

# **CORDEX and West Africa:**

## **Modeling the climate change and variability**

**e.g. How CORDEX is gonna help or ... confuse us?**

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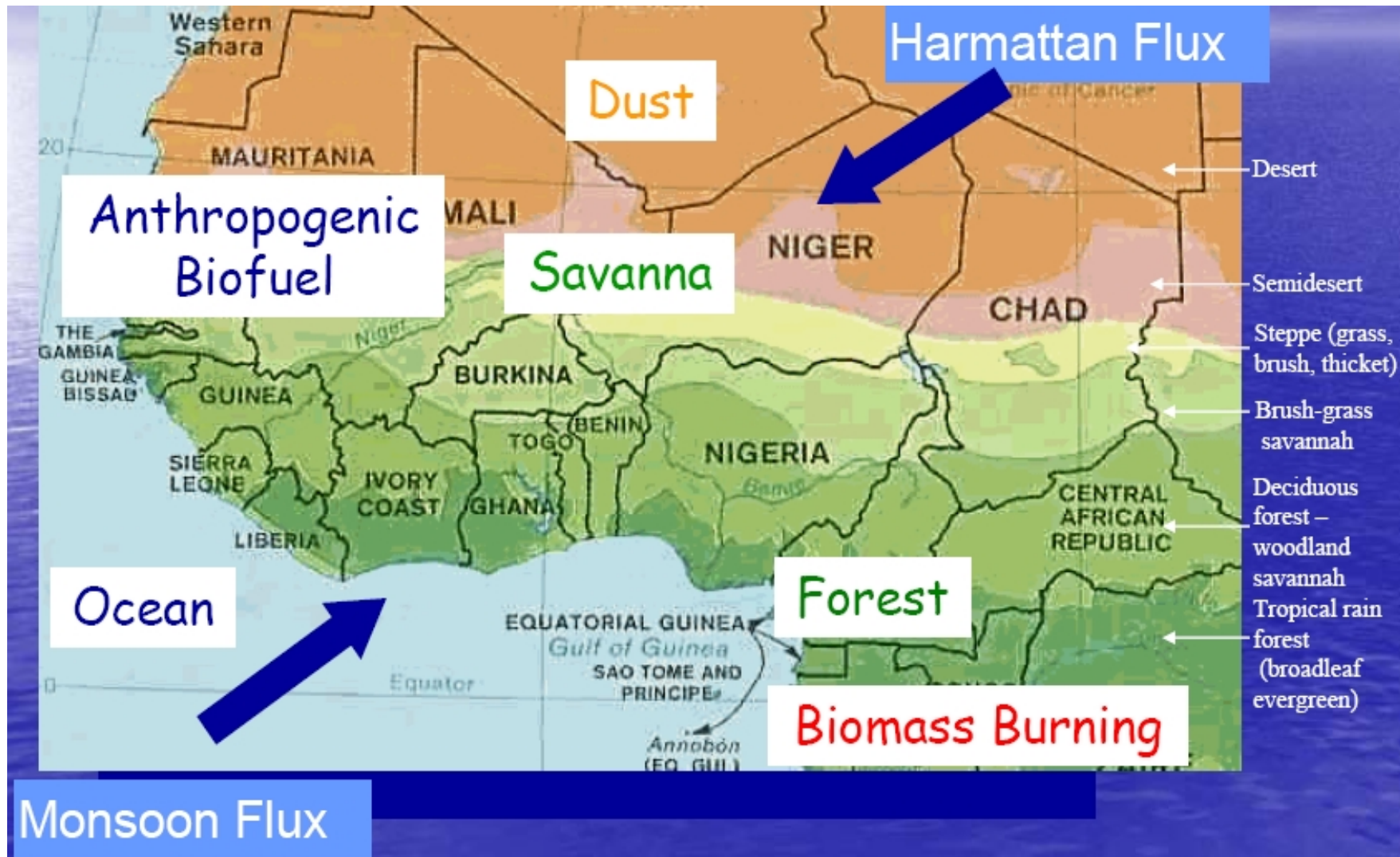
# □ References

**Sylla MB**, A Dell'Aquila, PM Ruti and F Giorgi, 2010: Simulation of the intraseasonal and the interannual variability of rainfall over West Africa with RegCM3 during the monsoon period. *International Journal of Climatology* **30**:1865–1883, [DOI: 10.1002/joc.2029](https://doi.org/10.1002/joc.2029)

**Sylla MB**, AT Gaye, GS Jenkins, JS Pal and F Giorgi, 2010: Consistency of projected drought over the Sahel with changes in the monsoon circulation and extremes in a regional climate model projection. *Journal of Geophysical Research*, **115**, D16108, [DOI: 10.1029 /2009JD012983](https://doi.org/10.1029/2009JD012983)

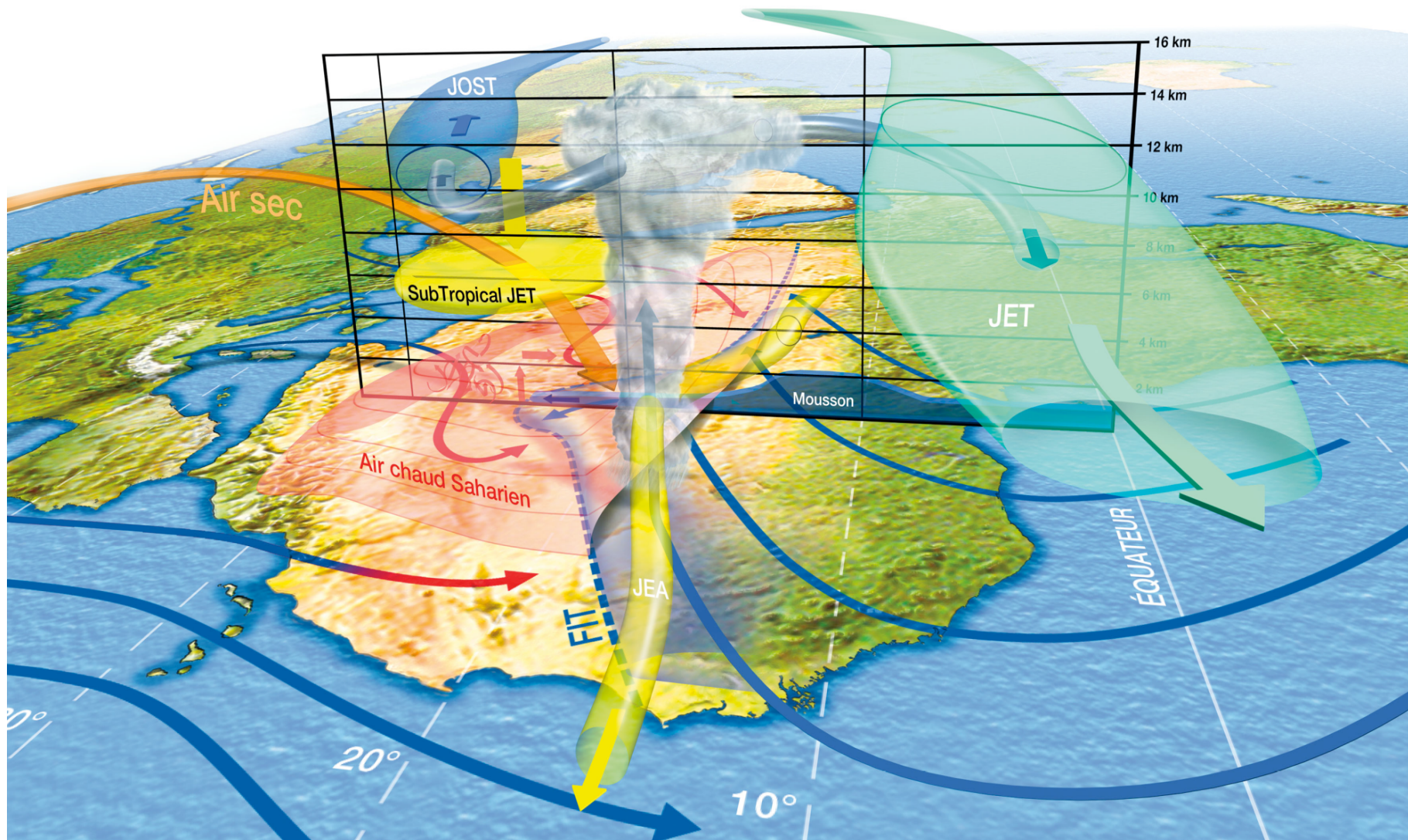
**Sylla MB**, F Giorgi, PM Ruti, S Calmanti and A Dell'Aquila, 2011: The impact of deep convection on the West African summer monsoon climate: a regional climate model sensitivity study. *Quaternaly Journal of Royal Meteorological Society*: [Under Revision](#)

