

SECOND ANNUAL CONFERENCE ON CLIMATE CHANGE AND DEVELOPMENT IN AFRICA

*Theme*

*Advancing Knowledge, Policy and Practice in Climate Change and Development*

Addis Ababa, Ethiopia / 19-20 October , 2012

*SUB-THEME I : CLIMATE SERVICE DELIVRY FOR DEVELOPMENT*

*SESSION 3: FRONTIERS OF RESEARCH AND DEVELOPMENT FOR CLIMATE SCIENCE,  
SERVICES AND POLICY*

# **RESEARCH STRATEGIES FOR WEST AFRICA**

Cheikh KANE

African Center of Meteorological Applications for Development  
Niamey, NIGER



# PRESENTATION OUTLINE

I. AMMA PROGRAMME LESSONS

II. EXISTING FRAMEWORKS AND ONGOING INITIATIVES IN WEST AFRICA

III. CONCLUSION



## I. AMMA PROGRAMME LESSONS

### **Objective 1**

To improve our understanding of the West African Monsoon (WAM) variability

### **Objective 2**

- a. To provide the underpinning science to link WAM variability to related societal issues and
- b. To define & implement relevant monitoring & prediction strategies

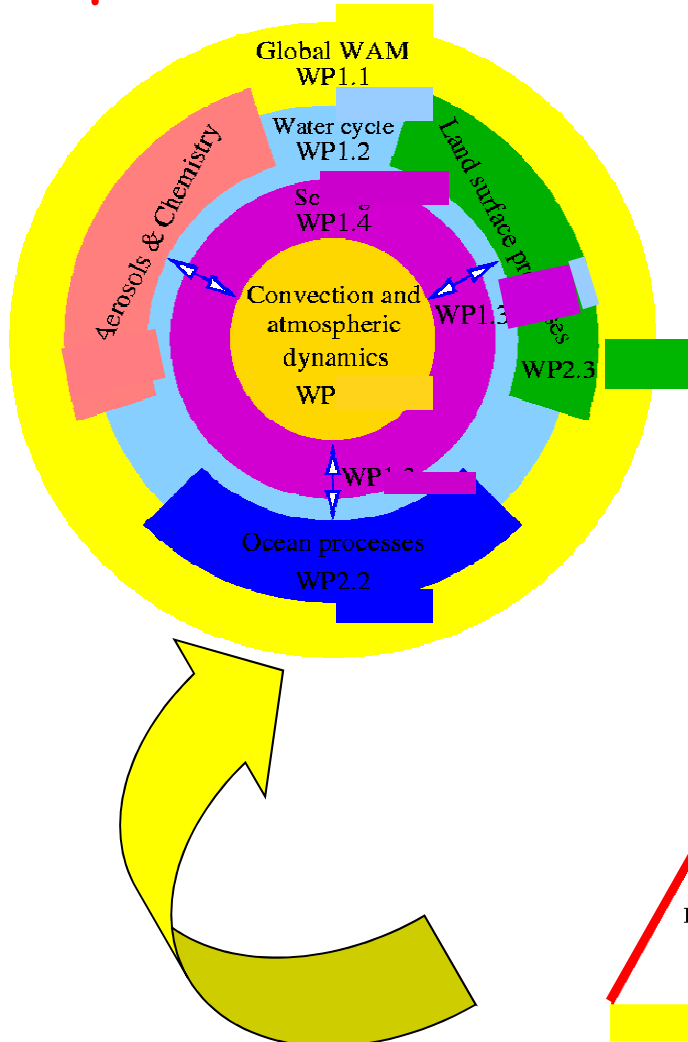
### **Objective 3**

To ensure that the AMMA research is integrated with prediction & decision making activities (Forecast / EWS)

