Data sharing practices, experiences, challenges and opportunities at ACMAD

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Data at ACMAD

- Currently does not collect country data, thus have no own data

- Available data are those
  - from country personnel who visited ACMAD
  - On microfiche transferred to ACMAD as part of the Data Rescue Project
- Can only share data with the consent of the country

- However, involved in sharing weather and climate information

Experiences

GEONETCast (1)

- It is a global network of satellite-based data dissemination systems providing environmental data to a world-wide community (Data exchange and data delivery).
- Partners include
  - China Meteorological Agency (CMA)
  - National Oceanic and Atmospheric Administration (NOAA)
  - WMO
  - EUMETSAT
- GEOSS – GEONETCast is a GEOSS initiative

GEONETCast (II)

- EUMETCast is one of the 3 main components of the global GEONETCast infrastructure of GEOSS.
- GEONETCast combines EUMETCast with GEONETCast-Americas operated by NOAA and FengYunCast operated by the Chinese Meteorological Agency, referred to as GEONETCast Networking Centres (GNC) to provide near-global dissemination

EUMETCast

A multi-service satellite broadcasting system for environmental data and information products, operated by EUMETSAT.

It shares weather, climate and environmental data across Europe, Africa and the Americas

Products

- GOES East and West image data
- FY-2 image data
- Land and ocean Sea Ice Satellite Application Facility (SAF) products
- EUMETSAT meteorological products
- NOAA-NESDIS ocean colour and sea surface temperature products
- VEGETATION products from VITO
- MODIS Ocean colour products
- In-situ and observationa

Advantages of using GeonetCast

- A Variety of receiver equipment;
- The high reliability and data transfer rate
- The wide variety of freely available images and products
- The long-term commitment by EUMETSAT to maintain infrastructure in Africa
- The constantly growing receiver network, the growing number of products and (Third Party) data providers.

ACMAD

vito
vision on technology

GEONETCast
for and by Developing Countries

SEVENTH FRAMEWORK
PROGRAMME

EUROPEAN COMMISSION
European Research Area

What is DevCoCast?

A 3-year project, funded under the EU 7th Framework Programme

Started in May 2008

16 partners from Africa, Latin America and Europe

With support from

VEGETATION

The Global Ocean Observing System

GOOS

UNESCO
United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

And many national & international projects

Concept

Many **Developing Countries** face **serious environmental risks…**

…and need adequate **Earth Observation data** and derived **environmental information** for their **sustainable development.**

GEONETCast provides **reliable** and continuous **access** to environmental information all over the world!

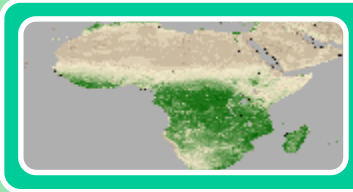
And **DevCoCast** brings them closer together

4 Core activities

Sharing cross-cutting Earth Observation **products**

Setting up receiver and hub **infrastructure**

Capacity building: supporting & **training** user communities



Building on capacity: Making everyday use of GEONETCast

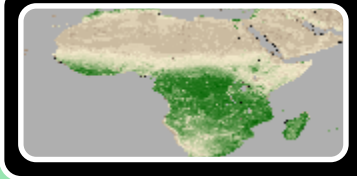
All for **and by** the Developing Countries and
using GEOSS Core **GEONETCast** infrastructure as **central technology**

4 Core activities

Sharing cross-cutting Earth Observation **products**

Setting up receiver and hub **infrastructure**

Capacity building: supporting & **training** user communities



Building on capacity: Making everyday use of GEONETCast

Sharing EO products across the continents

Existing products created in **Latin America, Africa** & Europe

Gathered centrally by ocean & land **hubs** and EUMETSAT in Europe

Broadcast across Africa, the Americas & Europe

GEONETCast exchange with CMA for pilot user in China

Received using low cost receiving stations

A wide variety of products

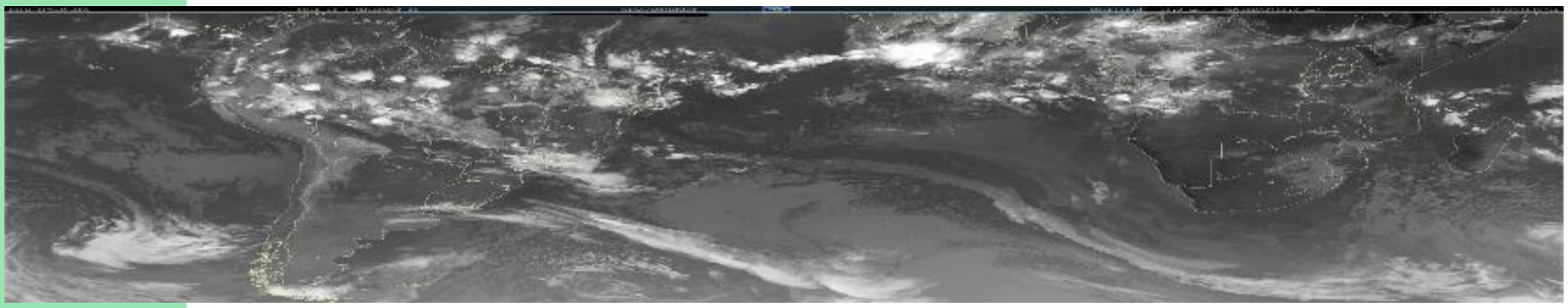
Combining **operational production systems**

- GMES Land service (Geoland2)
- ChloroGIN network, part of Global Ocean
- Observing System (GOOS)
- FP6-YEOS Yellow Sea forecasting
- …

Cross-cutting application themes and **GEO Societal Benefit Areas**:

- vegetation & agriculture
- inland water & ocean
- severe weather
- fires, floods,...

A wide variety of products

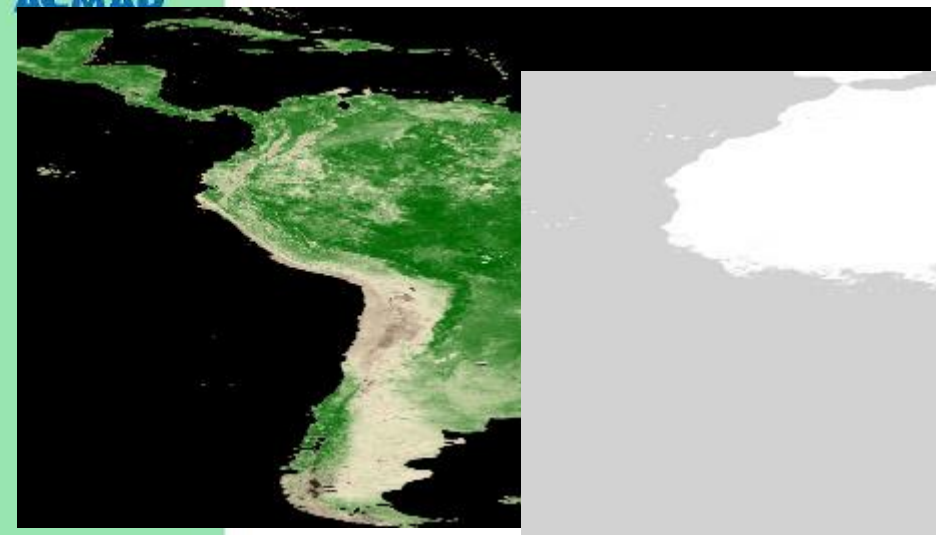


15min GOES-MSG IR composites produced in Brazil

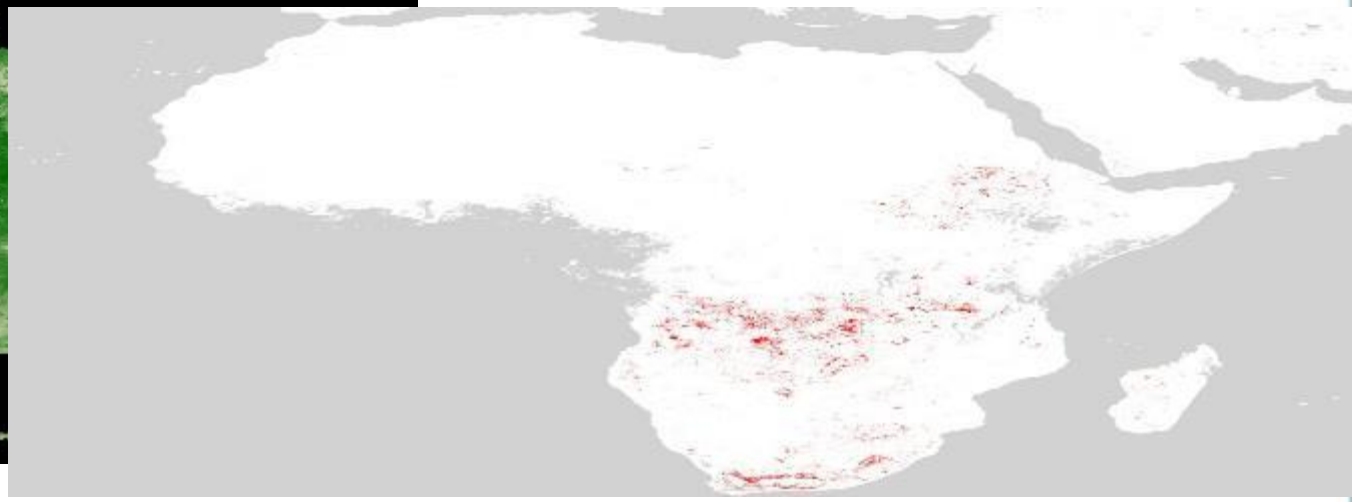
From **basic** satellite **imagery**...

