Asia: Monthly Climate Outlook February to November

Issued: May 2023

Overview

Asia Current Status and Outlook – Temperature

Asia Current Status and Outlook – Rainfall

Global Outlook – Temperature

Global Outlook – Rainfall

Asia Current Status and Outlook - Temperature

Current Status:

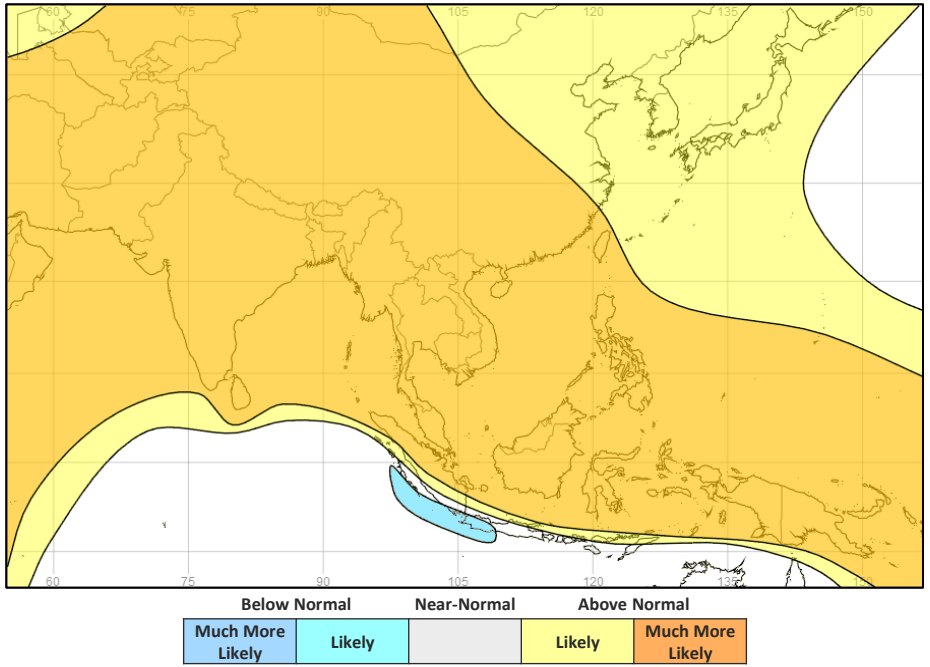
Many areas were warm or hot in February and March. The exception being much of India, which was near-normal and locally cold in central areas. Indonesia was mixed for both months. By April, the above normal temperatures were confined to southeast Asia, as well as Afghanistan, whilst elsewhere temperatures were near-normal.

Outlook:

It is likely, or much more likely, to be warmer than normal over most of Asia during the next three months. This increases the likelihood that pre-monsoon heatwaves will be more intense than normal. The start of the South Asian Monsoon is expected to be slightly delayed, indicating an increased likelihood of forest fires and very poor air quality.

Small parts of southwest Indonesia are likely to have near- to below normal temperatures.

3-Month Outlook June to August - Temperature



Asia Current Status and Outlook - Rainfall

Current Status:

Over the last three months, much of Asia has been either near-normal or wet. An exception to this was much of the Indian sub-continent which was dry during February but then wet or very wet in March. Much of Southeast Asia was drier than normal in April.

