AFRICA: Monthly Climate Outlook August to May

Issued: November 2023

Overview

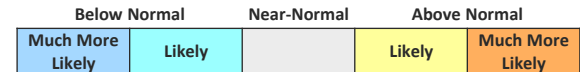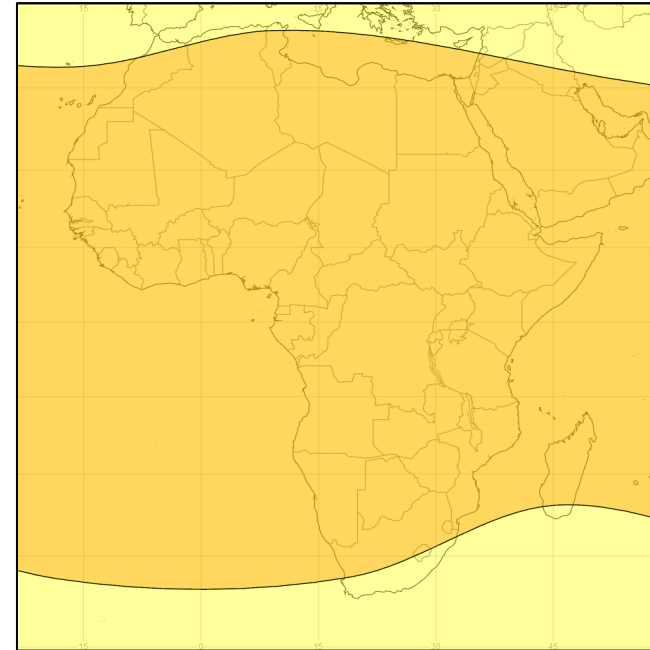# Africa Current Status and Outlook - Temperature

Current Status:
Over the last three months, temperatures were hotter than normal in West Africa. The exception being Liberia, Ghana and Nigeria which were colder than normal in August. Central and eastern Africa were mostly warm or hot over the last three months, though a few areas in eastern Africa were cool in September. In most of Southern Africa, in August and September temperatures were cool or cold, continuing into October for South Africa, Zambia and Madagascar.

Outlook:
Consistent with a warming climate, it is likely or much more likely to be warmer than normal across most of the continent over the next three months.

3-Month Outlook December to February - Temperature

Below Normal		Near-Normal	Above Normal	
Much More Likely	Likely		Likely	Much More Likely

# Africa Current Status and Outlook - Rainfall

Current Status:
Over the past three months, in West Africa rainfall was mostly near-normal though Cameroon and Nigeria were dry or very dry. DRC was very dry in August and September, while Chad and Niger were wet in September. Ahead of the Short Rains season in October-December, most parts of East Africa had near-normal rainfall or were dry in August and September. In October, Kenya, Ethiopia and Somalia were wet or very wet. Rainfall was mostly near-normal in Southern Africa August and September. In October, Zambia, Zimbabwe and Mozambique were wet or very wet.

Outlook:
Over the next three months, consistent with both the current El Niño event and a positive Indian Ocean Dipole (IOD), it is likely or much more likely to be wetter than normal in East Africa, the west of the DRC, and the north of Zambia, Mozambique and Madagascar.

In southern Africa, it is likely to be drier than normal in South Africa and parts of Namibia and Botswana.