GOES, MSG

A wide variety of products

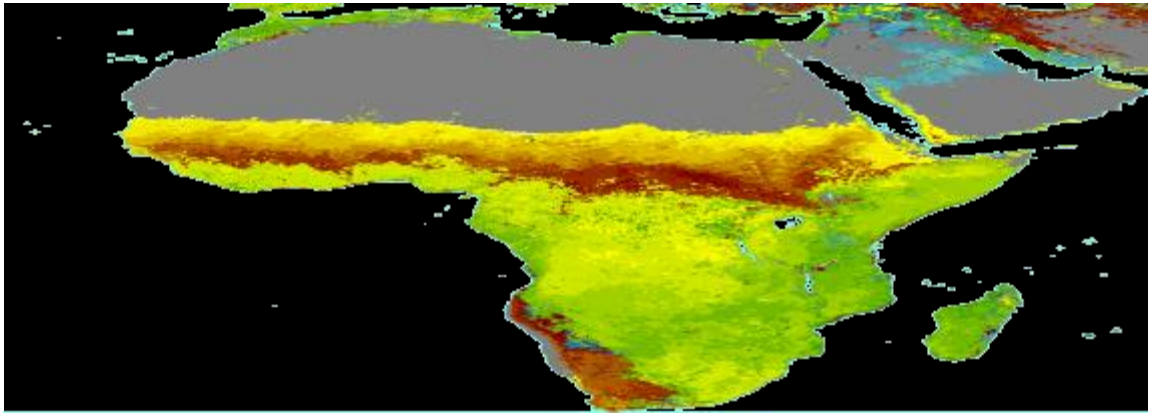


NDVI from May 2010



Burnt Areas between April & June 2010

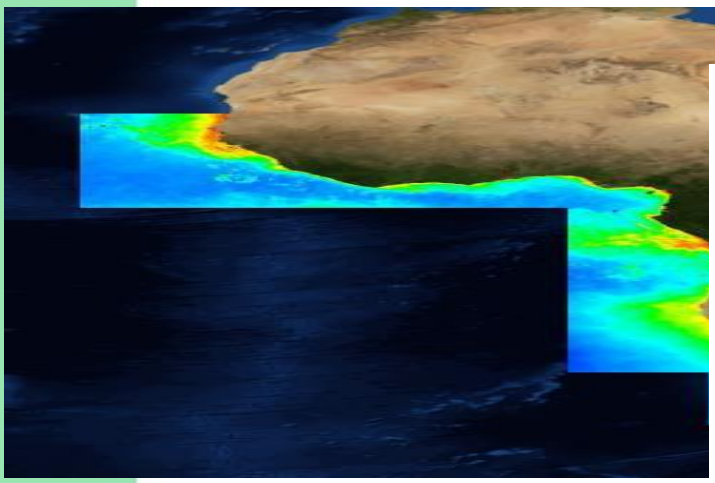
From **basic** satellite **imagery**...
Over **added value land data**...



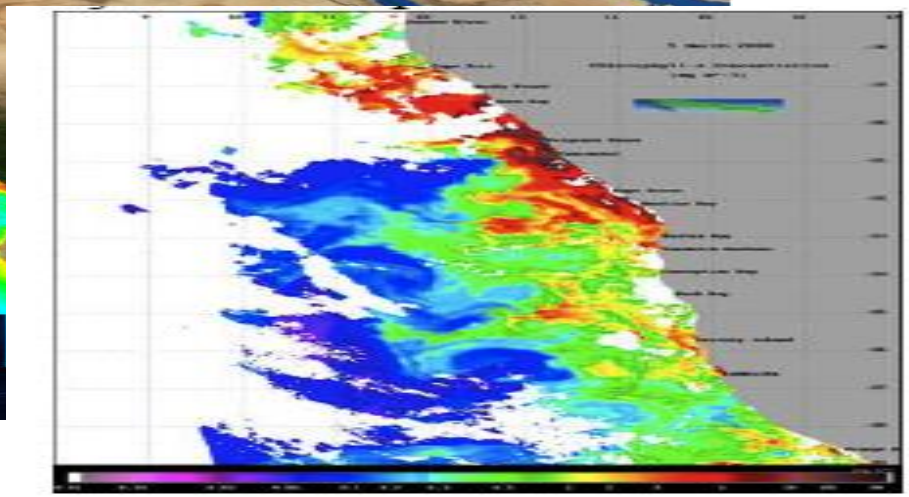
Start of vegetation growth season

GOES, MSG, **SPOT-VEGETATION, NOAA AVHRR, MODIS**

A wide variety of products



Ocean colour



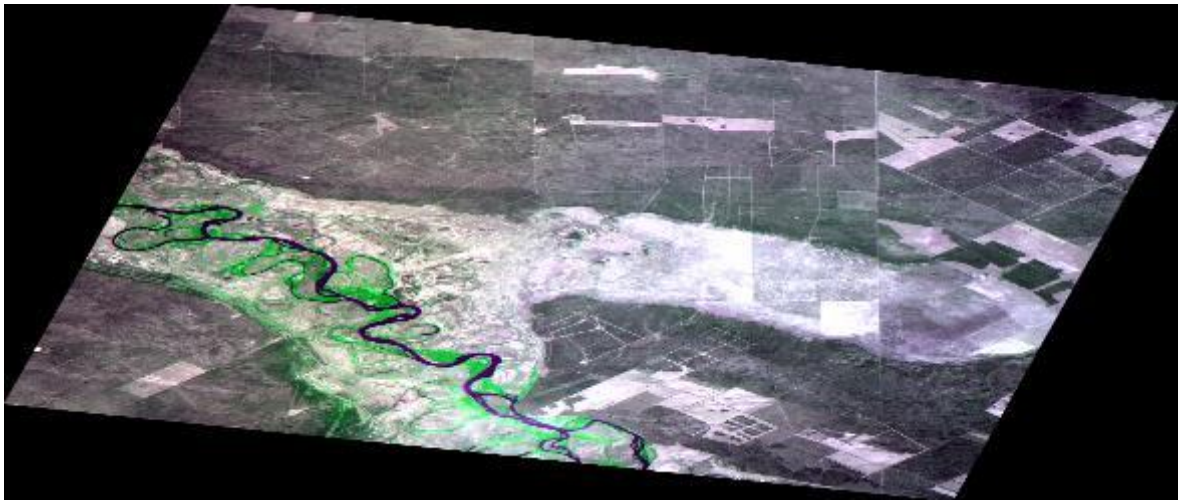
Harmful algae blooms

From basic satellite imagery...

Over added value **ocean data...**

GOES, MSG, SPOT-VEGETATION, NOAA AVHRR, **MODIS, SeaWIFS, MERIS**

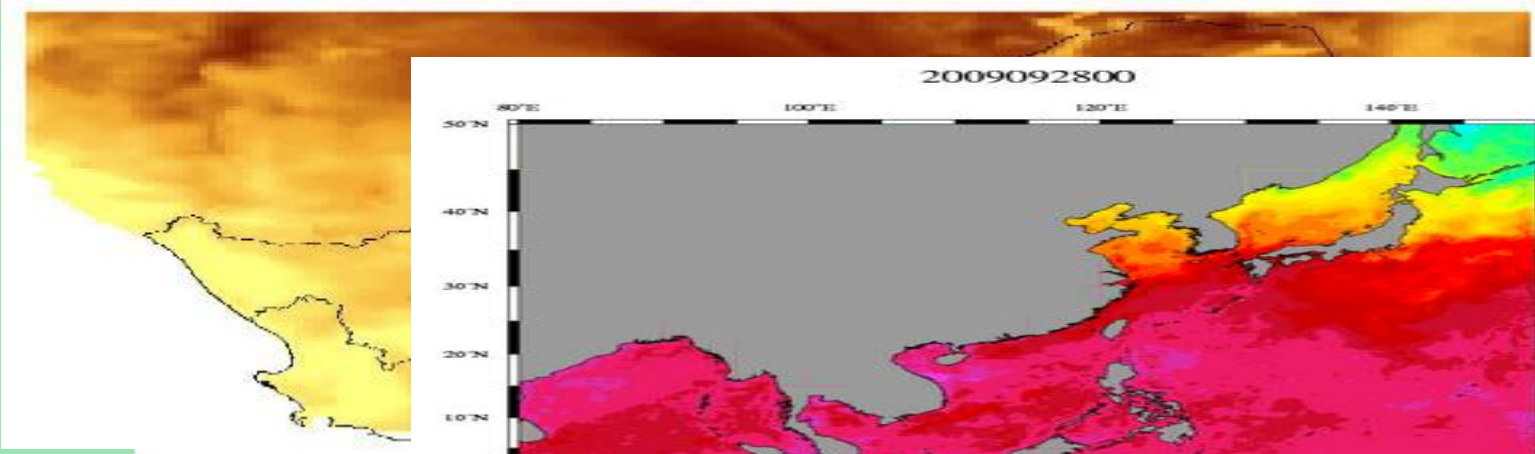
A wide variety of products



Scene in Latin America from
21 Jan 2009, 10m resolution

From **basic** satellite **imagery**...
Over **added value data**...
And high resolution **CBERS...**
GOES, MSG, SPOT-VEGETATION, NOAA AVHRR, MODIS, SeaWIFS, MERIS, **CBERS**