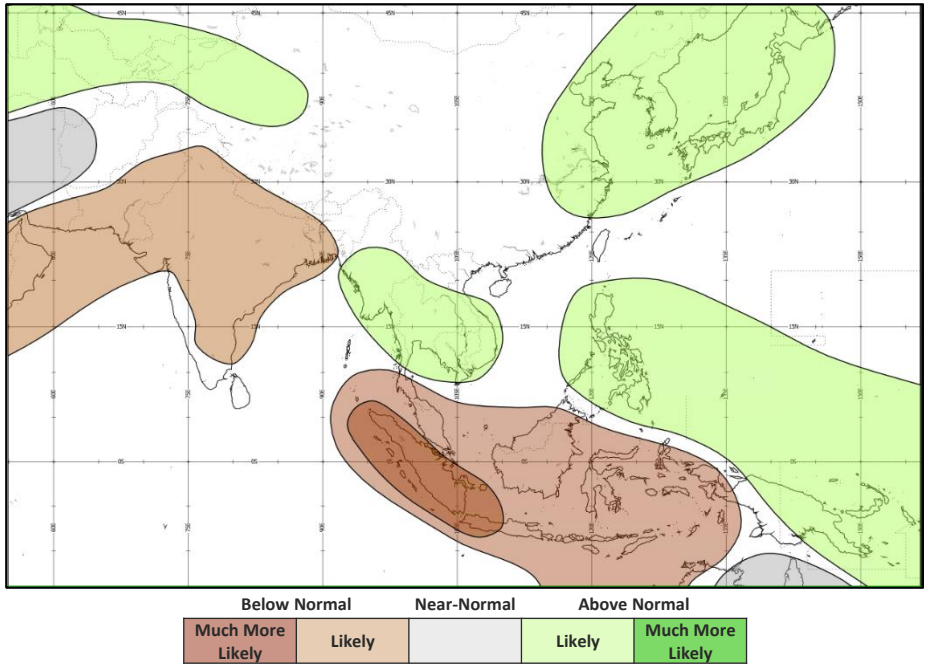
Outlook:

Over the next three months, it is likely to be wetter than normal in Japan, eastern China, the Korean Peninsula and the Philippines. It is likely to be drier than normal in Indonesia, Malaysia, and parts of the Indian subcontinent.

The South Asian Monsoon usually starts in May over the Bay of Bengal, arriving in the Indian Peninsula by June. Overall, it is likely to be drier than normal at the start of this period across the Indian sub-continent, including much of India and Bangladesh, suggesting a delayed onset.

Parts of Southeast Asia as well as Tajikistan and Kyrgyzstan are likely to be wetter than normal, though this in the context of this being a dry time of year for the latter.

3-Month Outlook June to August - Rainfall

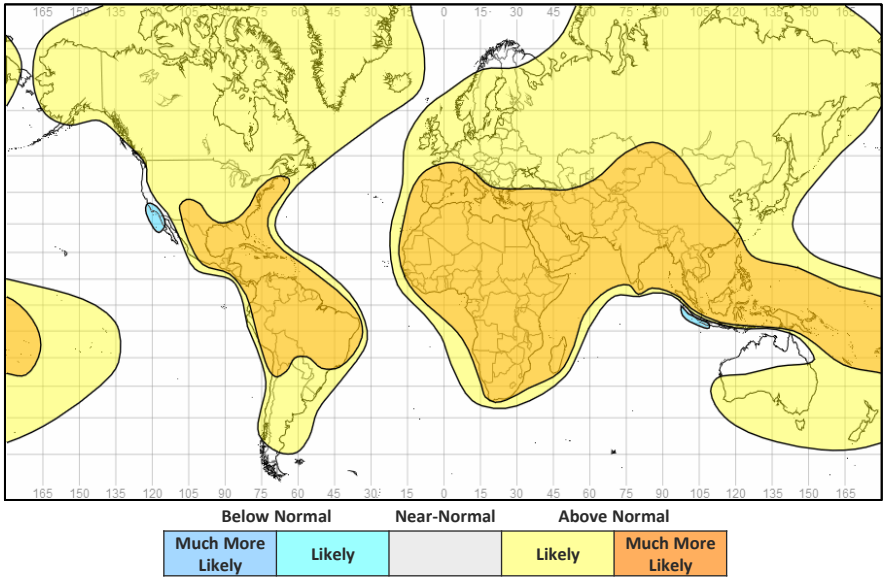


Global Outlook - Temperature

Outlook:

With the backdrop of a warming climate and the emerging El Niño, most land areas are likely to be warmer than normal with limited exceptions. These exceptions include northern Australia, small parts of southwest Indonesia and western Mexico/southwest USA where it is likely to be colder than normal.