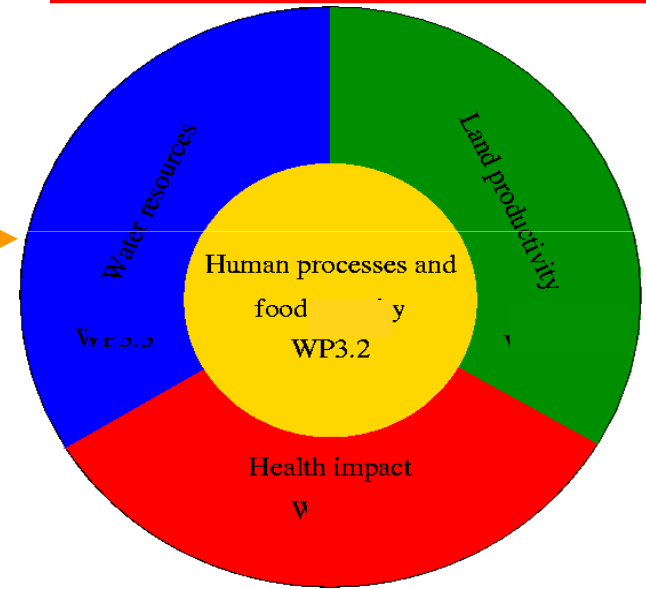


# A multidisciplinary approach

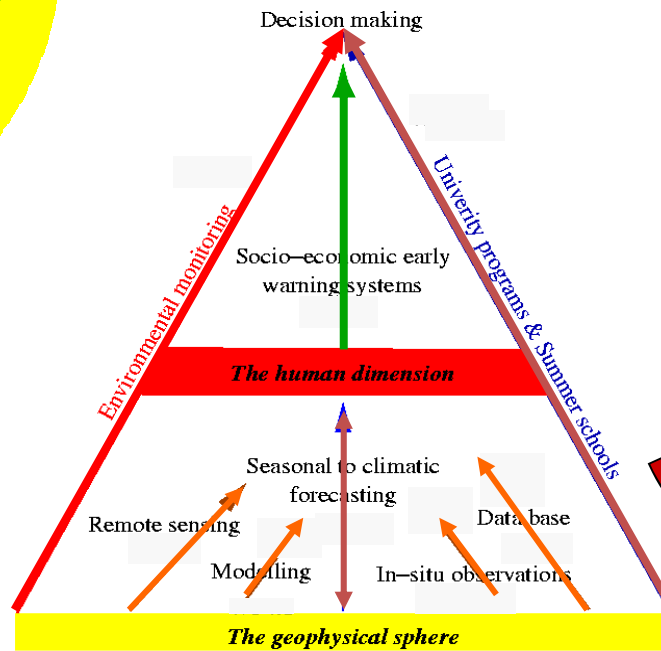
## Geophysical Sphere



## Human Dimension