3-Month Outlook December to February - Rainfall

Below Normal		Near-Normal	Above Normal	
Much More Likely	Likely		Likely	Much More Likely
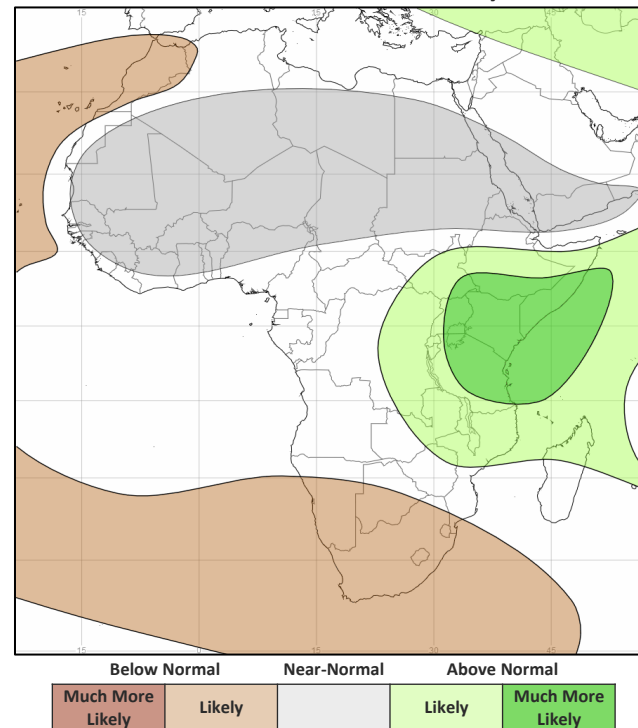
Global Outlook - Temperature

Outlook:

With the backdrop of a warming climate and the current El Niño event, most land areas are likely or much more likely to be warmer than normal over the next few months, the only exception being the southern tip of South America.

3-Month Outlook December to February - Temperature

Below Normal		Near-Normal	Above Normal	
Much More Likely	Likely		Likely	Much More Likely
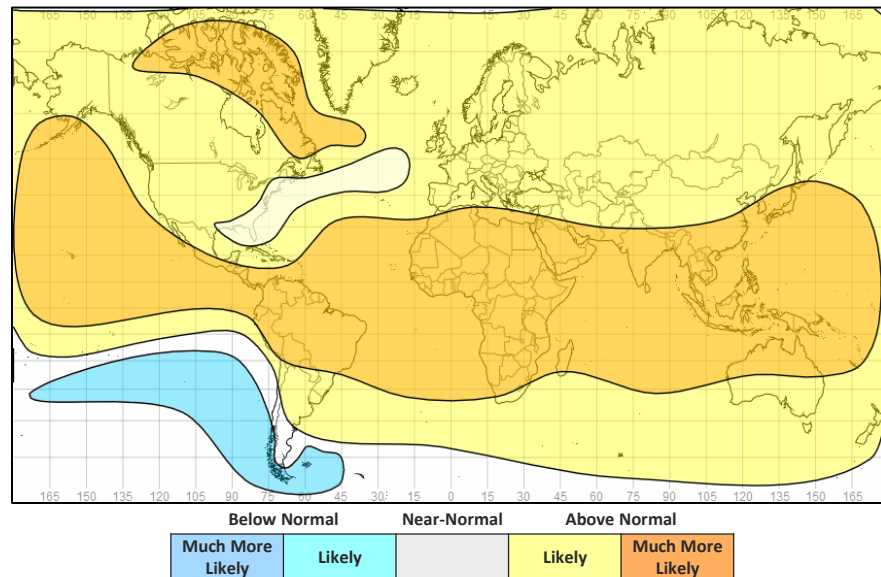
Global Outlook - Rainfall

Outlook:

El Niño-Southern Oscillation (ENSO) – Sea surface temperatures (SSTs) across the equatorial Pacific remain indicative on an ongoing El Niño event. In the Niño 3.4 region SSTs are currently 1.4°C above normal and the atmospheric response is now consistent with El Niño conditions. The current El Niño is moderate in strength.