# ❑ West African domain



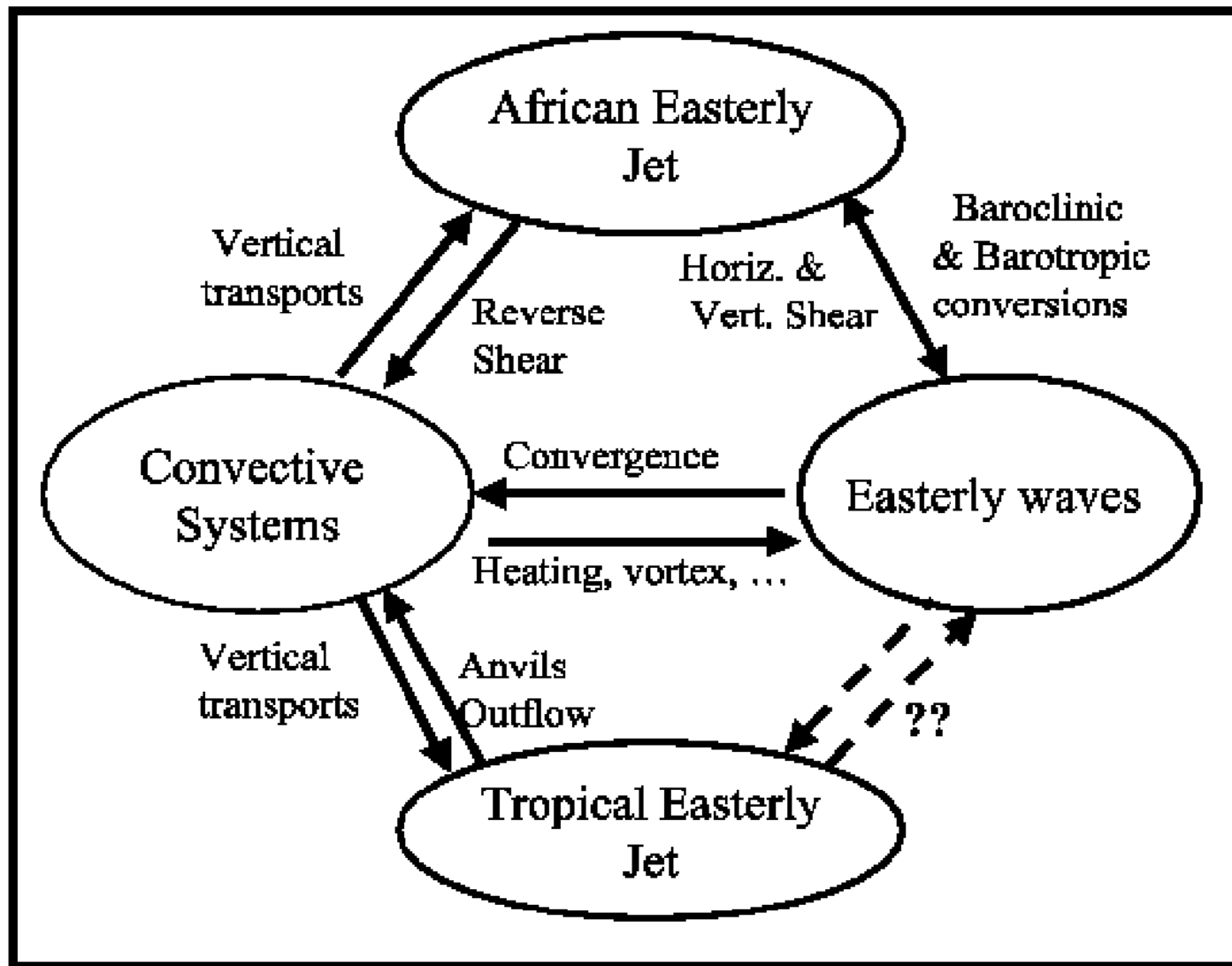
AMMA 2005

# □ The West African Monsoon system



Janicot et al. 2010

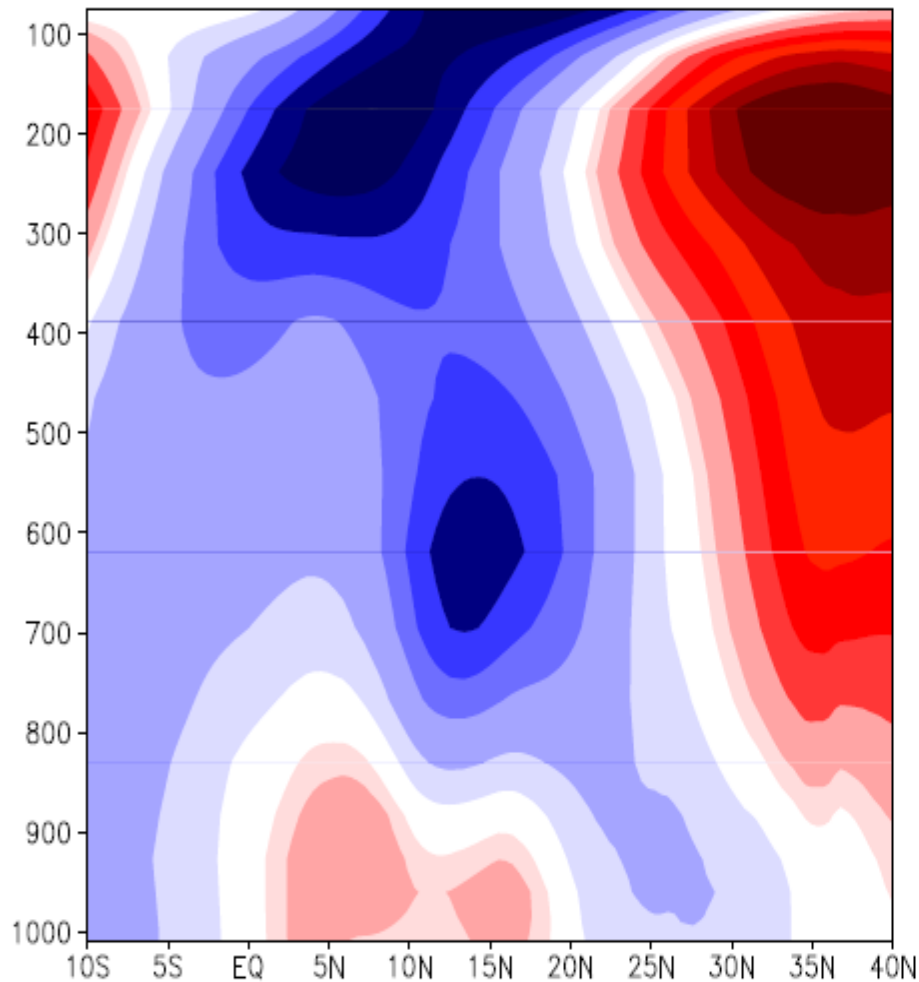
## ✓ Interaction between the axes



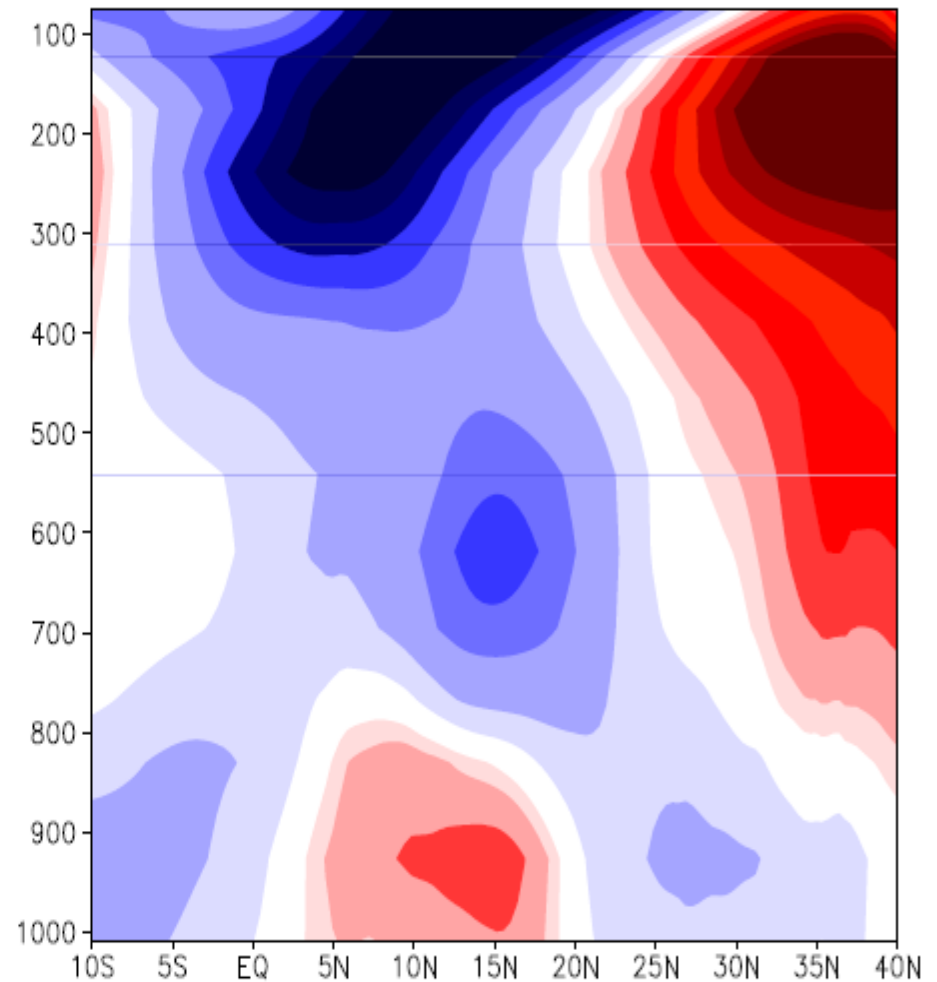
Redelsperger et al. 2002

# ✓ Main features in the Zonal Wind (U1000-100)

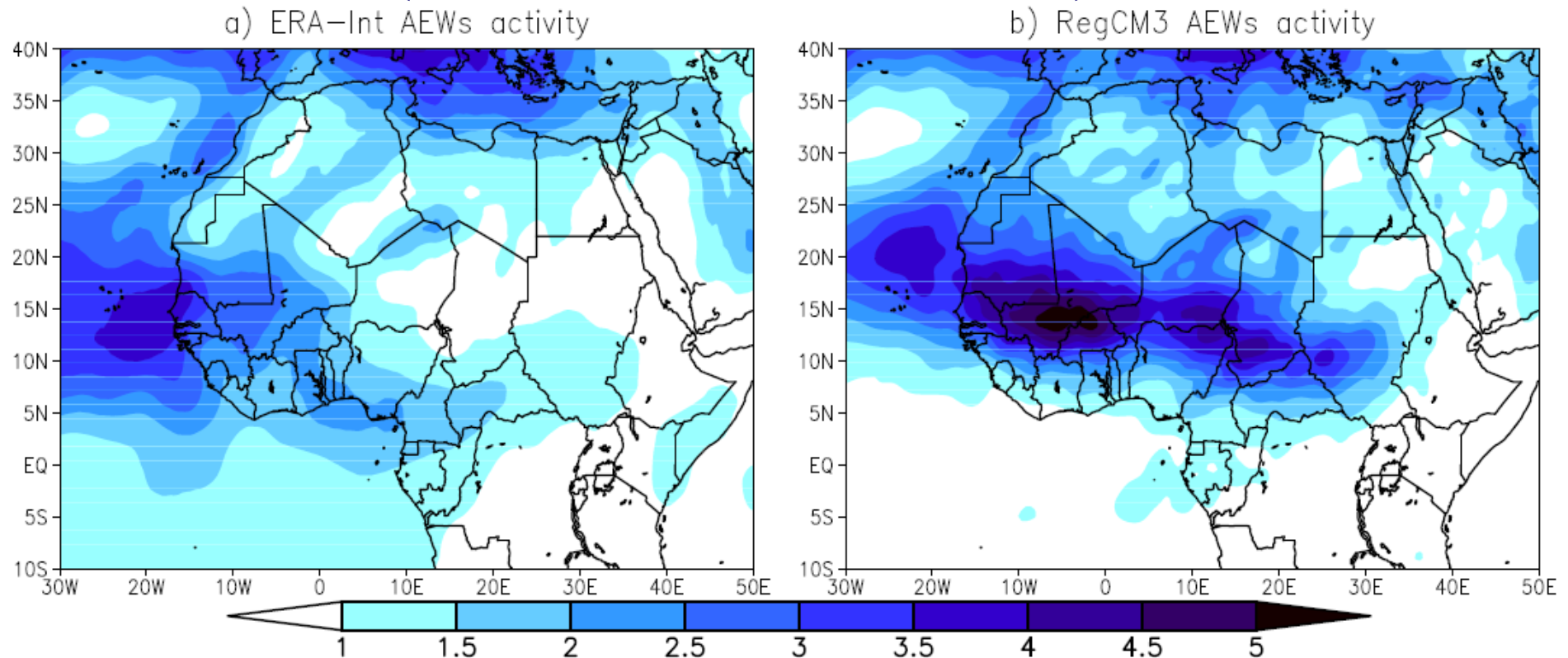
