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Asia: Monthly Climate Outlook June to March

Issued: September 2023

Overview

Asia Current Status and Outlook – Temperature

Asia Current Status and Outlook – Rainfall

Global Outlook – Temperature

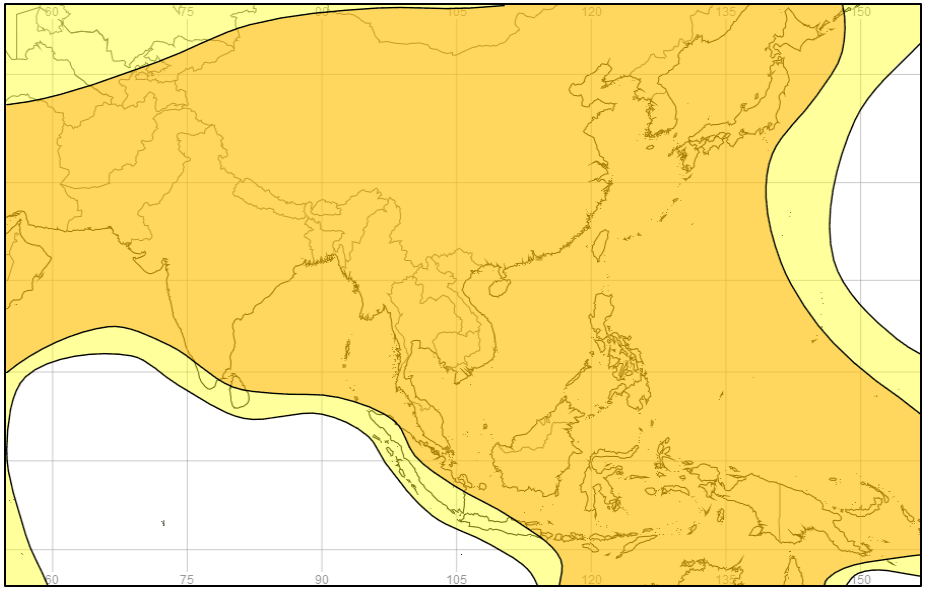
Global Outlook – Rainfall

Asia Current Status and Outlook - Temperature

Current Status: Much of Asia has been warm or hot over the last three months. The exception being large parts of northwest India in June where cold conditions were observed. Temperatures across China varied over the last three months, they were warm in June, cold in July and hot in August.

Outlook: It is likely or much more likely to be warmer than normal in all areas of Asia over the next three months, increasing the risk of heatwaves and related impacts for many parts.

3-Month Outlook October to December - Temperature



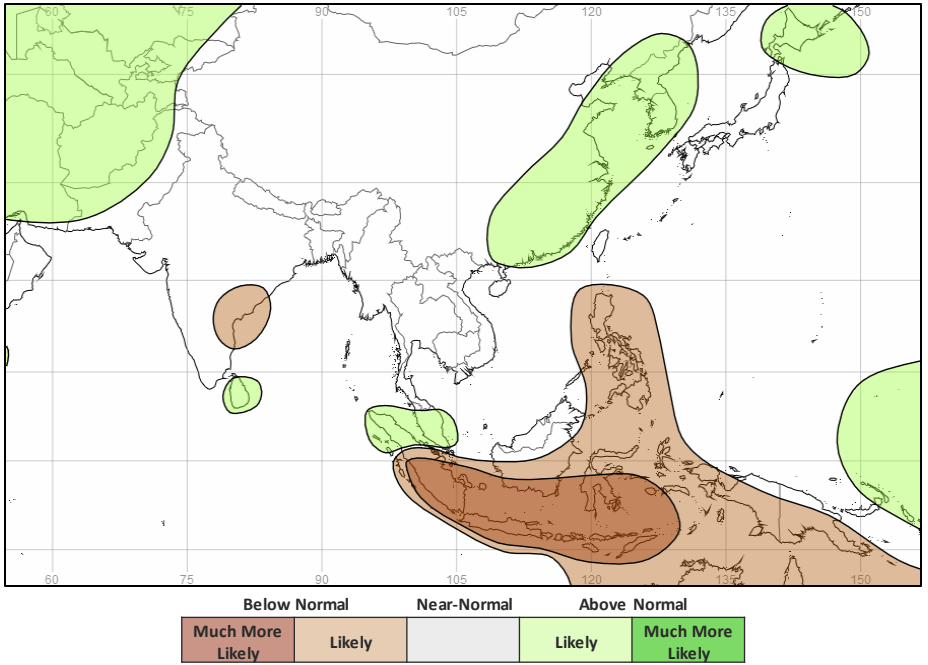
Asia Current Status and Outlook - Rainfall

