



Africa Multi-Hazard Early Warning and Early Action System

Role & Function of Continental Multi-Hazard Advisory Centre at ACMAD



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Niamey-Niger May 07, 2024

Outline

- ❖ **Brief presentation of ACMAD**
- ❖ **Value Chain to support the early warning**
- ❖ **Products and services for Early warning for Floods, Drought, Meningitis etc...**
- ❖ **Co-Production for anticipatory action**
- ❖ **Effective communication**
- ❖ **Conclusion**



Brief presentation of ACMAD

Who are we?

Created through resolution 540 of the UNECA Conference of Ministers in April 1985 following the droughts of the 70s and 80s, ACMAD is established in Niamey-Niger since October 1992 with mandate

Continental Weather and Climate Watch Centre

Institution of excellence for the Applications of meteorology for sustainable development

WMO Designated Regional Climate Centre for Africa since May 2015

Continental Multi Hazards Advisory Centre for Africa inaugurated in October 2022 as part of the Institutional Infrastructure of the African Union Multihazards Early Warning and Early Action System (AMHEWAS)

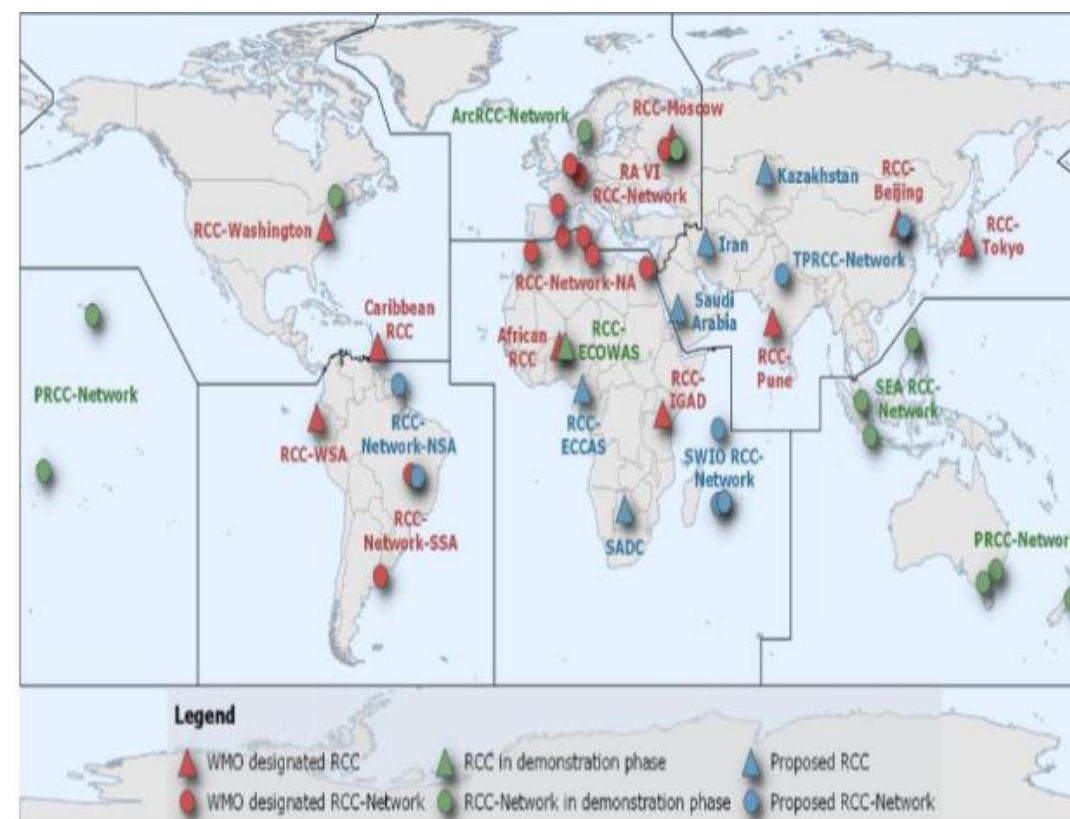


Figure 5: Established Regional Climate Centres

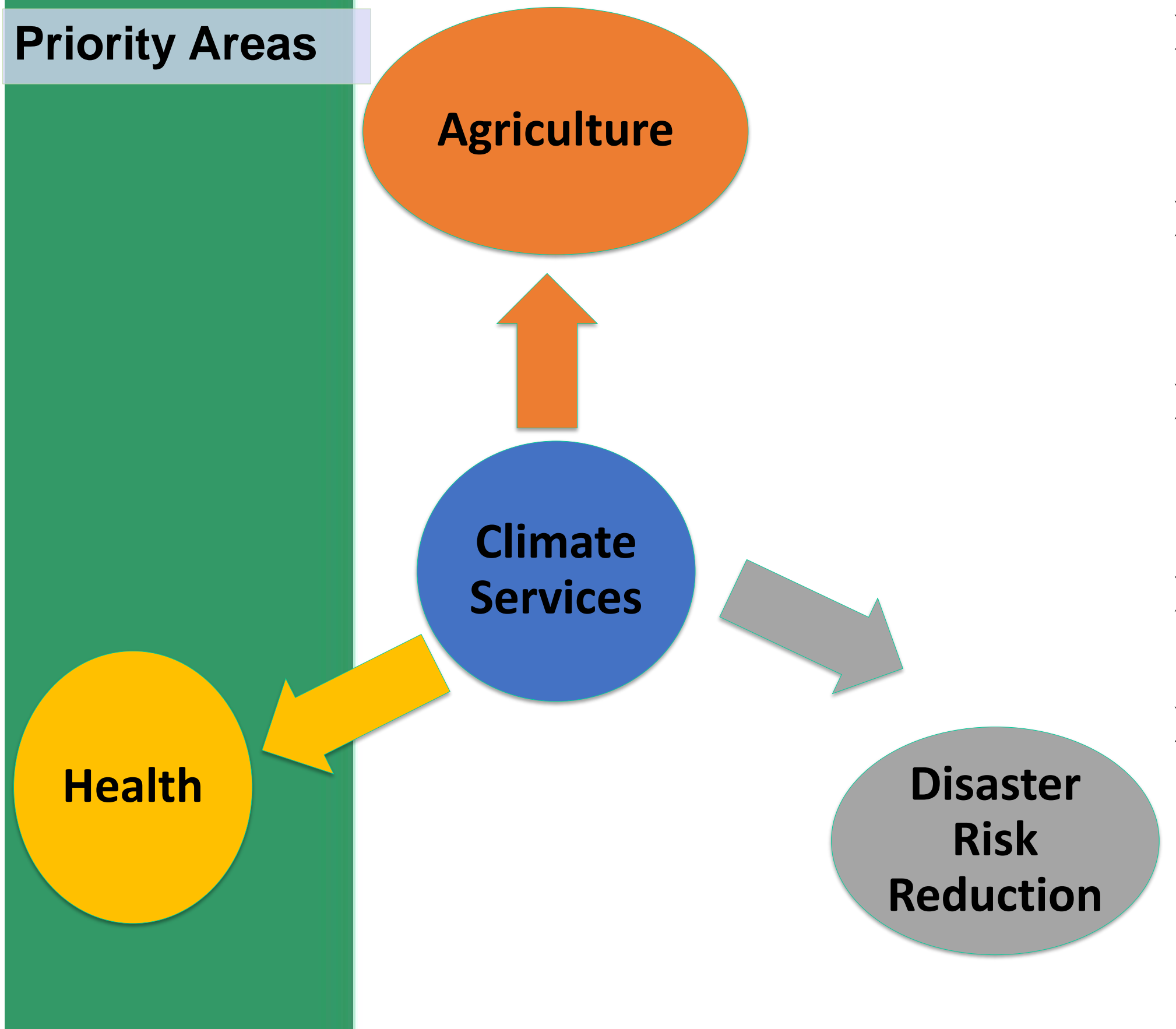
(WMO, 2022)



Brief on ACMAD Mission (2/2)

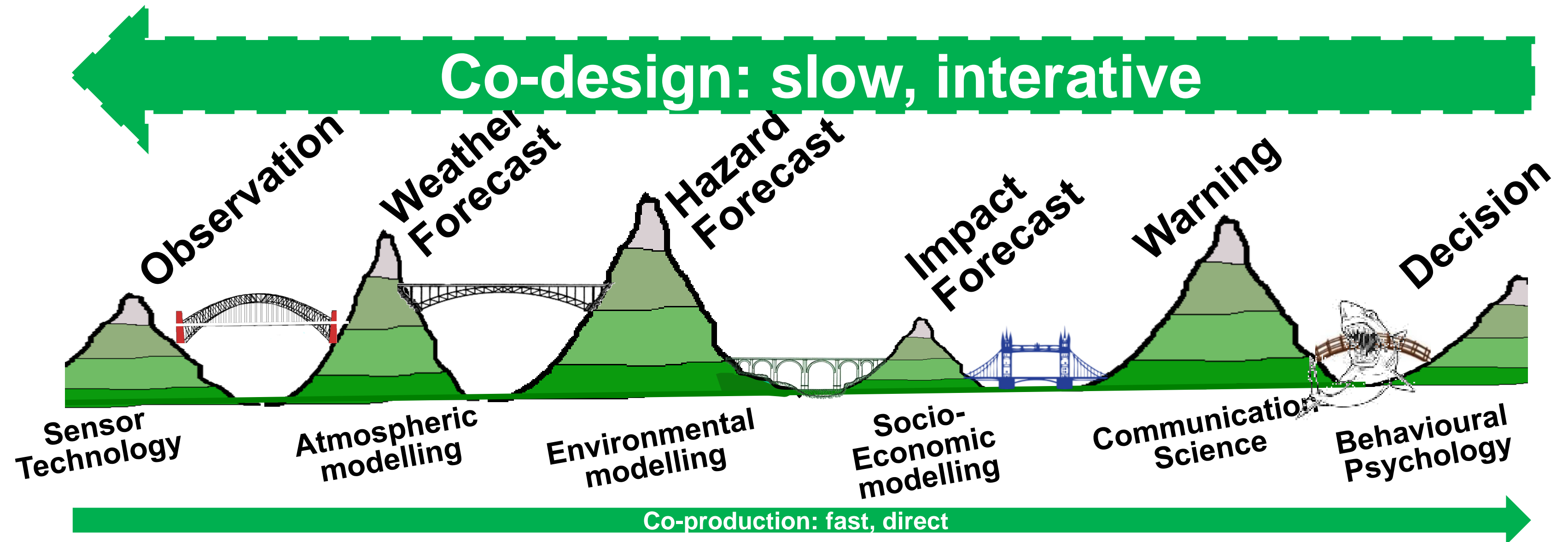
What do we do?