A wide variety of products

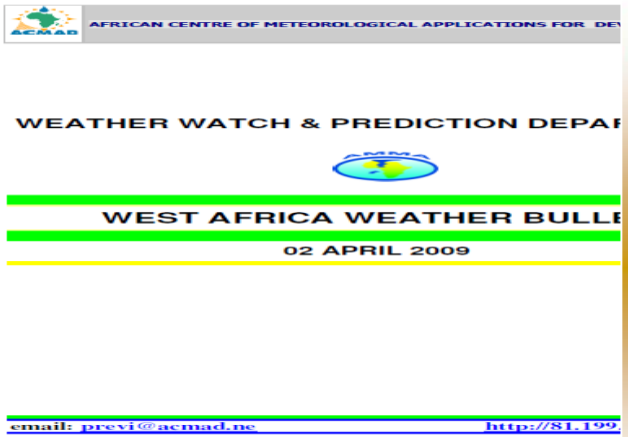


Fire risk in South Af

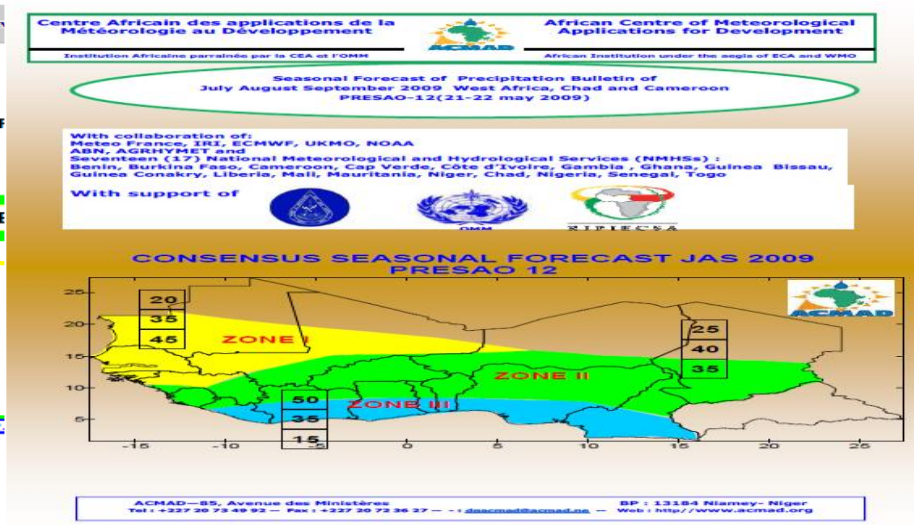
Sea Surface Temperature in the Yellow Sea

From **basic** satellite **imagery**...
Over **added value data**...
High resolution **CBERS**
To **model outputs** and **information** bulletins

A wide variety of products



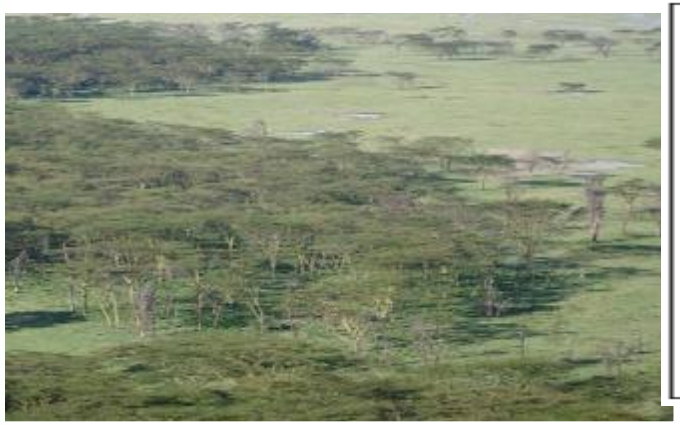
Weather & climate bulletin

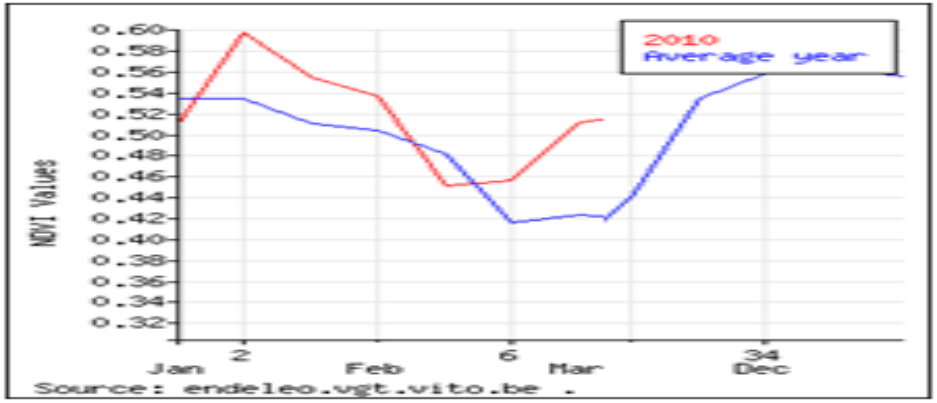


Agriculture & pasture bulletins

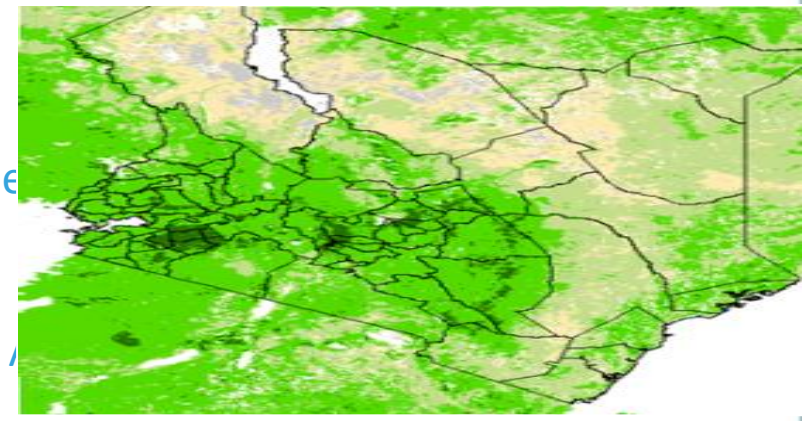
From **basic** satellite **imagery**...
Over **added value data**...
High resolution **CBERS**
To **model outputs** and **information** bulletins

Food security early warning & environmental monitoring in Africa





Forest monitoring in Kenya (Endeleo proje

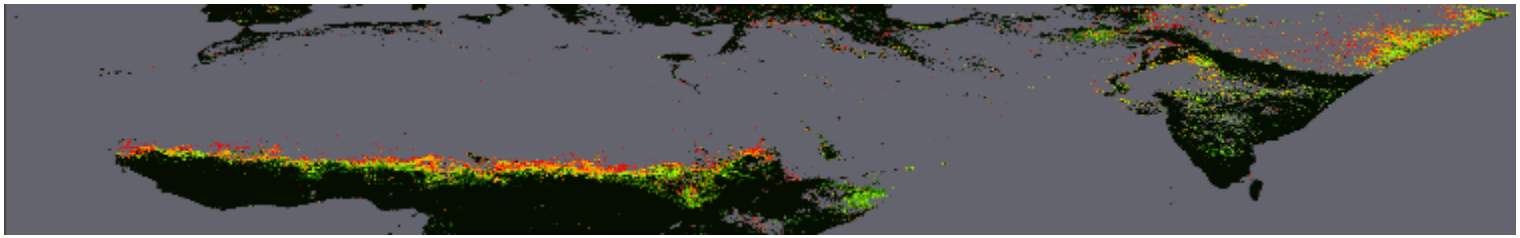


Monitoring 4 large marine ecosystems in A

- Fisheries
- Harmful algae
- Coastal management
- Integrated ecosystem

Building on capacity

Helping UN-FAO to fight the desert locust



Green vegetation dynamic map,
1-10 July 2010 (WorldWideWatch project)

