

AFRICA: Monthly Climate Outlook December to September

Issued: March 2023

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Overview

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Africa Current Status and Outlook - Temperature

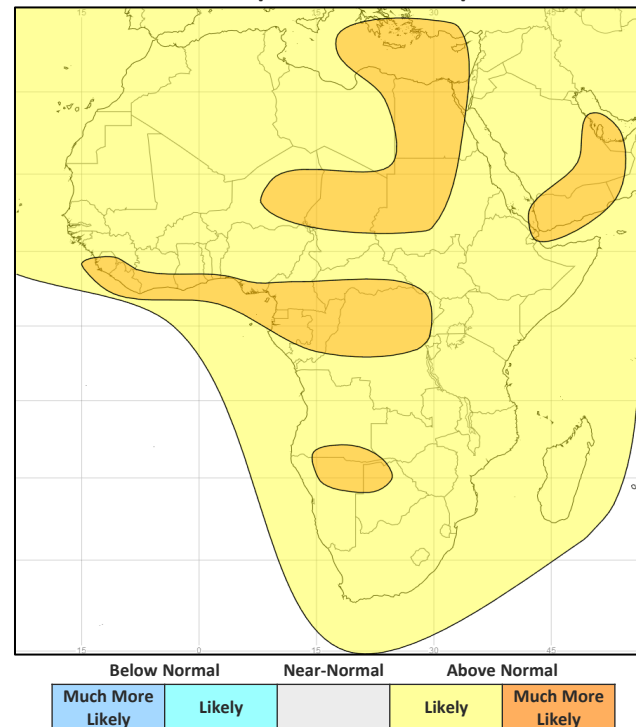
Current Status:

During December and January many parts of Western Africa were warm or hot. Conditions were more mixed in February with Liberia and Ghana both experiencing cold conditions. Temperatures have been near-normal or hotter than normal across much of Central and East Africa over the last three months, the main exception was southern Tanzania which has been cold. Southern Africa has experienced large variations in temperature over the last three months.

Outlook:

Over the next three months, it is likely or much more likely to be warmer than normal across all areas in Sub-Saharan Africa.

3-Month Outlook April to June - Temperature



Africa Current Status and Outlook - Rainfall

Current Status:

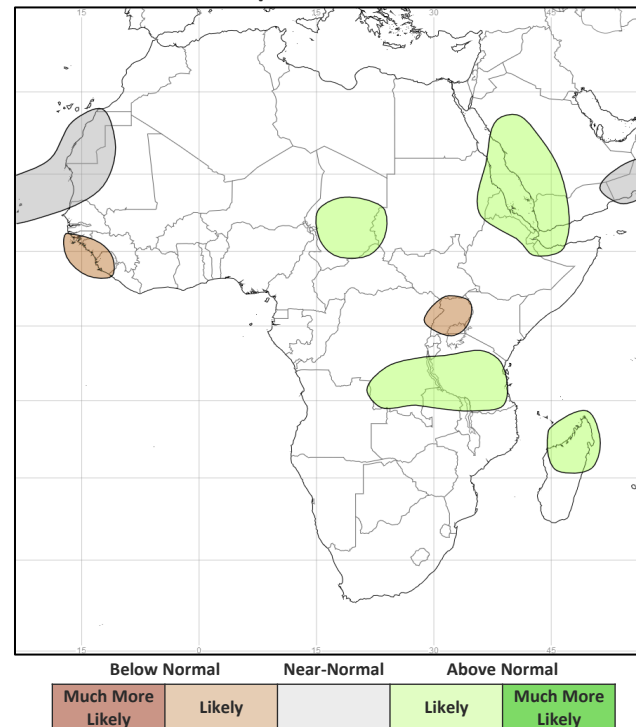
Over the last three months, most of West Africa and Central Africa has experienced near-normal rainfall. Rainfall across East Africa has been largely near-normal, although dry conditions were experienced in Ethiopia during January and Uganda, Kenya and Ethiopia in February. In Southern Africa, very wet conditions were experienced at times in South Africa, Zimbabwe and Mozambique, particularly during December and February.

Outlook:

The East African Long Rains season runs from March until May. The end of the recent La Niña is reflected in a change to model predictions, with many areas in Eastern Africa likely to experience near-normal rainfall. Above normal rainfall is likely across Tanzania, northern Ethiopia, Eritrea and Djibouti. In contrast to this, Uganda remains likely to be drier than normal.

Chad and southern DRC are likely to be wetter than normal. Drier than normal conditions are likely for Sierra Leone.