Priority Areas



- **Monitoring, forecasting and early warning for extreme events**
- **Contribute to the disasters situation Report and Continental watch in the framework of AMHEWAS**
- **Build capacities for its Member State's National Meteorological and Hydrological Services (NMHSs)**
- **Research and transfer of technology**
- **Vision: An African continent where all nations are benefit from a world class operational continental meteorological centre to become resilient on extreme events and empowered to support the sustainable development with better meteorological service.**

Value Chain to support the early warning

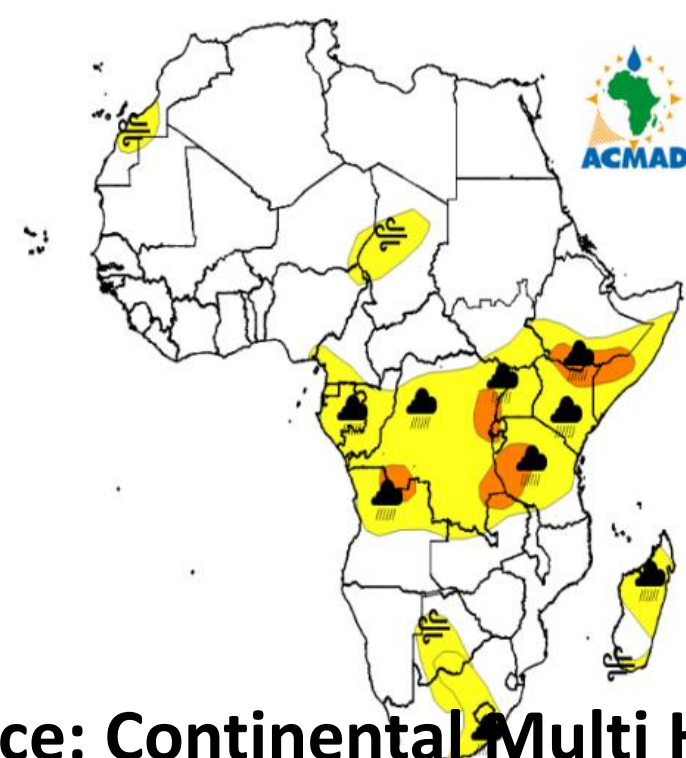
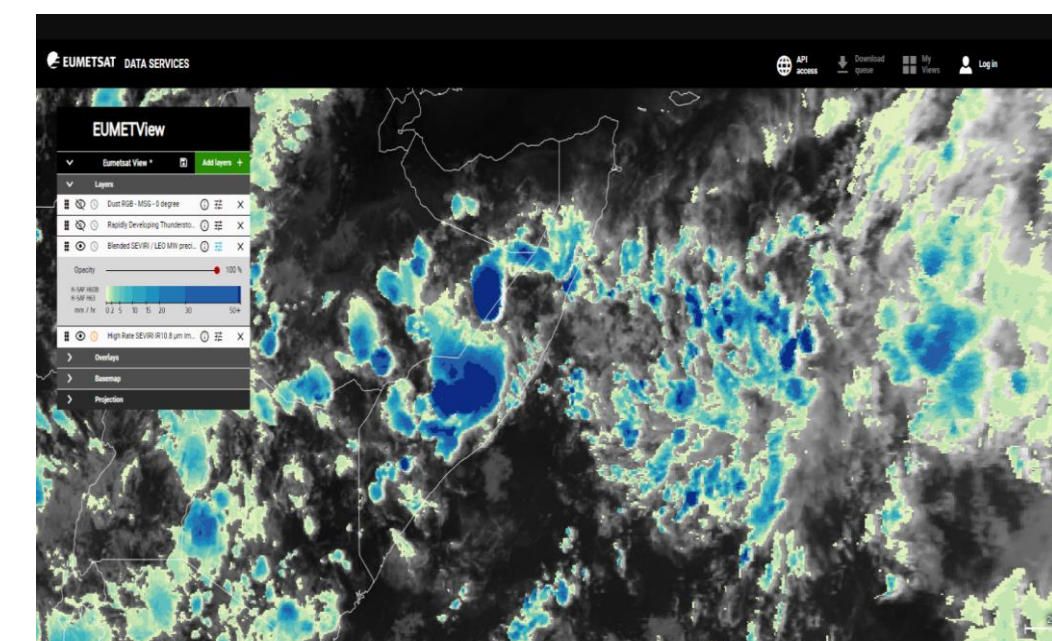
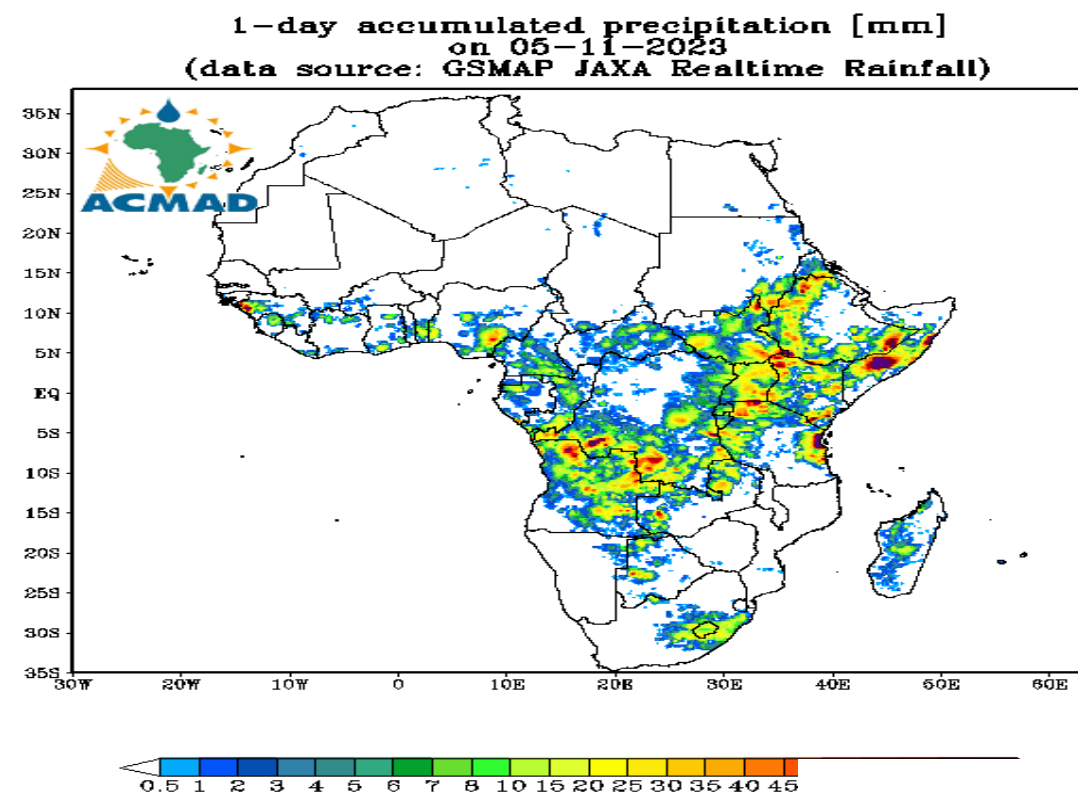
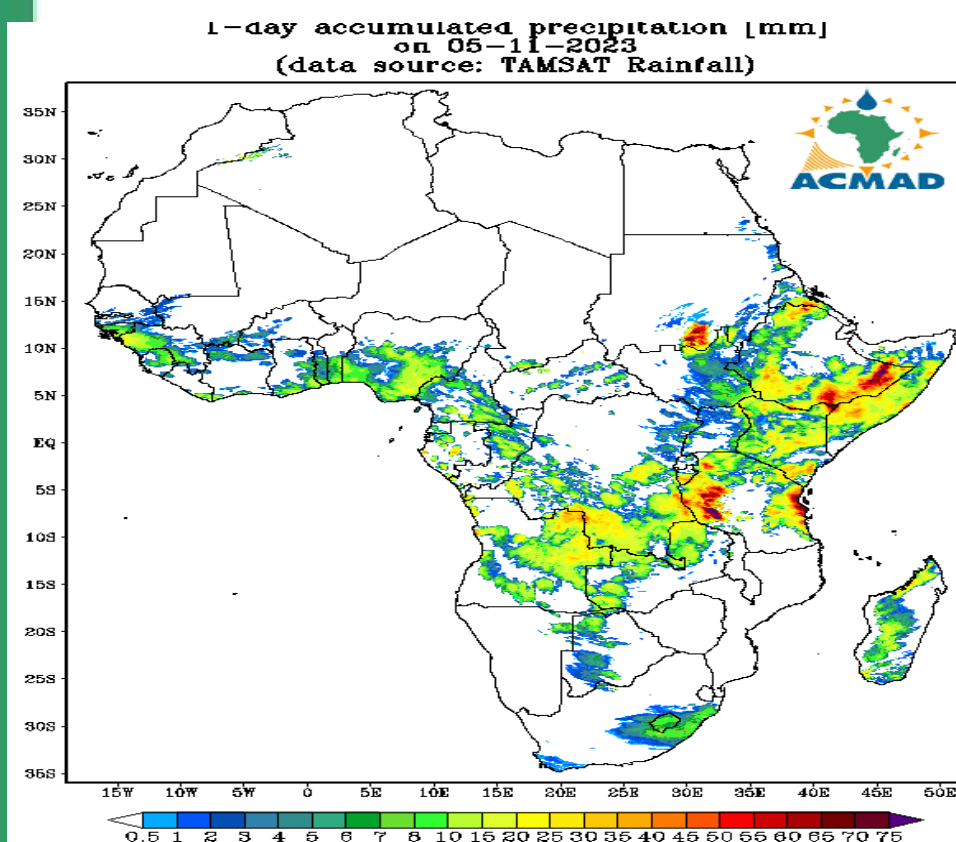


Bridges represent necessary Partnership
Mountains are needed expertise to operate warnings



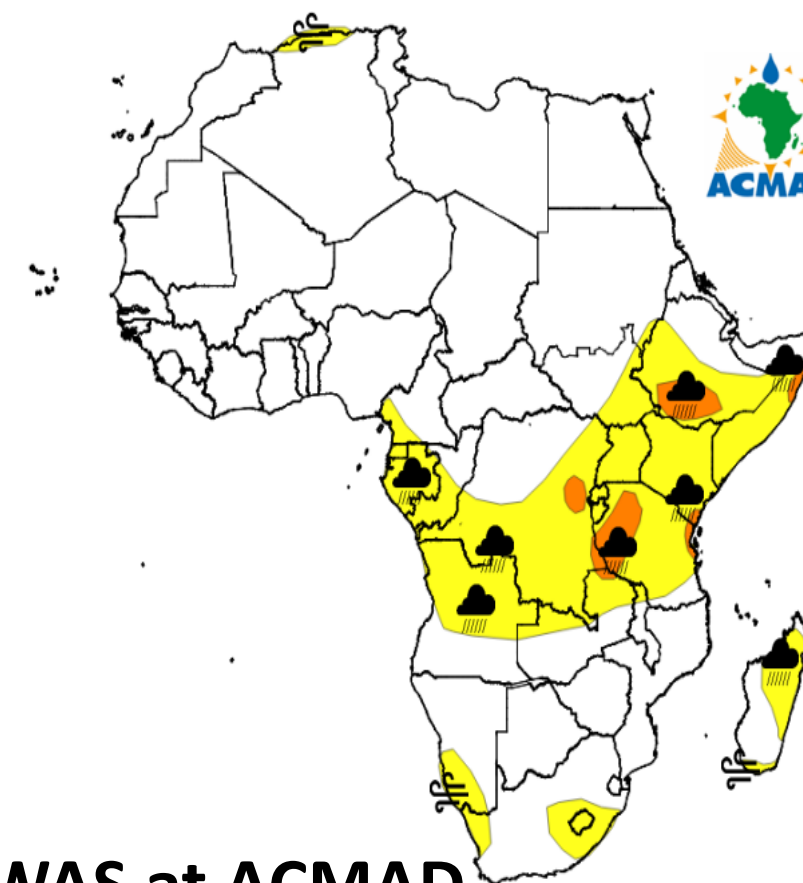
Early warning Information for floods Case of Somalia

Advisories 3 to 4 days ahead of Somali floods November 5, 2023. Moving along the value chain to impact outlook, warnings, anticipatory decision and action implementation is still a challenge. Ad hoc briefings with DRR and humanitarian actors is a requirement



MULTI-HAZARD OUTLOOK
Validity: 2023-11-06
issued on 2023-11-02

Rain	Wind	Dust	Meningitis
Very heavy >100mm	Very strong >80kmh ⁻¹	Very heavy >1000µg m ⁻³	Very likely
Heavy 50-100mm	Strong >65kmh ⁻¹	Heavy >600µg m ⁻³	Likely
Moderate 10 - 49mm	Moderate >50kmh ⁻¹	Moderate >400µg m ⁻³	Less likely
Light 1 - 10mm	Light <50kmh ⁻¹	Light <200µg m ⁻³	



