





AFRICA: Monthly Climate Outlook September to June

Issued: December 2021

<u>Overview</u>

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Annex 1 – Supplemental Information





Overview

Africa Current Status and Outlook – Temperature

Africa Current Status and Outlook – Rainfall

<u>Global Outlook – Temperature</u>

<u>Global Outlook – Rainfall</u>





Africa Current Status and Outlook - Temperature

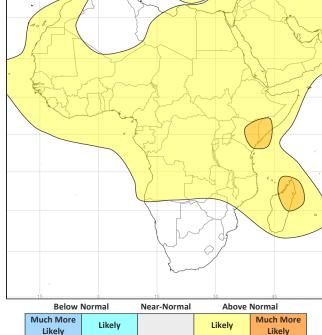
Current Status:

Most of the continent experienced warm or hot conditions during September, October and November. However, during November near-normal or cold conditions were experienced over parts of southern Africa and the northwest of the continent

Outlook:

During January to March, with the exception of Southern Africa and parts of North Africa, the region is likely to be warmer than normal.

3-Month Outlook January to March - Temperature







Africa Current Status and Outlook - Rainfall

Current Status:

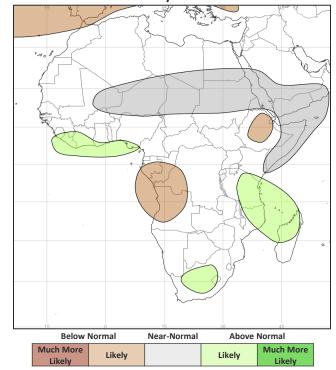
Following the end of the West Arican Monsoon in October, parts of West Africa remained wet or very wet during November. As seasonal rains shifted south across the continent, parts of central, eastern and southern Africa experienced below normal rainfall in November, although there were some exceptions such as Uganda which was wetter than normal.

Outlook:

Over the next three months, consistent with the typical influence of La Niña, wetter than normal conditions are likely across parts of South Africa and Lesotho. It is also likely to be wetter than normal for parts of Madagascar, Tanzania, Mozambique and parts of west Africa adjacent to the Gulf of Guinea. Drier than normal conditions are likely from Angola up to Gabon as well as over Ethiopia.

Additional information on the March – May outlooks can be found here.

3-Month Outlook January to March - Rainfall







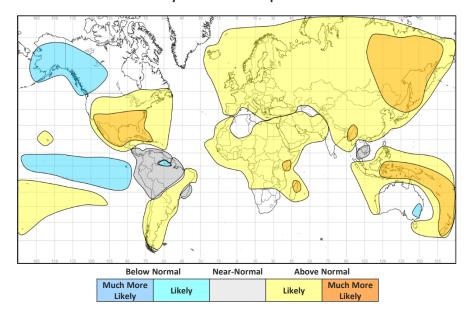
Global Outlook - Temperature

Outlook:

A moderate La Niña event will be the main driver of temperature and rainfall anomalies across the tropics over the next 3 months. La Niña's influence will also extend further north and south (see also the precipitation section).

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 South America, parts of mainland Southeast Asia, southeast Australia and northwest North America.

3-Month Outlook January to March - Temperature







Global Outlook - Rainfall

Outlook:

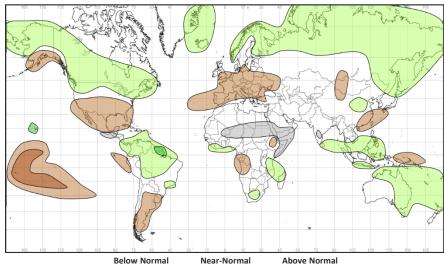
El Niño-Southern Oscillation (ENSO) – A moderate La Niña is ongoing in the tropical Pacific with its influence expected to persist throughout the next three months. It is uncertain how long the current La Nina state will continue, but there are signals that it may end during the austral autumn (March-April-May).

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 at https://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/gpc-outlooks/el-nino-la-nina/enso-impacts

For the next three month, the outlook for North America and Eurasia is also broadly consistent with the typical influence of La Niña, with northern parts of both continents likely to see wetter than normal conditions. Parts of East Africa, Mexico, the south of the USA, western and southern Europe and parts of southern Eurasia are likely to be drier than normal

