ACCOF-15

Regional Climate Outlook for the SADC Region

Period:

Monitoring: October – December 2023

Forecast: February to May 2024

Issue Date: February 2024

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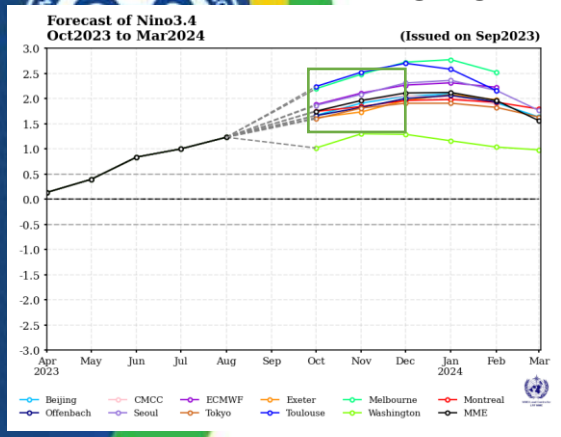
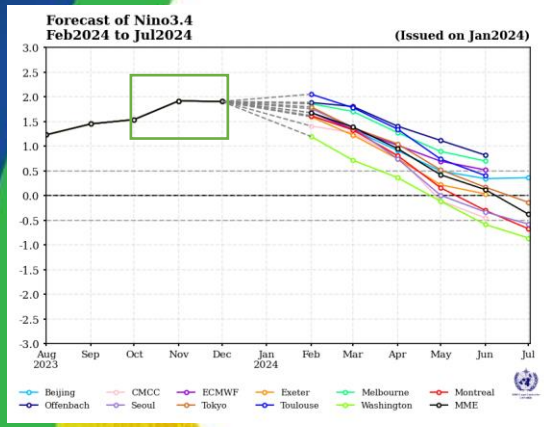
Outline

- Performance of the ONDJ 2023/24 period
- Performance and current state of regional climate drivers
  1. El Nino Southern Oscillation (ENSO) status and its forecast
  2. Indian Ocean Dipole (IOD) status and its forecast
  3. Status of other drivers and their forecasts
- GPCs rainfall forecast for FMAM 2024 season
- SADC Regional Seasonal Climate Outlook for FMAM 2024 Season

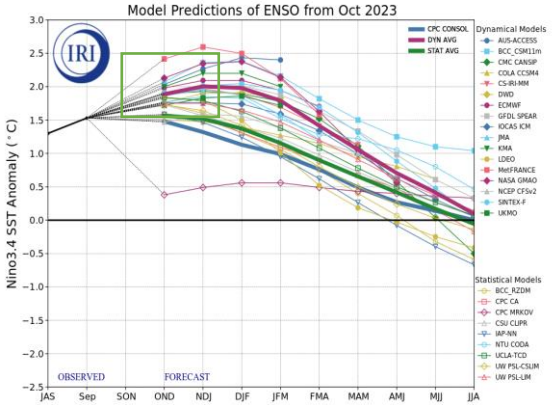
Teleconnections analysis - Index plumes Obs and Fcst

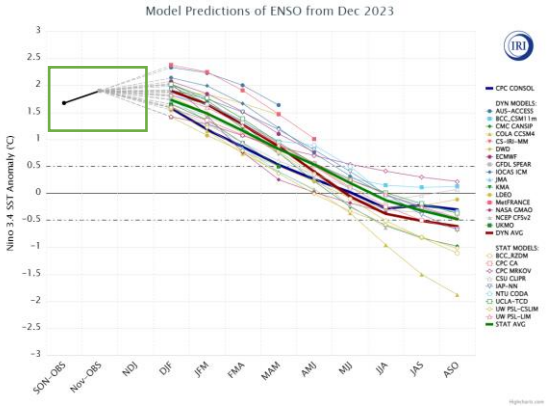
WMO-LC



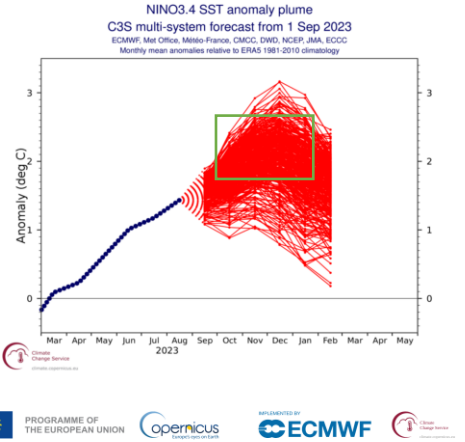


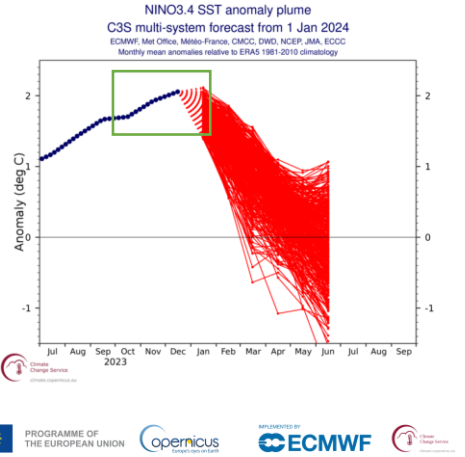
IRI





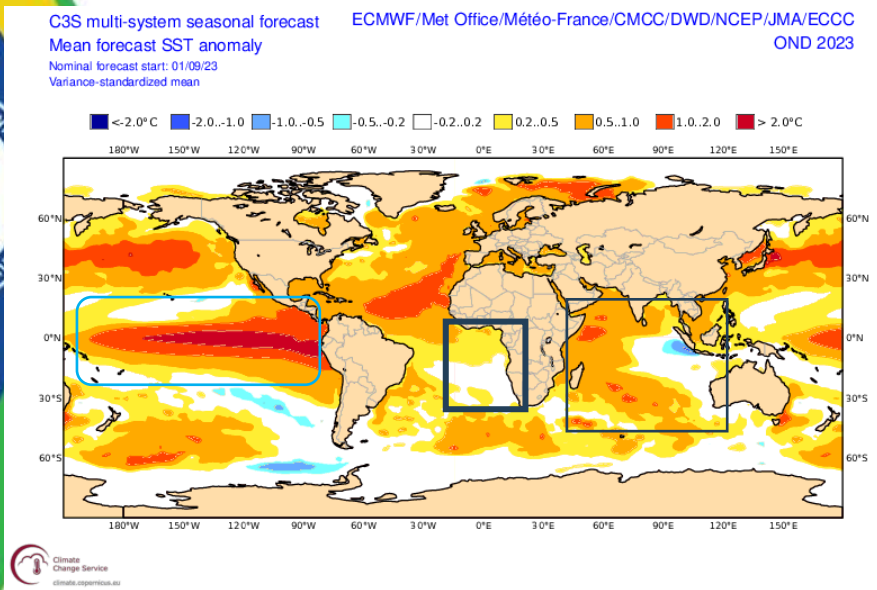
C3S



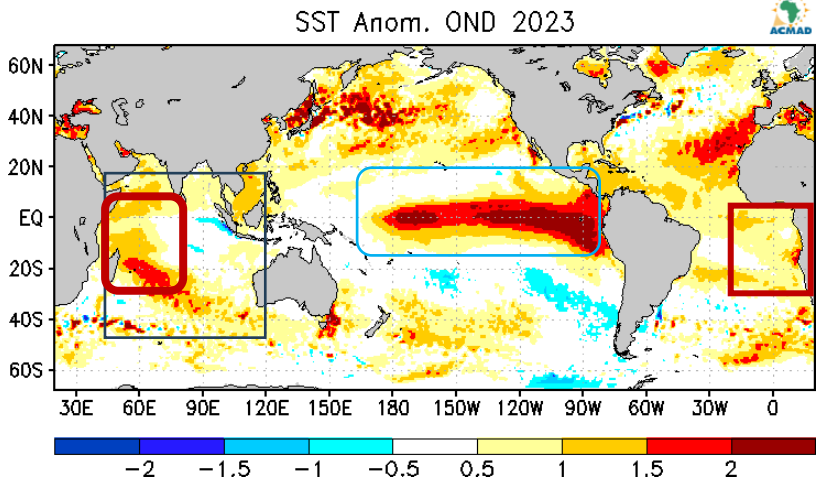


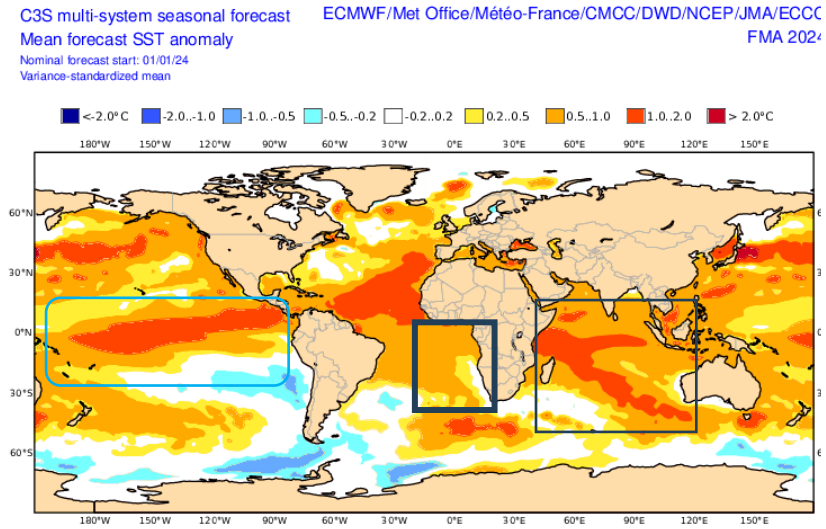
Teleconnections analysis (i,e ENSO)

