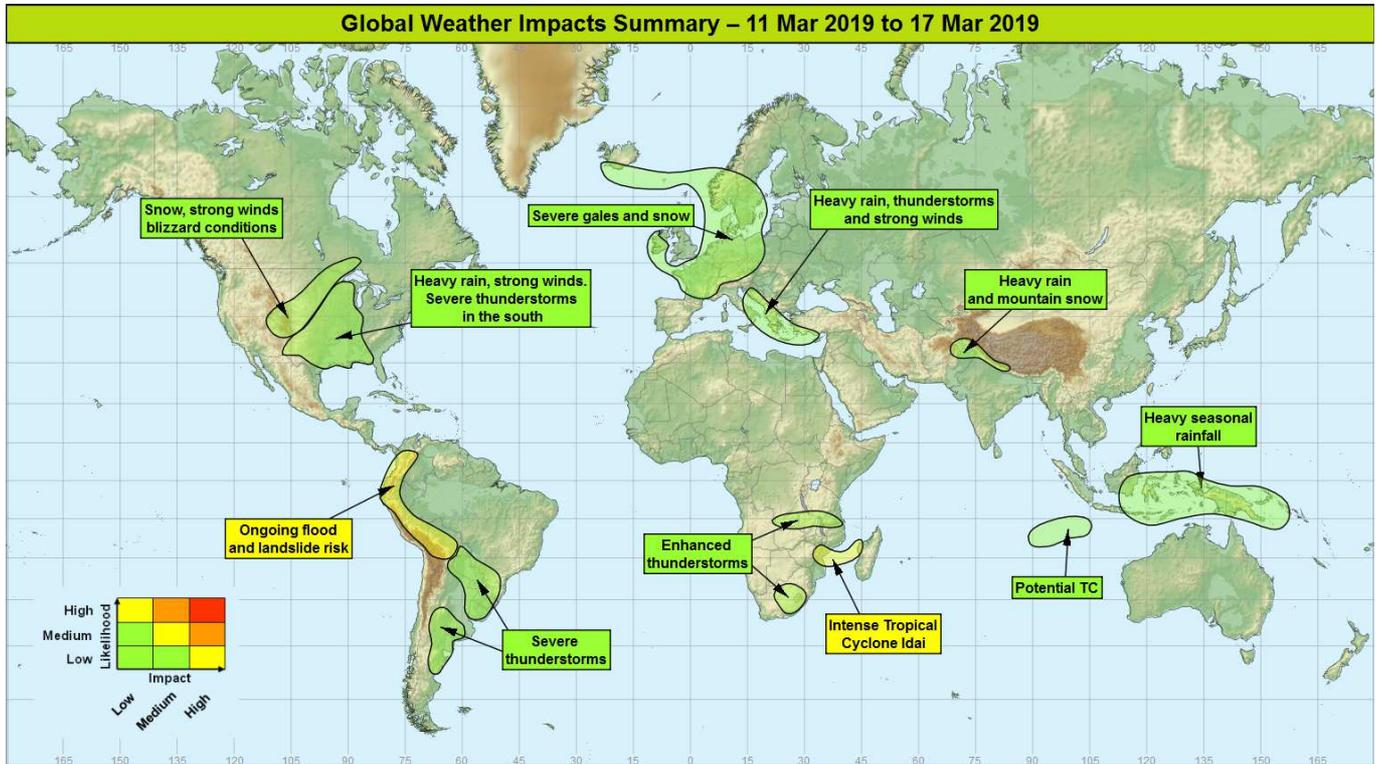


## Global Weather Impacts – Monday 11<sup>th</sup> to Sunday 17<sup>th</sup> March 2019

Issued on Monday 11<sup>th</sup> March 2019

### HEADLINES

- Intense Tropical Cyclone Idai threatens Mozambique.
- Another week of enhanced showers for the northern Andes, with further impacts likely.



