

Climate and its variability in West Africa and the Sahel

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AGRHYMET RCC-WAS

2024-10-28

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Socio-economical context

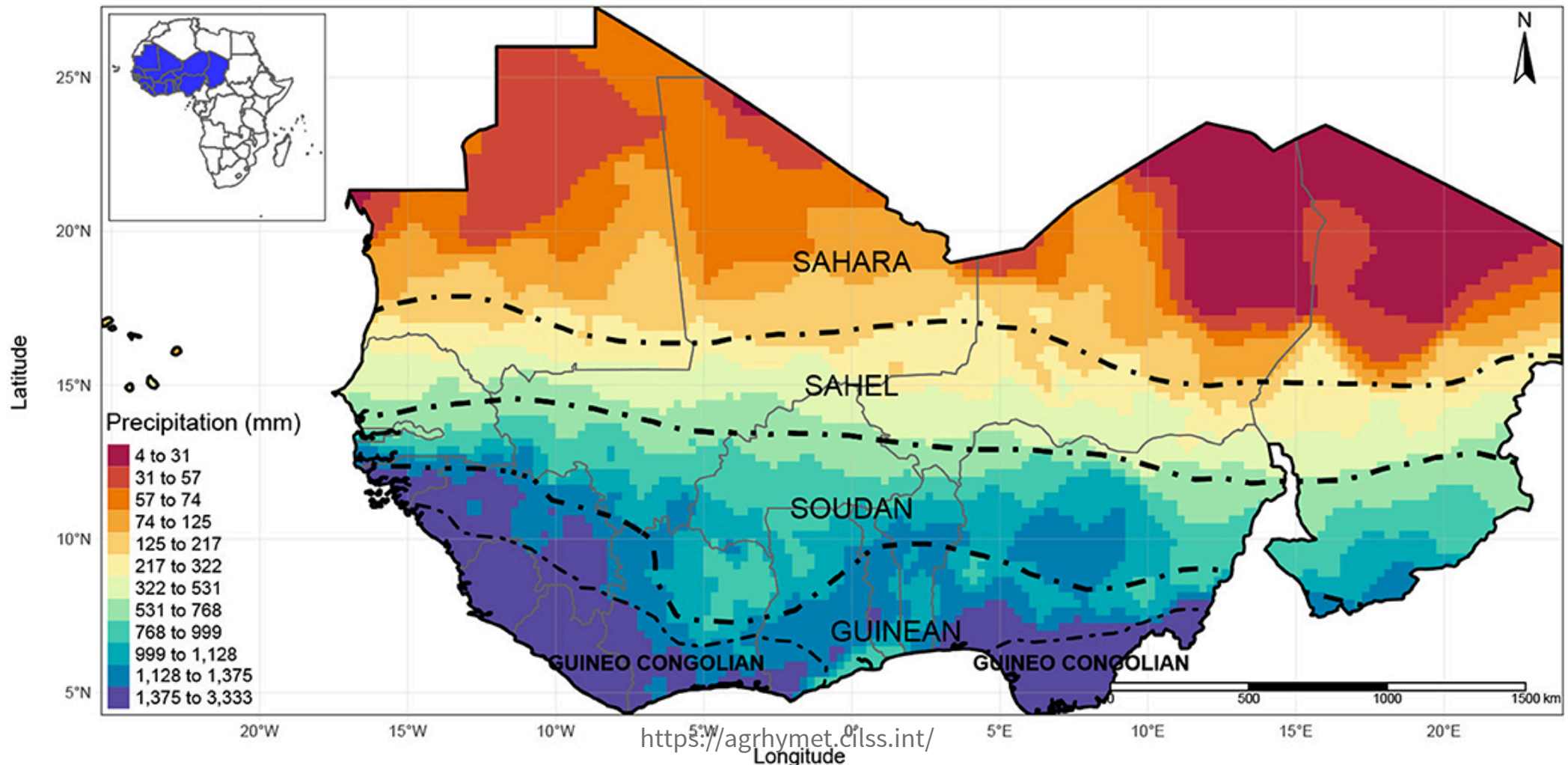
West Africa: => most densely populated regions in Africa => its climate plays a crucial role in the well-being of its populations.



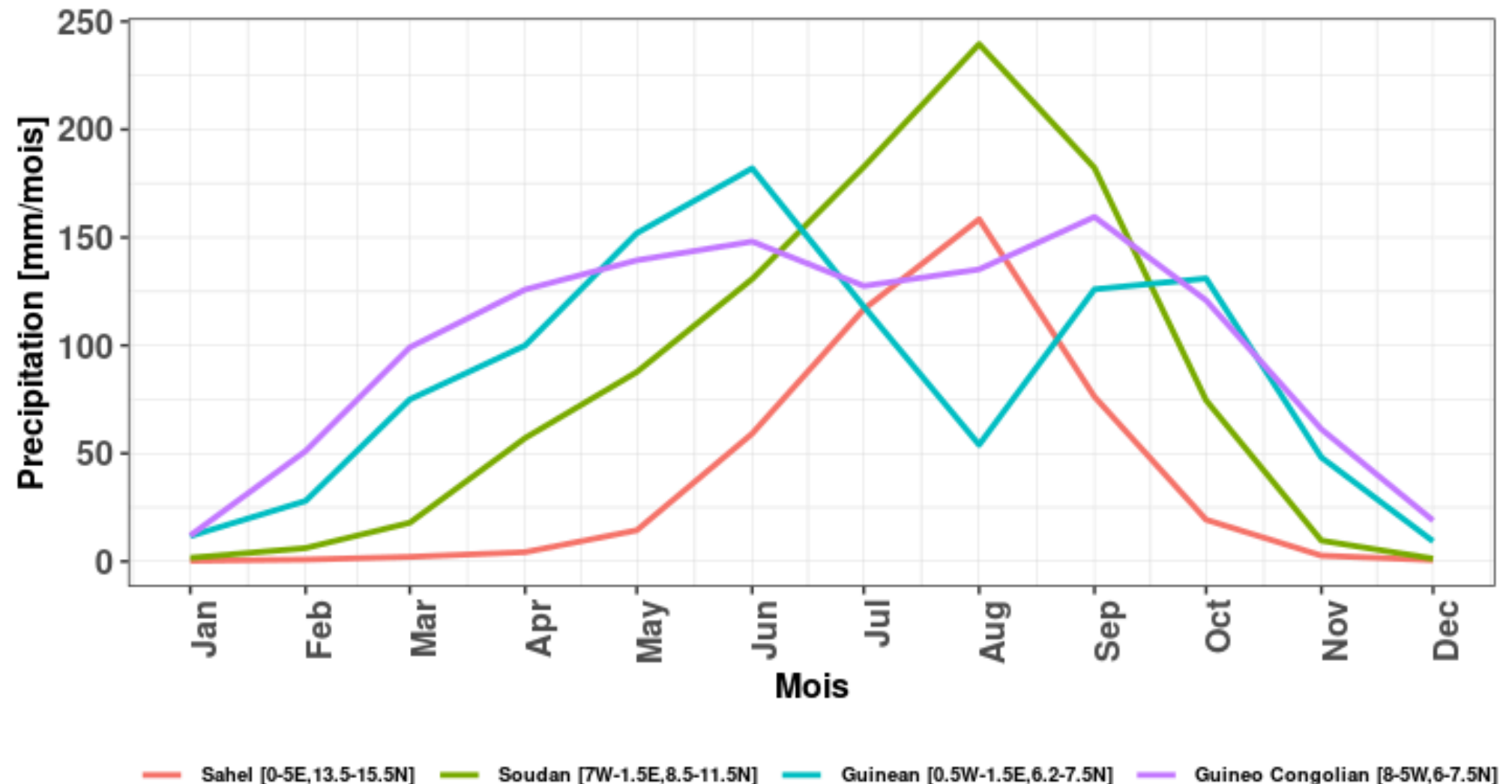
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Climate homogenous zones in West Africa

