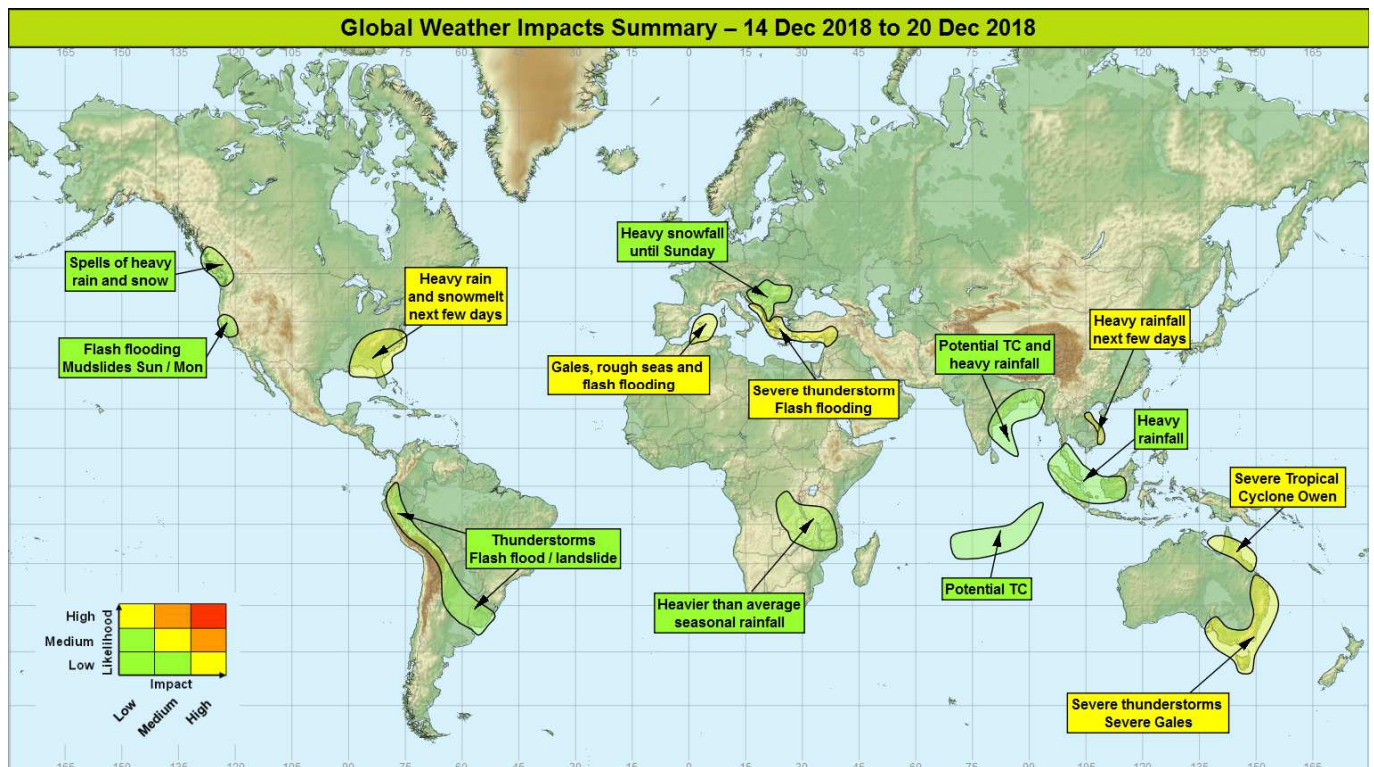


## Global Weather Impacts – Friday 14<sup>th</sup> December to Thursday 20<sup>th</sup> December 2018

Issued on Friday 14<sup>th</sup> December 2018

### HEADLINES

- Severe Tropical Cyclone Owen impacting northern Queensland.
- Heavy rainfall easing for Vietnam by the end of the weekend.
- Very unsettled in parts of southern Europe and the Mediterranean.
- Heavy rain and snowmelt later could lead to severe flooding in parts of the southeastern USA.
- Severe thunderstorms and unusually strong winds for southeastern Australia.



### DISCUSSION

#### Tropical Cyclones

##### Severe Tropical Cyclone Owen (Australia)

##### Weather

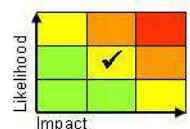
Owen has continued to strengthen through Thursday over the Gulf of Carpentaria and is a category 3 system with sustained winds around 85 mph and gusts to 120 mph.

