Asia: Monthly Climate Outlook
June to March

Issued: September 2021

Overview

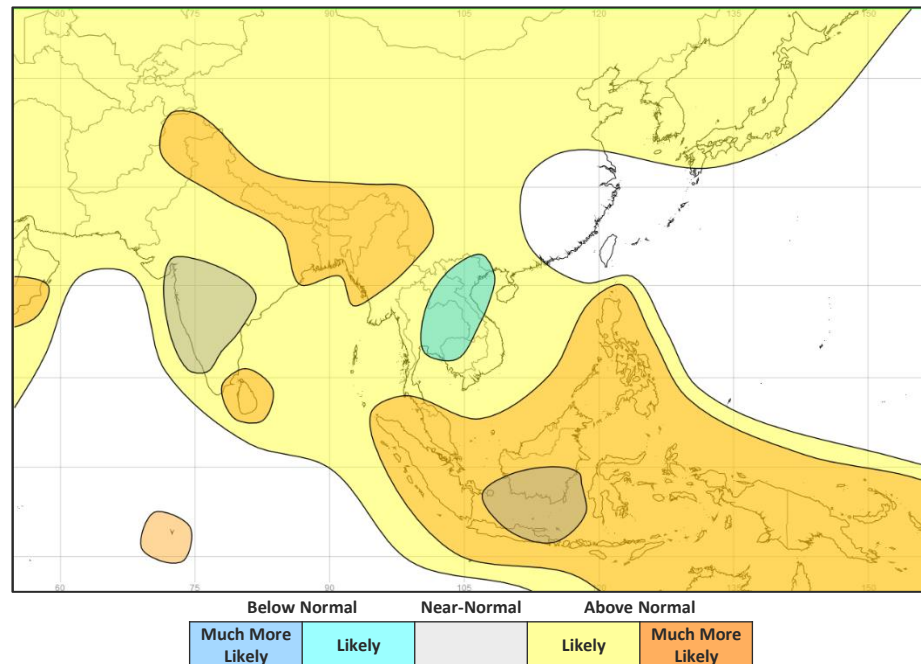# Asia Current Status and Outlook - Temperature

Current Status:

Over the last three months, most of the region has been warm or hot, with some large variations across countries such as China, Myanmar and Vietnam. Vietnam in particular has experienced cold conditions widely in July, and more locally in central parts in August.

Outlook:

For the next three months, warmer than normal conditions are likely across much of the region, and much more likely across large parts of Indonesia and Malaysia, and the Philippines, these areas affected by the increased likelihood of a return to La Niña conditions. The exception is the Indochina Peninsula, and parts of Vietnam, where below normal temperatures are likely.

3-Month Outlook October to December - Temperature

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

Asia Current Status and Outlook - Rainfall

Current Status:

Over the last three months, Afghanistan was very wet in parts of the far east. It was also wet to very wet across Myanmar, Indonesia and parts of China.

Outlook:

Over the next three months, the emerging La Niña episode, initially reinforced by the negative Indian Ocean Dipole, make above normal rainfall likely widely across this region, and much more likely across Indonesia, Malaysia and the Philippines. Central Asia and eastern China are likely to experience below normal rainfall.

3-Month Outlook October to December - Rainfall

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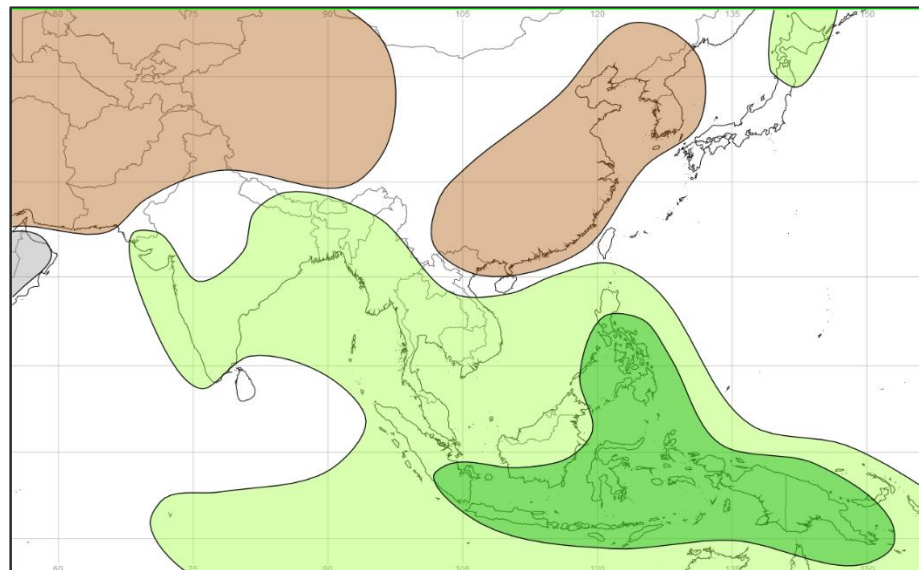
Global Outlook - Temperature

