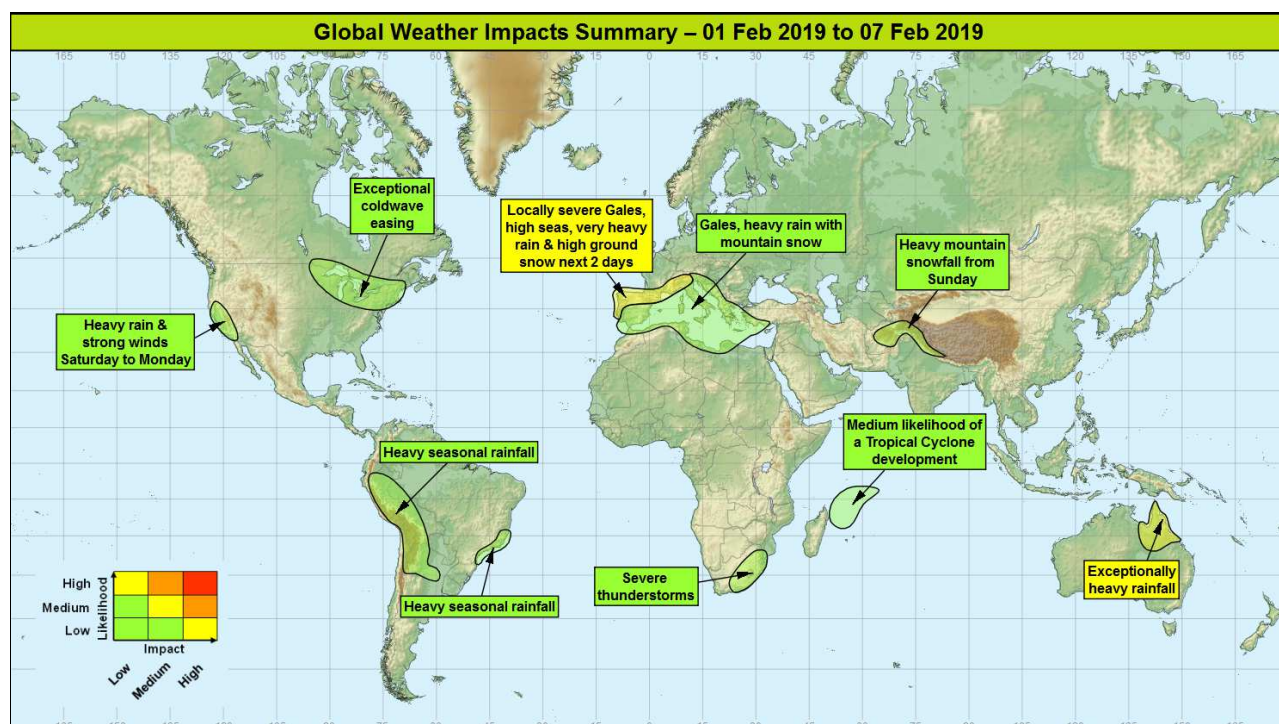


## Global Weather Impacts – Friday 1<sup>st</sup> to Thursday 7<sup>th</sup> February 2019

Issued on Friday 1<sup>st</sup> February 2019

### HEADLINES

- Exceptional amounts of heavy monsoon rainfall over northeastern Australia through the next week.
- Further widely unsettled weather for southern Europe and the Mediterranean.



### DISCUSSION

#### Tropical Cyclones

There are currently no active tropical cyclones.

The following regions are being monitored for potential tropical cyclone development:

#### Southwestern Indian Ocean

##### Weather

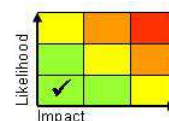
There is a moderate likelihood of at least one tropical cyclone development to the northeast of Madagascar next week. Although any developments would likely remain offshore through this period, there is a small risk that if one system were to form it could go on to affect Reunion and Mauritius in around 8-10 days time.