3-Month Outlook June to August - Temperature



Global Outlook - Rainfall

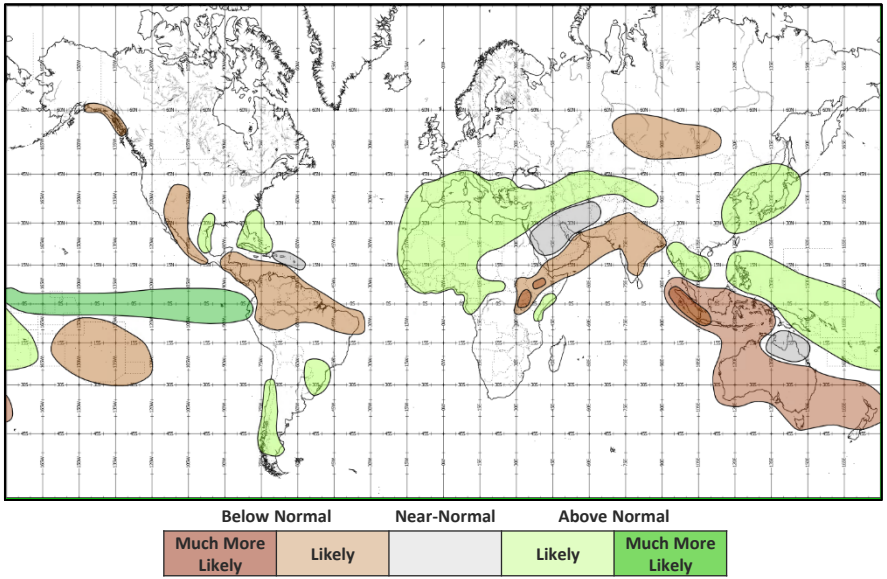
Outlook: El Niño-Southern Oscillation (ENSO) – Sea surface temperatures (SSTs) in the tropical Pacific Ocean continue to rise and are approaching El Niño thresholds, even exceeding these thresholds in eastern parts of the basin. The atmosphere, however, remains in an ENSO-neutral state. Through the coming months, SSTs are likely to continue to rise and the transition to an El Niño event is expected in the next two months, with a greater than 90% chance of it then persisting into the Northern Hemisphere winter.

ENSO impacts regional weather patterns around the world, leading to some regions experiencing wetter than normal conditions and other regions drier than normal conditions.

Should El Niño fully develop, then the chance of heatwaves, drought and wildfire increases across parts of southern and southeast Asia and Australia, and wetter than normal conditions may be experienced across parts of East Africa, central Asia and the Middle East.

Indian Ocean Dipole (IOD) – The Indian Ocean Dipole is currently neutral and is not influencing regional conditions. All forecasts currently suggest development of a positive IOD phase during the Northern Hemisphere summer, however forecast accuracy at this time of year is low and will improve over coming months.

