CILSS : Another Sahel is possible !

Use of The EUMETCast Station for Agrometeorological Applications in West Africa

By

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Outline

- **Introduction: Background information on CILSS and AGRHYMET**
- **The PUMA, AMESD and MESA programs**
- **Agrometeorological Applications**
  - Rainfall monitoring
  - Vegetation monitoring
- **Challenges**
- **Partnerships**

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Background information on CILSS and AGRHYMET

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- **CILSS: Permanent Inter-State Committee for Drought Control in the Sahel**
- **Created in 1973, at the aftermath of the great Sahel drought**

13 member states :

Benin, Burkina Faso, Cape Verde, Chad, Côte d'Ivoire, The Gambia, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal, Togo

3 sites

- The Executive Secretariat in Ouagadougou (Policy issues)
- The AGRHYMET Regional Centre in Niamey (Information and Training)
- The Sahel Institute (INSAH) in Bamako (Research coordination)

Mandate: invest in research on food security and combat the effects of drought and desertification for a new ecological balance in the Sahel

The AGRHYMET Regional Center

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- AGRHYMET: Created in 1974,
- Mission : to contribute to achieving sustainable food security and rational natural resource management through:

– **Capacity building** of member states' Meteorological and Hydrological Services (training, equipment and financial support)

– **Production and dissemination of information** to various decision makers (national authorities, cooperation partners, NGOs and farmers)

The AGRHYMET Operating scheme

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Partners

Data and Information

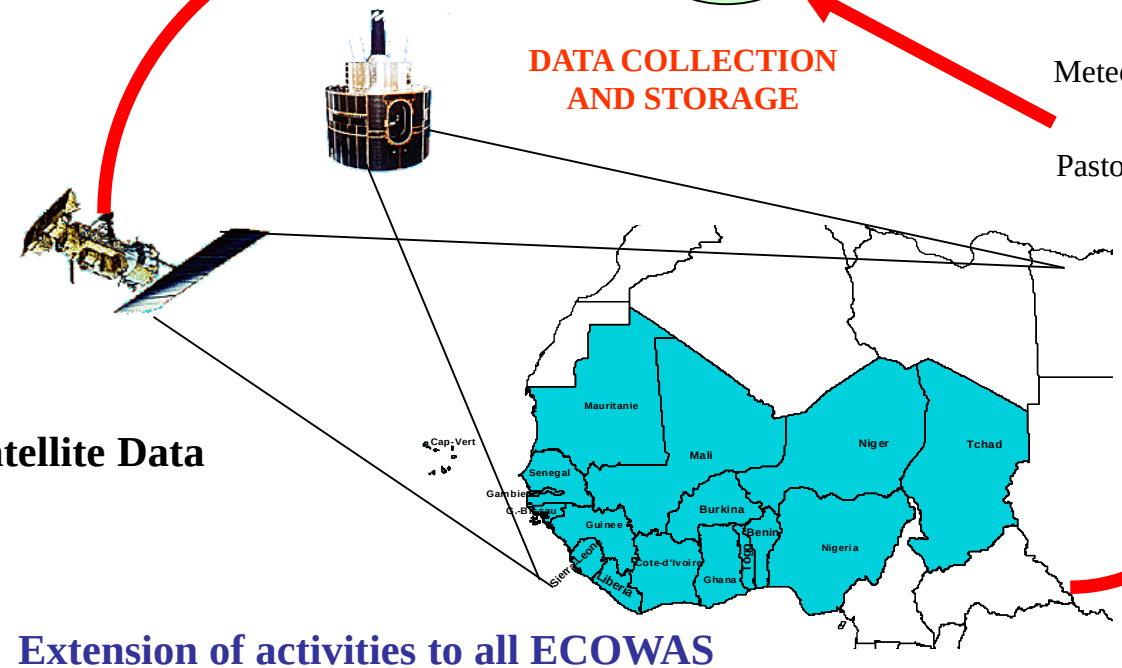
Financial and Technical assistance

Hydrology
Meteorology
Agriculture
Pastoralism
AGRHYMET
Food Security & Nutrition

ANALYSIS DIFFUSION TRAINING

DATA COLLECTION AND STORAGE

Hydrology
Meteorology
Agriculture
Pastoralism
MWG Countries
Food Security & Nutrition



Satellite Data

Ground Observation and Survey Data

Extension of activities to all ECOWAS member countries since 2006

Agricultural campaign monitoring

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- Seasonal forecast of rainfall, starting and cessation dates of the rainy season, dry spell durations and maximum river discharges
- Identification of zones where **rainfall at the start of the season** allowed sowing
  - Focus on zones with late sowing relatively to the average and the previous year
- **Crop water requirement satisfaction** indices
- **Vegetation indices** derived from EO satellites
- **Warning on crop pests and diseases infestations**
- Prediction of **potential crop yields** using crop models
- Publication of **Monthly and Special alert bulletins**

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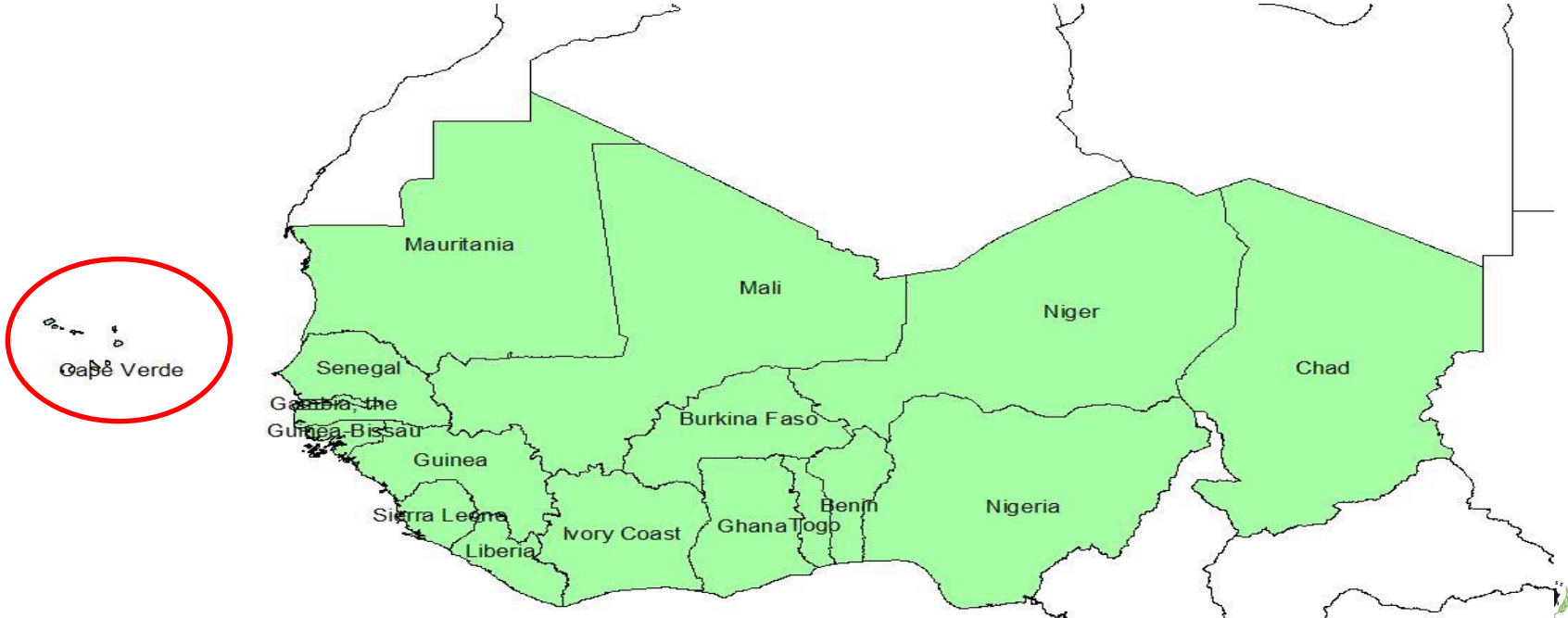
The PUMA, AMESD and MESA programs