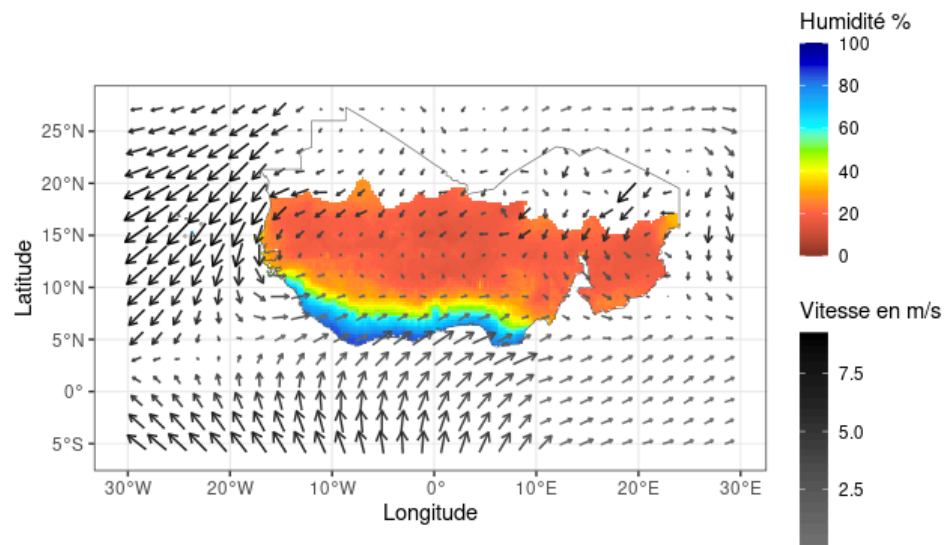
Rainfall and PET are two most important: => water budgets, Coupling Land-Atmosphere



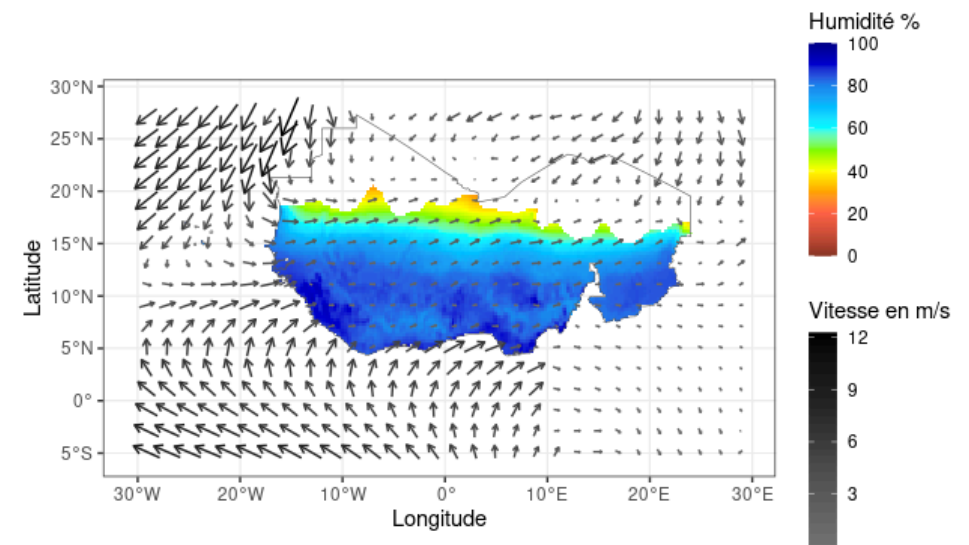
Climate homogenous zones in West Africa



Seasonal Rainfall Patterns and West Africa Monsoon (WAM) Influence



Dry season.