Outlook:

Over the next three months, many regions are likely to be warmer than normal, consistent with the warming observed over the past decade. There are some notable exceptions to this with below normal temperatures likely across parts of northern South America (away from the immediate coast where warm sea surface temperatures will keep temperatures above normal), southern Australia, and parts of Indochina.

3-Month Outlook October to December - Temperature

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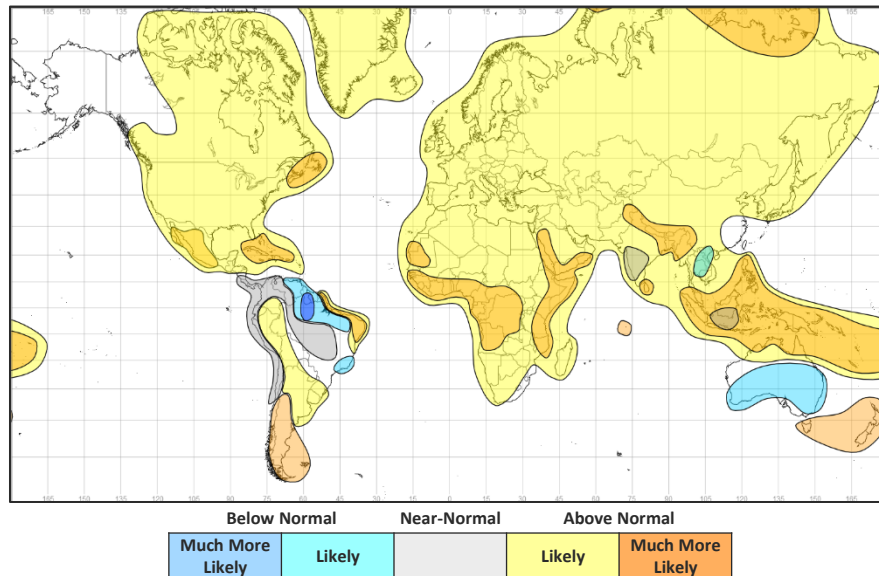
Global Outlook - Rainfall

Indian Ocean Dipole (IOD) - Indian Ocean Dipole (IOD) - A negative IOD event is established and is expected to persist for the next few months returning to neutral by December. During a negative phase, waters in the eastern Indian Ocean (near Indonesia) are warmer than normal, and the western Indian Ocean (near Africa) are cooler than normal. This typically results in wetter than normal conditions for Indonesia and SE Australia, and drier than normal conditions for Horn of Africa / East Africa.

El Niño-Southern Oscillation (ENSO) - Although ENSO neutral conditions are currently observed in the Pacific Ocean, the NOAA Climate Prediction Center / NECP forecast a 70-80% chance of La Nina emerging in the 2021-22 Northern Hemisphere winter and have issued a La Nina Watch alert. This weak La Nina episode is expected to persist into early 2022 and follows a La Nina event during the winter and spring of 2020-21. Although no two La Nina episodes are the same, this consecutive event may bring compounding impacts in some regions. La Niña typically results in enhanced rainfall across tropical land areas, especially Indonesia/Malaysia and northern/eastern Australia.

Over the next three months, large parts of southern Asia, Australasia, northern parts of South America, along with southern parts of Africa are likely to be wetter than normal.
Meanwhile, much of West, Central and East Africa, Central Asia and the Middle East are likely to be drier than normal.