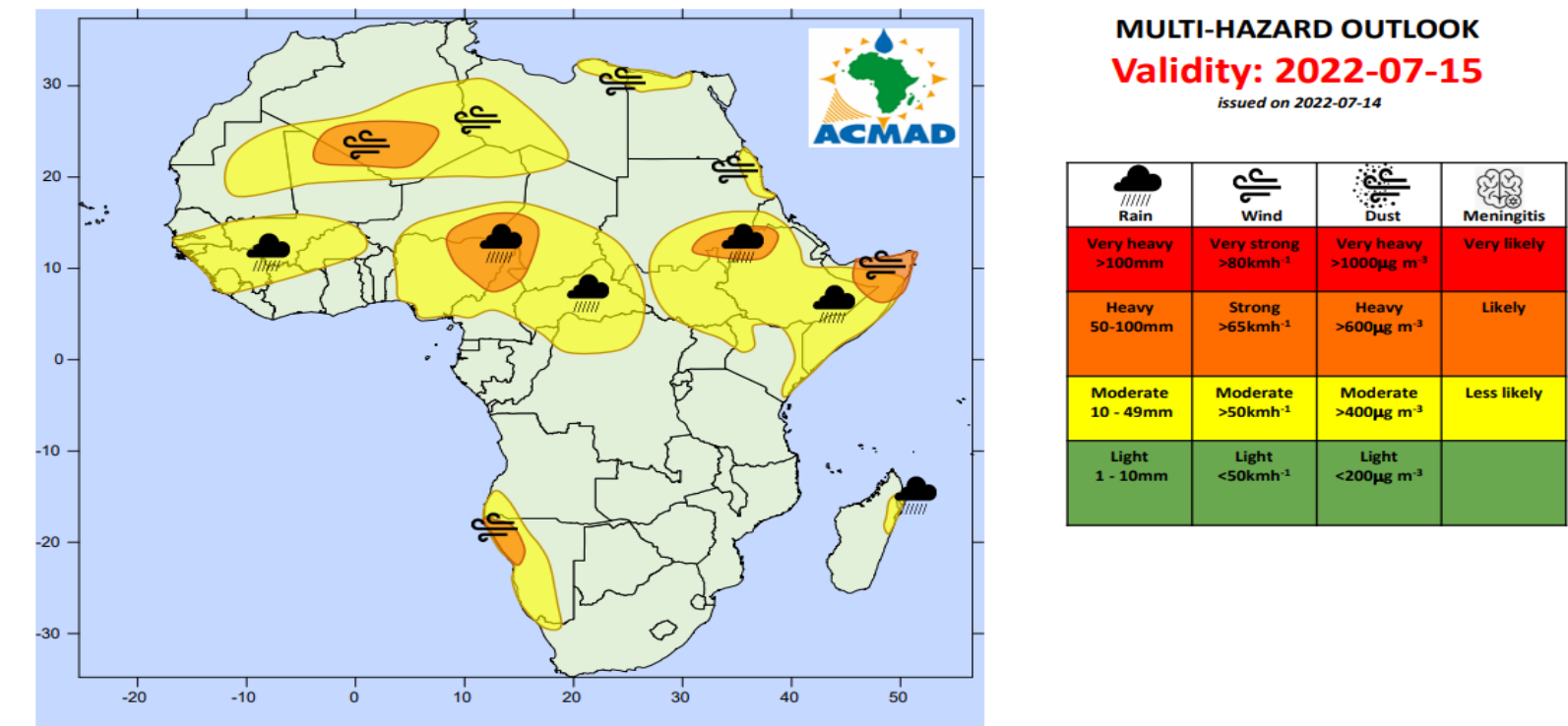
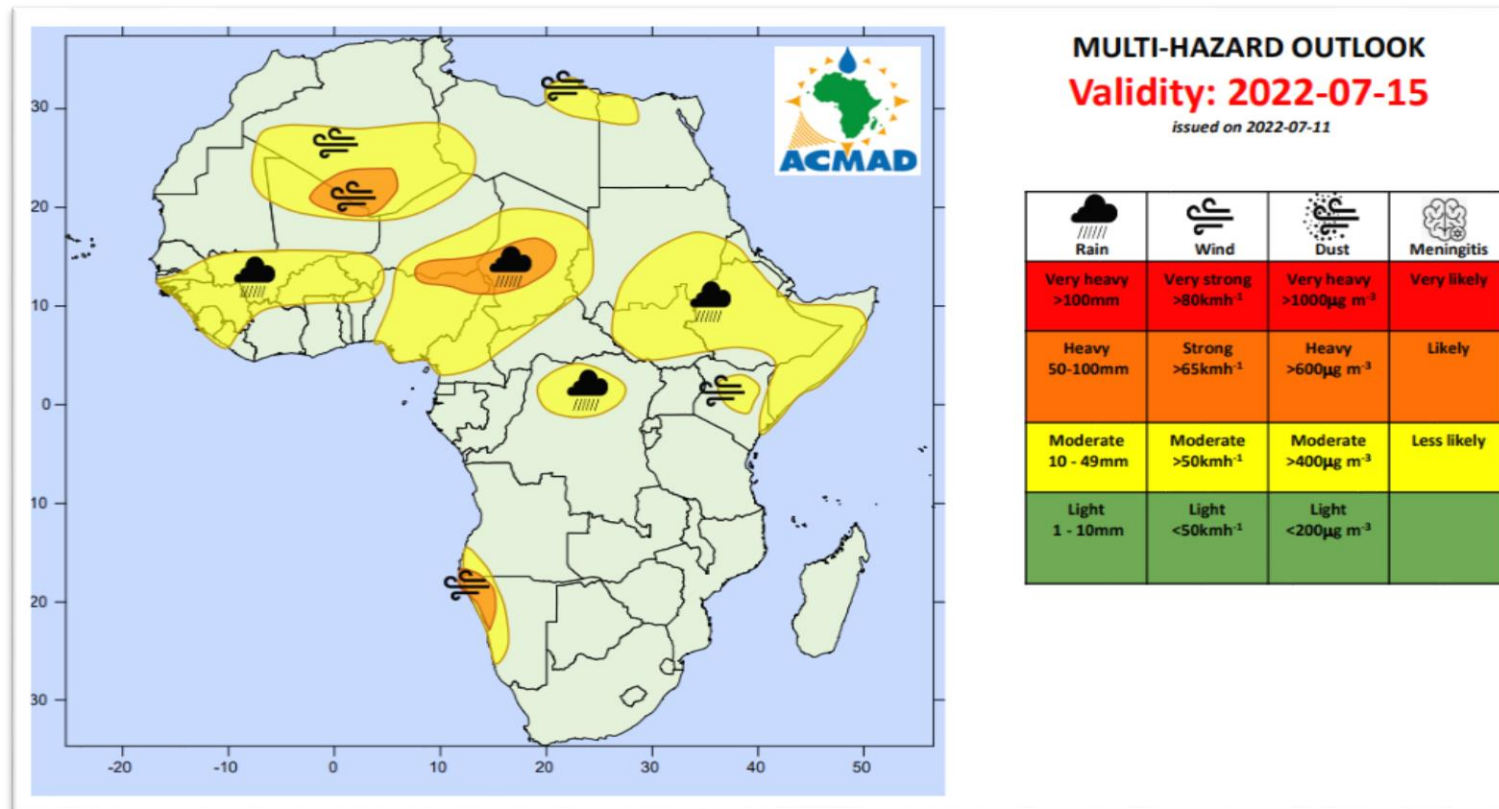
MULTI-HAZARD OUTLOOK
Validity: 2023-11-05
issued on 2023-11-02

Rain	Wind	Dust	Meningitis
Very heavy >100mm	Very strong >80kmh ⁻¹	Very heavy >1000µg m ⁻³	Very likely
Heavy 50-100mm	Strong >65kmh ⁻¹	Heavy >600µg m ⁻³	Likely
Moderate 10 - 49mm	Moderate >50kmh ⁻¹	Moderate >400µg m ⁻³	Less likely
Light 1 - 10mm	Light <50kmh ⁻¹	Light <200µg m ⁻³	

Source: Continental Multi Hazard Advisory Centre of AMHEWAS at ACMAD

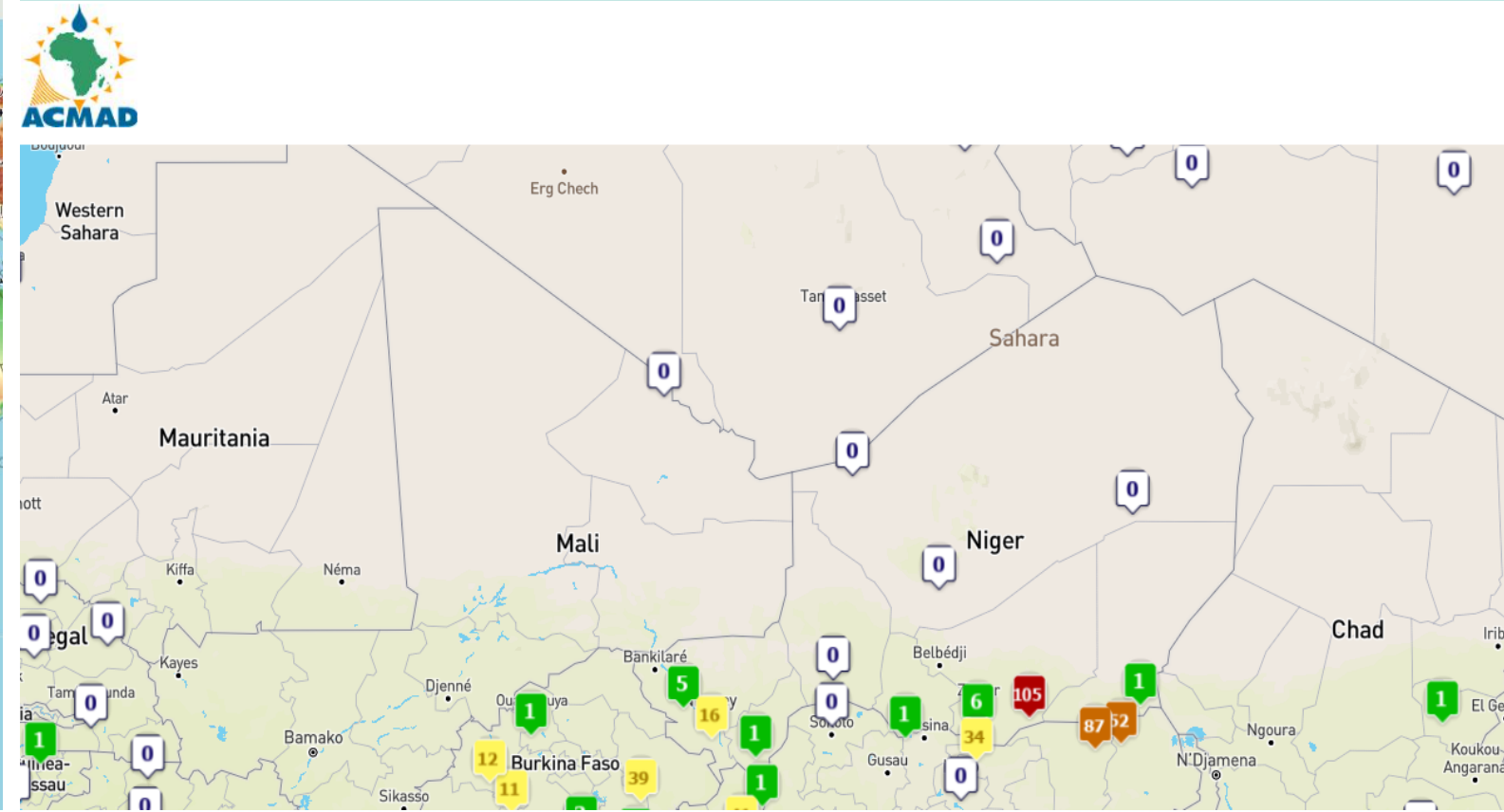
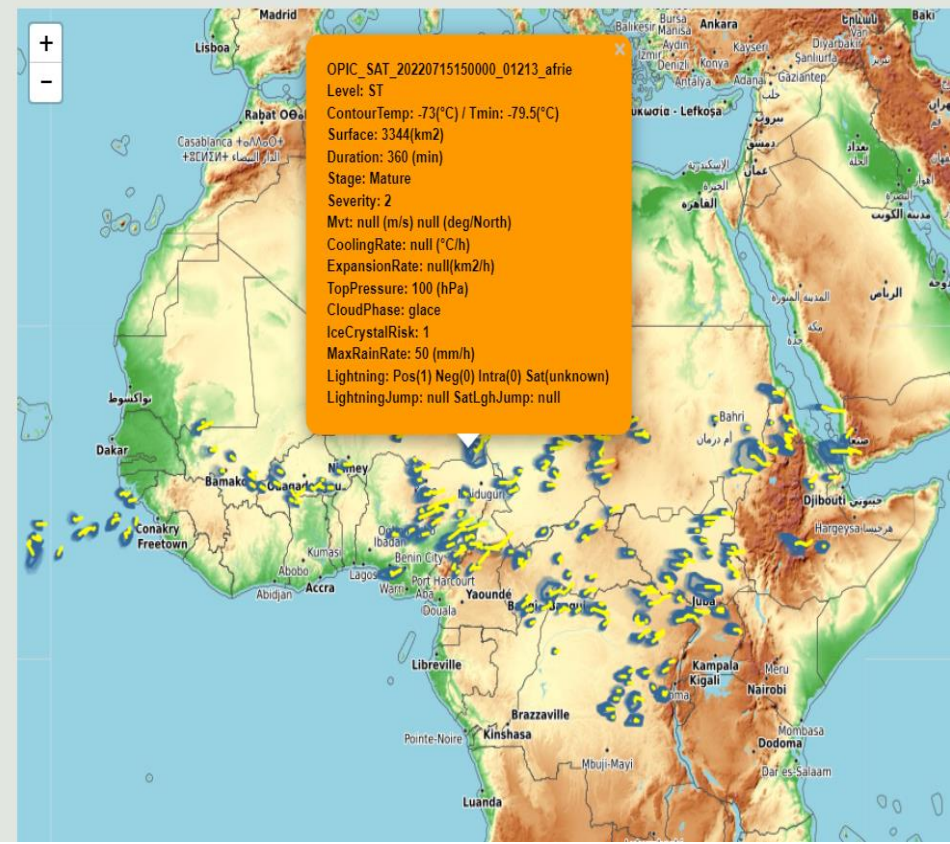
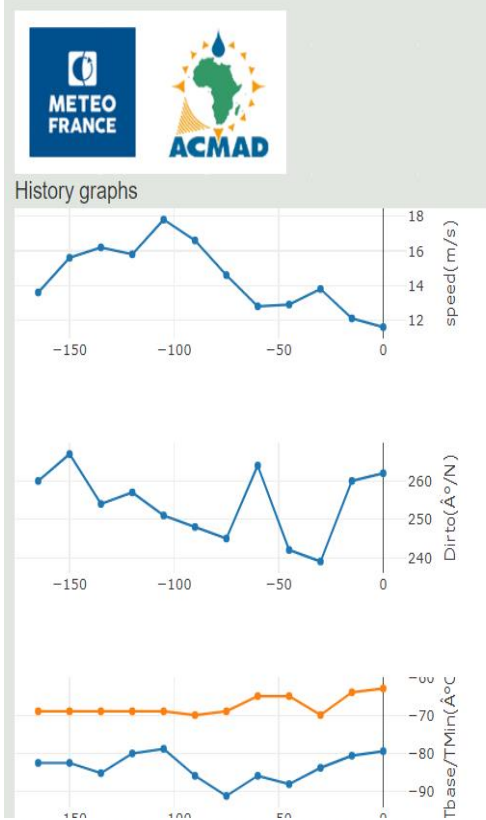


