

# AFRICA: Monthly Climate Outlook October to July

**Issued: January 2022**

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# Overview

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# Africa Current Status and Outlook - Temperature

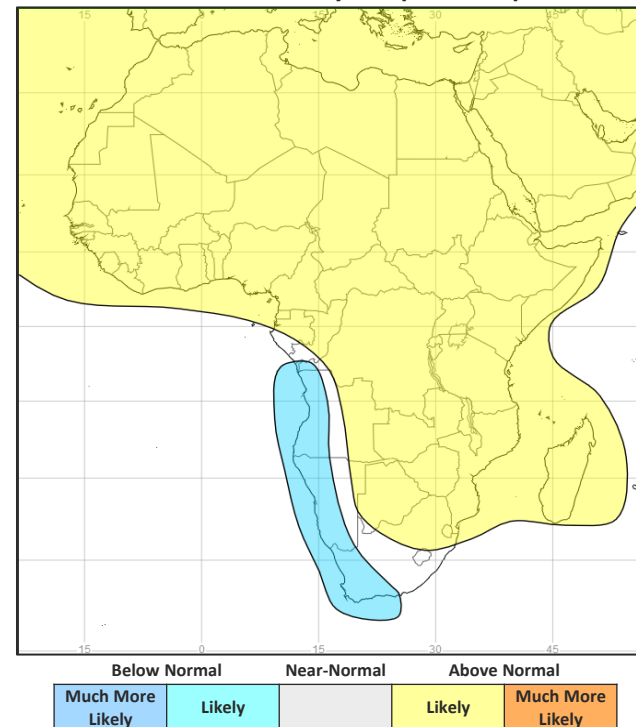
## Current Status:

Most of the continent has experienced warm or hot conditions over the past three months. The main exception was over parts of southern Africa where near-normal or cold conditions were observed in November and December.

## Outlook:

For the next three months, most of the continent is likely to be warmer than normal. There are some exceptions where near normal to colder than normal conditions are likely - western parts of South Africa, Namibia, and Angola.

## 3-Month Outlook February to April - Temperature



# Africa Current Status and Outlook - Rainfall

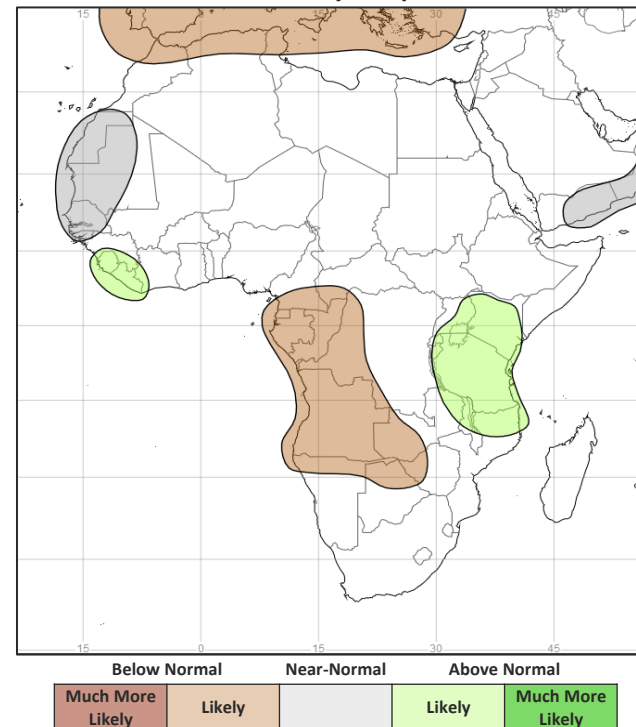
## Current Status:

Following the end of the West African Monsoon in October, parts of West Africa remained wet or very wet during November. In November and December, as seasonal rains shifted south across the continent, parts of central, eastern and southern Africa were drier than normal, however, South Africa, DRC, parts of Uganda and coastal Kenya were wetter than normal.

## Outlook:

Over the next three months, parts of East Africa are likely to be wetter than normal, mainly Tanzania, Kenya, Rwanda, Burundi and parts of Uganda. Parts of West Africa are likely to experience near-normal rainfall, although Sierra Leone and Liberia are likely to be wetter than normal.

