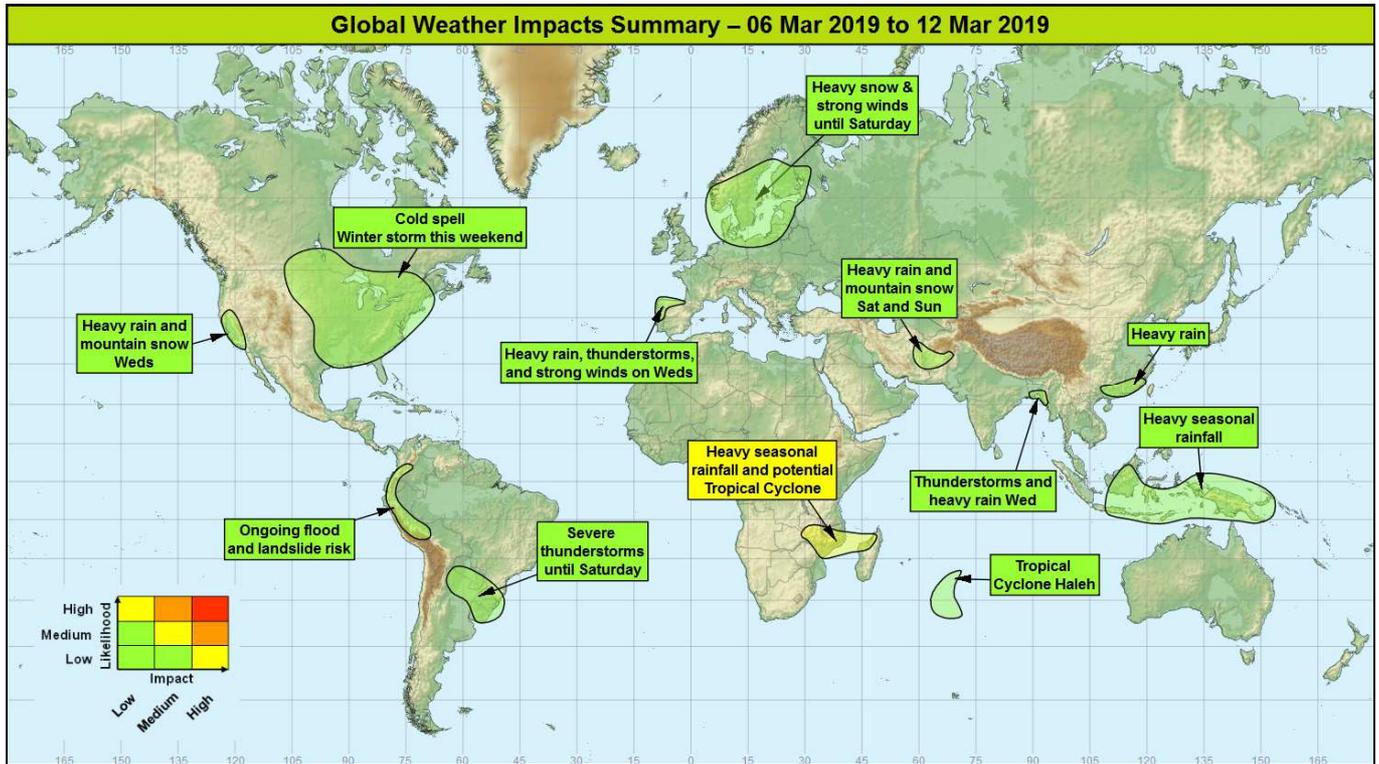


## Global Weather Impacts – Wednesday 6<sup>th</sup> to Tuesday 12<sup>th</sup> March 2019

Issued on Wednesday 6<sup>th</sup> March 2019

### HEADLINES

- Heavy rainfall will affect parts of southeast Africa through this week.
- Remaining very cold across large parts of North America, with a further multi-hazard winter/spring storm this weekend.



### DISCUSSION

#### Tropical Cyclones

#### Tropical Cyclone Haleh (Southwest Indian Ocean)

##### Weather

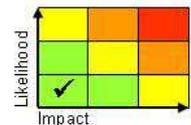
Tropical Cyclone Haleh was located almost 900 miles southeast of Mauritius on Wednesday morning with maximum sustained winds of around 85 mph. Haleh has passed peak intensity and should continue to slowly weaken as it moves south over open ocean through the rest of this week.

##### Discussion

As Haleh continues south the system will become increasingly weakened by a combination of increased vertical wind shear and ever decreasing sea surface temperatures. Through the weekend Haleh is likely to undergo an extra-tropical transition, and then be steered eastwards by the polar front jet stream across the open Southern Ocean.

