African Centre of Meteorological Applications for Development (ACMAD)

https://acmad.org/

- **ACMAD's role in AMHEWS as the Continental Multi-Hazard Advisory Centre**
- **DECEMBER 06, 2023, 6:15 PM, DUBAI– UAE, WMO PAVILION AT COP 28**

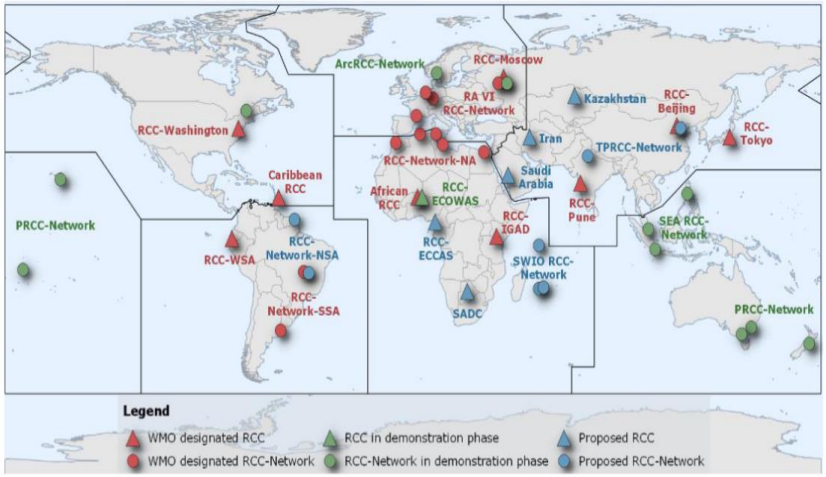


Figure 5: Established Regional Climate Centres (WMO, 2022)

OUTLINE

I CONTEXT AND EARLY WARNING VALUE CHAIN

II FLOODS ADVISORIES AND WATCHES , DISASTER SITUATION REPORTS

III *LESSONS LEARNT and WAY FORWARD*

BRIEF ON ACMAD MISSION

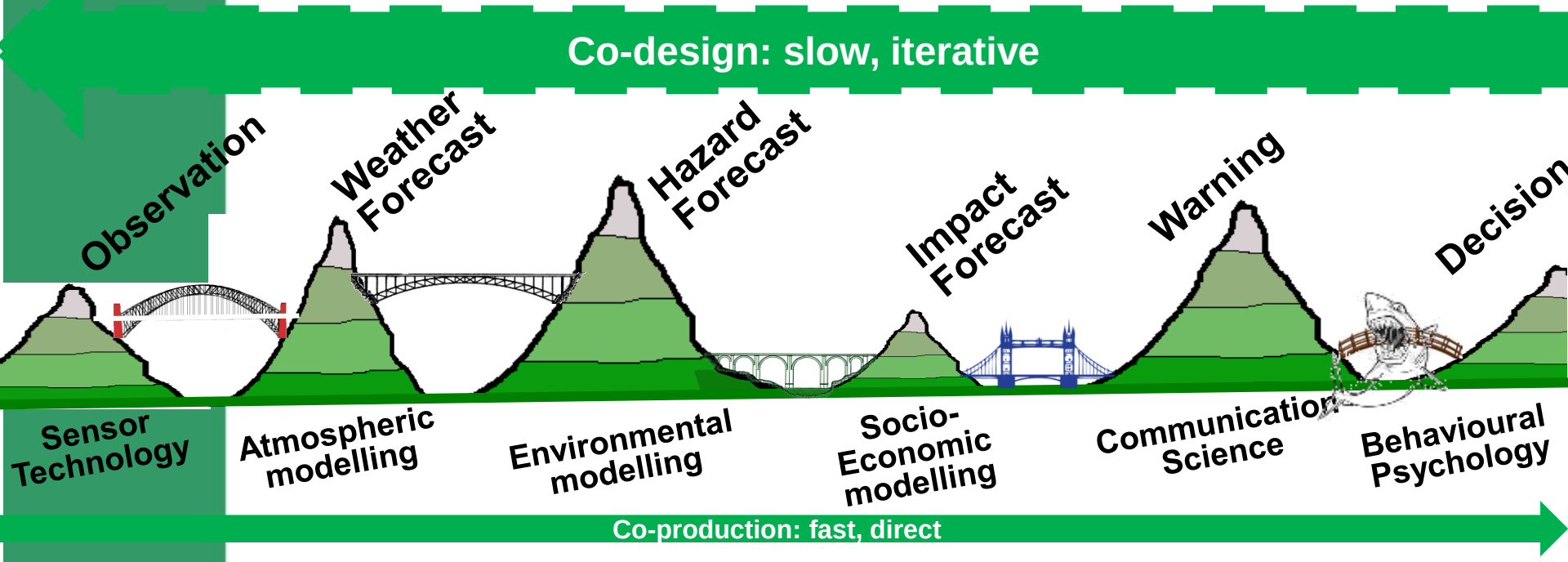
Created trough resolution 540 of the UNECA Conference of Ministers in April 1985 following the droughts of the 70s and 80s , ACMAD is established in Niamey-Niger since October 1992

Continental Weather and Climate Watch Centre for Africa with Monitoring, *forecasting* and *early warning for* droughts, floods, tropical cyclones and other extreme events as functions .