## 3-Month Outlook February to April - Rainfall



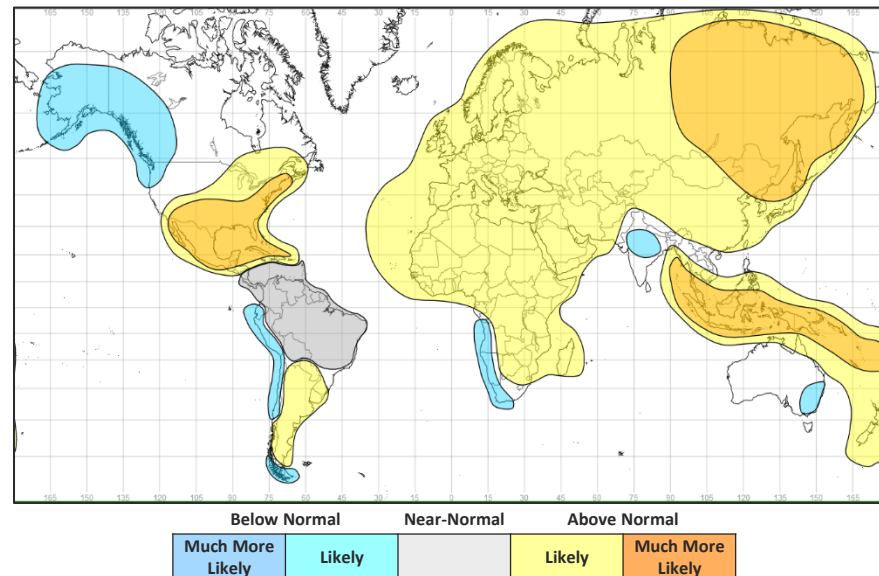
# Global Outlook - Temperature

## Outlook:

A moderate La Niña is ongoing across the tropical Pacific. La Niña will be the main driver of temperature and rainfall anomalies across the tropics over the next three months. La Niña's influence will also extend further north and south, mainly early in the period.

Consistent with long-term climate change, many parts of the globe are likely to see above normal temperatures over the next three months. However, one of the key characteristics of La Niña is a cooling of the surface seawaters of the central and eastern tropical Pacific Ocean. This means near or below normal temperatures are likely for northern and western parts South America, southeast Australia, parts of southern Africa and northwest North America.

## 3-Month Outlook February to April - Temperature



# Global Outlook - Rainfall

## Outlook:

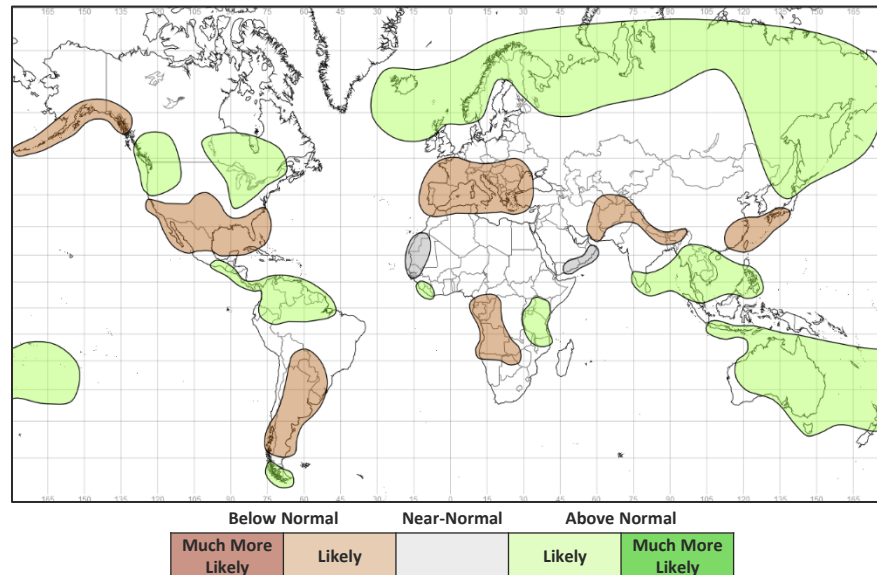
**El Niño-Southern Oscillation (ENSO)** – La Niña is ongoing with sea surface temperatures and atmospheric conditions across the Pacific basin indicative of a moderate event. The event has likely peaked and, according to NOAA, whilst La Niña is likely to continue into the Northern Hemisphere early spring (67% chance during March-May 2022) a transition to ENSO-neutral is more probable later in the season (51% chance during April-June 2022). The effects of La Niña are likely to remain wide-reaching for several months to come.