Current Status: Rainfall across Indonesia was mainly near-normal, although there were some large regional variations. Dry conditions were widespread in August. Rainfall across Indonesia was mainly near normal, although there were some large regional variations at times and dry conditions were more widespread in August.

Over the past three months northern and western parts of India, parts of China and, at times, Pakistan were wet or very wet. Elsewhere in the Indian sub-continent and China rainfall was near-normal.

Outlook: Over the next three months, it is likely to be drier than normal across eastern India, though Sri Lanka is likely to be wetter than normal. Much of Indonesia is likely to be drier than normal, apart from in northern Sumatra which is likely to be wetter than normal. Eastern China and much of Central Asia is likely to be wetter than normal.

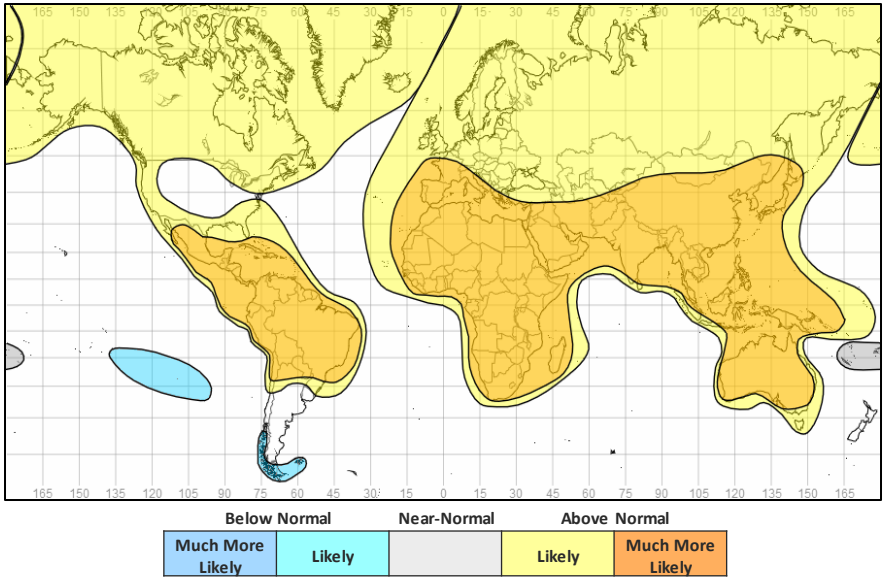
3-Month Outlook October to December - Rainfall



Global Outlook - Temperature

Outlook: With the backdrop of a warming dimate and the current El Niño event, most land areas are likely to be warmer than normal with limited exceptions.

