

Investigating West Africa Monsoon Dynamics Associated with Climate Change Trends under SRES A2 Emission Scenarios

Abdoulaye SARR

ANACIM, Dakar, Sénégal

E-mail: layesarr@voila.fr ; abdoulayesar@gmail.com; laye.sarr@anacim.sn

OUTLINE

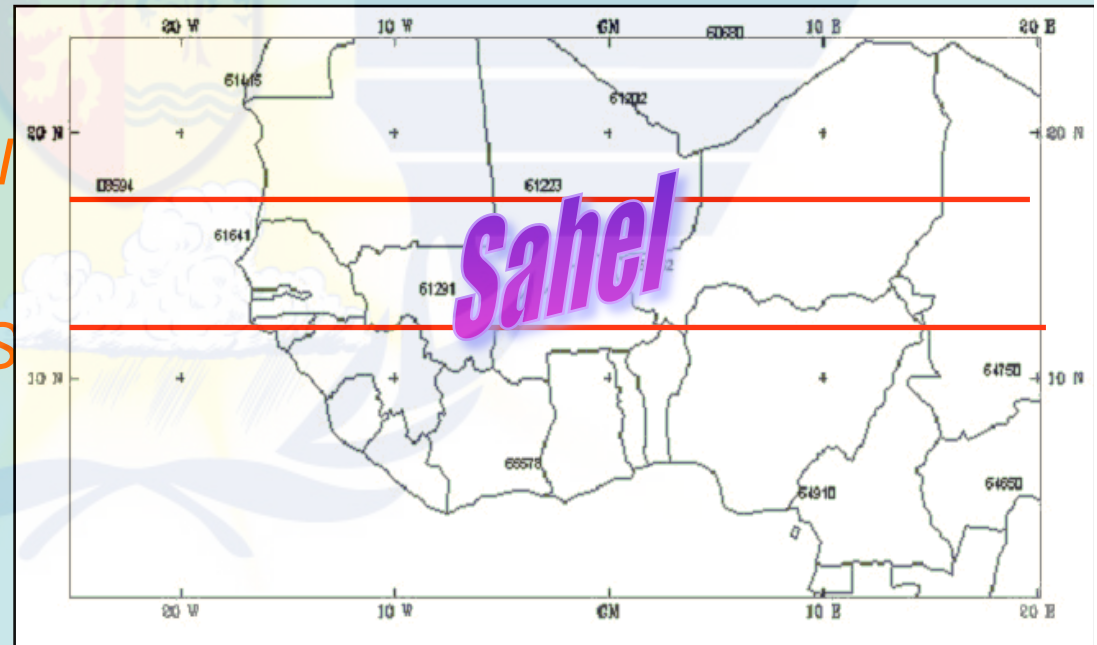
- INTRODUCTION
- KEY FEATURES OF WEST AFRICA
- MODELLING STRATEGY
- VALIDATION CRU/ARC2
- PROJECTED CLIMATE CHANGE
- MESSAGE &