With a couple of notable exceptions (including East Africa) La Niña, very broadly speaking, tends to increase the likelihood of wetter than normal conditions across many land areas of the tropics. More information on typical impacts can be found here <https://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/gpc-outlooks/el-nino-la-nina/enso-impacts>

For the next three months, the outlook for North America and Eurasia is also broadly consistent with the influence of La Niña with northern parts of both continents favoured to see wetter than normal conditions. However, as we move into the Northern Hemisphere spring, the influence of La Niña on weather patterns at higher latitudes tends to decline.

**Indian Ocean Dipole (IOD)** – The IOD returned to a neutral state during early November and is expected to remain neutral throughout February to April; it will have little effect on global climate during this period.

## 3-Month Outlook February to April - Rainfall



# Current Status

[Current Status maps](#)

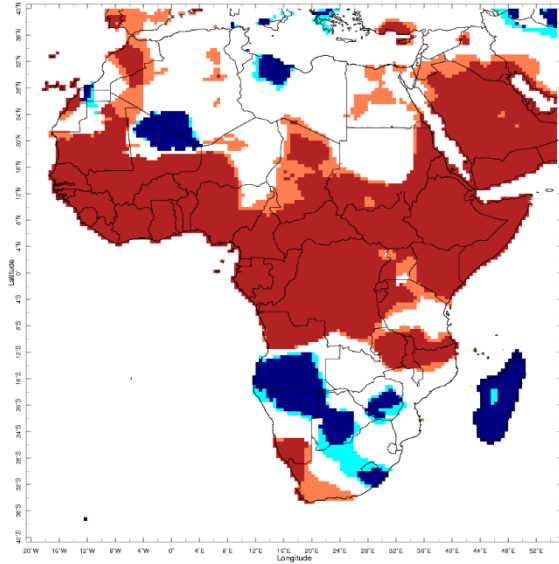
[Western Africa](#)

[Central Africa](#)

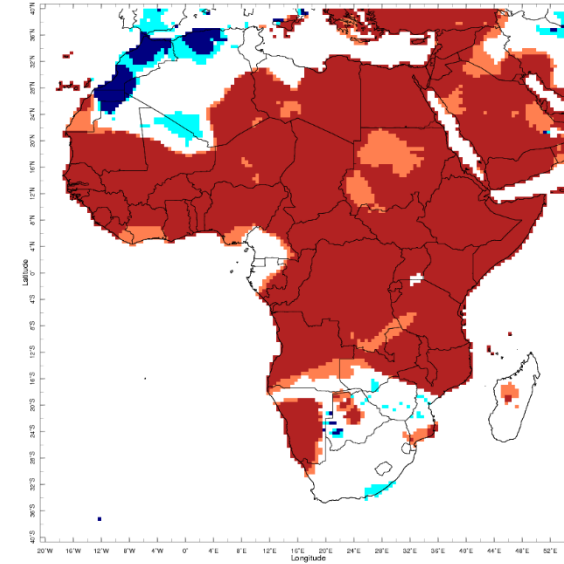
[Eastern Africa](#)

[Southern Africa](#)

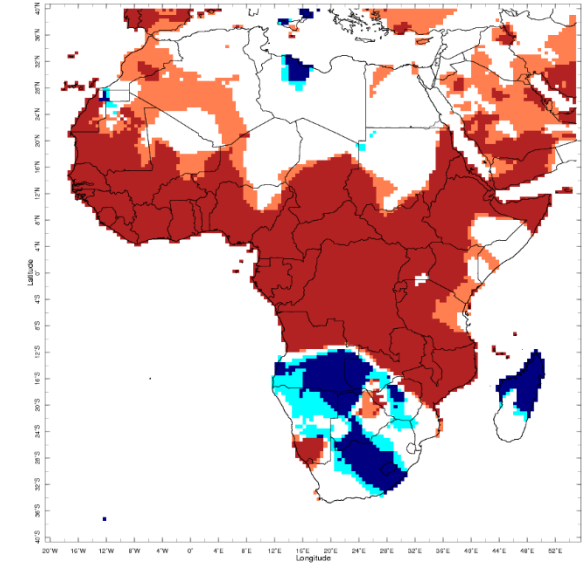
# Current Status – Temperature percentiles