##### Discussion

An area of shear instability on the ITCZ is signalled to generate an enclosed circulation over the weekend. This will likely begin to organise deep convection in its vicinity with conditions becoming favourable for the gradual development of a tropical cyclone during the early part of next week. There is still low confidence regarding this development, with the signal markedly varying between different model output. The GM now has support from ECMWF regarding this feature, but there is no support from the GFS, which continues to develop a different area of low pressure out over the open ocean.

##### Expected Impacts

Since any development is likely to remain offshore during this period, impacts will be restricted to strong wind and rough sea impacts on marine transport.



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

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## Europe

### Much of southern Europe and the Mediterranean, along with northern parts of Morocco, Algeria, Tunisia and Libya

#### **Weather**

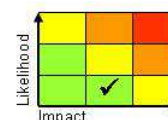
Remaining very unsettled during the coming week through this region. Periods of heavy rain and thunderstorms will affect much of this region. Through the next week many locations could see 50-100 mm of rainfall, with peak accumulations of up to 300 mm possible in the Balkan mountain region (which would be approaching twice the average February rainfall). At higher elevations the rainfall will fall as snow, as low as 1000 M over the southern Alps, and 800 m over the Pyrenees. Very strong winds will also be seen across large parts of this region, with gales and very rough seas likely. The winds will be strong enough across parts of North Africa to lift dense dust storms that could extend north into southern Europe at times.

#### **Discussion**

A series of trough extensions and disruptions will occur across this region over the coming week, and these features will help develop deep surface lows in the Bay of Biscay, and Central Med. Bands of heavy rainfall will surround these systems, and strong winds will help to orographically enhance the precipitation totals across high ground. On the northern edge of these lows colder continental air will result in a threat of significant snowfall, especially at higher elevations.

#### **Expected Impacts**

Flash flooding and river flooding are significant threats in this region, with an enhanced likelihood of landslides in areas where the terrain is steep. Dangerous marine conditions are expected, with large waves and the possibility of coastal flooding. Heavy snowfall chiefly over the regions mountains, but could transiently impact some cities in northern Italy too. Lifted dust storms may impact on aviation and the air quality across North Africa and southern Europe.



### Northern and western Iberia, southern France and northern Italy

#### **Weather**

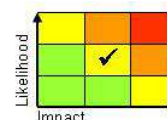
Within the broader green zone highlighted above (that will bring impacts through the coming week), Storm Helena (named by the Spanish Met Service) will bring a period of severe gales (gusts up to 60mph). Some very heavy rainfall and mountain snow (to low levels across northern Italy) through Friday and Saturday

#### **Discussion**

Through Friday and Saturday a deep area of low pressure (named Storm Helena) will be forced by a trough extension and disruption driving southeast from Biscay into the western Med, with Helena taking a similar track. After a period of severe gales across northern Iberia on Friday, the strongest winds will transfer into the Catalan regions of Spain and France on Saturday as a strong Mistral flow develops. Throughout the period the strong N to NW'ly wind will lead to 100 mm of precipitation falling on the hills facing this direction. This precipitation will be locked up as snow above 1800 M on the cold front, and above 800 M in the post frontal airmass showers. Across Italy on Friday, heavy snow is likely to fall to lower levels for a time.

#### **Expected Impacts**

Flash flooding and river flooding are significant threats in this region, with an enhanced likelihood of landslides in areas where the terrain is steep. Dangerous marine conditions are expected, with large waves and the coastal flooding likely. Heavy snowfall is expected over fairly modest hills (and even to low levels across northern Italy), with an enhanced risk of avalanches on mountains.



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**North America****Central and eastern North America****Weather**

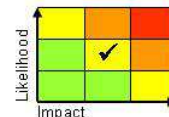
Exceptionally cold temperatures have been affecting the northern Mid-west of the USA and Central Canada over the past few days, and extended to the Eastern Seaboard through Thursday (although not as severe as further west). Milder air is now pushing across the region from the southwest, with temperatures returning to near normal values through the next couple of days; this transition will be accompanied by some snowfall, mostly around the northern Great Lakes, where generally 5-10 cm of snow could fall.