a. ERA-Interim JJA Zonal Wind



b. RegCM3 JJA Zonal Wind

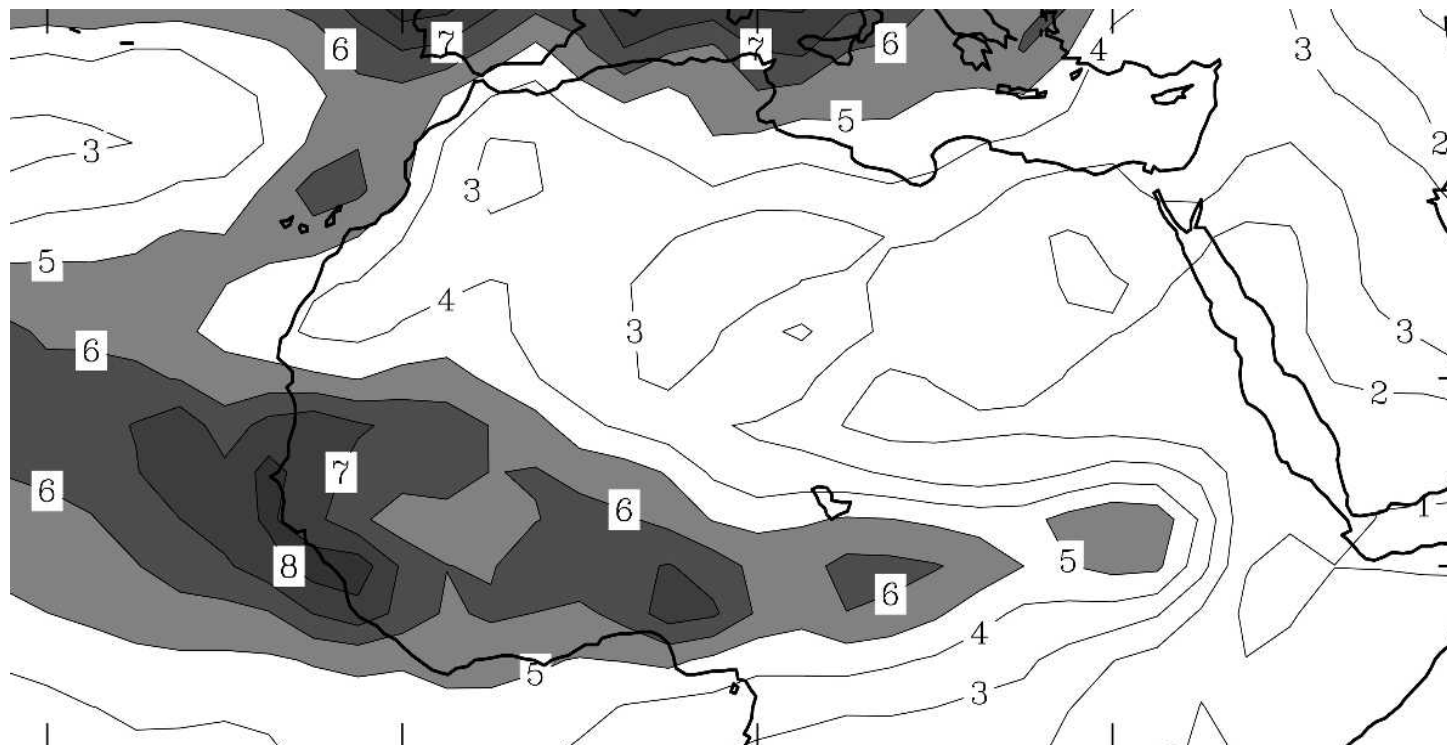


# ✓ AEWs activity in the Meridional Wind (V600, V650, V700 ?)

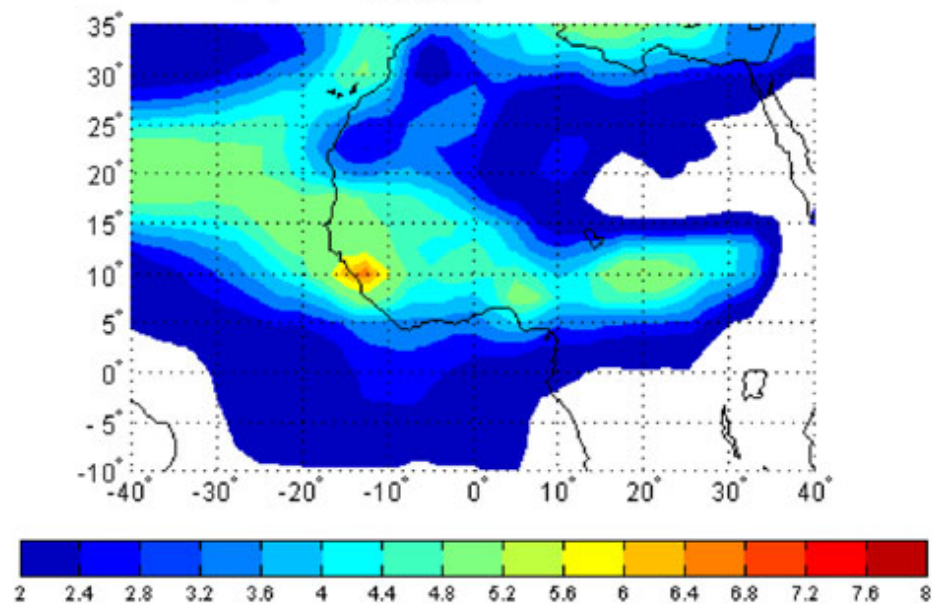


**No Panic !!! Simulation may be RIGHT!**

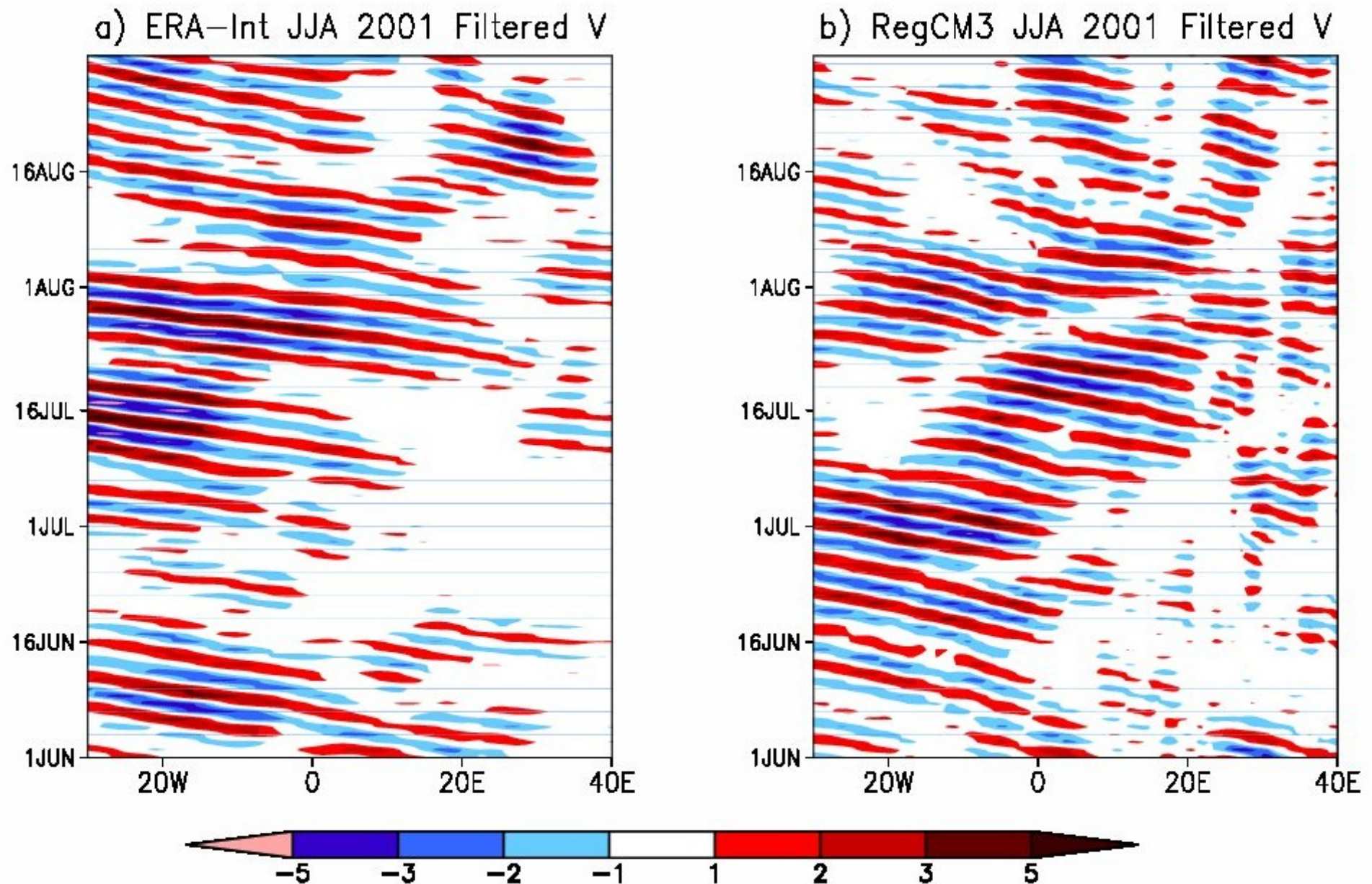
Mekonnen et al. (2006) and Ruti and Dell'Aquila (2010)