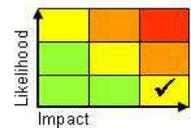
### DISCUSSION

#### Tropical Cyclones

#### Intense Tropical Cyclone Idai – SW Indian Ocean Weather

Idai is now an Intense Tropical Cyclone with sustained 10-minute mean winds of 104 mph. Idai is expected to continue intensifying over the next 24-48 hours as it makes slow south-westward progress across the Mozambique Channel. There remains some uncertainty over its track from the middle of this week although the official advisory has good support in forecasting the system to make landfall on Friday near to Beira, Mozambique. However, there are still a minority of solutions which keep Idai offshore further east over the Mozambique Channel throughout the week. There remains significant potential for a very powerful tropical cyclone, with winds of well over 100mph, making landfall across central Mozambique. As well as the destructive winds, significant rainfall could occur, with around 300-500mm possible in a swathe across central Mozambique, Zimbabwe and perhaps southern Malawi. Heavy rain and strong winds are currently ongoing across the far west of Madagascar, centred near Maintirano on the west coast.

#### Discussion



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

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Idai is an area of high SST and low vertical wind shear which makes further strengthening likely, although its initial slow motion may mean that the rate of strengthening remains modest. There is a consistent signal from ensemble models and the Reunion RMSC for it to be steered southwest and then west by the sub-tropical high over the next few days. Despite this there remains some uncertainty over its track, with recent runs of the GM (11/00Z excepted) allowing Idai to recurve and remain over open water. This leads to uncertainty over rainfall totals with potential for significantly less over land than EC and GFS based on its differing track. Tropical cyclones are notoriously difficult to forecast in this region and the spread in forecast tracks is not surprising.

### Expected Impacts

Risk of flash and river flooding which is a particular hazard in urban areas with the potential for significant flooding along major rivers such as the Zambezi. 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, produce power interruptions and damage buildings/infrastructure. If significant flooding were to occur in the major river systems of the region some crops could be lost along the farmed flood plains. Disruption is also likely in coastal areas due to extremely strong winds, large waves and a potential storm surge.

### The following area is being monitored for Tropical Cyclone development:

#### SE Indian Ocean

##### Weather

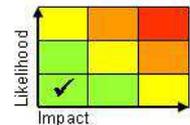
A tropical low and enhanced convection close to Christmas Island, south of Java, Indonesia, may develop into a tropical cyclone over the next few days, passing close to Cocos Island. Even if a tropical cyclone does not develop, an area of enhanced showers and thunderstorms is likely. This system looks most likely to remain away from land however.

##### Discussion

An area of enhanced convection is evident on imagery to the south of Java. This looks to be the most likely area of tropical cyclogenesis over the next few days, however with the MJO in Phase 4 kicking out numerous Rossby Waves there are signals from the models for any number of potential developments in a broad region spanning the S Indian Ocean to the E Maritime Continent. Signals have varied over the past few model runs with low confidence in any particular solution, but as stated, the aforementioned enhanced convection looks like the most likely candidate in the next few days.

##### Expected Impacts

Very low prob of flooding and wind impacts affecting the sparsely populated island of Cocos.



#### Europe

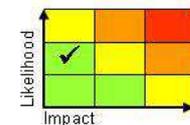
##### North-western Europe

##### Weather

Snow showers are expected across much of continental northwest Europe through today (Monday), piling up onto windward Alpine slopes. In addition, a swathe of severe gales will make landfall across the Netherlands this afternoon. A larger scale system will bring a further spell of very strong winds across Ireland later on Tuesday, before moving over parts of the near continent, accompanied by heavy rain for many and heavy snow across parts of Scandinavia. This unsettled pattern looks likely to continue for the rest of the week, although will probably become less severe.

##### Discussion

There remains a degree of uncertainty in the development of individual systems, but there is a good signal for a period of unsettled and potentially very windy weather across much of the near continent. The uncertainty relates to frontal waves which may cross to the cold side of the powerful jet and undergo cyclogenesis, with the potential for some very potent lows to form. Differences from model to model and run to run are unlikely to resolve themselves until relatively short lead times.



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## Expected Impacts

The main impacts are likely to be wind related, so disruption to travel, especially aviation and marine seems likely. There is a lesser risk of disruption to power supplies from fallen trees. Snowfall may bring some disruption to parts of southern Scandinavia.

## Albania, Greece, Croatia, Bosnia Herzegovina and Montenegro

### Weather

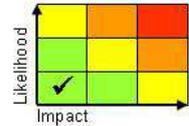
A weather system sinking southeastwards across Europe today will redevelop across the Adriatic Sea bringing a spell of heavy rain and thunderstorms to the region today, Tuesday and Wednesday. Some areas stretching from the Balkans, through Greece down to southern Turkey are likely to see over 100mm of rain over the next few days.