Seasonal prediction models indicate a moderate or strong El Niño is likely to continue through to the Northern Hemisphere spring (62% chance during April-June 2024).
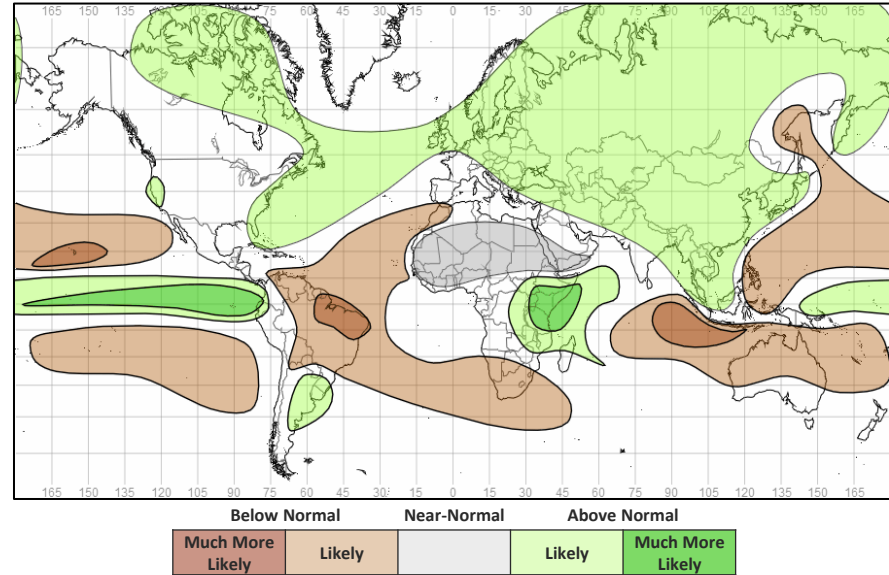
El Niño impacts regional weather patterns around the world, leading to some regions experiencing wetter than normal conditions and other regions drier than normal conditions. During El Niño, temperatures around the globe are likely or much more likely to be higher than normal, and this is reflected in the current outlooks.

Indian Ocean Dipole (IOD) – The Indian Ocean Dipole is currently positive.

Seasonal forecasts currently suggest that this event will persist until the end of year before returning to neutral conditions early in 2024.

This will reinforce the influence of El Niño, further increasing the likelihood of drought across Southeast Asia (especially Indonesia) and Australia, with above normal rainfall across East Africa, increasing the risk of floods.

3-Month Outlook December to February - Rainfall

Below Normal		Near-Normal	Above Normal	
Much More Likely	Likely		Likely	Much More Likely

Current Status

Current Status – Temperature percentiles

August

September

October

Temperature Percentiles (BLUE below 20th and RED above 80th)

| 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
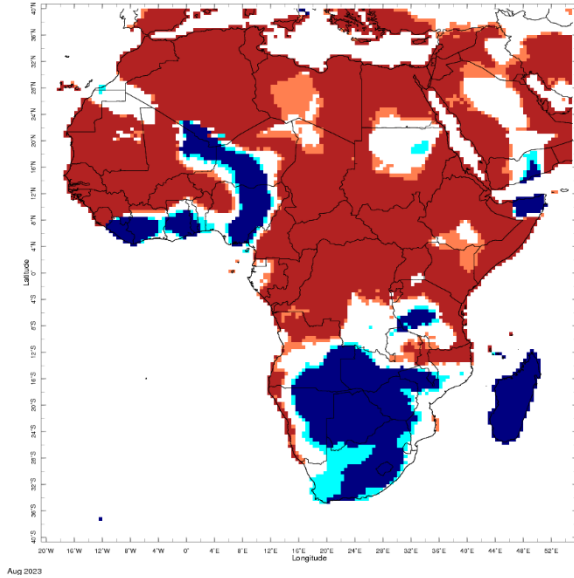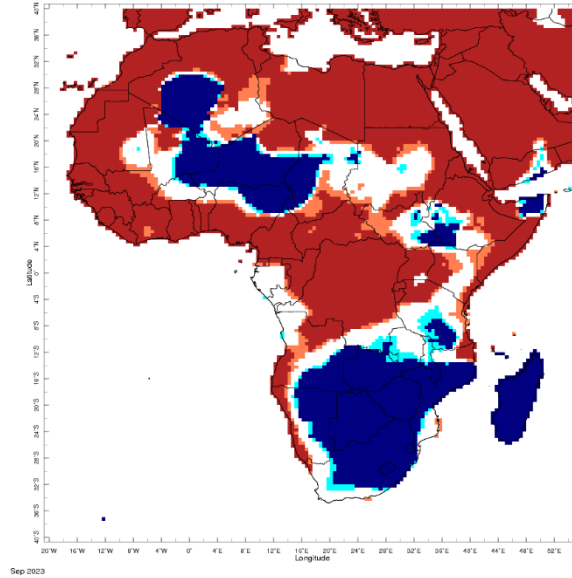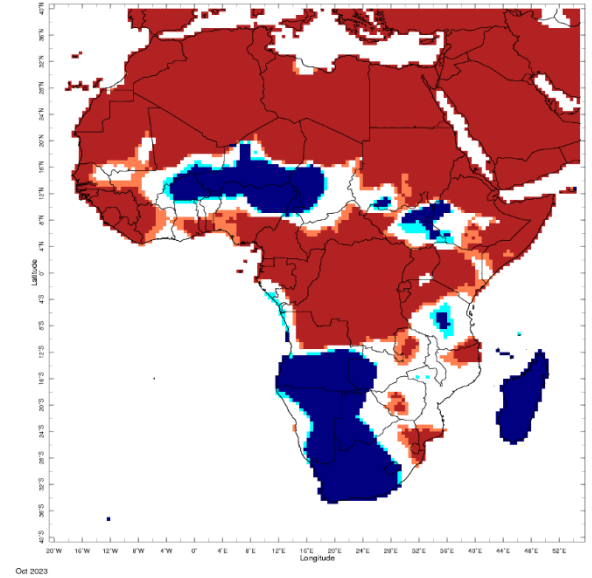
Notes: The percentiles shown in the map indicate a ranking of temperature, with the 0th percentile being the coolest and the 100th percentile being the warmest in the 1981-2010 climatology. Orange and red shading represent values above the 80th (Warm) and 90th (Hot) percentile, respectively; regions shaded in light and dark blue indicate values below the 20th (Cool) and 10th (Cold) percentile, with respect to the 1981-2010 climatology. The data used in this map are from the NOAA Climate Prediction Center.