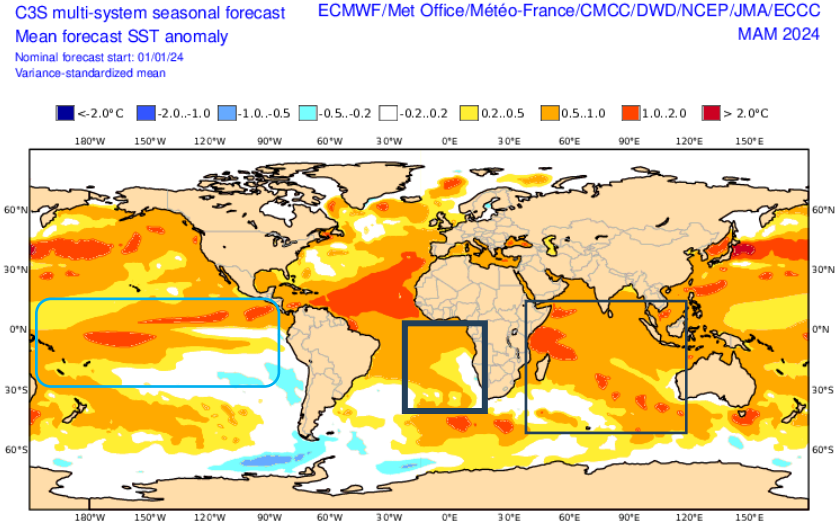
Sea Surface Temperatures mean anomaly outlook



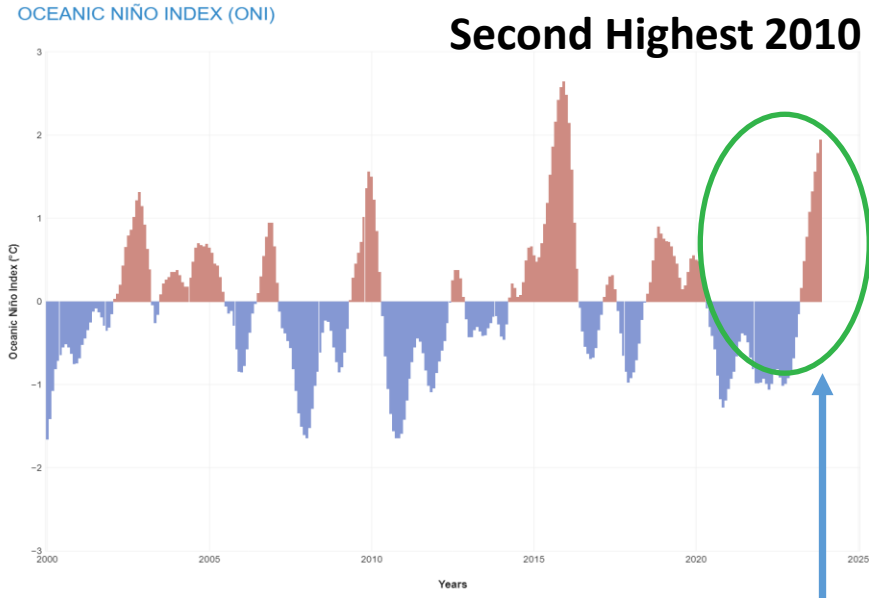
Observed Sea Surface Temperatures mean anomaly







What transpired

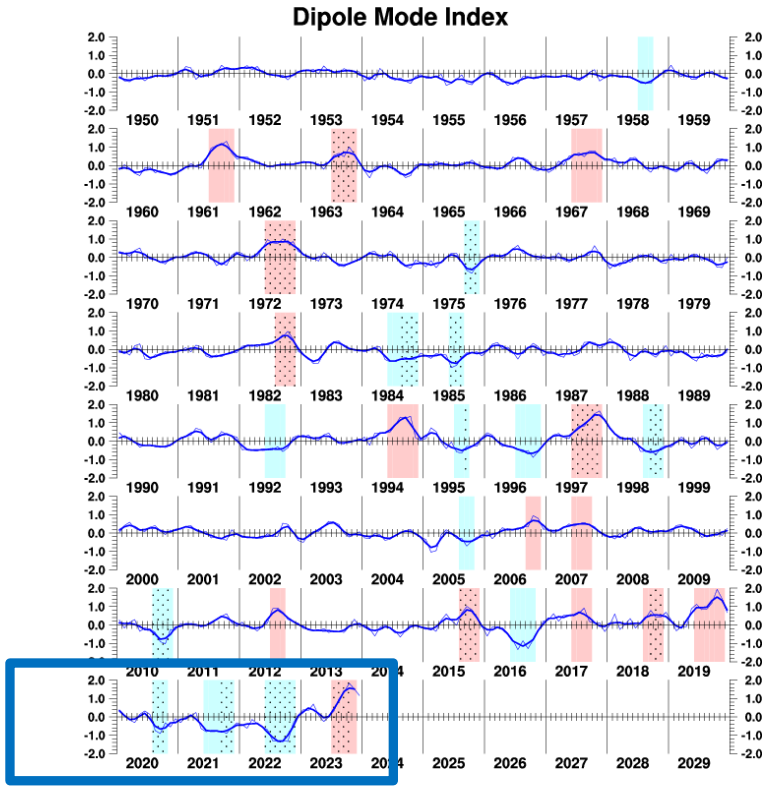


Second Highest 2010

2009	-0.8	-0.8	-0.6	-0.3	0.0	0.3	0.5	0.6	0.7	1.0	1.4	1.6
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2010	1.5	1.2	0.8	0.4	-0.2	-0.7	-1.0	-1.3	-1.6	-1.6	-1.6	-1.6
2011	-1.4	-1.2	-0.9	-0.7	-0.6	-0.4	-0.5	-0.6	-0.8	-1.0	-1.1	-1.0
2012	-0.9	-0.7	-0.6	-0.5	-0.3	0.0	0.2	0.4	0.4	0.3	0.1	-0.2
2013	-0.4	-0.4	-0.3	-0.3	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.5	-0.3	0.0	0.2	0.2	0.0	0.1	0.2	0.5	0.6	0.7
2015	0.5	0.5	0.5	0.7	0.9	1.2	1.5	1.9	2.2	2.4	2.6	2.6
2016	2.5	2.1	1.6	0.9	0.4	-0.1	-0.4	-0.5	-0.6	-0.7	-0.7	-0.6
2017	-0.3	-0.2	0.1	0.2	0.3	0.3	0.1	-0.1	-0.4	-0.7	-0.8	-1.0
2018	-0.9	-0.9	-0.7	-0.5	-0.2	0.0	0.1	0.2	0.5	0.8	0.9	0.8
2019	0.7	0.7	0.7	0.7	0.5	0.5	0.3	0.1	0.2	0.3	0.5	0.5
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2020	0.5	0.5	0.4	0.2	-0.1	-0.3	-0.4	-0.6	-0.9	-1.2	-1.3	-1.2
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4	-0.1	0.2	0.5	0.8	1.1	1.3	1.6	1.8	1.9	

Observed evolution of IOD

- Was forecasted to be positive, and it has been positive during the OND 2023 rainfall season and will soon become neutral