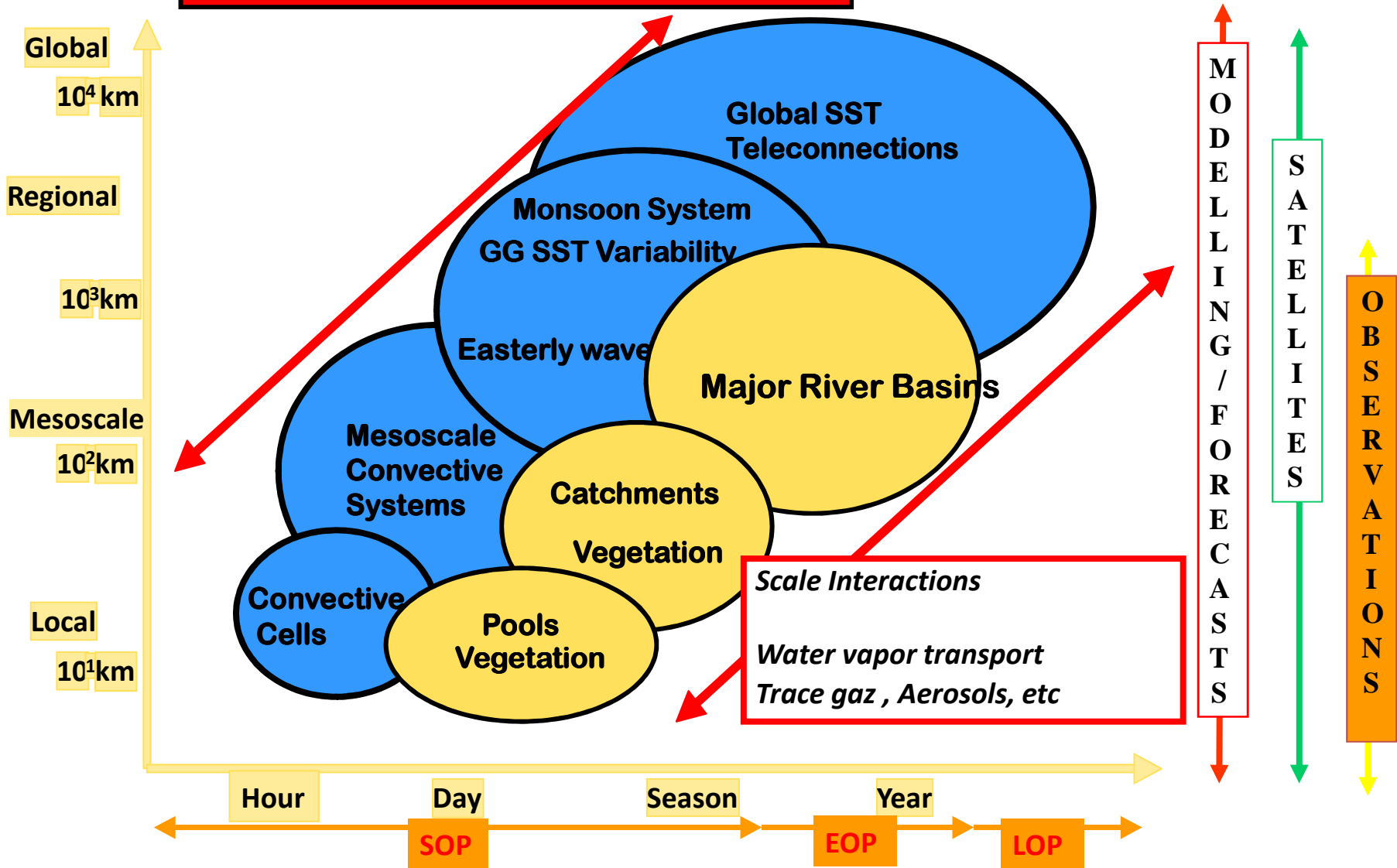


## Tools & Methods



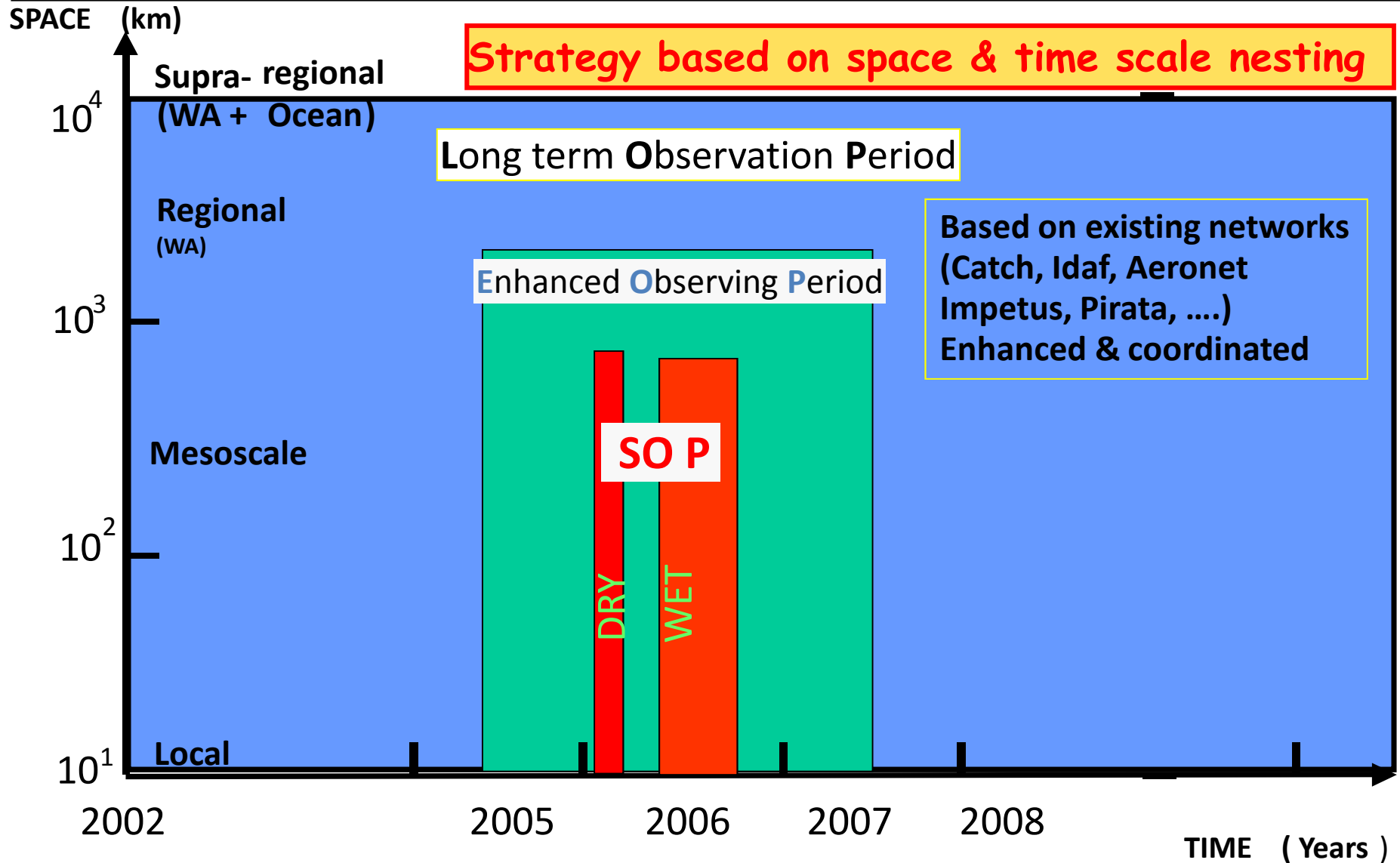


# A multiscale approach



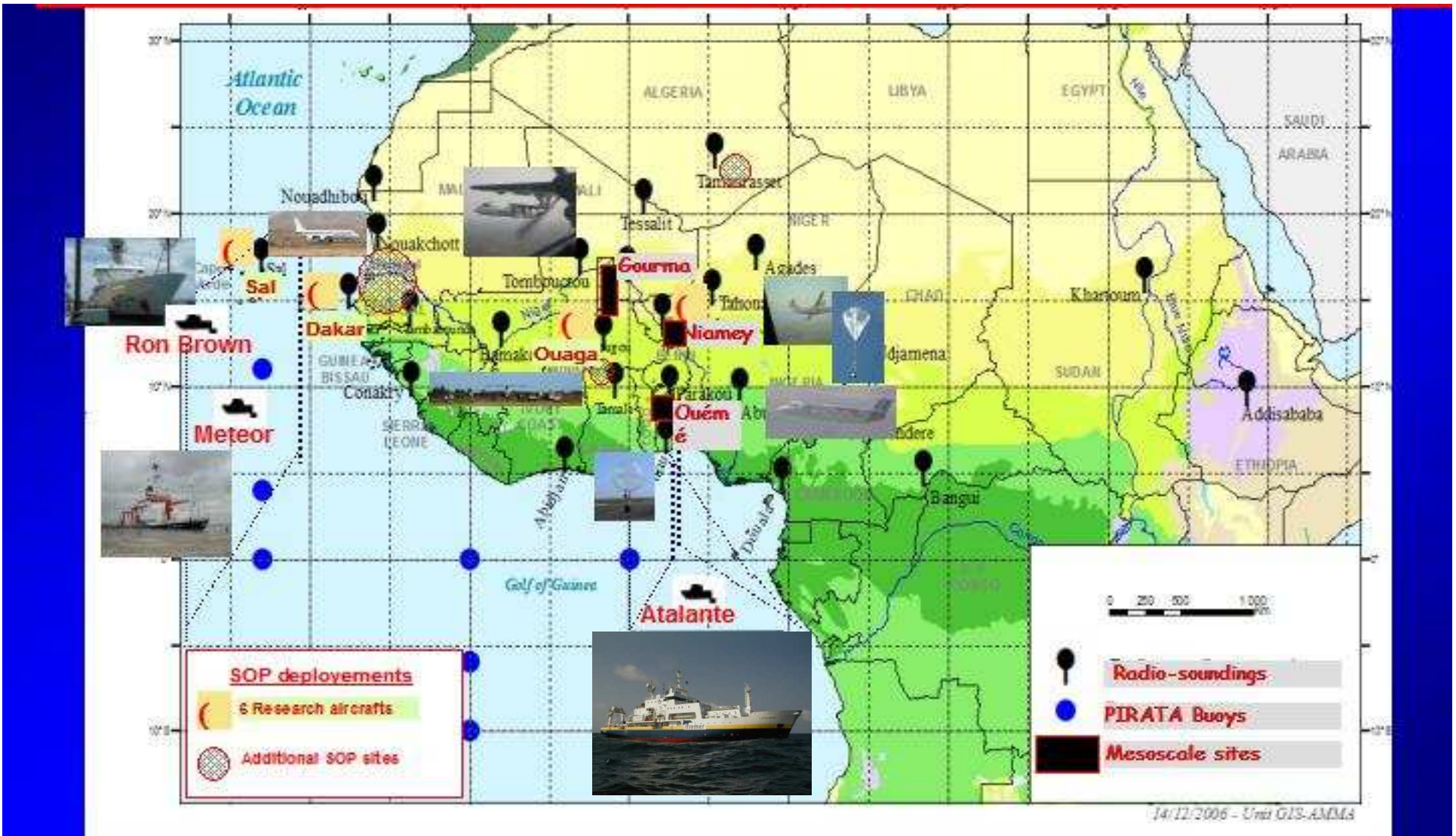