16 Beneficiaries Countries

ECOWAS member countries (excepted Cape Verde) + Mauritania and Chad

- **National Agencies in Charge of :**
  - **Environmental monitoring**
  - **Meteorology**
  - **Agriculture and livestock breeding**
  - **Food Security Early Warning**



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The EUMETcast Receiving Station

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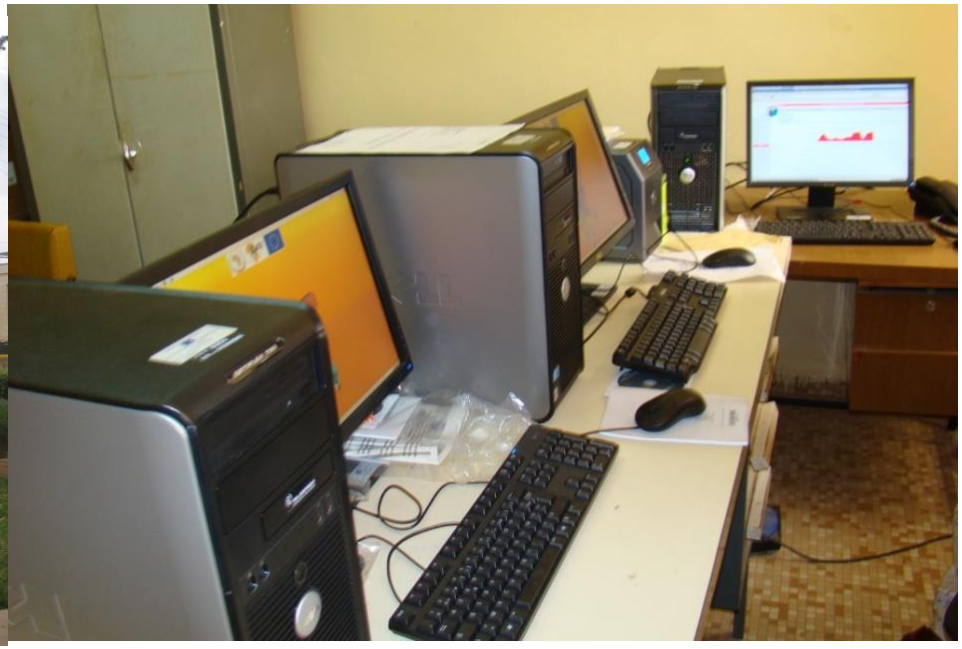

- Upgrade of the PUMA station
- Upgrade of the AMESD station (rainfall and vegetation monitoring)
- Improve access to earth obserbation data in all the countries
- Improve the availability of information products in the CILSS/ECOWAS region
- Insure Cross fertilization among the diffrent african regions in the use of Earth observation data
- Raise the awarness of decision makers on the availability of products derived from earth observation data and seek their support

Main Objectives

- Improve **the access to earth observation data** in all the countries
- Improve the **availability of information products** in the CILSS/ECOWAS region
- Insure **cross fertilization** among the different African regions in the use of Earth observation data
- Raise **awareness of decision makers** on the availability of products derived from earth observation data and seek their support
- **Build the capacity of the staff of regional and national institutions** in charge of enviromental monitoring and food security early warning through working visits and training workshops

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Agrometeorological applications

Use of satellite products for the agricultural campaign monitoring

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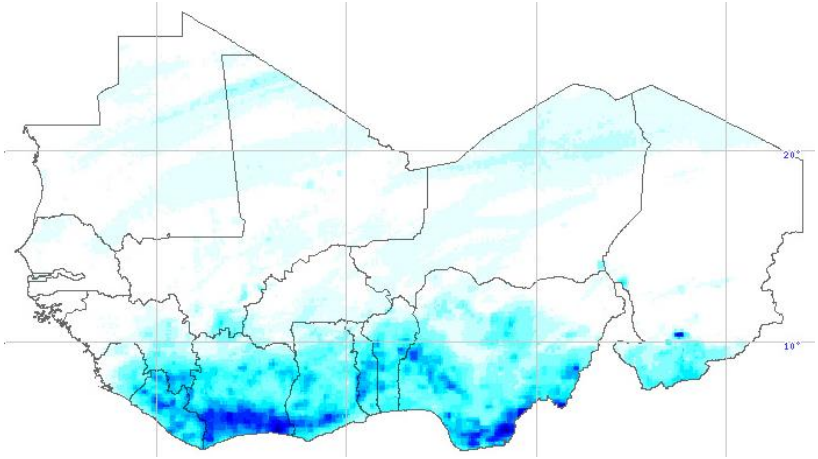
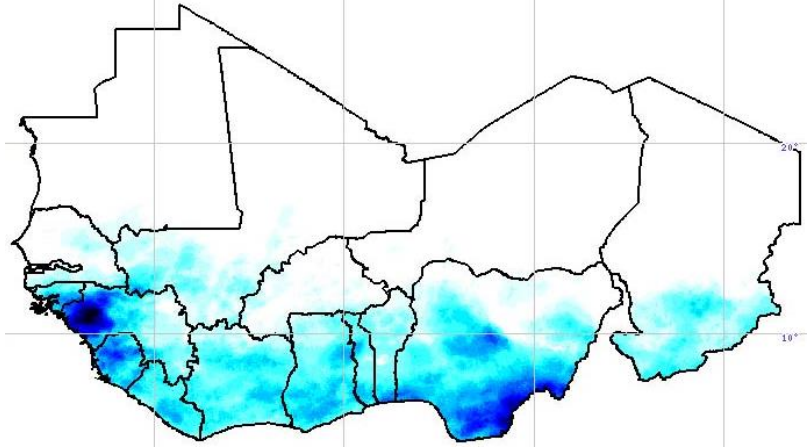
3rd Dekad March 2016