ACMAD is a WMO designated RCC since Congress in May 2015 and a Continental MultiHazards Advisory Centre since October 2022

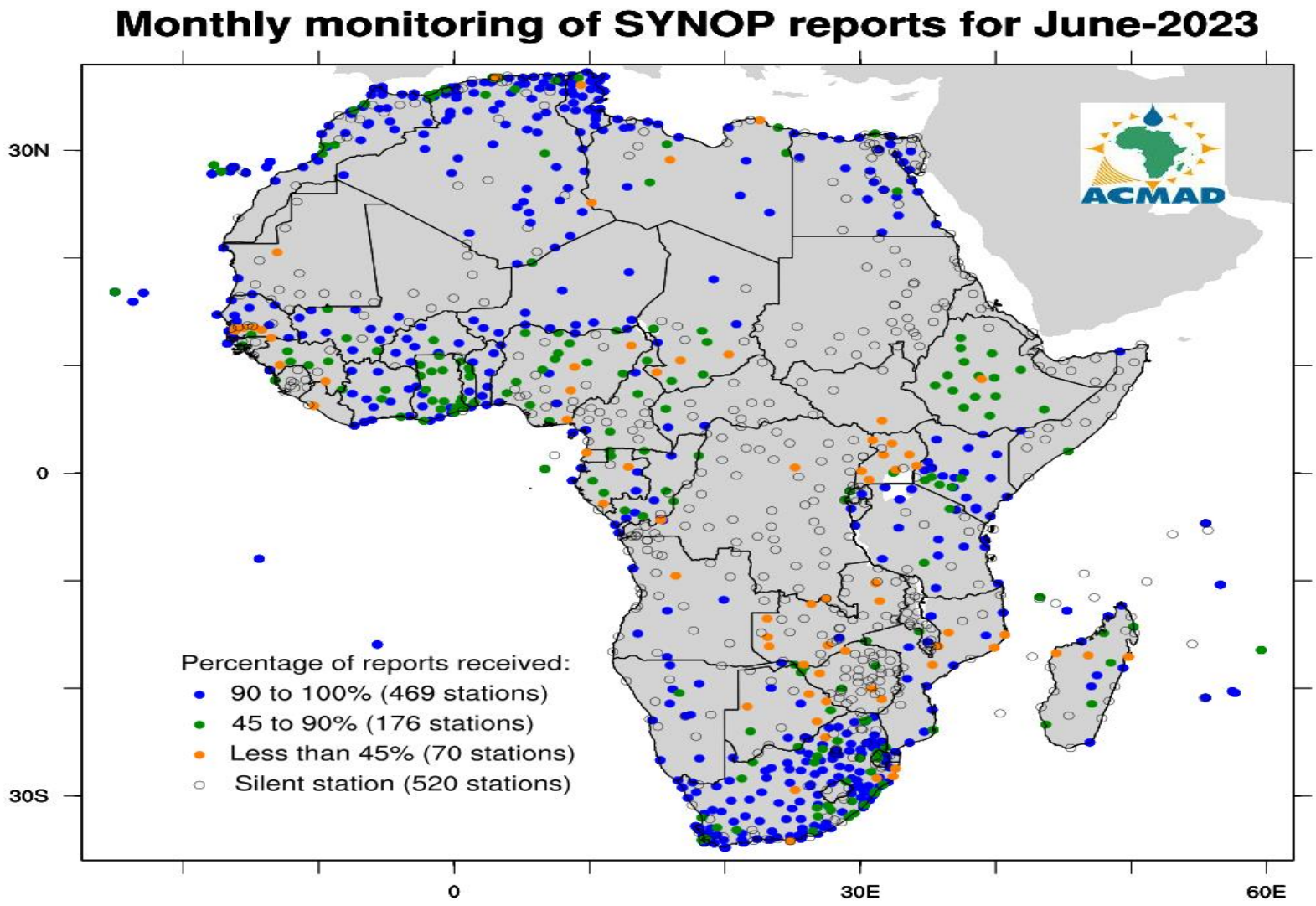
Institution of excellence for the Applications of meteorology for sustainable development with capacity building, methods, tools and products development, contribution to global weather and climate programs, promotion of database , research and innovation as functions

Where is AMHEWAS on the warning value chain? We will how the value chain performed with Somali floods, Cyclone FREDDY and storm Daniel in Libya



Bridges represent necessary Partnership
Mountains are needed expertise to operate warnings

STATUS OBF BASIC SURFACE OBSERVATIONS FOR GLOBAL NUMERICAL WEATHER PREDICTION . NETWORK IS QUITE INSUFFICIENT TO DETEC CITY SCALE FLASH FLOODS

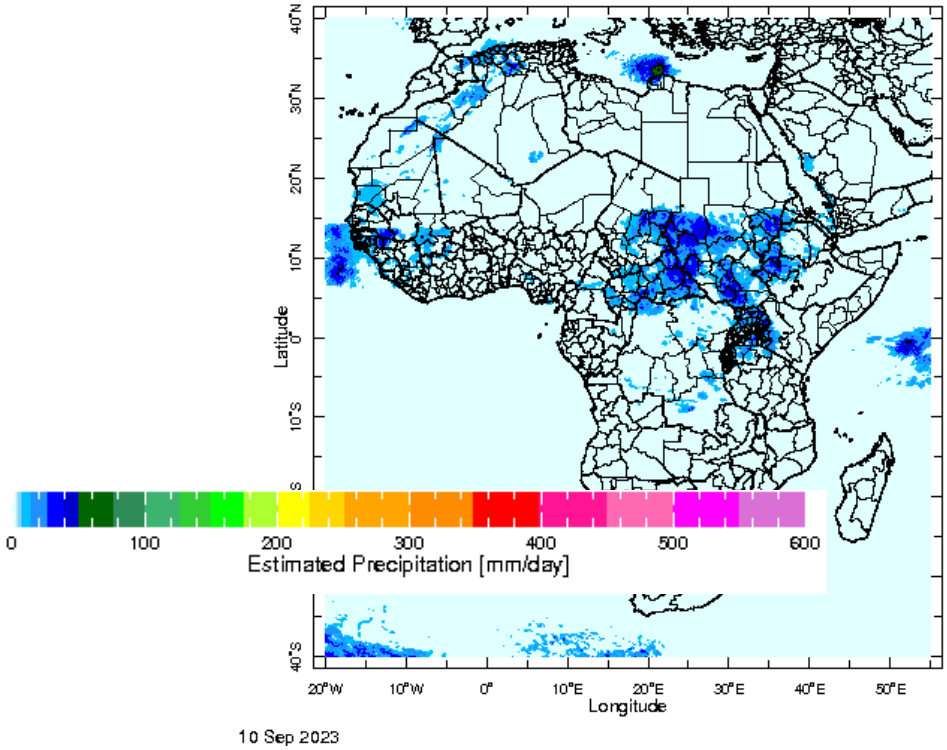


Continental daily extreme rainfall monitoring Services
CASE OF STORM DANIEL

STORM DANIEL AND EXTREME RAINFALL IN THE MEDITERANEAN REGION
MORE THAN 10 thousands reported missing by Libyan Red Cross,