Current Status – Western Africa

Current Status: Temperature				Current Status: Rainfall		
	August	**September**	**October**	**August**	**September**	**October**
Sierra Leone	Hot	Hot	Hot	Dry	Normal	Normal
Liberia	Cold	Hot	Hot	Normal	Normal	Normal
Mali	Hot	Mixed (2)	Hot	Very Dry (1)	Mixed (3)	Mixed (3)
Ghana	Cold	Hot	Warm	Normal	Normal	Normal
Nigeria	Cold	Mixed (2)	Warm	Very Dry	Dry	Dry
Cameroon	Warm	Hot	Hot	Very Dry	Very Dry	Very Dry

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.
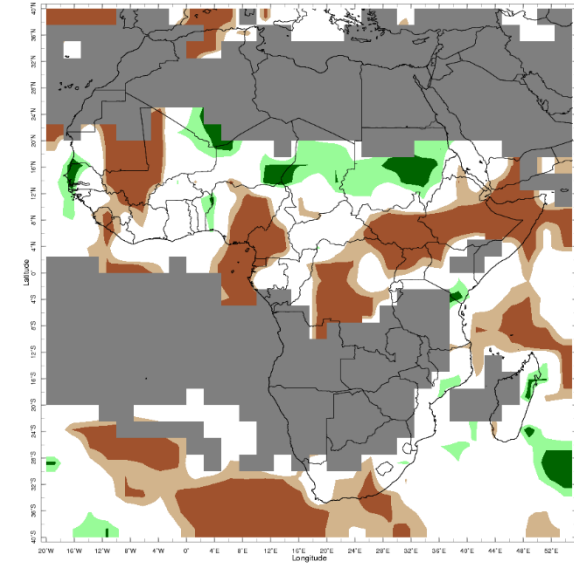
* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) Note: Normal in the east
(2) Note: Cold in northeast, hot in southwest
(3) Note: Dry in the southwest, wet in the northeast

Current Status – Precipitation percentiles

August

September

October

Rainfall Percentiles (BROWN below 20th and GREEN above 80th)