3-Month Outlook October to December - Temperature



Global Outlook - Rainfall

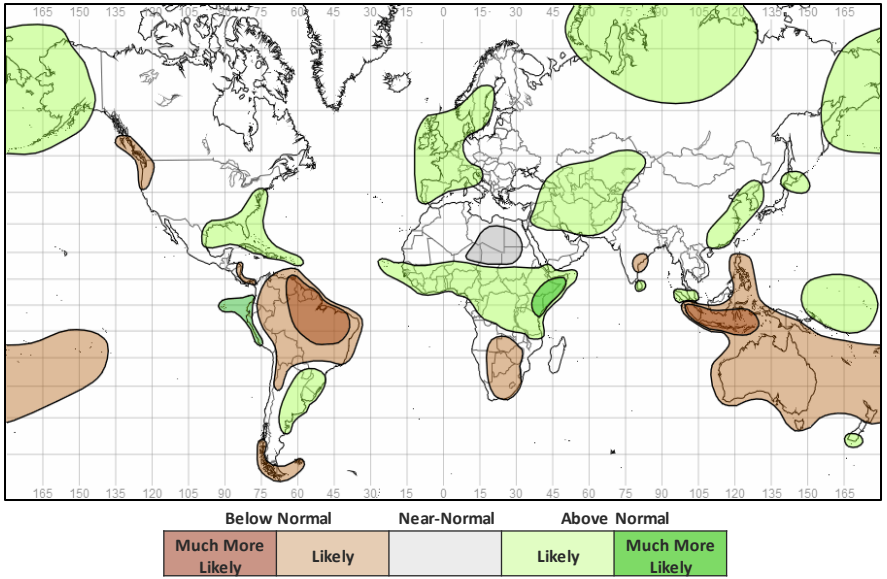
Outlook:

El Niño-Southern Oscillation (ENSO) – Sea surface temperatures across the equatorial Pacific continue to rise indicative of a developing El Niño, with latest sea surface temperatures in the Niño 3.4 region 1.6°C above normal. The atmospheric response has been slower though and is now consistent with El Niño conditions, and both the National Oceanic and Atmospheric Administration (NOAA) and Bureau of Meteorology (BoM) have declared that an El Niño event is now underway. A moderate to strong El Niño is highly likely over the next three months and this event is expected to persist well into the northern hemisphere winter. However, it is worth noting a strong El Niño does not necessarily equate to strong El Niño impacts in any given location.

El Niño impacts regional weather patterns around the world, leading to some regions experiencing wetter than normal conditions and other regions drier than normal conditions. During El Niño, temperatures around the globe are likely or much more likely to be higher than normal, and this is reflected in the current outlooks.

Indian Ocean Dipole (IOD) – Sea surface temperatures (SSTs) in the western side of the basin (off the coast of East Africa) continue to rise, increasing the index up to +1.3°C above normal. A positive IOD event was declared by BoM on the 19th September – seasonal forecasts currently suggest this event will persist until the end of year. A positive IOD will act to reinforce the influence of El Niño further increasing the likelihood of drought across southeast Asia (especially Indonesia) and Australia, with heavy rainfall and flooding events across East Africa.