Satellite underestimated rainfall

Investments in GBON is essential for EW4All

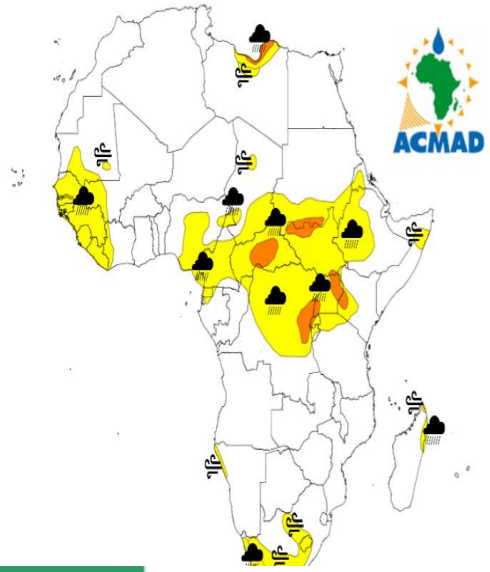


ACMAD vigilance products a few days ahead FOR STORM DANIEL

1- Libya's National Meteorological Centre said the storm peaked in north-eastern Libya on 10 September, 2023 with *strong winds* of 70 - 80 km/h.

2- Impacts: Communications interruption, the fall of electricity towers and trees (from disaster situation reports).

3- Torrential rains of between 150 - 240 mm caused *flash floods* in several cities, including Al-Bayda, which recorded 414.1 mm (from 10 Sep 8am to 11 Sep 8am, a new rainfall record).

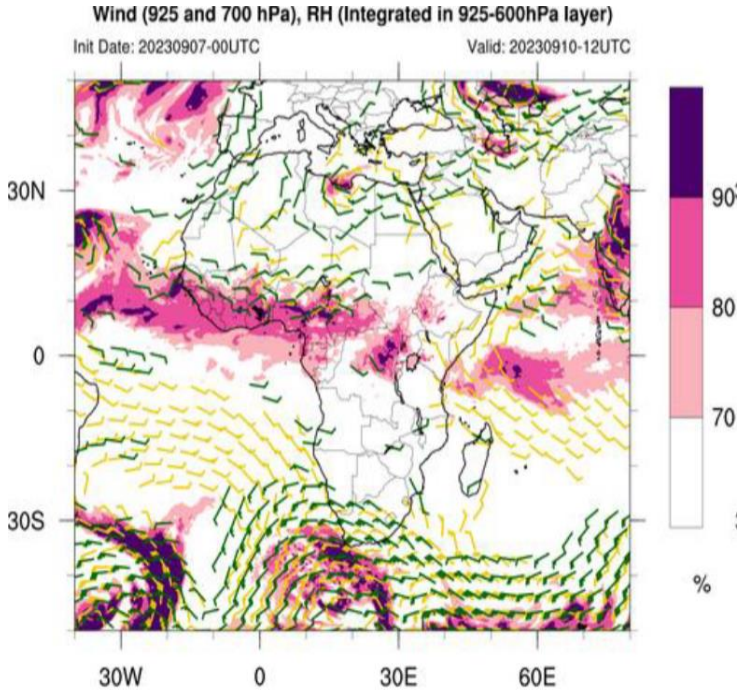


MULTI-HAZARD OUTLOOK

Validity: 2023-09-10

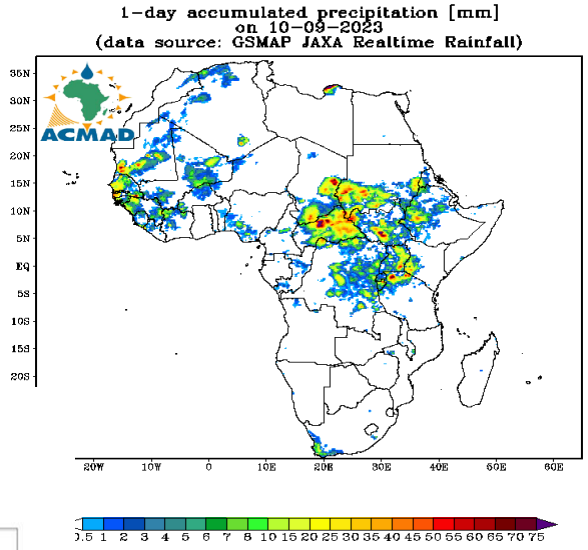
issued on 2023-09-07

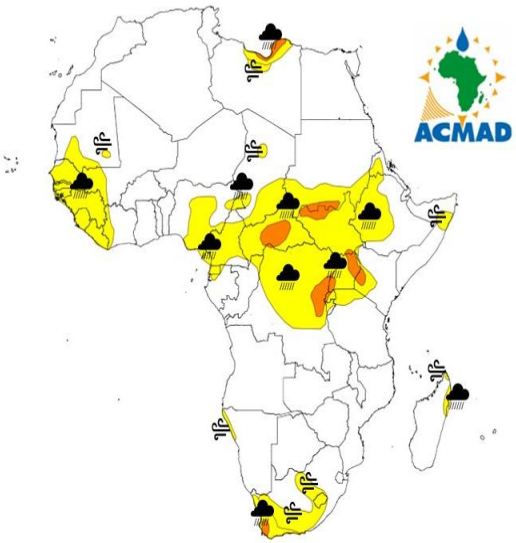
Rain	Wind	Dust	Meningitis
Very heavy >100mm	Very strong >80kmh^{-1}	Very heavy >1000µg m^{-3}	Very likely
Heavy 50-100mm	Strong >65kmh^{-1}	Heavy >600µg m^{-3}	Likely
Moderate 10 - 49mm	Moderate >50kmh^{-1}	Moderate >400µg m^{-3}	Less likely
Light 1 - 10mm	Light <50kmh^{-1}	Light <200µg m^{-3}	



HEAVY RAINS AND STRONG WINDS 3 days AHEAD ASSOCIATED WITH STORM DANIEL (THE DEADLIEST MEDITERANEAN CYCLONE) SEPT 2023)