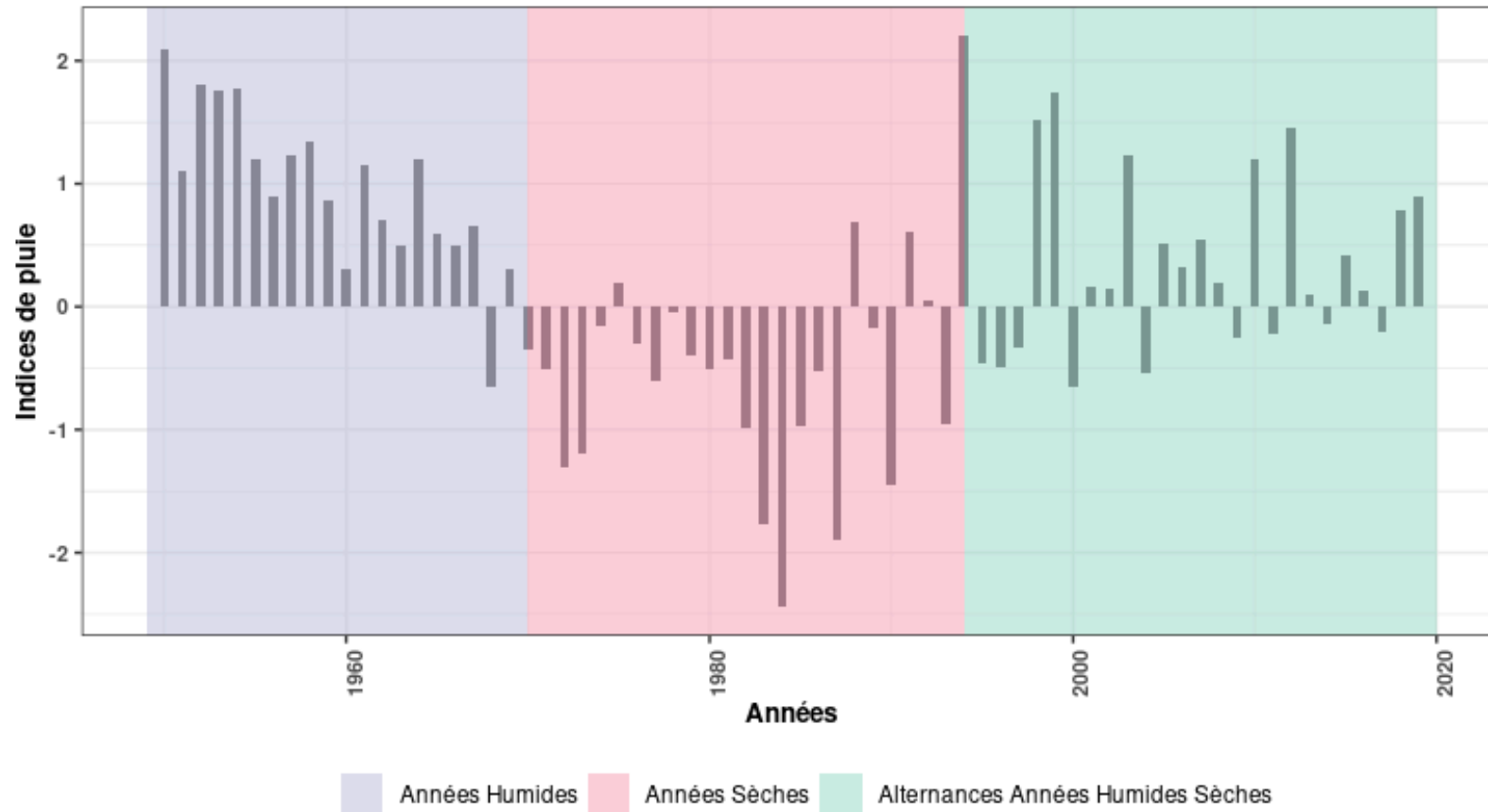


Monsoon period.

- **Dry season:** Harmattan winds from the Sahara desert, dry and dusty.
- **Monsoon period:** Humid winds advected by atlantic ocean.

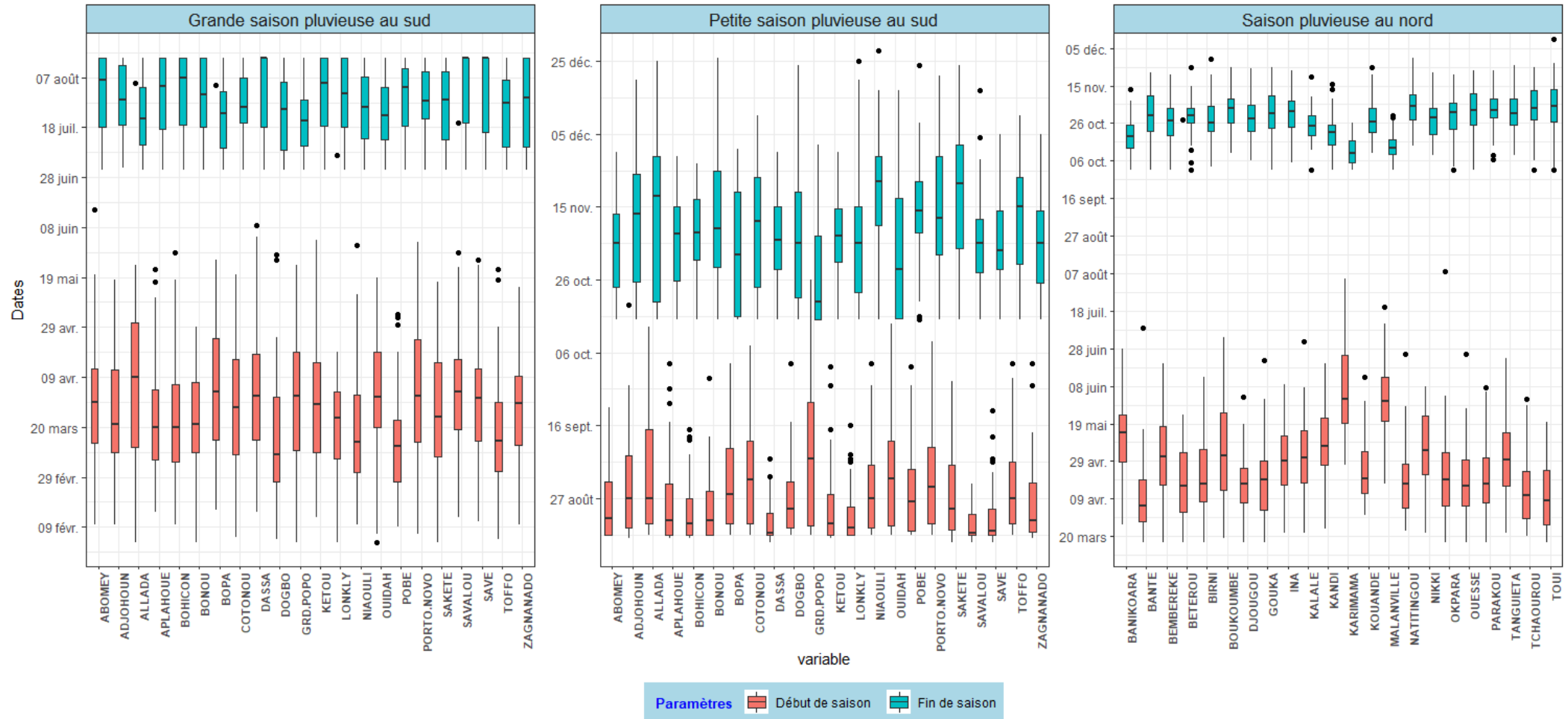
Rainfall Variability and Trends

- Interannual variation in intensity and duration of the WAM has led to:



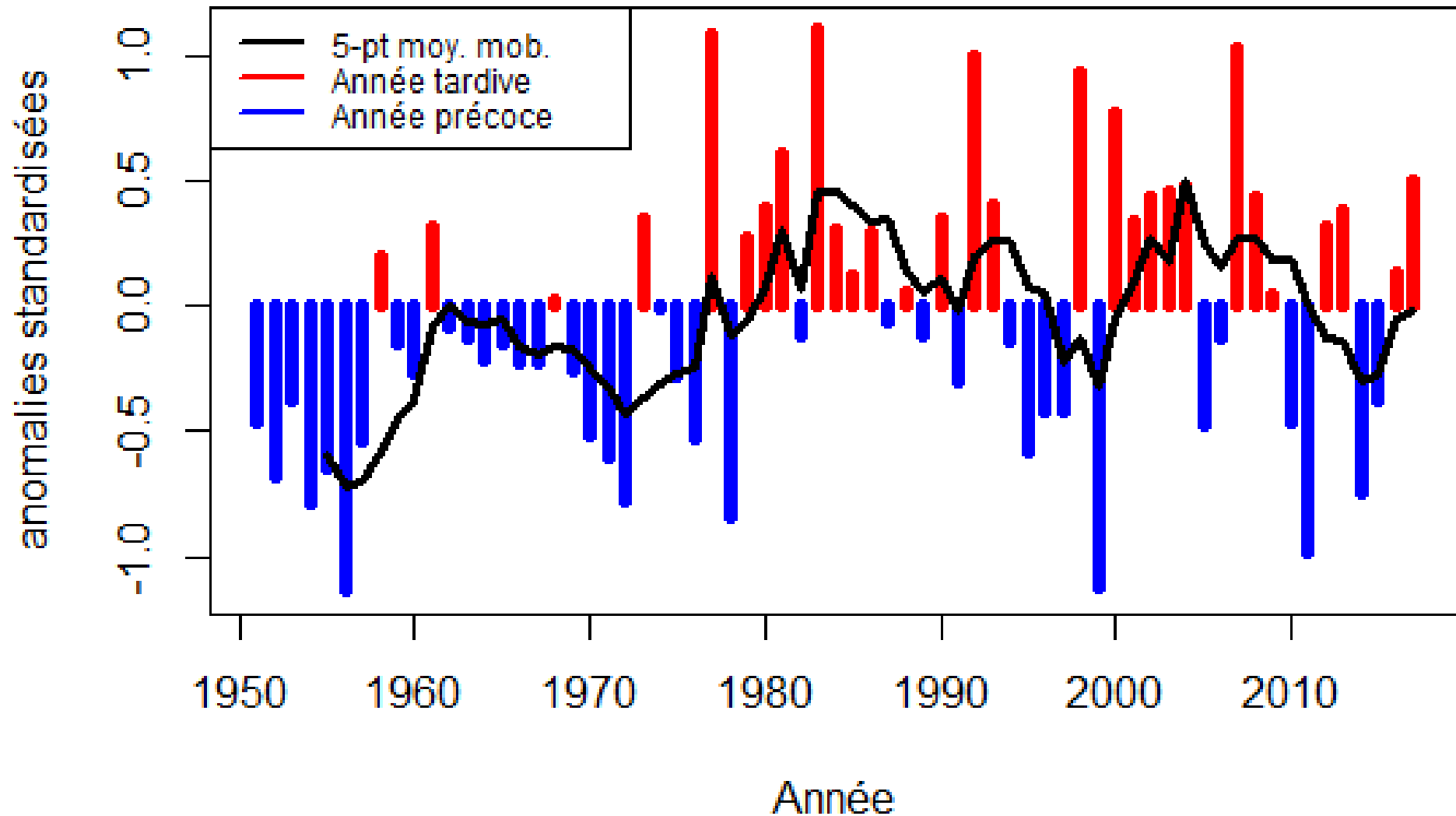
Rainfall index trends (standardized anomalies) for the Sahel zone over the period 1950-2019 (source AGRHYMET RCC-WAS)

Rainfall Variability and Trends



Rainfall onset for some stations over Benin

Rainfall Variability and Trends

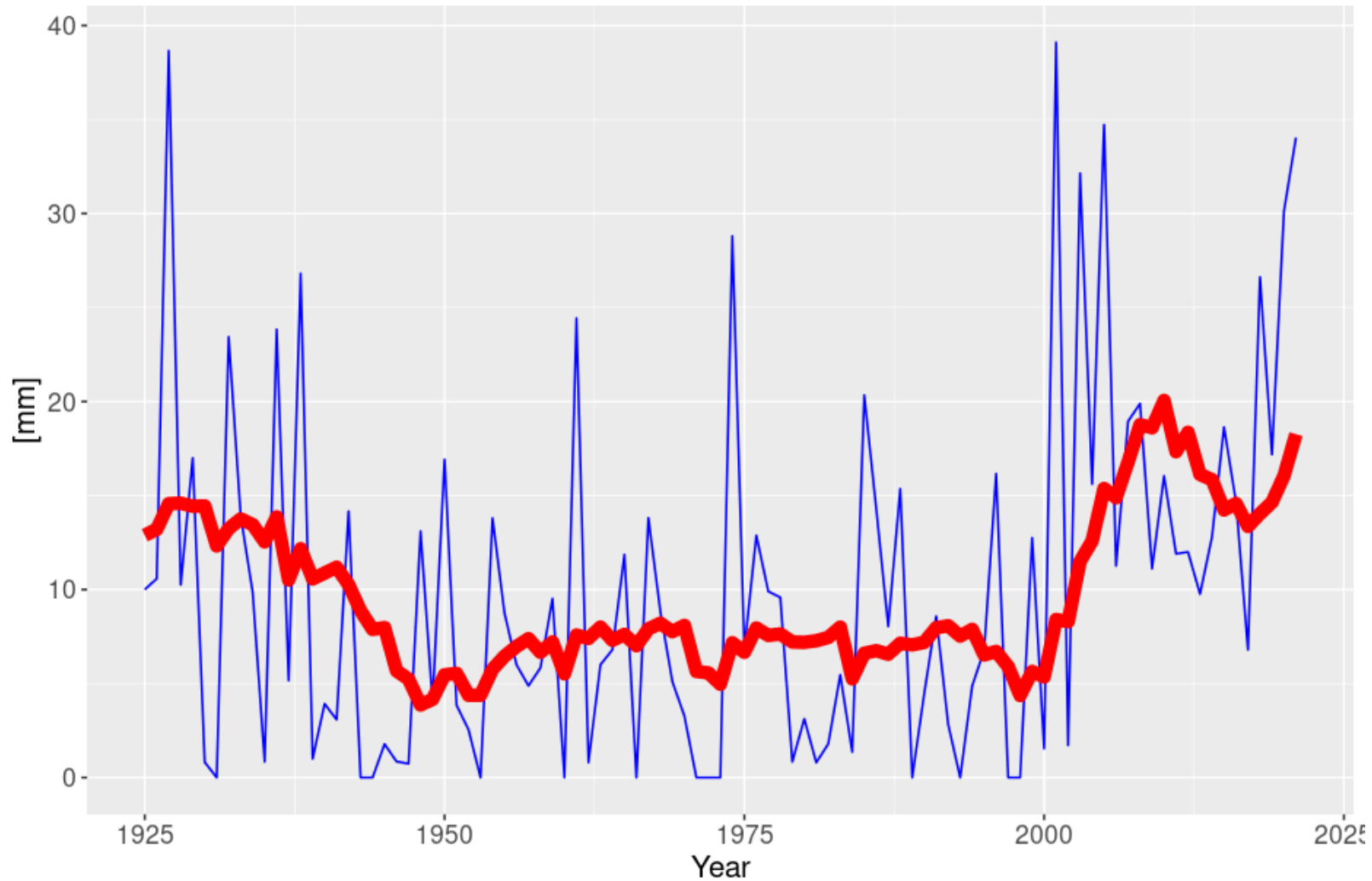


Rainfall onset for some stations over Benin, Trends

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Extreme Weather Events

- Interannual variation in intensity and duration of the WAM has led to:

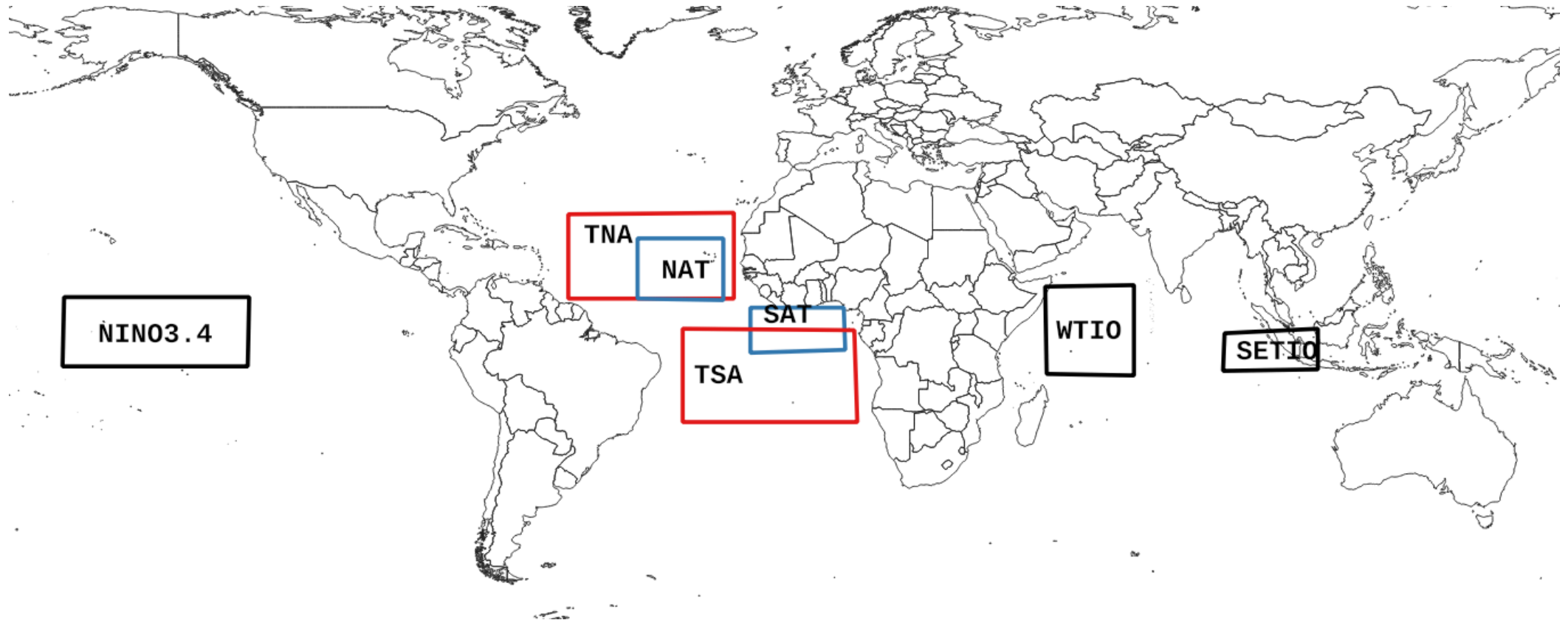


- 99th percentiles of daily rainfall amounts in the city of Niamey with 10-Years Moving-Average (source AGRHYMET RCC-WAS)
- droughts , floods, heatwaves, etc.

Others key factors influencing climate variability in West Africa and the Sahel

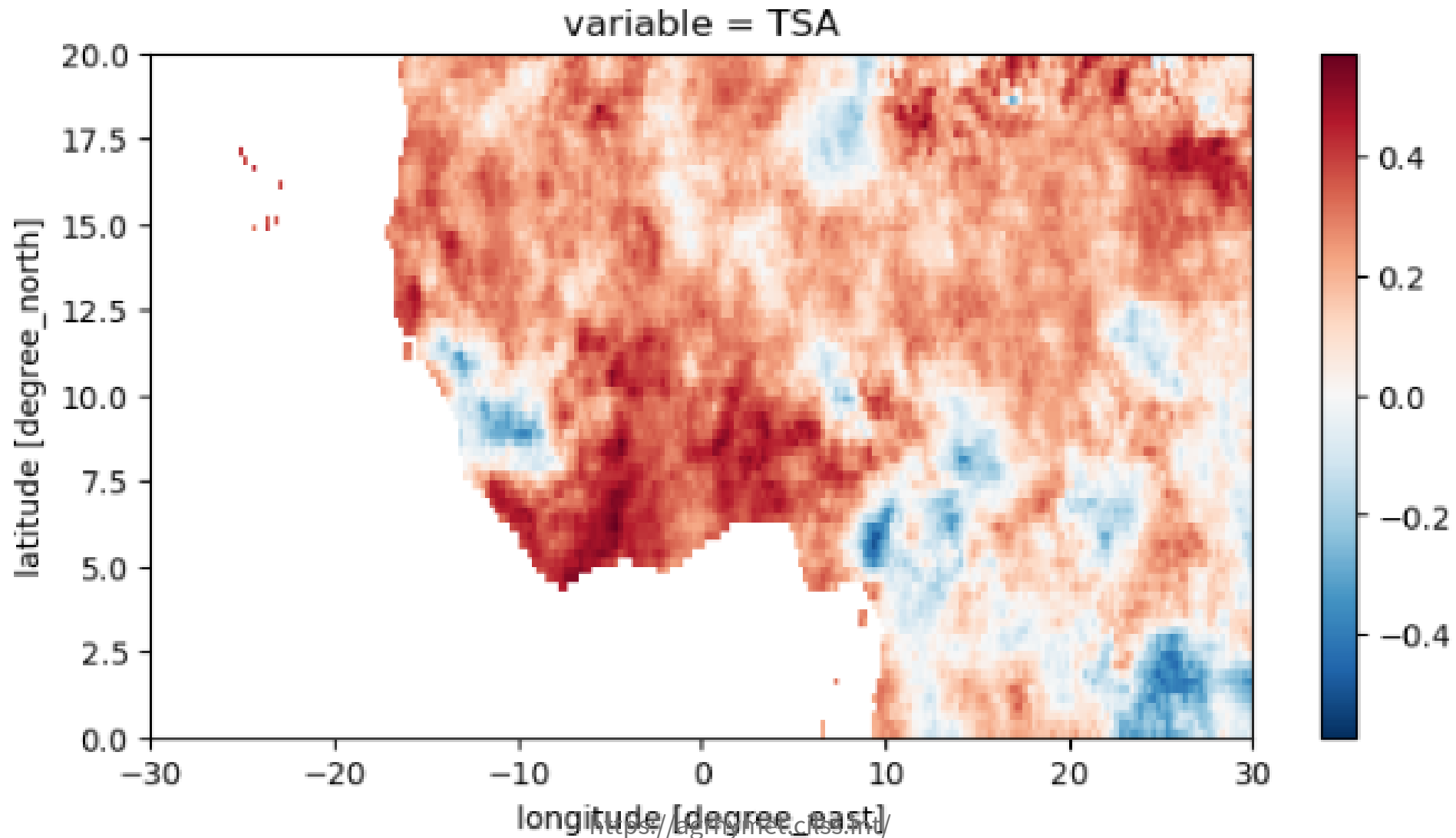
- Teleconnections and Global Influences,
- Continental surface factors,
- Atmospheric factors,