Owen may strengthen to a category 4 system for a time today (Friday) before it steadily weakens through the weekend as it tracks southeast across northern Queensland then just offshore the Queensland Coast. Owen is likely to decay early next week across northeastern Queensland. This system could produce up to 500 mm of rainfall in a few days across parts of northeastern Queensland.

##### Discussion

The warm waters of the Gulf of Carpentaria and a low wind shear environment have allowed Owen to rapidly intensify. Another 12 hours or so in this environment may see Owen become a Category 4 system prior to landfall, equivalent to a category 2 hurricane.

All models show a significant weakening as of this system as it tracks across northern Queensland, with an eventual decay early next week.



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## Expected Impacts

Damage, disruption, and danger to life due to destructive winds will be the primary hazard, although the area is sparsely populated and used to tropical cyclones. Flash and river flooding could occur across northern Queensland, and should Owen hug the coast flooding is likely quite widely with some impacts for cities such as Townsville and Cairns.

## Potential Tropical Cyclones

### Bay of Bengal, Eastern India and Bangladesh

#### Weather

A well marked low pressure system lies over the southern Bay of Bengal around 500 miles southeast of Chennai.

This system is likely to strengthen to become a named cyclone today (Friday), and will track northwestwards during the next few days.

This system is expected to weaken before making landfall later on Sunday or Monday across northern Andhra Pradesh.

However, outer rain bands of this system are expected to bring unseasonable heavy rainfall (50-100 mm) to parts of northeastern India from Sunday to Tuesday, and to Bangladesh from Monday to Wednesday.

#### Discussion

High seas surface temperatures coupled with moderate vertical wind shear should allow for a modest strengthening of this system through the next few days. All main deterministic models indicate a tropical system developing, but also show this system weakening before landfall due to the interaction of a low latitude upper trough moving in from the west that will engage the plume to bring heavy rainfall to northeast India and Bangladesh that are usually dry at this time of year.

#### Expected Impacts

The most probable impacts are from heavy rain, bringing potential unseasonable flash flooding.



### Southern Indian Ocean

#### Weather

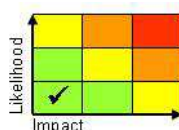
There are increasing indications that a tropical cyclone will develop in the southern Indian Ocean this weekend, almost mirroring the development expected in the Bay of Bengal. Should it indeed develop, it is not expected to impact land.

#### Discussion

As the MJO moves from the Indian Ocean and into the Maritime Continent, conditions become more favourable for tropical cyclogenesis in the Southern Indian Ocean due to shedding of Equatorial Rossby Waves (as in Bay of Bengal on the other side of the equator). Both deterministic and ensemble products suggest the potential for one dominant tropical cyclone develop during the later part of this week.

#### Expected Impacts

No impacts expected on land. Rough seas are possible.



## Europe

### Western Mediterranean, the Balearics Isles and northern Algeria

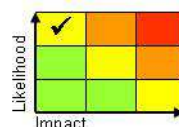
#### Weather

A spell of very strong winds is expected to affect parts of the western Mediterranean and the Balearics Isles today (Friday). Gusts of wind may reach 50 to 60 mph and are likely to generate some very large waves over parts of the western Mediterranean.

There will also be widespread heavy showers and thunderstorms that could produce very heavy rainfall, especially for parts of northern Algeria, perhaps close to the capital Algiers.

#### Discussion

A sharpening upper trough crossed Iberia on Thursday and is undergoing disruption over the western Mediterranean forcing cyclogenesis close to the eastern coast of Spain with the resultant low pressure system (named Flora by the Spanish Met Agency) that will transfer eastwards today, before weakening this weekend.



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## Expected Impacts

Winds may cause significant disruption to transport, especially aviation. Some minor damage to property and power lines is possible. Large waves may lead to some coastal impacts in the region and disrupt marine transport. Flash flooding is also possible from thunderstorms, especially across northern Algeria.

## Coastal parts of the Balkans, Greece, southern Turkey and northwestern Syria

### Weather

Several spells of heavy showers and thunderstorms are expected to affect this part of southeastern Europe and into the Levant region through the next 7 days.

As much as 300 mm of rain could accumulate during this time, especially in southern Turkey, with up to 100 mm of rain possible in 24 hours. Large hail and frequent lightning also possible.

The Balkan coastline is most at threat during the next few days, with Greece most likely to see this severe weather this weekend and again from Tuesday. Southern Turkey will see the most severe conditions from Sunday, then into northwestern Syria from Monday.

### Discussion

A succession of upper troughs will drive areas of severe convection eastwards across southeastern Europe, the eastern Mediterranean and the Levant region through the next week.