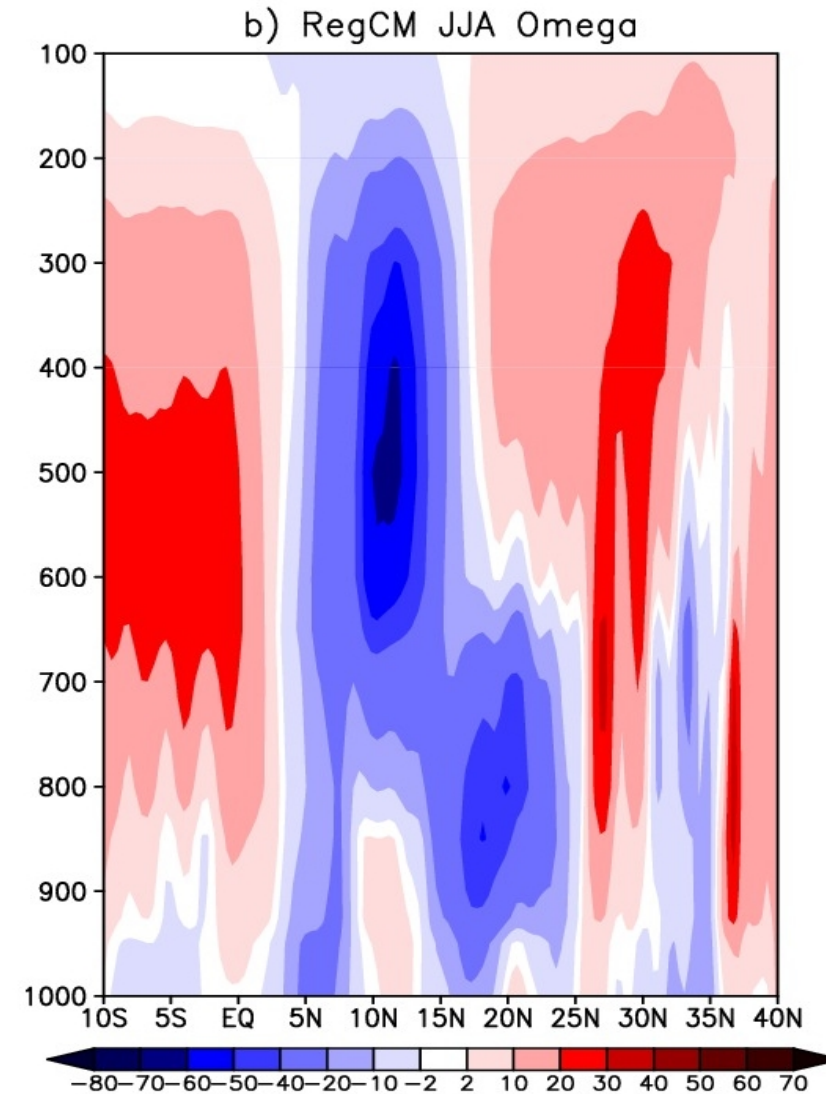
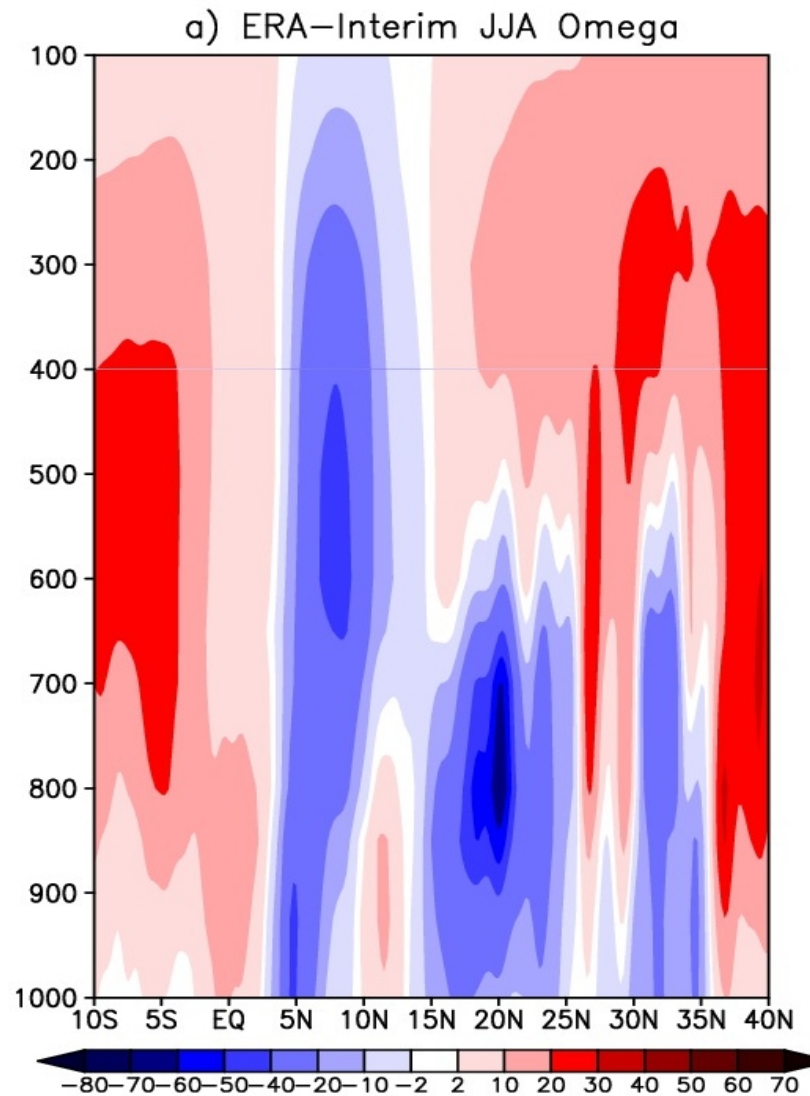
(d) ERA40