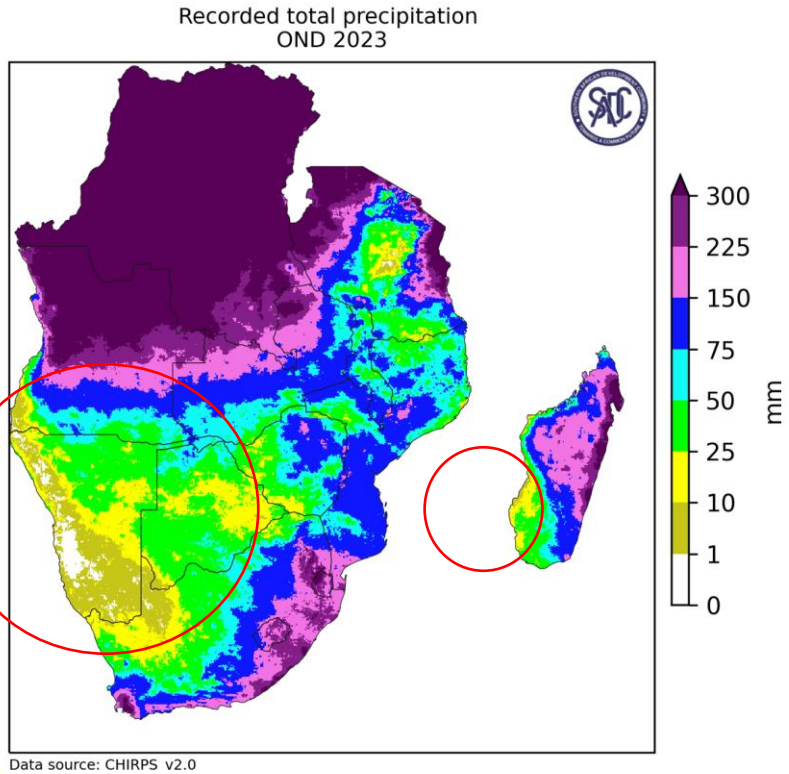


https://ds.data.jma.go.jp/tcc/tcc/products/elnino/iodevents.html

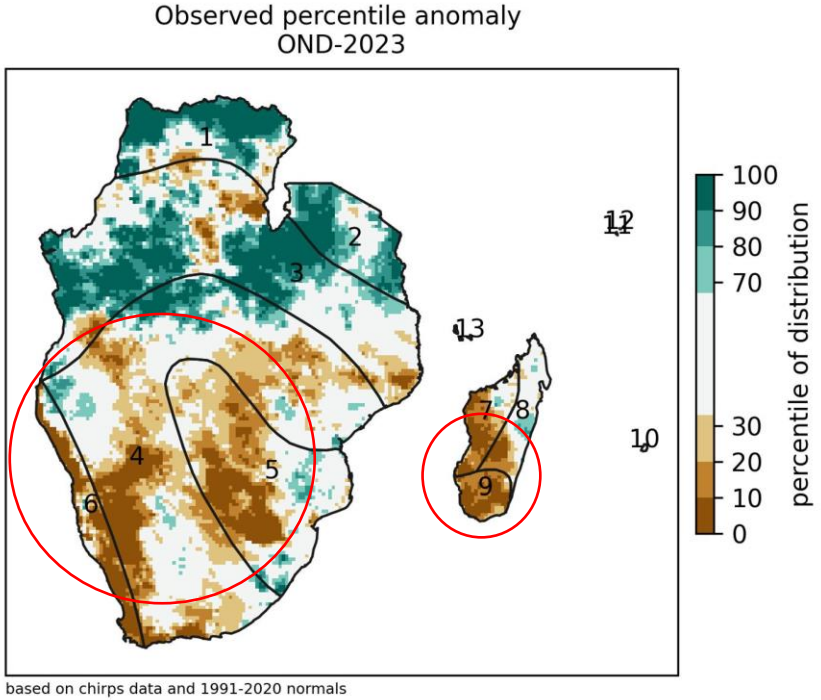
SADC Regional Seasonal Climate Drivers

Rainfall in October-November-December 2023

Observed rainfall

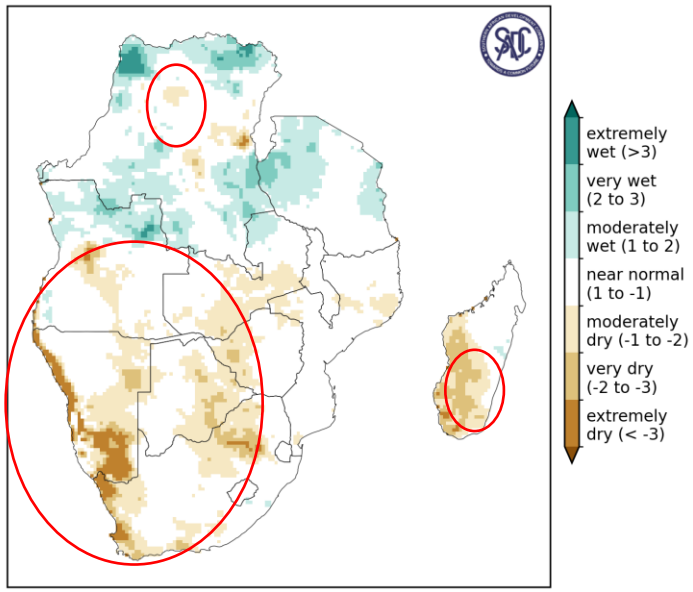


Observed rainfall anomaly

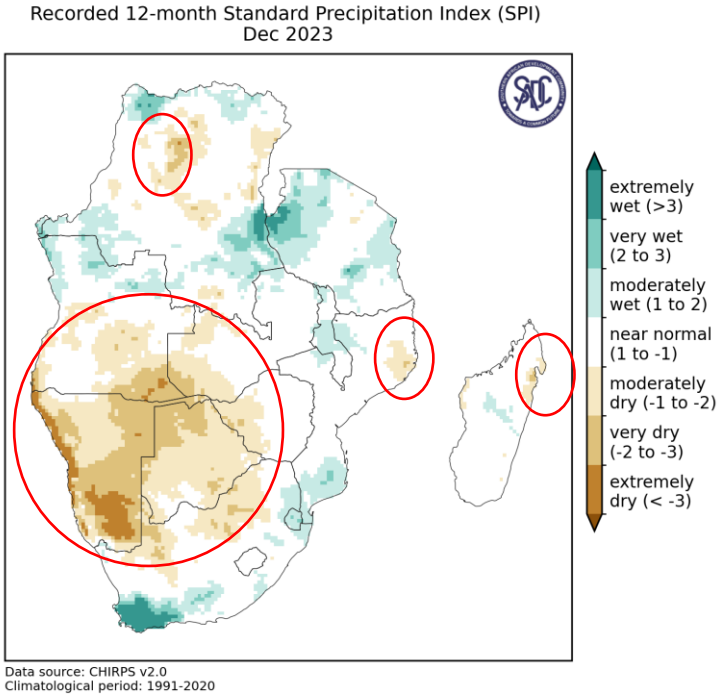


IMPACTS OF THE RAINFALL DISTRIBUTION - SPI

SPI-3 for OND 2023

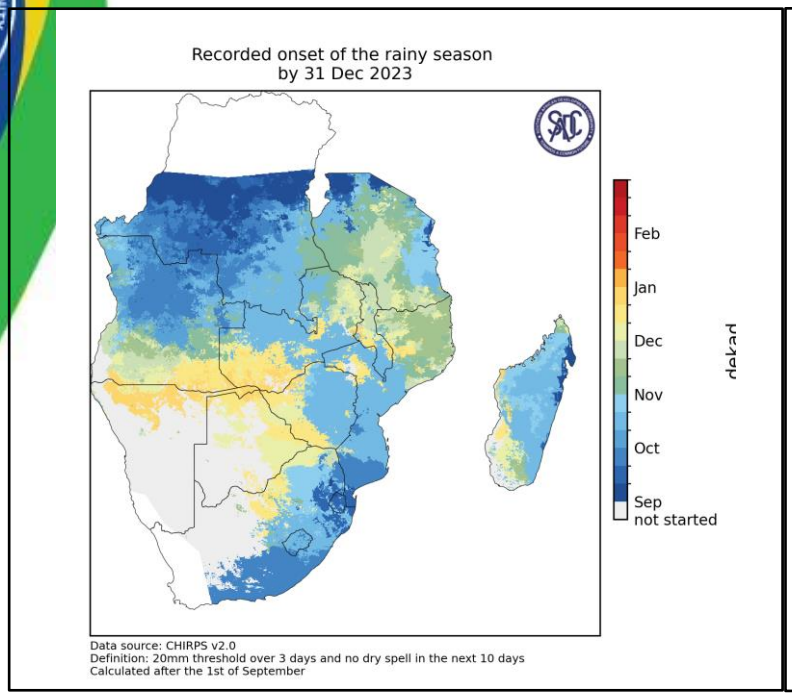


SPI-12

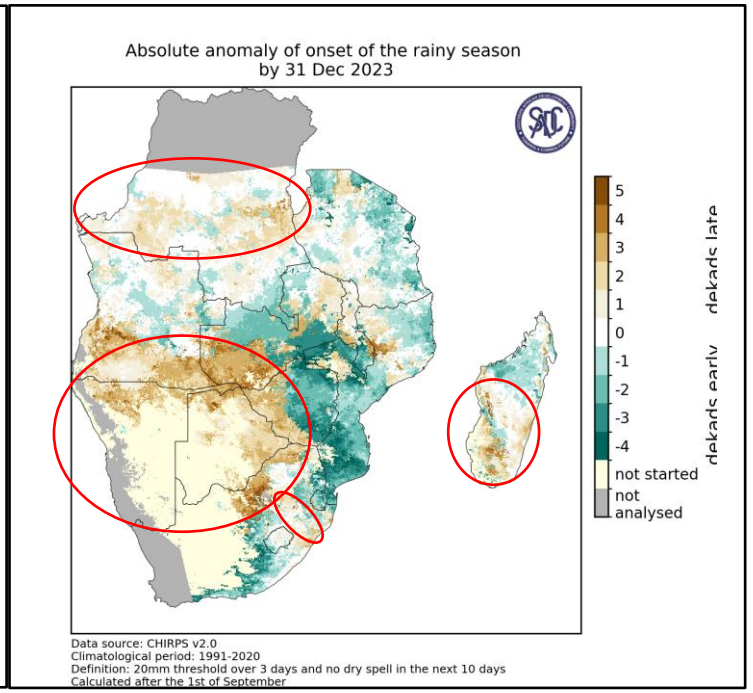


IMPACTS OF THE RAINFALL DISTRIBUTION - ONSET

ONSET – 2023/24 Season



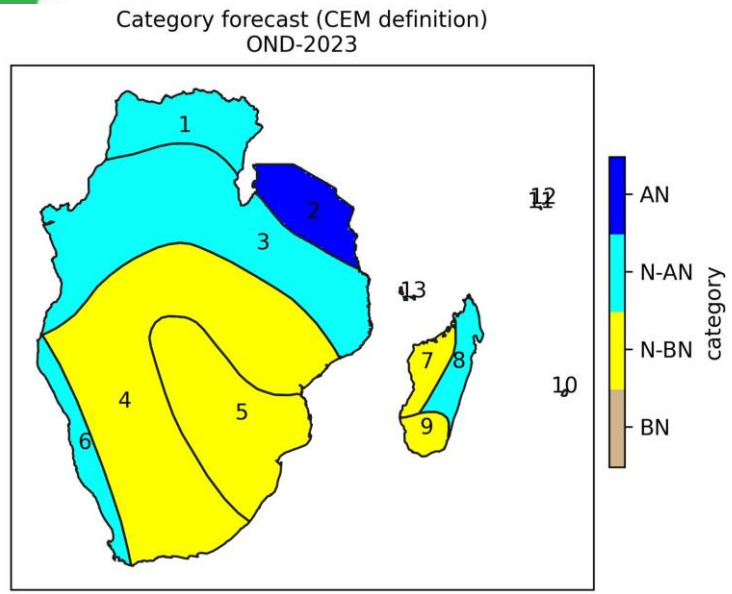
Early or Late ONSET



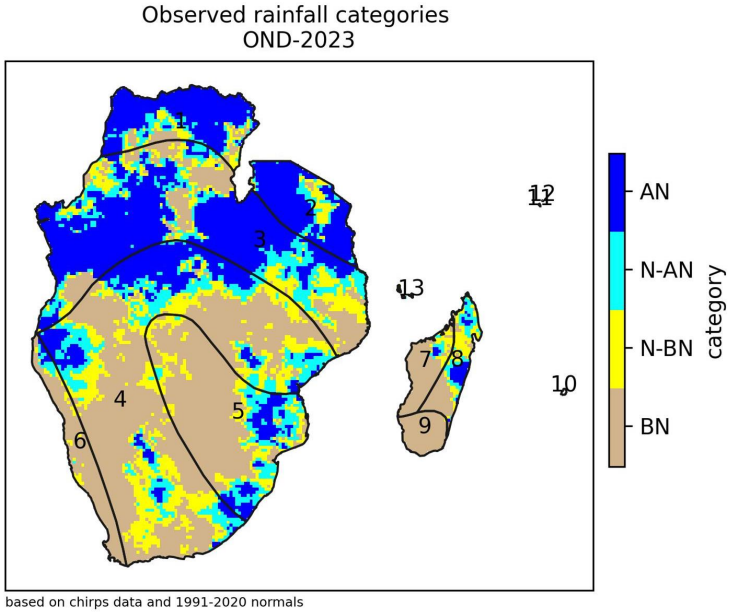
ONSET: Defined as accumulation of at least 20mm of rainfall over three days, which are not followed by a dry spell in the next 10 days (i.e. there is at least one rainfall event in the next 10 days)

