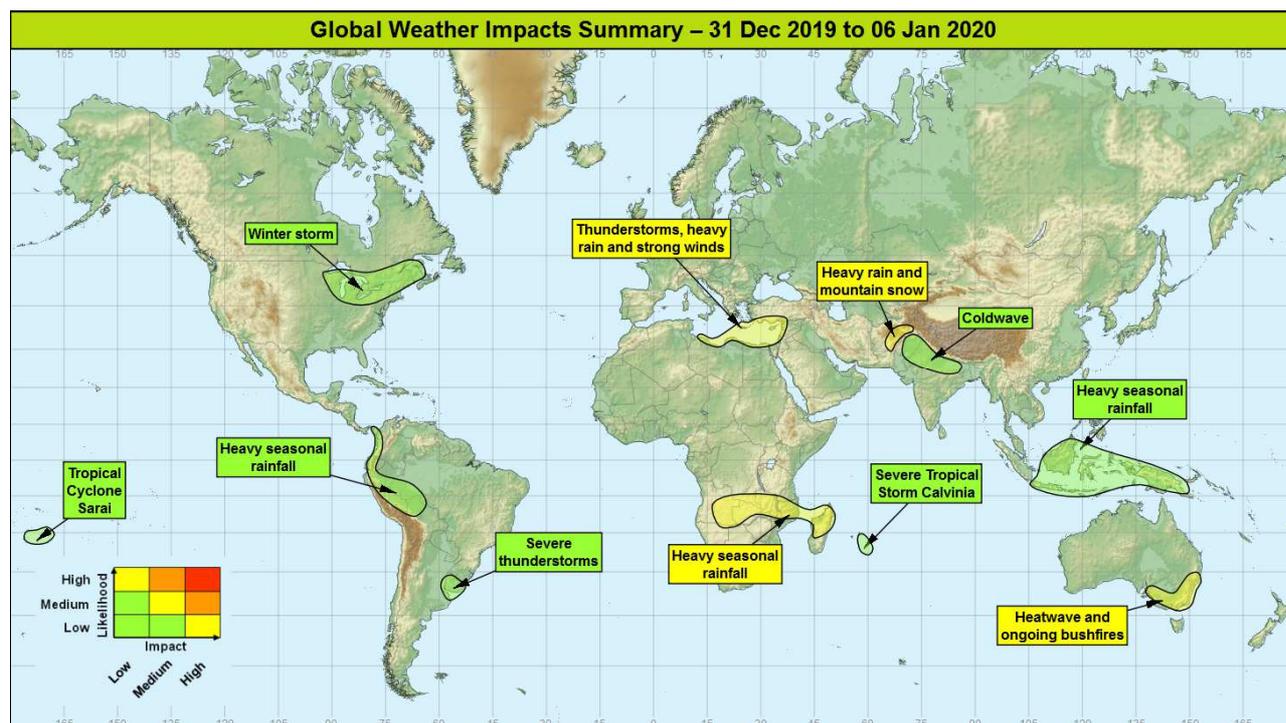


Global Weather Impacts – Tuesday 31st December 2019 to Monday 6th January 2020

Issued on Tuesday 31st December 2019

HEADLINES

- TC Sarai affecting Tongatapu today, may affect Niue later. Calvinia moves away from Mauritius
- Heavy rain and thunderstorms affecting southern Africa and the Mediterranean.
- Fire weather conditions hindering containment of ongoing bushfires in southeast Australia.



DISCUSSION

Tropical Cyclones

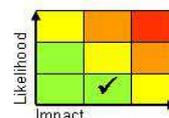
Severe Tropical Storm Calvinia (Southwest Indian Ocean)

Weather

Calvinia was slow moving through yesterday (Mon), less than 100 miles to the south-east of Mauritius – the island was affected by gusty winds and rain-bands revolving around Calvinia’s tight core. Over 200mm of rain has been recorded over the past couple of days (to 0000Z Tues) on Mauritius, but the worst has likely now passed as the severe tropical storm drifts steadily south-eastwards away from the Mascarene Islands today. Little further rainfall is expected whilst winds ease, although large, chaotic seas are likely to remain for another day or two.

Discussion

Calvinia has had a complicated life so far, formed by an Equatorial Rossby Wave before becoming slow moving and erratic within weak steering flow. Fortunately, both the Mascarene Islands and the cyclone are small – Calvinia’s strongest winds are held close to the core and the chance of a direct land hit is small. The steering flow should increase markedly today as Calvinia gets picked in the flow forward of a mid-latitude trough – this initially helping to strengthen the cyclone has it also accelerates south-eastwards out into the open ocean.



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Expected Impacts

There is a small chance that further rainfall, or gusty winds, could generate further impacts given the last two days of poor weather experienced by Mauritius, but in general conditions should be improving today. Large seas are likely to remain for a day or two, which could give some locally dangerous coastal conditions.