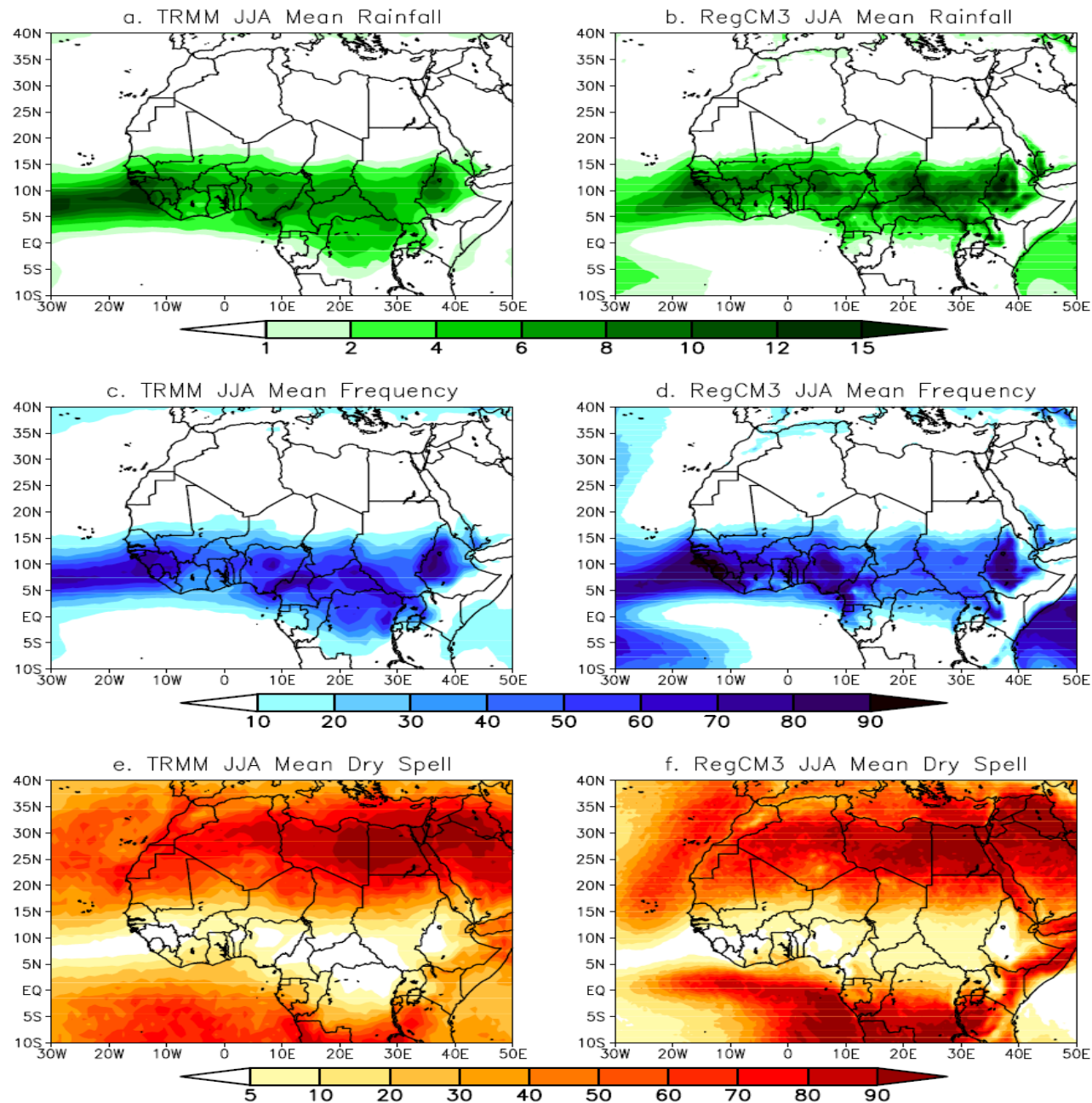
# ✓ AEWs Propagation



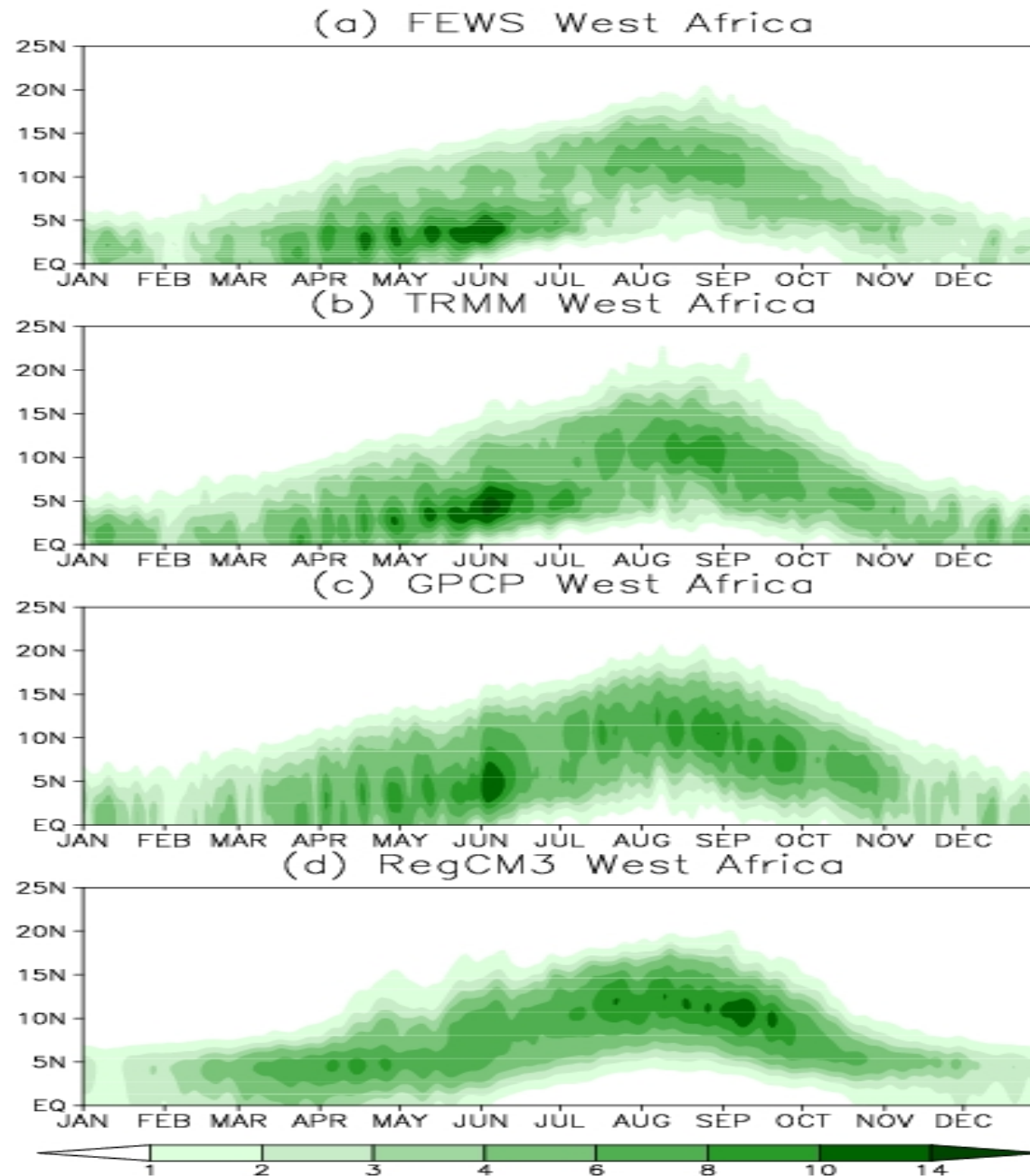
# ✓ The Strong Ascent along the ICTZ



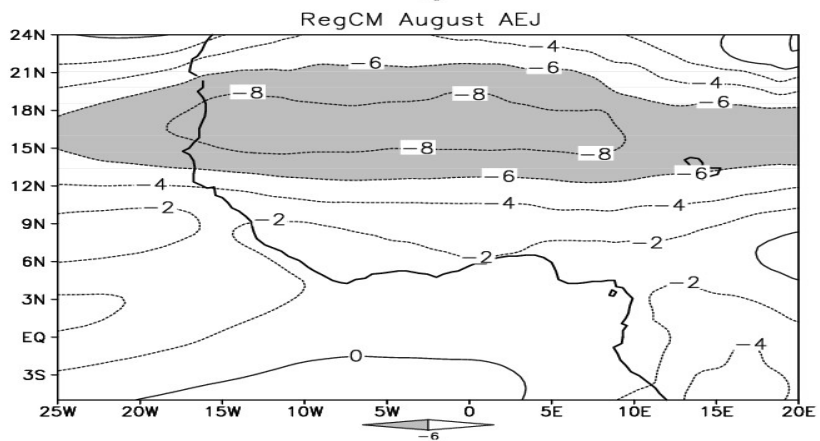
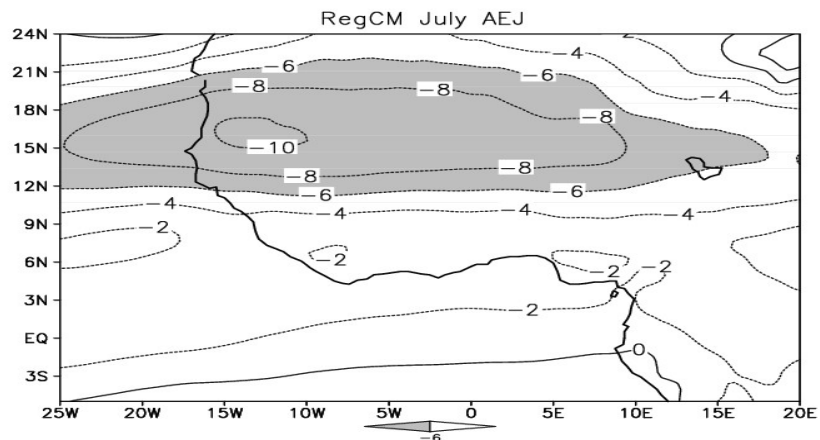
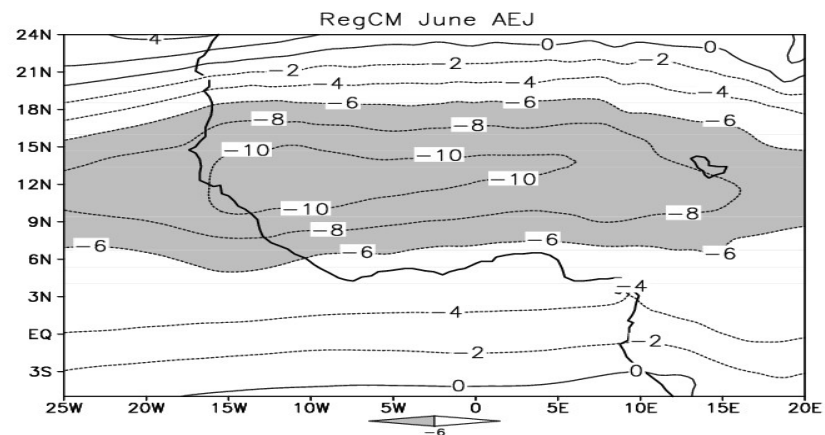
# ✓ Rainfall statistics



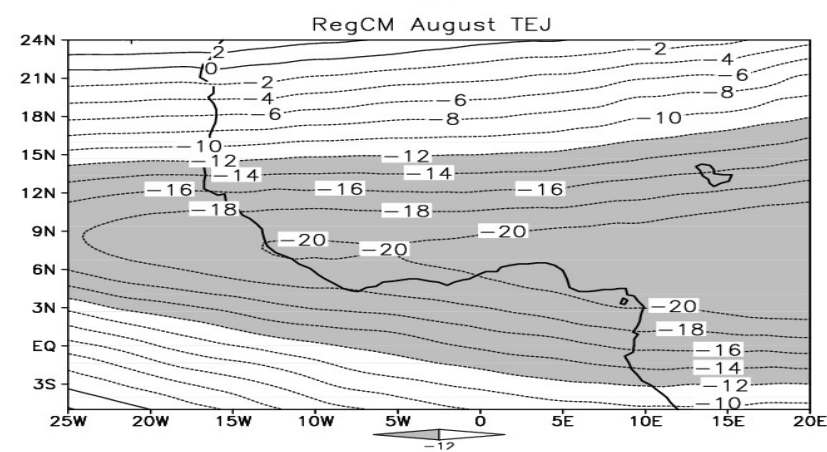
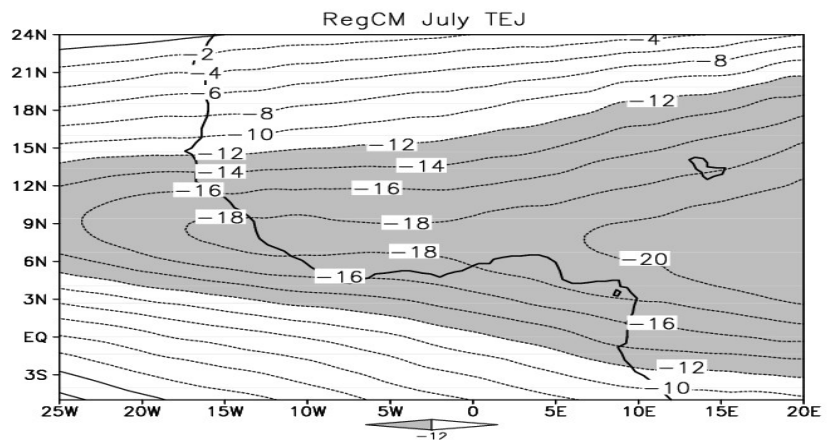
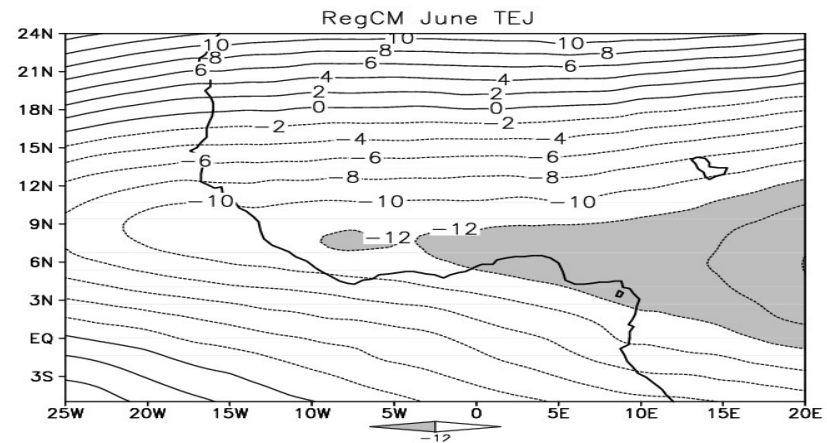
# ❑ Intraseasonal Variability: Jump of the Monsoon



