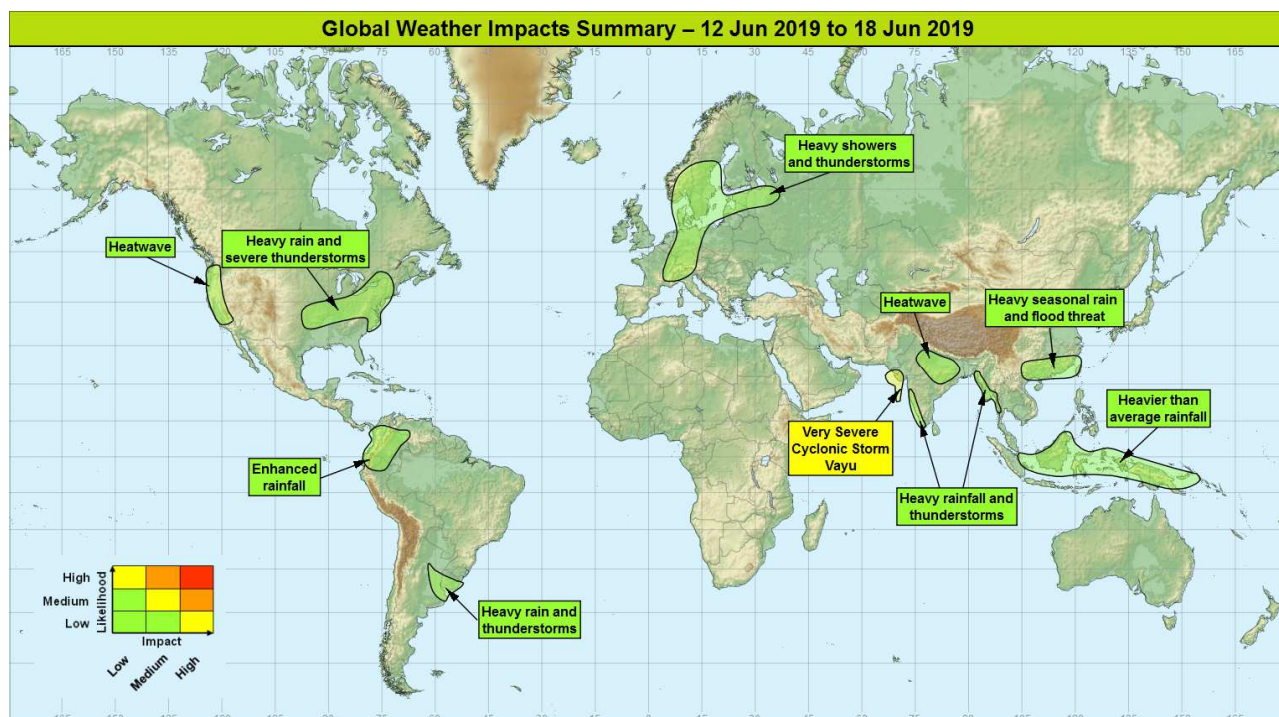


## Global Weather Impacts – Wednesday 12<sup>th</sup> to Tuesday 18<sup>th</sup> June 2019

Issued on Wednesday 12<sup>th</sup> June 2019

### HEADLINES

- Very Severe Cyclonic Storm Vayu has formed in the eastern Arabian Sea, and is expected to track north towards Gujarat where a landfall is expected early on Thursday.



### DISCUSSION

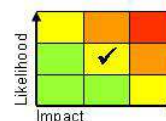
#### Tropical Cyclones

#### Very Severe Cyclonic Storm Vayu, Arabian Sea, including western India

##### Weather

Cyclonic Storm Vayu currently around 340km south of Veraval (Gujarat) and is expected to continue to make progress northward across the Arabian Sea, with mean wind speeds of 85 mph, and gusts to 100 mph. It is expected to rack north-northwards off the west India coast line and intensify a little further prior to landfall, with mean wind speeds of 95 mph and gusts of 105 mph. Landfall is forecast to be over Gujarat early on Thursday morning, probably between Porbanda and Mahuva, around Veraval. Heavy rain (locally 300 to 450 mm) is associated with Vayu, along with very rough seas.

##### Discussion



This forecast may be amended at any time

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Very Severe Cyclonic Storm Vayu will continue to progress north across the Arabian Sea off the west coast of India. The Indian Meteorological Department (RSMC) expect the storm to cross the Gujarat coast early on Thursday morning, then track northwestwards just inland of the coast. Once landfall is made, uncertainty in the track of the system increases markedly. Some solutions allow Vayu to become slow-moving, whilst others take it back offshore across the Arabian Sea. This has large implications for amounts of rainfall, with some more extreme solutions signalling locally around 800 mm. Current model consensus is for the storm to move back offshore limiting overall rainfall accumulations to up to 450 mm. It is also worth noting that there are some solutions that curve Vayu away from Gujarat (as per the latest GM output), such that it fringes the coast or does not make landfall. However this is considered a lower probability solution at this time, but will limit the impacts of this event.