3-Month Outlook April to June - Rainfall



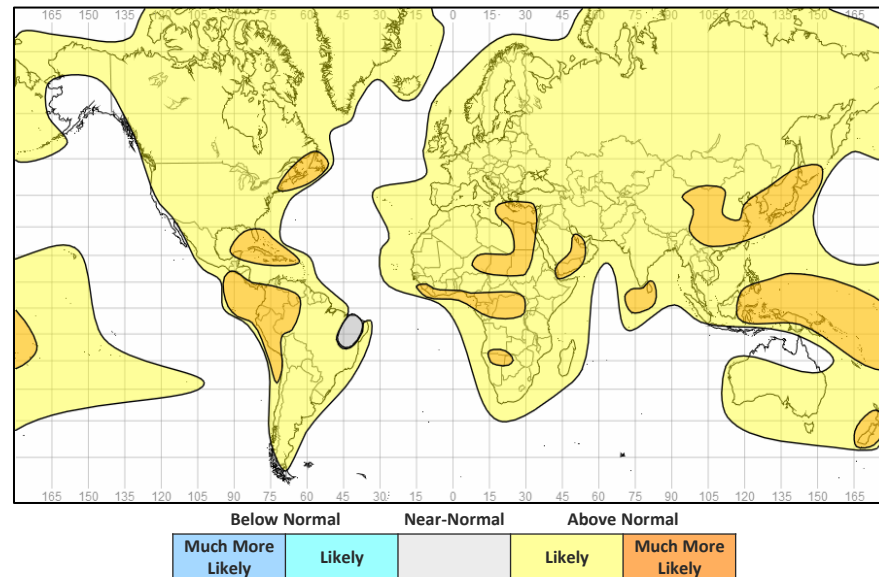
Global Outlook - Temperature

Outlook:

The recent La Niña has now ended with El Niño-Southern Oscillation (ENSO) neutral conditions likely to continue through to the early Northern Hemisphere summer.

Over the next three months, with the backdrop of a warming climate and the loss of the cooling influence of La Niña, most land areas are likely to be warmer than normal. Exceptions to this include northeast Brazil where temperatures are likely to be near-normal.

3-Month Outlook April to June - Temperature



Global Outlook - Rainfall

Outlook:

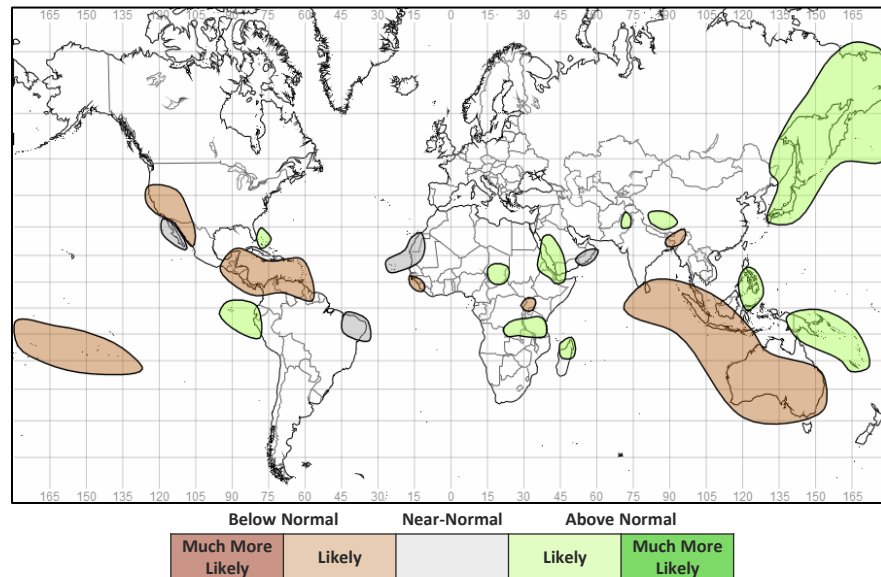
El Niño-Southern Oscillation (ENSO) – The recent La Niña in the tropical Pacific Ocean has now ended with atmospheric and sea surface temperature conditions indicative of El Niño-Southern Oscillation (ENSO) neutral conditions. ENSO is most likely to remain in a neutral phase, at least through the Northern Hemisphere spring.

With ENSO-neutral conditions likely to continue through the Northern Hemisphere spring and early summer, predictability on seasonal timescales is expected to be lower than in recent years when ENSO has been active.

At longer lead times (Northern Hemisphere summer onwards) there is an increased likelihood of El Niño developing (60% for August-October). However, due to the spring predictability barrier, uncertainty in ENSO prediction is higher at this time of year, and this can typically be associated with lower forecast accuracy.