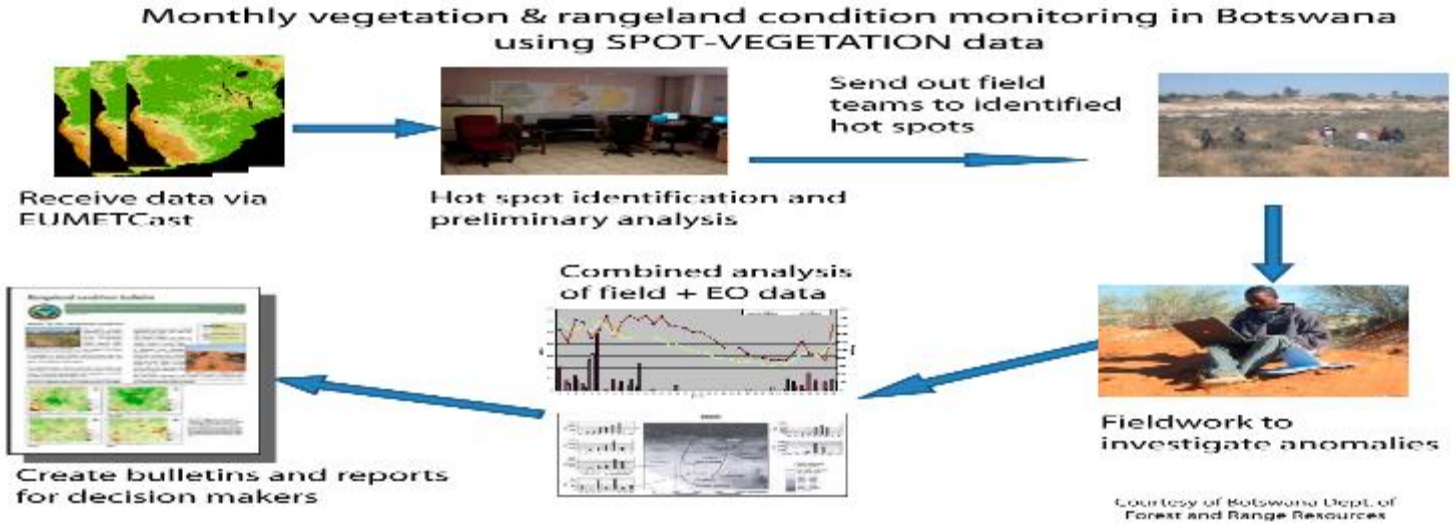
Making a real difference

Using GEONETCast, early hot spot identification

Saves fieldwork time

Final reports for the Minister of Environment are

- more detailed & comprehensive
- provided 3 times more frequently



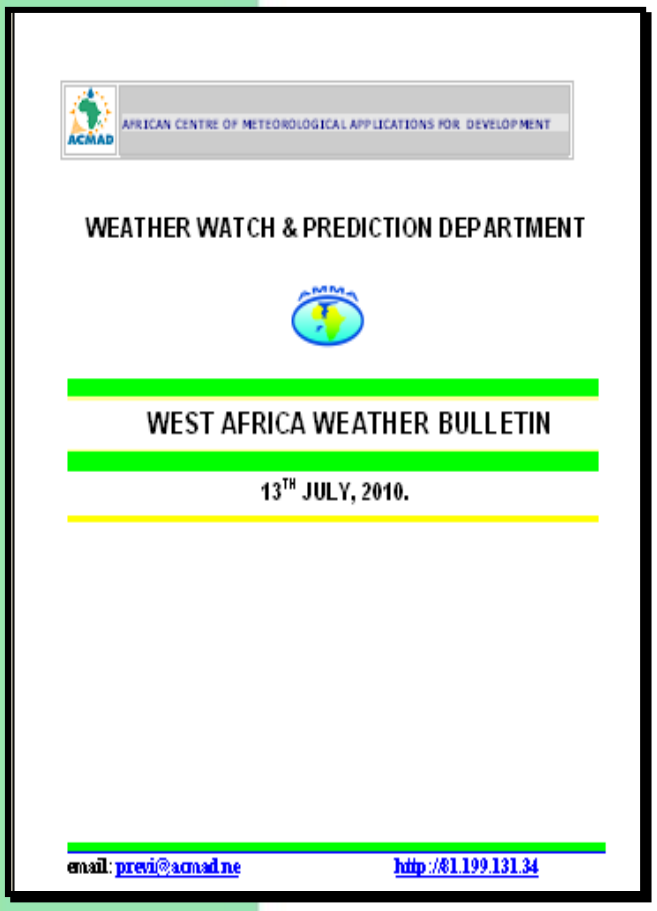
GEONETCAST Products and ACMAD

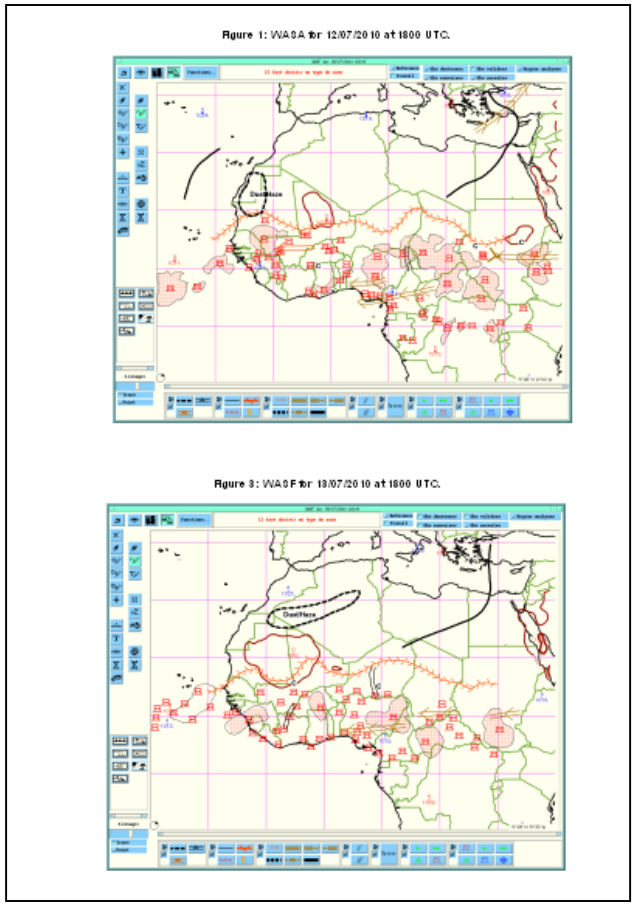
•Meteorological data (MSG products/images, observational and forecast
products) received by ACMAD through EUMETCast Africa are used to generate weather bulletins (see list of bulletins) including warning to NMHSs and DRR
managers and other regional UN organizations

•Environmental data provided by VITO – Various products derived from
SPOT – Vegetation for land applications (climate bulletins)

PRODUCTS

1. West Africa Synthetic Analysis / Forecast





- ITD,
- Low level & upper level trough
- Subtropical Jet
- Easterly African Jet
- Tropical easterly Jet
- Easterly waves,
- Organized or isolated convective systems
- Dust haze areas,
- Heat low.

Technical doc for forecasters, material training

2. Southern Africa Synthetic Analysis / Forecast

WEATHER WATCH & PREDICTION DEPARTMENT

SOUTHERN AFRICA WEATHER BULLETIN

13TH JULY, 2010

Figure 2. SASA Valid 1800Z on 12/07/2010

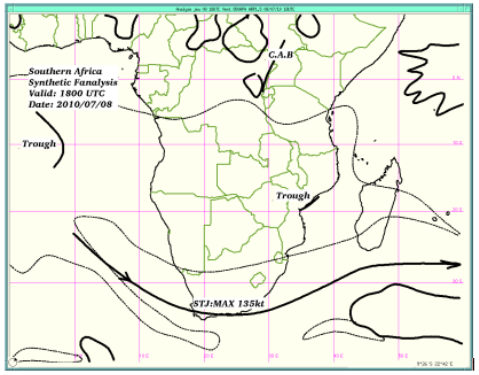
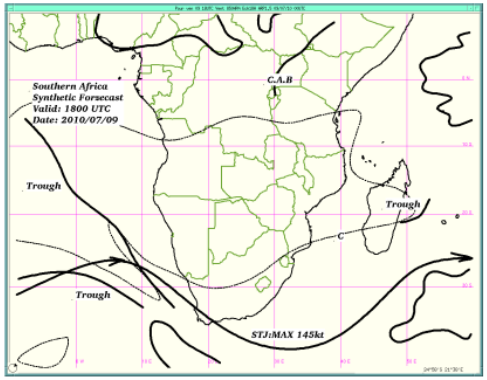


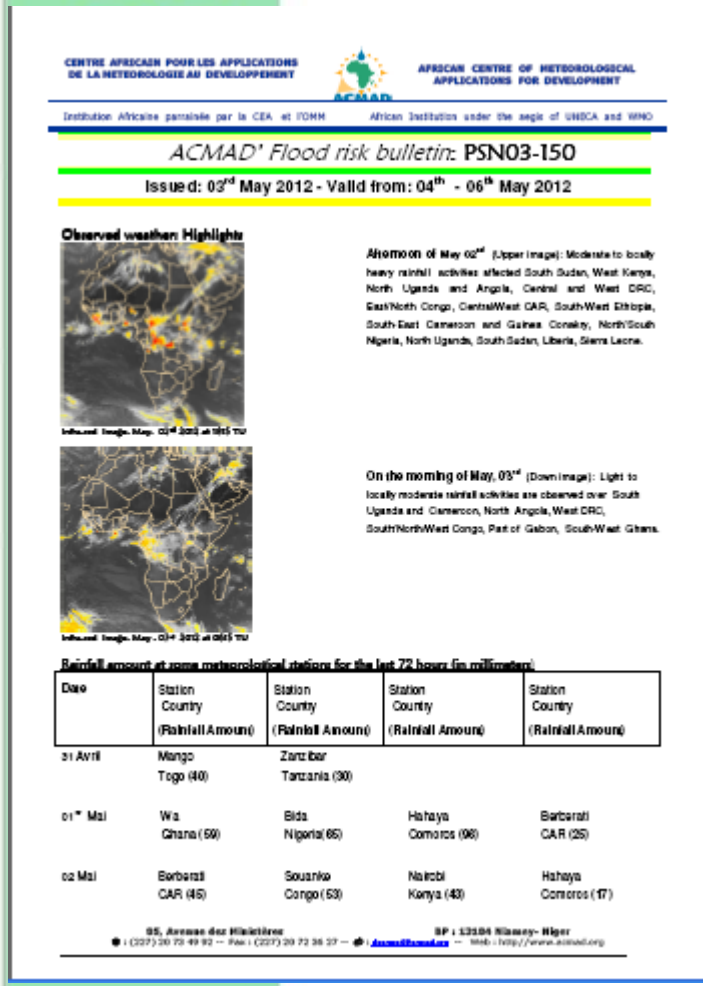
FIGURE 5: SASF VALID 1800Z ON 13/07/2010



- Anticyclone,
- Vortices,
- ITCZ,
- Congo Air Boundary
- Extra-Tropical trough
- Ridge
- Front
- Overcast areas
- Convective areas
- Tropical Cyclone

Technical doc for forecasters, material training

3. Flood Risk Forecasting,



CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT

Institution Africaine parrainée par la CEA et l'OMM — African Institution under the aegis of UNECA and WMO