0   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9   1.0
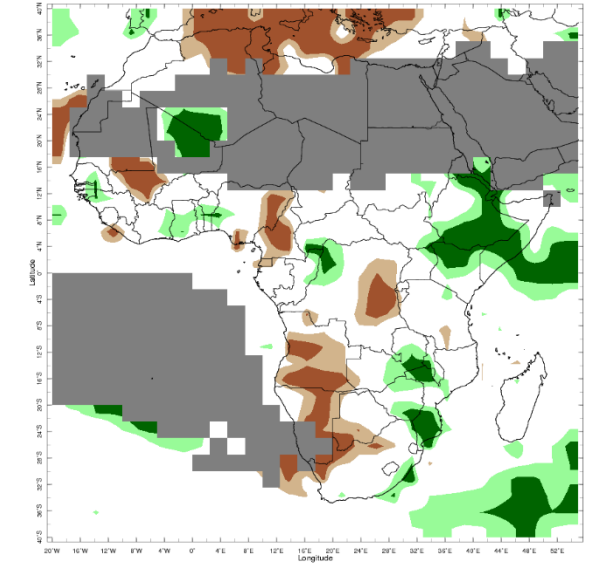
Notes: The percentiles shown in the map indicate a ranking of rainfall, with the 0th percentile being the driest and the 100th percentile being the wettest in the 1981-2010 climatology. Green and dark green shading represent values above the 80th (Wet) and 90th (Very Wet) percentile, respectively; regions shaded in light and dark brown indicate rainfall below the 20th (Dry) and 10th (Very Dry) percentile, with respect to the 1981-2010 climatology. Grey areas on the map mask out regions that receive less than 10 mm/month of rainfall on normal in the 1981-2010 climatology for the month. The data used in this map are from the NOAA Climate Prediction Center.

Current Status – Central Africa

Current Status: Temperature			
	August	**September**	**October**
Niger	Mixed (2)	Cold	Mixed (1)
Chad	Hot	Mixed	Mixed (1)
DRC	Hot (1)	Hot	Hot

Current Status: Rainfall			
	August	**September**	**October**
Niger	Normal	Wet	Normal*
Chad	Wet	Wet	Normal*
DRC	Very Dry	Very Dry	Mixed (3)

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).
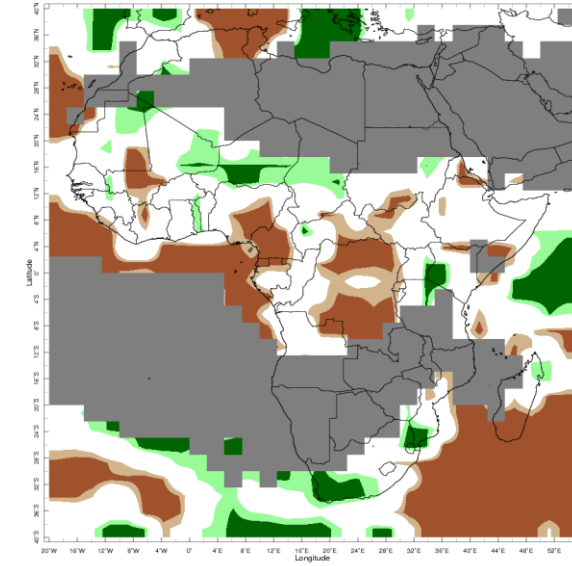
Additional Information:

(1) **Note:** Cold in the south, hot in the north
(2) **Note:** Cold in central regions, hot elsewhere
(3) **Note:** Dry in the east, wet in the northwest and normal elsewhere

Current Status – Eastern Africa (1)

	Current Status: Temperature				Current Status: Rainfall		
	August	**September**	**October**		**August**	**September**	**October**
Sudan	Mixed (1)	Normal	Hot		Wet	Normal	Normal
South Sudan	Hot	Mixed	Normal		Very Dry	Dry	Normal
Uganda	Hot	Hot	Hot		Very Dry	Normal	Normal
Rwanda	Warm	Hot	Hot		Normal	Dry	Normal

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) Note: Cold in the north, hot in the south

Current Status – Eastern Africa (2)

Current Status: Temperature			
	August	**September**	**October**
Tanzania	Mixed (2)	Mixed (2)	Normal
Ethiopia	Hot	Mixed (3)	Mixed (3)
Kenya	Warm	Warm	Warm
Somalia	Warm	Hot (1)	Hot