##### Expected Impacts

None.



#### These additional areas are being monitored for Tropical Cyclone development

Mozambique Channel – See *Africa* section.

**This forecast may be amended at any time**

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## Europe

### Baltic Sea region

#### **Weather**

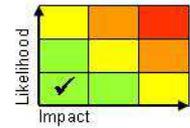
A spell of heavy snow is likely to affect southern Scandinavia from late Wednesday through to Friday. For many locations snow will only be transitory, but for parts of southern Norway (including Oslo) and central Sweden in excess of 50cm of snow could fall. In addition severe gales, with gusts potentially up to 70 mph could affect countries bordering the Baltic Sea for a on Friday, especially Denmark, northern Germany, northern Poland and The Baltic States.

#### **Discussion**

A low that crosses the UK on Thursday, may then undergo a second phase of deepening as it pushes east across southern Scandinavia on Friday. This is heavily dependent on interaction with an upper trough. The track and depth of this system remains somewhat uncertain and this leads to uncertainty in the location of the exact location of the heaviest snowfall and strongest winds.

#### **Expected Impacts**

Some travel and power disruption is likely as a result of heavy snow across southern parts of Norway, and for a time across Sweden and Finland; there is increasing confidence that the Oslo area is likely to be affected. Where strong winds develop, damage to buildings and trees is possible with some power cuts likely. The winds are also likely to disrupt ferry services and bridge crossings in and around the Baltic Sea.



### Northwestern Iberia

#### **Weather**

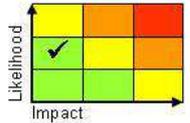
An area of heavy rain, showers and thunderstorms coupled with very strong winds will affect this region through Wednesday, the system associated with this has been named Storm Laura by the Spanish Met Service. A further 50 mm of rainfall is possible in places, along with gusts of wind reaching 50 to 60 mph. In addition to the rain and wind, large waves are likely to impact some coastal regions.

#### **Discussion**

The training frontal zone is associated with the depression that slowly moves across the British Isles through Wednesday, will form several troughs or small scale lows along it. One such low will move close by northwest Iberia on Wednesday, this will be an active feature with forecast profiles supporting deep, embedded instability. Behind the main frontal band organised and intense bands of showers and thunderstorms are likely, accompanied by hail and very strong gusts of wind.

#### **Expected Impacts**

Flash and coastal flooding is possible. Some disruption to travel likely, with a risk of fallen trees and disruption to power supplies.



### North America

#### California

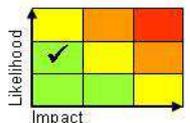
#### **Weather**

Parts of California have experienced a spell of very heavy rainfall in recent weeks leading to severe flooding and evacuations. An ongoing spell of rain, mountain snow and strong winds will continue to affect the state on Wednesday, before clearing away to the east overnight in Thursday. The heaviest rainfall is expected to be along the Pacific coastline where a further 25-50 mm is likely to fall, whilst a further 1.5 metres of snow is possible over the Sierra Nevada mountain range.

#### **Discussion**

A south-shifted Pacific jet stream, often associated with El Niño, has resulted in a constant stream of sub-tropical moisture being drawn up towards California over several weeks. Although the jet remains south-shifted beyond Wednesday and continues to bring precipitation to the region, the lack of tropical air within these systems will mean that precipitation totals are much reduced.

#### **Expected Impacts**



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Further urban and river flooding is possible. Heavy snowfall in the higher elevations of the Sierra Nevada is likely to make travel difficult. There is an increased threat of mud/rockslides and debris flow flooding in the foothills, particularly in the vicinity of burn scars.

## Southern Canada, central and eastern USA

### Weather

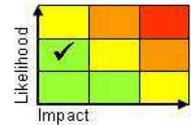
The eastern half of North America will remain in the grip of a potent cold snap, with temperatures widely 10-20 °C below average. Over the weekend conditions will begin to turn milder. However, this transition to milder conditions will bring multiple hazards. Heavy snow and freezing rain in northern areas, especially around the Great Lakes; meanwhile there is the potential for severe thunderstorms to break out in the south, bringing the usual hazards of torrential rain, large hail and a risk of tornadoes.

### Discussion

Arctic air is now well established across a large part of Northern America east of the Rockies. Later this week an upper trough will move in off the Pacific, sharpening as it crosses the Rockies over the weekend and drawing north a plume of warm, moist air from the Gulf of Mexico. This interaction leads to cyclogenesis with the system then moving northeast across much of central and northern parts of the USA. On the northern flank of this system heavy snow and freezing rain is likely to develop, whilst in the warm sector ahead of the cold front, there is the potential for severe thunderstorms to break out in the Deep South.