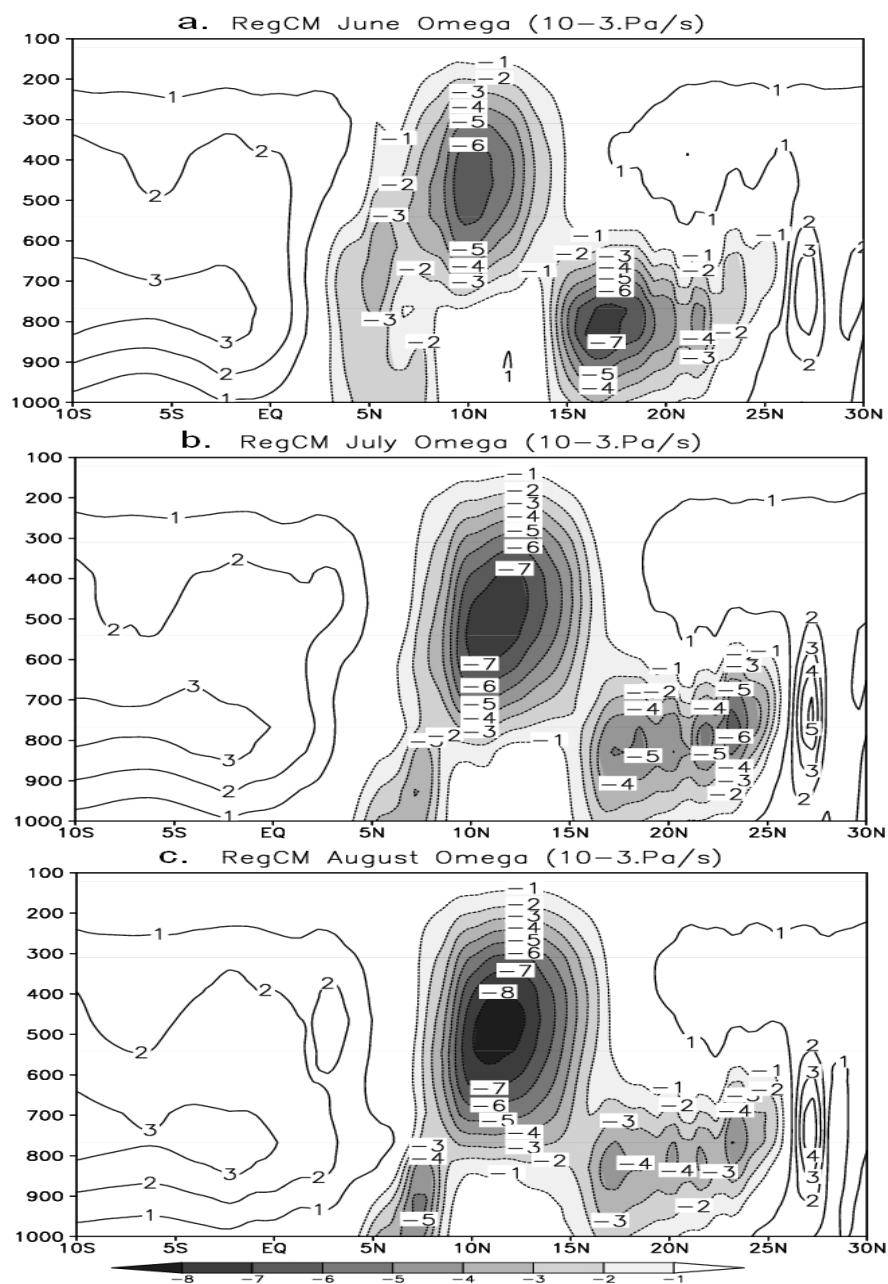
# AEJ



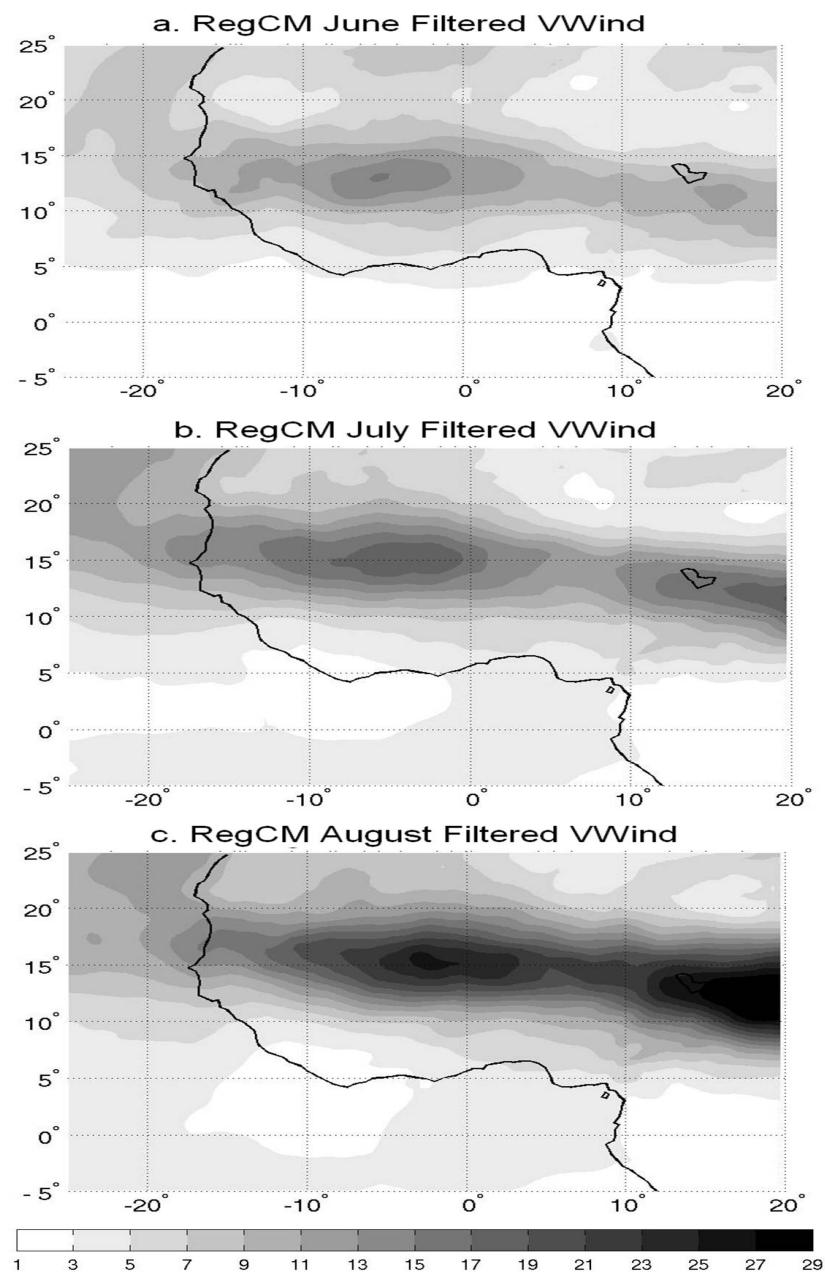
# TEJ



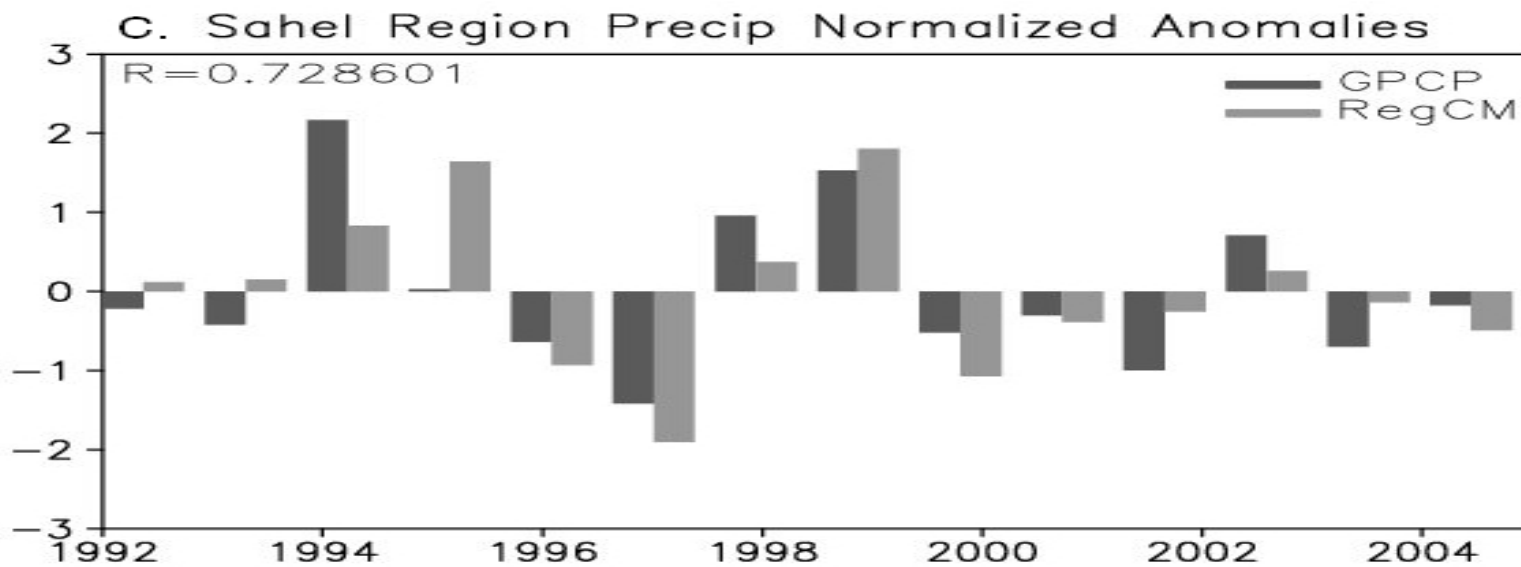
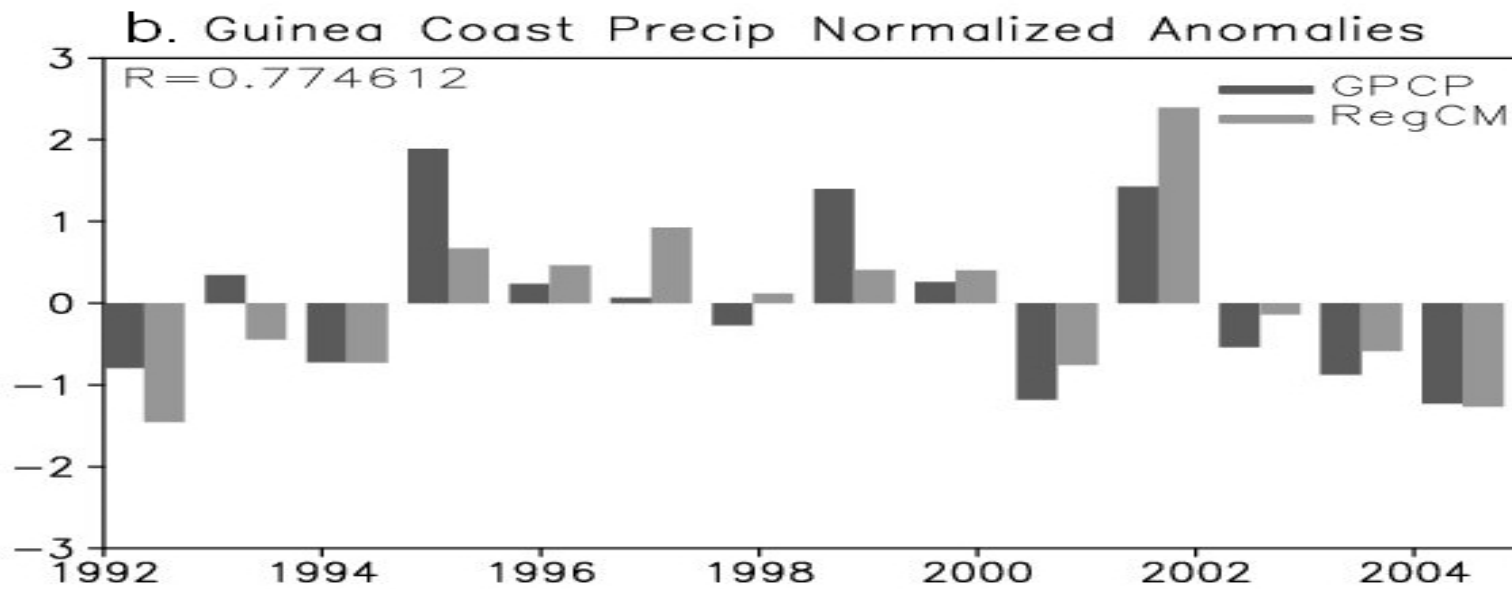
# Pressure Velocity