### Discussion

The remnants of one of the systems that has crossed NW Europe will undergo rapid lee low cyclogenesis today as it crosses the Alps and progresses down the Adriatic Sea. Strong pressure gradients to the north of the system will lead to very strong Bora winds along the Adriatic coast; while heavy rain and thunderstorms will develop along the eastern flank as warm, moist air is drawn northwards.

### Expected Impacts

Some flash flooding is possible, with heavy snow over mountains and strong Bora winds in its wake. The strong winds will be hazardous to shipping in the area.



## North America

### Central and SE USA

#### Weather

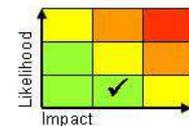
An exceptionally deep area of low pressure is expected to form over the Central Plains of the US on Wednesday, tracking north-eastwards over the following couple of days. Multiple hazards are expected in association with this system. A large swathe of heavy rain, accompanied by strong winds, looks likely to develop, bringing 100-150mm across many parts of central and southern US. There is the potential for severe thunderstorms to develop, which could bring large hail, localised damaging winds, and the risk of tornadoes to south-central and south-eastern parts through to the weekend.

#### Discussion

A potent upper trough/cut-off vortex will slowly drift across the far S of the US over the next couple of days, engaging high WBPT air returning northwards on the backing low-level flow, and spinning up a very deep depression (sub 980hPa) during the middle part of next week. All models agree very well upon this evolution, with high confidence in the development. There is less confidence in the details of heavy rain however, particularly wrt to the details of any severe convection which could develop within the system's warm sector.

#### Expected Impacts

Heavy rain may result in some urban and river flooding, frequent lightning may disrupt power supplies, large hail damage crops and property, with a risk of greater disruption (albeit on a very localised scale) if any significant tornadoes form.



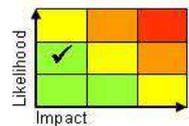
## Four Corners up to Minnesota/Great Lakes area, USA.

### Weather

In association with the system described above, an area of heavy snow and very strong winds/gales will develop as colder air from the northwest engages the developing precipitation area. Some areas could see as much as 50cm of snow, accompanied by gale force winds bringing blizzard conditions at times.

### Discussion

Colder air arriving from the NW behind a Pacific frontal zone will undercut the developing system allowing pbn to turn to snow along quite a wide swathe. There is relatively high confidence in the region to be affected, although details of snowfall amounts naturally carry lower confidence at this range.



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## Expected Impacts

Snowfall and strong winds will likely disrupt road, rail and air travel in the region. There is a risk that accretion of snow and ice on trees and power lines may lead to some short term outages. Heavy snowfall will also exacerbate the already elevated avalanche risk in parts of the Rockies.

## Central America and Caribbean

Nil significant.

## South America

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

#### Weather

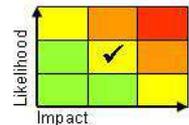
Heavy showers and thunderstorms are expected to continue to affect the northern Andes region for the next week. Rainfall accumulations will vary by location due to the showery nature of the rainfall, but some places are likely to see a further 200-300 mm of rain over the next week.

#### 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.

#### Expected Impacts

Flash flooding and landslides remain an ongoing threat in the mountainous areas, as well as downstream river flooding. With much of this region now preconditioned by previous rainfall, further heavy rain will produce some additional impacts. There has already been significant damage to infrastructure from flooding, with homes, bridges and roads destroyed.



### Northern Argentina, Paraguay and southern Brazil

#### Weather

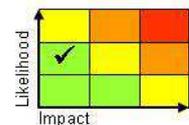
Frequent showers and thunderstorms, at times organised and severe, are expected to affect the region over the next few days. Thunderstorms will produce strong winds, large hail and a risk of tornadoes. Locally in excess of 100 mm of rainfall is possible in a few hours.

#### Discussion

A number of disturbances embedded within the subtropical jet are expected to lead to further episodes of severe convection along the South Atlantic Convergence Zone (SACZ). 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 damage.



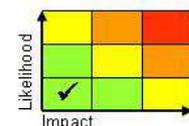
### Central Argentina

#### Weather

A separate area of thunderstorms looks likely to develop further south from Thursday. Much like their counterparts further north, strong winds and large hail are significantly risks, whilst the storms will bring in excess of 100 mm in a few hours to some localities.