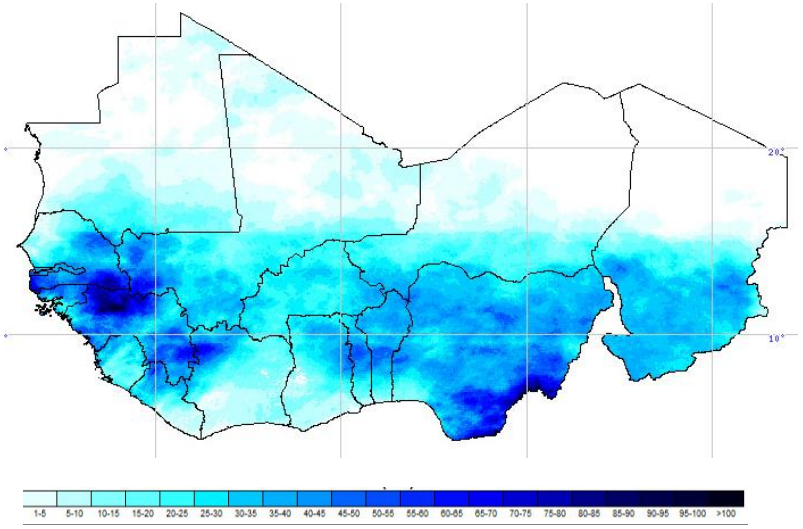


1st Dekad October 2016



Dekadal cumulative Rainfall

2nd Dekad August 2016



MESA
Monitoring for Environment and Security in Africa

Use of satellite products for the agricultural campaign monitoring

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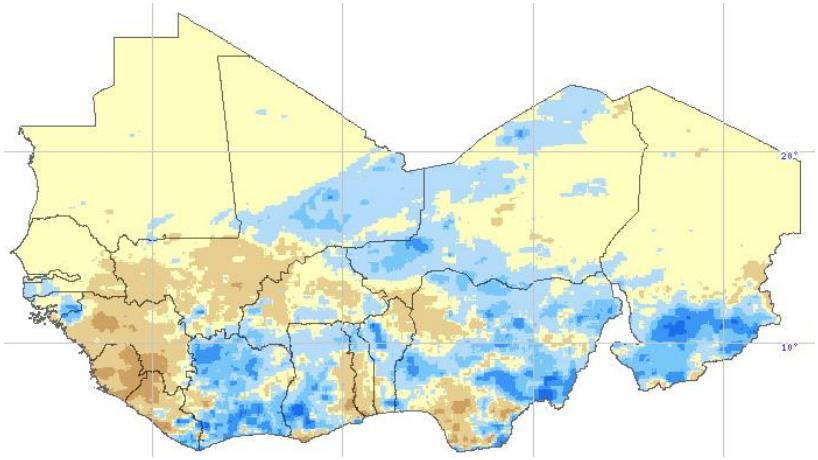
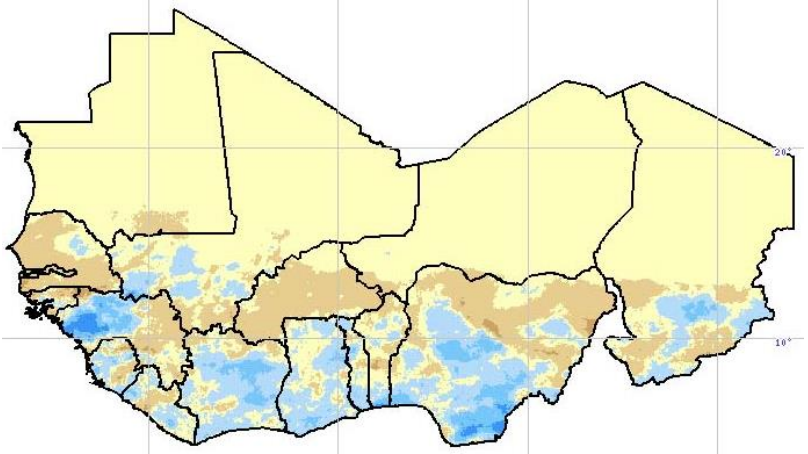
1st Dekad June 2016
Early Onset in the East

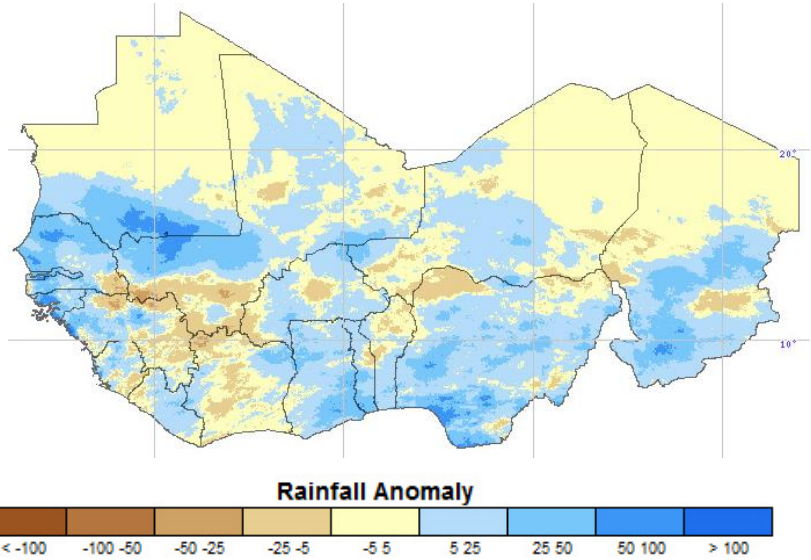


1st Dekad October 2016
Early Cessation in the East



Dekadal rainfall anomalies

1st Dekad August 2016
Generally Good conditions throughout the Sahel



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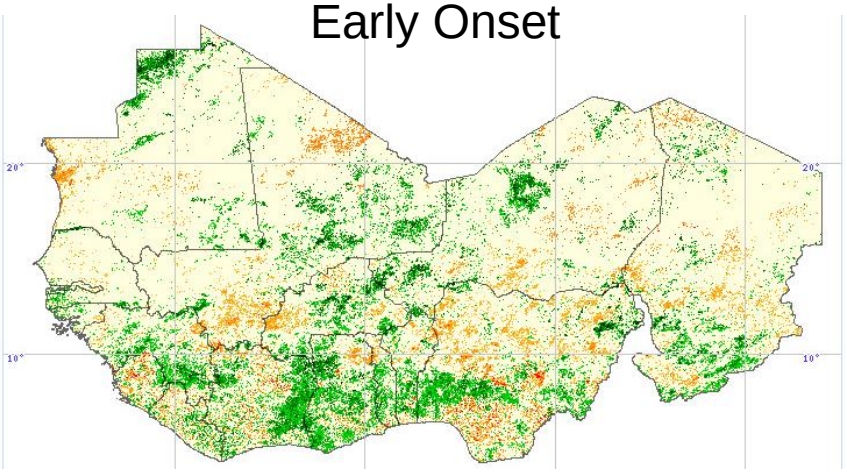
Early Onset