**Discussion**

A long fetch northerly flow on the rear flank of a vortex extending that moved into northeast Canada has advected exceptionally cold arctic air to a large portion of North America. Temperatures are now on the rise across this region, partly due to the arctic air warming out in situ, partly due to warm advection now taking place from the southwest. By the end of Saturday temperatures will be near normal across much of the region.

**Expected Impacts**

Although most impacts are now reducing in magnitude, as the cold spell comes to an end, the process of previously frozen pipes 'un-freezing' will likely lead to many bursts and disruptions to utilities in the region.

**California****Weather**

Heavy rainfall, falling as snow on the Sierra Nevada mountains, is expected to affect much of California on Saturday and Sunday, including Los Angeles. As much as 100 mm of rain could fall near the coast, with peak rainfall of 200 mm in the mountains (accumulating as snow at above 1500 M). There is also the threat of gale force winds across California for a time, building very rough coastal seas.

**Discussion**

A diffluent upper trough will engage a baroclinic zone in the west Pacific on Friday, this will spins up a small but potent surface low that will push across California this weekend. An active cold front extending south from this low will bring heavy rainfall and mountain snowfall to California on Saturday and Sunday. Frequent showers in the cool northwesterly flow that follows the system will then bring further precipitation to the region through Monday. Although there remains some slight uncertainty for the development of the surface low, all solutions show this feature bringing unusually strong winds from the westerly quadrant to the central and northern parts of the States western coastline.

**Expected Impacts**

Flash flooding is likely, along with an enhanced threat of mudslides (especially in burn scar regions). Very strong winds could disrupt aviation and bring down some trees, and could build dangerous marine conditions and cause coastal flooding. Snowfall over the Sierra Nevada mountains may disrupt travel on high passes and will enhance the risk of avalanche here.

**Central America and Caribbean**

Nil significant.

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**South America****Peru, Bolivia, northern Chile, Ecuador, northwest Argentina and western Brazil****Weather**

Frequent heavy showers and thunderstorms will affect this area through the coming week, resulting in heavy seasonal rainfall. Up to 100 mm of rain is possible in 24 hours, with a weekly peak total of up to 400 mm (around twice the monthly average).

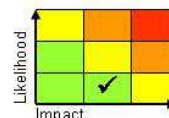
There is the potential for significant water to run towards the Pacific through the desert regions of northwestern Chile and southwestern Peru. In northwestern Argentina is at threat of severe thunderstorms that could result in intense rainfall, frequent lightning, large hail, strong winds and tornadoes.

**Discussion**

The progression of the MJO into Phase 7 through the next week is likely to be contributing to a period of enhanced seasonal rainfall in this part of South America. In addition an unusually strong sub-tropical high located in the River Plate region, will continue to drag the monsoon plume south across this part of South America. This high will also cause a weakening of the trade winds across the Eastern Pacific (off the northern Chile and southern Peru coastlines), resulting in sea breezes drawing moist oceanic air inland, allowing some isolated convection to break out across the usually very dry Atacama desert and western Andes.

**Expected Impacts**

Flash flooding and landslides are a significant threat in the mountainous areas. Flash flooding also possible if thunderstorms impact urban areas. Severe thunderstorms also bring the threat of large hail damage, frequent lightning that could disrupt aviation and power networks, strong gusty winds and isolated tornadoes. Across the desert regions the unusually high level of rainfall runoff may bring severe flooding in the usually dry alluvial plains that many people live and farm along.

**Central eastern Brazil.****Weather**

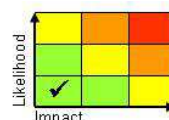
Spells of heavy rain and thunderstorms are expected along Brazil's Atlantic coastline from Sunday to Tuesday. Around 50-100mm could fall each day, with the area of heavier rainfall generally migrating northeast with time. Some locations could see as much as 200 mm over the week.

**Discussion**

A strong subtropical high located over the River Plate region (discussed in the previous section), will drive a mid-latitude cold front northwards across this area. This front will act as a focus for heavy rain and thunderstorm activity. Model profiles show high perceptible water moisture, and suggest convection will be very efficient at generating heavy precipitation.