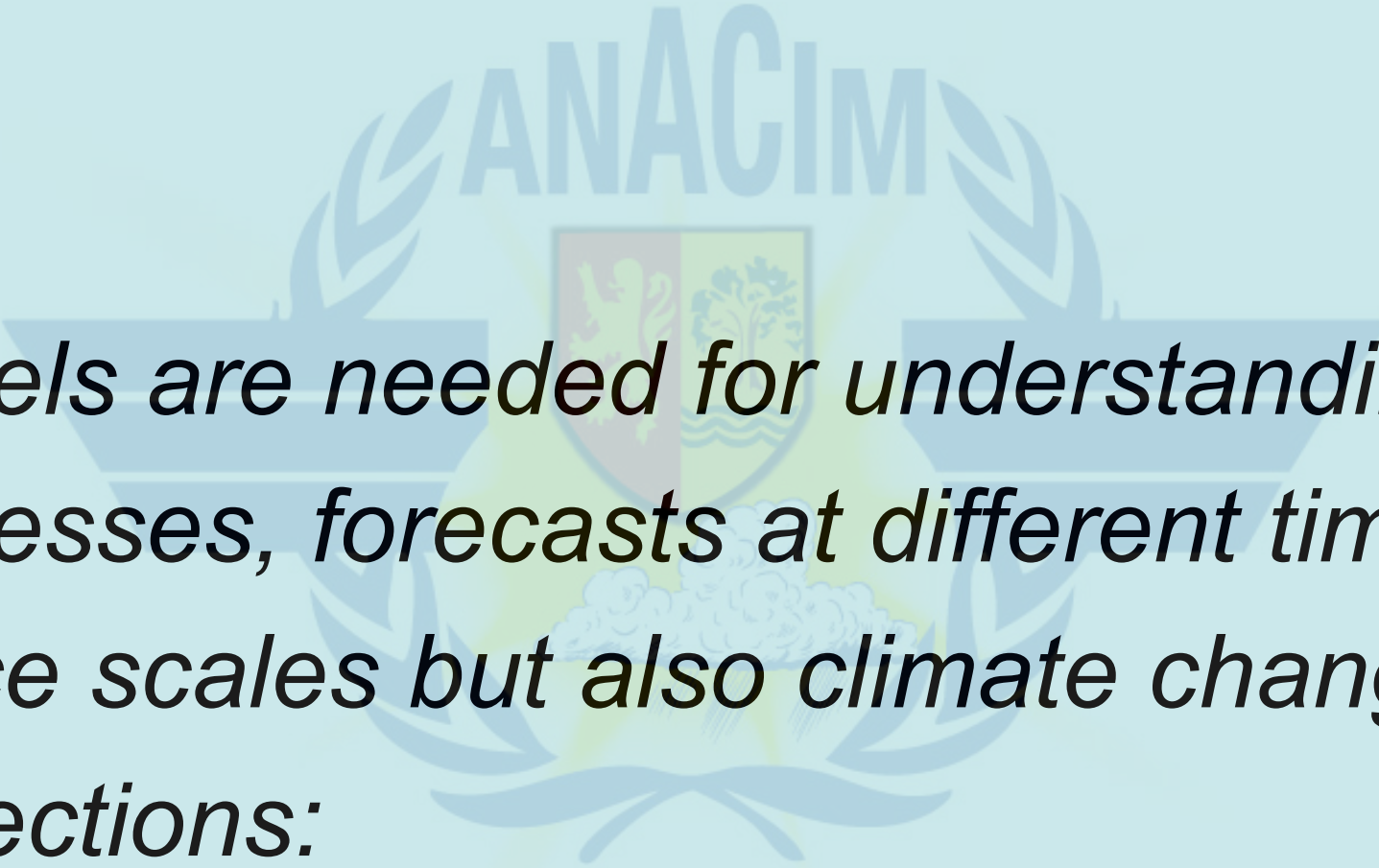


MOTIVATION

- *KNOWN PROBLEMS OF REGION*

- *DROUGHT*
- *DESERTIFICATION*
- *DEFORESTATION*
- *EXTREME EVENTS*
- *ETC...*





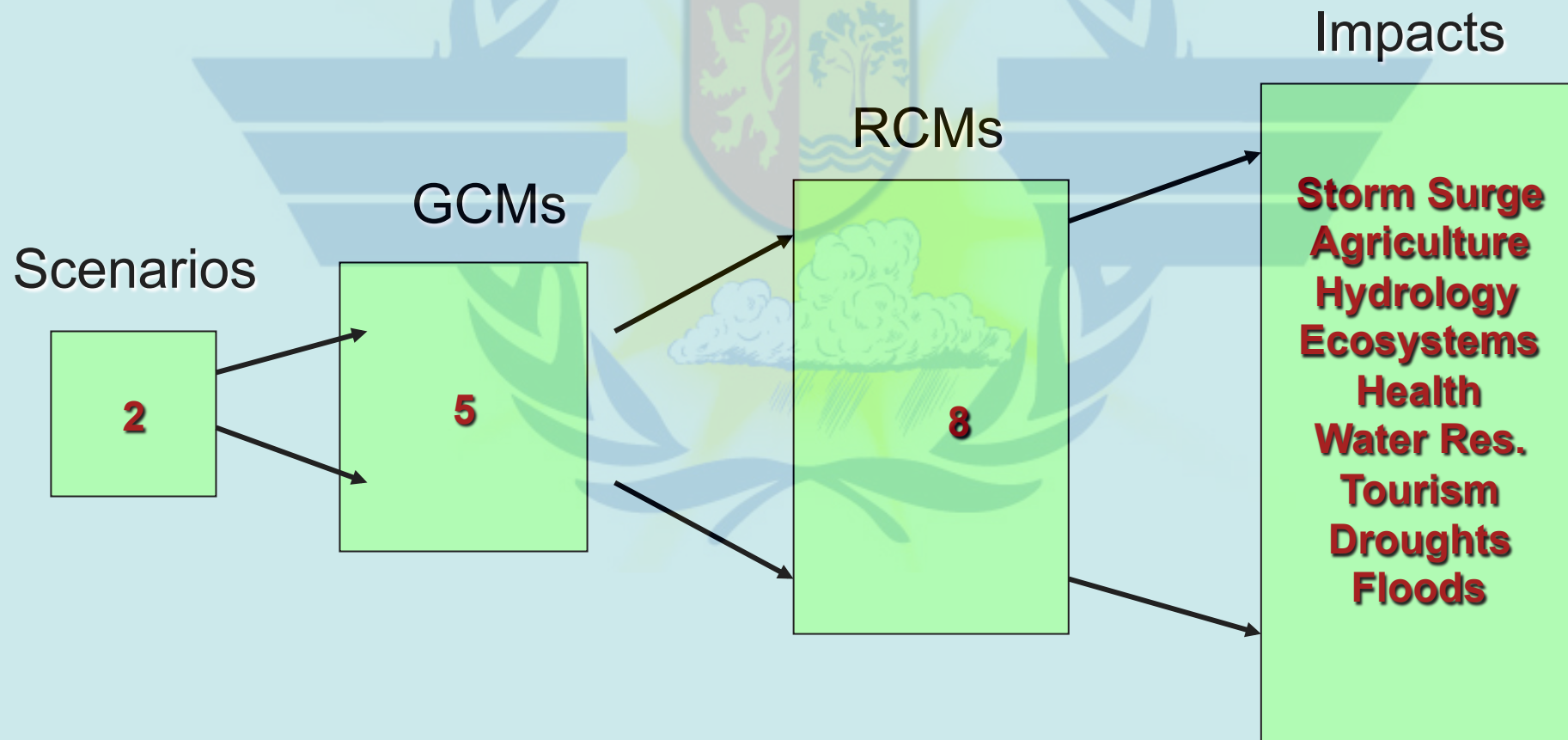
Models are needed for understanding processes, forecasts at different time and space scales but also climate change

Projections:

More and more needs are expressed

Because of CC and Extremes

Uncertainties in regional climate change projections: **The PRUDENCE strategy**

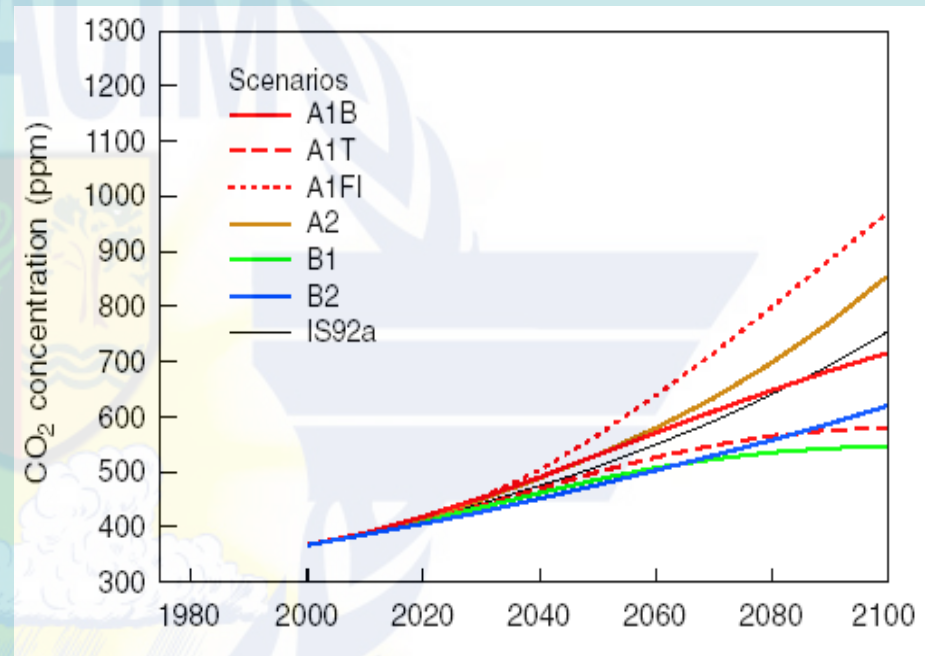


CORDEX IS FOLLOWING THE SAME SCHEME



HERE WE PRESENT ONE
REALISATION USING ICTP
RCP

SRES A2



RegCM4 at 40Km HR

CTRL: 1968-2000

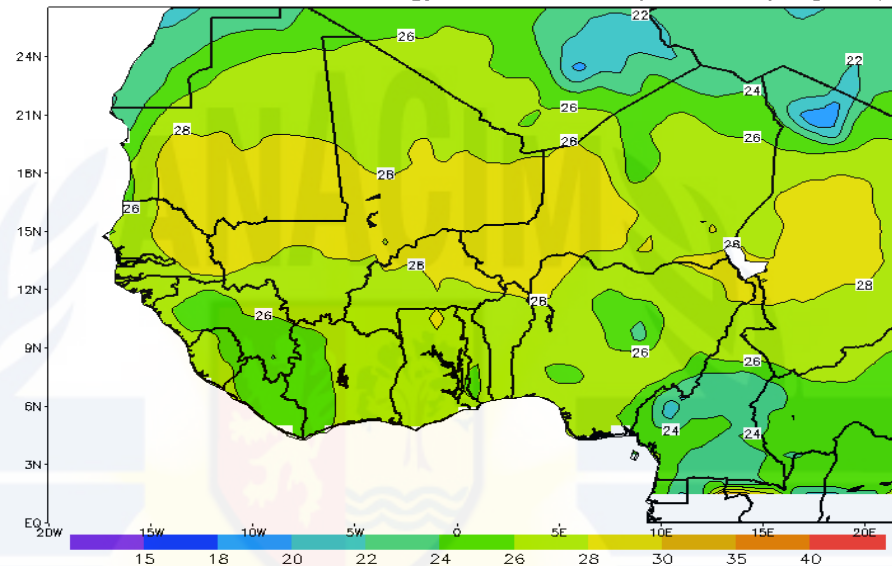
SRES: A2 2068-2100



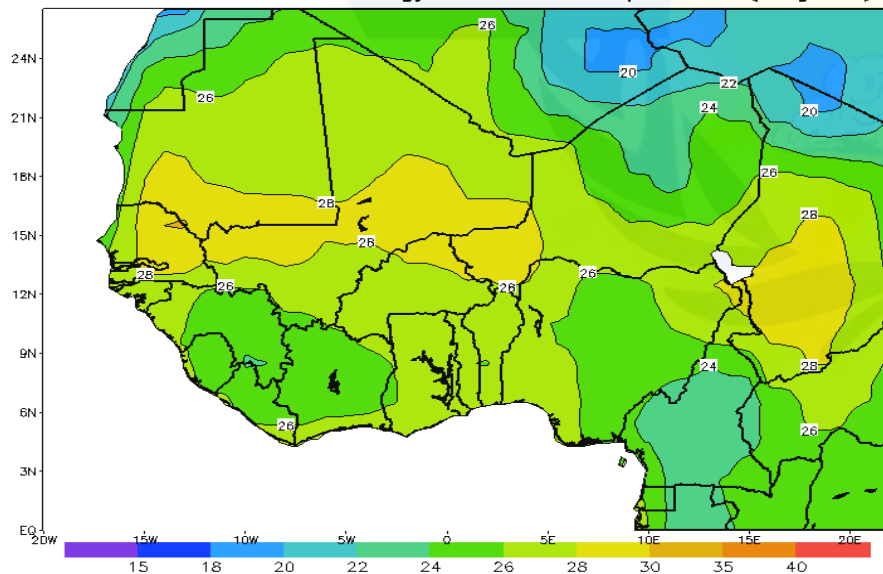
VALIDATION TO IDENTIFY STRENGTH/WEAKNESS FOR FUTURE MODEL IMPROVEMENT

Validation TEMP

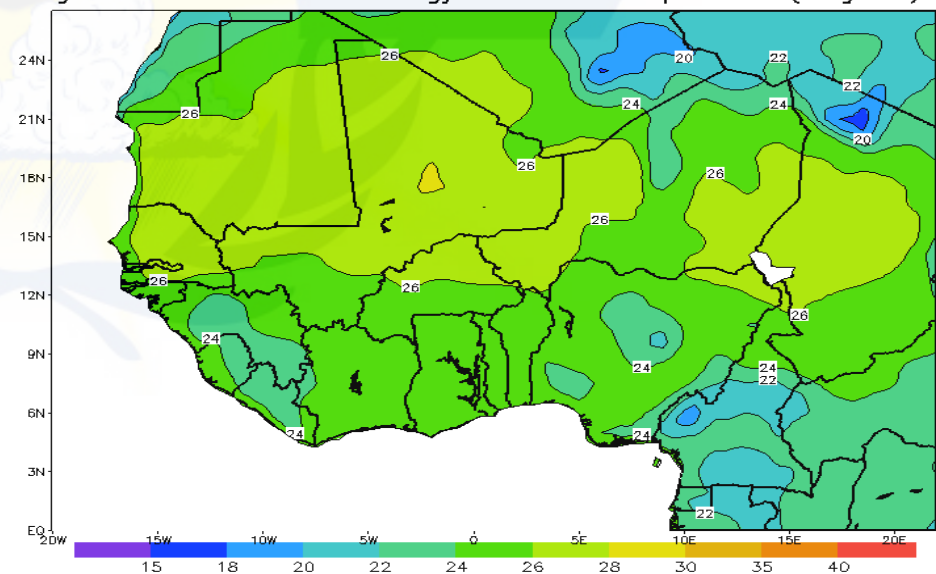
CRUV3 1970–99 climatology Surface temperature(deg C)