Current Status: Rainfall			
	August	**September**	**October**
Tanzania	Normal*	Normal*	Normal
Ethiopia	Very Dry	Normal	Very Wet (5)
Kenya	Mixed (4)	Normal	Wet
Somalia	Very Dry	Normal	Wet

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) Note: Cold in the far north
(2) Note: Hot in coastal regions, cold in the west, normal elsewhere
(3) Note: Hot in northeast, cold in southwest
(4) Note: Very dry in the northwest, wet in the southeast, normal elsewhere
(5) Note: Normal in the northwest

Current Status – Southern Africa

	Current Status: Temperature				Current Status: Rainfall		
	August	September	October		August	September	October
South Africa	Cold	Cold	Cold		Dry	Wet	Normal (4)
Zambia	Cold (1)	Cold	Cool		Normal*	Normal*	Wet
Zimbabwe	Cold	Cold	Warm		Normal*	Normal*	Wet
Mozambique	Mixed	Cold	Normal		Normal*	Normal	Very Wet (5)
Malawi	Normal	Cool	Normal		Normal*	Normal*	Normal
Madagascar	Cold	Cold	Cold		Normal (2)	Normal (3)	Normal

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) **Note:** Normal in the east
(2) **Note:** Wet in the east
(3) **Note:** Very dry in the south
(4) **Note:** Wet in coastal regions of the south and east
(5) **Note:** Normal in the north

Outlooks

Outlooks: Notes for use

Outlooks for months 4 to 6:

As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range.

Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Climatological odds:

A forecast is only provided in the outlooks where there is information in the model data about likely outcomes. Therefore, where the likelihoods for above, near and below normal conditions are evenly balanced the phrase 'climatological odds' will be used. This means the outcome could fall anywhere within the possible climatological range. Near-normal conditions should not necessarily be assumed, and users should update with shorter-term forecasts when available.

Outlook: December to May – Western Africa (1)

		Forecast summary		
		December	December to February	March to May
Sierra Leone	*Temperature*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal
Liberia	*Temperature*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal
Mali	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal
Ghana	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal

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Outlook: December to May – Western Africa (2)

		Forecast summary		
		December	December to February	March to May
Nigeria	*Temperature*	**Much more likely to be warmer than normal**	**Much more likely to be warmer than normal**	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal
Cameroon	*Temperature*	**Much more likely to be warmer than normal**	**Much more likely to be warmer than normal**	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Climatological odds	Likely to be near-normal

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Outlook: December to May – Central Africa

		Forecast summary		
		December	December to February	March to May
Niger	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal
Chad	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal
Democratic Republic of Congo	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal

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Outlooks

Outlook: December to May – Eastern Africa (1)

		Forecast summary		
		December	December to February	March to May
Sudan	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be near-normal	Likely to be near-normal
South Sudan	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Likely to be wetter than normal	Likely to be near-normal
Uganda	*Temperature*	Climatological odds	Much more likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Much more likely to be wetter than normal	Likely to be wetter than normal	Likely to be wetter than normal
Rwanda	*Temperature*	Climatological odds	Much more likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Much more likely to be wetter than normal	Much more likely to be wetter than normal	Likely to be wetter than normal

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: December to May – Eastern Africa (2)

		Forecast summary		
		December	December to February	March to May
Tanzania	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Much more likely to be wetter than normal	Likely to be wetter than normal
Ethiopia	*Temperature*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Likely to be wetter than normal
Kenya	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Much more likely to be wetter than normal	Much more likely to be wetter than normal	Likely to be wetter than normal
Somalia	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Much more likely to be wetter than normal	Likely to be wetter than normal

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: December to May – Southern Africa (1)

Forecast summary				
		December	December to February	March to May
South Africa	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be drier than normal	Likely to be drier than normal
Zambia	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Likely to be drier than normal	Likely to be drier than normal
Zimbabwe	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Likely to be drier than normal
Mozambique	*Temperature*	Climatological odds	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Likely to be drier than normal

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: December to May – Southern Africa (1)