ACMAD' Flood risk bulletin: PSN03-150

Issued: 03rd May 2012 - Valid from: 04th - 06th May 2012

Observed weather Highlights

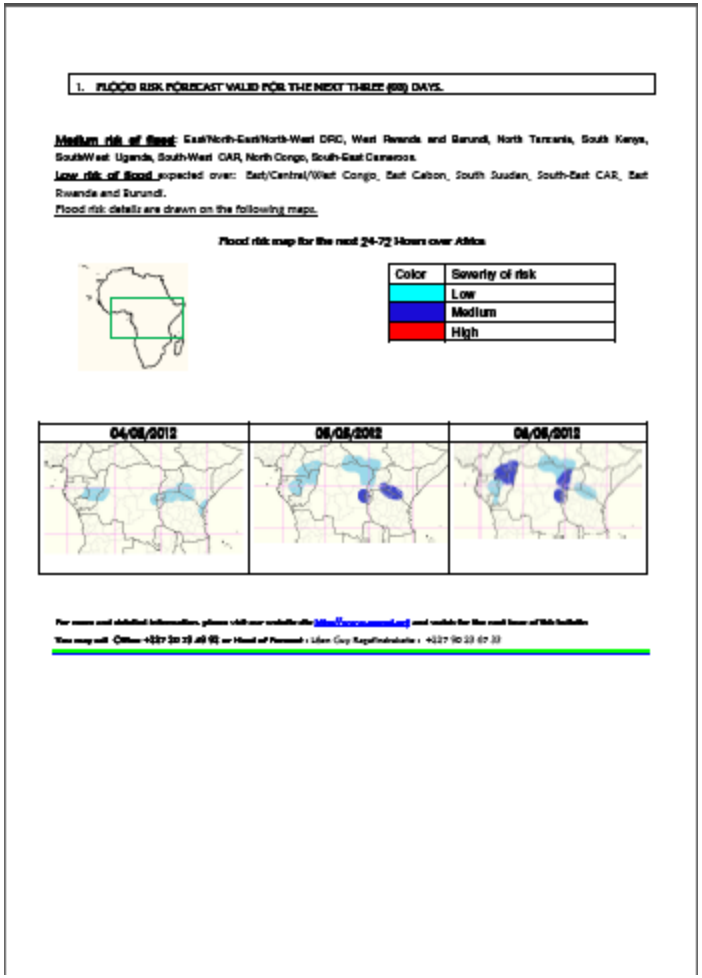
Afternoon of May 02nd (Upper image): Moderate to locally heavy rainfall activities affected South Sudan, West Kenya, North Uganda and Angola, Central and West DRC, East/North Congo, Central/West CAR, South-West Ethiopia, South-East Cameroon and Guinea Conakry, North/South Nigeria, North Uganda, South Sudan, Liberia, Sierra Leone.

On the morning of May, 03rd (Down image): Light to locally moderate rainfall activities are observed over South Uganda and Cameroon, North Angola, West DRC, South/North/West Congo, Part of Gabon, South-West Ghana.

Rainfall amount at some meteorological stations for the last 72 hours (in millimeters)

Date	Station Country (Rainfall Amount)	Station Country (Rainfall Amount)	Station Country (Rainfall Amount)	Station Country (Rainfall Amount)
01 Avril	Mango Togo (40)	Zanzibar Tanzania (30)		
01er Mai	Wa Ghana (59)	Bida Nigeria (65)	Hahaya Comoros (98)	Barbarati CAR (25)
02 Mai	Barbarati CAR (45)	Sounako Congo (53)	Nairobi Kenya (43)	Hahaya Comoros (17)

05, Avenue des Ministères — BP : 13184 Niamey- Niger



1. FLOOD RISK FORECAST VALID FOR THE NEXT THREE (03) DAYS.

Medium risk of flood: East/North-East/North-West DRC, West Rwanda and Burundi, North Tanzania, South Kenya, South/West Uganda, South-West CAR, North Congo, South-East Cameroon.

Low risk of flood expected over: East/Central/West Congo, East Gabon, South Sudan, South-East CAR, East Rwanda and Burundi.

Flood risk details are drawn on the following maps.

Flood risk map for the next 24-72 Hours over Africa

Color	Severity of risk
	Low
	Medium
	High

04/05/2012	05/05/2012	06/05/2012

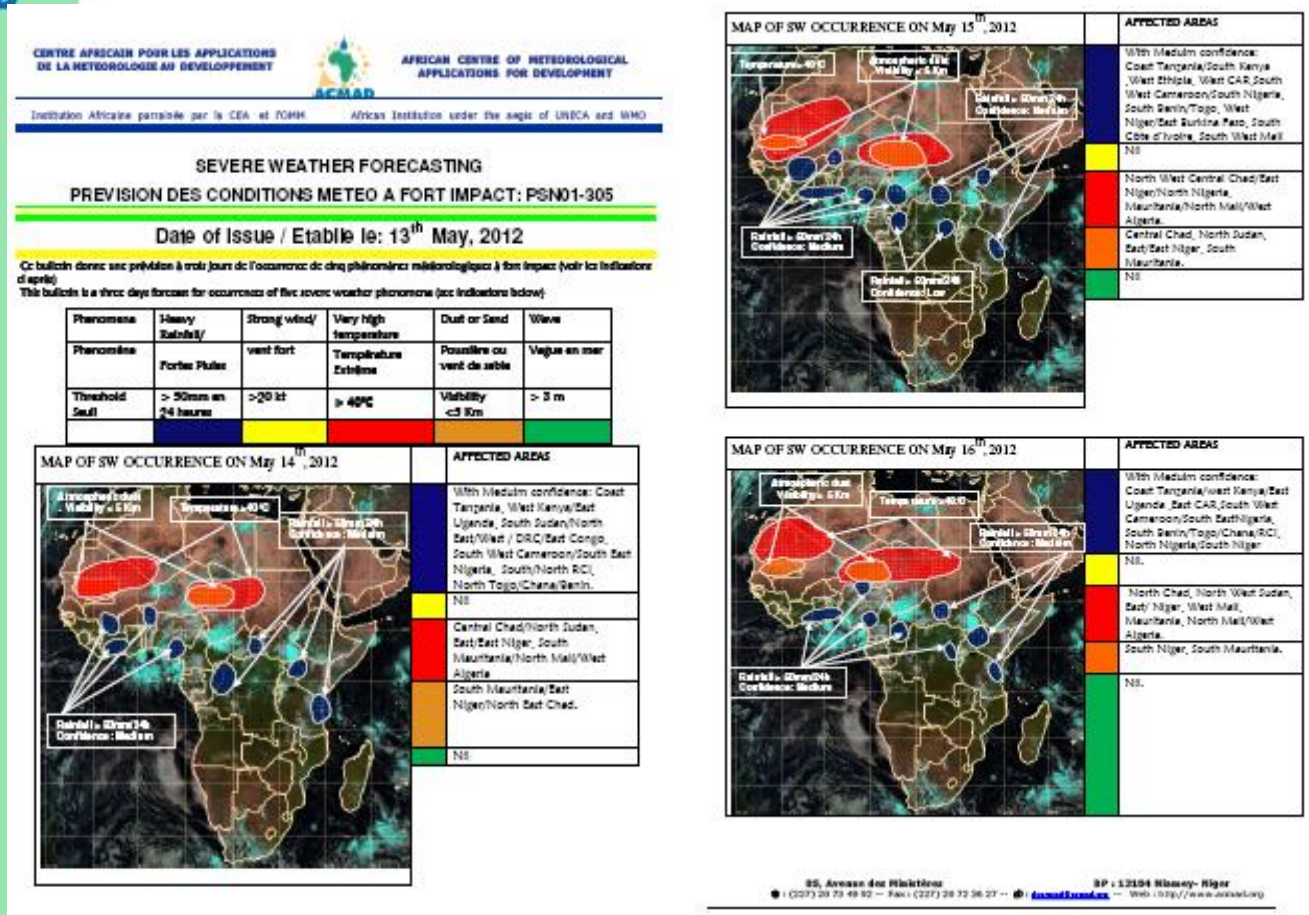
- Forecast of Flood Risk , based on the 3 past days rainfall and 3 next days forecasted .
- Three levels of risk:

  HIGH
  MEDIUM
  LOW

- **T+ 72H**

NMSs, Regional DRR Coord., IFRCC, UNISDR, OCHA, RECS …

4. High Impact Weather Forecatsing



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SEVERE WEATHER FORECASTING

PREVISION DES CONDITIONS METEO A FORT IMPACT: PSN01-305

Date of Issue / Etablie le: 13th May, 2012

Ce bulletin donne une prévision à trois jours de l'occurrence de cinq phénomènes météorologiques à fort impact (voir les indications ci après)

This bulletin is a three days forecast for occurrence of five severe weather phenomena (see indications below)

Phenomena	Heavy Rainfall/	Strong wind/	Very high temperature	Dust or Sand	Wave
Phénomène	Fortes Pluies	vent fort	Température Extrême	Poussière ou vent de sable	Vague en mer
Threshold Seuil	> 50mm en 24 heures	>20 kt	> 40°C	Visibility <5 Km	> 3 m

MAP OF SW OCCURRENCE ON May 14th,2012

AFFECTED AREAS

With Medium confidence: Coast Tanzania, West Kenya/East Uganda, South Sudan/North East/West / DRC/East Congo, South West Cameroon/South East Nigeria, South/North RCI, North Togo/Ghana/Benin.

Nil

Central Chad/North Sudan, East/East Niger, South Mauritania/North Mali/West Algeria

South Mauritania/East Niger/North East Chad.

Nil

MAP OF SW OCCURRENCE ON May 15th,2012

AFFECTED AREAS

With Medium confidence: Coast Tanzania/South Kenya ,West Ethiopia, West CAR,South West Cameroon/South Nigeria, South Benin/Togo, West Niger/East Burkina Faso, South Côte d'Ivoire, South West Mali

Nil

North West Central Chad/East Niger/North Nigeria, Mauritania/North Mali/West Algeria.

Central Chad, North Sudan, East/East Niger, South Mauritania.

Nil

MAP OF SW OCCURRENCE ON May 16th,2012

AFFECTED AREAS

With Medium confidence: Coast Tanzania/west Kenya/East Uganda ,East CAR,South West Cameroon/South EastNigeria, South Benin/Togo/Ghana/RCI, North Nigeria/South Niger

Nil.