# International Field Program: a strong component of AMMA



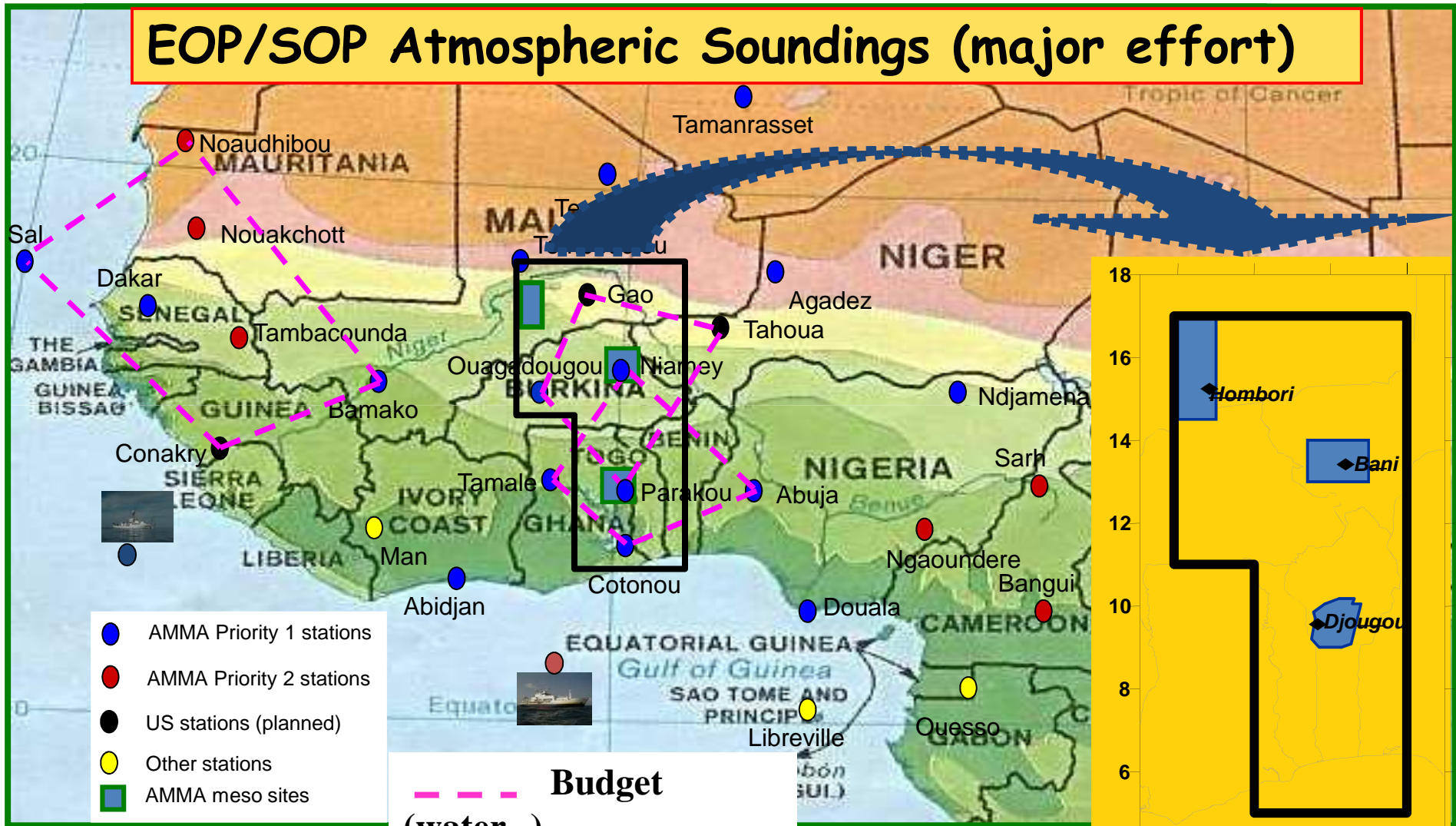


## An Ocean-Atmosphere-Land Regional Campaigns