HIGH RESOLUTION OBSERVING NETWORK AND Km SCALE FORECASTING SYSTEMS, IMPACT OUTLOOK, RISK ANALYSIS, BESPOKE WARNING, ANTICIPATIORY DECISIONS AND ACTIONS WERE MISSING AND ARE CHALLENGES AHEAD





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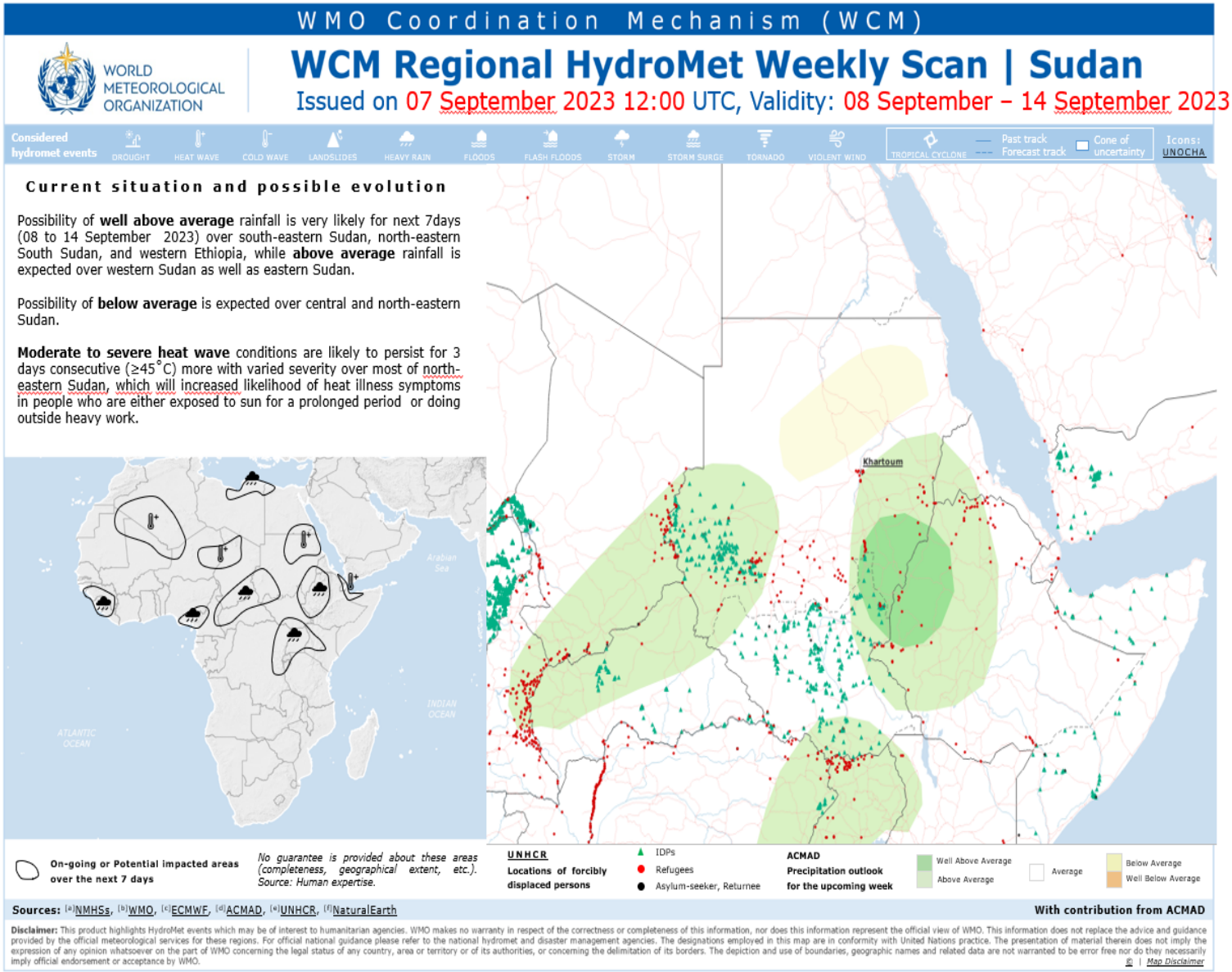
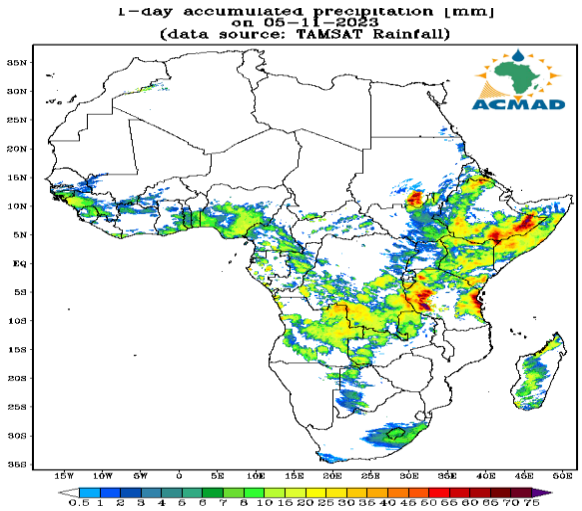
Light 1 - 10mm	Light <50kmh^{-1}	Light <200µg m^{-3}	

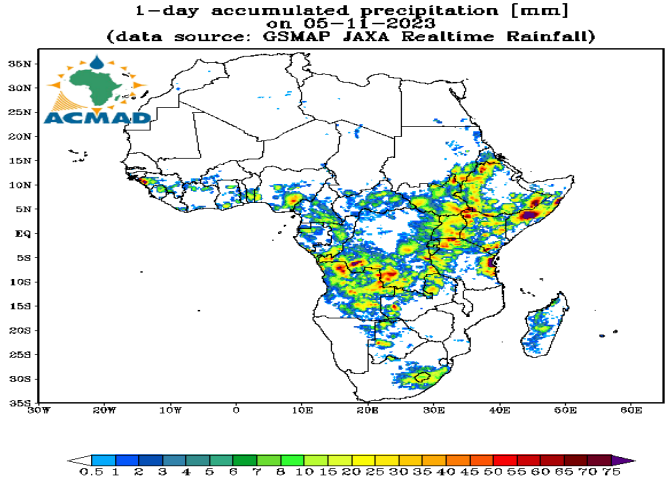
OPERATIONAL SERVICE CO-DESINGED AND CO-DEVELOPED WITH UNHCR AND WMO CORDINATION, Heavy rains related to storm Daniel expected days ahead