### Expected Impacts

Dangerous maritime conditions with large waves and fairly strong coastal winds along the coastline of Western India. Potentially damaging winds may be present as the centre of the cyclone makes landfall across Gujarat early Thursday. Heavy rain associated directly with the system is only expected to affect Gujarat Province of India and perhaps Sindh province where both flash and flooding of smaller river catchments is possible.

### Europe

#### Central and north-eastern Europe

##### Weather

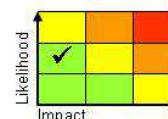
Further thunderstorms are likely across much of central and north-eastern Europe for much of the next week, becoming organised at times within the highlighted area. Some places could see 75-100mm of rain in a relatively short space of time.

##### Discussion

A warm continental plume ahead of a waving frontal zone across central parts of Europe will be the focus for severe thunderstorms as a major upper vortex becomes established across western Europe. Forecast profiles show large CAPE (in excess of 2000 J/Kg), with enough vertical wind shear to produce organised deep convection with the potential for MCS development. Tornadoic developments are possible at times, mainly close to advancing cold front, but strong downdraught winds are more likely.

##### Expected Impacts

Flash flooding along with power outages and disruption to the transport networks (especially aviation) is possible. Hail is likely to cause disruption to transport and damage to crops, some buildings and vehicles.



### North America

#### Central and eastern USA

##### Weather

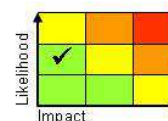
Heavy rain and thunderstorms will continue to affect the highlighted regions through the next week. Some places could see over 50 mm in a 24 hour period, and in excess of 100mm over the week.

##### Discussion

Further plumes of warm moist air will be drawn northwards from the Gulf of Mexico and tropical Atlantic ocean into the southern and eastern United States. However with the Pacific North America (PNA) pattern now positive, the amplitude of the upper pattern across the region is much reduced. As a result only fairly modest organisation of convection is expected, with upper troughs and highest WBPT air often not co-located.

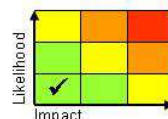
##### Expected Impacts

Flash flooding is the most likely impact, but frequent lightning, large hail, damaging winds and isolated tornadoes are also possible and may cause localised disruption and damage.



### Pacific coast USA

##### Weather



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A heatwave will continue to affect the region through the rest of the week, before conditions turn somewhat less hot over the weekend. Maximum temperature of 37.8°C was recorded at San Francisco on Tuesday (average for June is 21°C) and similar values are expected over the next couple of days.

## **Discussion**

A persistent area of high pressure over western Canada has slowed heat to build up over the region. Over the next few days, the ridge is expected to decline retrogress into the Pacific Ocean, allowing a maritime airmass to spread in across the region, with temperatures gradually falling back to normal over the weekend.

## **Expected Impacts**

Due to our cooler than normal May and lack of time to acclimate, heat related illnesses such as heat exhaustion and heat stroke will be possible, although mainly for vulnerable groups.

## **Central America and Caribbean**

Nil significant.

## **South America**

### **North Peru, Ecuador, Colombia and Venezuela**

#### **Weather**

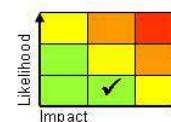
A continuation of the enhanced seasonal rains over north-west South America is expected, with a further 250-300mm likely in some places. The highest rainfall totals most likely over west facing slopes of the Andes mountains in Colombia.

#### **Discussion**

The ITCZ remains active in the areas, with a series of African Easterly Waves helping to maintain activity along it, and through this area for the next week. The Andes will likely aid lift, resulting in orographically focused rain totals.

#### **Expected Impacts**

Further flash flooding and landslides are likely in this region, along with the potential for river flooding.



### **Uruguay and north-east Argentina**

#### **Weather**

A repeating pattern of areas of heavy rain and thunderstorms associated with areas of warm, tropical air being drawn southwards is expected to affect this region over the next week. Some places could see 50 mm, locally 75 mm per day, with 100-150mm in some locations over the next week.

#### **Discussion**

The usual pattern of plumes of moist tropical air being drawn southwards and providing a focus for heavy rain and embedded, mostly elevated convection will take place over the next week. Upper forcing is relatively weak, although strong flow aloft will provide efficient exhaust for long lived and organised cells to develop.