Indian Ocean Dipole (IOD) – The Indian Ocean Dipole is currently neutral and therefore won't provide any predictive value for this period. There is a chance that a positive IOD phase will develop during the Northern Hemisphere summer. However, like ENSO forecasts made at this time of year, forecast accuracy is also low for IOD predictions.

3-Month Outlook April to June - Rainfall



Current Status

[Current Status maps](#)

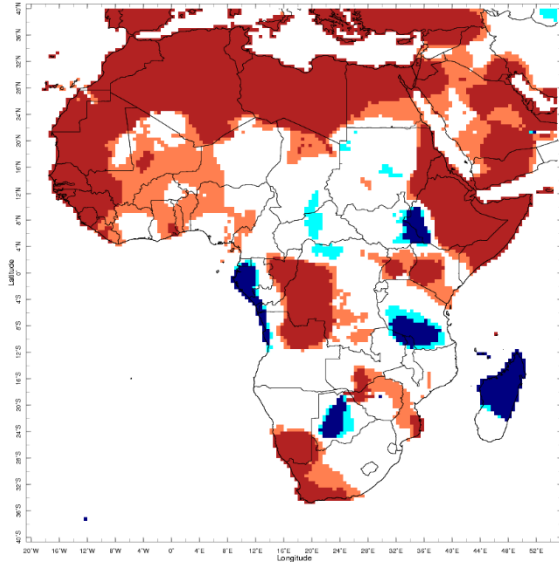
[Western Africa](#)

[Central Africa](#)

[Eastern Africa](#)

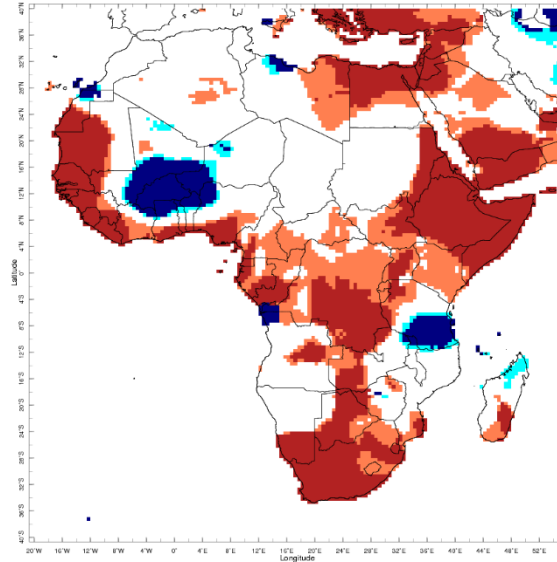
[Southern Africa](#)