North Chad, North West Sudan, East/ Niger, West Mali, Mauritania, North Mali/West Algeria.

South Niger, South Mauritania.

Nil.

05, Avenue des Ministres BP : 12104 Niamey- Niger

- Heavy rainfall
- Extreme T°
- Dust storm
- Strong winds
- Strong waves

T+ 72H

WARNING NMSs, Regional DRR Coord., IFRCC, UNISDR, OCHA, RECS …

5. Weekly rainfall monitoring

AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT

WEEKLY MONITORING AND FORECAST BULLETIN HEAVY RAINS / FLOODING

PSN04-47

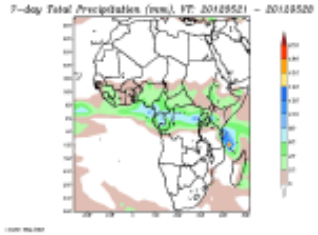
Forecast of 21st May 2012 Valid From 21st May to 28th May 2012

Highlights:

Last week was characterised by moderate to heavy rainfall over: West Madagascar, Part of Comoros, Congo and Gabon, Coast Tanzania, South/West Kenya, East/North/South Uganda, South Ethiopia and Chad, South/East Central African Republic, South-East Nigeria, Nord Democratic Republic of Congo, part of Guinea Gulf Countries, South/West Burkina Faso, and West Mali.

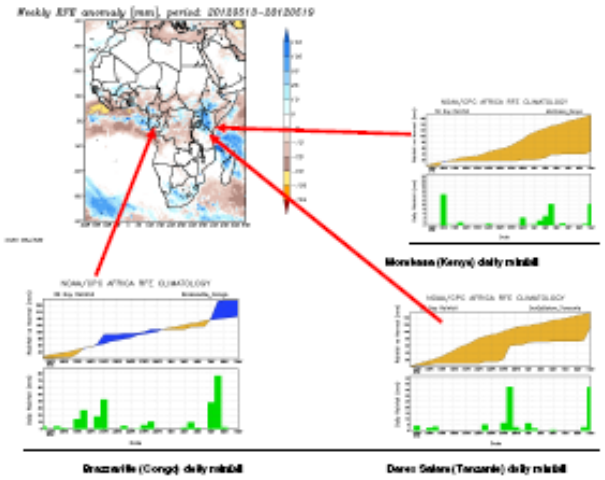
Weekly Outlook

Moderate to heavy rain are expected over: South/West Kenya, Coast Tanzania, East/Central/South Uganda, North/East Democratic Republic of Congo, Part of Gabon, North Congo, South Cameroon and Nigeria.
The light to moderate rain will be affecting: North/South/West Somalia, East Madagascar, East/South/West Sudan and Ethiopia, Coast Kenya, North Tanzania, Part of Uganda, Cameroon, Congo, Nigeria, Sierra Leone, Liberia, Guinea Conakry and Central African Republic, Guinea Gulf Countries, Great Lake Countries, West Mali, South-East Senegal, South Niger and Chad.
See the map below:



1

RECENT RAINFALL EVOLUTION AT SELECTED STATIONS



RAINFALL PATTERNS FOR LAST 30 DAYS

Comments:

During the last 30 days, above normal rainfall was observed over: East/North/West Madagascar, Part of Democratic Republic of Congo, Liberia, Sierra Leone, Somalia, Uganda, Congo, Coast/North Tanzania, Coast/South/West Kenya, South Sudan and Chad, Great Lake Countries, South Cameroon, East/South/West Central African Republic, South/West Central Burkina Faso, North Guinea Gulf Countries, West Mali, East/North/Central/South Guinea Conakry, South-East Senegal.

However rainfall deficits were recorded over: South Guinea Gulf Countries, North Angola, South Democratic Republic of Congo, North Central African Republic, East/Central/South Nigeria, Central/West/North Cameroon.

3

- Significant Rainfall over the past dekad.
  - amount
  - tercile of the dekad
  - climatological mean
  - seasonal cumulative
  - tercile of the seasonal cumulative
  - comparison current year vs past year & climatological mean
- Rainfall Outlook for the next dekad

NMSs, Regional DRR Coord., IFRCC, UNISDR, OCHA, RECS …

On the Job Training (04 months) and attachment (06 months)

. ON the JOB TRAINING: NMSs capacity bulding: operational framework that will enable trainnees to master forecasting techniques, methodologies and tools practiced at ACMAD.

. attachment: Support from NMS for ACMAD's capacity strengthening

OUTLINE

- Data Rescue and Management
- Climate Monitoring
- Long Range Forecasting and climate outlooks
- Climate scenarios for Impacts studies

CLIMATE MONITORING

- Training on production of maps, plots for climate monitoring;
- Training for interpretation on maps and plots to produce bulletins, reports and statements;
- Production of 10 day and monthly bulletins including seasonal monitoring products,
- Statements for the WMO and AMS statements on the global climate
- Climate and health including vigilance maps

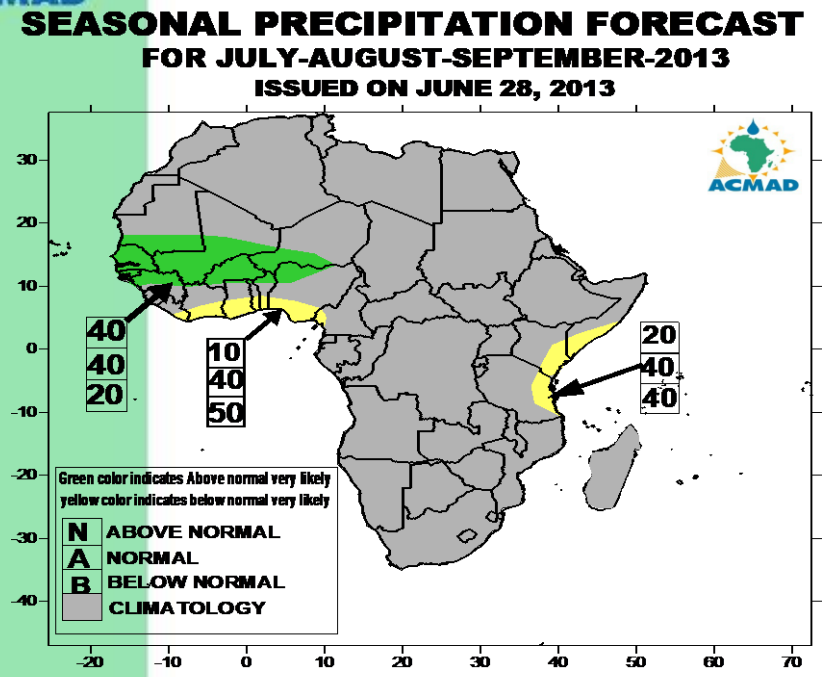
LONG RANGE FORECASTING AND CLIMATE OUTLOOKS

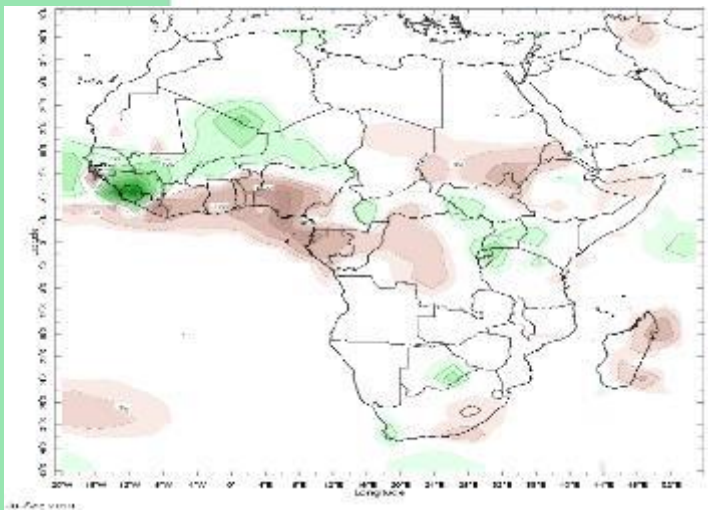
- Training on long Range forecasting
- Production of Long Range forecast and outlook products and bulletins
- Verification of forecasts
- Dissemination via web and emails

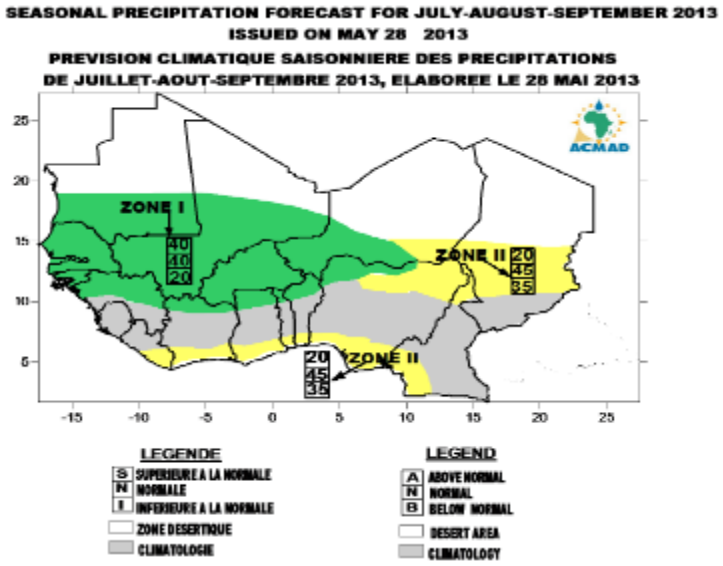
CLIMATE SCENARIOS FOR IMPACT STUDIES

- Need to install regional climate models
- Collect , process and interpret global and regional climate projections
- Produce and publish statements on climate scenarios
- Support African negotiators and ACPC with climate change information