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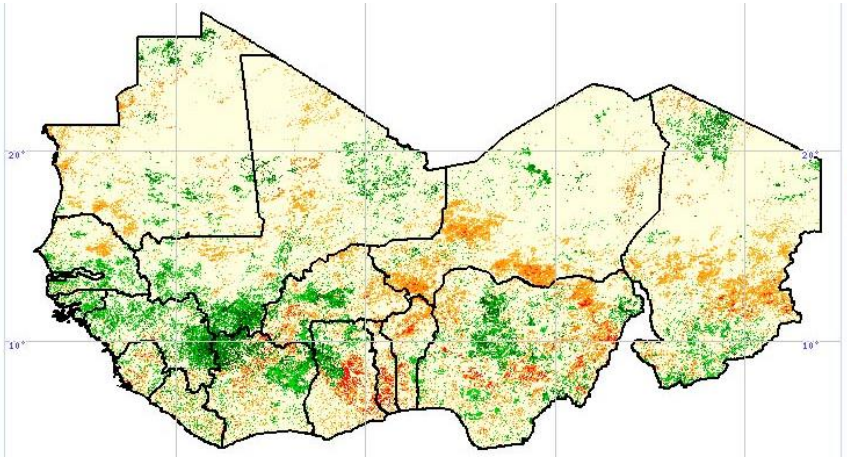
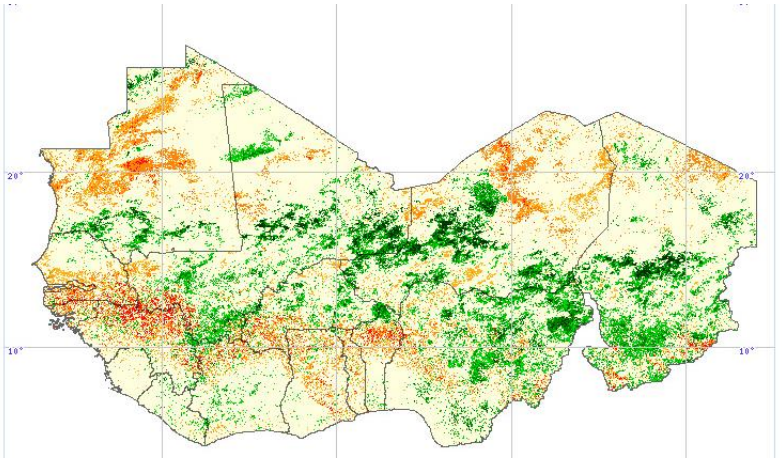
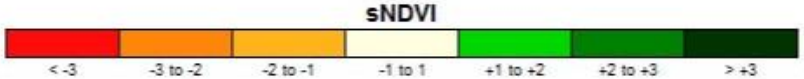
Early Cessation in the East



Vegetation indices : sNDVI

1st Dekad August 2016
Generally Good conditions
throughout the Sahel





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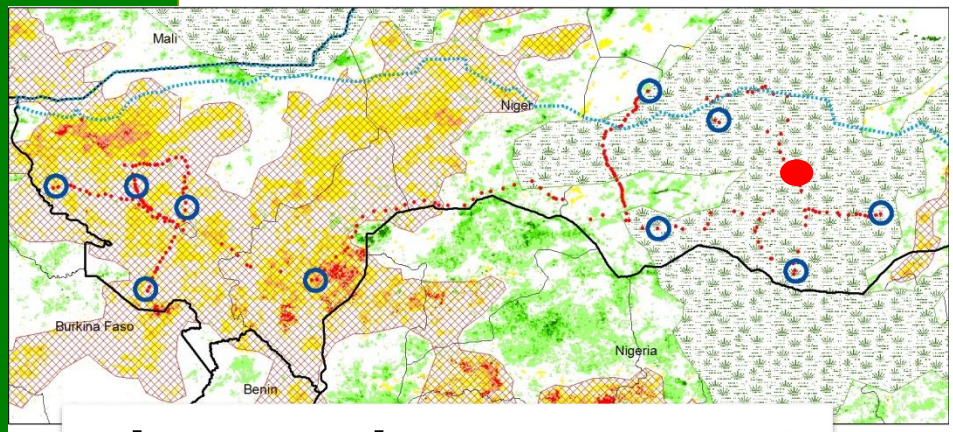
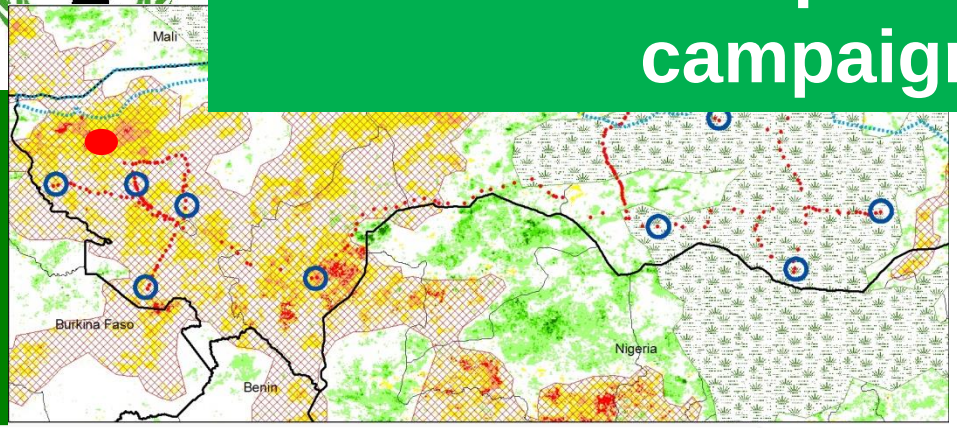
Use of satellite products for the agricultural campaign monitoring

