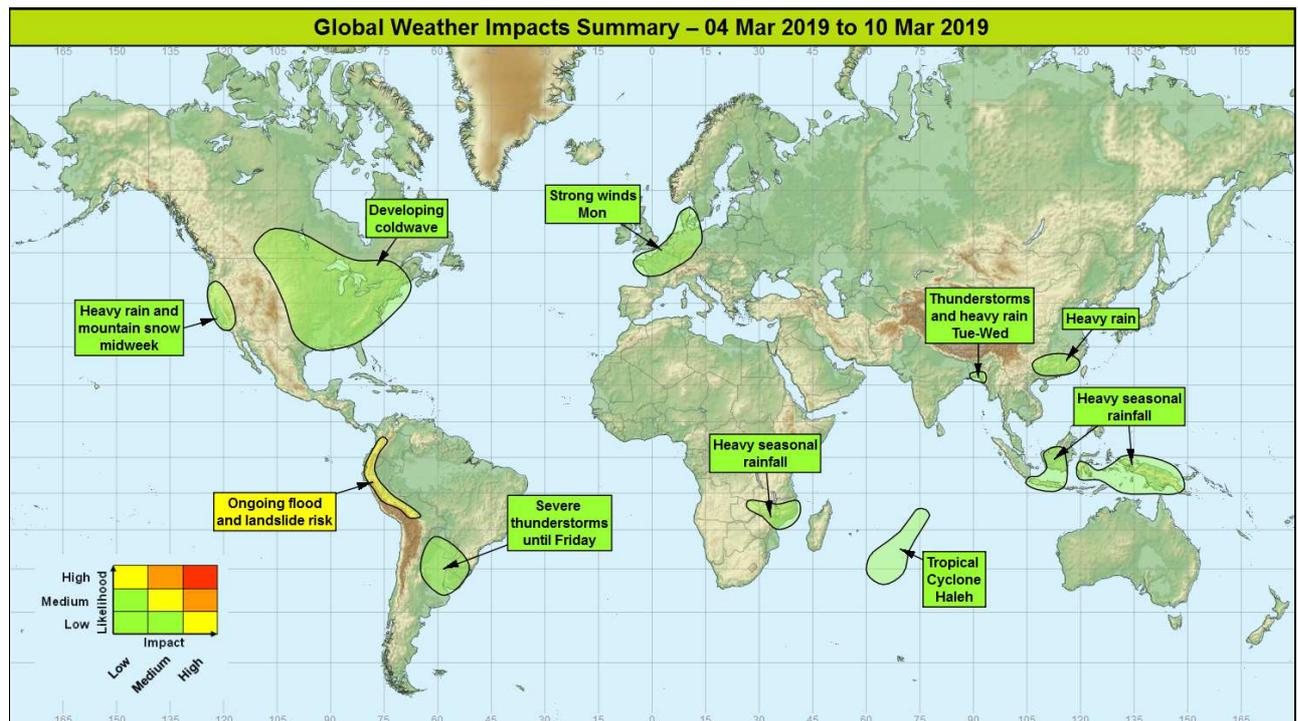


## Global Weather Impacts – Monday 4<sup>th</sup> to Sunday 10<sup>th</sup> March 2019

Issued on Monday 4<sup>th</sup> March 2019

### HEADLINES

- Enhanced flooding and landslide risk persists across parts of Peru, Colombia, Ecuador and Bolivia.
- Potential for heavy rainfall to affect parts of southeast Africa through this week.
- Very cold across parts of North America, with a winter storm bringing severe thunderstorms and heavy snow at first today along the east coast.



### DISCUSSION

#### Tropical Cyclones

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

##### Weather

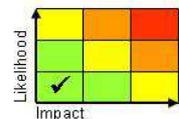
Tropical Cyclone Haleh was located around 1100 miles northeast of Mauritius on Monday morning and is expected to undergo further strengthening over the next couple of days into an intense tropical cyclone with forecast maximum sustained winds of 110 mph. However, Haleh is expected to remain well away from land before eventually moving into the mid-latitude westerly flow and weakening later in the week.

##### Discussion

After a brief hiatus, intensification of Haleh has recommenced, as the tropical cyclone has moved into a more favourable environment for development. Haleh is likely to remain a tropical cyclone through much of the week before slowly weakening as it moves south over decreasing oceanic heat content.

##### Expected Impacts

None.



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

Global Guidance Unit, Operations Centre, Met Office, FitzRoy Road, Exeter

Tel: +44(0)1392 884319 VPN: n6225 4319 Email: [ggu@metoffice.gov.uk](mailto:ggu@metoffice.gov.uk)

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## Europe

### Northern France, Low Countries, Denmark and Germany

#### Weather

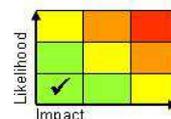
Storm *Freya* is expected to continue to bring a spell of strong winds to much of northwest Europe during Monday with the potential for gusts of up to 70-80 mph around exposed coasts and 50-60 mph inland.

#### Discussion

*Freya* has now reached maturity, but will still bring a spell of very strong winds during Monday across Denmark. An instant occlusion in the cold air behind *Freya* will bring to a second swathe of strong winds across northern France and Germany.

#### Expected Impacts

Damage to buildings and trees is possible with some power cuts likely. Some disruption to transport, including rail, air, road and ferry services is likely.