Current Status – Temperature percentiles



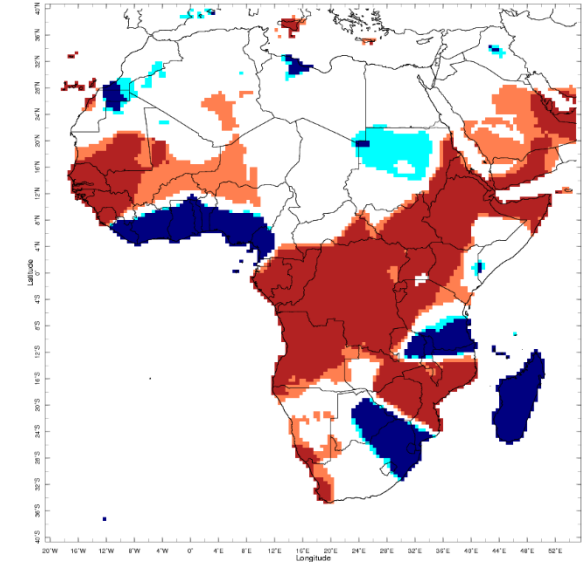
Dec 2022

December



Jan 2023

January



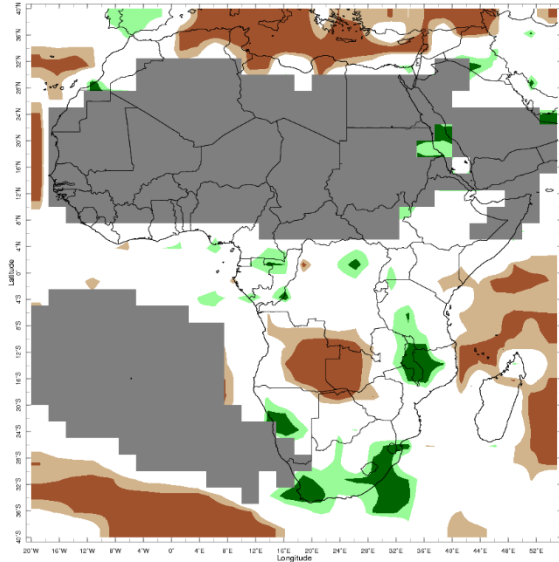
Feb 2023

February



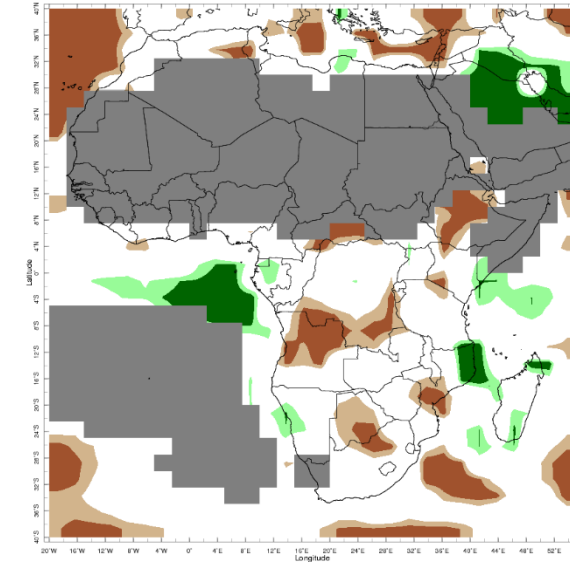
Notes: The percentiles shown in the map indicate a ranking of temperature, with the 0th percentile being the coolest and the 100th percentile being the warmest in the 1981–2010 climatology. Orange and red shading represent values above the 80th (Warm) and 90th (Hot) percentile, respectively; regions 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 – Precipitation percentiles



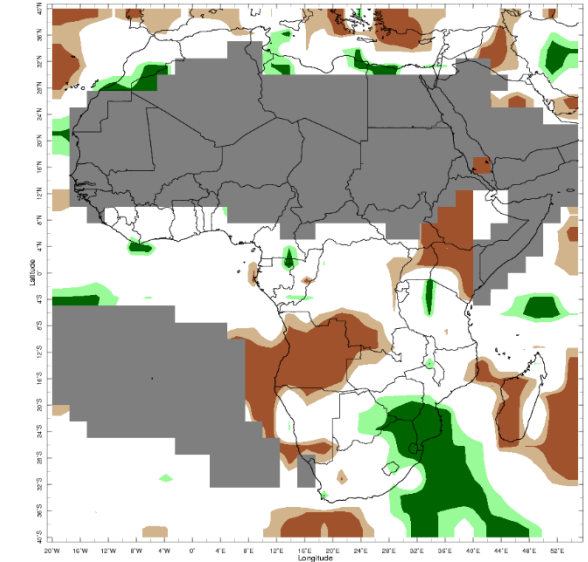
Dec 2022

December



Jan 2023

January



Feb 2023

February



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 – Western Africa

Current Status: Temperature

	December	January	February
Sierra Leone	Hot	Hot	Hot
Liberia	Warm	Hot	Cold
Mali	Warm	Mixed (1)	Warm
Ghana	Warm	Mixed (2)	Cold
Nigeria	Warm	Mixed (2)	Mixed (3)
Cameroon	Normal	Warm	Mixed (4)

Current Status: Rainfall

	December	January	February
	Normal	Normal*	Normal
	Normal	Normal	Normal
	Normal*	Normal*	Normal*
	Normal	Normal	Normal
	Normal	Normal	Normal
	Normal	Normal	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 south, normal in the north.
- (2) Note:** Cold in the north, warm in the south, normal elsewhere
- (3) Note:** Cold in the south, warm in the north
- (4) Note:** Cold in the west, hot in the southeast, normal elsewhere

Current Status – Central Africa

	Current Status: Temperature		
	December	January	February
Niger	Normal	Normal	Warm
Chad	Normal	Normal	Normal
DRC	Normal (1)	Warm	Hot

	Current Status: Rainfall		
	December	January	February
Niger	Normal*	Normal*	Normal*
Chad	Normal*	Normal*	Normal*
DRC	Normal	Normal (2)	Normal (2)

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: Hot in the west

(2) Note: Dry or very dry in the south

Current Status – Eastern Africa (1)

Current Status: Temperature

	December	January	February
Sudan	Normal	Normal	Mixed (1)
South Sudan	Normal	Warm	Hot
Uganda	Warm	Warm	Hot
Rwanda	Normal	Warm	Hot

Current Status: Rainfall

	December	January	February
	Normal*	Normal*	Normal*
	Normal	Normal*	Normal*
	Normal	Normal	Dry
	Normal	Normal	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: Cool in the northwest, hot in the southeast

