic and atmospheric circulation associated with the drought in the north northeast Brazil during the austram autumn season from 2012 to 2015.

2. MATERIAL AND METHODS

I part:

Xavier et al., (2017)
0,25° x 0,25°

• Precipitation anomalies

NOAA
ERSST V3B

• Sea surface temperatura and Outgoing longwave radiation anomalies

Era-Interim dataset
(u,v,q)
1,5° x 1,5°

• Walker and Hadley circulation

II part:

✓ A regional climate model will be used to try to simulated the drought event.

3.RESULTS

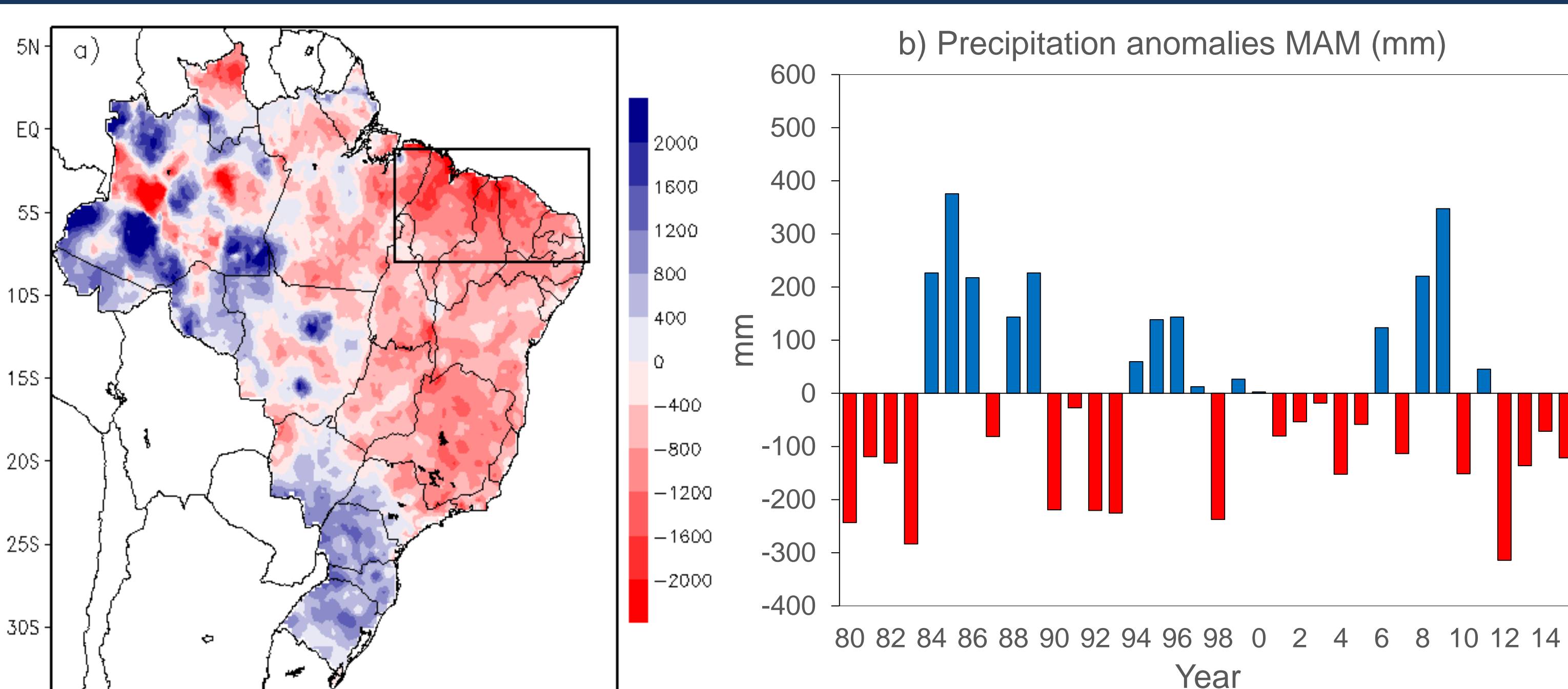


Figure 1: a) Precipitation anomalies accumulated (mm) over Brazil from 2012 to 2015 and b) Area average austral autumn 1980-2015 precipitation anomaly time series with respect to 1980-2009 precipitation climatology (mm).