The first Heavy rain event leading to floods during summer monsoon of 2022 in Niger .
 Vigilance product anticipated this hazard 4 days ahead (on Jul 11 2022) . Rapid Developing
 Thunderstorms product from EUMETSAT Data and Processing System by Meteo-France
 (major Global ACMAD Partners).



Observed daily rainfall (mm) on: 16-juliet-2022

MSG 2022-07-15T15:00:00Z : RDT-CW_v515_



Early warning Information for Drought



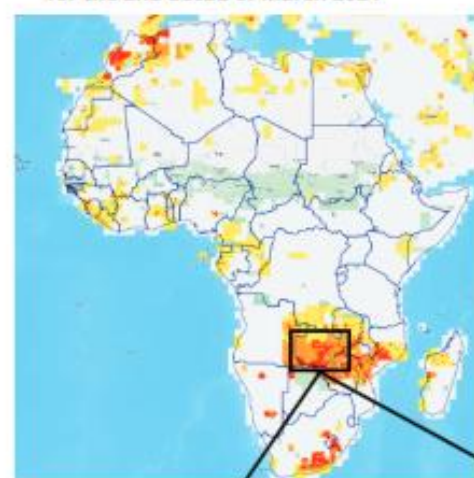
PART OF NORWEGIAN REFUGEE COUNCIL



Copernicus Europe's eyes on Earth

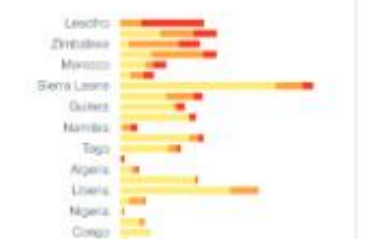
AFRICA DROUGHT MONITORING AND ADVISORY (ADMA) SYSTEM

Combined Drought Index (CDI) for the 2nd decad of March 2024



Drought Stress Levels per Country

High Medium Low



Drought impact in East Africa, 2009

What is ADMA?

It is a near-real-time system that uses Earth Observation and Weather Information to monitor drought conditions and Issue Early Warning in Africa. It contains various tools, such as graphs and maps, to display, analyse information and generate drought reports. It provides an overview of the situation in the case of imminent drought.

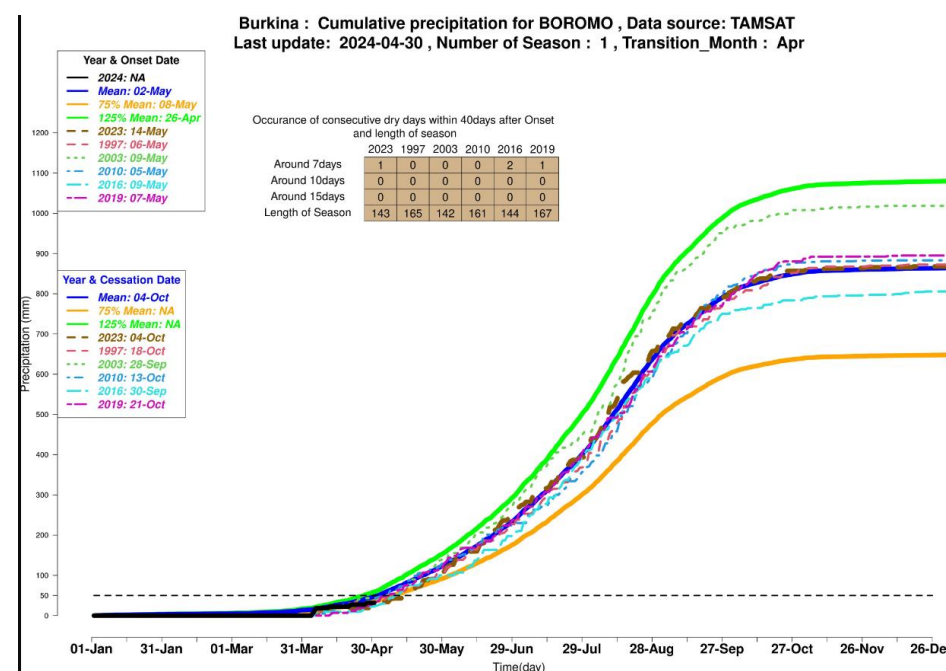
#EarlyWarningForEarlyAction



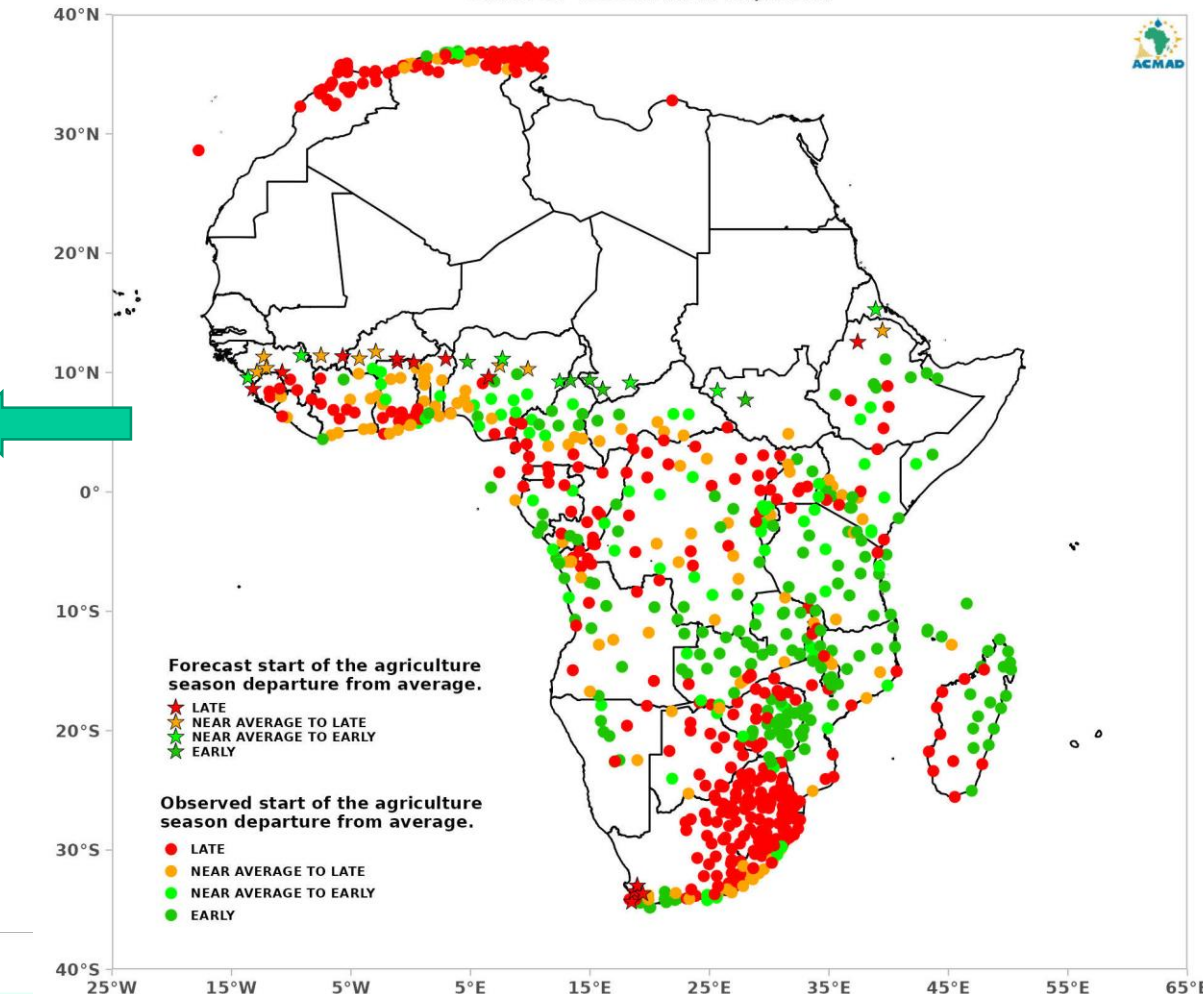
Scan Here



ada.acmad.org



MONITORING OF OBSERVED ANOMALIES ON THE START OF THE AGRICULTURE SEASON AND OUTLOOK
OBSERVATION AND MONITORING UNTIL: Apr-20,2024
OUTLOOK VALIDITY PERIOD: From Apr-21-2024 to May-05-2024
DATE OF ISSUE: APR-21,2024.