Tropical Cyclone activity and their likely tracks may also be affected by the La Nina episode. Typically, during a La Nina, the North Atlantic Hurricane Season (June – November, currently above-average with 19 named storms) is slightly more active, Pacific cyclones are more likely to run due west towards the Philippines and Indochina rather than curve north towards eastern China, and there is also a signal for greater than usual tropical cyclone activity in the Mozambique Channel (season Nov – Apr)

3-Month Outlook October to December - Rainfall

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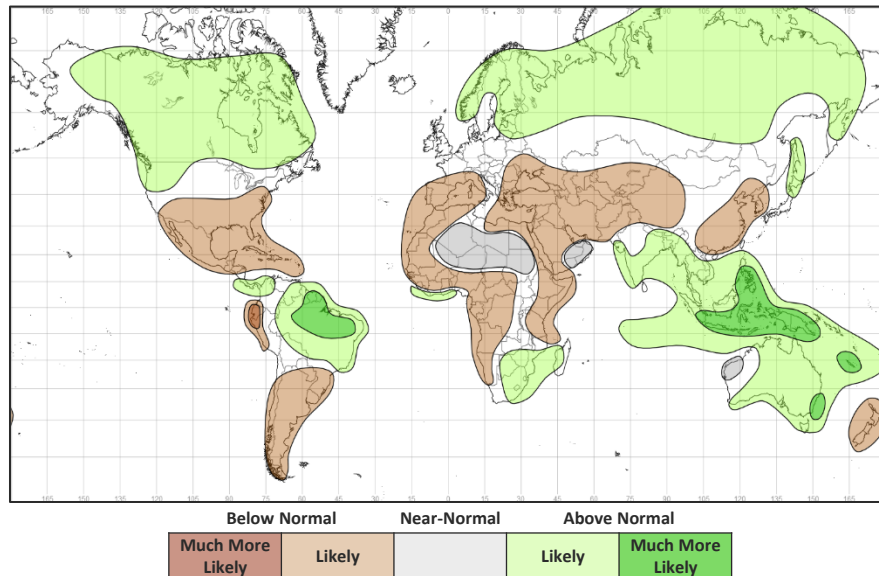
Current Status

Current Status – Temperature percentiles

June

July

August

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

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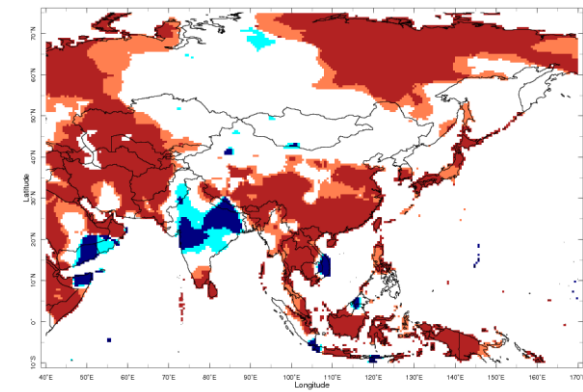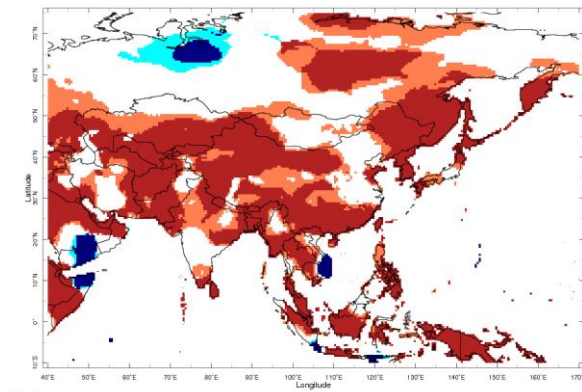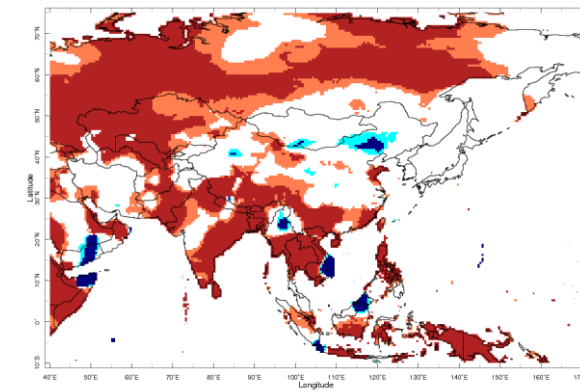
Notes: The percentiles shown in the map indicate a ranking of temperature, with the 0th percentile being the coolest and the 100th percentile being the warmest in the 1981-2010 climatology. Orange and red shading represent values above the 80th (Warm) and 90th (Hot) percentile, respectively; regions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