Teleconnections and Global Influences

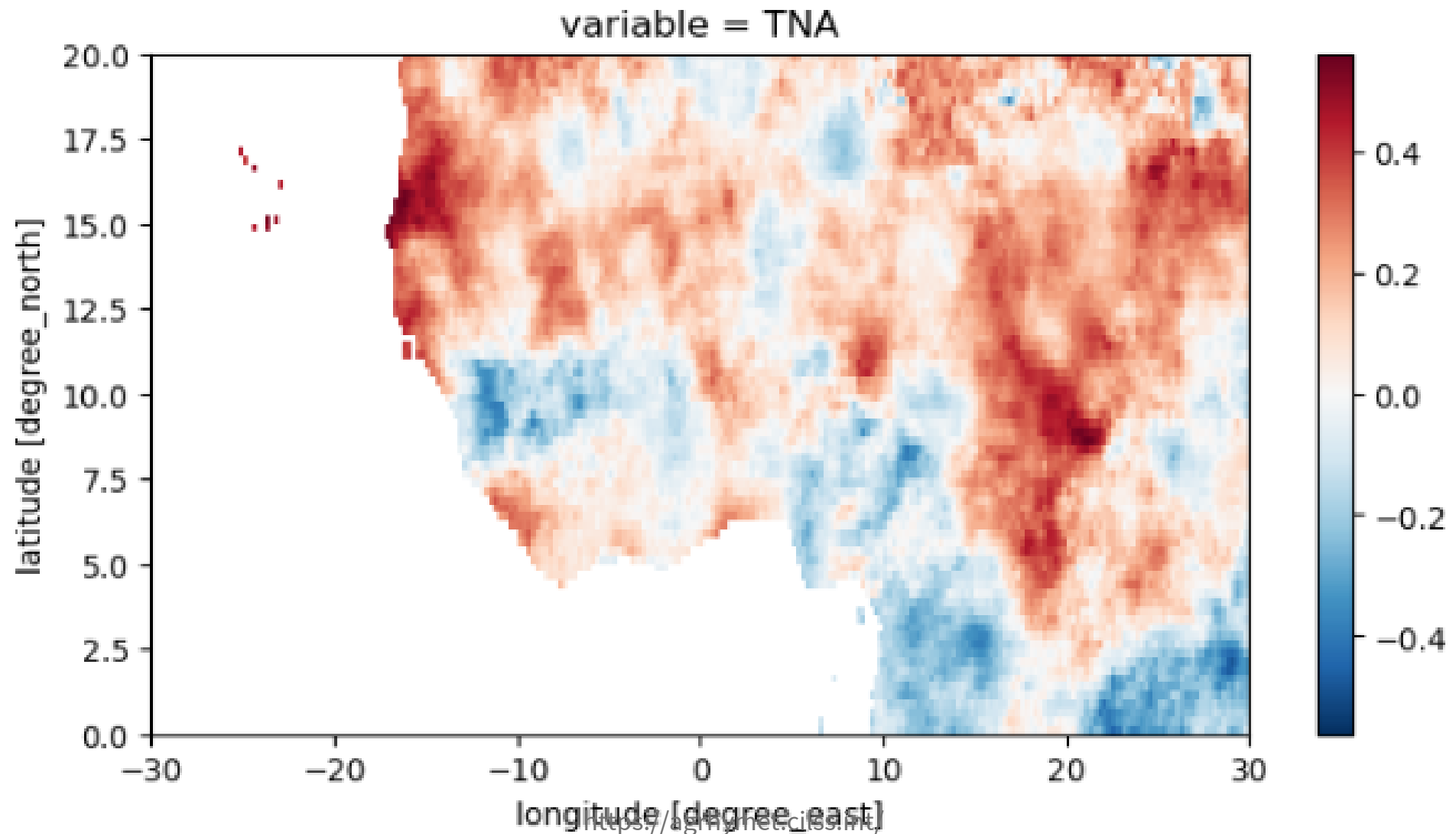


Some Teleconnections

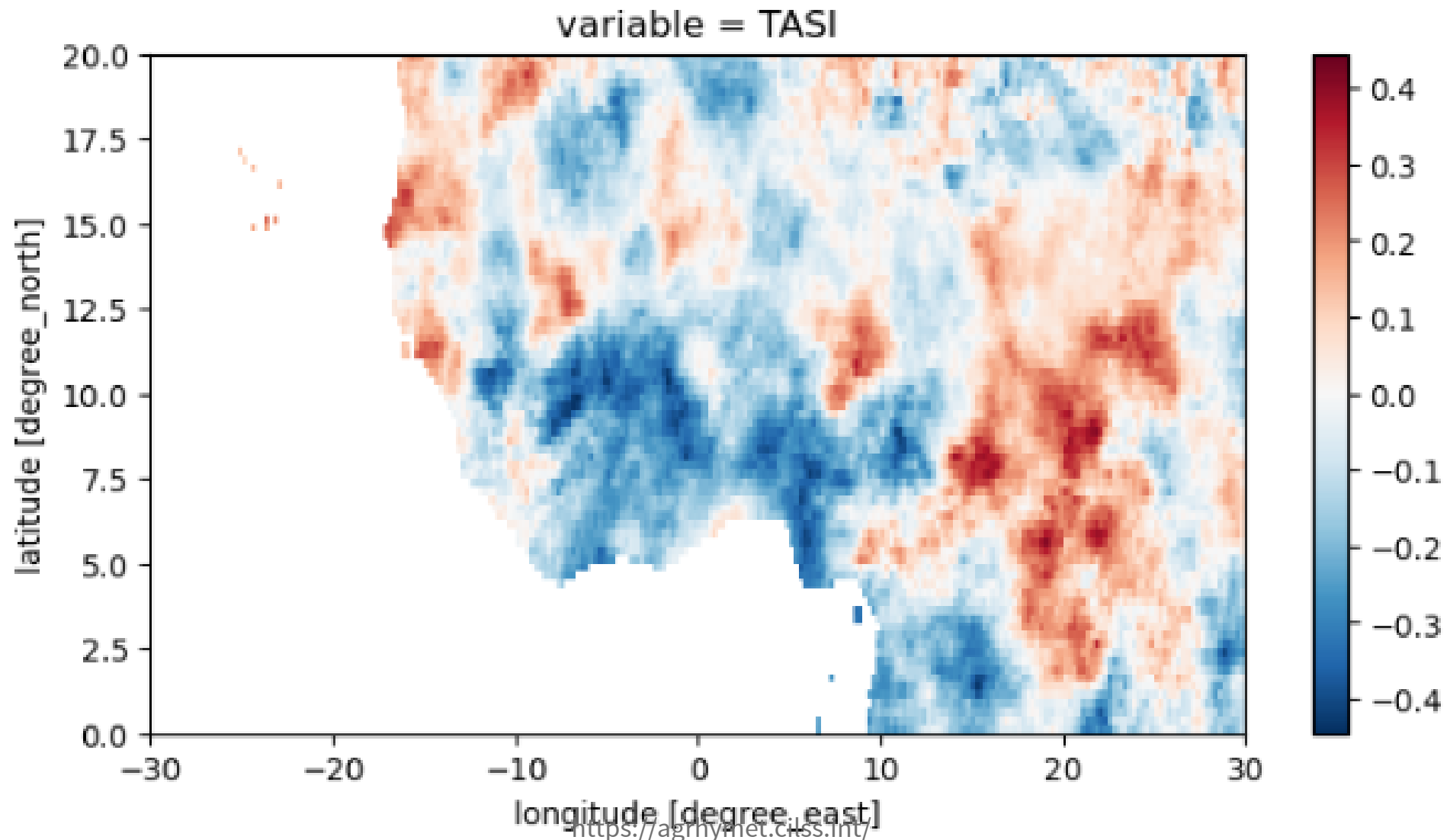
Teleconnections and Global Influences



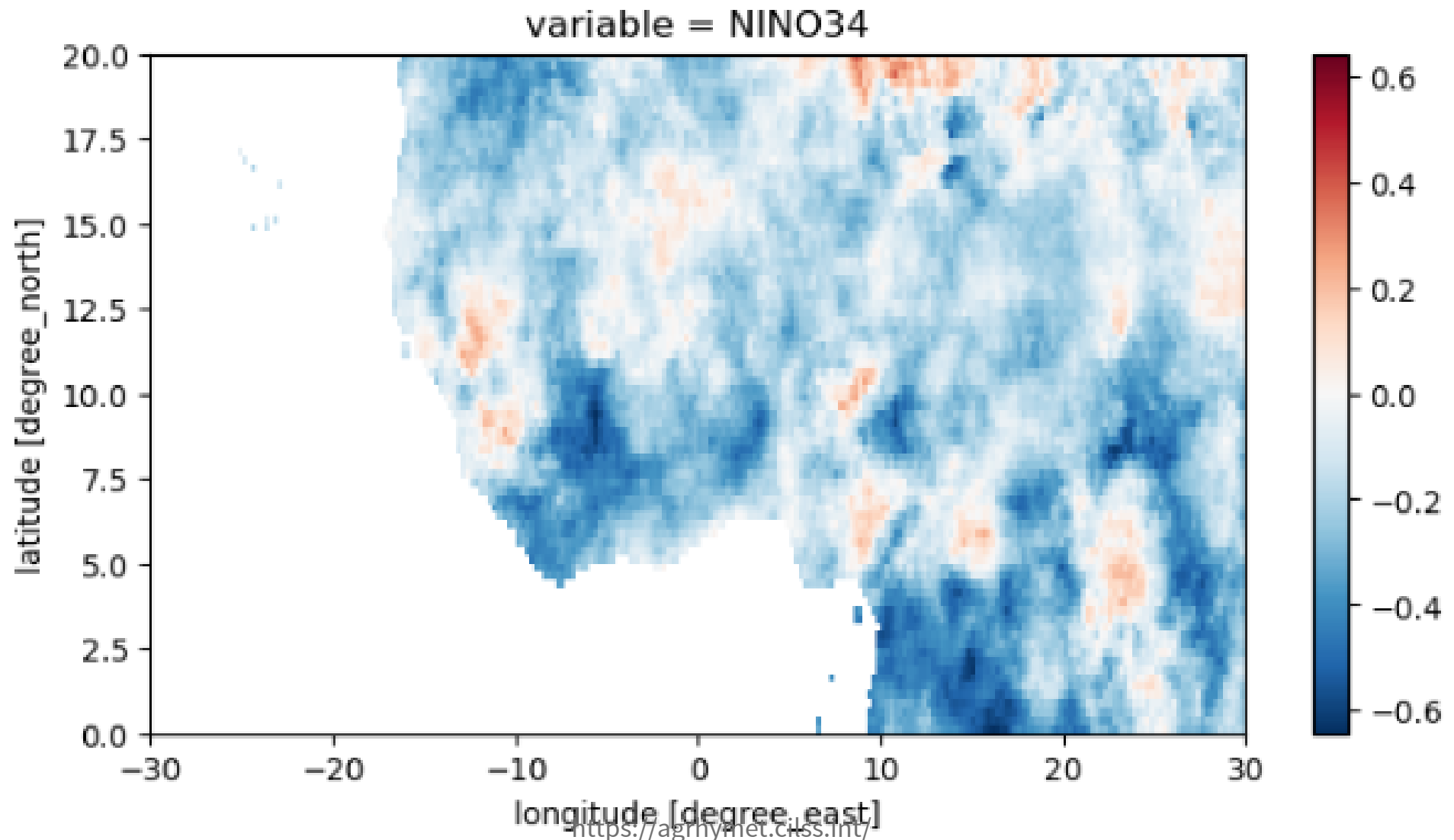