CONTINENTAL BRIEF FOR POLICY AND DECISION MAKERS BASED ON SIGNIFICANT WEATHER AND CLIMATE EVENTS UPDATE. VALID FOR: MARCH TO JUNE 2024

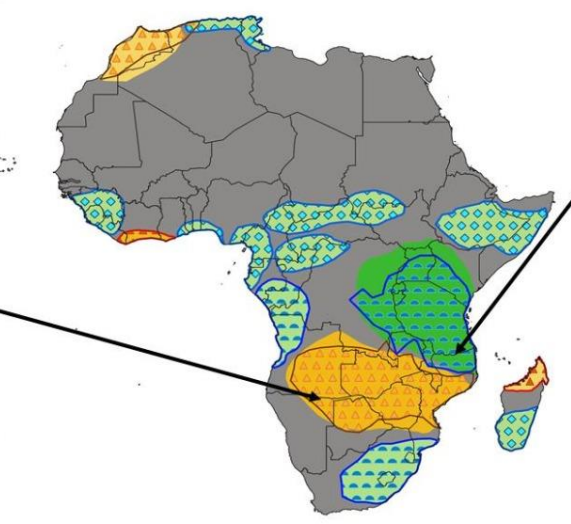


CLIMATE ANOMALIES
Drier than average season very likely
Prolonged drought with reported persistent impacts

HAZARDS
Weak to Moderate drought, dry spells, near average to late onset very likely.

POTENTIAL IMPACTS
Moisture stress, decreased river discharge, reduced rain-fed crop yield prospect, degradation of pastures and high food prices.

MEASURES
Develop and implement policy to support drought tolerant and short cycle crops, soil and water conservation practice, maximize full irrigation farming. Use watershed based in-situ water harvesting structures Develop and implement policy in support of weather based insurance and dam management



LEGEND

- Observed drought hazard
- Observed flood hazard
- Drought hazard outlook
- Flood hazard outlook

CLIMATE ANOMALIES
Wetter than average season very likely
Heavy rainfall with reported flooding events

HAZARDS
Heavy rainfall events may lead to flash flood, riverine flooding, landslides and soil erosion. High chance of lightning, hail formation and stormy weather are expected

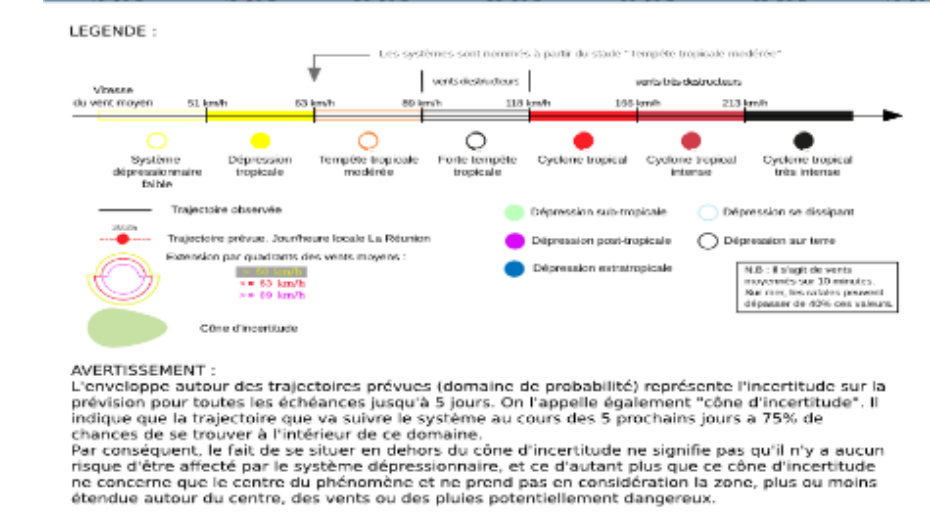
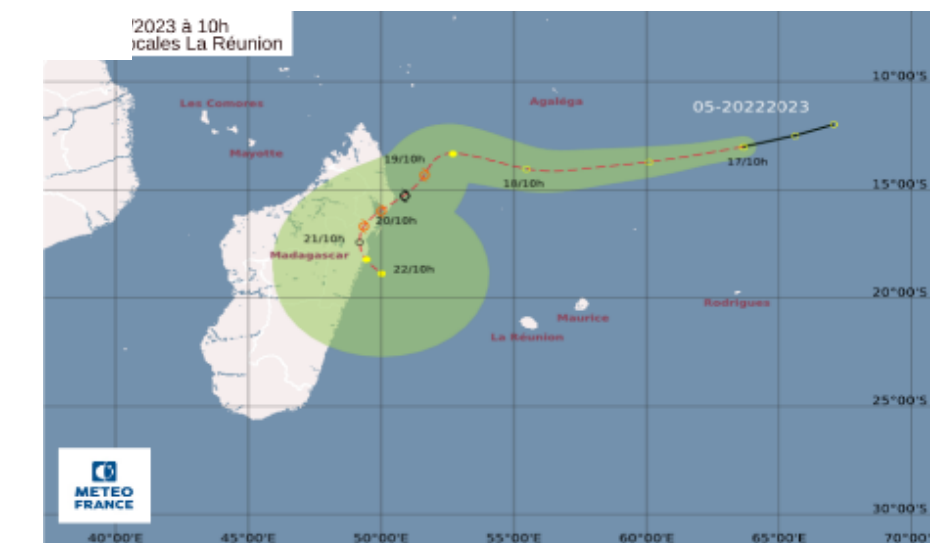
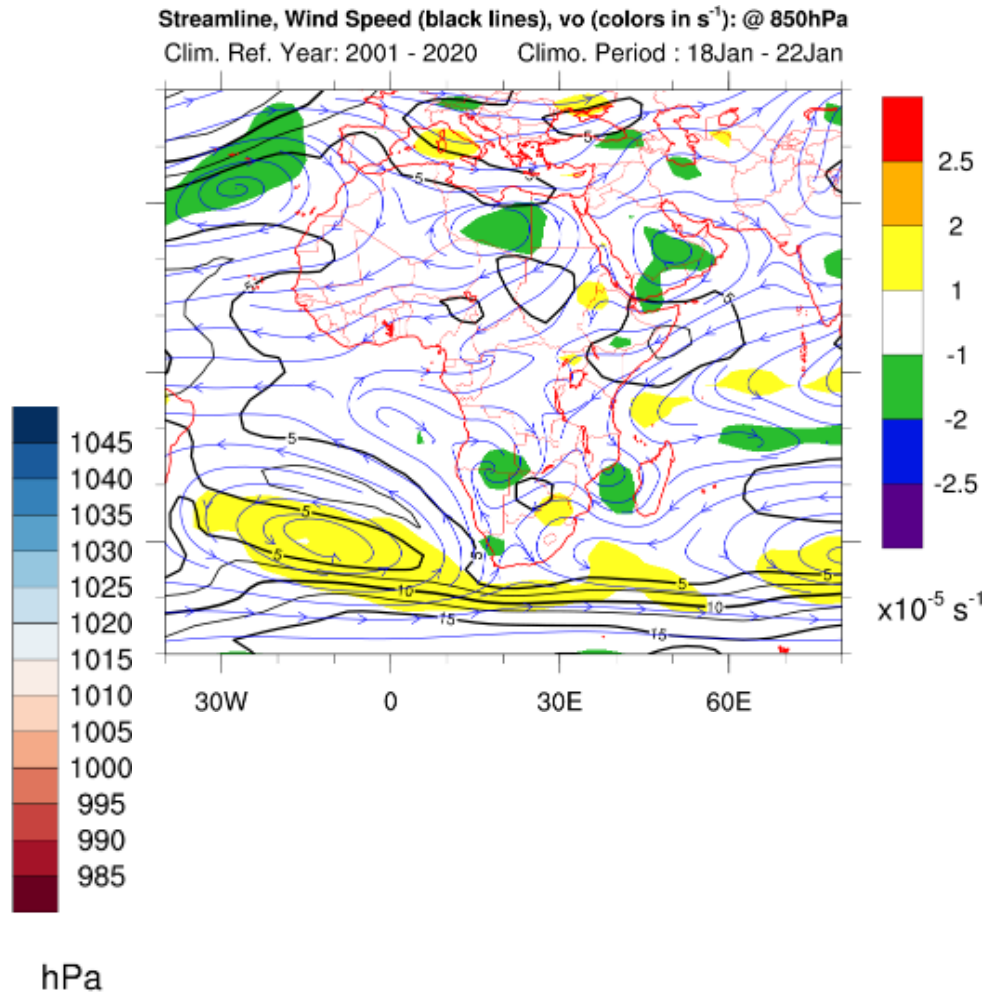
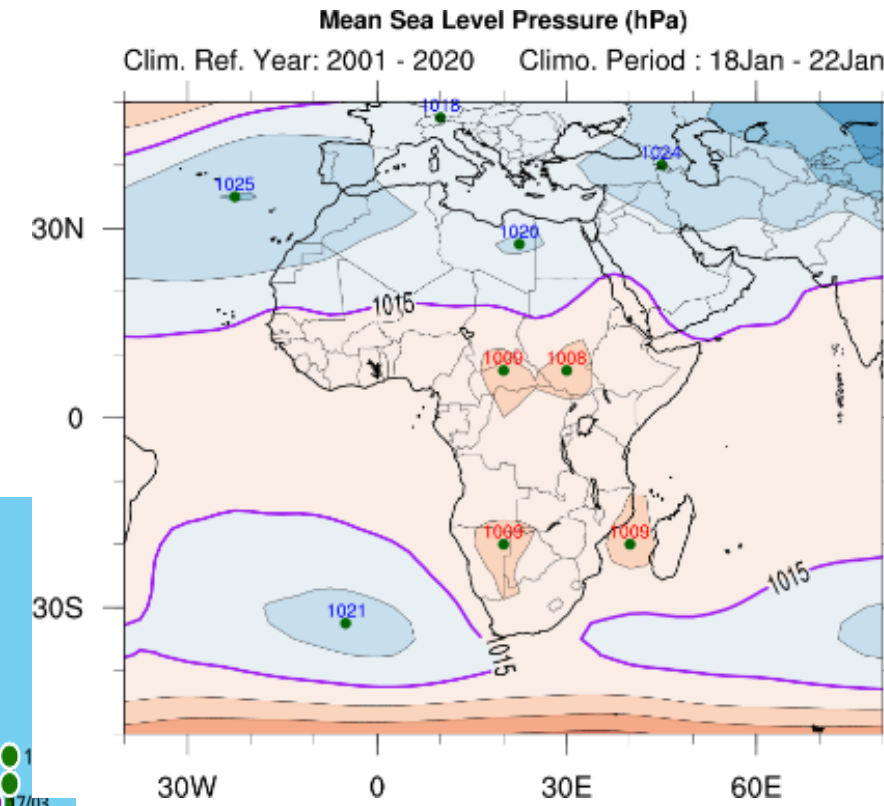
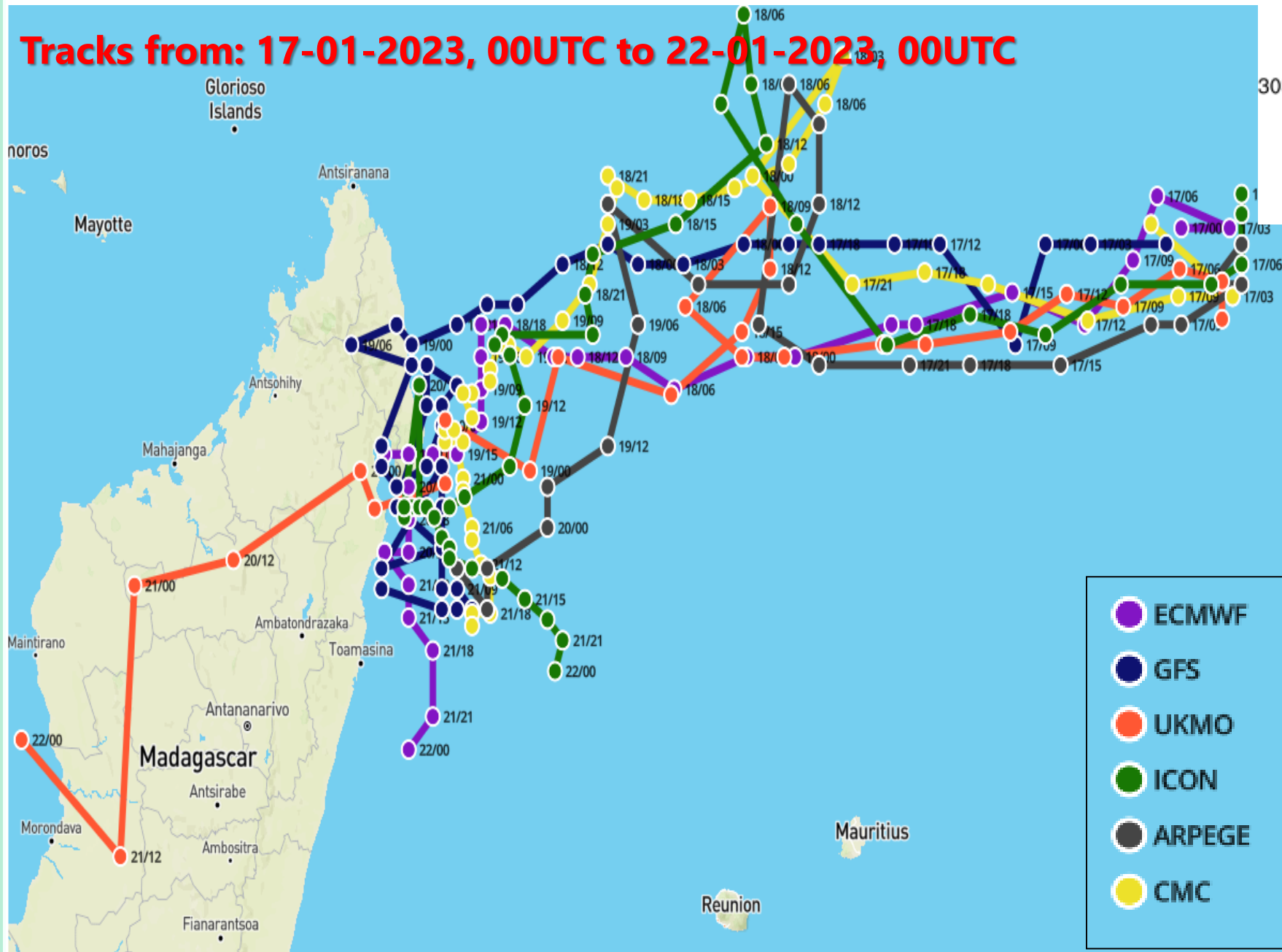
POTENTIAL IMPACTS
Waterlogging, pest and diseases infestation, Outbreak of water borne diseases damage to infrastructures(dams, reservoirs, bridges, roads...) Displacement of people due to floods.