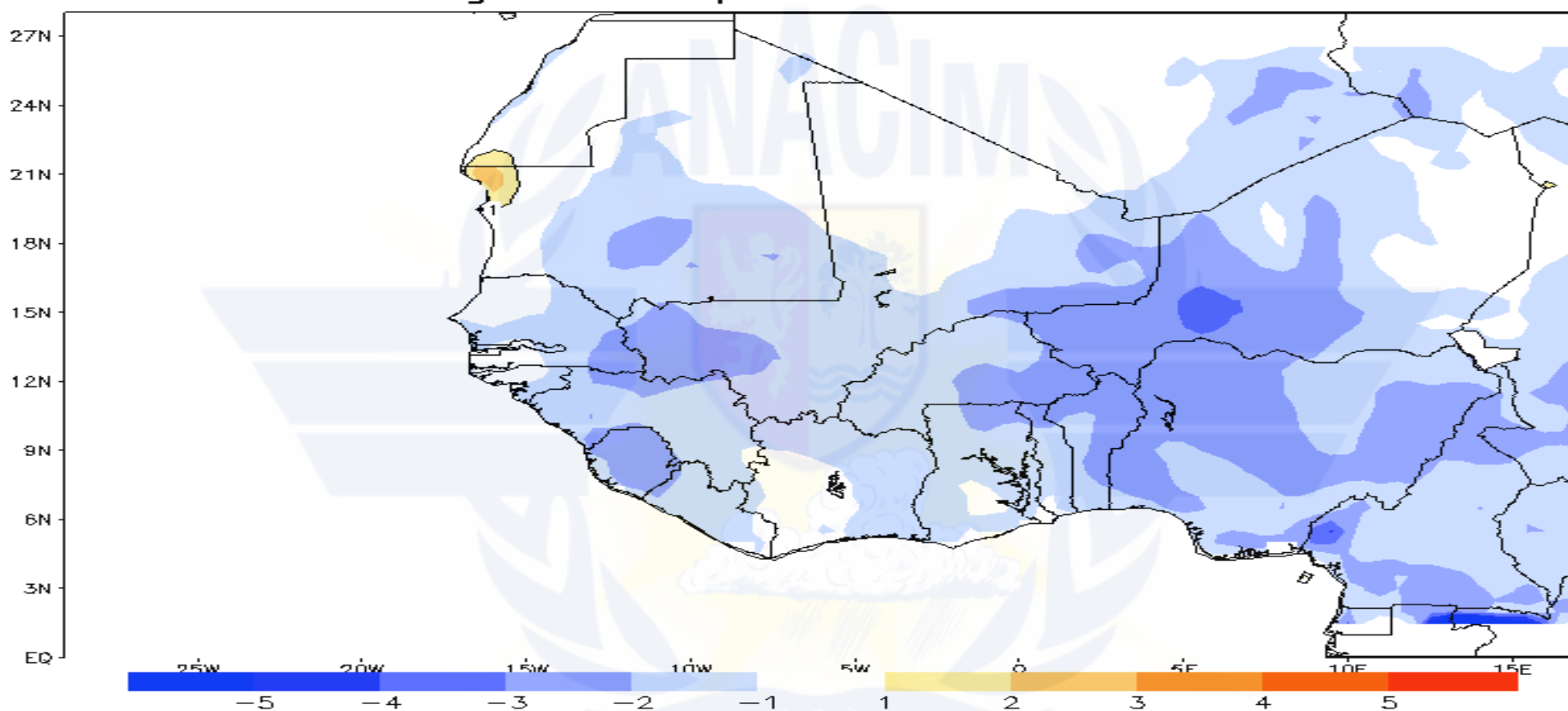


ECAM5 1970–99 climatology Surface temperature(deg C)



RegCM41970–99 climatology Surface temperature(deg C)