#### Discussion

A cut-off vortex slowly wandering northwards later this week will engage a plume of higher WBPT extruded southwards from the main tropical reservoir, generating an area of severe convection and likely torrential rainfall, large hail and strong winds. Details obviously vary between models, but the synoptic ingredients are strong and well agreed upon.



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## Expected Impacts

Increased potential for flash flooding, and landslides in more mountainous terrain. Hazards from lightning strikes and large hail will pose significant secondary issues, impacting utilities and transport.

### Africa

#### Far western Madagascar, central Mozambique

See *Tropical Cyclones* section.

### South Africa, Lesotho

#### Weather

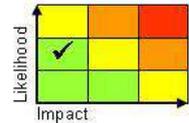
A zone of enhanced showers and thunderstorms looks likely to affect this region over the next couple of days. 30-50mm of rain could fall in an hour or two, with some locations possible seeing rainfall totals of over 100mm by the end of Tuesday.

#### Discussion

A cold front has stalled over the region, the backing flow ahead of the associated cut-off upper vortex drawing a plume of very warm, moist and unstable air southwards, providing a focus for outbreaks of severe convection over the next couple of days before the vortex sinks away and conditions stabilise. Forecast profiles highlight 30-35mm of precipitable water, and 1500-2500 J/Kg of CAPE along with strongly sheared profiles indicative of fairly long lived storms. All models indicate areas of over 100mm of rainfall, which is over a month's worth of rainfall for somewhere like Bloemfontein. Densely populated areas such as Johannesburg could be affected.

#### Expected Impacts

Flash flooding is the most likely impact, particularly in urban catchments. Large hail, and strong, gusty winds will be an additional, secondary hazard in some storms.



### West Angola, south DRC, Zambia, north Malawi, south Tanzania, north Mozambique

#### Weather

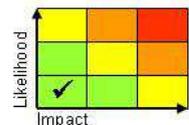
Enhanced showers and thunderstorms are expected to develop each day for the next few days, bringing 25-50mm to some locations in only an hour or two.

#### Discussion

Weak southerly flow around the periphery of Idai is expected to develop a frontogenetic region, with a moisture and convergence boundary setting up as this pushes up against the monsoon plume. This boundary is likely to become a focus for explosive deep convection over the next few days; its slow moving nature meaning that some locations will likely see multiple rounds of heavy showers and thunderstorms and large rainfall totals building up.

#### Expected Impacts

Flooding, both flash and fluvial, and possible in association with this storms, with an increased likelihood of landslides in more mountainous areas. The main focus of the storms is likely to be across north Malawi, away from the hardest hit areas of recent flooding which occurred in the south.



### Middle East

*Nil significant*

### Asia

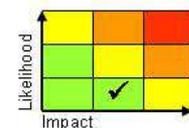
#### Far eastern Afghanistan, northern Pakistan, and far northern India.

#### Weather

An area of rain and some mountain snow will continue to move eastwards across the region today. Widely 10-20mm of precipitation may fall, with totals locally exceeding 50mm. Over the mountains to the north of Kandahar over 50cm of additional snow may fall.

#### Discussion

A trough in the sub-tropical jet will continue to engage the WBPT plume drawn north from the Gulf of Oman across this region. This will result in large areas of dense medium/high cloud and areas of precipitation. Following the passage of the upper trough more benign conditions will become re-established.



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## Expected Impacts

Following a particularly unsettled winter and recent floods, this region is more vulnerable to poor weather than normal. 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. The recent heavy rainfall and floods may have left thousands displaced in the Kandahar province of Afghanistan alone. A period of significantly below average temperatures in the wake of this system could further impact these vulnerable populations. Furthermore, there will be an increased risk of avalanche and landslides.

## Eastern Indonesia 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 300 mm over the next week. In a typical 7-day period, this region normally receives around 50-100 mm.

### 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. This week however, with the MJO passing through the region, convection is expected to be more widespread and intense.

### Expected Impacts

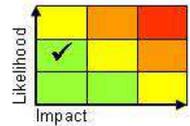
An increased likelihood of flash flooding and landslides leading to localised damage to infrastructure and property.

## Australasia

Papua New Guinea – See *Asia* section.

## Additional information

Nil.



**Issued at:** 110810 UTC **Meteorologist:** D J Harris

**Global Guidance Unit**

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