MEASURES
Select excess-water tolerant crops, wide tree planting campaigns Develop new and rehabilitate the existing drainage structure, Update and implement flood contingency plans improve water management in reservoirs and dams



Cyclone early warning Information

(Global deterministic models : ARPEGE, CMC, ECMWF, ICON, GFS and UKMO) – **Climatology of the forecast period** favors evolution towards the Mozambican channel
Cyclone CHENOSO





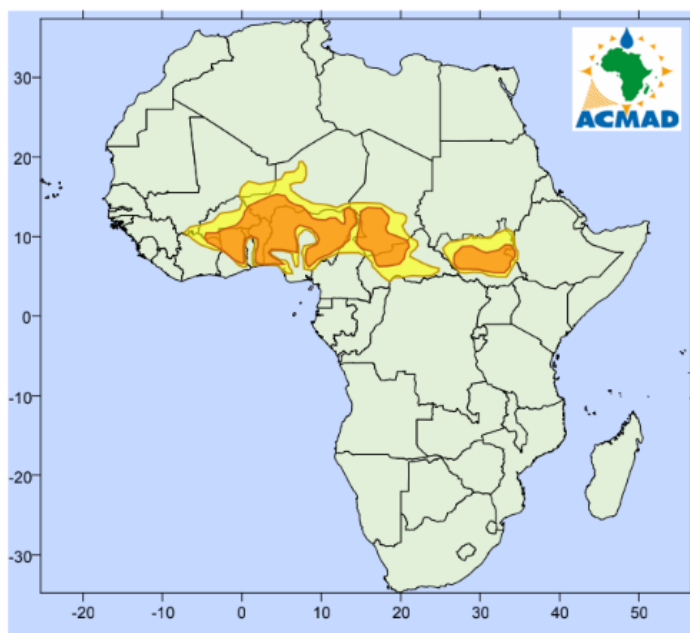
Early warning for Health

VIGILANCE MAP AND POLICY BRIEF FOR HEAT WAVE

Valid From April 30 to May 4, 2024
Issued on April 29, 2024



HIGHLIGHT: Moderate heat wave is expected in Burkina Faso, Ghana, Togo, Benin, Niger, Nigeria, Cameroon, Chad, C.A.R., and South Sudan.



Phenomenon	Hazard	Potentials Impacts	DRM Measures / Advices
In next 5 days apparent temperature >40°C to 44°C are expected for two days	Heat wave Conditions persists on 2days	Moderate temperature heat is tolerable for general public but moderate health concern for vulnerable people(people chronic diseases, infants and elderly)	Civil Protection Services to monitor closely the heat wave situation with NHMSs.
apparent temperature 40°C to 44°C are expected for more than 2 days	Moderate heat wave conditions are likely to persist for 3days ore more with varied severity	High temperature Increased likelihood of heat illness symptoms in people who are either exposed to sun for a prolonged period or doing heavy work High health concern for vulnerable people	Civil Protection services to take adaptive and preventive measures to the heat wave situation with NHMSs.
Apparent temperatures >45°C are expected for more than 2 days	Severe heat wave is very likely to persist for more than 2 days,	Very high likelihood of developing heat illness and heat stroke in all ages	Civil Protection services to take adaptive and preventive measures to the strong heat wave situation with NHMSs.

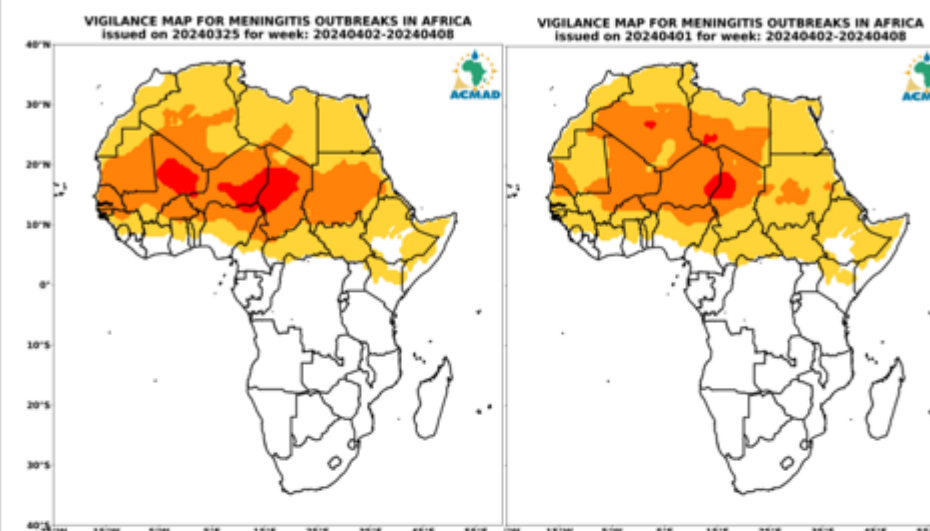
Disclaimer:
The presentation of country boundaries on the map does not imply any opinion whatsoever on the part of ACMAD concerning the legal status of any country, territory or area, or concerning the delimitation of frontiers or boundaries.



Meningitis Outbreak Outlook/Advisory For WHO-AFRO Meningitis Surveillance And Control Generated

Climate Service for Health/Meningitis - Verification

Meningitis Outbreaks Outlook/Advisory for 02-08 Apr 2024



Phenomenon	Hazard	Potentials Impacts	Advisory / Measures
•Dust concentration below 150µg/m ³ •Relative humidity above 40% •Temperature below 27°C	Emergence of Meningitis cases not likely	Potential pressure on the health system	Routine surveillance systems at regional and national levels
•Dust concentration between 150 to 400µg/m ³ •Relative humidity between 20 & 40% •Temperature above 27°C	Emergence of Meningitis cases very likely	Loss of life, pressure on the health system	Activation of surveillance systems at regional and national levels
•Dust Concentration at least 400µg/m ³ and above •Relative humidity less than 20% •Temperature above 30°C	Emergence of Meningitis cases very likely and epidemic status possible	Loss of life, increased pressure on the health system	Strengthen and increase meningitis surveillance systems at both regional and national levels

ACMAD vigilance maps of the period from 02nd to 08th April 2024, call for possible meningitis epidemics status over Mali, Niger, Nigeria, and Chad. Potential cases were expected in Senegal, Mauritania, Guinea, Ghana, Benin, Togo Burkina Faso, Mali, Libya, Nigeria, Cameroon, Algeria, and Sudan.

As reported by WHO-AFRO, on week 14 of 2024 (ie 01st-07th Apr): One district (1) crossed the epidemic threshold in Niger and nine (9) districts crossed the alert threshold in six (6) countries: Benin (2), Central African Republic (1), Chad (1), Mali (2), Niger (2) and Senegal (1).

Meningitis case distribution by country for 1st – 07th April 2024
(source: WHO AFRO Meningitis Surveillance And Control Programme)



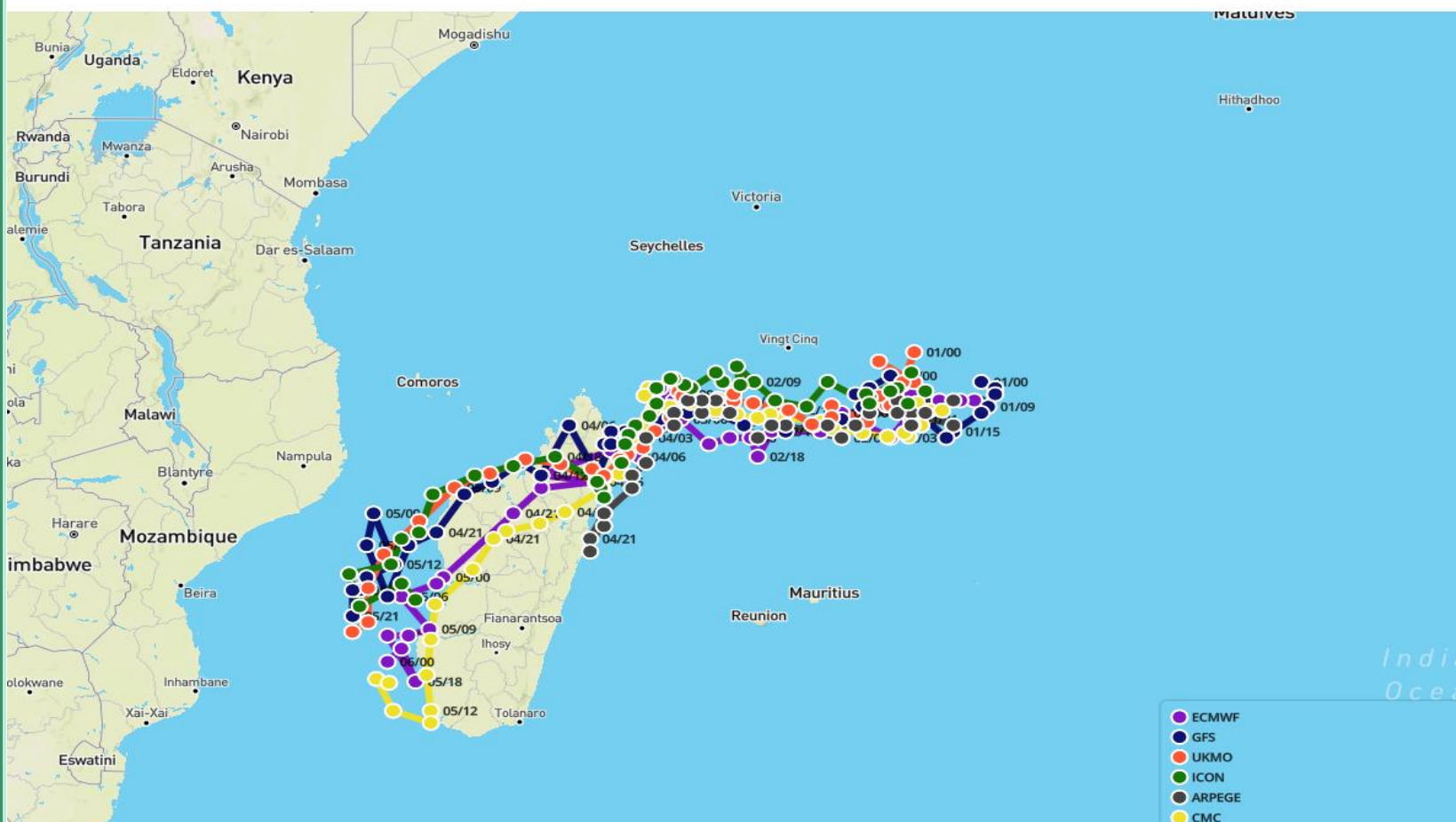


Co-Production for anticipatory action

Tropical cyclone track forecasts from: 01-March-2024, 00UTC to 06-March-2024, 00UTC