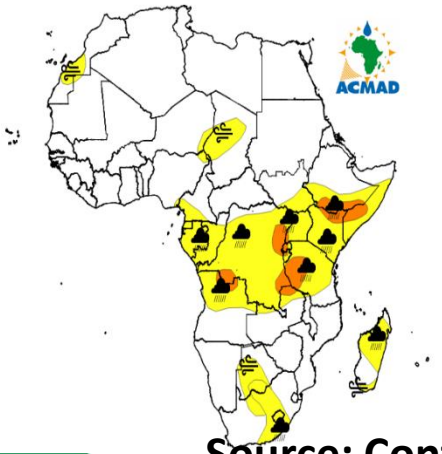
Little information on expected impacts and risk, anticipatory action preventing implementation of risk reduction measures



Advisories 3 to 4 days ahead of **recent Somali floods**. Moving along the value chain to impact outlook, warnings, anticipatory decision and action implementation is still a challenge. <u>Ad hoc briefings with DRR and humanitarian actors is a requirement to operationalize DRR platforms</u>





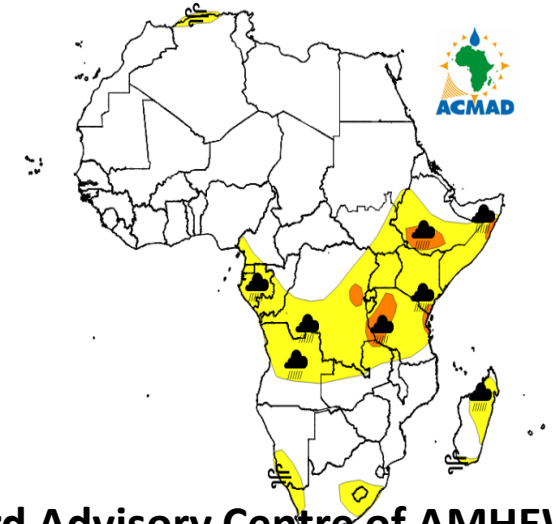


MULTI-HAZARD OUTLOOK

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	Meni
Very heavy >100mm	Very strong >80kmh^{-1}	Very heavy >1000µg m^{-3}	Very
Heavy 50-100mm	Strong >65kmh^{-1}	Heavy >600µg m^{-3}	Lik
Moderate 10 - 49mm	Moderate >50kmh^{-1}	Moderate >400µg m^{-3}	Less
Light 1 - 10mm	Light <50kmh^{-1}	Light <200µg m^{-3}	

Source: Continental Multi Hazard Advisory Centre of AMHEWAS at ACMAD

OPERATIONAL SERVICE CO-DESINGED AND CO-DEVELOPED WITH UNHCR AND WMO CORDINATION FOR THE RECENT SOMALI FLOODS, some exposure with refugees or displaced people camps

WMO Coordination Mechanism (WCM)