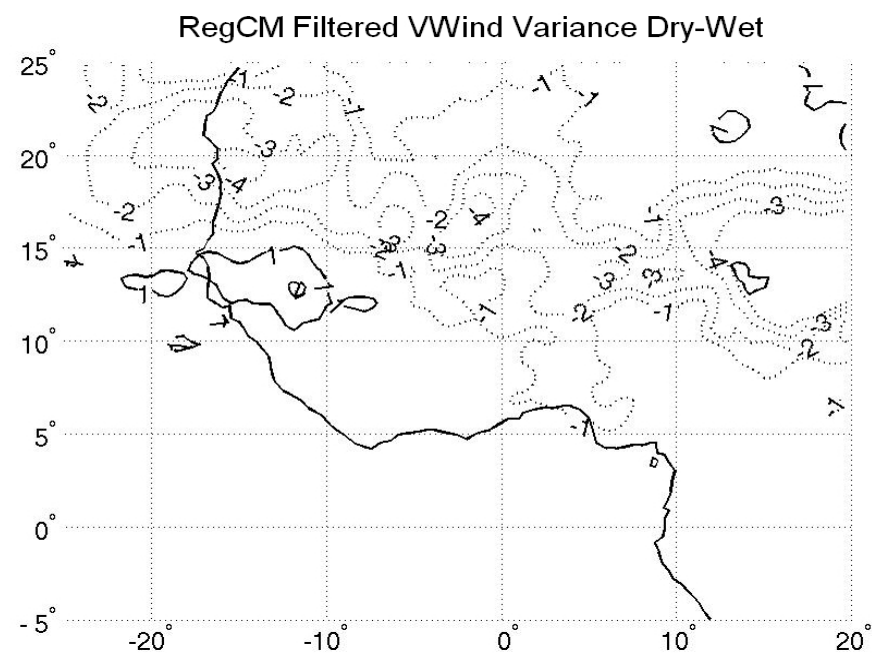
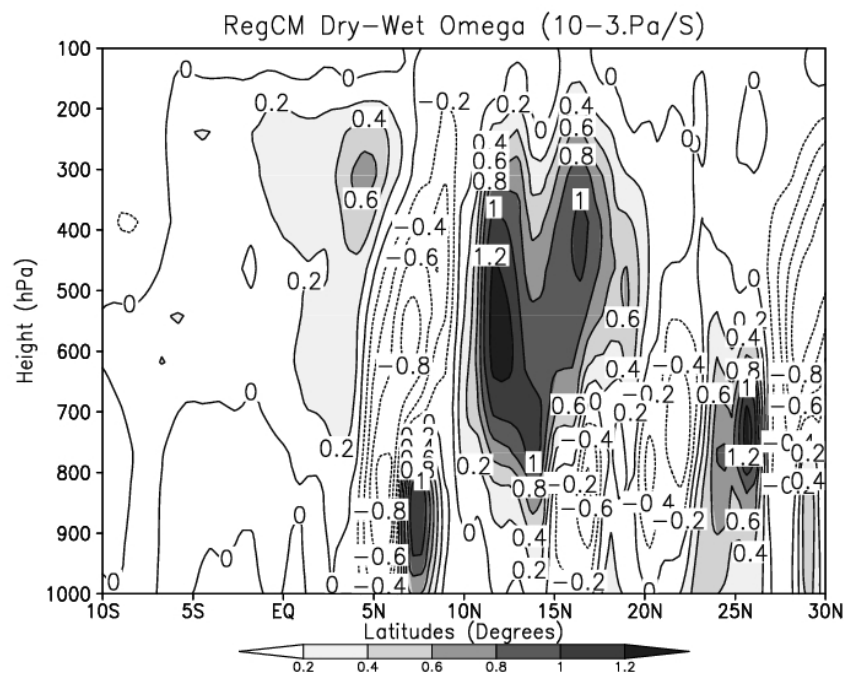
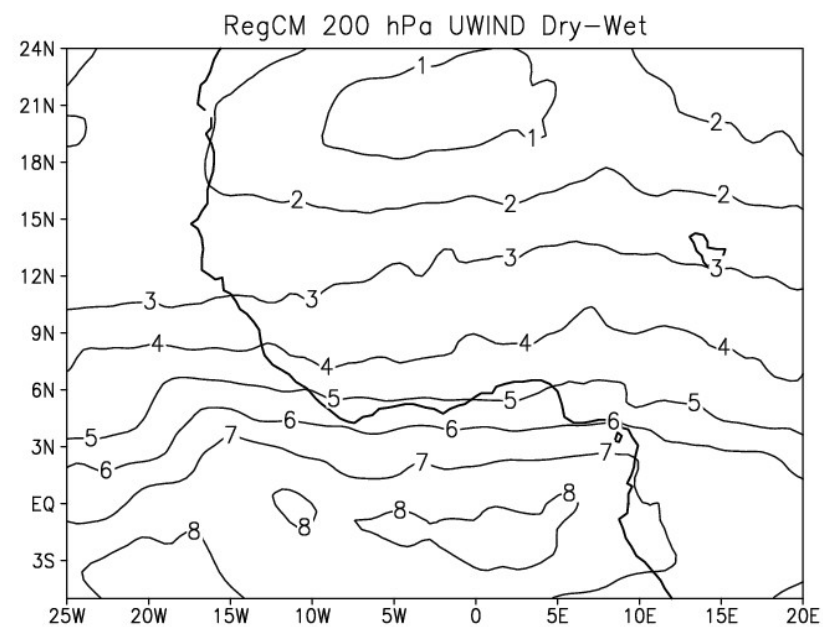
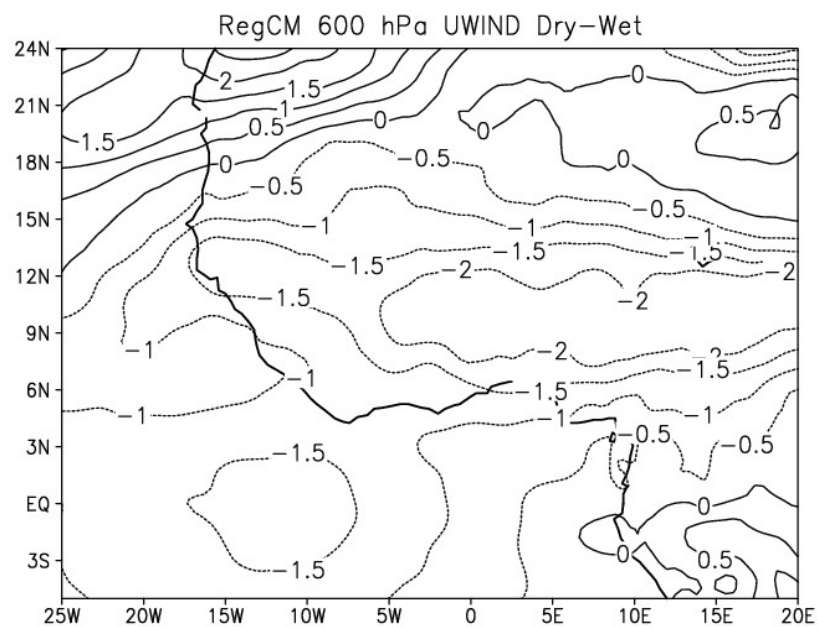