OLR Anomaly MAM 2012–2015

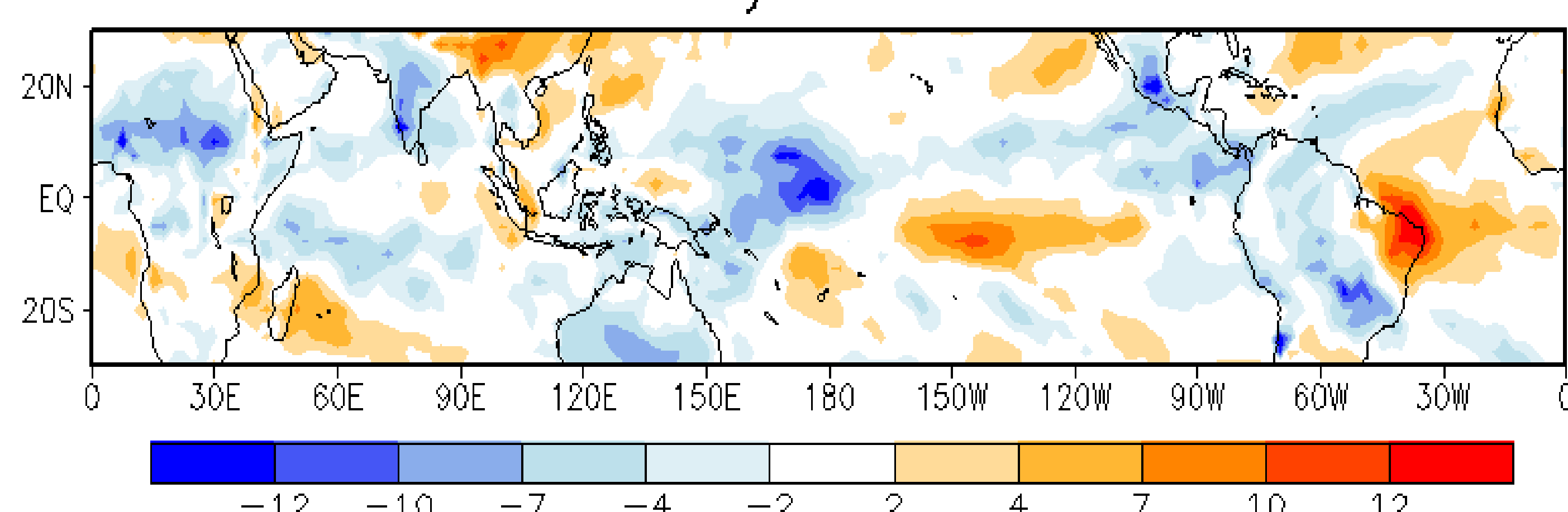


Figure 2: Outgoing longwave radiation in $W m^{-2}$ anomalies from 2012 to 2016. Blue shading (enhanced and convective precipitation). Orange-red shading (precipitation suppressed). Anomalies are computed with respect to the 1980-2009 climatological period.

SST Anomalies MAM 2012–2015

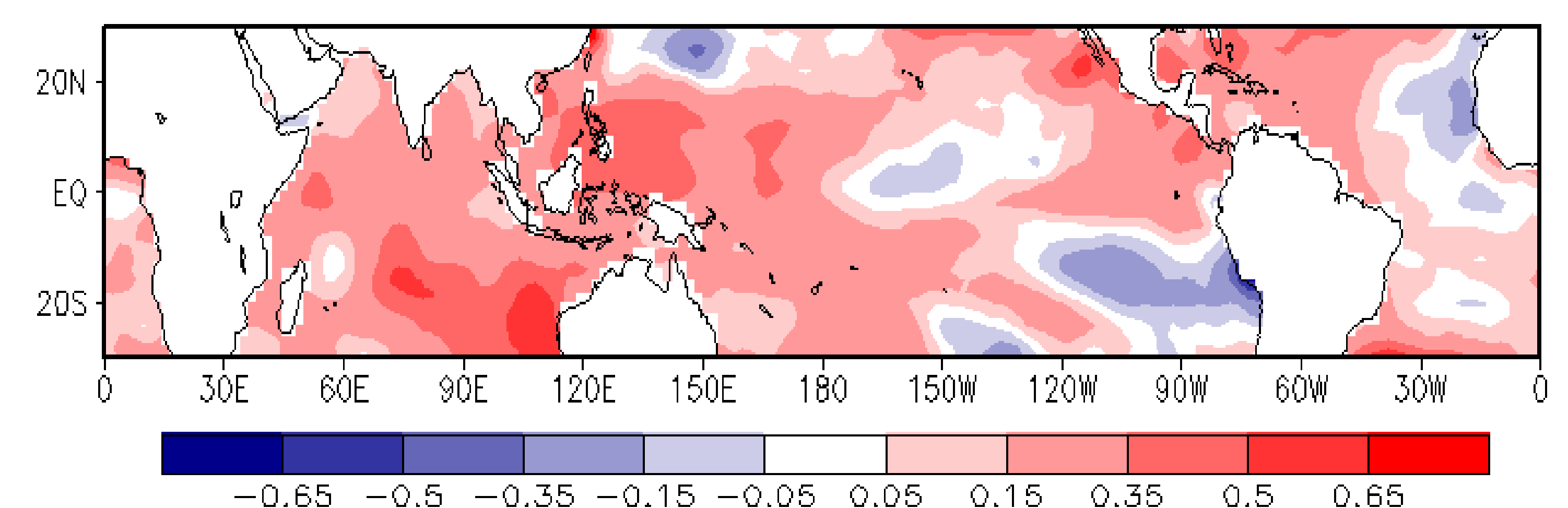


Figure 3: Sea surface temperature anomalies ($^{\circ}C$) from 2012 to 2015. Anomalies are computed with respect to the 1980-2009 climatological period.