### Expected Impacts

Initially the very cold conditions could impact vulnerable populations and affect agriculture in the region. Some travel and power disruption is likely as a result of heavy snow and freezing rain developing through this coming weekend across central and northern USA. Heavy rain and thunderstorms in the south may result in some urban and river flooding, with a risk of greater disruption (albeit on a very localised scale) if any tornadoes form.



## Central America and Caribbean

Nil significant.

## South America

### Northern Andes region (Southern Colombia, Ecuador, Peru and Bolivia)

#### Weather

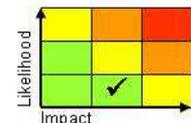
Although rainfall is not expected to be as heavy nor widespread as recent weeks, further showers and thunderstorms are expected to affect the northern Andes region for the rest of this week. The heaviest rainfall expected to be across Ecuador and northern Peru. Here, rainfall accumulations will vary by location due to the showery nature of the rainfall, but some places could see a further 200-300 mm of rain over the next week.

#### Discussion

Along the Pacific coastline north of NE Peru there are positive SST anomalies, and these indicate a weakening of trade winds and the Humboldt Current in this region. This setup allows sea breezes to draw moist oceanic air to the usually dry western Andes, with an unusually high frequency of heavy showers and thunderstorms occurring here. There is also likely to be an input from the South American monsoon and South Atlantic Convergence Zone as it moves north from Argentina.

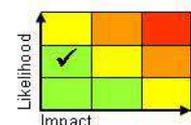
#### Expected Impacts

Flash flooding and landslides remain an ongoing threat in the mountainous areas, as well as downstream river flooding. The most recent flood impacts have been reported from northwest Peru where homes and bridges have been destroyed and many thousands of people impacted. With much of this region now preconditioned by previous rainfall, further heavy rain will likely produce similar impacts.



### Northern Argentina, Uruguay, Paraguay and southern Brazil

#### Weather



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Frequent showers and thunderstorms, at times organised and severe, are expected to affect the region until Saturday. Thunderstorms will produce strong winds, large hail and a small risk of a tornado. During this period, some locations are likely to receive 200-300 mm of rainfall, often falling in short periods. This would represent around double the normal monthly rainfall for some locations.

## Discussion

A number of disturbances embedded within the subtropical jet are expected to lead to several episodes of severe convection along the South Atlantic Convergence Zone (SACZ). This round of severe convection will ease as a marked cold front moves north and brings more benign conditions following by the end of the week. Ahead of the cold front the environment will often be characterised by high CAPE and shear, supporting mesoscale convective systems and supercells.

## Expected Impacts

Severe thunderstorms are not unusual in this part of the world at this time of year but rainfall anomalies since the end of December have exceeded 200% in the far northeast of Argentina, across Uruguay and in the far south of Brazil. Further heavy rainfall is likely to lead to flash flooding and increased risk of landslides. Severe thunderstorms will also cause some highly localised but potentially significant property and infrastructure impacts due to strong winds, hail and lightning.

## Africa

### Mozambique, Malawi, southern Tanzania and Zambia

#### Weather

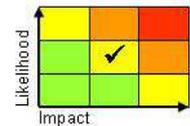
Showers and thunderstorms are expected to remain frequent, heavy and widespread across the region, with these being focussed by a shallow depression. The heaviest rainfall is expected to affect central Mozambique and southern Malawi. It is possible that some locations may receive in excess of 500 mm of rainfall during this period which is equivalent to around what normally falls over 4-6 weeks. Over the weekend the depression is signalled to move out into the Mozambique Channel and potentially develop into a tropical cyclone.

#### Discussion

Progression of the MJO across the Indian Ocean into Phase 3 favours enhanced rainfall in this region, this rainfall has also been aided by an Equatorial Rossby Wave (ERW) that has recently crossed Madagascar and is now interacting with the monsoon low. Across much of the area highlighted rainfall has been below average over recent months, so this rainfall could be welcome to the agricultural sector. In the area around Lake Malawi rainfall has been above average over the past month, so here these additional falls may lead to greater impacts here. As noted in the previous section the monsoon low may emerge across the Mozambique Channel this weekend, if this occurs high SSTs (~30°C) and low wind shear may allow this feature to develop into a tropical cyclone.