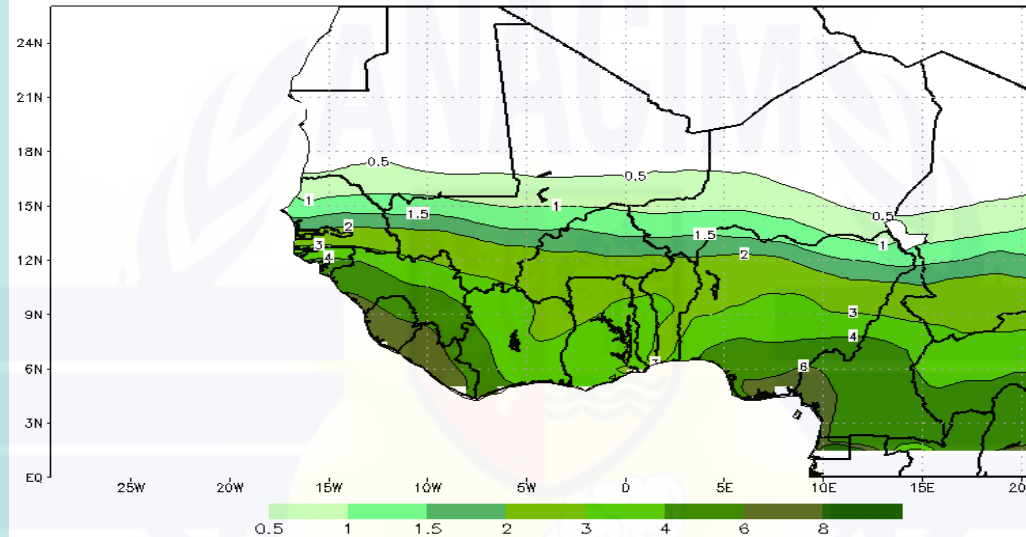




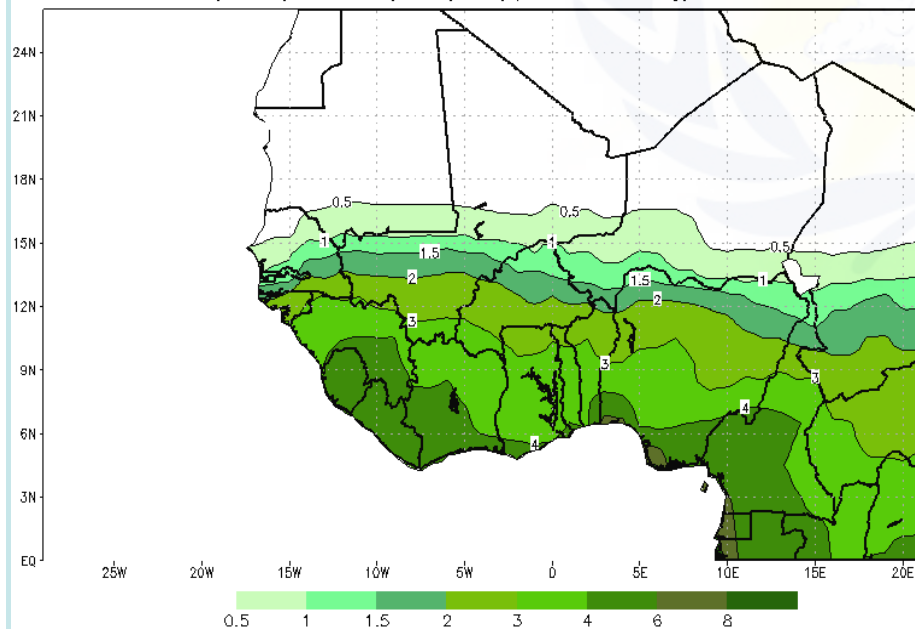
RegCM Systematic temp bias

Precip

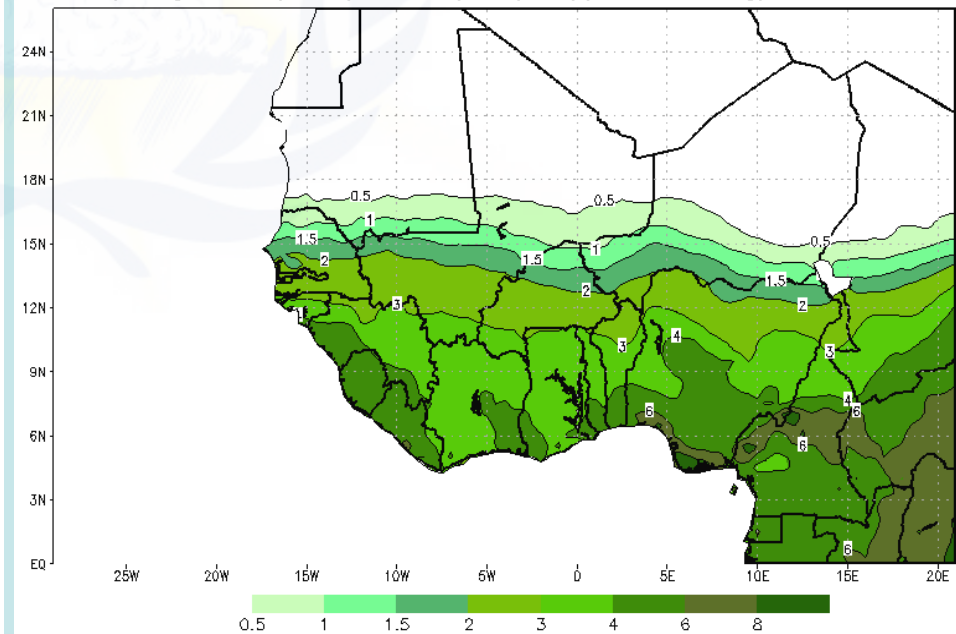
CRU V3 precipitation(mm/day) climatology 1970 1999



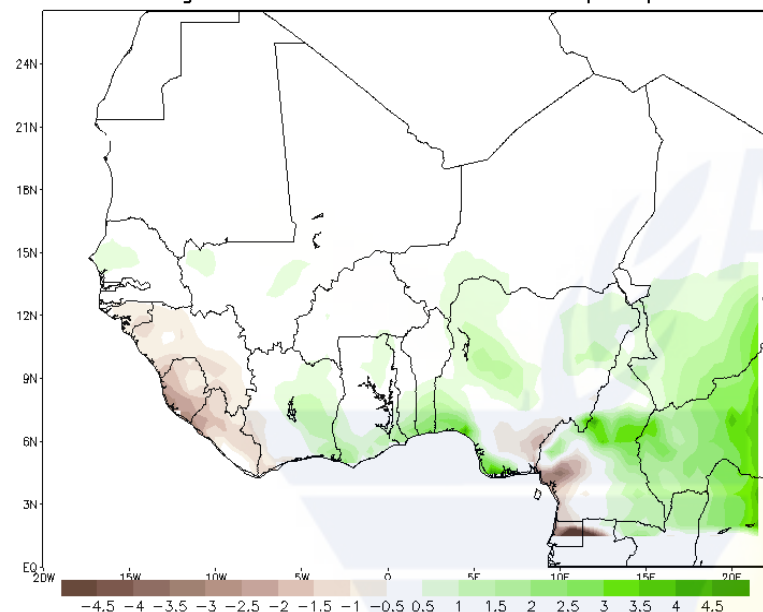
ECAM5 precipitation(mm/day) climatology 1970 1999



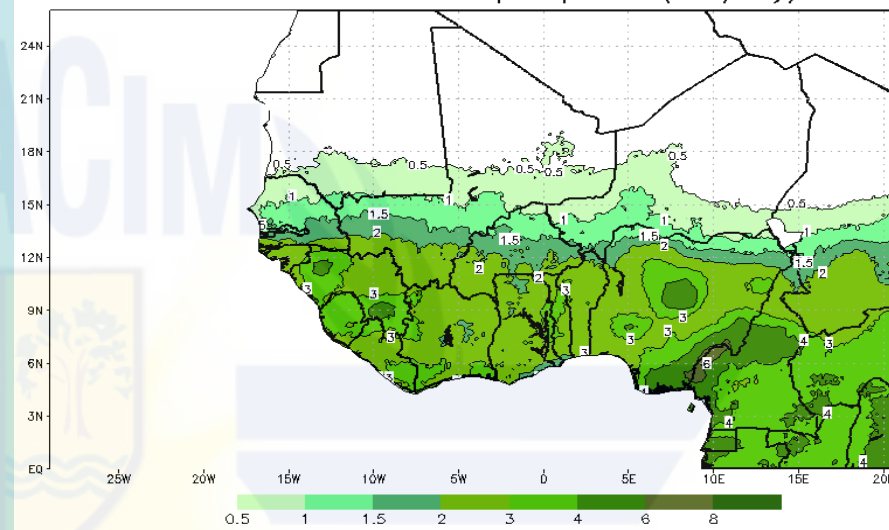
EC5/RegCM4 precipitation(mm/day) climatology 1970 1999



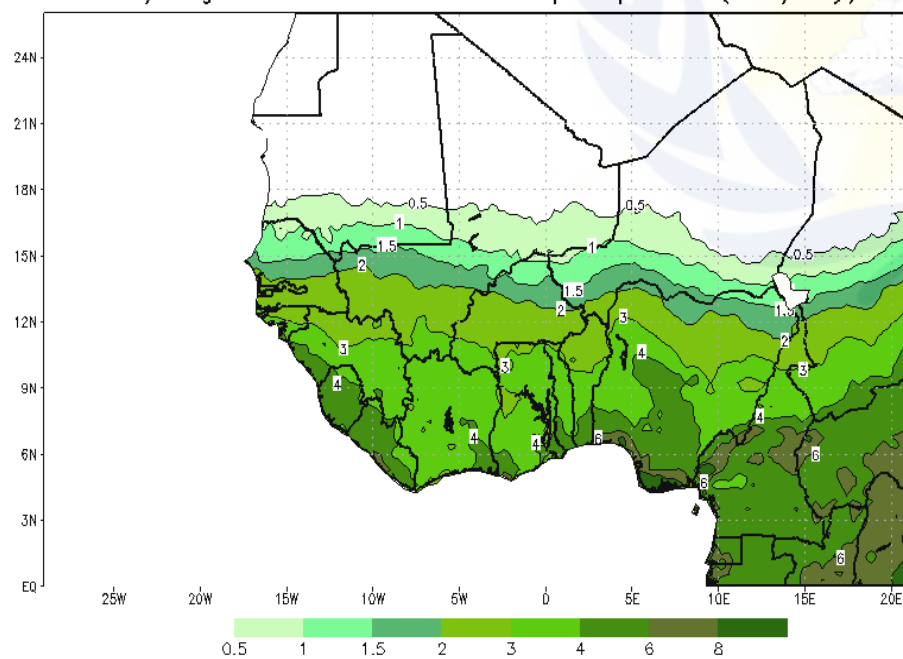
RegCM4 and with reference to CRU precip



ARC mean 19900–1999 precipitation(mm/day)