3-Month Outlook June to August - Rainfall



Current Status

Current Status maps

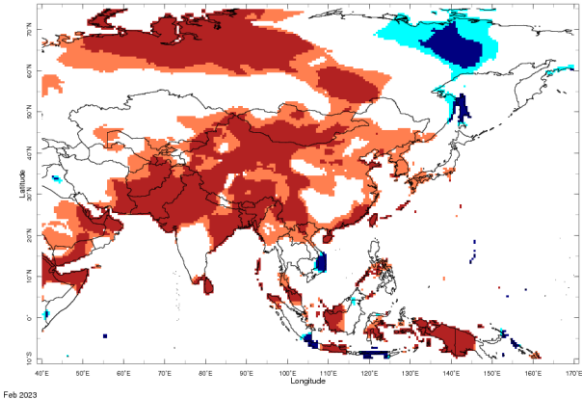
Central Asia

Southern Asia

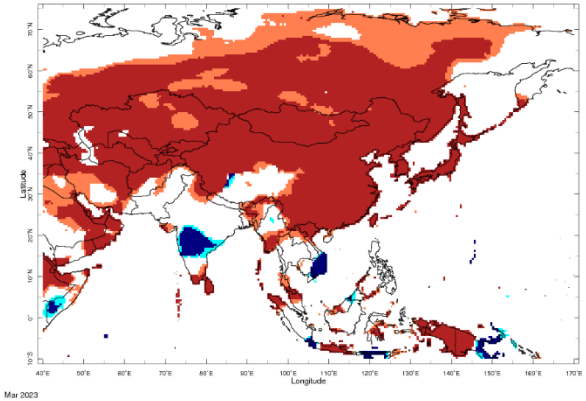
Southeast Asian Peninsula

Southeastern Asia / Indonesia

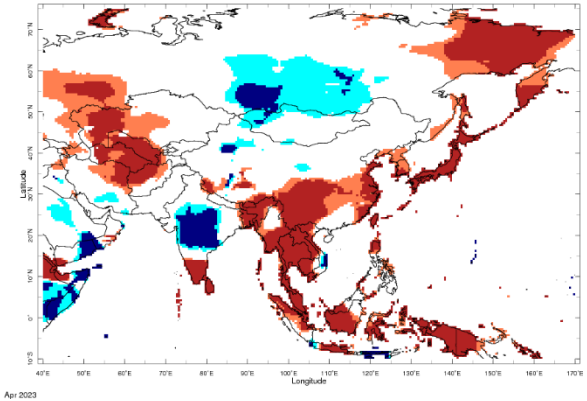
Current Status – Temperature percentiles



February



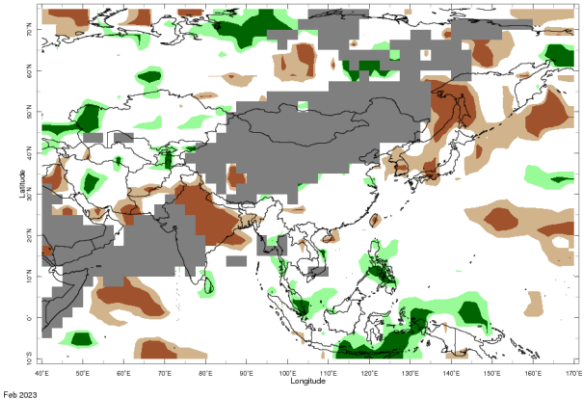
March



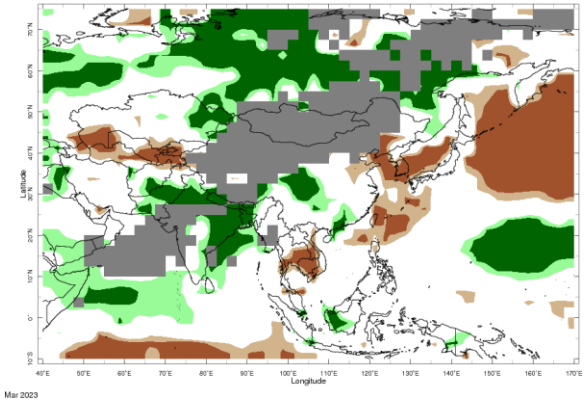
April

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.

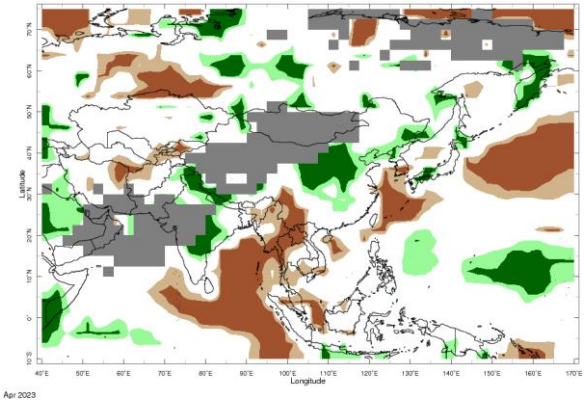
Current Status – Precipitation percentiles



February



March



April

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 Asia

	Current Status: Temperature			Current Status: Rainfall		
	February	March	April	February	March	April
Afghanistan	Hot	Hot	Warm (4)	Mixed (1)	Normal (2)	Dry
Tajikistan	Warm	Hot	Normal	Wet	Very Dry	Dry
Kyrgyzstan	Warm	Hot	Normal	Wet	Normal (3)	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: Dry in the far south, wet in the far north, normal elsewhere
(2) Note: Very wet in the south.
(3) Note: Dry or very dry in the west, normal elsewhere
(4) Note: Hot in the northwest, normal elsewhere