Forecast vs. observed October November December 2023

Forecast issued in Sep 2023



What actually happened

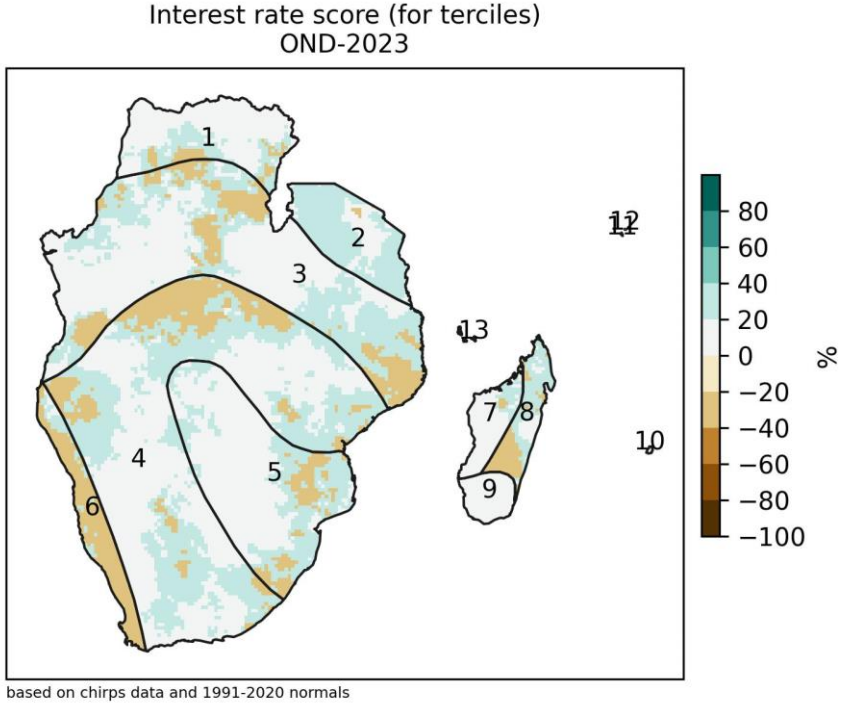


Note that colours in these maps correspond to each other

Verification of October November December 2023 Outlook

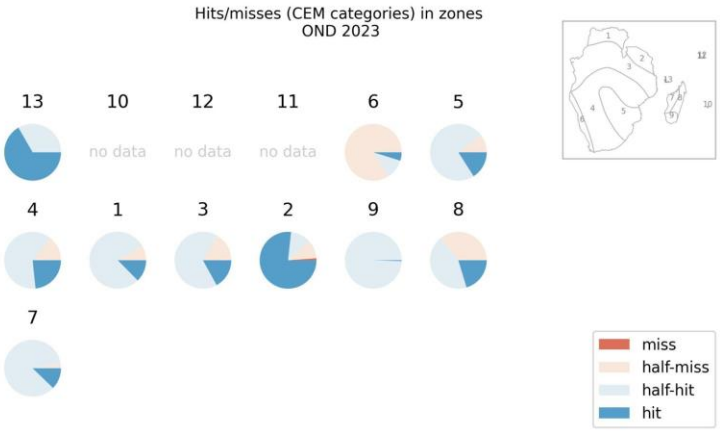
Interest rate is one of WMO-recommended skill scores expressing “return on investment” in the forecast

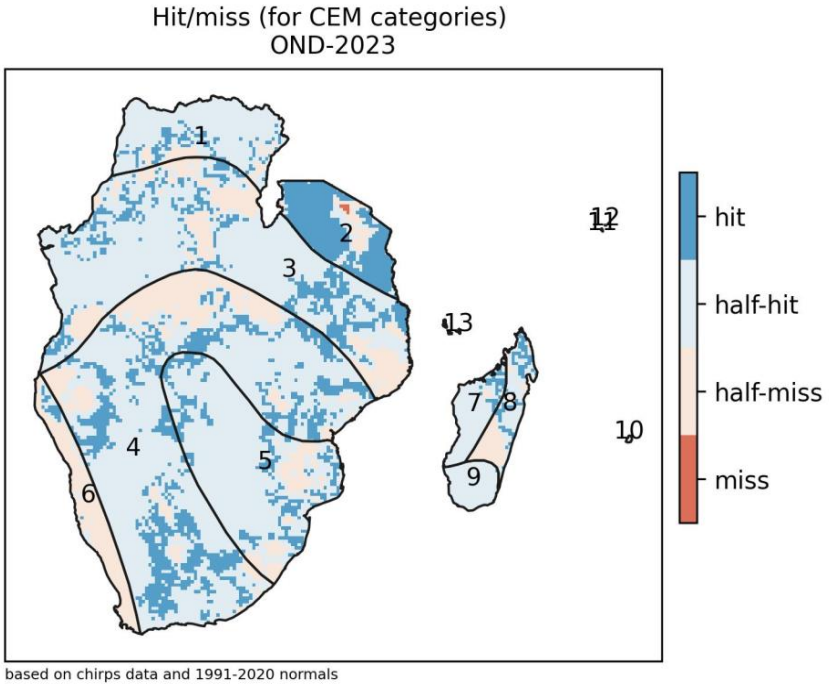
- positive values - forecast beneficial
- negative values - forecast not beneficial



Verification of October November December 2023 Outlook

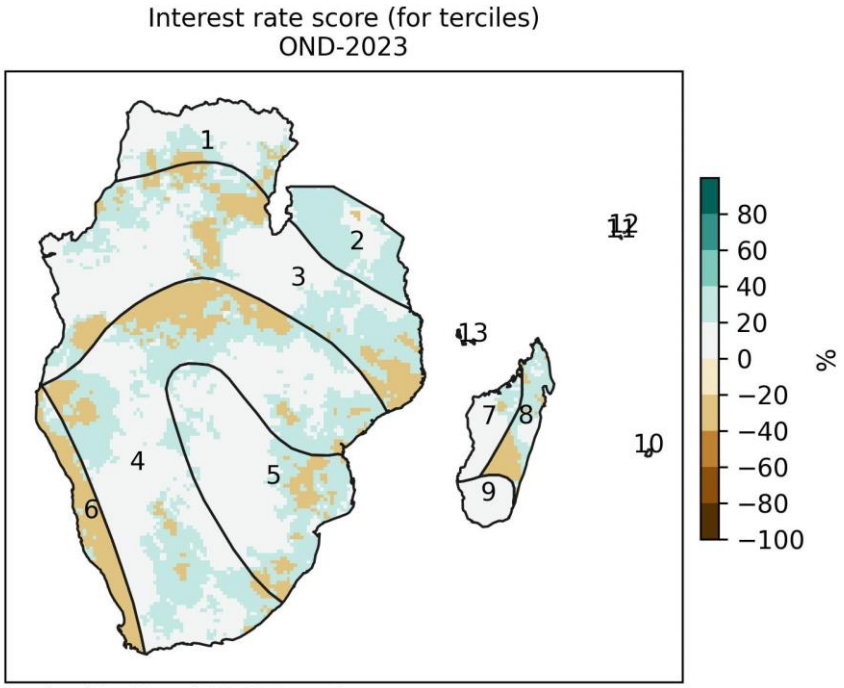
- hit - correct category forecasted
- half hit - correct direction of anomaly forecasted
- half miss - forecast missed direction
- miss - forecast missed category