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

3-Month Outlook January to March - Rainfall



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





Current Status

Current Status maps

Western Africa

Central Africa

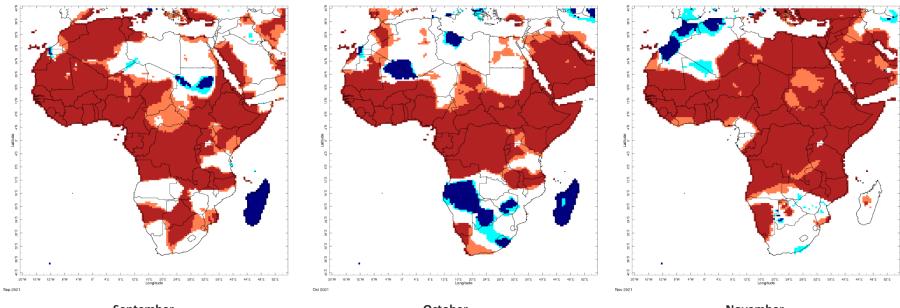
Eastern Africa

Southern Africa





Current Status – Temperature percentiles



September October November

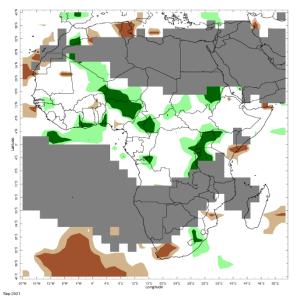


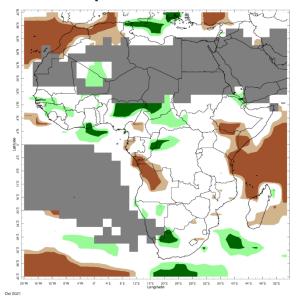
Notes: The percentiles shown in the map indicate a ranking of temperature, with the 0th percentile being the coolest and the 100th percentile being the warmest in the 1981-2010 climatology. Orange and red shading represent values above the 80th (Warm) and 90th (Hot) percentile, respectively; regions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

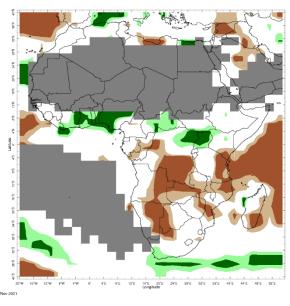




Current Status – Precipitation percentiles







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

October November

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

	Currer	Current Status: Temperature		
	September	September October November		
Sierra Leone	Hot	Hot	Hot	
Liberia	Hot	Hot	Hot	
Mali	Hot	Mixed (1)	Mixed (1)	
Ghana	Hot	Hot	Hot	
Nigeria	Hot	Hot	Hot	
Cameroon	Hot	Hot	Mixed (6)	

Cui	Current Status: Rainfall			
September	October	November		
Normal	Normal	Normal		
Normal	Normal	Normal		
Normal	Normal	Normal*		
Mixed (2)	Normal (4)	Wet		
Mixed (3)	Mixed (5)	Very 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: Hot in the south, cold in the north
- (2) Note: Very Wet in the south; Normal elsewhere
- 3) Note: Very Wet in the northeast; Normal in the southwest
- 4) Note: Very Wet along the coast; otherwise, normal
- 5) Note: Very Wet in the north; otherwise, normal
- (6) Note: Normal southwest, hot northeast





Current Status – Central Africa

	Current Status: Temperature		
	September October November		
Niger	Hot	Mixed	Hot
Chad	Hot	Mixed	Hot
DRC	Hot	Hot	Hot

Current Status: Rainfall			
September October November			
Wet	Normal	Normal*	
Normal	Mixed (1)	Normal*	
Normal	Normal	Mixed (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: Wet/Very Wet in the south; normal elsewhere
- (2) Note: Large variations; Very Dry in south, Very Wet in northeast





Current Status – Eastern Africa (1)

	Curre	Current Status: Temperature		
	September October November			
Sudan	Normal	Mixed	Hot	
South Sudan	Hot	Hot	Hot	
Uganda	Hot	Hot	Hot	
Rwanda	Hot	Hot	Hot	

Current Status: Rainfall			
September	September October November		
Very Wet	Normal	Normal*	
Normal	Normal	Normal	
Very Wet	Normal	Very Wet	
Very Wet	Normal	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
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Current Status – Eastern Africa (2)

	Curre	Current Status: Temperature		
	September	September October November		
Tanzania	Normal	Normal	Hot	
Ethiopia	Hot	Hot	Hot	
Kenya	Hot	Hot	Hot	
Somalia	Hot	Hot	Hot	

Cu	Current Status: Rainfall			
September October November				
Mixed (1)	Normal	Mixed (5)		
Normal	Mixed (2)	Normal		
Normal	Mixed (3)	Normal		
Normal	Mixed (4)	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 Wet around Lake Victoria; Normal elsewhere
- (2) Note: Very Dry in the south; otherwise, normal
- (3) Note: Very dry in the north and northeast; otherwise, normal
- (4) Note: Very dry in the far south; otherwise, normal
- (5) Note: Normal west, very dry east