Models : ARPEGE, CMC, ECMWF, ICON, GFS and UKMO



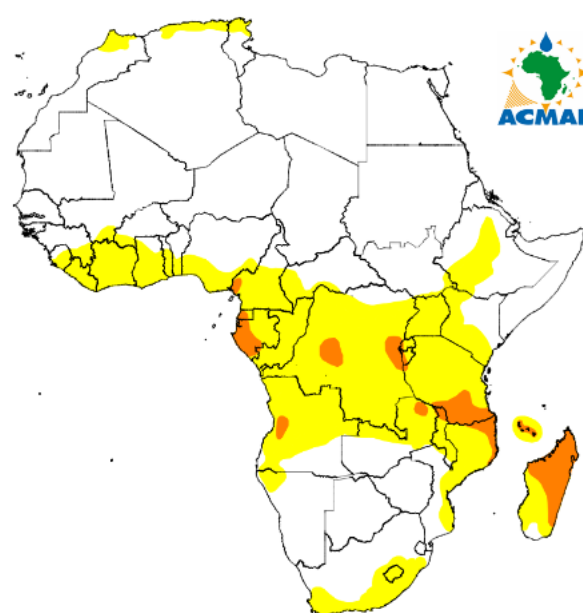
VIGILANCE MAP AND POLICY BRIEF FOR HEAVY RAINFALL AND STRONG WINDS

Valid From March 1 to 5, 2024

Issued on February 29, 2024



HIGHLIGHT: Heavy rainfall is expected in Cameroon, Equatorial Guinea, Gabon, Angola, D.R.C, Rwanda, Burundi, Zambia, Malawi, Tanzania, Mozambique, Madagascar and Comoros Islands.



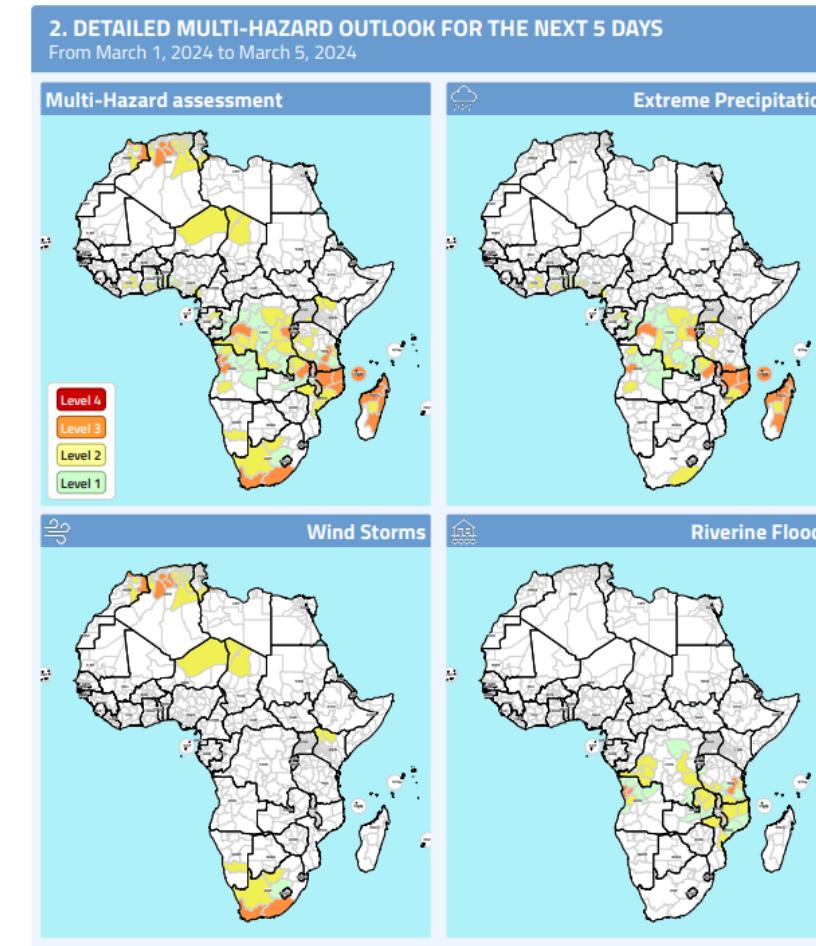
Phenomenon	Hazard	Potentials Impacts	DRM Measures / Advices
In next 5 days accumulate d rainfall (50-100mm) is likely,	Moderate rainfall, flash flood, riverine flooding, landslides, soil erosion and lightning likely	Displacements of people due to floods, outbreak of water borne diseases, damage of infrastructures (roads, bridges, ...)	DRM authorities to keep informed about the development of the meteorological situation and raise awareness, taking action is more likely, the situation needs to be monitored closely with NHMS
In next 5 days accumulate d rainfall (100-150mm) is very likely,	Heavy rainfall, flash flood, riverine flooding, landslides, soil erosion and lightning, strong winds,	Displacements of people due to floods, outbreak of water borne diseases, damage of infrastructures (roads, bridges, ...)	Update Flood contingency plans, Improve water management in reservoirs and dams, DRM authorities be ready to take adequate actions, DRM to be continuously in touch with NHMS to be informed of the detailed expected meteorological conditions.
In next 5 days accumulate d rainfall (>150mm) is very likely,	Extreme heavy precipitation, flash flood, riverine flooding, landslides, soil erosion and lightning, strong winds, severe thunderstorms	Loss of lives, Injuries, Displacements of people due to floods, outbreak of water borne diseases, damage of infrastructures (roads, bridges, ...)	Civil Protection service and DRM authorities to activate contingency plan for disaster preparedness and emergency response (awareness, assistance to victims, search & rescue operations), and be in close touch with NHMS for further accuracy at the national level.

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Contribution in Continental Watch



Africa Multi-Hazard Early Warning and Action System for DRR Continental Situation Room



PRODUCTS TO SUPPORT AUC SitRoom In AMHEWAS

Contribution in Situation Report



Multi-hazard Early Warning and Early Action System Situation Room/ Health, Humanitarian Affairs and Social Development

SITUATIONAL OVERVIEW

- Heavy rains brought by Storm Daniel at the weekend caused two dams to burst on the usually dry Wadi Derna riverbed traversing through the city and left a trail of devastation.
- Heavy rainfall accompanied with strong winds hit north-eastern Libya on September 10th, 2023, causing severe riverine and flash floods that resulted in a big number of casualties and damage.

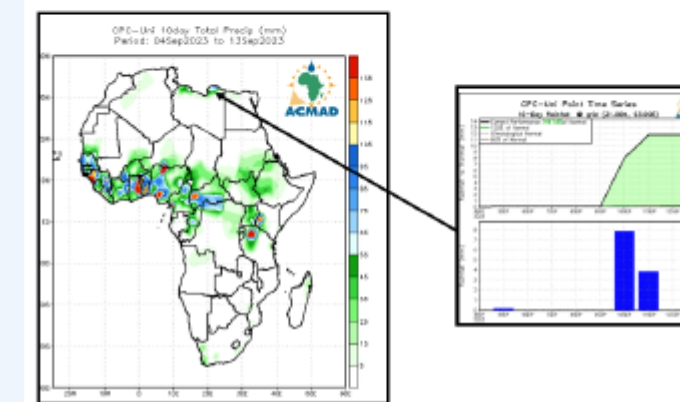
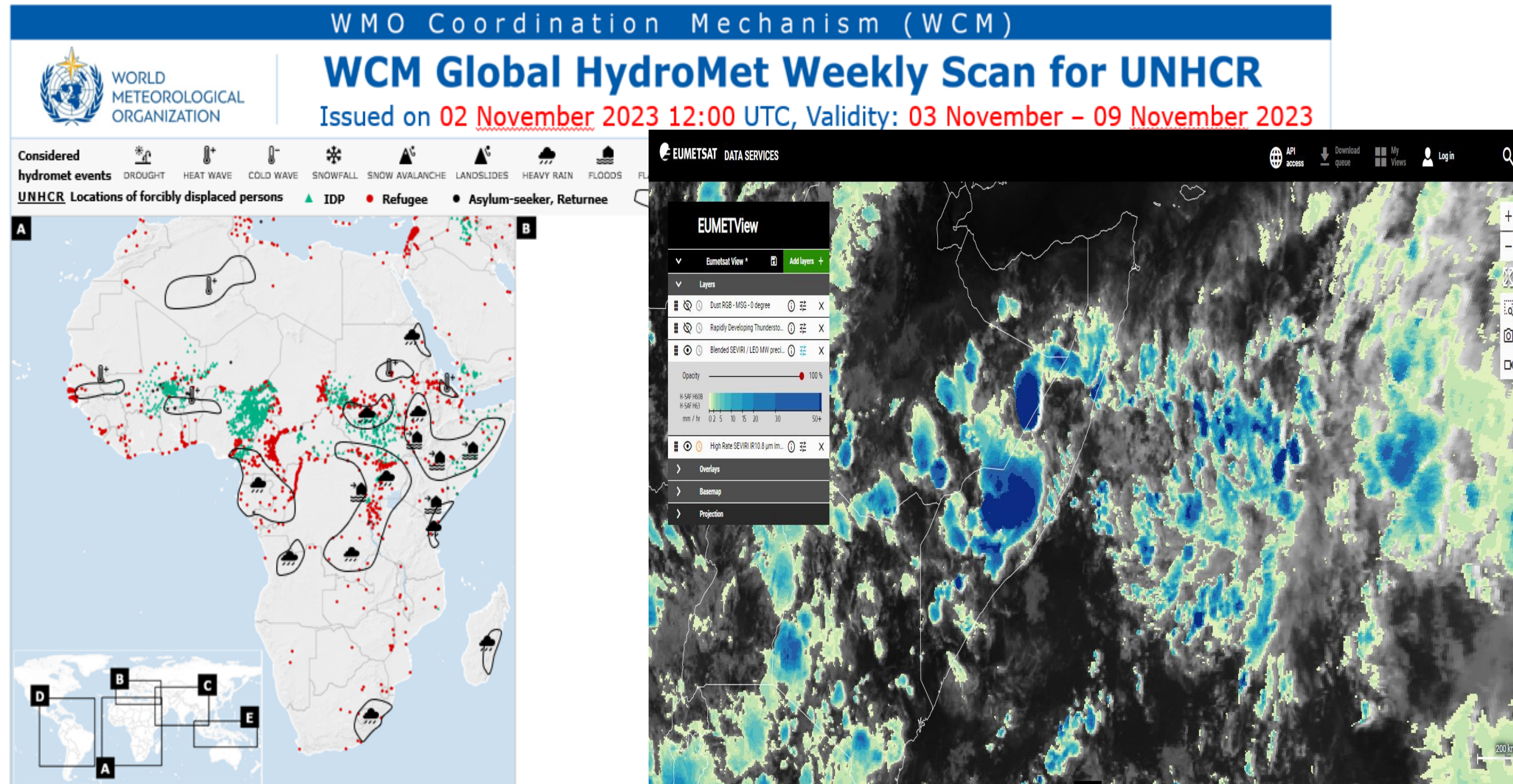