# AEWs Activity



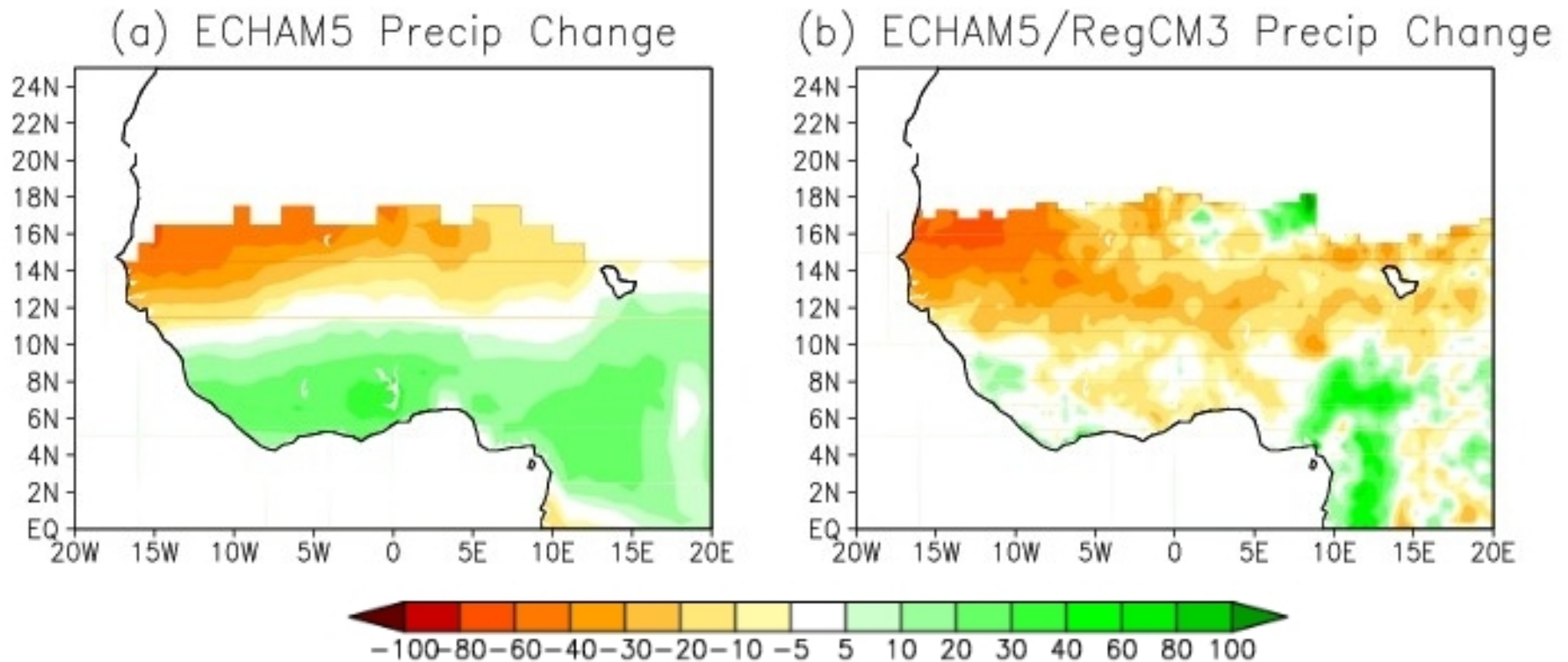
## ✓ Interannual Variability





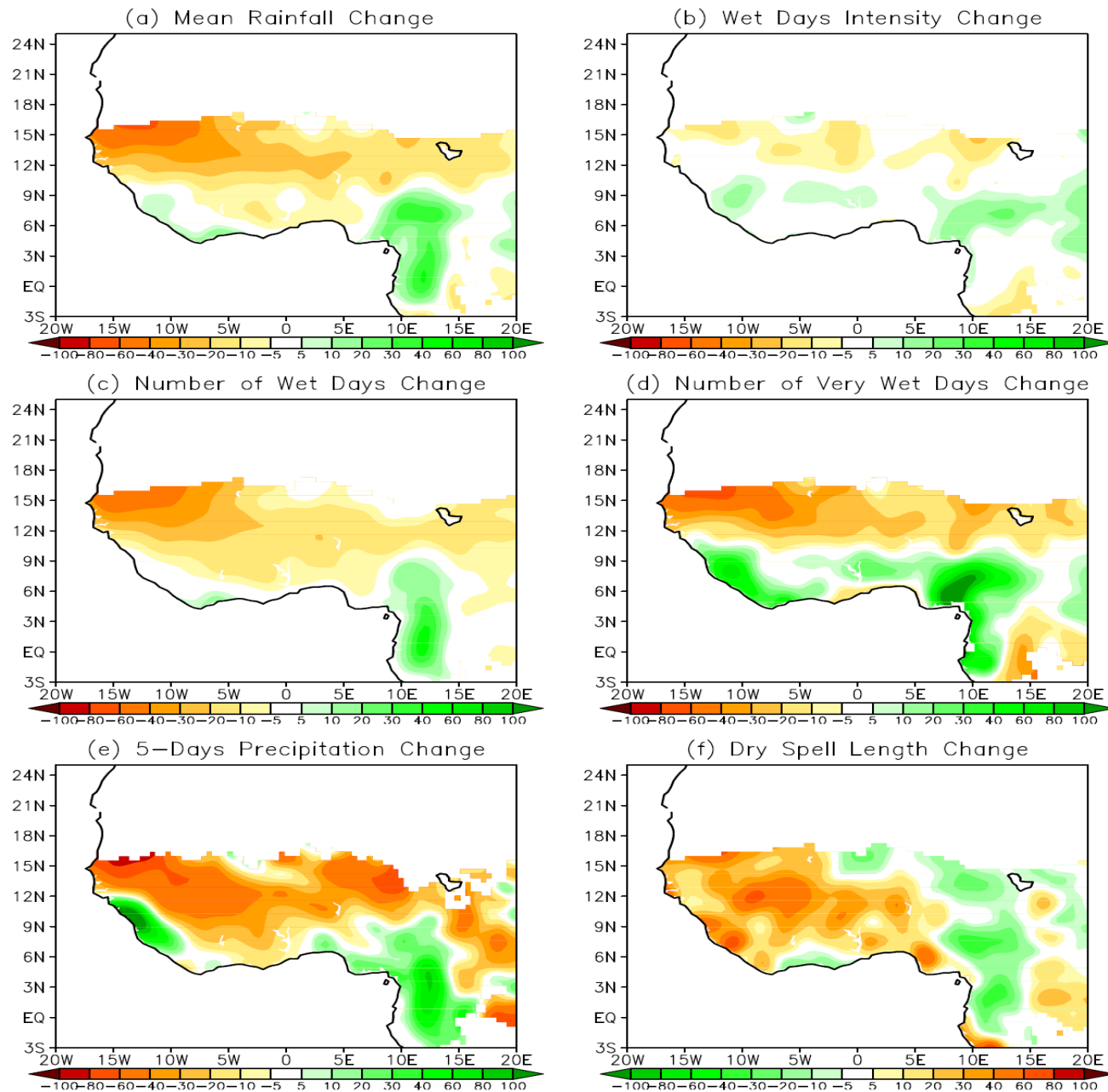
# ❑ 21st Century Precipitation Change

## ✓ The GCM Vs the RCM

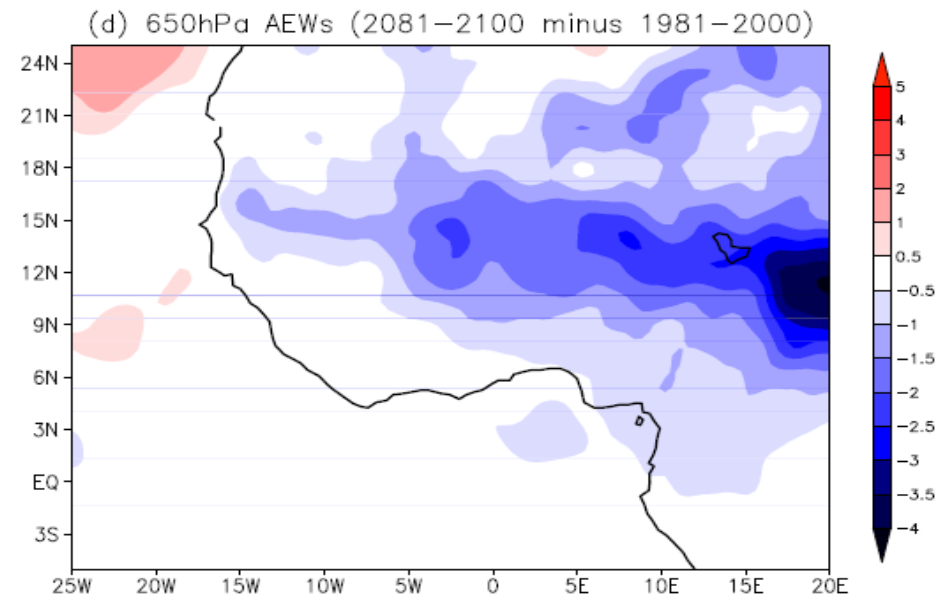
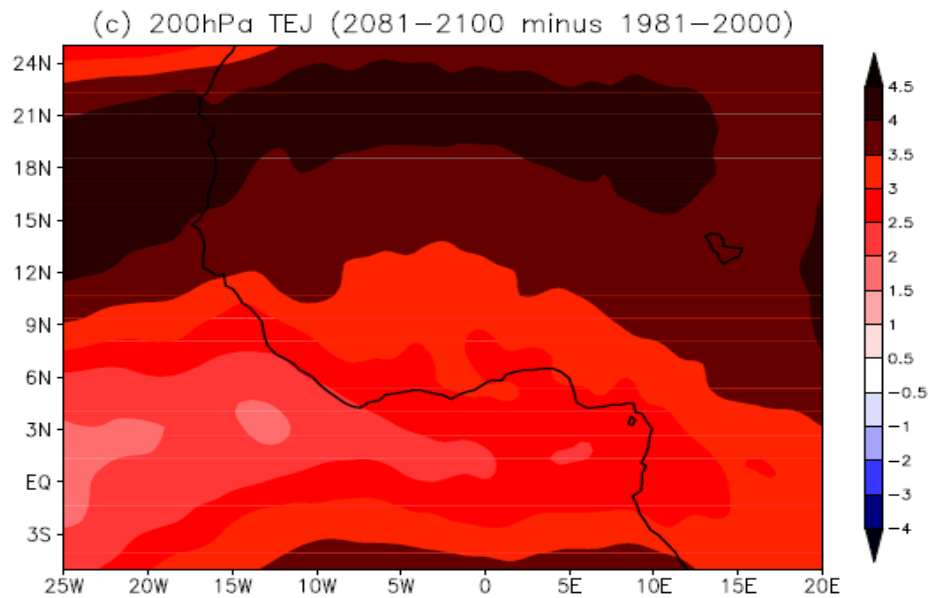
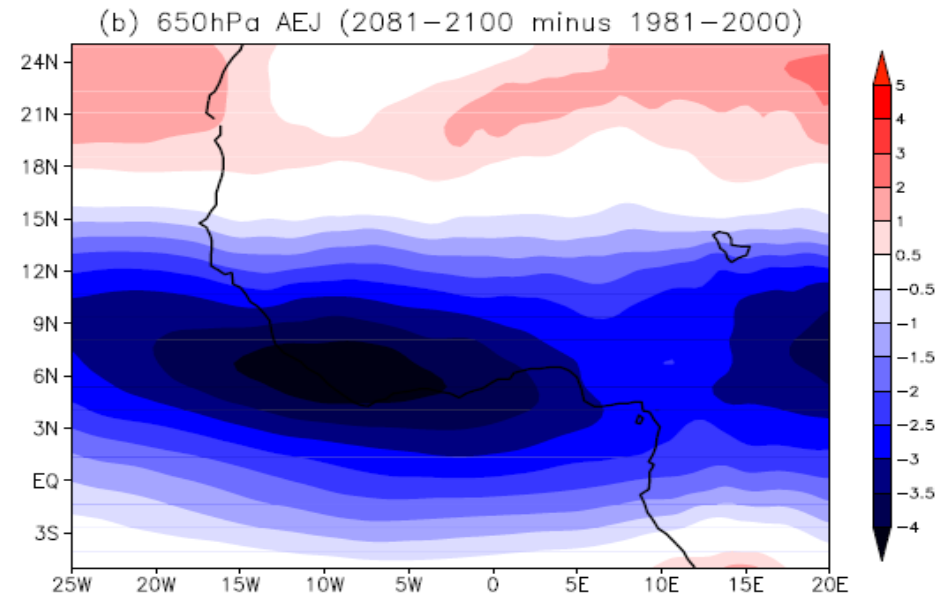
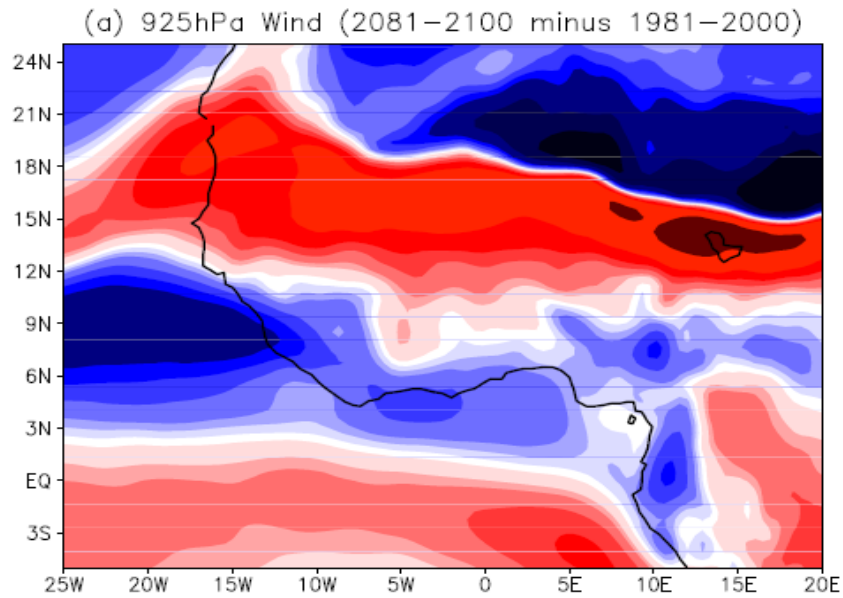


**Just an EXAMPLE !!!**

# ✓ Change in rainfall statistics



# ✓ Consistency with the WAM circulation



## □ Conclusion

### □ WAM: Complex and unique features

- AEJ position
- TEJ strength
- AEWs propagation
- Strong ascent in the ITCZ
- Jump of the monsoon ...

### □ Which GCMs to downscale?

### □ Which level to deliver ?

- Example: U100? U850 or 700hPa?