Current Status – Precipitation percentiles

June

July

August

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

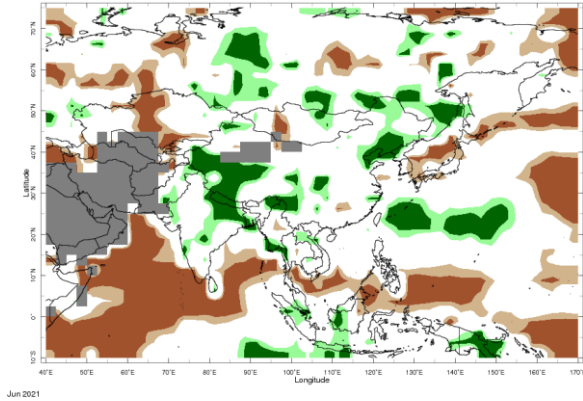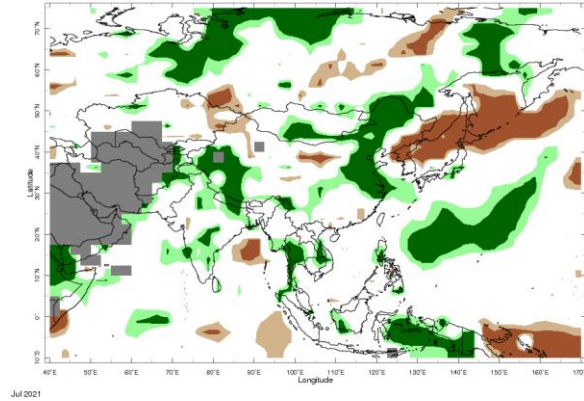| 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
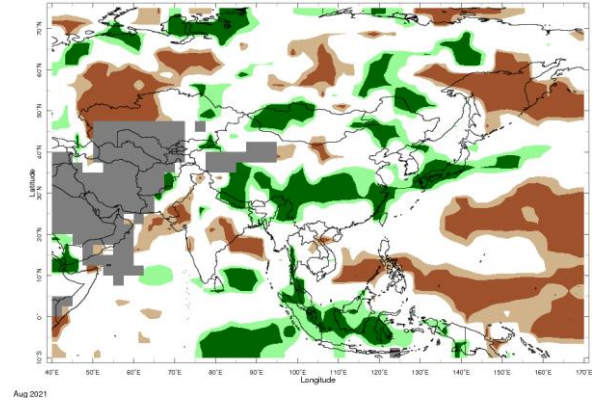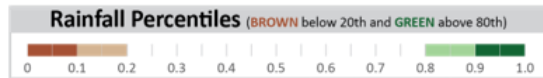
Notes: The percentiles shown in the map indicate a ranking of rainfall, with the 0th percentile being the driest and the 100th percentile being the wettest in the 1981-2010 climatology. Green and dark green shading represent values above the 80th (Wet) and 90th (Very Wet) percentile, respectively; regions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

Current Status – Central Asia

Current Status: Temperature				Current Status: Rainfall		
	June	July	August	June	July	August
Afghanistan	Hot	Hot	Warm	Very Dry*	Normal*	Mixed (1)
Tajikistan	Hot	Hot	Normal	Normal	Wet	Normal*
Kyrgyzstan	Warm	Hot	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: Normal* widely, but Very Wet in the far east.