3-Month Outlook October to December - Rainfall



Current Status

Current Status maps

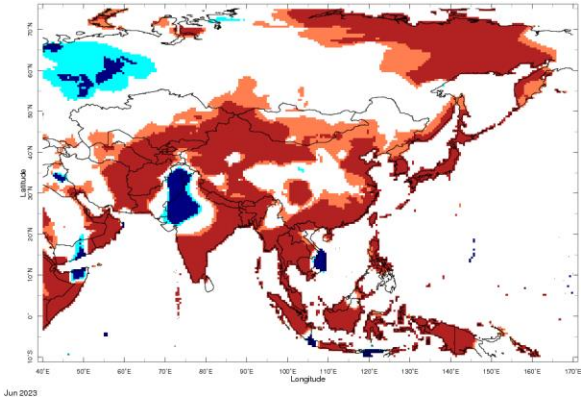
Central Asia

Southern Asia

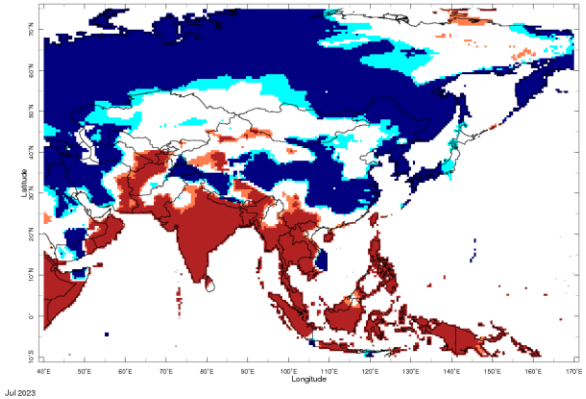
Southeast Asian Peninsula

Southeastern Asia / Indonesia

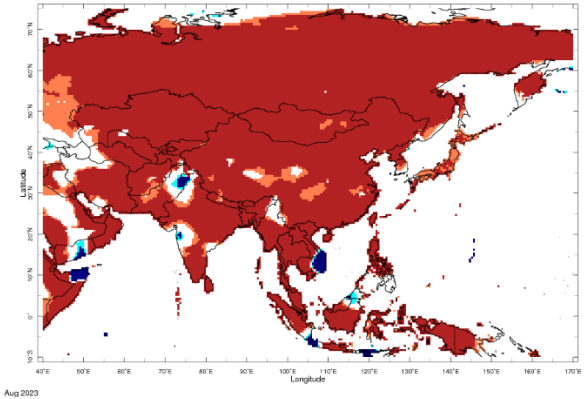
Current Status – Temperature percentiles



June



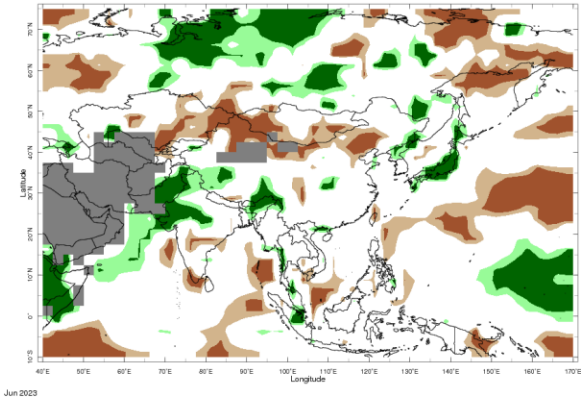
July



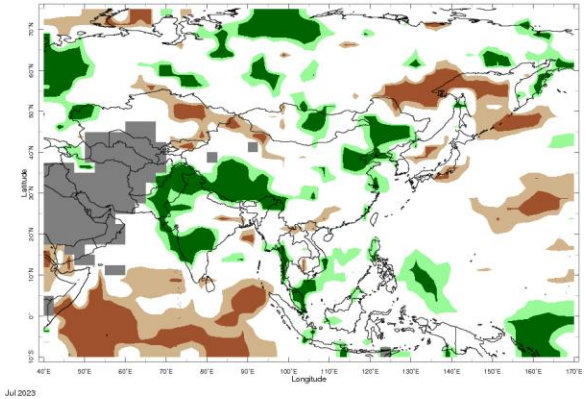
August

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.

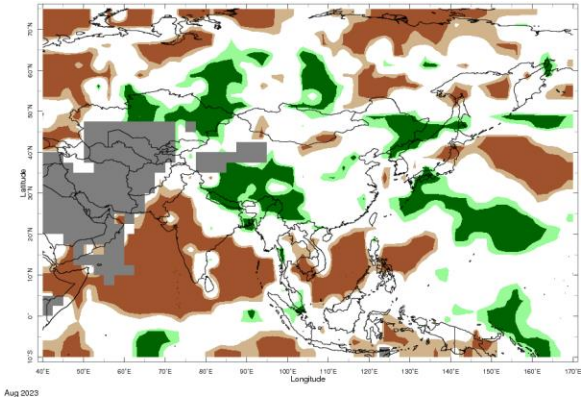
Current Status – Precipitation percentiles



June



July



August

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	Hot	Normal*	Very Wet	Normal*
Tajikistan	Hot	Mixed (1)	Hot	Normal	Normal	Normal*
Kyrgyzstan	Hot	Normal	Hot	Normal	Dry	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 west, cold in the east