#### Expected Impacts

Risk of flash flooding which is a particular hazard in urban areas. Although large parts of the region are sparsely populated, some fairly heavily populated centres sit on the floodplains of central Mozambique. These events may disrupt travel, power interruptions and damage to buildings/infrastructure. If significant flooding were to occur in the major river some crops could be lost along the farmed flood plains. Low risk of significant wind impacts, mainly in coastal areas, should a tropical cyclone form.



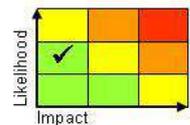
## Middle East

### Eastern Iran and southwest Afghanistan.

#### Weather

An area of rain and some mountain snow will move across the usually desert regions of eastern Iran and southwest Afghanistan this weekend. Widely 5-10mm of precipitation may fall, with totals locally exceeding 30mm. Over the mountains to the north of Kandahar over 50cm of additional snow may fall.

#### Discussion



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A trough in the sub-tropical jet will engage a WBPT plume drawn north from the Gulf of Oman across this region this weekend. This will result in the formation of a surface depression, large areas of dense medium/high cloud and areas of precipitation. Following the passage of the upper trough benign conditions will become once more re-established early next week.

**Expected Impacts**

Following recent floods in this region in recent days the ground and rivers will be pre-conditioned for a quick response to additional precipitation. Further flash and river flooding is possible even in response to the relatively modest precipitation totals of this event.

**Asia**

**Bangladesh and northern Myanmar**

**Weather**

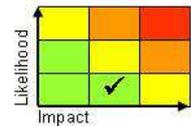
Shower and thunderstorm activity is expected to continue to be more frequent than usual on Wednesday with the potential for some locations to receive 20-100 mm of rain in a few hours. Whilst significantly higher amounts of rainfall occur during the southwest monsoon, this out-of-season rainfall would represent 2-3 times the March average for those areas that receive the highest totals.

**Discussion**

The subtropical jet described above will extend eastward and engage a moisture laden low-level surface flow from the Bay of Bengal to trigger numerous heavy showers and thunderstorms, some of which are likely to become organised and locally severe.

**Expected Impacts**

Increased likelihood of flash flooding and damage to properties from rainfall, large hail, frequent lightning and locally strong winds. Vulnerable populations in the region, including the Cox's Bazar area, may be more susceptible to impacts owing to it being the dry season and monsoon preparedness is unlikely to have commenced (rainfall onset occurs during April and May).



**Southeast China**

**Weather**

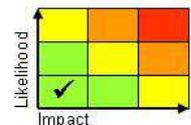
A succession of weather systems are expected to produce heavy rainfall across the region through the rest of the week. The heaviest rainfall is expected to fall across Guizhou, Hunan and Jiangxi provinces where over the next week, 50-100 mm of rainfall is expected to fall widely and locally a further 150 mm is possible. For context, Gazhou, Jiangxi typically receives 180 mm of rain during March.

**Discussion**

A series of disturbances along the sub-tropical jet are expected to engage the strong baroclinic zone that lies across the southern third of China. This is expected to lead to several cyclogenesis events, spawning areas of low pressure that then develop as they move towards Japan but producing significant rainfall where the frontal zone remains slow-moving across China.

**Expected Impacts**

A slightly enhanced likelihood of flash flooding and temporary transport disruption. The cumulative effects of several rainfall episodes may also increase the risk of landslides in more mountainous areas.

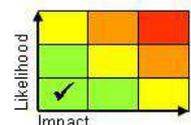


**Indonesia, Malaysia and Papua New Guinea**

**Weather**

Above average rainfall is expected across many Maritime Continent islands through the next week. Whilst downpours are expected to be rather localised, they are likely to develop in a similar place each day with 100-150 mm of rain possible falling in 24 hours with some places likely to receive around 400 mm over the next week. In a typical 7-day period, this region normally receives around 50-100 mm.

**Discussion**



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Over the past couple of weeks, the MJO phase has not been supportive of widespread convection but has instead allowed diurnal convection driven by the land-sea breeze cycle to become dominant. Since this is a cyclical process, convection has developed over similar locations each day, particularly along the central spine of narrow islands such as Java and East Britain. Increasingly through this week, as the MJO transfers from Phase 3 into 4 convection is expected to widespread with also increased thunderstorm.

### **Expected Impacts**

An increased likelihood of flash flooding leading to localised damage to infrastructure and property, including major cities such as Jakarta.

**Afghanistan** – See *Middle East* section.

### **Australasia**

**Papua New Guinea** – See *Asia* section.

### **Additional information**

Nil.

**Issued at:** 060820 UTC    **Meteorologist:** Nick Silkstone

**Global Guidance Unit**

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