Oct 2021

**October**


Nov 2021

**November**


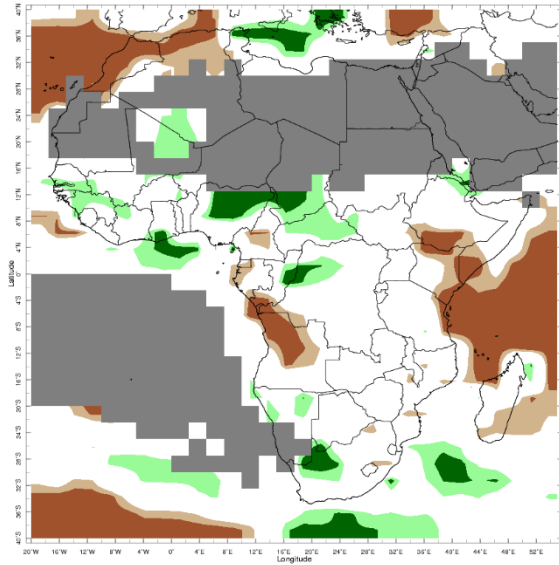
Dec 2021

**December**


**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.

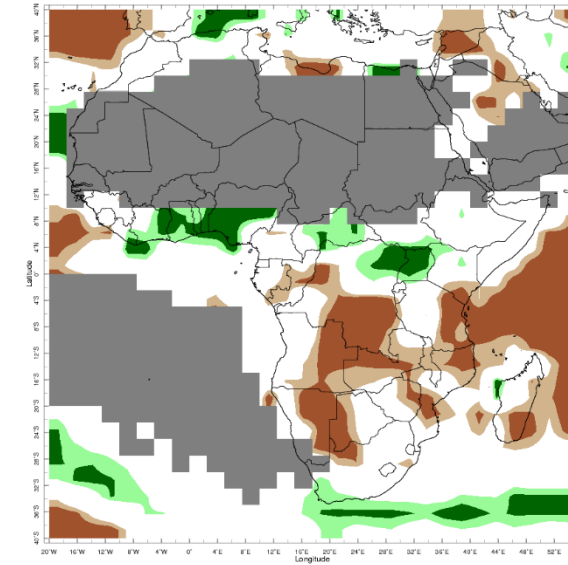


# Current Status – Precipitation percentiles



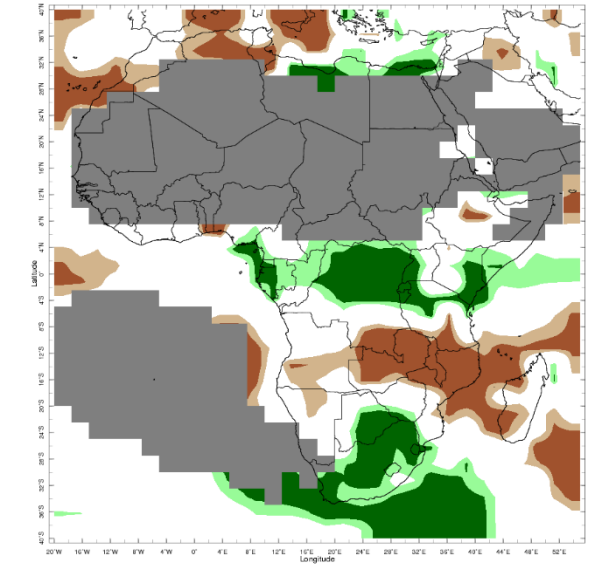
Oct 2021

October



Nov 2021

November



Dec 2021

December



**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

	October	November	December
Sierra Leone	Hot	Hot	Hot
Liberia	Hot	Hot	Hot
Mali	Mixed (1)	Mixed (1)	Hot
Ghana	Hot	Hot	Hot
Nigeria	Hot	Hot	Hot
Cameroon	Hot	Mixed (4)	Hot

### Current Status: Rainfall

	October	November	December
	Normal	Normal	Normal*
	Normal	Normal	Normal
	Normal	Normal*	Normal*
	Normal (2)	Wet	Normal
	Mixed (3)	Very Wet	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:** Hot in the south, cold in the north
- (2) **Note:** Very Wet along the coast; otherwise, normal
- (3) **Note:** Very wet in the north; otherwise, normal
- (4) **Note:** Normal southwest, hot northeast

# Current Status – Central Africa

## Current Status: Temperature

	October	November	December
Niger	Mixed	Hot	Hot
Chad	Mixed	Hot	Hot
DRC	Hot	Hot	Hot

## Current Status: Rainfall

	October	November	December
	Normal	Normal*	Normal*
	Mixed (1)	Normal*	Normal*
	Normal	Mixed (2)	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:** Wet/Very Wet in the south; normal elsewhere