Current Status – Southern Asia

	Current Status: Temperature			Current Status: Rainfall		
	February	March	April	February	March	April
Pakistan	Hot	Normal	Normal	Dry	Very Wet	Normal (3)
India	Mixed (1)	Mixed (2)	Mixed (2)	Very Dry	Very Wet	Normal (4)
Nepal	Hot	Normal	Normal	Normal	Very Wet	Wet
Bangladesh	Hot	Normal	Hot	Dry	Very Wet	Normal
Sri Lanka	Hot	Hot	Warm	Wet	Wet	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 north and far south, normal elsewhere
(2) Note: Hot in the far south, cold in central regions and normal elsewhere
(3) Note: Wet in the north
(4) Note: Very wet in the far northwest and central regions

Current Status – Southeast Asian Peninsula

	Current Status: Temperature			Current Status: Rainfall		
	February	March	April	February	March	April
China	Warm	Hot (2)	Mixed	Normal	Normal (5)	Dry
Myanmar	Warm	Normal	Warm	Normal	Normal	Normal (7)
Vietnam	Mixed (1)	Mixed (3)	Mixed (4)	Normal	Dry	Normal (7)

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: Warm in the north, cold in the centre
(2) Note: Normal in Tibet, otherwise hot
(3) Note: Warm in the north, cold in the centre
(4) Note: Hot in the north and south, cold in the centre
(5) Note: Wet/very wet in some central and southern regions
(6) Note: Wet/very wet in central and northeastern regions, dry in the southwest, normal elsewhere
(7) Note: Dry/very dry in the south

Current Status – Southeastern Asia / Indonesia

	Current Status: Temperature			Current Status: Rainfall		
	February	March	April	February	March	April
Indonesia	Mixed (1)	Mixed (1)	Mixed (1)	Mixed (2)	Normal	Normal
Papua New Guinea	Hot	Mixed (3)	Hot	Normal	Normal	Normal (4)

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: Large variations across the country
(2) Note: Large variations but many areas wet or very wet
(3) Note: Hot in the west, cold in the east
(4) Note: Wet in the east

Outlooks

Outlooks – Notes for use

Central Asia

Southern Asia

Southeast Asian Peninsula

Southeastern Asia / Indonesia

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 – Central Asia

		Forecast summary		
		June	June to August	September to November
Afghanistan	*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	Likely to be wetter than normal
Tajikistan	*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**	Climatological odds	Likely to be wetter than normal
Kyrgyzstan	*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**	Climatological odds	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: June to November – Southern Asia (1)

		Forecast summary		
		June	June to August	September to November
Pakistan	*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	Likely to be wetter than normal
India	*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 drier than normal**	**Likely to be drier than normal**	Likely to be drier than normal
Nepal	*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 drier than normal**	**Likely to be drier than normal**	Likely to be near-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: June to November – Southern Asia (2)

		Forecast summary		
		June	June to August	September to November
Bangladesh	*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 drier than normal**	**Likely to be near-normal**	Likely to be near-normal
Sri Lanka	*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	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: June to November – SE Asian Peninsula

		Forecast summary		
		June	June to August	September to November
China	*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 in the northeast; Climatological odds elsewhere	Likely to be wetter than normal in the northeast; Climatological odds elsewhere	Likely to be wetter than normal in the northeast; Climatological odds elsewhere
Myanmar	*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
Vietnam	*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

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 – SE Asia / Indonesia

		Forecast summary		
		June	June to August	September to November
Indonesia	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**; Likely to be near-normal or likely to be colder than normal in the far southwest	Much more likely to be warmer than normal; likely to be near-normal or likely to be colder than normal in the far southwest
	Rainfall	**Much more likely to be drier than normal**	Likely to be drier than normal	Likely to be drier than normal
Papua New Guinea	*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/

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

The South Asian Climate Outlook Forum (SASCOF) http://www.imdpune.gov.in/Clim_RCC_LRF/Index.html
Latest Output (September 2022) - http://sahfhydromet.rimes.int/wp-content/uploads/2022/10/Enhanced-SCOS-SASCOF-23-JJAS.pdf

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)

Enquiries

Email: internationaldevelopment@metoffice.gov.uk

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