SAMPLE PRODUCTS







SAMPLE PRODUCTS

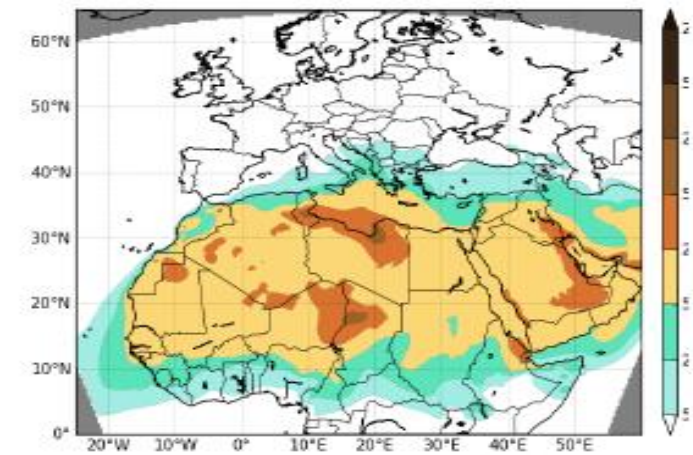


Figure 3 : Dust surface Concentration (µg/m^3) 8th to 14th April 2013

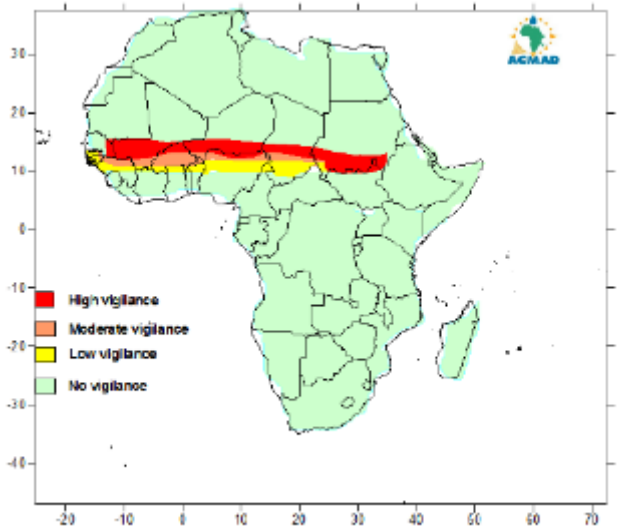


Figure 5: Vigilance map emergence of meningitis in Africa

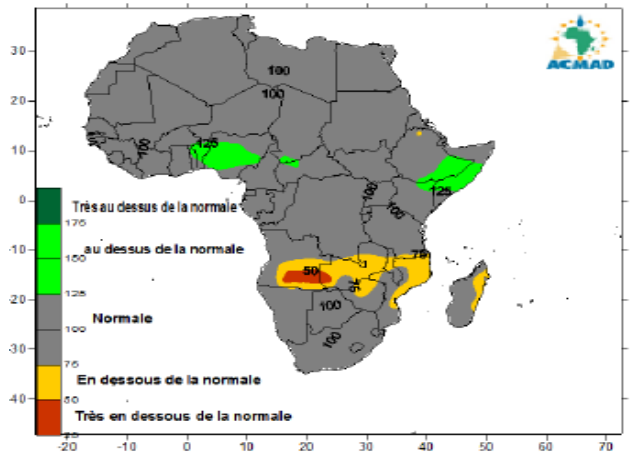
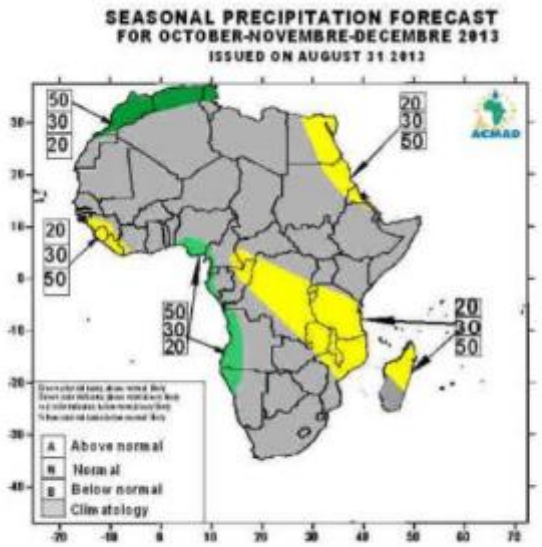
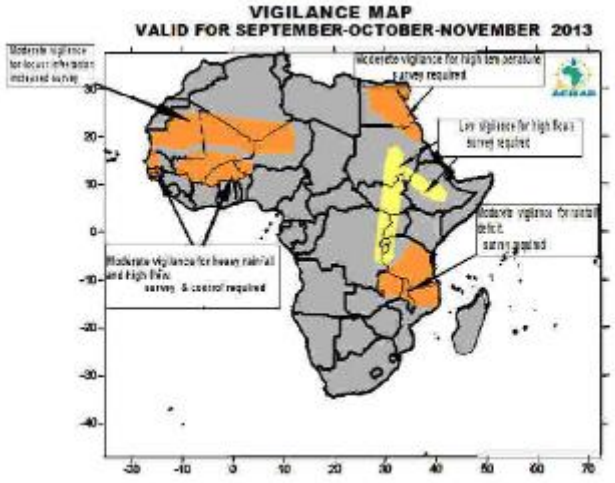
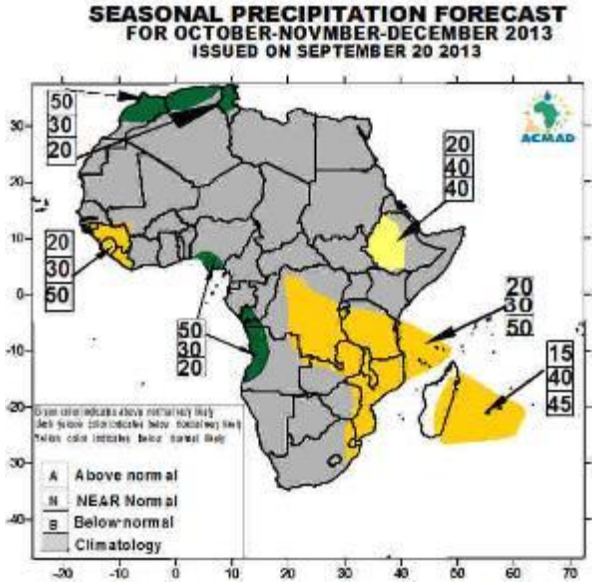


Figure 7b : Précipitations saisonnières (%) MAM 2013
(Source : NOAA/NCEP)

SAMPLE PRODUCTS







Part 1
ACMAD data collection and management system

Data collection and Management tools-1

- Data Sources : Antenne EUMETCAST,

RETIM sur EUMETCAST,Internet, Archives

- Processing: SYNERGIEServers, MESSIR COMM Puma PC2, specialized applications
- display: Client Synergie, Messir Vision

Data collection and Management tools -2

- ACMAD -AMESD – Integrated system
- Archiving tools-and intranet facilities
- Network management and security software
- Internet Access at 2Mb/s by Optic Fiber
- Energy back up system.
- WiFi facility

Part 2
Dissemination services of ACMAD's products

www.acmad.org

ACMAD

OMM

Homepage

- About African RCC
- Long Range Forecasting
- Climate Monitoring
- Climate Data Service
- Training and Capacity Building
- Research and Development
- Climate Prediction and Projection (beyond 2 years)
- Non operational Data services
- Coordination
- Documents
- Meetings
- Partners
- African RCC Evaluation

Welcome to the African Regional Climate Centre

WMO Regional Association I Pilot African Regional Climate Centre (WMO RA I Pilot African RCC).

High impact and/or extreme climate events (e .g droughts , floods) usually occur in many countries of a given region at the same time making it difficult for any individual nation to better estimate their effects based on information from that nation alone. WMO has defined a 3 level meteorological infrastructure at global, regional and national levels to address his member's needs for climate services with:

Read More

Benin, Nigeria, Mali , Togo , Gambia, Ghana , Senegal , Sierra Leone ,
Côte d'Ivoire, Cape verde, Mali, burkina Faso, Guinea-Bissau , Tunisia
Sud Soudan, Angola ,Burundi ,Cameroon, Central African Republic
Sudan, Gabon, Liberia, São Tomé and Principe, Libya, Algeria, Chad
Egypt ,Congo RDC,Niger , Equatorial Guinea, Guinea, Mauritania
Marocco, Rwanda ,Swaziland ,Burundi ,Comoros, Djibouti , Kenya
Eritrea, Ethiopia, Madagascar ,Malawi , Mauritius , Mozambique
Seychelles ,Somalia , Tanzania, Uganda, Zambia ,Zimbabwe
Botswana, Lesotho ,South Africa , Namibia

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Reduction

- Climate Change Assessment Service: *The objective is to inform decision makers to formulate appropriate strategies for climate change adaptation to build climate resilient societies and economies*
- Drought Service and Seasonal Climate Forecast: *The objective of the drought service and seasonal climate forecast is to support strategic planning ahead-of-season (1- month to 3-months outlook) both through assessing seasonal and intra-seasonal variabilities and to forecast the probability of drought events*

Example Product: ASCAT AHRPT - Metop

The prime objective of the Advanced SCATterometer (ASCAT) is to measure wind speed and direction over the oceans, and the main operational application is the assimilation of ocean winds in NWP models. Other operational applications, base on the use of measurements of the backscattering coefficient, are sea ice edge detection and monitoring, monitoring sea ice, snow cover, soil moisture and land surface parameters

RANET

Following the evolution of the RANET technology, and having experienced a limitation with the problem that affected the continental broadcast of the RANET system with Worldspace technology, it is very urgent and necessary to identify a system that will replace and or substitute the missing component of the original RANET system.