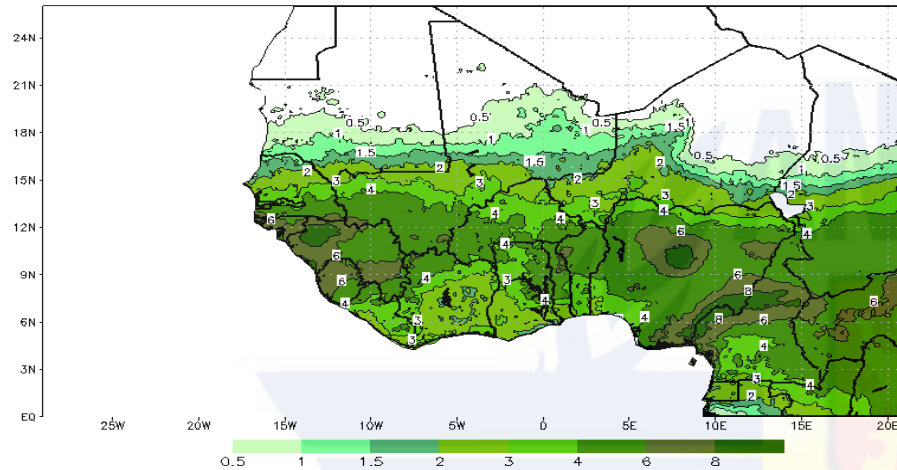
EC5/RegCM4 mean 1990–1999 precipitation(mm/day)



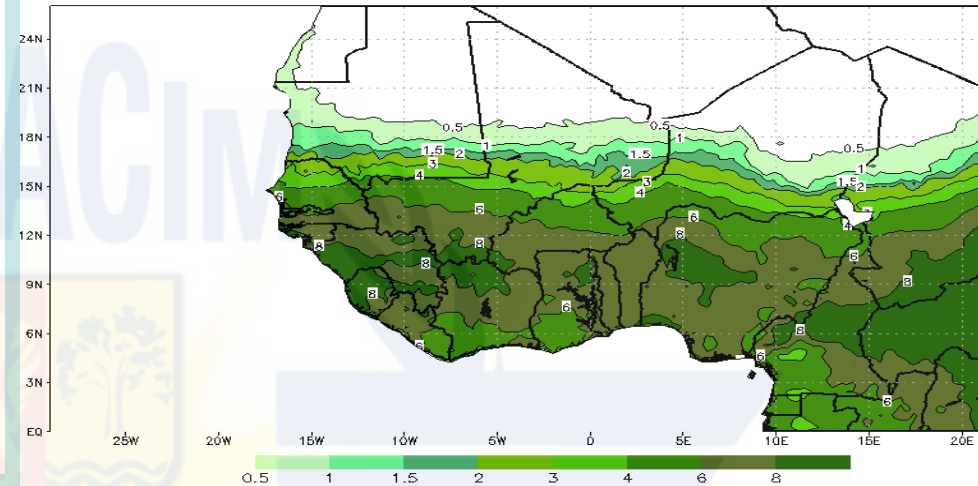
amma 4th

Conf . 2-6 July 2012 , Toulouse

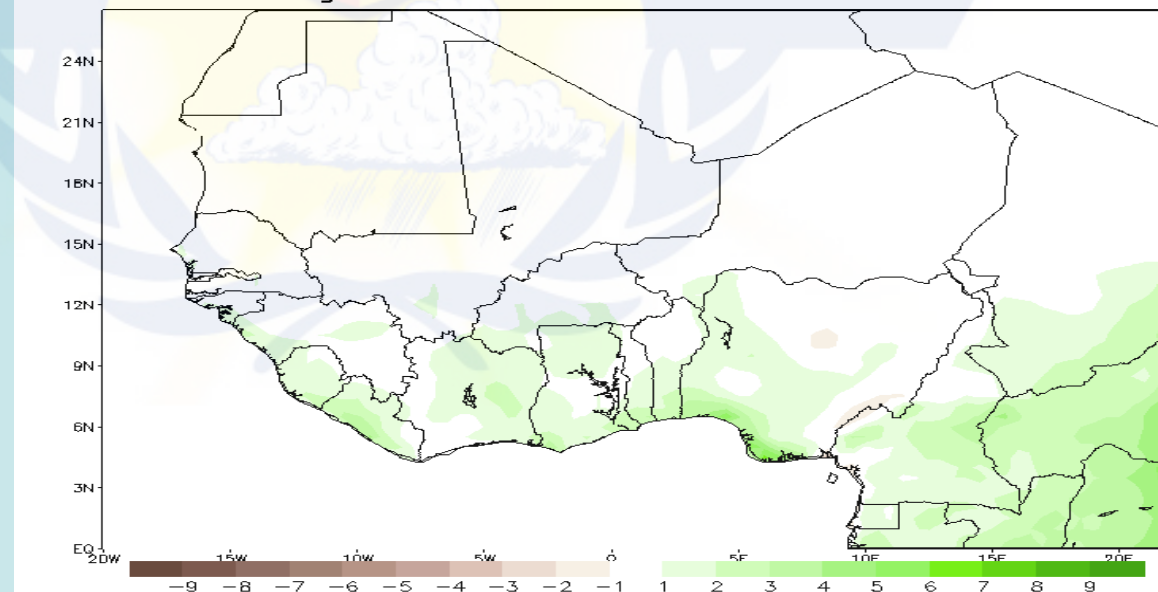
ARC precipitation(mm/day) climatology 1990–1999