Current Status – Southern Asia

Current Status: Temperature			
	June	July	August
Pakistan	Mixed (1)	Hot	Warm
India	Mixed (2)	Normal (5)	Hot
Nepal	Cold	Warm	Hot
Bangladesh	Warm	Hot	Hot

Current Status: Rainfall			
	June	July	August
Pakistan	Mixed (4)	Mixed (3)	Normal
India	Normal	Mixed (6)	Mixed (7)
Nepal	Very Wet	Very Wet	Very Wet
Bangladesh	Wet	Normal	Wet

Notes:

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

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

Additional Information:

(1) Note: Hot in the west, Normal in the east.
(2) Note: Hot in extreme south. Cool to Cold for many central regions.
(3) Note: Normal in the south, Wet in the north.
(4) Note: Normal in the west, wet in the east.
(5) Note: Warm/Hot in the north and extreme south.
(6) Note: Wet in the north and central regions; normal elsewhere
(7) Note: Locally dry

Current Status – Southeast Asian Peninsula

Current Status: Temperature			
	June	**July**	**August**
China	Hot (1)	Hot	Mixed (4)
Myanmar	Warm	Hot	Mixed (5)
Vietnam	Mixed (2)	Cold	Mixed (6)

Current Status: Rainfall			
	June	**July**	**August**
China	Normal	Mixed (3)	Mixed (7)
Myanmar	Normal	Very Wet	Wet
Vietnam	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, Normal in the north
(2) Note: Hot north and south, Cold central parts.
(3) Note: Large variations across the country
(4) Note: Hot in the far south, mainly normal elsewhere
(5) Note: Hot in the south, normal to cold in the north.
(6) Note: Cold in central parts, hot elsewhere.
(7) Note: Very Wet across central parts, Normal elsewhere

Current Status – Southeastern Asia / Indonesia

Current Status: Temperature			
	June	July	August
Indonesia	Hot	Hot	Hot
Papua New Guinea	Hot	Hot	Hot

Current Status: Rainfall			
	June	July	August
Indonesia	Normal	Normal (1)	Wet
Papua New Guinea	Wet	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: Wet in the east

Outlooks

Outlooks: Notes for use

Outlooks for months 4 to 6:

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

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

Climatological odds:

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

Outlook: October to March – Central Asia

		Forecast summary		
		October	October to December	January to March
Afghanistan	*Temperature*	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal in north. Likely to be near-normal in south.	Likely to be drier than normal	Likely to be drier than normal
Tajikistan	*Temperature*	Climatological odds	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	Climatological odds
Kyrgyzstan	*Temperature*	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Likely to be drier 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.

Outlooks

Outlook: October to March – Southern Asia

		Forecast summary		
		October	October to December	January to March
Pakistan	*Temperature*	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be near-normal	Likely to be drier than normal	Climatological odds
India	*Temperature*	Likely to be warmer than normal around coasts. Climatological odds elsewhere	Much more likely to be warmer than normal in the far north and south. Likely to be near-normal or climatological odds elsewhere.	Likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Likely to be drier than normal
Nepal	*Temperature*	Likely to be warmer than normal	Much more 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
Bangladesh	*Temperature*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be wetter 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: October to March – SE Asian Peninsula

		Forecast summary		
		October	**October to December**	**January to March**
China	*Temperature*	**Likely to be warmer than normal** to **much more likely to be warmer than normal** in the west and coastal regions. Climatological odds elsewhere.	**Likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	**Likely to be wetter than normal** in some areas. Climatological odds elsewhere.	**Likely to be drier than normal** in some eastern parts. Climatological odds elsewhere	Climatological odds
Myanmar	*Temperature*	**Much more likely to be warmer than normal**	**Much more likely to be warmer than normal** in the north. **Likely to be warmer than normal** in the south.	Likely to be warmer than normal
	Rainfall	**Likely to be wetter than normal**	**Likely to be wetter than normal**	Likely to be near-normal
Vietnam	*Temperature*	**Likely to be warmer than normal**	**Likely to be warmer than normal**	Climatological odds
	Rainfall	**Likely to be wetter 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.

Outlooks

Outlook: October to March – SE Asia / Indonesia

		Forecast summary		
		October	October to December	January to March
Indonesia	*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	Much more likely to be wetter than normal	Much more likely to be wetter 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	Much more likely to be wetter than normal	Much more 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.

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.ncdc.noaa.gov/teleconnections/enso/indicators/sst.php

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 (Apr 2021) - http://rcc.imdpune.gov.in/SASCOF17/concensus.html

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

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

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

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