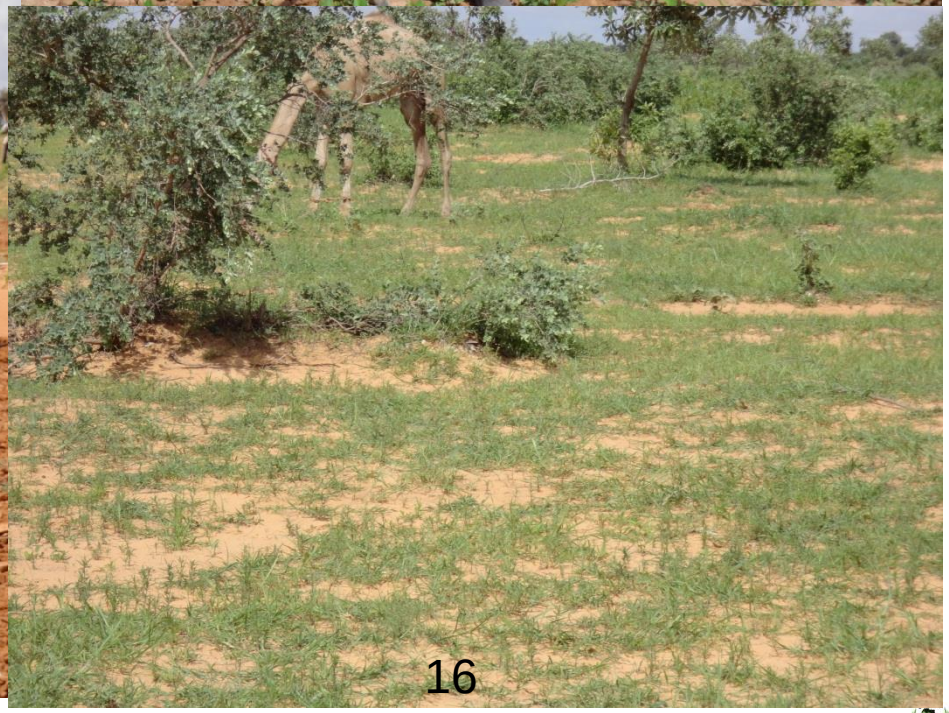


Niger, 10th August 2012

Use of satellite products for the agricultural campaign monitoring



Niger, 13th August 2012



Use of satellite products for the agricultural campaign monitoring

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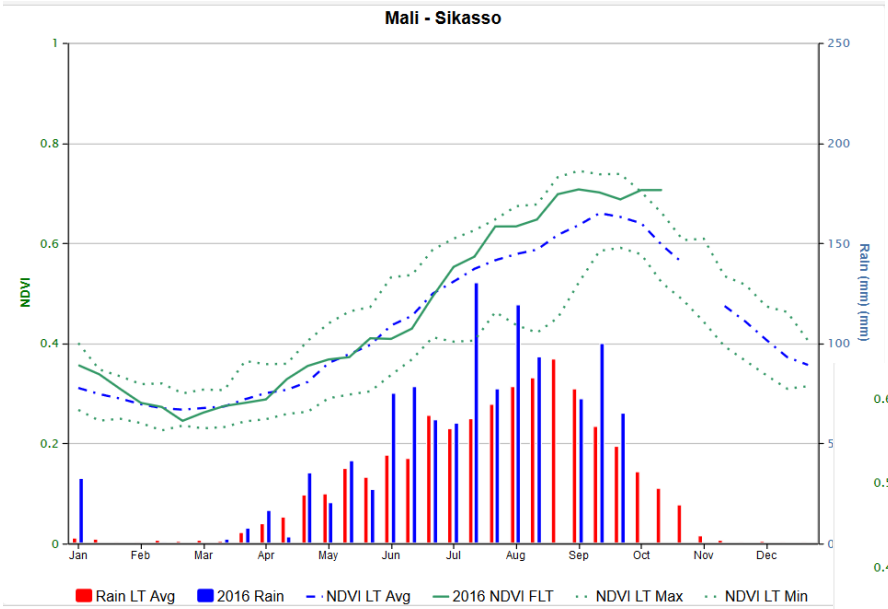
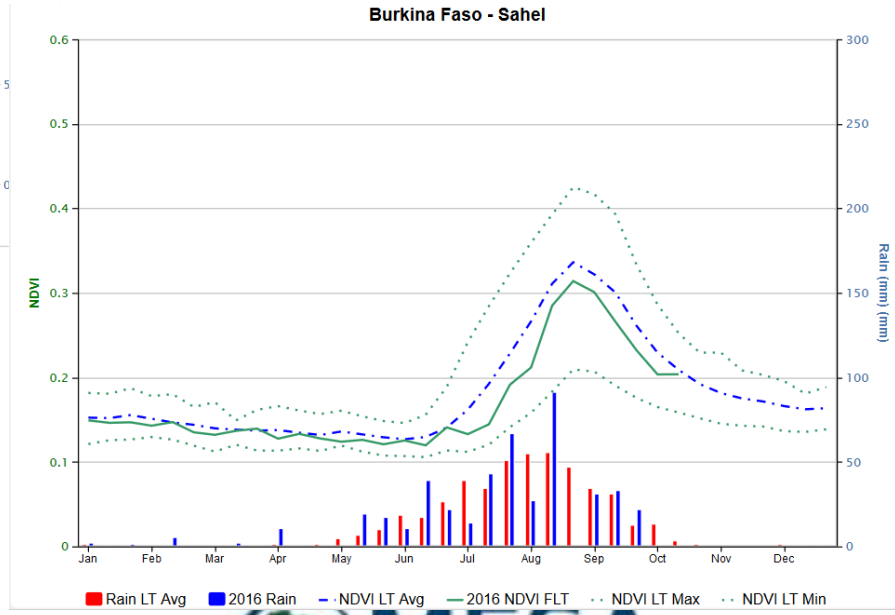
Rainfall and vegetation indices profiles per administrative units