**(2) Note:** Large variations; Very Dry in south, Very Wet in northeast

**(3) Note:** Very Wet in the north, Dry in the south and normal elsewhere

## Current Status – Eastern Africa (1)

Current Status: Temperature

	October	November	December
Sudan	Mixed	Hot	Normal
South Sudan	Hot	Hot	Hot
Uganda	Hot	Hot	Hot
Rwanda	Hot	Hot	Hot

Current Status: Rainfall

	October	November	December
	Normal	Normal*	Normal*
	Normal	Normal	Normal*
	Normal	Very Wet	Mixed (1)
	Normal	Dry	Very 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:** Very Wet in the west; normal elsewhere

## Current Status – Eastern Africa (2)

### Current Status: Temperature

	October	November	December
Tanzania	Normal	Hot	Hot
Ethiopia	Hot	Hot	Mixed (5)
Kenya	Hot	Hot	Hot
Somalia	Hot	Hot	Normal

### Current Status: Rainfall

	October	November	December
	Normal	Mixed (4)	Mixed (6)
	Mixed (1)	Normal	Normal
	Mixed (2)	Normal	Wet
	Mixed (3)	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:** Very Dry in the south; otherwise, normal
- (2) Note:** Very dry in the north and northeast; otherwise, normal
- (3) Note:** Very dry in the far south; otherwise, normal
- (4) Note:** Normal west, very dry east
- (5) Note:** Hot in the northwest, hot in the southeast
- (6) Note:** Wet in the north; Very Dry in the south.

# Current Status – Southern Africa

## Current Status: Temperature

	October	November	December
South Africa	Mixed	Normal	Cold
Zambia	Mixed	Mixed (4)	Mixed (5)
Zimbabwe	Cool	Normal	Cool
Mozambique	Normal	Mixed (1)	Hot
Malawi	Hot	Hot	Hot
Madagascar	Cold	Normal	Cold

## Current Status: Rainfall

	October	November	December
	Mixed (2)	Normal	Very Wet
	Normal*	Dry	Very Dry
	Normal*	Normal	Normal
	Normal	Dry	Very Dry
	Normal*	Dry	Very Dry
	Mixed (3)	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:** Hot in the north, normal in the south
- (2) Note:** Very Wet in the northeast; near normal elsewhere
- (3) Note:** Dry in the far south and far north; near normal elsewhere
- (4) Note:** Normal in south, elsewhere hot
- (5) Note:** Hot in the east, cold in the west

# 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: June to November – Western Africa (1)

		Forecast summary		
		February	February to April	May to July
Sierra Leone	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Likely to be wetter than normal	Climatological odds
Liberia	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Likely to be wetter than normal	Climatological odds
Mali	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	Climatological odds	Climatological odds
Ghana	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

**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: June to November – Western Africa (2)

		Forecast summary		
		February	February to April	May to July
Nigeria	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Climatological odds	Climatological odds
Cameroon	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal in the south; Climatological odds elsewhere	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: June to November – Central Africa

		Forecast summary		
		February	February to April	May to July
Niger	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Climatological odds	Climatological odds
Chad	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Climatological odds	Climatological odds
Democratic Republic of Congo	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal in the west; Climatological odds elsewhere	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: June to November – Eastern Africa (1)

		Forecast summary		
		February	February to April	May to July
Sudan	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Climatological odds	Climatological odds
South Sudan	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Climatological odds	Likely to be wetter than normal
Uganda	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be wetter than normal	Likely to be wetter than normal
Rwanda	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be wetter than normal	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: June to November – Eastern Africa (2)

		Forecast summary		
		February	February to April	May to July
Tanzania	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Climatological odds
Ethiopia	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Climatological odds	Likely to be wetter than normal
Kenya	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 wetter than normal	Climatological odds
Somalia	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	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: June to November – Southern Africa (1)

		Forecast summary		
		February	February to April	May to July
South Africa	Temperature	Climatological odds	Likely to be warmer than normal in the northeast; Likely to be colder than normal in the southwest	Climatological odds
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Zambia	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal in the west; Likely to be wetter than normal in the east; Climatological odds elsewhere	Climatological odds
Zimbabwe	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal in the west; Climatological odds elsewhere	Climatological odds
Mozambique	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be wetter than normal in the north; Climatological odds elsewhere	Likely to be wetter than normal in the north; Climatological odds elsewhere	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: June to November – Southern Africa (1)

		Forecast summary		
		February	February to April	May to July
Malawi	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Likely to be wetter than normal	Climatological odds
Madagascar	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

**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



## Outlooks for March-May - Additional information:

The latest output from the WMO Long Range Forecast Multi Model Ensemble (right) for March to May, shows that South Sudan, Uganda, Burundi, Rwanda, parts of Kenya and Tanzania, Lesotho and parts of South Africa are likely to be wetter than normal. However, it should be noted that forecast uncertainty generally increases with longer range, meaning that this March to May outlook is typically less reliable than the 1-3 month outlook. In addition, the longer-range outlook utilises fewer models because not all seasonal models are available for the extended range.