Teleconnections and Global Influences



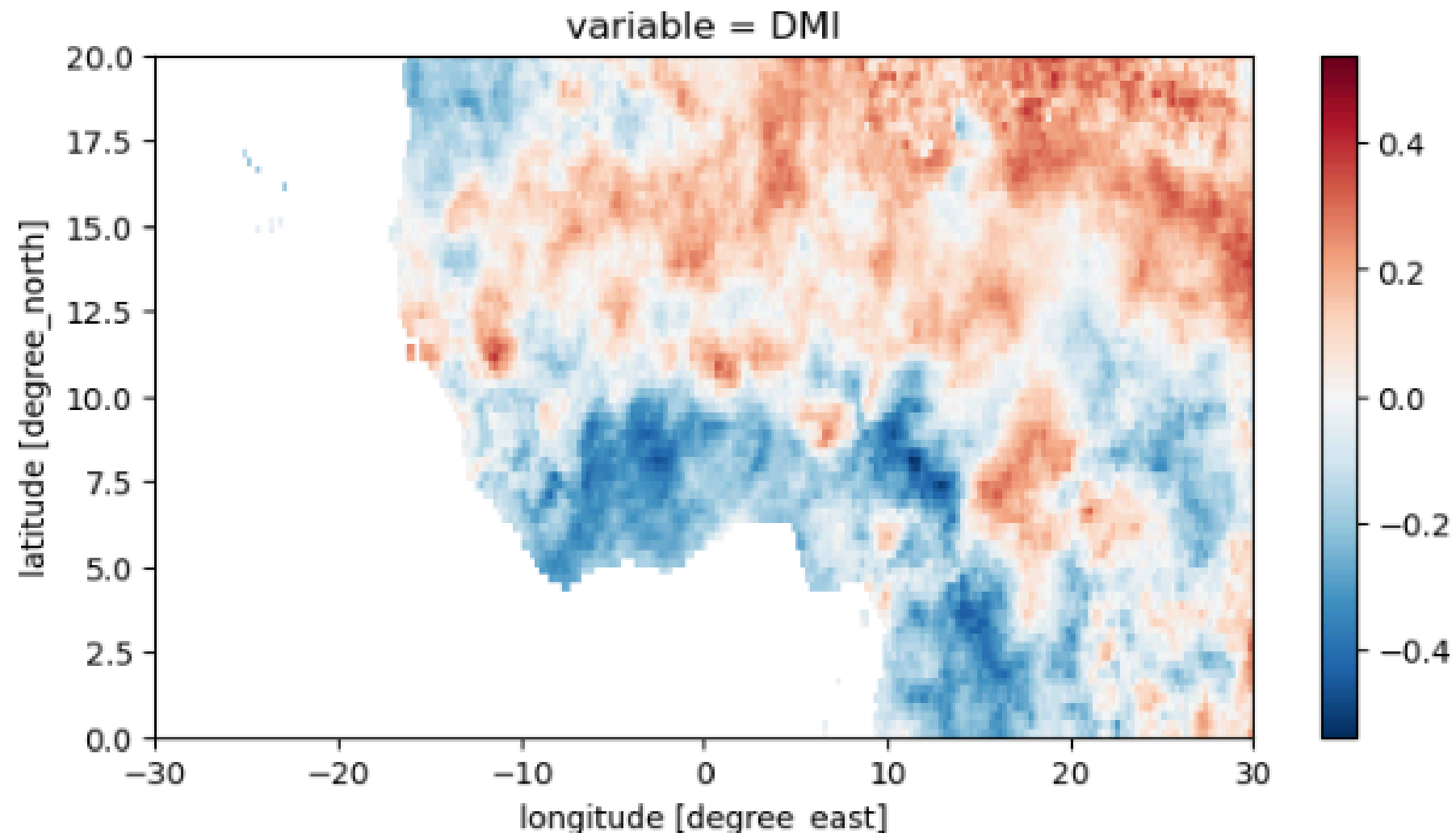
Teleconnections and Global Influences



Teleconnections and Global Influences

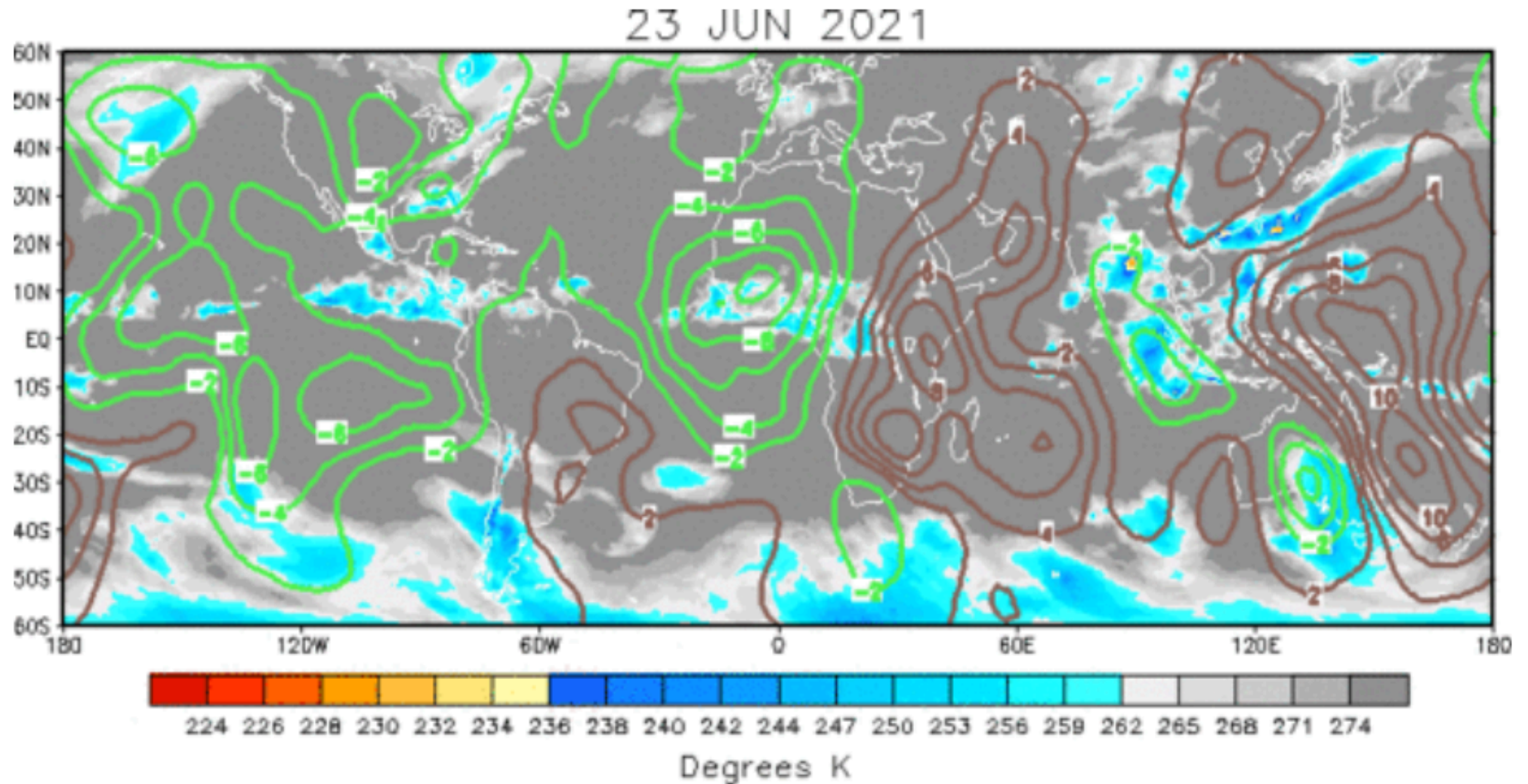


Teleconnections and Global Influences



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Atmospheric factors



Madden-Julian Oxillation

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Conclusion