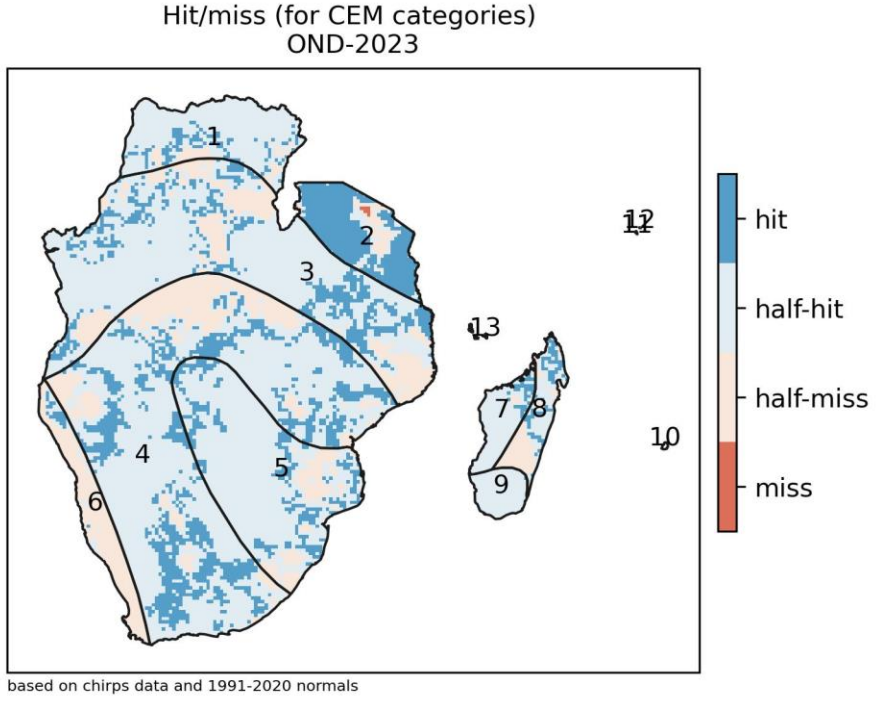




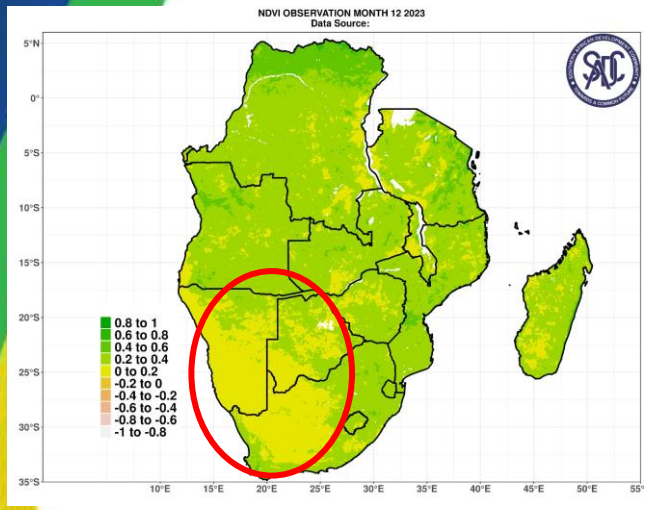
Summary of October-November-December 2023 period

- The seasonal outlook performed very well over most parts of the region, but
- It was poor in a few parts at the center of the region and the extreme southwestern areas.
- Dynamical models also under performed during the OND 2023 season in the same parts of the region and performed well in the other parts of the region.



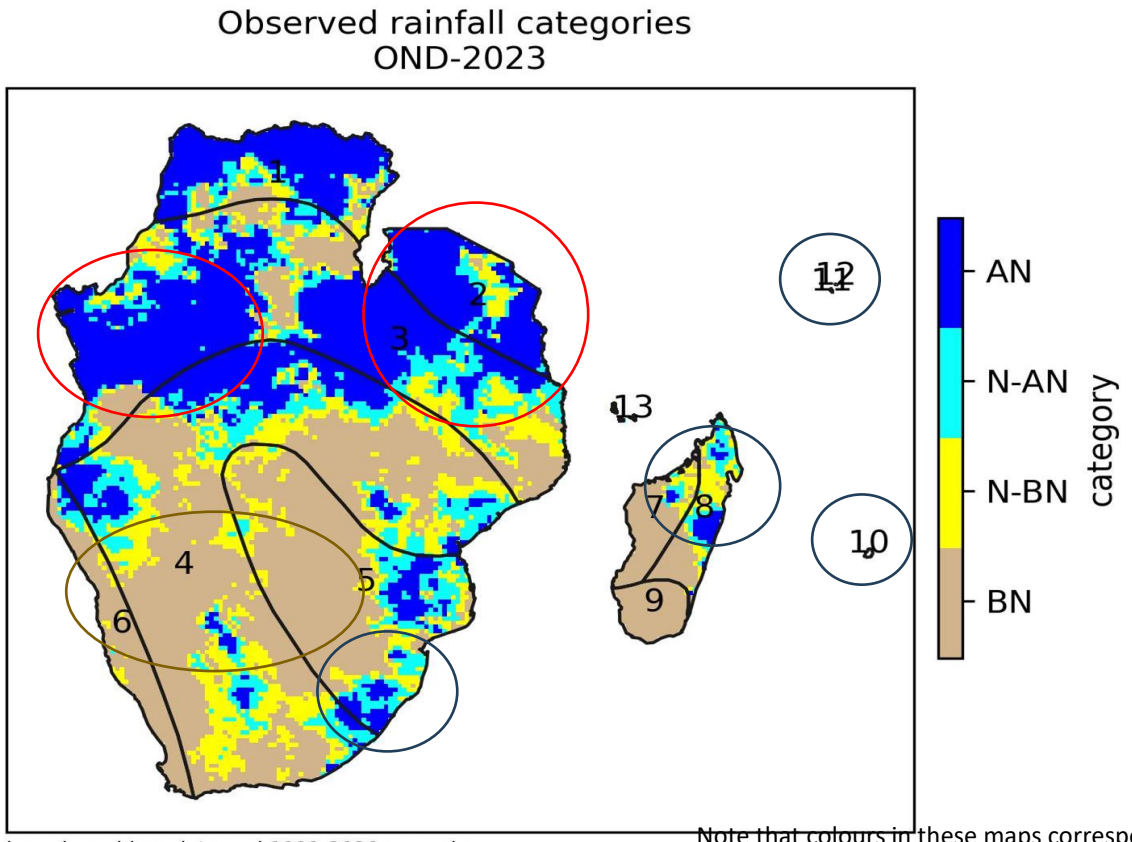


Vegetation conditions



- Vegetation Index (NDVI) shows well below average vegetation conditions in many areas where livestock is a major livelihood, including southern Angola, Namibia, Botswana, southern Zambia and western Zimbabwe. In some of these areas, reports of drought-related livestock deaths have been received. The situation is likely to worsen with the ongoing dryness, and the forecast below average rainfall as per SARCOF and several national forecasts.

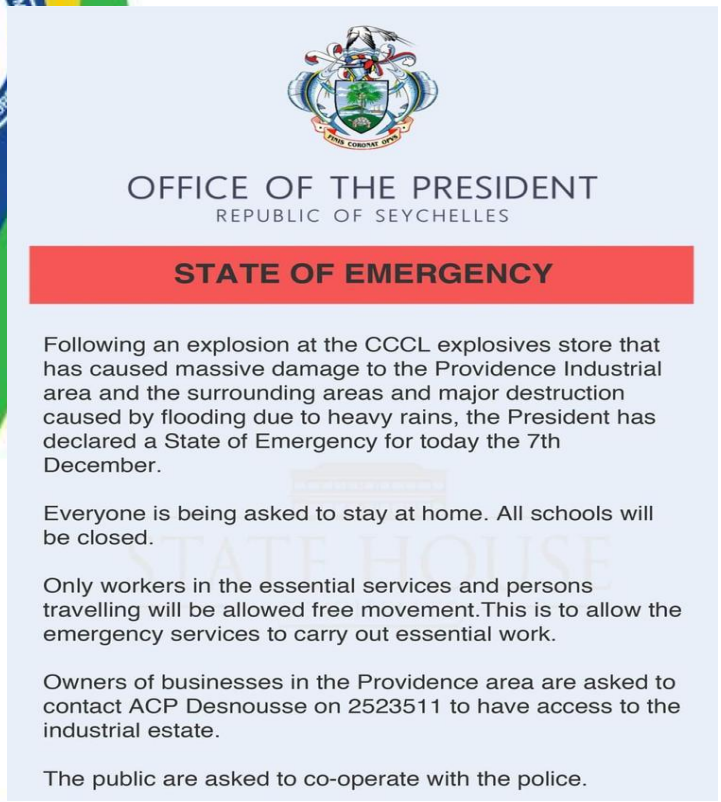
Reported Impacts by MS



based on chirps data and 1991-2020 normals

Note that colours in these maps correspond to each other

Seychelles: Extreme event Case - 6th December 2023



OFFICE OF THE PRESIDENT
REPUBLIC OF SEYCHELLES

STATE OF EMERGENCY

Following an explosion at the CCCL explosives store that has caused massive damage to the Providence Industrial area and the surrounding areas and major destruction caused by flooding due to heavy rains, the President has declared a State of Emergency for today the 7th December.