of Observations over West Africa



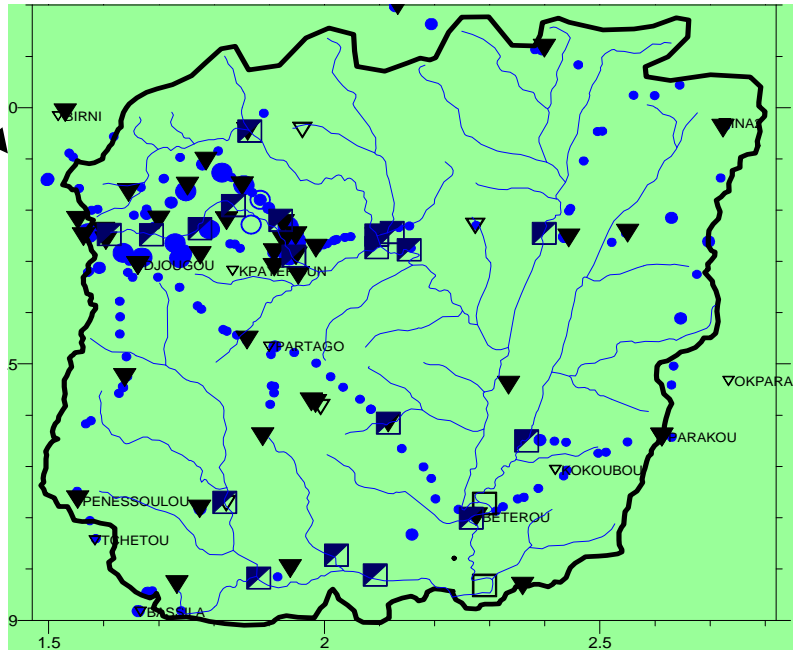
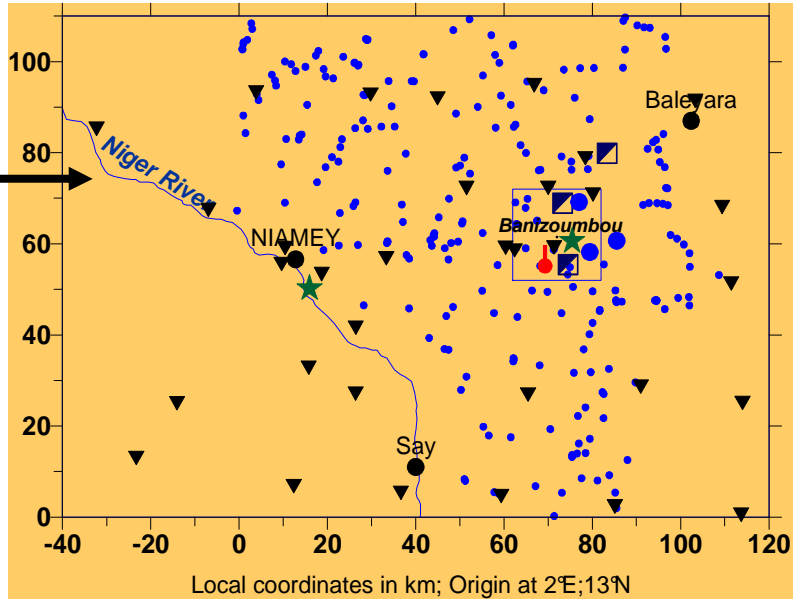
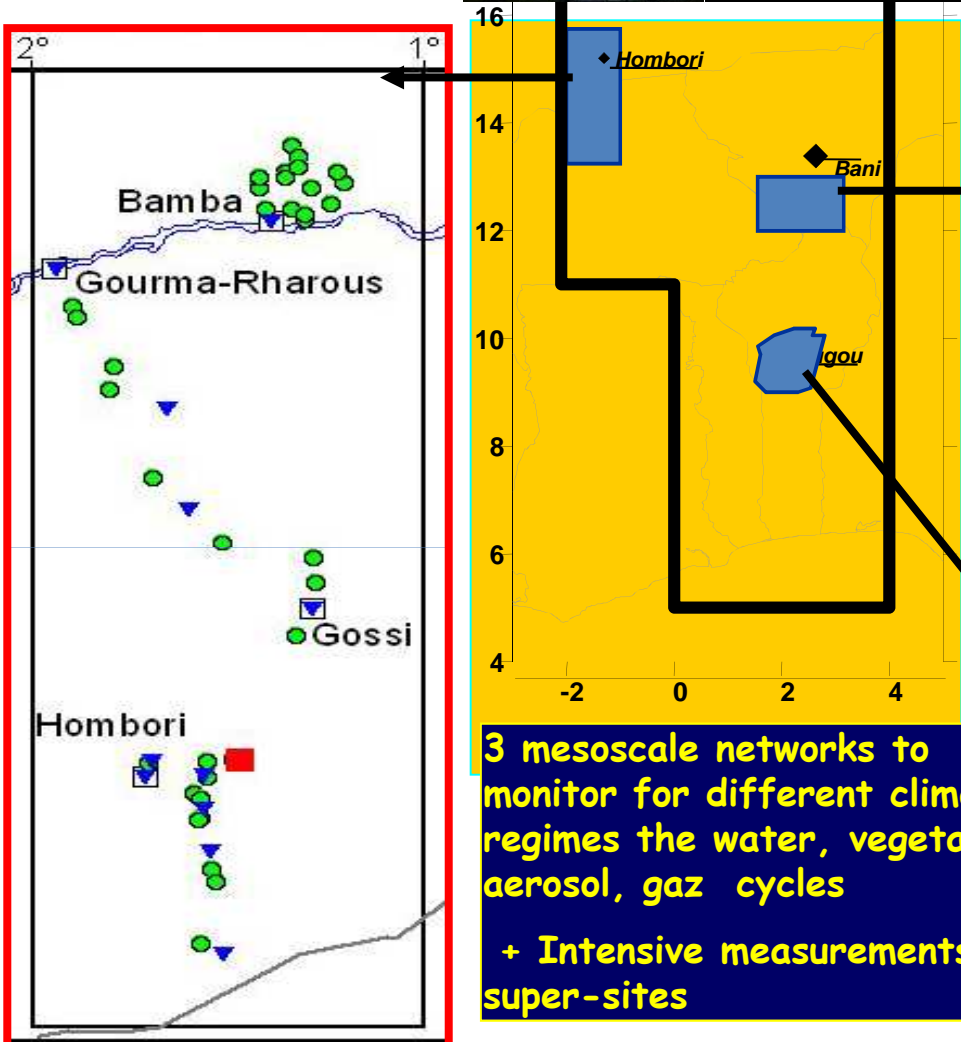