RANET – cont'd

In some regions, some services provided by the continental broadcast have been addressed by the use of Internet technology offered by the Mobile telephone companies' infrastructure installed in many villages of those regions.

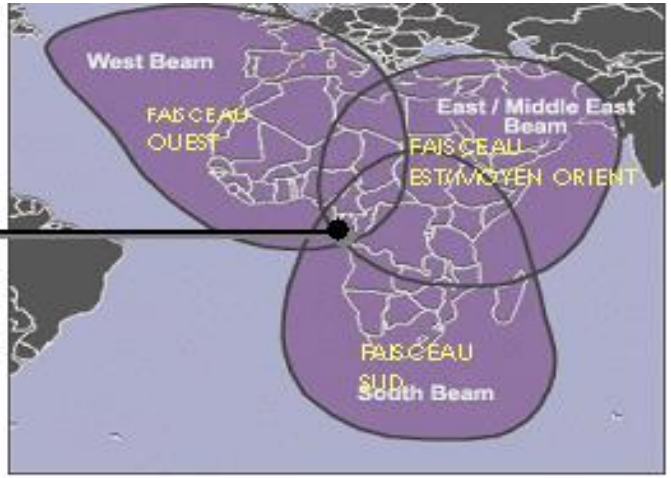
New RANET Technologies

After the collapse of WorldSpace system used for RANET, new technologies had to be identified

- Cellular Network Coverage (carrier of messages)
- GPRS Modems (Internet and short messages)
- Computer Servers (weather SMS)
- Automatic Weather Station (local weather data)
- Website (climate information and data)
- Climate information (scientific and indigenous)
- Community Radio Stations

RANET : SCHEMA GENERAL

3 - SATELLITE AfriStar™



2 - STATION MONTANTE

4 - AU « C I D* » : TELECHARGEMENT ADAPTATION - RADIODIFFUSION FM et RETOUR (e-mail)

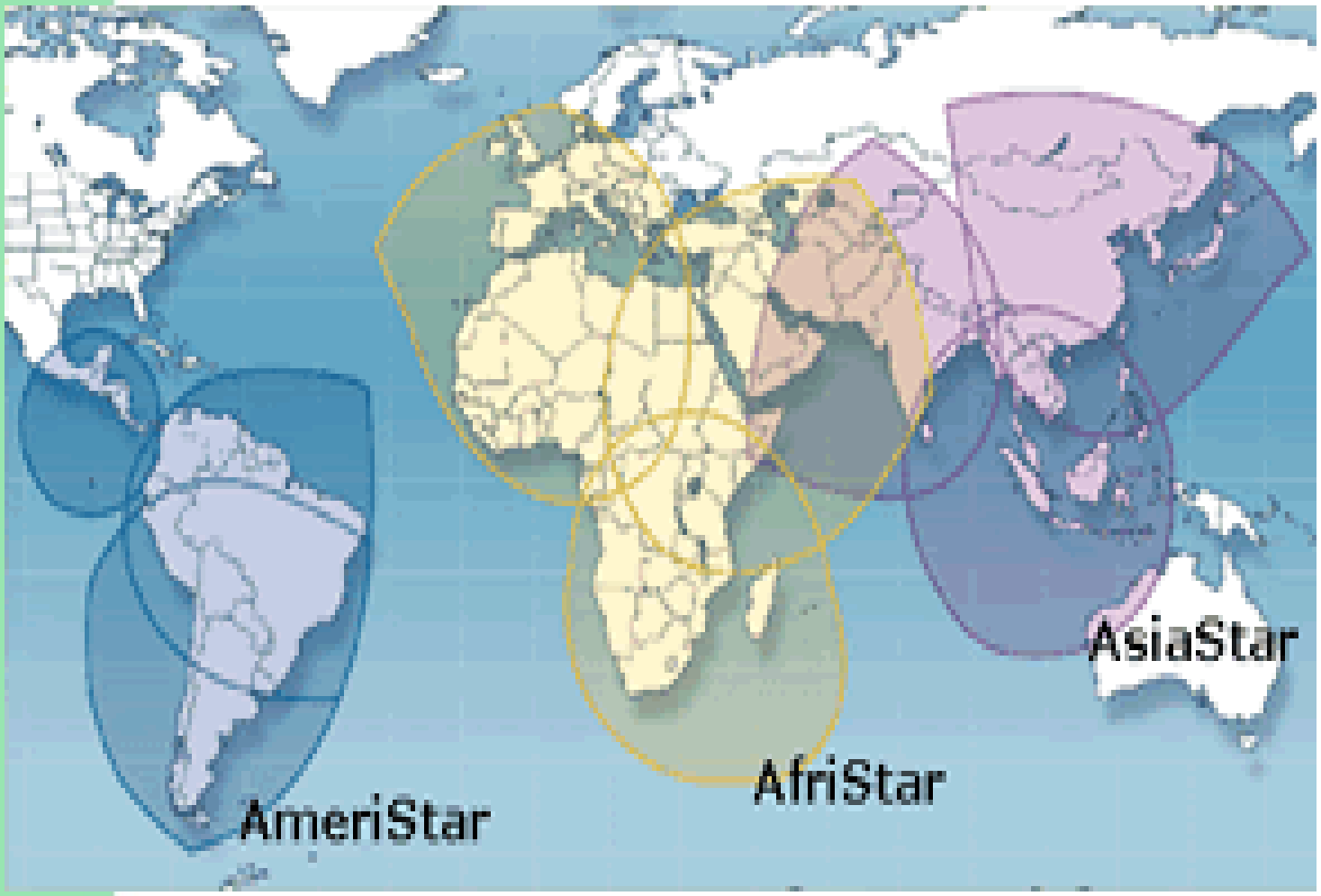
1 - SERVEUR

WEB

5 - RADIOS SOLAIRES et à MANIVELLE

* CID : Centre Communautaire Intégré d'Information pour le Développement Durable

Diffusion Continentale (Satellite Worldspace)



RALT (Ranet Africa Leadership Team) Work group on:

"GEONETCAST technology and possibilities to equip some African countries based on priorities"

Purpose of RALT

1. Facilitate and develop RANET programs and activities throughout Africa.
2. Mobilize necessary resources for regional and country activities.
3. Serve as a focal point for regional and international partnerships and communication.
4. Provide training and facilitate exchanges of experience.
5. Oversee, monitor, and develop regional scale networks common to country programs.
6. Develop appropriate regional institutional infrastructure

Exploring other possibilities… necessary actions…

With the aim of RANET to avail vital information at low cost to remote areas, within optimum period of time, there is need to explore other possibilities towards nonprofit organizations.

That is why, looking at the large number of installed EUMETCAST stations in many regions of Africa, and the technology used, it appear very reasonable to look at that technology and couple it with RANET initiative to complete the transmission chain.

That should naturally reduce installation maintenance and training cost for the RANET actors.

Key Challenges

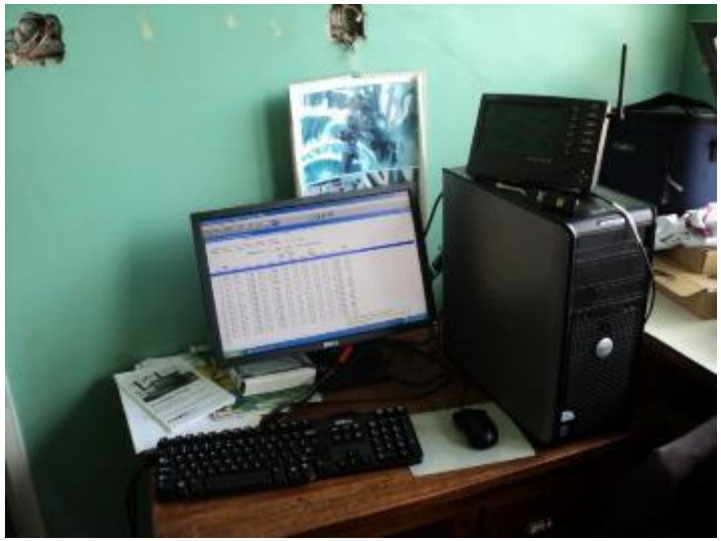
- Lack of staff: uses part-time staff for CC issues
- Internet bandwidth still needs to be improved
- Limited access to projections: Need to have coordinated modeling on Africa
- Feedback from users in a structured way

Gaps

- One way dissemination, ACMAD cannot send data or products through GeonetCast

- eLibrary to best serve countries

- Structure to engage users to ensure demand-driven products



Two way flow of climate information between farmers and Meteorological Services

These collaborate in improving community food security, livelihoods, agriculture, early warning services

Potential Roles

Have established network of farmers

Have community offices to host RANET activities

Provide computer facilities in the villages

Have personnel to distribute information among farmers

Provide funds to purchase RANET technologies and installations

Provide funds to train farmers, pay for radio airtime

Provide feed back on the system

Recommendations

- Products must be integrated to generate tailor-measured information
- Explore using GEONETCast for RANET?
- Activate RANET for demonstration and get feedback
- Translate RANET content and products in at least English and French

Recommendations - Annex

Working group report with following recommendations:

- Establish PUMA 2010/e-station synoptic representation in Africa, with the operation status of each of them.
- Establish network of the Administrators of those stations.
- Activate RANET1 for demonstration and get hints to view content.
- Translate RANET content and products in at least 2 official languages (English and French)…
- Integrate RANET component in All EUMECAST training sessions over all regions of Africa.
- Support and encourage expert group (such as RALT) meeting and experience sharing.

Opportunities

- Create regional datasets (can be used in NAPS)
- Establish mechanism where NMHSs transfer data to Regional Centres
- Establish mechanism where Regional Centres transfer data to ACMAD?
- Establish continental Knowledge Management platform

Thank you for your attention