RegCM JJAS 1990–99 climatology



RegCM4 diff with ARC for decade 9099



*Good perf
Over Sahel
Overest. GG*

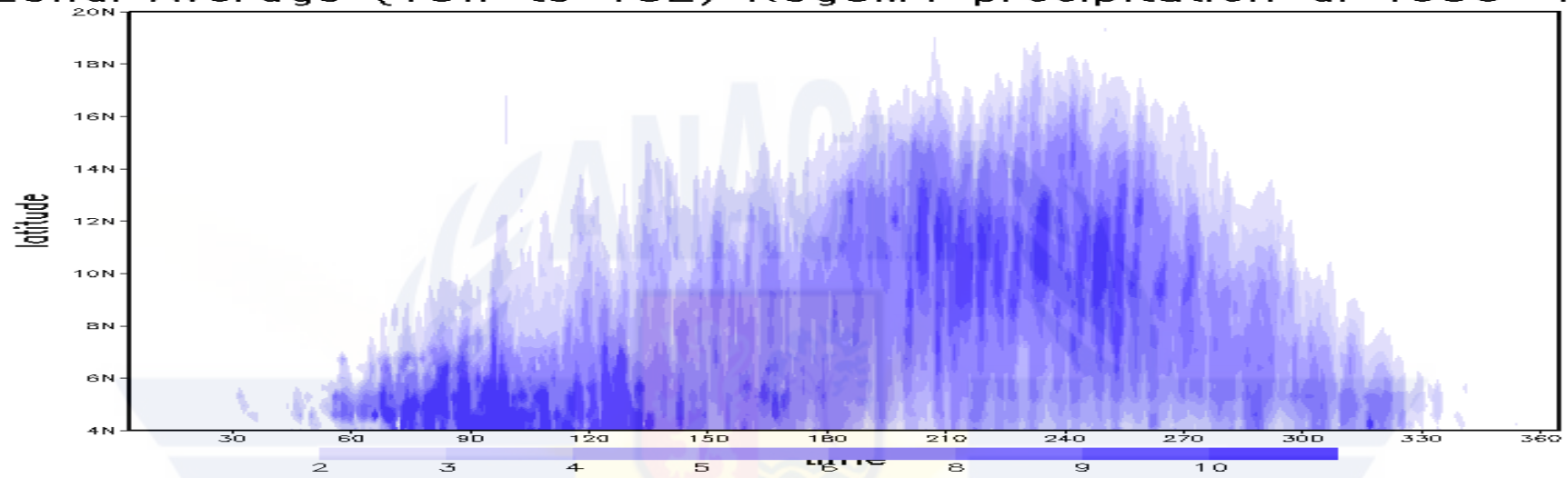
A focus on JJAS

asarr

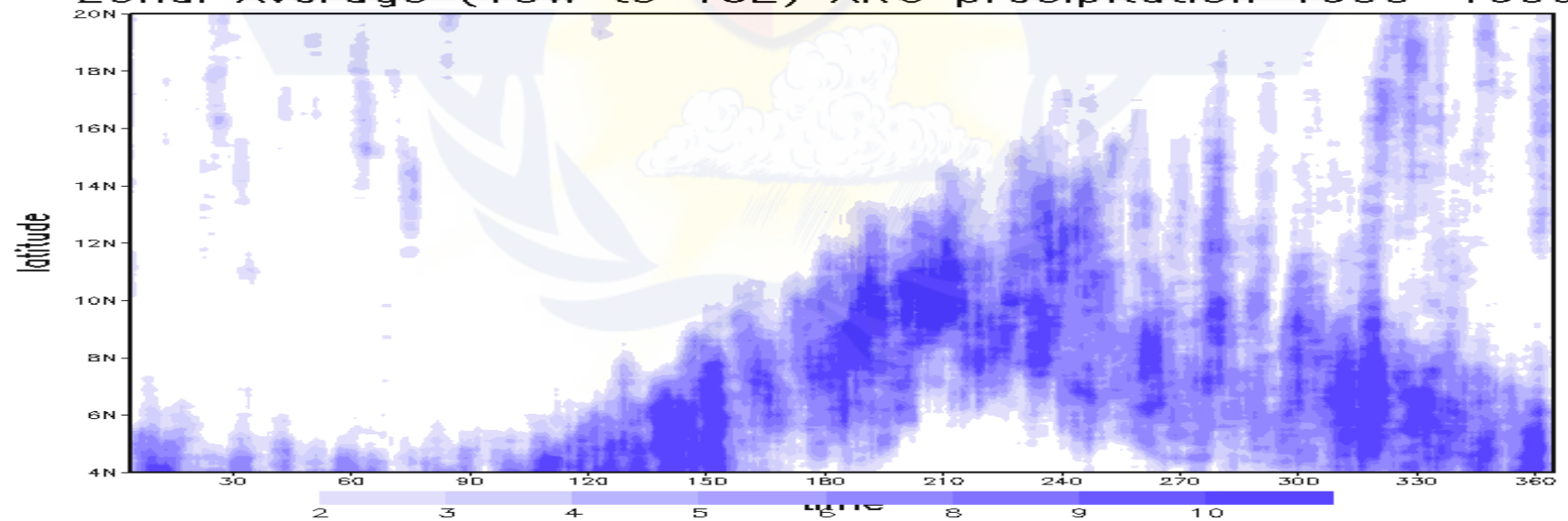
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Zonal Average (10W to 10E) RegCM4 precipitation di 1990–1999