Source AGRHYMET MESA e-station

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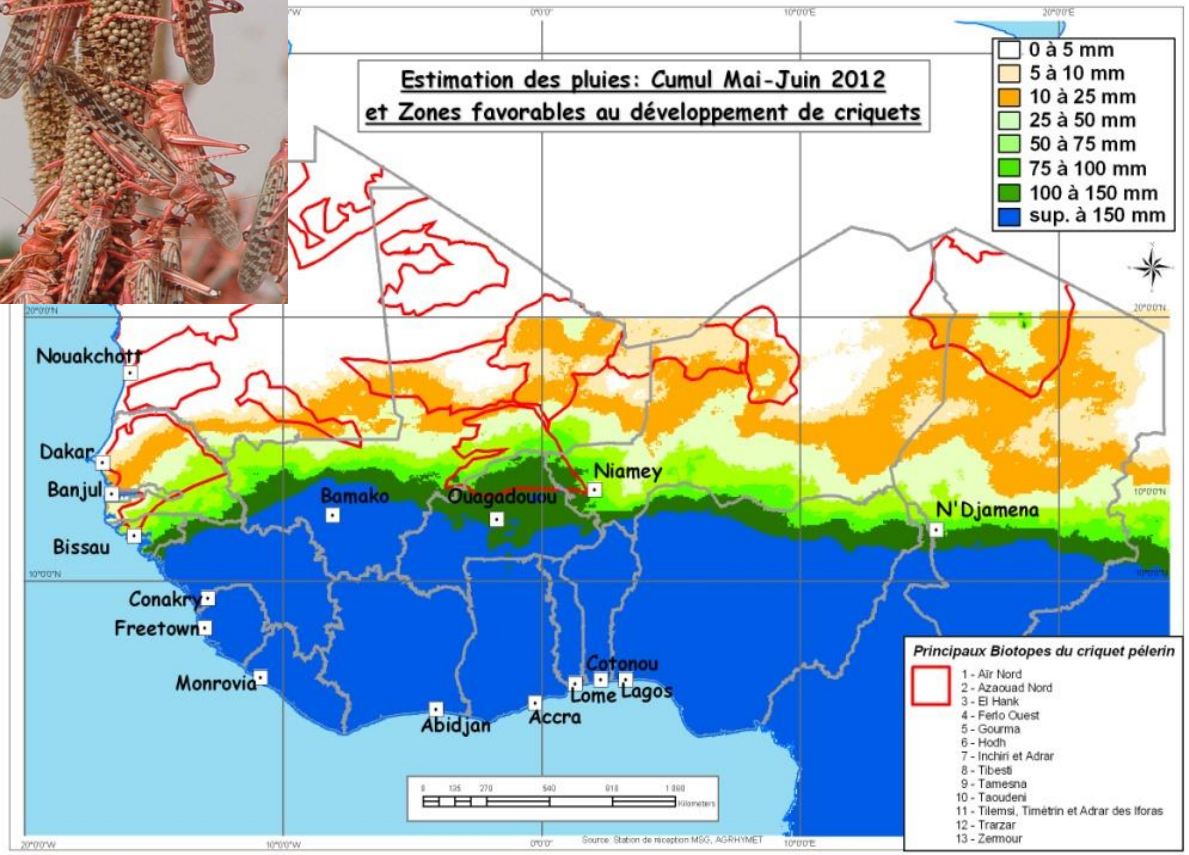
Favorable conditions in desert locust breeding areas



Use of satellite products for the agricultural campaign monitoring

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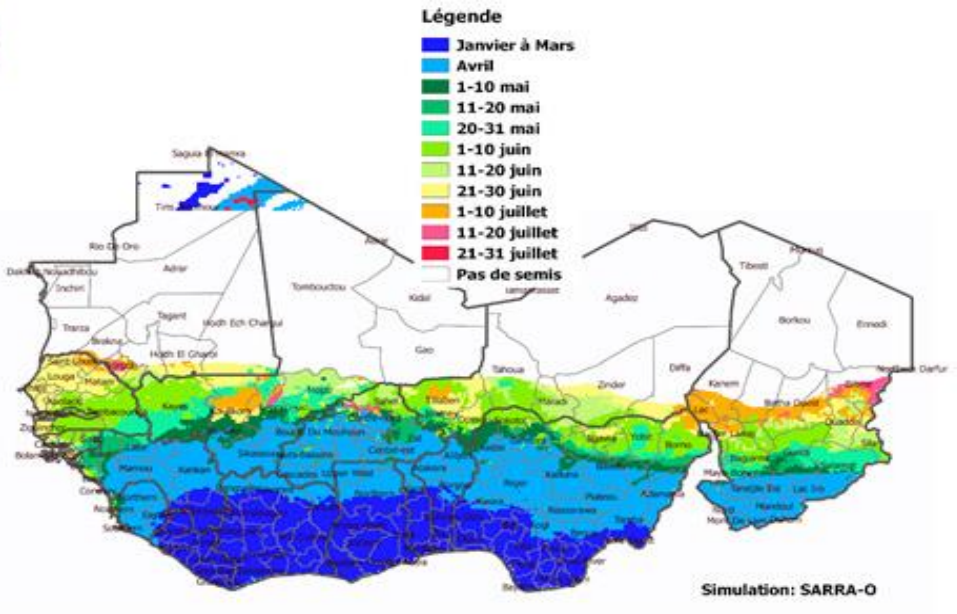
Crop growing conditions (SARRA-O crop model)