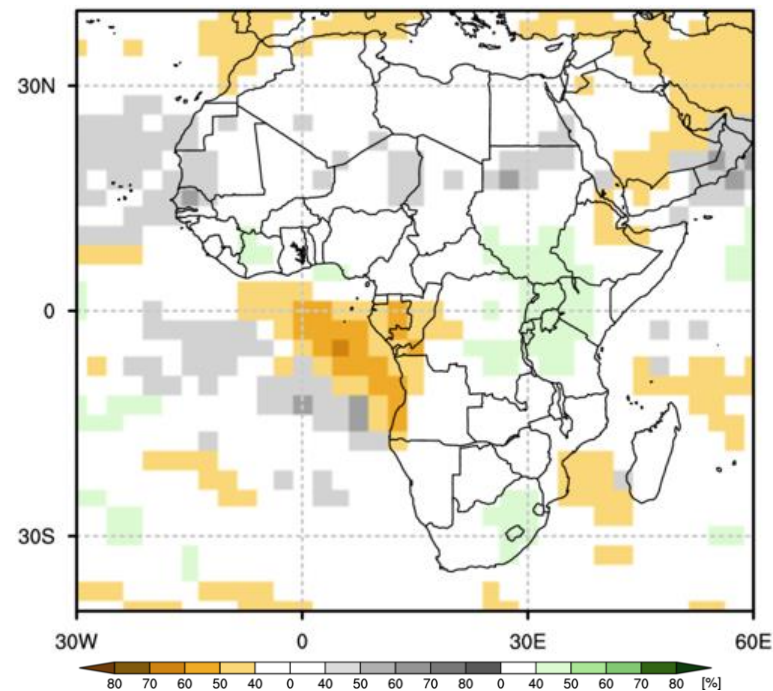
The latest statement from the NOAA Climate Prediction Centre / NCEP states that *“La Niña is likely to continue into the Northern Hemisphere spring (67% chance during March-May 2022) and then transition to ENSO-neutral (51% chance during April-June 2022).”* ([Full statement](#) - 24/12/2021)

### East Africa influence March-May:

In East Africa, the ‘Long Rains’ occur in March-April-May (MAM) and are predominantly controlled by the seasonal migration of the Intertropical Convergence Zone (ITCZ), rather than the influence of La Niña or the Indian Ocean Dipole (IOD). The ITCZ tracks the position of maximum solar irradiance across the continent and is accompanied by rainfall. However, parts of Kenya, Tanzania, Ethiopia and Somalia experienced drier 2021 Short Rains, during October-November-December, and if this were followed by a drier or delayed 2022 Long Rains in March-April-May there is the potential for further widespread drought.

### Southern Africa influence March-May:

La Niña conditions increase the likelihood of low-pressure weather systems tracking across southern Africa in April, bringing wetter than normal conditions.



WMO LFR-MME Forecast for precipitation Mar – May 2022, issued Jan 2021

## For further information

WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (LC-LRFMME)

[https://www.wmolc.org/seasonPmmeUI/plot\\_PMME](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.ncdc.noaa.gov/teleconnections/enso/indicators/sst.php>

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): <https://www.icpac.net/events/ghacof-59-climate-services-for-resilience/> (August 2021)

PRÉvisions climatiques Saisonnières en Afrique Soudano-Sahélienne (PRESASS): <http://acmad.net/rcc/presassS.php> (April 2021)

Southern African Regional Climate Outlook Forum (SARCOF): <http://csc.sadc.int/en/news-and-events/326-climate-outlook-forum-2021-sarcof-25> (August 2021)

PRÉvisions climatiques Saisonnières en Afrique, pays du Golfe de Guinée (PRESAGG): <http://acmad.net/rcc/presagg.php> (February 2021)

South-West Indian Ocean Climate Outlook Forum (SWIOCOF) - [http://www.acmad.net/new/NEWSITEACMAD/wp-content/uploads/2021/10/SWIOCOF-10\\_Statement-EN.pdf](http://www.acmad.net/new/NEWSITEACMAD/wp-content/uploads/2021/10/SWIOCOF-10_Statement-EN.pdf) (October 2021)

# 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

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