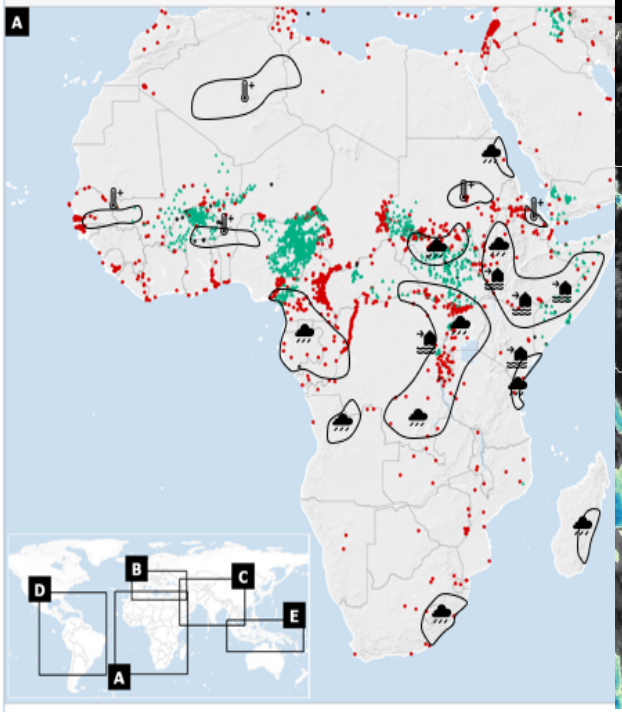
WORLD METEOROLOGICAL ORGANIZATION

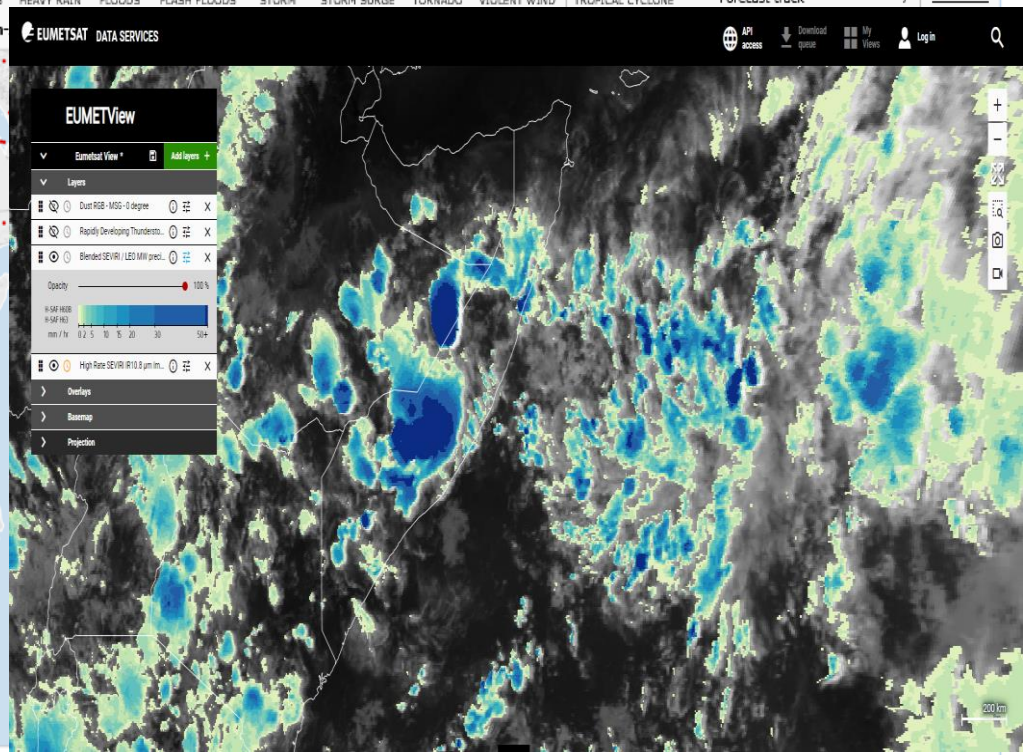
WCM Global HydroMet Weekly Scan for UNHCR

Issued on 02 November 2023 12:00 UTC, Validity: 03 November – 09 November 2023

Considered hydromet events: DROUGHT, HEAT WAVE, COLD WAVE, SNOWFALL, SNOW AVALANCHE, LANDSLIDES, HEAVY RAIN, FLOODS, FLASH FLOODS, STORM, STORM SURGE, TORNADO, VIOLENT WIND, TROPICAL CYCLONE, Past track, Forecast track, Cone of uncertainty. Icons: UNOCHA

UNHCR Locations of forcibly displaced persons: IDP, Refugee, Asylum





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

A In the next 7days (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 (≥45°C), are expected in the next 7days over E. Senegal, S. Mali, S-E. Burkina Faso and N-W. Nigeria, C. Algeria, E. Sudan, and N-E Ethiopia.

B <Text - contribution Area B – Max 3 lines>

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: [a]NMHSs, [b]WMO, [c]UNHCR, [d]RSMCs/TCWCs, [e]ECMWF, [f]NaturalEarth. With contribution from ACMAD, BMKG, DWD, MeteoSwiss

Vigilance Services from The Continental Multi hazard Advisory Centre days ahead of the half a billion $ of damages *Cyclone FREDDY.* Impact outlook (not quantified) and proposed anticipatory actions provided with low resolution. no effective operational and better coordinated resources mobilization mechanisms

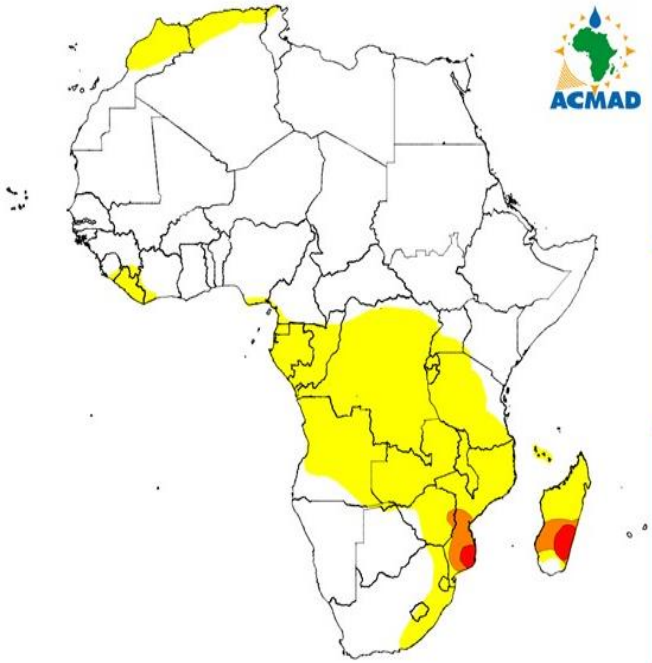
VIGILANCE MAP AND POLICY BRIEF FOR HEAVY RAINFALL AND STRONG WINDS

Valid From February 21 to 25, 2023

Issued on February 20, 2023

HIGHLIGHT: Tropical Cyclone FREDDY is expected to landfall along the south-eastern coast of Madagascar on Tuesday night , 21st February and will generate extreme heavy rainfall and strong wind, it is expected to reach the coast of Mozambique on Thursday 24th February 2023.