### Expected Impacts

Flash flooding looks likely at times, with the possibility of crop damage from large hail and power disruption from frequent lightning.



## Croatia, Bosnia, Hungary, Slovakia, Slovenia, Serbia, Montenegro, Albania and Romania

### Weather

A significant spell of snow is expected to extend northeastwards across many parts of southeastern Europe through the next 3 days, with some places seeing over 30 cm of snow.

### Discussion

There is good agreement for a warm front to move north across southeastern Europe through the next few days, with the frontal precipitation encountering much colder continental air to generate significant snowfall inland from the Adriatic coast.

### Expected Impacts

Heavy snowfall is likely to lead to significant transport and power disruption in this region during the next 3 days, and could lead to some communities being temporarily cut off.



## North America

## Southeast United States (especially North Carolina/Virginia and northern Florida).

### Weather

An active weather system is expected to track east across the southeastern USA through the next few days, producing severe thunderstorms that could result in up to 200 mm of rain across northern Florida, along with large hail, tornadoes and frequent lightning.

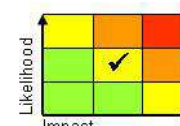
Less rainfall is expected further north, but 50-100 mm of rain could fall in parts of north Carolina and Virginia, adding to the melting of the recent large snowfall.

### Discussion

Following the severe winter storm which brought significant snowfalls (40-60cm) to North Carolina and Virginia, a quiet and fairly cold spell has seen only a slow thaw. By Friday another significant rain-bearing system is expected to affect some of those areas affected by the previous winter storm, with the combination of heavy rain and warm tropical air melting the remaining snow and potential for severe flash and possibly river flooding. 100-200mm on top of the snow could lead to the equivalent of over 300mm of rainfall entering the river system in a single day, close to 4 times the monthly average for December. In addition, thunderstorms to the southeast of the main rain area could bring localised flash flooding, and the odd tornado.

### Expected Impacts

River flooding is likely to be the main impact, which could possibly be quite widespread in parts of the Carolinas and Virginia due to the addition of melting snow. Significant flooding of homes and businesses could occur, with localised transport disruption. Localised flash flooding (especially in northern Florida) and wind / large hail damage is possible elsewhere from severe thunderstorms.



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## Far southwest of Canada, and extreme northwest of United States

### **Weather**

A succession of Pacific weather systems will see 300 to 500 mm of rainfall build up through the coming week, although much of this will be over high ground areas and locked up as snow. This is a fairly typical occurrence for this time of the year in this region, but further significant flooding is likely in Vancouver that could see up to 200 mm of rain through the week, which is over half a month's worth of rainfall.

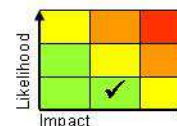
As well as the rainfall, severe gales or storm force winds are expected to impact coastal regions, with very large waves likely.

### **Discussion**

A number of frontal systems are expected to drive in from the Pacific, with a strong orographic modulation to precipitation. Despite this being a fairly usual occurrence here for the time of year, models do show anomalously high rainfall totals with respect to climate. Vancouver in particular, often close to the warm sector/triple points of the various systems may see especially heavy rain at times, but most of the heaviest precipitation will be locked up as snow over the western slopes of the Cascades and coastal mountain ranges as well as the high ground of Vancouver Island and across the Olympic Mountains.

### **Expected Impacts**

Vancouver has already seen flooding impacts, with further flooding likely here. Very heavy mountain snowfall will increase the avalanche risk and will produce power and transport network impacts. Coastal flooding and wind damage is expected to be associated with each system.



## Northern California

### **Weather**

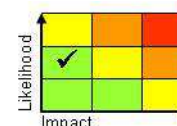
Periods of wet weather is expected to affect northern California on Sunday and Monday, affecting areas that were severely impacted by recent wildfire events.

### **Discussion**

An active Pacific frontal system is likely to bring heavy rainfall (up to 150 mm in 36 hours) to coastal and Sierra Nevada mountain regions of northern California later this weekend and into next week.

### **Expected Impacts**

Flash flooding and mudslides look likely to impact a region still recovering from severe wildfire impacts.



## Central America and Caribbean

Nil significant.

## South America

## Uruguay, northern Argentina, far south of Brazil, Bolivia, Peru and Ecuador

### **Weather**

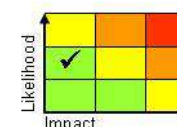
Severe thunderstorms are expected to affect parts of Uruguay, northern Argentina and southern Brazil today (Friday) and Saturday, and again on Monday. Up to 150 mm of rain could fall in 24 hours with large hail, frequent lightning and tornadoes possible.