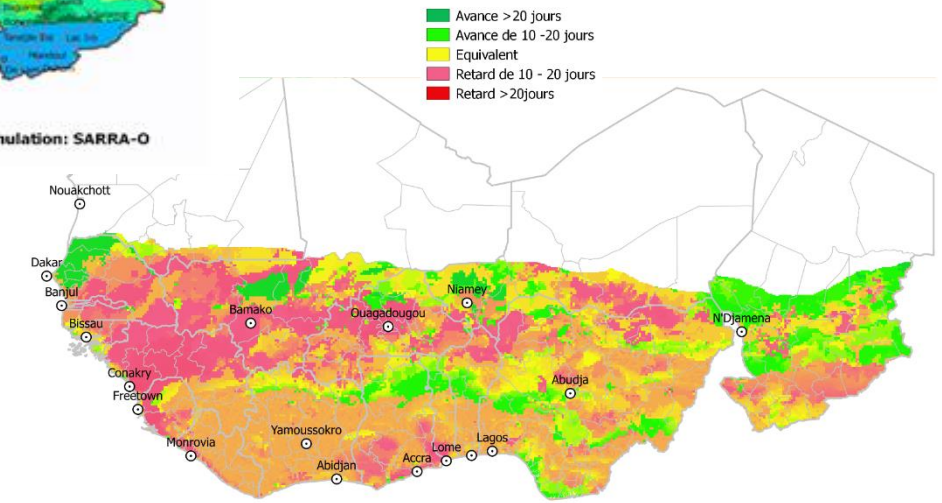
Starting dates of the 2018 season



Anomalies of starting dates relatively to the last 5 year average

s de semis en 2018 par rapport à la moyenne 2013-2017

Simulation: Modèle SARRA-O/CIRAD/AGRHYMET



Use of satellite products for the agricultural campaign monitoring

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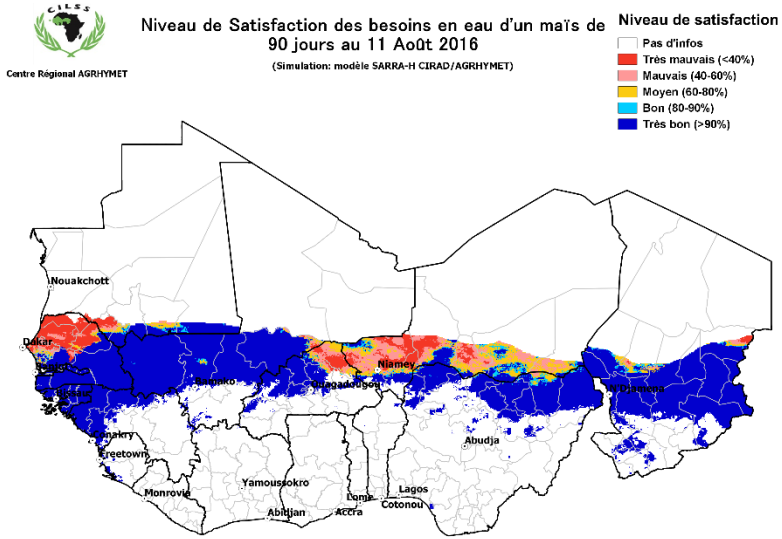
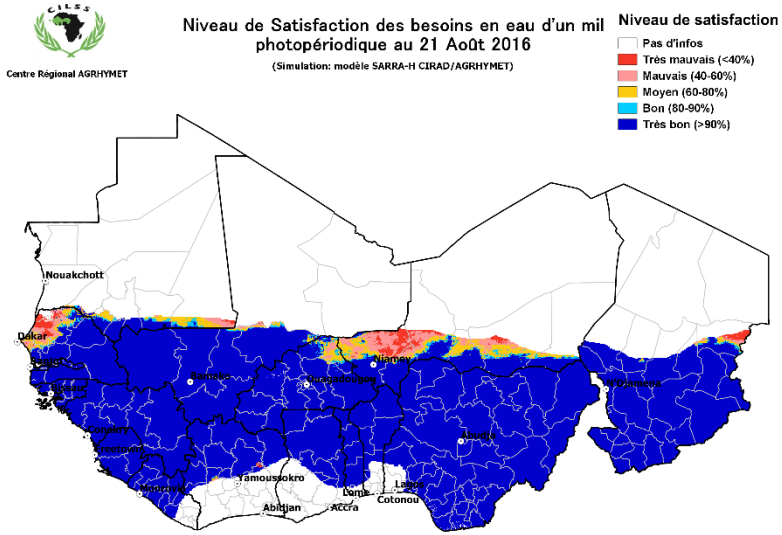
Crop growing conditions (SARRA-O crop model)

Crop water requirements satisfaction indices
Maize 90 days



Crop water requirements satisfaction indices
Photoperiod sensitive Millet



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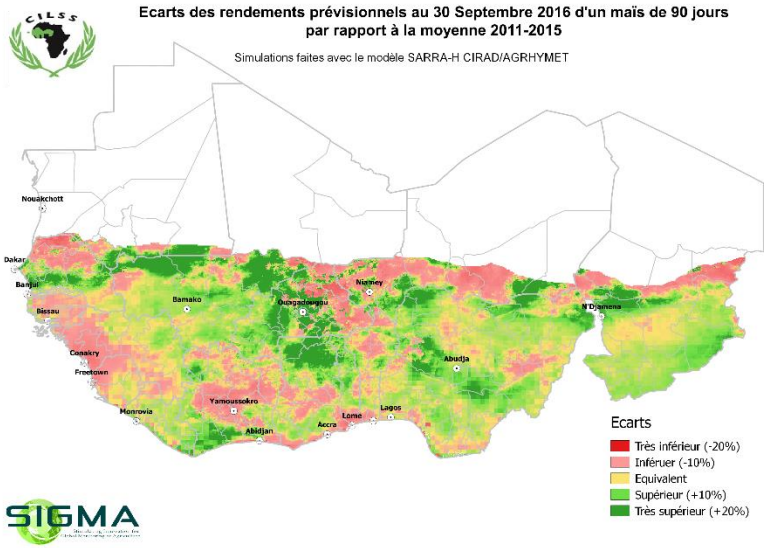
Potential crop yields (SARRA-O crop model)

Maize 90 days



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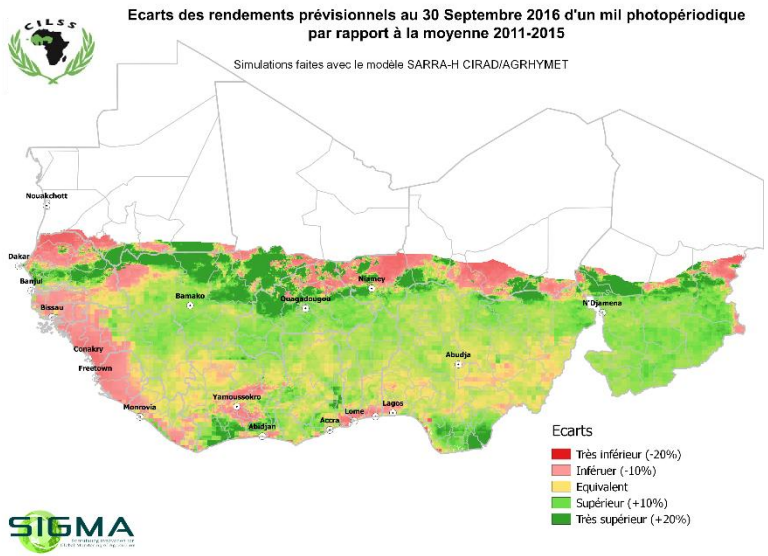