Heavy rainfall is expected in Mozambique, Zimbabwe and Madagascar

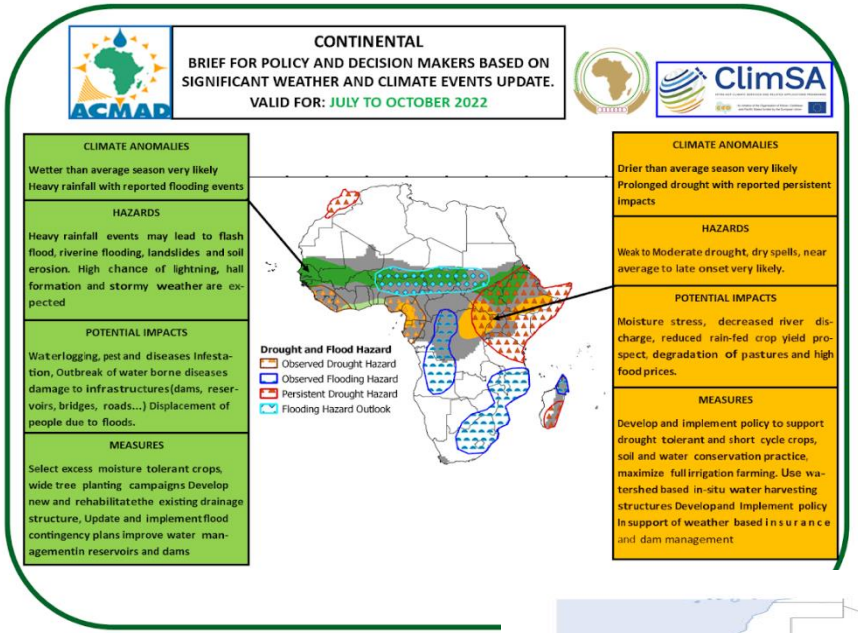


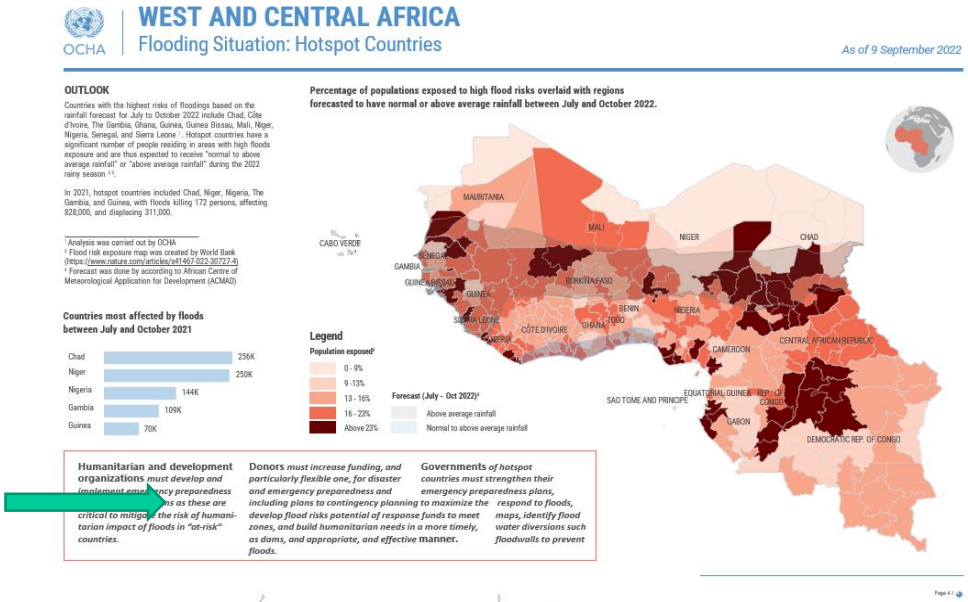
	Phenomenon	Hazard	Potentials Impacts	DRM Measures / Advices
	In next 5 days accumulated rainfall (50-100mm) is likely,	Moderate rainfall, flash flood, riverine flooding, landslides, soil erosion and lightning likely	Displacements of people due to floods, outbreak of water borne diseases, damage of infrastructures (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 NHMSs
	In next 5 days accumulated 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 NHMSs to be informed of the detailed expected meteorological conditions.
	In next 5 days accumulated 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, ...)	Madagascar and Mozambique's Civil Protection service and DRM authorities to activate Tropical Cyclone 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.

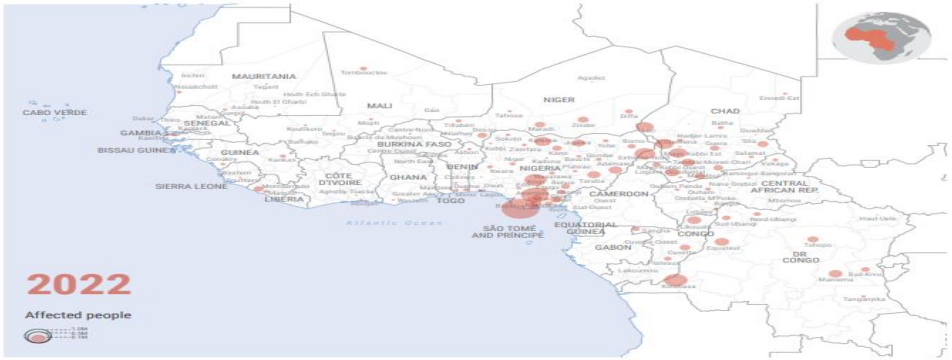
Disclaimer: The presentation of country boundaries on the map does not imply any opinion whatsoever on the part of ACMAD concerning the legal status of any country, territory or area, or concerning the delimitation of frontiers or boundaries.

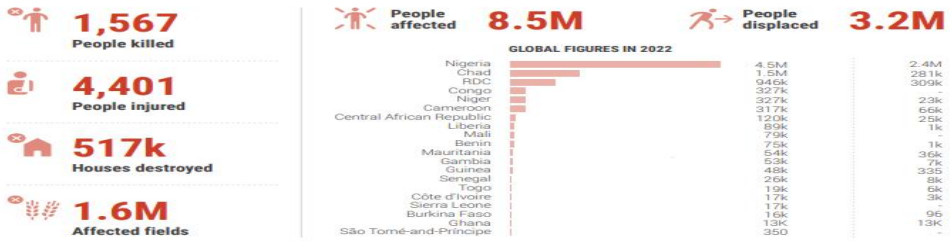
IMPACT BASED FORECAST-ACTIONALBLE INDICATORS