Zonal Average (10W to 10E) ARC precipitation 1990–1999

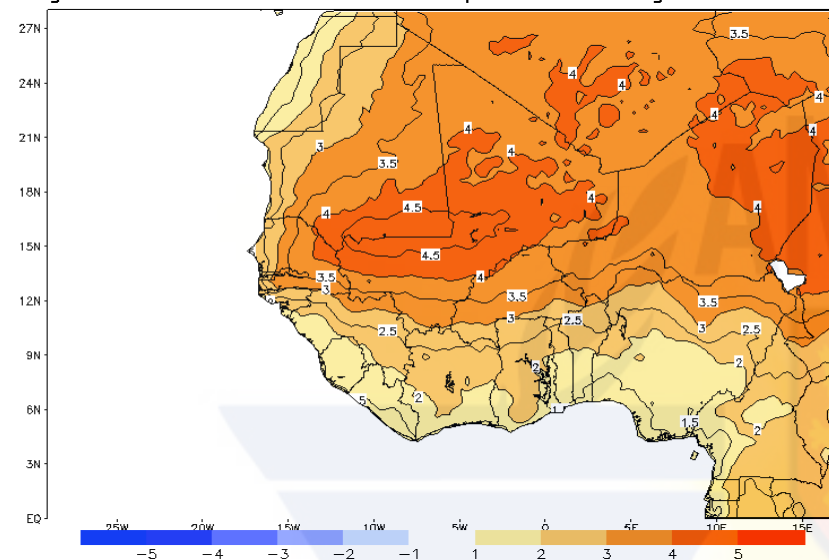


SEAS CYCLE

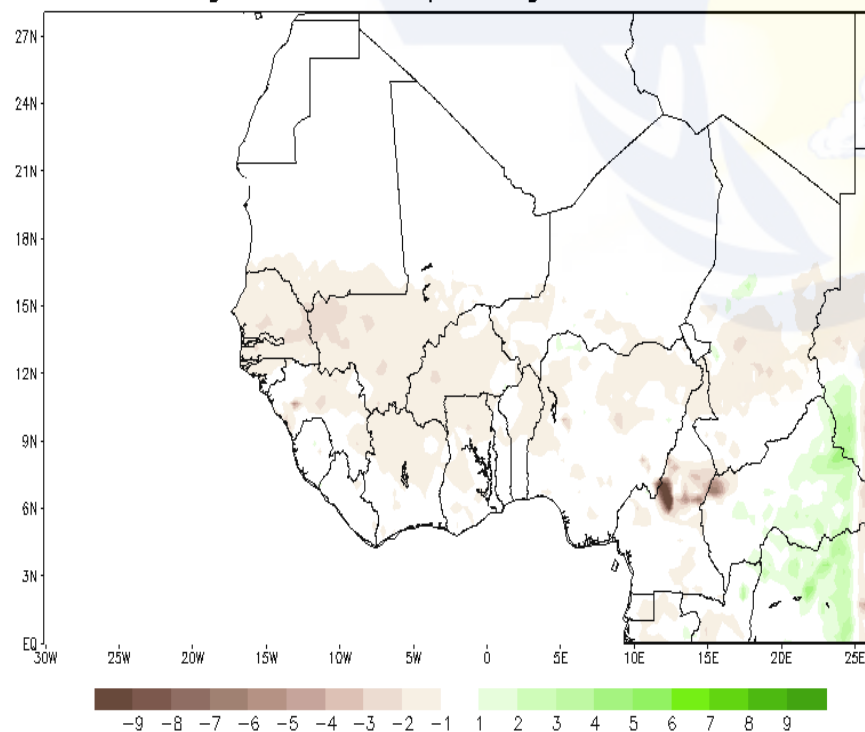


PROJECTED CLIMATE BEHAVIOR UNDER SRES A2 SCENERIOS

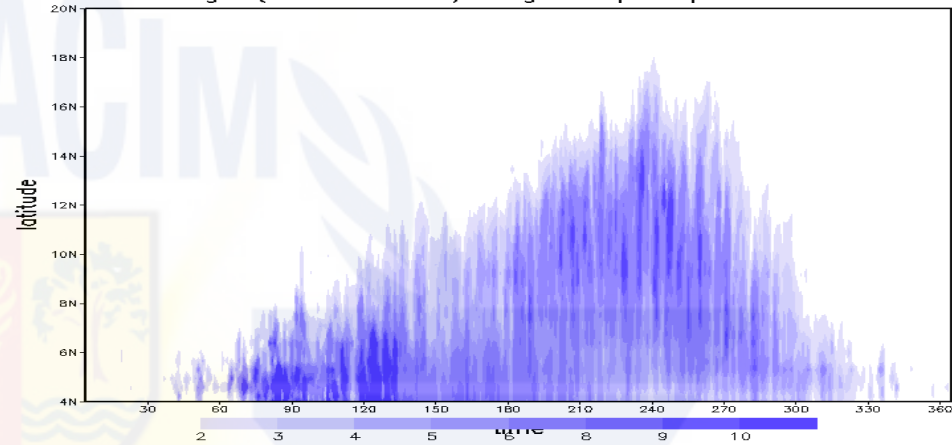
RegCM4 SRES a2 mean JJAS temperature change d3 versus d1



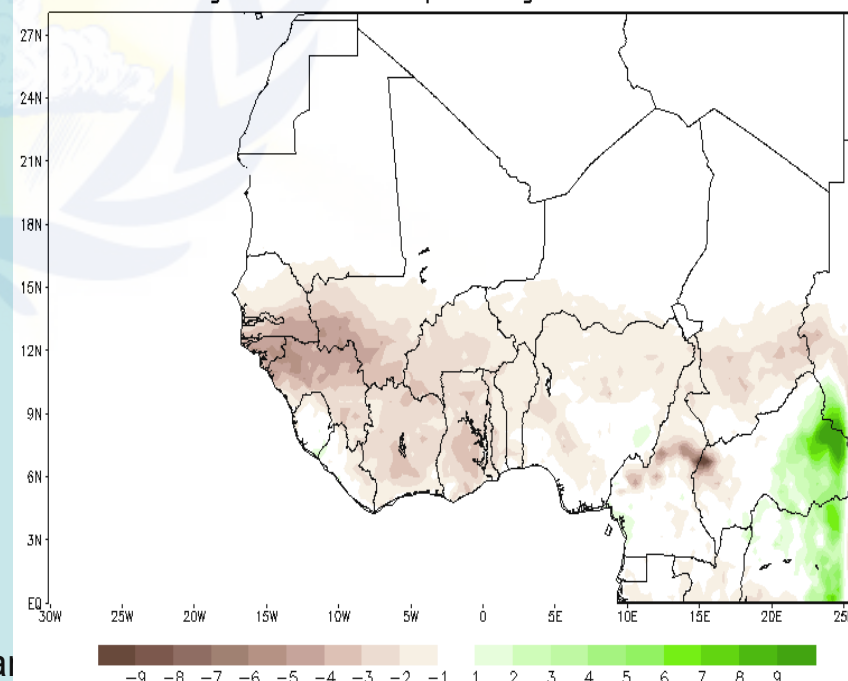
RegCM4 JJAS Precip Change D1 SRES a2



Zonal Average (10W to 10E) RegCM4 precipitation 2090-2099



RegCM4 JJAS Precip Change D3 SRES a2



NEXT STEPS/ MESSAGE

*Identify key dynamics features associated
with shown projected climate for MODEL CONSISTENCY
FURTHER NEST AT 12KM CENTERED OVER SENEGAL*

- **The biggest exercise with RCMs is CORDEX supported by WCRP**
- **Many groups are involved and in Africa only SA is participating on the modelling activities**
- **AMMA could support on capacities for CAMMEX IN WAF**
- **Specific investigations Ex: Western Africa strong “hot spots”**
- **Domain frustrations**
- **Etc.**