# EOP/SOP Atmospheric Soundings (major effort)



EOP: also soundings of Ozone, Wind profiler, GPS stations (vapor), Radar, ...

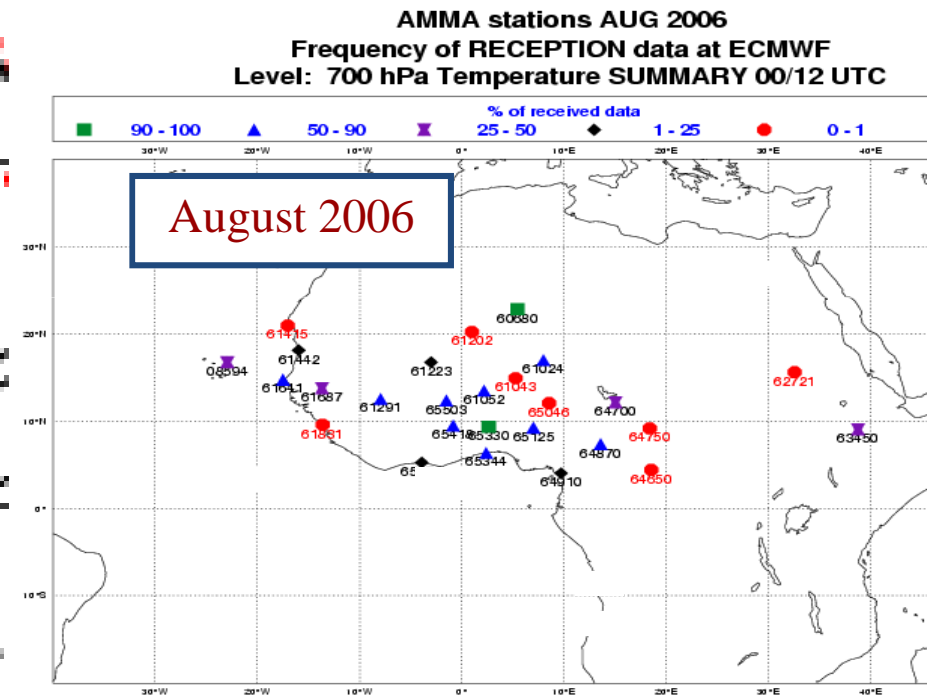
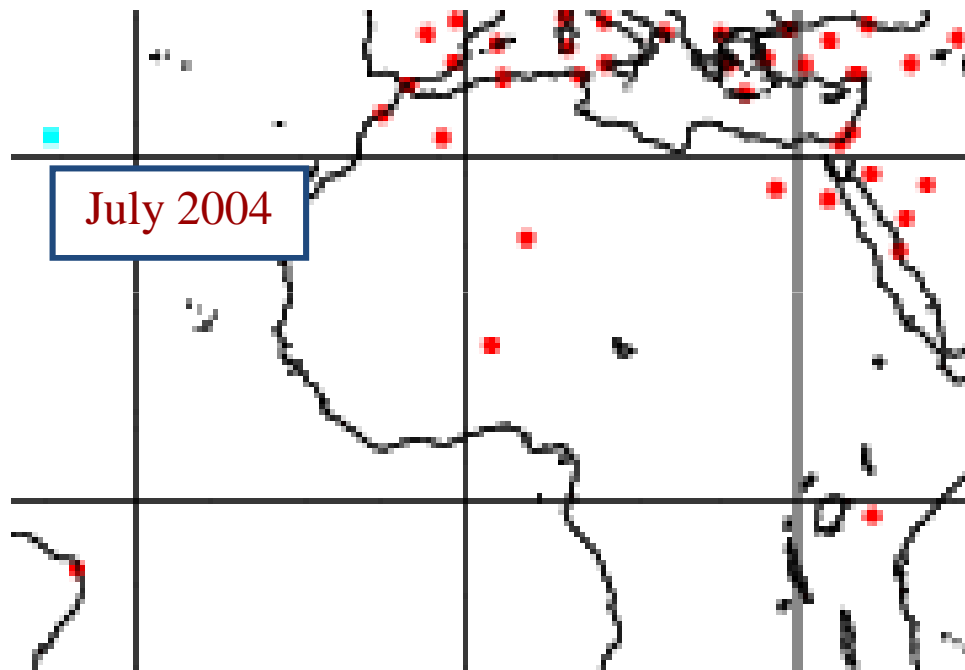