ACMAD-UNOCHA West and Central Africa office



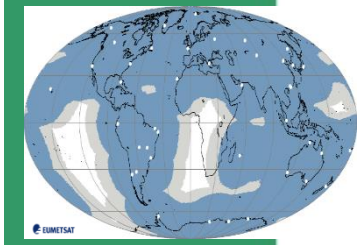


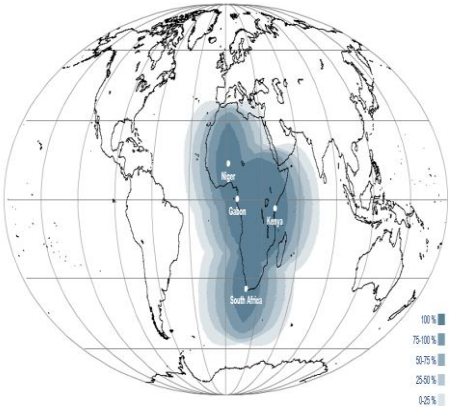




ACMAD SUPPORT PROVISION OF LEO DATA FOR ASSIMILATION IN HIGH RESOLUTION REGIONAL AND GLOBAL NWP

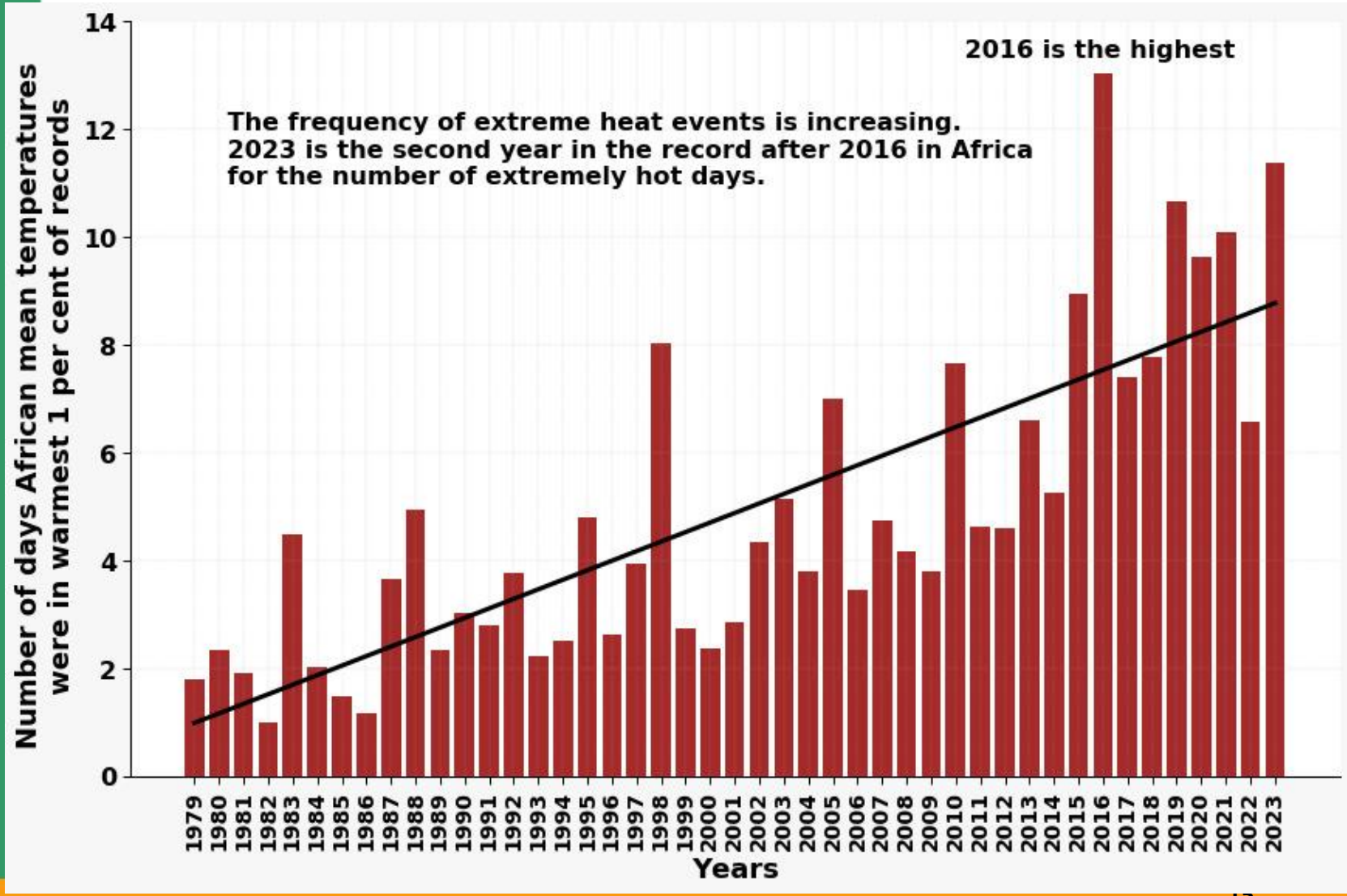
- 4 Regional Advanced Retransmission System for low earth orbiting satellite data contributing to implementation of **WMO and Africa space strategies and programmes, RARS data may unlock source of predictability in global and limited area models**
- **Contribute to research and development of Satellite Applications products for detecting, *tracking and forecasting severe thunderstorms***
- **Upcoming AMSAF is key for country level and local precise warnings to trigger evacuation and protection of exposed assets**





OUTPUT OF ABOUT 5 Million Euros AfDB Funded resilience building project

EXTREME TEMPERATURES AND HEAT WAVES SHOULD BE A PRIORITY FOR AFRICA MULTIHAZARDS EARLY WARNING AND ACTION SYSTEM.



CHALLENGES AND OPPORTUNITIES

1. *Limited expertise to cover all types of Hazards (e.g land and mud slides) in different sectors (e.g Health, agriculture, infrastructure)*

2. *Address the huge capacity and capability gaps (e.g establishing and operating situation rooms to generate and share information on hazards, impacts, preparation, anticipatory actions and response)*

3. *Assessment and management of compounding and cascading disasters*

4. *Prioritize training and operation of impact forecasting, warning, decision making and action as well as benefits assessments*

5. *Build on achievements of past projects including SAWIDRA for modernizing national warnings*

6. *Useful Predictability up to five days ahead for heavy rain events , tropical cyclones and storm tracks, disruptions on the start of season and spells*

7. *Assessment and management of Compounding and cascading disasters*

LESSONS LEARNT AND WAY FORWARD

1. ***Routine exchange of local impact data between communities, national, regional and continental stakeholders to accelerate impact forecasting and improve the production of the State of Climate for Africa supporting African Climate Negotiators on Loss and damage***
2. ***Operate the MultiHazards Advosiy Centre (staff including research and studies, internet, indirect costs $200 to 300 thousands) considering that Observation, data management , research, modelling and prediction/forecasting are funded components***
3. ***Capacity development with testbed and forecast demonstrations, ad hoc and regular briefings and debriefings at the situation room including with humanitarian and DRR communities***
4. ***Partner with ClimSA, AMSAF, HYDROMET …. For coordination***

- ***Train forecasters and DRR experts on tools and products***
- Support countries ***establish and operate national early warning Information system/centres***

4

THANK YOU