Bolivia, Peru and Ecuador will see heavier than usual monsoon rainfall this coming week, resulting in up to 400 mm of rainfall in places.

### **Discussion**

An active pulse of the South Atlantic Convergence Zone (SACZ) will occur over the coming few days, with another pulse likely on Monday. As repeated plumes of tropical moisture are drawn south, organised and very deep, vigorous convection is likely to develop, particularly along the south of the plume. Significant CAPE and vertical wind shear is present on forecast profiles, offering potential for large hail, gusty winds, and the odd tornado or two.

These pulses of the SACZ will feed north to enhance monsoon rainfall further north at times.



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## Expected Impacts

Flash flooding is likely, with an enhanced risk of landslides. Damage to infrastructure and property from large hail and lightning strikes also possible.

## Africa

**Northern Algeria** – see *Europe* section

## **Tanzania, northern Mozambique, Malawi, northern Zambia, southeast Democratic Republic of Congo**

### Weather

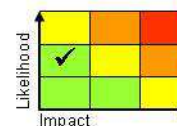
Heavier than usual seasonal rainfall is expected to accumulate through the coming week, with as much as 200 mm of rainfall likely in places. This would be close to the monthly average occurring in a week.

### Discussion

There is a strong model signal for heavier than climatological rainfall falling across this part of Africa during the next week.

### Expected Impacts

Enhanced likelihood of flash flooding and landslides compared to normal through the next week.



## Middle East

**Northwestern Syria** – see *Europe* section

## Asia

**India and Bangladesh** – see *Tropical Cyclones* section

## Vietnam

### Weather

Heavy showers and thunderstorms are expected to continue across central Vietnam for the next few days, brought in on a persistent moist northeasterly wind. Typical daily accumulations in the region of 50-100 mm are expected, but some locations could see a daily total of as much as 150 mm. Cumulative totals of 200 mm are likely through the next few days, on top of in places already incredibly heavy rainfall earlier this week.

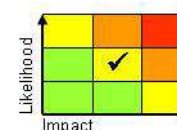
### Discussion

A persistent cold surge in the NE'ly monsoon flow will impinge on a large part of coastal Vietnam over the next few days, bringing in fairly persistent rounds of heavy showers and thunderstorms. Model signals indicate that rainfall will be less than that which has been observed earlier this week, with 960 mm in 48 hours at Da Nang leading to severe flooding in the city, transport disruption due to landslides, over 20 reported fatalities.

The northeast monsoon cold surge will ease by the end of the weekend, allowing for much drier conditions to develop.

### Expected Impacts

Flash flooding of homes, businesses and urban areas are likely. River flooding also possible with an enhanced risk of landslides.



## **Southern Thailand, Malaysia, Singapore, Indonesia (Borneo and Sumatra)**

### Weather

Enhanced heavy shower activity is likely to continue in this region, particularly areas immediate adjacent to the South China Sea. 50-100 mm per day is likely to be recorded in various locations, with 300 mm accumulating over the next few days.

### Discussion

The combination of a cold surge and a Borneo Vortex will bring a markedly enhanced area of showers and thunderstorms to parts of western Indonesia until early next week. Equatorial Rossby Wave activity looks likely to enhance shower activity too.



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**Expected Impacts**

Localised flash flooding and enhanced risk of landslides are the most likely impacts.

**Australasia**

**Australia - North Queensland and east Queensland coast** – see *Tropical Cyclones* section

**Southeastern Australia****Weather**

A deep depression has brought unseasonably strong winds to parts of southeastern Australia, but these winds will ease by the weekend as the depression weakens.

The main focus will be associated with the severe thunderstorms that are expected to continue across eastern fringes of New South Wales and southern Queensland, continuing to affect Sydney and Brisbane until the end of the weekend.

These storms will produce frequent lightning, large hail and very heavy rainfall (up to 200 mm of rain in 12 hours possible).

**Discussion**

A slow moving upper vortex will continue to engage a warm plume across the eastern fringe of Australia through the next 2 or 3 days. Forecast profiles show large CAPE, strong vertical wind shear and high precipitable water, so there is potential for further severe storm activity.

**Expected Impacts**

Flash flooding is a significant risk, especially in urban areas. Large hail and lightning will pose an additional hazard, and danger to life and power networks. In addition, very strong winds may lead to some disruption to transport, and unseasonable very rough seas affecting maritime craft around southeastern Australia.

**Additional information**

Nil.

**Issued at:** 140815 UTC    **Meteorologist:** Paul Hutcheon

**Global Guidance Unit**

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