Current Status – Southern Africa

	Curre	Current Status: Temperature		
	September October November			
South Africa	Mixed (1)	Mixed	Normal	
Zambia	Hot	Mixed	Mixed (5)	
Zimbabwe	Normal	Cool	Normal	
Mozambique	Mixed (1)	Normal	Mixed (1)	
Malawi	Hot	Hot	Hot	
Madagascar	Cold	Cold	Normal	

Cur	Current Status: Rainfall			
September	September October			
Mixed (2)	Mixed (3)	Normal		
Normal*	Normal*	Dry		
Normal*	Normal*	Normal		
Normal	Normal	Dry		
Normal*	Normal*	Dry		
Normal	Mixed (4)	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/.

Additional Information:

(1) Note: Hot in the north, normal in the south (2) Note: Dry in the far north, normal elsewhere

(3) Note: Very Wet in the northeast; near normal elsewhere

(4) Note: Dry in the far south and far north; near normal elsewhere

(5) Note: Normal in south, elsewhere hot

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





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: January to June – Western Africa (1)

		Forecast summary		
		January	January to March	April to June
Sierra Leone	Temperature	Likely to be warmer than normal	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
Liberia	Temperature	Likely to be warmer than normal	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
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	Likely to be near-normal	Climatological odds
Ghana	Temperature	Likely to be warmer than normal	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 in the far south; Climatological odds elsewhere	Climatological odds





Outlook: January to June – Western Africa (2)

		Forecast summary		
		January	January to March	April to June
Nigeria	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 in the north; Likely to be wetter than normal in the south	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 wetter than 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: January to June – Central Africa

		Forecast summary		
		January	January to March	April to June
Niger	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 near-normal	Climatological odds
Chad	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 near-normal	Climatological odds
Democratic	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
Republic of Congo	Rainfall	Likely to be wetter than normal	Climatological odds	Climatological odds





Outlook: January to June – Eastern Africa (1)

		Forecast summary		
		January	January to March	April to June
Sudan	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 near-normal	Climatological odds
South Sudan	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Climatological odds
	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	Climatological odds	Climatological odds	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 wetter than normal	Climatological odds	Climatological odds





Outlook: January to June – Eastern Africa (2)

		Forecast summary		
		January	January to March	April to June
Tanzania	Temperature	Likely to be warmer than normal	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 near-normal	Likely to be drier than normal	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 near-normal	Likely to be wetter than normal
Somalia	Temperature	Much more 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 near-normal	Climatological odds





Outlook: January to June – Southern Africa (1)

		Forecast summary		
		January	January to March	April to June
South Africa	Temperature	Likely to be colder than normal	Climatological odds	Climatological odds
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Climatological odds
Zambia	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
Zimbabwe	Temperature	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Mozambique	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 north, else Climatological odds	Climatological odds





Outlook: January to June – Southern Africa (1)

	Forecast summary			
		January	January to March	April to June
Malawi	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
Madagascar	Temperature	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Climatological odds	Climatological odds





Annex 1 – Supplemental Information

Met Office



Outlooks for March-May - Additional information:

The latest output from the WMO Long Range Forecast Multi Model Ensemble (right), shows that for large areas of Africa, models are predicting similar likelihoods for above normal, near-normal and below-normal outcomes, with no tercile typically being more than 50% likely. South Sudan, the north of Uganda, 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.

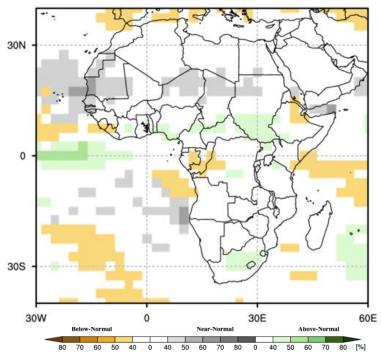
The latest statement from the NOAA Climate Prediction Centre / NCEP states that "La Niña is favored to continue through the Northern Hemisphere winter 2021-22 (~95% chance) and transition to ENSO neutral during the spring 2022 (~60% chance during April-June)." (Full statement 27/12/2021)

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 Dec 2021





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.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 (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 probabilistic 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.

Definition
When probability of lower tercile > 70%
When probability of lower tercile is 40-70%
When probability of middle tercile is 40-70%
When probability of middle tercile > 70%
When probability of upper tercile is 40-70%
When probability of upper tercile > 70%
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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