Current Status – Eastern Africa (2)

	Current Status: Temperature		
	December	January	February
Tanzania	Mixed (1)	Mixed (1)	Mixed (1)
Ethiopia	Mixed (2)	Hot	Hot
Kenya	Warm	Warm	Hot
Somalia	Hot	Hot	Mixed (3)

	Current Status: Rainfall		
	December	January	February
Tanzania	Normal	Normal	Normal
Ethiopia	Normal	Very Dry	Very Dry
Kenya	Normal	Normal	Very Dry
Somalia	Normal	Normal*	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 southeast, warm or hot in the northwest
- (2) **Note:** Hot in the northeast, cold in the southwest
- (3) **Note:** Hot in the north, normal elsewhere

Current Status – Southern Africa

Current Status: Temperature

	December	January	February
South Africa	Mixed (1)	Hot	Mixed (6)
Zambia	Normal (2)	Normal (2)	Mixed (7)
Zimbabwe	Warm	Normal	Hot
Mozambique	Normal (3)	Normal (3)	Hot
Malawi	Normal	Normal	Hot
Madagascar	Cold	Normal	Cold

Current Status: Rainfall

	December	January	February
	Wet	Normal	Mixed (8)
	Mixed (4)	Normal	Normal
	Normal	Normal	Very Wet
	Normal	Mixed (5)	Mixed (9)
	Very Wet	Normal	Normal
	Normal	Normal	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:** Hot in the southwest and the far northeast, normal elsewhere
- (2) **Note:** Hot in the southwest
- (3) **Note:** Warm in the far south
- (4) **Note:** Very dry in the west; wet in the east
- (5) **Note:** Very wet in the northeast, dry in central regions, normal elsewhere
- (6) **Note:** Cold in the northeast, hot in the far southwest, normal elsewhere
- (7) **Note:** Cold in the northeast, otherwise ranging from normal to hot
- (8) **Note:** Very wet in the northeast, normal elsewhere
- (9) **Note:** Very wet in the south, normal elsewhere

Outlooks

[Notes for use](#)

[Western Africa](#)

[Central Africa](#)

[Eastern Africa](#)

[Southern Africa](#)

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: April to September – Western Africa (1)

		Forecast summary		
		April	April to June	July to September
Sierra Leone	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 drier than normal	Likely to be drier than normal	Climatological odds
Liberia	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 drier than normal	Climatological odds	Likely to be drier than normal
Mali	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Likely to be wetter than normal
Ghana	Temperature	Likely to be warmer than normal	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.

Outlook: April to September – Western Africa (2)

		Forecast summary		
		April	April to June	July to September
Nigeria	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Cameroon	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	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.

Outlook: April to September – Central Africa

		Forecast summary		
		April	April to June	July to September
Niger	Temperature	Likely to be warmer than normal	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 wetter than normal
Chad	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be wetter than normal in the south; Climatological odds in the north	Likely to be wetter than normal
Democratic Republic of Congo	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal in the south; Climatological odds in the north	Likely to be wetter than normal in the south; Climatological odds in the north	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: April to September – Eastern Africa (1)

		Forecast summary		
		April	April to June	July to September
Sudan	Temperature	Likely to be warmer than normal	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 wetter than normal
South Sudan	Temperature	Climatological odds	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
Uganda	Temperature	Likely to be near-normal	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
Rwanda	Temperature	Likely to be near-normal	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

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: April to September – Eastern Africa (2)

		Forecast summary		
		April	April to June	July to September
Tanzania	Temperature	Likely to be near-normal	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 near-normal
Ethiopia	Temperature	Likely to be colder than normal	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 in the north; Climatological odds in the south	Likely to be drier than normal in the south; Likely to be wetter than normal in the north
Kenya	Temperature	Likely to be colder than normal	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
Somalia	Temperature	Likely to be warmer than normal	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.

Outlook: April to September – Southern Africa (1)

		Forecast summary		
		April	April to June	July to September
South Africa	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Zambia	Temperature	Likely to be near-normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Zimbabwe	Temperature	Likely to be near-normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Mozambique	Temperature	Climatological odds	Likely to be warmer than normal	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.

Outlook: April to September – Southern Africa (1)

		Forecast summary		
		April	April to June	July to September
Malawi	Temperature	Likely to be near-normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Madagascar	Temperature	Likely to be warmer than normal	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 north, Climatological odds south	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 63 Statement](#) (February 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): <http://acmad.net/rcc/presagg.php> (February 2022)

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 CPTC (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)

Enquiries

Email: internationaldevelopment@metoffice.gov.uk

Web: <https://www.metoffice.gov.uk/services/government/international-development>