## North America

### California

#### Weather

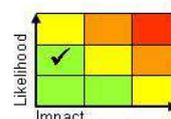
Parts of California have experienced a spell of very heavy rainfall in recent weeks leading to severe flooding and evacuations. Another spell of rain, mountain snow and strong winds will affect the state through the middle of next week. The heaviest rainfall is expected to be along the Pacific coastline where a further 40-60 mm is likely to fall, whilst a further 1.5 metres of snow is possible over the Sierra Nevada 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. This has led to low-level rainfall and mountain snowfall accumulations building up leading to an increased susceptibility to impacts from further events.

#### Expected Impacts

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

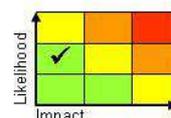
Severe thunderstorms, heavy rain and snow will clear away to the east through the early part of Monday. In the wake of this severe weather, a plunge of arctic air will move south across the eastern half of North America with temperatures falling widely 10-20 °C below average. The extent and coverage of the cold temperatures will abate by the end of next week, particularly across southern USA.

#### Discussion

Active cold front, which brought a severe thunderstorm and tornado outbreak in Alabama, is now clearing away to the east. On the northern flank of this system further snow is expected to fall through Monday morning, with 5-10 cm, possibly 20 cm in major cities such as New York (marginal) and Boston. Strong cold advection in its wake is expected to allow cold air to sink as far south as the Gulf of Mexico.

#### Expected Impacts

Some travel and power disruption is likely as a result of heavy snow across central and eastern USA. Heavy rain and thunderstorms across Florida may result in some urban and river flooding given already saturated soils. Although not expected to be as extreme or prolonged as previous coldwaves, the very cold conditions that follow could impact vulnerable populations and affect agriculture in the region.



### Central America and Caribbean

Nil significant.

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## South America

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

#### **Weather**

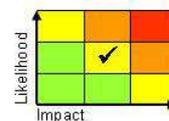
Further heavy showers and thunderstorms are expected to affect the northern Andes region over the next week with the heaviest rainfall expected to be across Ecuador and northern Peru. Rainfall accumulations will vary by location due to the showery nature of the rainfall, but locally 100 mm of rain is possible in a few hours, with some places seeing a further 200-400 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.



### Northeast Argentina, Paraguay and southern Brazil

#### **Weather**

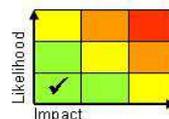
Frequent showers and thunderstorms, at times organised and severe, are expected to affect the region until Friday. Thunderstorms will produce strong winds, large hail and a few tornadoes possible in addition to heavy rain. During this period, some locations are likely to receive 200-300 mm of rainfall, 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, culminating in a marked cold front which will lead to more benign conditions following by the end of the week. 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. 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

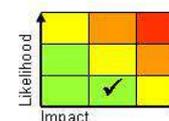
### Central Mozambique, northern Zimbabwe, southern Zambia

#### **Weather**

Showers and thunderstorms are expected to remain frequent, heavy and widespread across the region through much of this week. The heaviest rainfall is expected to affect central Mozambique over the next couple of days before transferring into northern Zimbabwe and southern Zambia by midweek. It is possible that some locations may receive 250-400 mm of rainfall during this period which is equivalent to around what normally falls over 4-6 weeks.

#### **Discussion**

Progression of the MJO across the Indian Ocean favours enhanced rainfall in this region, aided by an equatorial Rossby wave that has recently crossed Madagascar. Rainfall has been fairly poor in the some areas highlighted and 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.



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## Expected Impacts

Risk of flooding in urban and low-lying areas, particularly as a result of heavy rain falling in a short period of time. River flooding is slightly less likely owing to the poor seasonal rainfall so far. Although large parts of the region are sparsely populated, impacts in any major cities include potential transport disruption, power interruptions and damage to buildings/infrastructure.

## Middle East

Nil significant.

## Asia

### Bangladesh and northern Myanmar

#### Weather

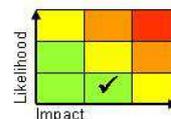
Shower and thunderstorm activity is expected to be more frequent than is usual on Tuesday and Wednesday with the potential for some locations to receive 75-150 mm of rain in a few hours. Whilst significantly higher amounts of rainfall occur during the southwest monsoon, this out-of-season rainfall would 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 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

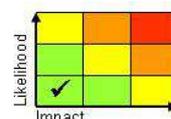
A succession of weather systems are expected to produce heavy rainfall across the same region over the next week. The heaviest rainfall is expected to fall across Guizhou, Hunan and Jiangxi provinces where over the next week, 100-150 mm of rainfall is expected to fall widely and locally 250 mm is possible. For context, Gzhou, Jiangxi typically receives 180 mm of rain during March.

#### Discussion

A series of westerly disturbances emerging from the Himalayas is expected to engage the strong baroclinic zone that lies across the southern third of China currently. 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

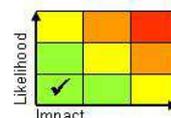
Increased likelihood of flash flooding and temporary transport disruption. The cumulative effects of several rainfall episodes may also increase the risk of landslides in more mountainous areas.



### 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.



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## **Discussion**

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. Next week, the MJO is expected to support more widespread shower and thunderstorm activity.

## **Expected Impacts**

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

## **Australasia**

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

## **Additional information**

Nil.

**Issued at:** 040855 UTC    **Meteorologist:** Brent Walker

**Global Guidance Unit**

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Global Guidance Unit, Operations Centre, Met Office, FitzRoy Road, Exeter

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