Fig 1: Total Precipitation Observed over Africa in the last 10 days

- The International Organization for Migration (IOM) reports that in Derna more than 30,000 people were displaced, 3,000 in Albayda and 1,000 in Al Mkeheley. Additionally, IOM said 6,085 other people have been displaced in other storm-hit areas like Benghazi, with the number of deaths still unverified. The number of victims is expected to keep rising as recovery operations continue.
- In the nearby neighborhood of Al-Eliwa, around 96% of properties were reported to have been flooded and many properties along the river have disappeared, leaving only their foundations visible.
- Health facilities in the severely affected neighborhoods of Al-Bilad and Al-Maghar on either side of the river, home to healthcare facilities used by people from across the city were hit by floods.
- The communes in the affected areas have limited or no access to water, electricity and petrol among others because of damages to life saving services.
- There's a wave of displacement as people are trying to flee Derna but many are stuck because a lot of the roads are blocked. Unfortunately, most of the people have no shelter forcing some of them to return to their inhabitable homes and some families have been taking shelter in schools, underlining the urgent need for shelter.
- The images and map below are showing the scale of destruction before and after the floods with

Co-Production for anticipatory action



HYDROMET SIGNIFICANT EVENTS: ON-GOING (with new potential impact) & POTENTIALLY UPCOMING

A In the next 7 days (03 November to 09 November), **Very Heavy rainfall greater than 150mm** is expected over most of eastern Africa and central Africa such as S. Ethiopia, N. Somalia, S. Cameroon, Equatorial Guinea, Gabon, Congo and N. Angola, E. D.R.C, N. Kenya; there is a high chance of flooding over E. D.R.C, S. Ethiopia, N. Somalia, and N. Kenya. **Heavy to moderate** rainfall is expected over S. Congo, W. D.R.C, S-E South Africa, Burundi, Rwanda, W. Tanzania, Uganda, South Sudan, S-E. C.A.R., N. Angola, and E. Madagascar, while **light rainfall** is expected over S. Sudan, N. South Sudan, and E. Sudan. Hot conditions with persistence for 3 days consecutive ($\geq 45^{\circ}\text{C}$), are expected in the next 7 days over E. Senegal, S. Mali, S-E. Burkina Faso and N-W. Nigeria, C. Algeria, E. Sudan, and N-E Ethiopia.

B

C < Text - contribution Area C - Max 5 lines >

D < Text - contribution Area D - Max 3 lines >

E < Text - contribution Area E - Max 2 lines >

Sources: ⁽¹⁾NMHS, ⁽²⁾WMO, ⁽³⁾UNHCR, ⁽⁴⁾BSMC/TCWC, ⁽⁵⁾ECMWF, ⁽⁶⁾NaturalEarth.

With contribution from ACMAD, BMKG, DWD, MeteoSwiss

Disclaimer: This product highlights hydrometeorological events which may be of interest to UNHCR. WMO makes no warranty in respect of the correctness or completeness of this information, nor does this information represent the official view of WMO. This information does not replace the advice and guidance provided by the official meteorological services for these regions. For official national guidance please refer to the national hydromet and disaster management agencies. The designations employed in this map are in conformity with United Nations practice. The presentation of material therein does not imply the expression of any opinion whatsoever on the part of WMO concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its borders. The depiction and use of boundaries, geographic names and related data are not warranted to be error free nor do they necessarily imply official endorsement or acceptance by WMO.



ACMAD co-produced knowledge materials with partners such as UNOCHA, UNDRR, UNHCR, and FAO to support anticipatory actions and reduce disaster risks.



SITUATION REPORT FLOOD RISKS IN WEST AND CENTRAL AFRICA

JULY 2023

This note was produced by the West and Central Africa Flood Task Force created within the regional Emergency Preparedness and Response (EPR) group. The aim of the note is to provide information on seasonal flood forecasts for 2023 and to provide recommendations for disaster preparedness and response to natural hazards.



Food and Agriculture Organization of the United Nations

- Better production
- Better nutrition
- Better environment
- Better life

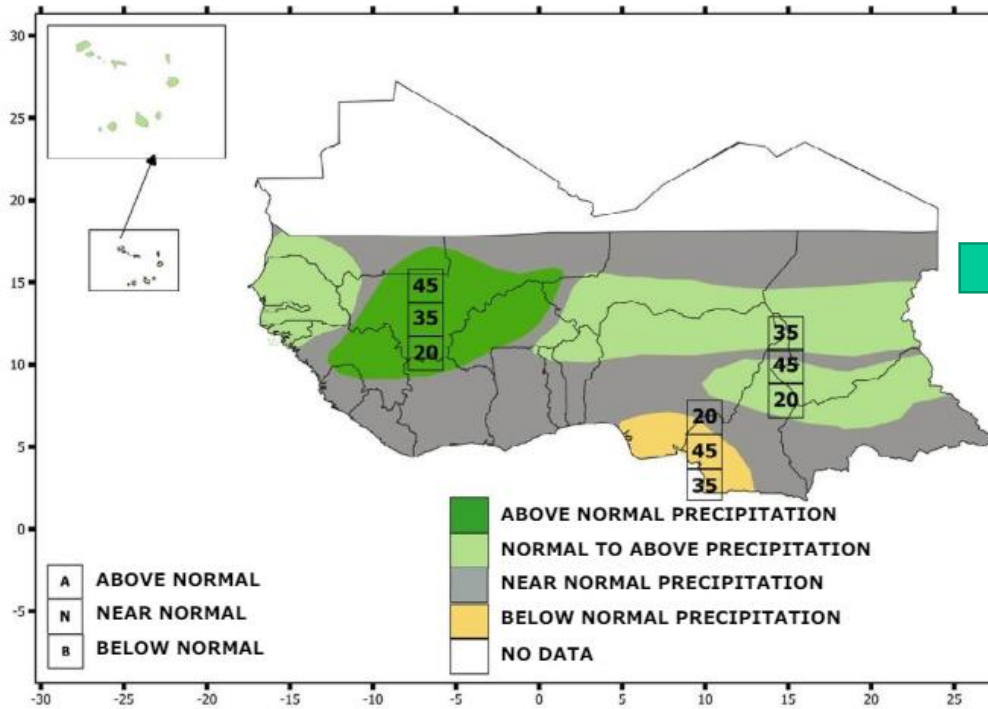
Proactive action to flood risk in the Sahel

FAO's initiative to safeguard livelihoods and food security

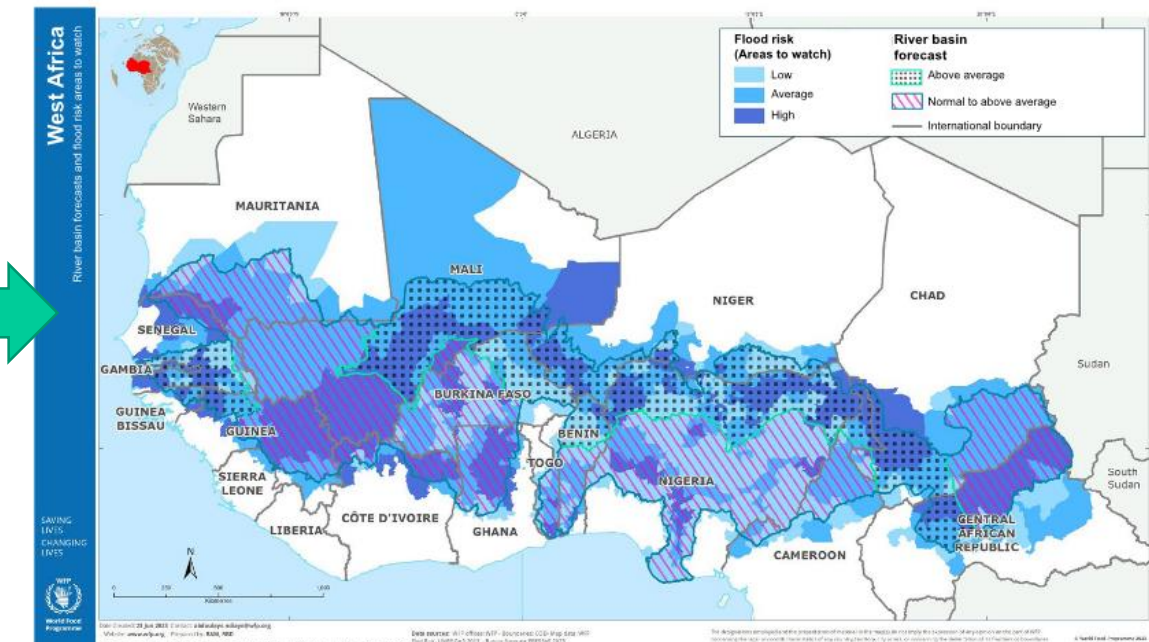
June 2023



Seasonal precipitation forecast for the Sudano-Sahelian region valid for July-August-September 2023
Elaborated June 7, 2023



Humanitarian impact analysis



CONTINENTAL BRIEF FOR POLICY AND DECISION MAKERS BASED ON SIGNIFICANT WEATHER AND CLIMATE EVENTS UPDATE. VALID FOR: JULY TO OCTOBER 2022

CLIMATE ANOMALIES

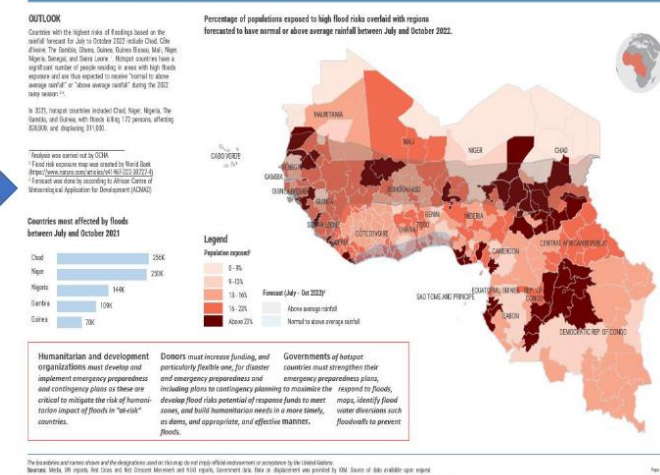
- Weather:** Wetter than average season very likely; Heavy rainfall with reported flooding events.
- Hazards:** Heavy rainfall events may lead to flash floods, riverine flooding, landslides, and soil erosion. High chance of lightning, hail formation and stormy weather are expected.
- POTENTIAL IMPACTS:** Work/lugging and diseases infections; Outbreak of water borne diseases; Damage to infrastructure (dams, reservoirs, bridges, roads...); Displacement of people due to floods.
- MEASURES:** Select secure weather tolerant crops; Seedling planting campaigns; Develop and rehabilitate existing drainage structures; Update and implement flood contingency plans; Review water management reservoirs and dams.

CLIMATE ANOMALIES

- Weather:** Drier than average season very likely; Prolonged drought with reported persistent impacts.
- Hazards:** Heat to moderate drought; Dry soils; Low average to late onset very likely.
- POTENTIAL IMPACTS:** Nutrient stress; decreased crop yields; reduced rain-fed crop yield prospects; degradation of pastures and high landrains.
- MEASURES:** Develop and implement policy to support drought-tolerant and short-cycle crop and water conservation practice; maximize fallow/inter-cropping; Use weather-based to also support livestock infrastructure; Develop/Implement policy to support of weather based in-situ and ex-situ farm management.

WITH BETTER OPERATIONAL COORDINATION WITH NATIONAL DATA PLATFORMS

WEST AND CENTRAL AFRICA Flooding Situation: Hotspot Countries





Effective communication

Coordinated ad hoc briefings with NMHSs, Regional Severe Weather and Climate Centres for impact forecasting and harmonization of hazards and impact information

Special briefings and statements for Africa Working Group on DRR (AWGDRR), WHO- AFRO, Regional Committee for Disaster Management in West Africa (GECEAO), UNOCHA, WMO with UNHCR

Feedback mechanism and user engagement

Leverage all communication resources and channels to ensure that information reaches the last mile.



CONCLUSION

- **Raise awareness of policy makers of availability of impact-based forecasting.**
- ***Build capacity of forecasters and disaster experts on operation of risk knowledge, outlook, advisory, watch, warning a***
- **Strengthen collaboration between institution**
- ***Better Access to data***
- ***Research and innovation***



THANK YOU



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