<u>Automatic</u>	▼ Rain	● Aquifère	▣ River
<u>Manual</u>	▽ Rain	• Aquifère	□ River
			● Vegetation



## Restoring the West African radiosonde network necessary to make forecasts & to monitor climate



- Greatest density of atmospheric soundings ever launched with 21 active stations
- 200 radiosonde operators and technicians working on the network + students and researchers from Africa, the Americas and Europe

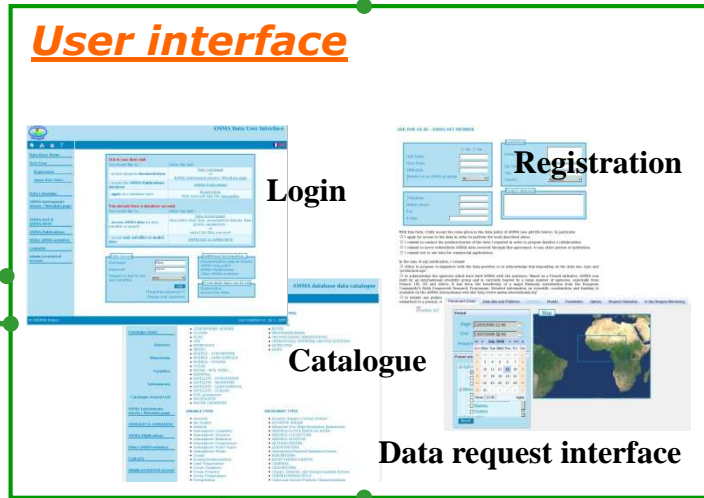


# The AMMA database

## Metadata

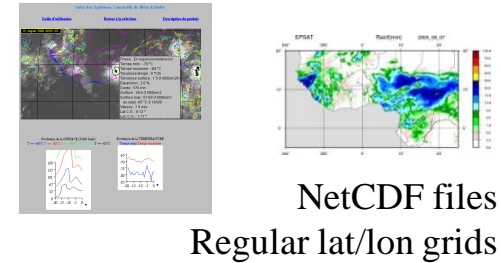
Information about all the datasets  
 → « catalogue base »

## User interface



## Satellite products

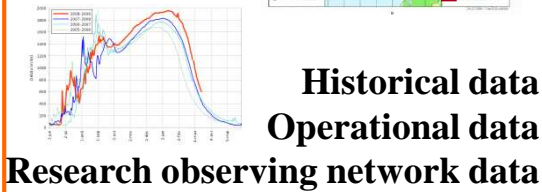
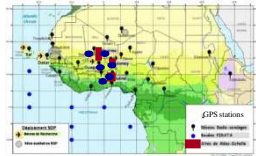
60 operational and research products



## In situ data

About 250 datasets

EOP / SOP / LOP data

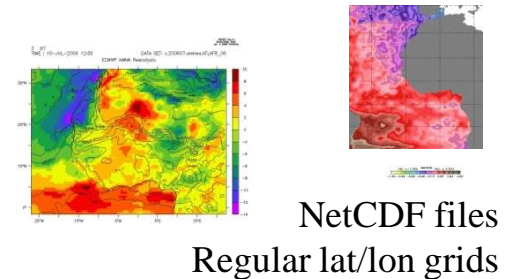


## Questionnaire data

1344 outputs of a socio-economics survey

## Model outputs

Outputs from 15 research + 10 operational models



Two synchronized systems

<http://amma-international.org/database> and <http://amma.agrhymet.ne/amma-data>



## Phase 2 of AMMA: Scientific priorities

AMMA's 2nd phase hinges on 3 key interacting research themes:

1. Continued effort to enrich our knowledge of the monsoon system.
2. Study of predictability and improvement of meteorological, seasonal and climate forecasting.
3. Interactions between society, environment and climate



## (1) Monsoon system

Improving dynamical models for weather and climate prediction requires continued improvements and refinements in our knowledge and understanding of WAM variability and predictability.