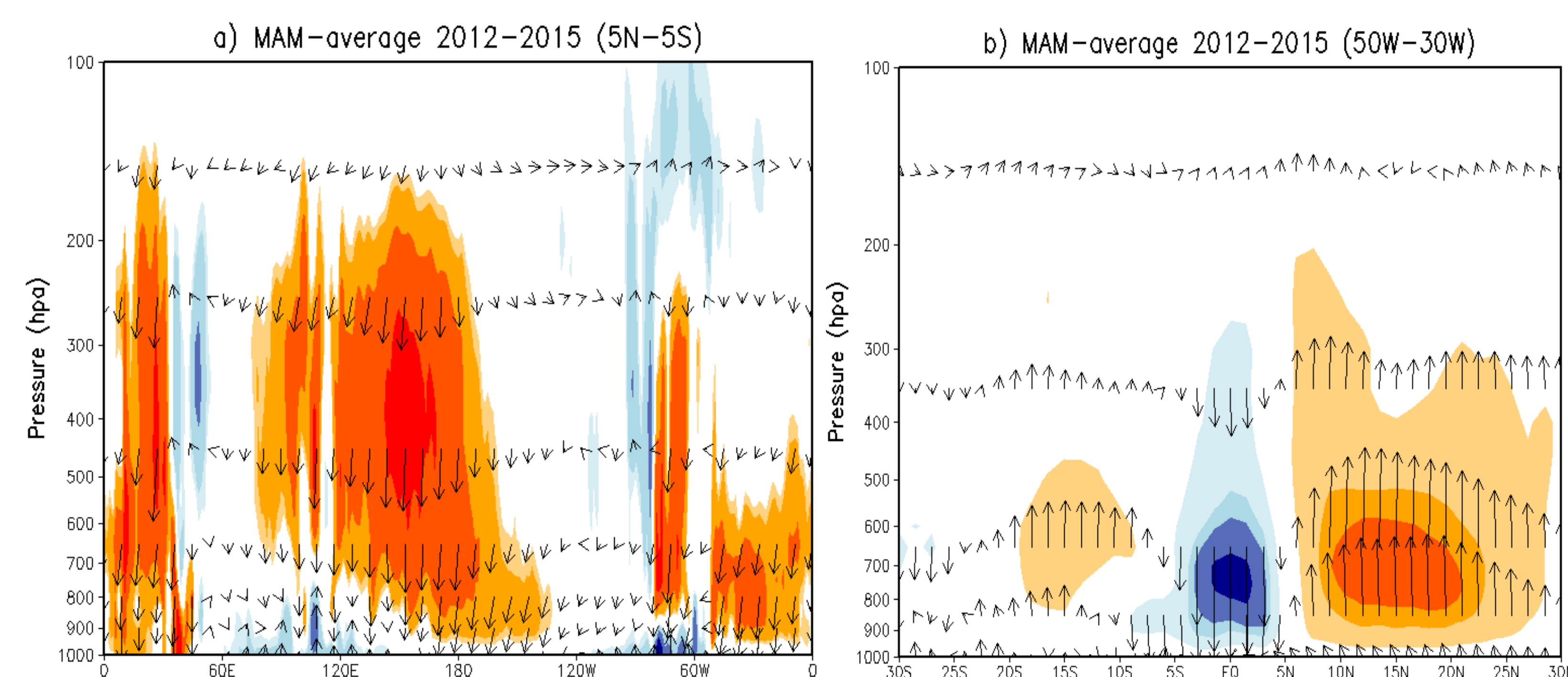


Figure 4: Austram autumn (March-April-May): a) walker circulation averaged over the latitudinal cross-session of $5^{\circ}S$ to $5^{\circ}N$ and b) hadley circulation averaged over the longitudinal cross-session of $50^{\circ}W$ to $30^{\circ}W$ during 2012 to 2016. Hot (cool) colors correspond to clockwise (counterclockwise) circulation. The shaded plot is vertical velocity (ω), which is superimposed by wind vector in m/s.

4.CONCLUSIONS

- The intertropical convergence zone was northward of his climatological position, contributing to the high values of precipitation anomalies verified in the north northeast Brazil;
- The Atlantic Ocean had most influence in the precipitation anomalies.
- This meteorological fields can help meteorologists to better understand the causes of this intense drought. Our results can also be used to support decision making, given all the social and economic problems associated with the drought in the semi-arid region.

5.REFERENCES

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6.ACKNOWLEDGMENTS

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