Everyone is being asked to stay at home. All schools will be closed.

Only workers in the essential services and persons travelling will be allowed free movement.This is to allow the emergency services to carry out essential work.

Owners of businesses in the Providence area are asked to contact ACP Desnousse on 2523511 to have access to the industrial estate.

The public are asked to co-operate with the police.

- Extremely Heavy Rainfall occurred on the evening of 6th December 2023 between 6pm and 11pm, with up to **360mm** reported **within the 6hrs !**
- **Massive flooding and landslides** occurred resulting in casualties and damages.
- **Three fatalities** were reported in the northern part of Mahe Island due to the floods.
- **State of Emergency** declared by the Office of the President on the morning of 7th December
- Several **houses and roads** were **destroyed** with **landslides** being reported in several areas

Tanzania

November 2024

Off season rains - January 2024

Tanzania

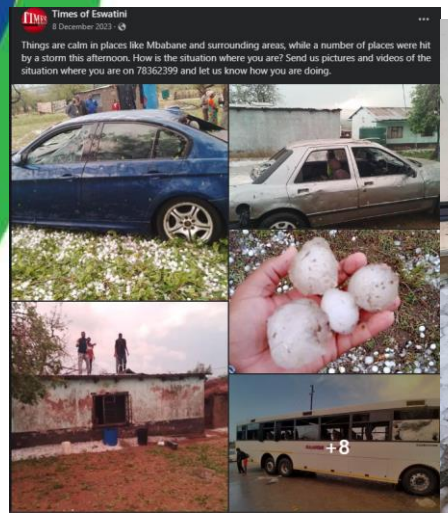
January, 2024

South Africa: Impacts

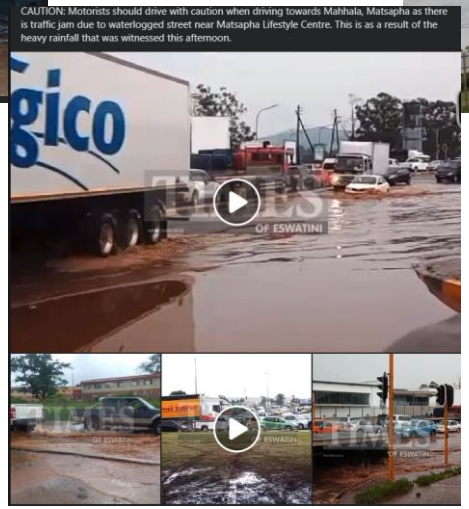
24 December 2023 Kwazulu-Natal Floods

"As of Friday, 29 December 2023, a total of 21 bodies have been recovered," said police spokesperson Colonel Robert Netshiunda.