**Expected Impacts**

Flash flooding and landslides are a significant threat in areas where terrain is steep (particularly where developments are unplanned and poorly located). Some large and vulnerable cities such as Sao Paulo lie in this region.

**Africa**

**Northern parts of Morocco, Algeria, Tunisia and Libya** – See *Europe* section.

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**Central and eastern South Africa, Lesotho, Swaziland and southwest Mozambique****Weather**

Severe thunderstorms are expected to affect this region through until Tuesday, with the peak activity tending to migrate northeast with time. These storms will produce intense rainfall, with up to 75-100 mm of rain falling in a few hours (the equivalent of a months worth of rain). Frequent lightning, large hail and strong winds are also likely.

**Discussion**

A complex upper trough will become slow moving and constantly re-enforced across southeast South Africa, with the marked upper forcing engaging a very warm plume that has been brought south from sub-tropical latitudes. This will result in large CAPE storms, with good vertical wind shear allowing for severe, long lasting storms to develop.

**Expected Impacts**

Severe thunderstorms will bring the threat of flash flooding, large hail damage, frequent lightning that could disrupt aviation and power networks, strong gusty winds.

**Middle East**

Nil significant.

**Asia****Afghanistan, northern Pakistan, India and Nepal****Weather**

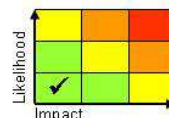
Rainfall and heavy mountain snow will moves east across this region between Sunday and Thursday. Across Afghanistan 50-100 cm of snowfall could affect the high mountains on Sunday and Monday, with up to 20 cm possible in Kabul. But as this region moves east to affect Kashmir and Nepal the precipitation will become even heavier with between 1-2 M of snowfall across the southern parts of the Himalayas.

**Discussion**

Blocking in the upper air across eastern Europe will lead to a longwave trough extension taking place across this region over the coming week, forming an almost mid-latitude style depression. This will lead to the strong southwesterly flow drawing warm moist air northeastwards from the Gulf region. Forced ascent of this airmass due to the upper trough, and later in the period increased orographic enhancement will lead to rainfall and above 2500 M heavy mountain snow.

**Expected Impacts**

Snowfall over the mountains will likely block some high road passes in the region and enhance the risk of avalanches. Overall the impact of the snowfall is likely to be positive as it will top up the snowpack in the region, when this melts in the spring and early summer it provides much of this regions water prior to the monsoon arrival.



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**Australasia****Northern Australia****Weather**

Frequent spells of intense rainfall and thunderstorms are expected throughout the next week. Urban areas along the Great Barrier Reef coastline are likely to see some intense downpours, this includes Cairns, Townsville and Mackay. At this stage, large parts of northern Queensland look likely to see 200-400 mm during this period with some areas seeing as much as 1000 mm. There is currently a low probability of some parts seeing in excess of 1000 mm during this period (in addition to amounts over 1000 mm that has already fallen in some locations). Average monthly rainfall for this region is between 200-500 mm.

**Discussion**

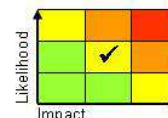
The monsoon trough currently sits over the north of Queensland focusing convection here. A tropical low is embedded within it and this will probably help to focus severe convection and heavy rainfall. In addition, the MJO now moving over the western Pacific (phase 6-7) may be having some influence in enhancing activity here. Whilst models are in good agreement of large totals accumulating over the coming week there are significant differences with the GM currently at the extreme end of solutions in producing spot maxima over the next 6 days of 1400 mm.

**Expected Impacts**

Rainfall will be the primary cause of impacts, with severe flash and river flooding potential quite widely across the northern Queensland. This will likely lead to the disruption of transport and utilities through this sparsely populated region, and the potential for some isolated communities to be cut-off for a number of days. The sparsely populated nature of this area means that despite the exceptional magnitude of this rainfall event, the impact is likely to be on a small number of people (unless a city such as Cairns is badly affected), and local or national (in extremis) resources are likely to be able to deal with any impacts.

**Additional information**

Nil.



**Issued at:** 010800 UTC    **Meteorologist:** Nick Silkstone

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