		Forecast summary		
		December	December to February	March to May
Malawi	*Temperature*	Climatological odds	**Much more likely to be warmer than normal**	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Climatological odds	Likely to be drier than normal
Madagascar	*Temperature*	**Much more likely to be warmer than normal**	**Much more likely to be warmer than normal**	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Annex 1 – Supplemental Information

For further information

WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (LC-LRFMME)
https://www.wmolc.org/seasonPmmeUI/plot_PMME

International Research Institute for Climate and Society (IRI)
http://iridl.ldeo.columbia.edu/maproom/

NOAA El Niño technical info
https://www.ncei.noaa.gov/access/monitoring/enso/

Met Office
https://www.metoffice.gov.uk/services/government/international-development

Climate Outlook Fora (https://public.wmo.int/en/our-mandate/climate/regional-climate-outlook-products), including:

Greater Horn of Africa Climate Outlook Forum (GHACOF): GHACOF 64 Statement (May 2023)
PRÉvisions climatiques Saisonnières en Afrique Soudano-Sahélienne (PRESASS): http://acmad.net/rcc/presassS.php (April 2022)
Southern African Regional Climate Outlook Forum (SARCOF): http://csc.sadc.int/en/news-and-events/338-the-twenty-sixth-southern-africa-regional-climate-outlook-forum-sarcof-26 (August 2022)
PRÉvisions climatiques Saisonnières en Afrique, pays du Golfe de Guinée (PRESAGG): https://agrhymet.cilss.int/doss/tocharg/2023/02/COMMUNIQUE-FINAL_PRESAGG_2023_VF_Engl.pdf (February 2023)
South-West Indian Ocean Climate Outlook Forum (SWIOCOF) - https://www.commissionoceanindien.org/wp-content/uploads/2022/10/SWIOCOF11_Statement-EN-final.pdf (September 2022)

Technical notes

The [WMO lead centre for long-range forecast multi-model ensemble (LC-LRFMME)](#) produce a probabilistic multi-model mean forecast product in which the multi-model mean is based on uncalibrated model output with a model weighting system that accounts for errors in both the forecast probability and ensemble mean. The method used by LC-LRFMME separately computes a probabilistic forecast and calculates tercile probabilities with respect to climatology for each individual model, before creating the weighted multi-model mean. In seasonal prediction, shifts in the tercile probabilities are always closely associated with the shifts in the probability of extremes, and we can use the probability of terciles to provide information on the likelihood of above- or below- normal conditions. The thresholds used in the forecast summaries are defined below.

Seasonal forecasts rely on the aspects of the global weather and climate system that are more predictable, such as tropical sea-surface temperatures or the El Niño–Southern Oscillation (ENSO). However, whilst such forecasts may be able to show what is more or less likely to occur, they acknowledge that other outcomes are possible.

In addition, forecast uncertainty generally increases with longer range so the 6-month outlook is less reliable. It is also based on less information, because not all models are available to this range. Therefore the information presented here should be used to raise early awareness of potential hazards, and should be updated with the 3-month outlook when available.

In the report and tables precipitation is referred to as rainfall but in fact encompasses any form of water, liquid or solid, falling from the sky. Temperatures are the (2 metre) near-surface temperature.

Description	Definition
Much more likely to be below normal	When probability of lower tercile > 70%
More likely to be below normal	When probability of lower tercile is 40-70%
Likely to be near-normal	When probability of middle tercile is 40-70%
Much more likely to be near-normal	When probability of middle tercile > 70%
Likely to be above normal	When probability of upper tercile is 40-70%
Much more likely to be above normal	When probability of upper tercile > 70%
Climatological odds	When probabilities for all categories are roughly 33%

Global Producing Centres (GPC) forecasts used by WMO LC-LRFMME:

- GPC CPTEC (INPE),
- GPC ECMWF,
- GPC Exeter (Met Office),
- GPC Melbourne (BOM),
- GPC Montreal (CMC),
- GPC Moscow (Hydromet Centre of Russia),
- GPC Offenbach (DWD),
- GPC Pretoria (SAWS),
- GPC Seoul (KMA),
- GPC Tokyo (JMA),
- GPC Toulouse (Meteo France),
- GPC Washington (NCEP)

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