Heavy Hailstorm 8 Dec

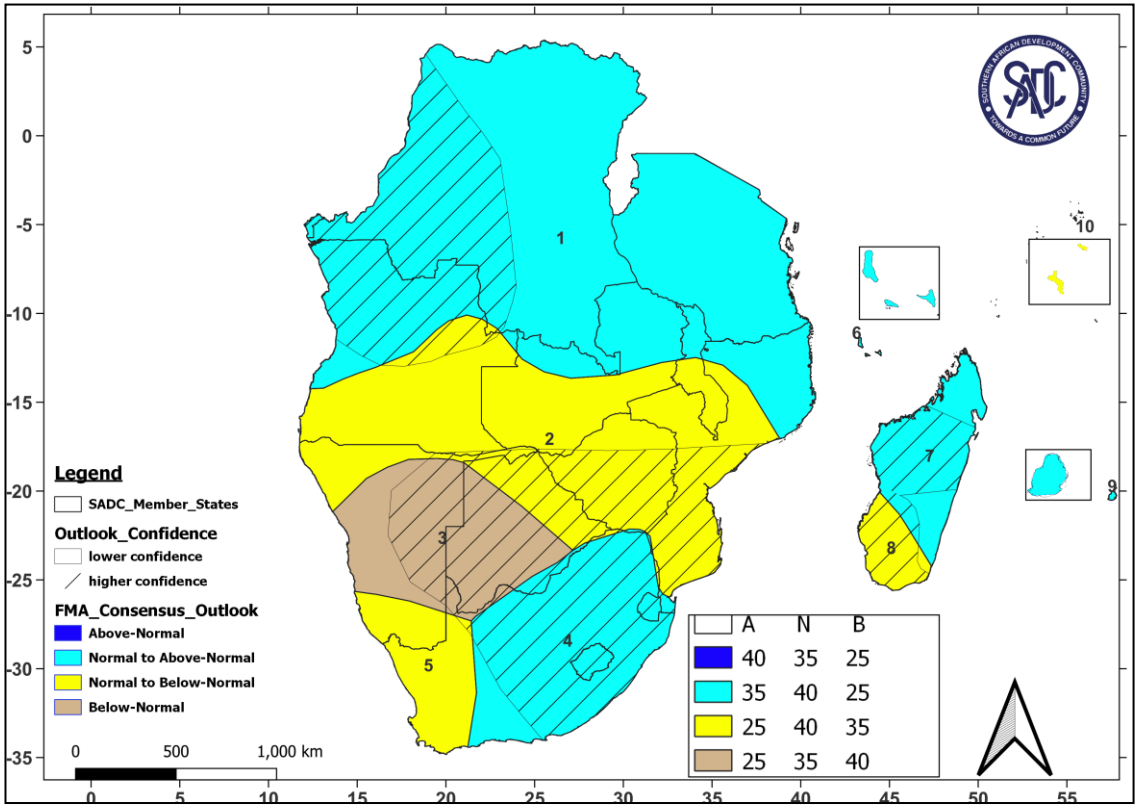


Matsapha and KaShali (Ngwane Park) 11 Jan 2024

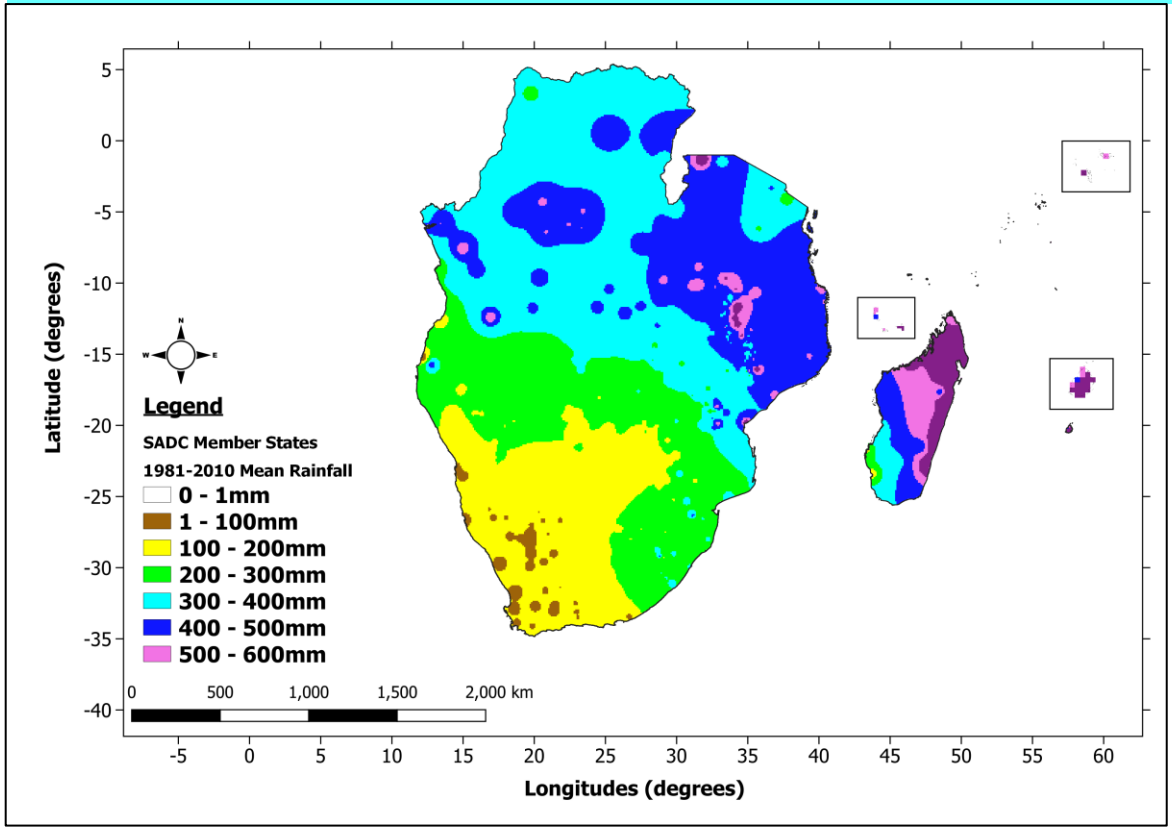


Drought cases in Botswana and Namibia

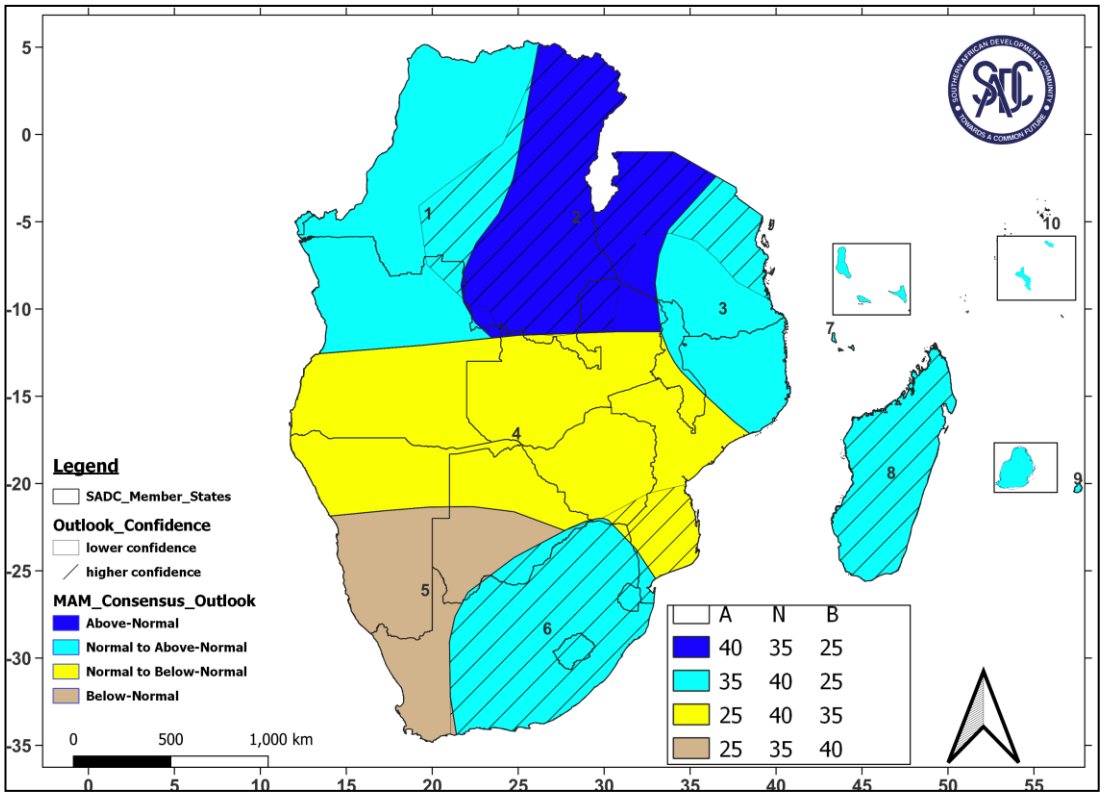
Seasonal Outlook for FMA 2024



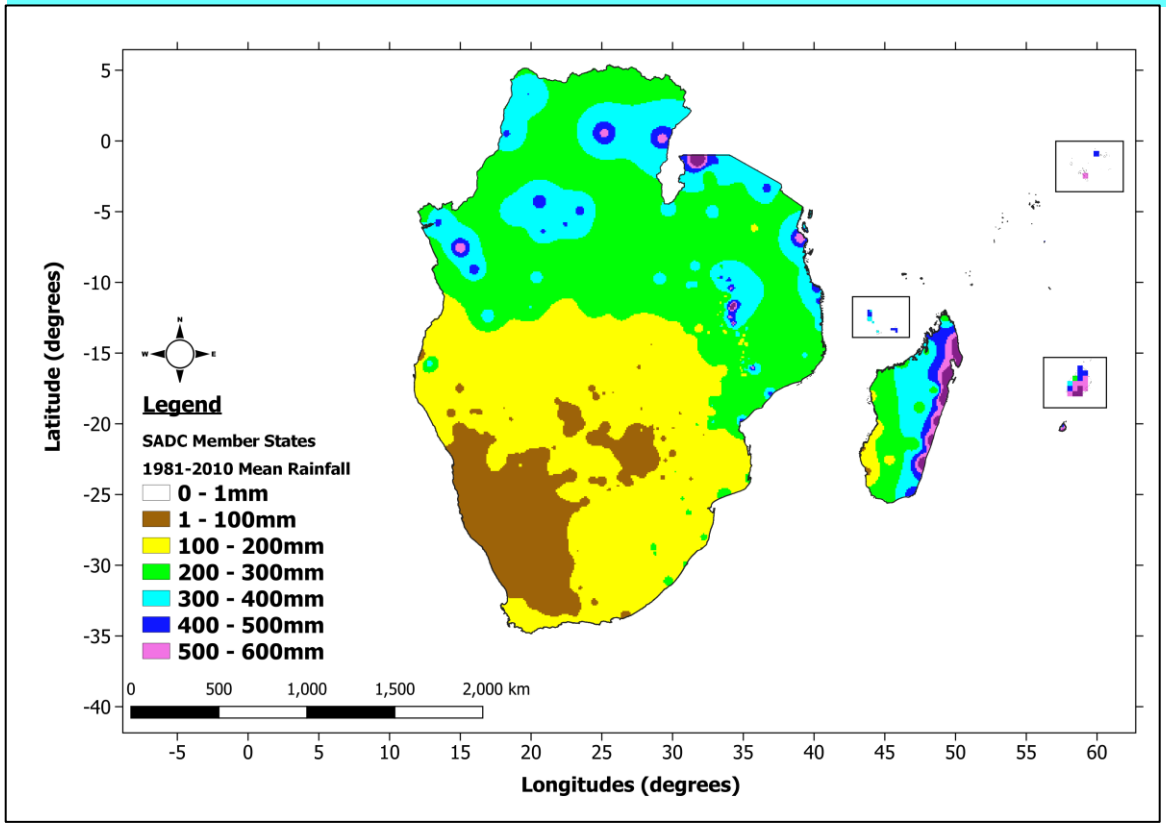
Long-term rainfall for FMA



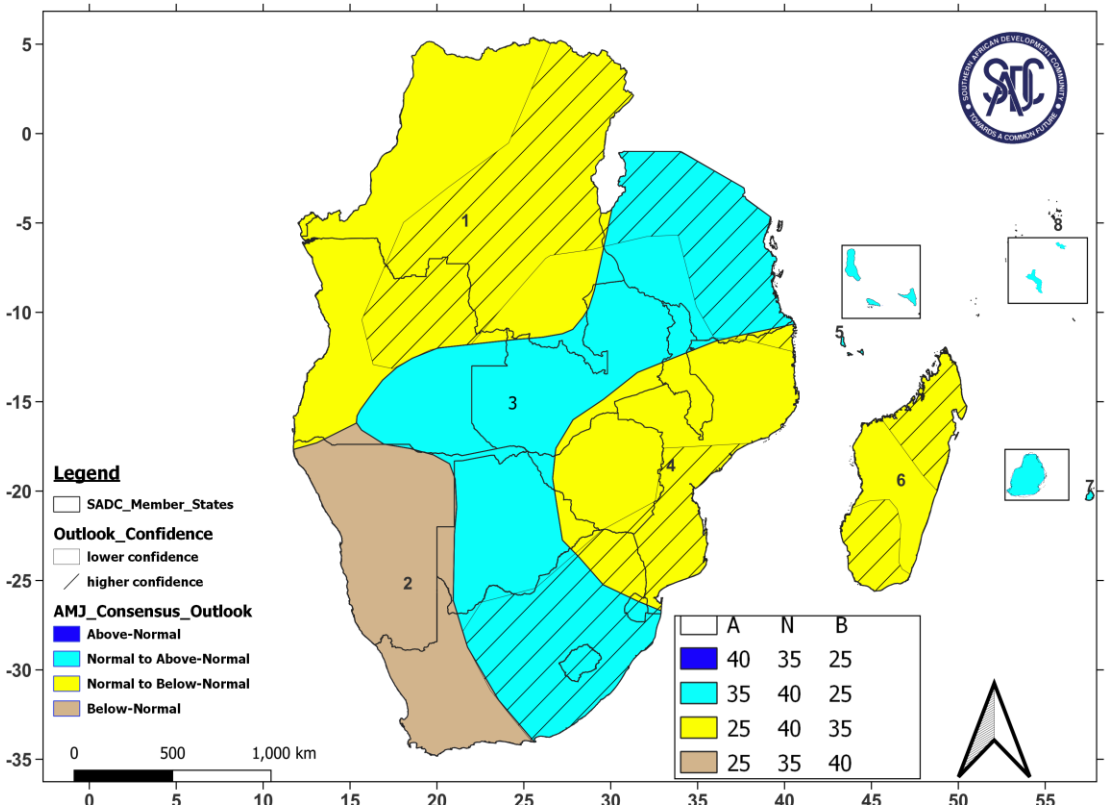
Seasonal Outlook for MAM 2024



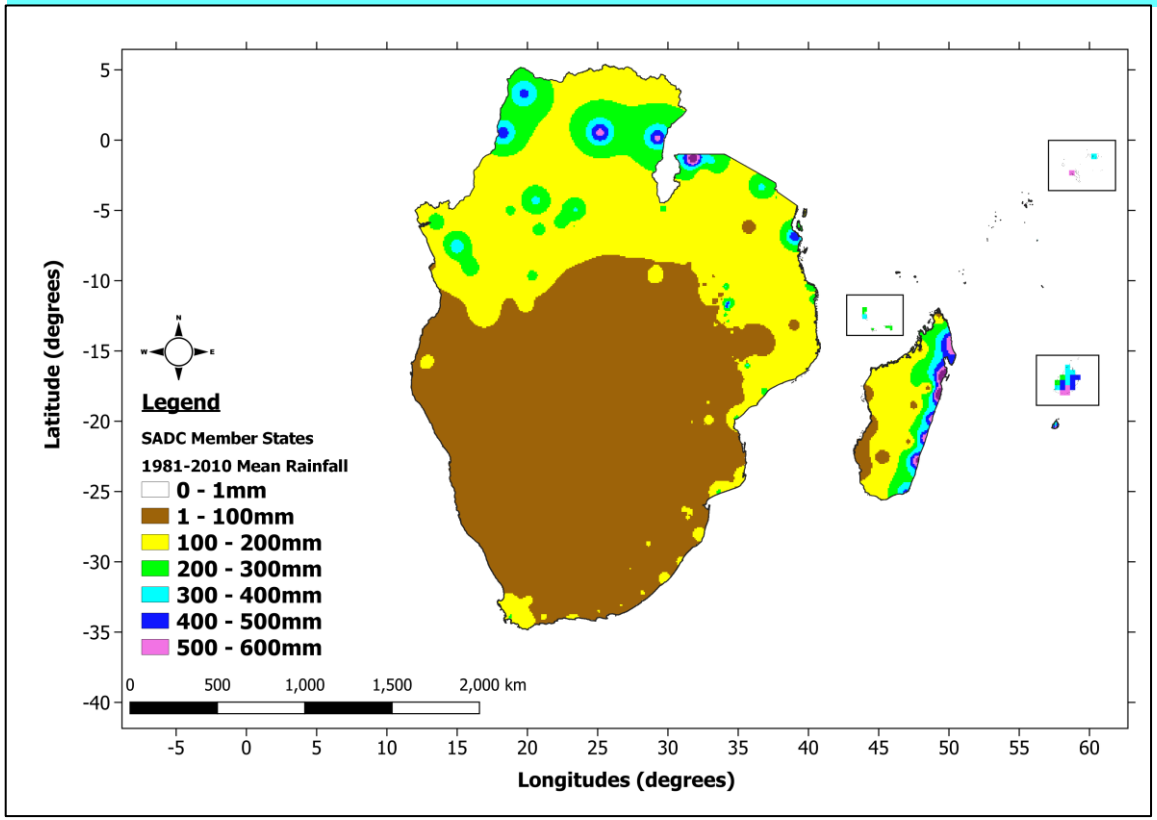
Long-term rainfall for MAM



Seasonal Outlook for AMJ 2024



Long-term rainfall for AMJ



GLOBAL PRODUCING CENTRES' (GPCS) OVERVIEW FOR THE Feb-May 2024 SEASON

The outlook is broadly consistent with the forecasts generated with the multi-model ensemble of international dynamical climate forecast mode presented by the World Meteorological Organization and other international organizations.

In summary, increased probability of above normal conditions is forecasted by the dynamical models over Tanzania and eastern DRC as well as over small island states.

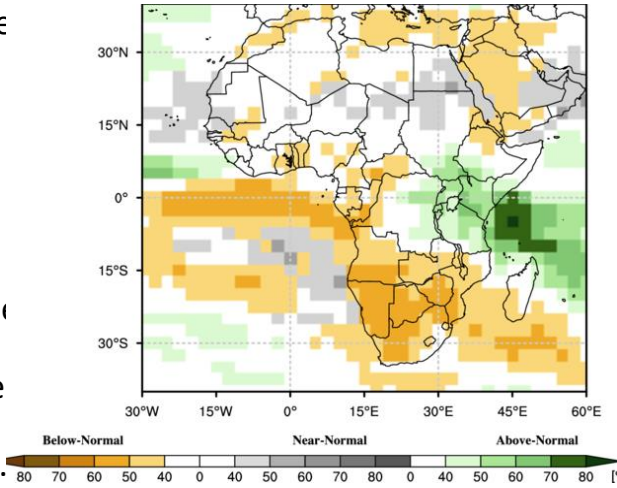
Below normal conditions are forecasted for all other countries within th continent, apart from the south-eastern coast of South Africa, where normal conditions are expected. The dry anomalies are forecasted to be particularly strong over the central-western part of SADC region - southern Angola, Namibia, western Botswana and western South Africa.

Over Madagascar - above normal conditions are forecasted for its northern part, while below normal for its southern part.

These forecasts are relatively consistent across the February to June 2024 period, with minor differences between sub-seasons.

Different multi-model forecasting systems agree relatively well in the overall direction of the anomalies, although their demonstrated skill varies.

MME Forecast for MAM