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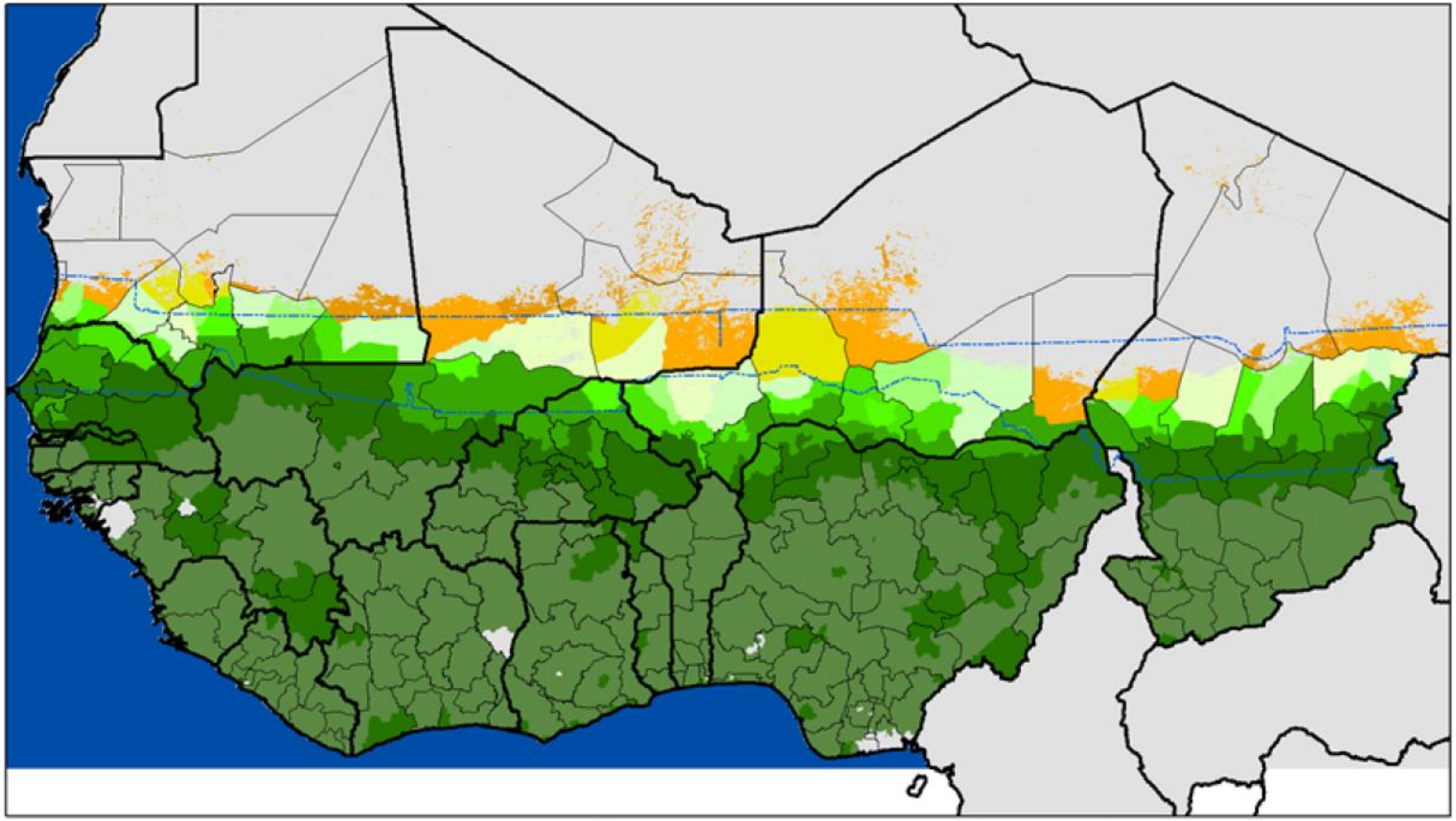
Average potential forage yields per administrative unit



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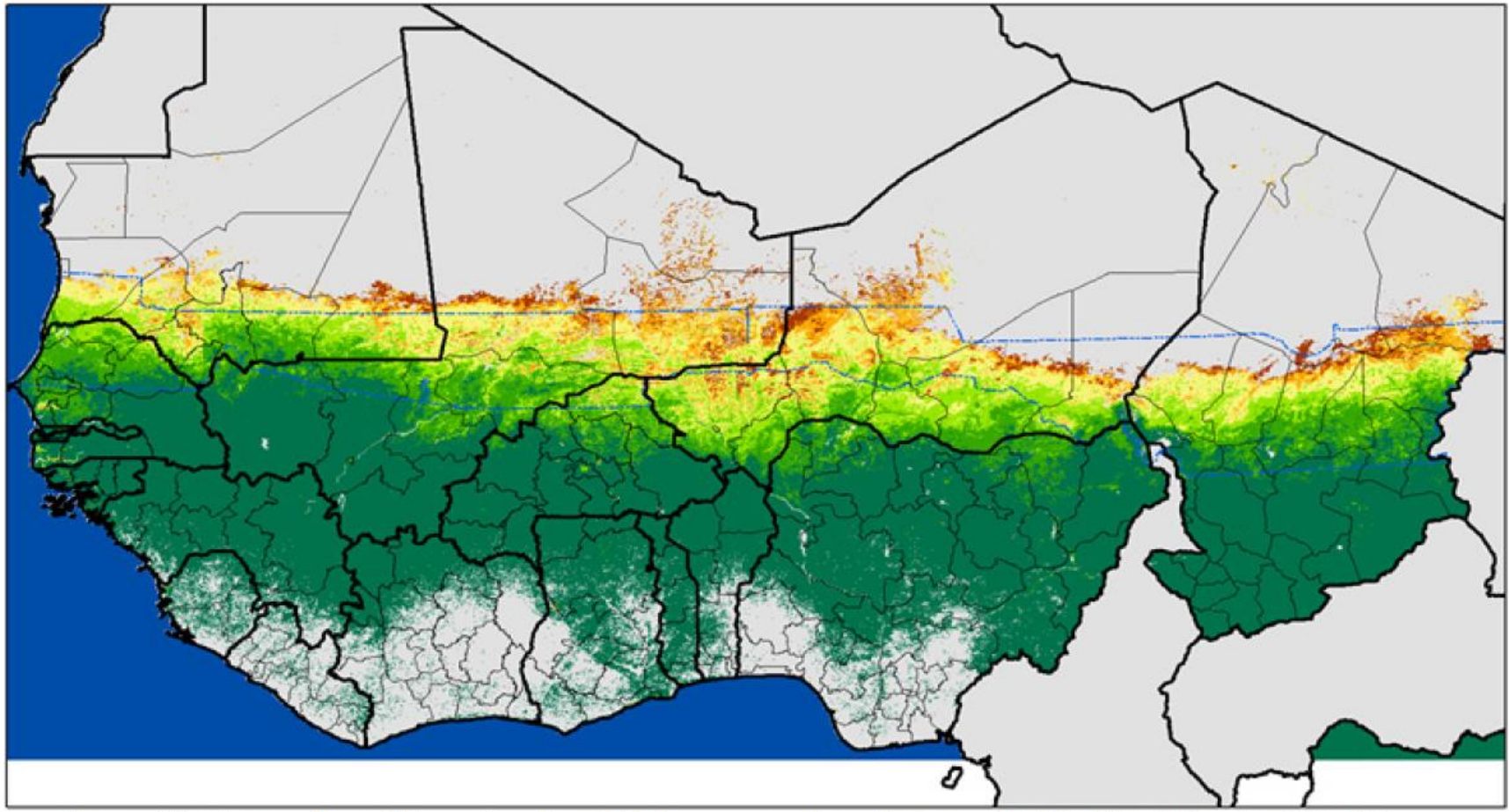
Livestock carrying capacity



Capacité d'accueil au 30 septembre 2016 : en nombre de jours Unité Bétail Tropical (UBT)

Limites administratives
Limites zone Pastorale

Flags
< 5
5 - 10
10 - 25
25 - 50
50 - 100
+ 100

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Some challenges

- Cloud contamination of vegetation products in humid zones
- Discrimination of crop types
- Estimation of cropped areas

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Projects and Partnerships

- **Projects**
  - PUMA/AMESD/MESA
  - SIGMA
  - GMFS
  - AGRICAB
  - IRI Data Library
- **Scientific partners**
  - JRC, VITO, FEWSNET, CIRAD, IRI, etc...
  - National Meteorological Services
  - National Agricultural Research Institutes,
  - Universities

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Thank you for your attention

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