This second phase of will focus on the essential feedback loops at three key scales: **weather, intra-seasonal** and **multi-annual**.



## **(2) Weather, seasonal and climate predictability and forecasting**

The AMMA program will work towards improving our ability to make weather and climate forecasts, and increasing our confidence in climate change projections.

In order to do this, the knowledge acquired from phase 1 must be “pulled-through” to improve dynamical models used for weather and climate prediction.

The research activity will be organized around 4 four major themes:

- (i) Evaluation and improvement of models;
- (ii) Utilization of current models (by way of new tools, ensemble prediction systems for example);
- (iii) Improvement of use of available observations (satellite observations, for example);
- (iv) Recommendation and implementation of permanent observing systems to improve monitoring capabilities and forecasts.

These themes will be promoted equally for weather (e.g. mesoscale convective storms, easterly waves and Kelvin waves, tropical cyclogenesis) and climate (intra-seasonal, seasonal and inter-annual to decadal) forecasting, as well as for climate change scenarios.

One of the essential aspects of integrating the knowledge acquired into improvement of forecasting models is the reinforcement of links between the AMMA scientists and operational centers, represented by people working on model improvement and data assimilation.



### **(3) Society, Environment and Climate Interactions**

This research theme will be organized around seven broad themes of scientific study:

- (i) Water resources;
- (ii) Land use, land cover and productivity;
- (iii) Agriculture and food security;
- (iv) Health;
- (v) Energy;
- (vi) Ecosystems;
- (vii) Urban zones and African megacities.

**This third scientific theme is the contribution of the African Community (AMMA-NET) to this second phase of AMMA.**



## II. EXISTING FRAMEWORKS AND ONGOING INITIATIVES IN WEST AFRICA





## EXISTING FRAMEWORKS

1. AU / NEPAD action plan, 2005
2. PAN AFRICAN UNIVERSITY, December 2011
3. ECOWAS SCIENTIFIC RESEARCH POLICY (ECORP), June 2012



## ONGOING INITIATIVES OF INTEREST IN (WEST) AFRICA

EU/ACP EDF Projects : GCCA, ACP/UE ST, AMESD/MESA

CCAFS

WASCAL (West African Science Service Center on Climate Change and Adapted Land Use)



## ONGOING INITIATIVES OF INTEREST IN (WEST) AFRICA (suite)

### GEF/LDCF/UNDP INITIATIVE

In May 2012, The GEF approved a set of 12 projects executed by UNDP and called “Climate Information and Early Warning Systems for Climate Resilient Development Programme” are receiving funding through the Least Developed Country Fund (LDCF) and are currently in the project design phase for the 11 countries currently receiving support (Liberia, Sierra Leone, Benin, Burkina Faso, Sao Tome and Principe, Gambia, Uganda, Ethiopia, Tanzania, Zambia and Malawi). Additional Projects may be also developed in Togo, Guinea and Mali.

All these projects include:

1. Procurement and installation or rehabilitation (in case of existing) of approximately 10+ hydrological monitoring stations with telemetry, archiving and data processing facilities.
2. Procurement and installation or rehabilitation of 20+ meteorological monitoring stations with telemetry, archiving and data processing facilities.
3. Procurement and installation or rehabilitation of radar for monitoring severe weather.



## ONGOING INITIATIVES OF INTEREST IN (WEST) AFRICA (suite)

4. Procurement and installation or rehabilitation of upper air monitoring stations.
5. Procurement and installation or rehabilitation of satellite monitoring equipment to receive real time climate and environmental information.
6. Training of at least 3-5 officers to maintain and repair equipment, computer infrastructure and telecommunications, including cost-effective technologies to interface with existing equipment/software.
7. NHMS capacity to make and use climate forecasts (on daily to seasonal, as well as medium- to long-term timescales) is strengthened by training at least 4 forecasters.
8. Tailored sector-specific early warning products that link climate, environmental and socio-economic information on a range of timescales are developed, based on identified user needs.
9. National capacity for assimilating forecasts and monitoring into existing development planning, PRSPs and disaster management systems is built, including coordination with systems and warnings developed by other initiatives.



## ONGOING INITIATIVES OF INTEREST IN (WEST) AFRICA (suite)

### NIGER PPCR (CIF) EXAMPLE

In Niger within the framework of PPCR, the Project of Development of the Information and the Climatic Prospective component is planning the enhancement of the capacities to generate climate data by improving the infrastructure:

- a. Synoptic Stations from 18 to 34 in 2015
- b. 617 to 796 rain gauges in 2015
- c. 39 pluviograph
- d. 39 agro-meteorological stations



### III. CONCLUSION

THE ISSUE OF DATA ACCESS AND SHARING IS STILL A CROSS CUTTING ISSUE TO BE TACKLED AT THE BEGINNING THROUGH POLICY MEASURES TO ALLOW AN EFFICIENT IMPLEMENTATION OF THE PROJECTS/PROGRAMMES.

WE HOPE CLIMDEV AFRICA PROGRAM COULD FILL THAT GAP WITH AN ADEQUATE ADVOCACY AND RELEVANT INVESTMENTS TO ENHANCE THE OBSERVATIONS NETWORK



**THANK YOU FOR YOUR ATTENTION**