#### **Expected Impacts**

Flash flooding, impacts mainly low, but a low potential of greater impacts should this heavy rain affect urban areas such as Buenos Aires and Montevideo.



## **Africa**

Nil.

## **Middle East**

Nil.

## **Asia**

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## Central and northern India

### **Weather**

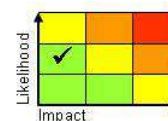
The pre-monsoon heat wave continues across parts of central and northern India as well as eastern Pakistan. Maximum temperatures will be widely in the mid to high 40s of Celsius each day and may exceed 50 °C very locally. In the hottest areas this around 5-10°C above average. Overnight temperatures will remain in excess of 30°C across much of this area. Over the next week the hottest conditions may become more confined to north and northeast India.

### **Discussion**

The arrival of the monsoon rains into India are currently around 10 days slower than average, but may well jump northwards over the next week due to both MJO propagation, and enhanced southwest flow due to Vayu tracking north in the Arabian Sea.

### **Expected Impacts**

Significant threat of sun and heat stress, especially affecting elderly and vulnerable groups. A detrimental effect on agriculture and power failures.



## Western India

### **Weather**

Enhanced south-westerly winds in the wake of Cyclonic Storm Vayu will draw persistent moist maritime air with heavy rain and thunderstorms to coastal regions of western India. Widely 100-200mm, and in places 300-500 mm could fall over the next 5-7 days.

### **Discussion**

Enhanced flow on the S flank of Cyclonic Storm Vayu will bring heavy persistent rainfall to western coastal areas of India. Profiles support the release of deep and moist convection with limited CAPE, which is very efficient at producing heavy precipitation. Many factors such as frictional convergence, surface heating, and chiefly orographic uplift will allow the continual release of deep instability in this region.

### **Expected Impacts**

Flash and the flooding of some smaller river catchments is probable across parts of western India, although this is not so unusual in the context of the progressing Indian Summer Monsoon, and felt to be very early in the wet season for these precipitation totals to cause major impacts.



## Southern Bangladesh and western Myanmar

### **Weather**

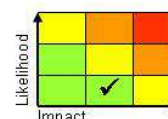
Intense showers and thunderstorms are expected in the coming days. Initially the heaviest rainfall is likely to fall just south of Cox's Bazar, over western facing slopes of Myanmar. However, over the coming weekend, there is increasing evidence to suggest heavy rains will spread further north to affect a wider area of southern Bangladesh, including Cox's Bazar. Some places could see over 500mm over the next few days.

### **Discussion**

Strong southwest winds will draw moisture northeast into Bangladesh and Myanmar leading to a threat of frequent thunderstorms and torrential rain over coast and inland mountains over the next few days. There is a weak signal for organisation around a monsoon depression on Tuesday, this may have the impact of temporarily reducing activity in the vicinity of Cox's Bazar, but heavy showers will likely return northwards later in the week increasing the risk of impacts here once again.

### **Expected Impacts**

Flash flooding looks like the main impact, with a risk for vulnerable populations within the Cox's Bazar district.

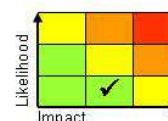


## Southern China and Taiwan

### **Weather**

Heavy rainfall and thunderstorms will affect southern China and Taiwan over the next 5 days. Up to 300 mm of rain could fall in a few days and there is also the potential for severe thunderstorms that could produce hail and strong winds.

### **Discussion**



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Strong convergence along the monsoon frontal zone and heating of the high terrain in the moist air to its south will continue to produce heavy precipitation in the form of showers and thunderstorms. Although shear is fairly modest for mid-latitudes, in the tropics this is seemed easily sufficient for the organisation of cells

## **Expected Impacts**

Both fluvial and flash flooding are likely to be the main impacts (especially in urban areas), with the additional enhanced risk of landslides in mountainous terrain. Disruption to transport and infrastructure is also likely in what is a densely populated area.

## **Maritime Continent**

### **Weather**

Heavier than normal rainfall is expected across this broad region over the next week, with more widespread than usual diurnal shower and thunderstorm development. Where showers occur, 25-50mm of rain in a few hours is likely, with some locations seeing over 200 mm of rain through the coming week.

### **Discussion**

The MJO has moved into the region, bringing a broad environment conducive to more widespread than average convection. Strong and consistent model signal for above average precipitation in this location.

### **Expected Impacts**

Localised flash flooding and increased risk of landslides in the more mountainous terrain.



## **Australasia**

Nil significant.

## **Additional information**

Nil.

**Issued at:** 120715 UTC **Meteorologists** Brent Walker / Tony Wardle

**Global Guidance Unit**

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