Current Status – Southern Asia

	Current Status: Temperature			Current Status: Rainfall		
	June	July	August	June	July	August
Pakistan	Mixed (1)	Mixed (1)	Mixed (1)	Very Wet	Very Wet	Very Dry (5)
India	Mixed (3)	Hot	Hot (4)	Normal (2)	Normal (2)	Mixed (6)
Nepal	Hot	Hot	Hot	Normal	Wet	Very Wet
Bangladesh	Hot	Hot	Hot	Normal	Normal	Wet
Sri Lanka	Normal	Hot	Hot	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 southwest, cold in the northeast
(2) **Note:** Very wet in the northwest and far northeast, dry across some central and southern regions.
(3) **Note:** Hot in the south and east, cold in the northwest and normal elsewhere
(4) **Note:** Normal in central regions.
(5) **Note:** Normal in the north
(6) **Note:** Very dry in south and west, wet in the northeast and normal elsewhere

Current Status – Southeast Asian Peninsula

	Current Status: Temperature			Current Status: Rainfall		
	June	July	August	June	July	August
China	Mixed	Mixed	Hot	Mixed (2)	Mixed (4)	Mixed (4)
Myanmar	Hot	Hot	Hot	Normal (3)	Normal (3)	Normal (5)
Vietnam	Mixed (1)	Mixed (1)	Mixed (1)	Normal	Normal (3)	Normal

Notes:

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

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

Additional Information:

(1) Note: Cold in the south, hot in the north
(2) Note: Very dry in the north and wet/very wet in parts of the southwest, normal elsewhere
(3) Note: Wet/Very wet in the south
(4) Note: Very wet in the northeast and southwest, normal elsewhere
(5) Note: Very wet in the north and coastal regions

Current Status – Southeastern Asia / Indonesia

	Current Status: Temperature			Current Status: Rainfall		
	June	July	August	June	July	August
Indonesia	Mixed (1)	Hot	Hot	Normal	Normal	Normal (3)
Papua New Guinea	Hot	Hot	Mixed (2)	Dry	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:

(1) Note: Large variations but hot for many areas
(2) Note: Hot in the west, normal in the east
(3) Note: Dry 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*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Climatological odds
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Likely to be wetter than normal
Tajikistan	*Temperature*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Climatological odds
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Likely to be wetter than normal
Kyrgyzstan	*Temperature*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Climatological odds
	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: October to March – Southern Asia (1)

		Forecast summary		
		October	October to December	January to March
Pakistan	*Temperature*	**Much more likely to be warmer than normal**	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Climatological odds	**Likely to be wetter than normal** in the west; Climatological odds elsewhere	Climatological odds
India	*Temperature*	**Much more likely to be warmer than normal**	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Climatological odds	**Likely to be drier than normal** in eastern India; Climatological odds elsewhere	Climatological odds
Nepal	*Temperature*	**Much more likely to be warmer than normal**	**Much more 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: October to March – Southern Asia (2)

		Forecast summary		
		October	October to December	January to March
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	Climatological odds	Climatological odds	Climatological odds
Sri Lanka	*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**	Likely to be drier than normal

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: October to March – SE Asian Peninsula

		Forecast summary		
		October	October to December	January to March
China	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Climatological odds
	Rainfall	Likely to be wetter than normal in the northeast; Climatological odds elsewhere	Likely to be wetter than normal in the southeast; Climatological odds elsewhere	Climatological odds
Myanmar	*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	Climatological odds	Climatological odds
Vietnam	*Temperature*	**Much more likely to be warmer than normal**	**Much more 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: October to March – SE Asia / Indonesia

		Forecast summary		
		October	October to December	January to March
Indonesia	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	**Much more likely to be drier than normal** in Java and southern Sumatra; Likely to be drier than normal elsewhere	**Much more likely to be drier than normal** in Java and southern Sumatra; Likely to be drier than normal elsewhere	Likely to be drier than normal
Papua New Guinea	*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 drier than normal	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.

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)

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