Seasonal Outlook confidence

This year, SARCOF outlook maps are annotated with information on confidence of the forecast.

Forecasts carry a different level of certainty, which reflects factors such as:

- the relative role of the predictable vs. the non-predictable (random) component of climate
- the strength of climate processes that allow forecasters to make a prediction
- the quality of data and the level of understanding of climate drivers that affects the ability of the forecasting system, model or approach to capture all relevant processes that determine future climate

These factors vary in space and in time - they change slightly every year and depend on location and season that is forecasted.

As presented in the outlook maps, the confidence information has been derived based on:

- numerically assessed level of agreement of various forecasting approaches in terms of direction and magnitude of forecasted anomalies
- numerically assessed level of skill, or ability of these forecasting approaches to correctly forecast conditions during previous forecasts
- level of confidence in the forecast expressed by the forecasters

While the forecast for regions/seasons with higher confidence could be interpreted and acted upon with more assuredness, those with lower confidence should be considered with more caution. In any case, irrespective of confidence, the user is advised that the forecast, as presented in the outlook document, indicates only increased probability that the forecast category will occur (as per probabilities indicated in the maps), rather than give an assurance that it will occur.

THANK YOU

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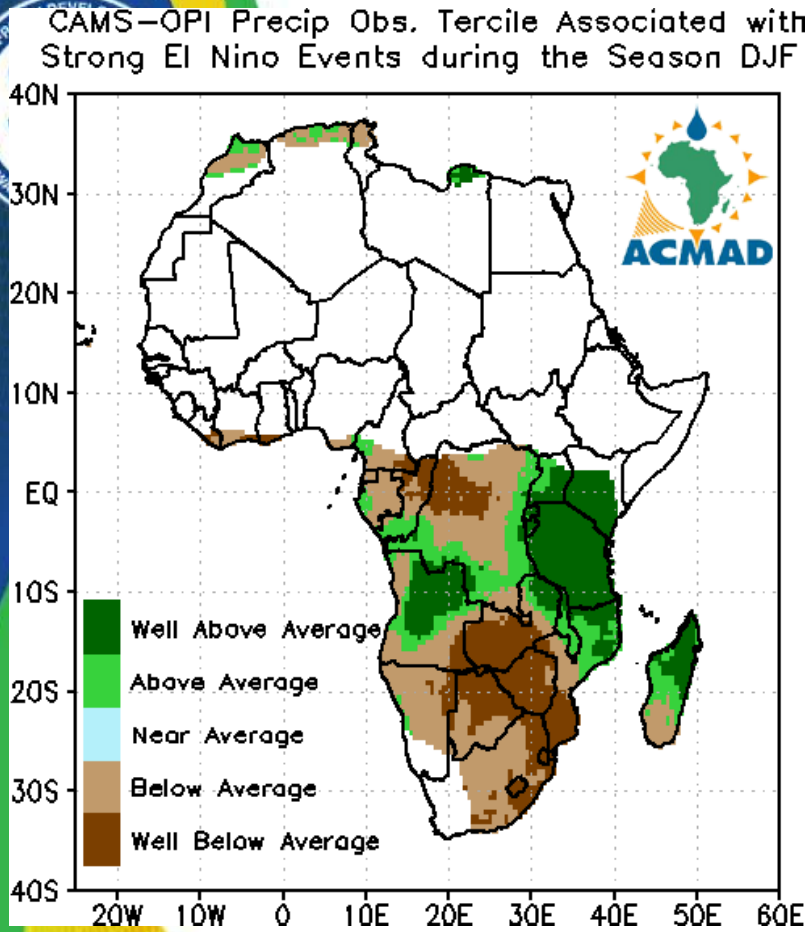
Climatological Rainfall distribution pattern during El Nino

Strong El Nino



Weak El Nino