Tropical Cyclone Sarai (Southwest Pacific Ocean)

Weather

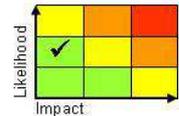
Tropical Cyclone Sarai is currently passing across Tonga, close to the main island of Tongatapu, bringing sustained winds of around 45mph, and gusts close to 55mph. Sarai has weakened overnight, and weakening will probably continue through today with the system becoming a tropical low. The official forecast track from RMSC Nadi takes Sarai well south of Niue; there still remains a significant chance that Niue could be affected by a tropical storm over the next day or two. Rainfall will ease markedly over Tongatapu today as Sarai moves away eastwards, after having received over 170mm at Fua'Amotu over the past couple of days.

Discussion

There is good model agreement for Sarai to move away from Tongatapu today, although a large divergence in tracks already is evident by the time it reaches the longitude of Niue. The official track (as of 0000 UTC) takes it south of Niue. The GM had been markedly overdoing rainfall in the initial stages (by as much as 30 times), but there is better agreement between the models for much lesser, non impactful amounts of rain today as the system moves away eastwards. Rainfall totals over Niue are uncertain at this time given the uncertain track, but potential for 100-150mm of rain is there should Sarai maintain coherency and pass close by or over the island.

Expected Impacts

Flash flooding from heavy rainfall is the primary hazard which may cause damage to property and infrastructure, as well as be a threat to life. Tropical storm force winds may damage temporary or poorly built structures. Some coastal flooding is possible.



Europe

Eastern Mediterranean including southern Turkey, Crete, Cyprus, western Syria, Lebanon, Israel, and northern Libya and Egypt

Weather

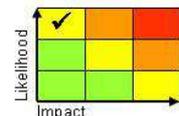
Further spells of very unsettled weather (thunderstorms) are expected over the next 7 days. Rainfall is expected to be highly variable but some places could receive up to 200 mm over the week, with the potential for 50-100 mm falling in a few hours. The northern coastal districts of Crete look particularly vulnerable. Strong to gale force winds will build rough seas at times through the Aegean Sea. Thunderstorms may spawn a few waterspouts/tornadoes in the eastern Mediterranean, including Cyprus later this week.

Discussion

PMSL in the eastern Med will be generally lower than normal over the next 7 days, as a number of trough extensions dive in to reinforce the broad surface circulation generated by recent events. This will provide ideal, unstable conditions for widespread thunderstorm development; these being steered onto coastlines by the variable flow direction. Pulses of strong winds are likely to drive in towards north Crete, with significant rainfall building up here. Should the troughs disrupt, as is signalled later in the week, the temporary equivalent barotropic structure would increase the risk of waterspouts of tornadoes accompanying the thunderstorms.

Expected Impacts

Increased likelihood of flash flooding and landslides. Localised damage to property and infrastructure is also possible from lightning and waterspouts moving onshore. Dangerous sea conditions are likely at times through the Aegean Sea.



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North America

North-eastern USA and southeast Canada

Weather

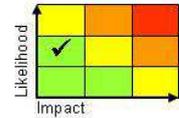
Winter Storm “Gage” (as named by the Weather Channel) will continue through today, with heavy snow and strong winds combining to bring blizzard conditions becoming the primary hazard (as opposed to ice/freezing rain and thunderstorms further south). 15-25cm of snow is expected across large parts of New England today, whilst further west significant lake effect snow (10-20 cm) will bring hazardous conditions more regionally south of Lake Superior, east of Lake Michigan, and north of Lake Huron. More settled conditions are expected by midweek, but another area of low pressure is expected to bring further heavy rain and thunderstorms to the southern and eastern states from Thursday.

Discussion

The mid-latitude depression named “Gage” has brought significant impacts to parts of the US, causing widespread transport and utilities disruption through a combination of ice, heavy snow and strong winds. Gage will be occluded out by today, with the main hazard being heavy snow ahead of the triple point across New England, and lake effect snow around the surface circulation further W. As the driving trough disrupts and the system becomes vertically stacked, a slow decaying process will begin by the end of Tuesday, with conditions improving as a new low forms on the triple point exiting Newfoundland and Labrador. A further strong pattern amplification takes place towards the end of the working week, generating a similar system although in this case the primary hazard currently looks to be thunderstorms in the warm air mass over SE parts of the country.

Expected Impacts

Power and transport network issues are likely to continue in association with winter hazards. Flash flooding is possible in the south due to thunderstorms.



Central America

Panama – See *South America* section.

South America

Panama, western Colombia, Ecuador, Peru and Bolivia

Weather

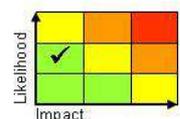
Continued heavy seasonal rainfall in the form of more widespread / frequent thunderstorms will affect areas close to the Andes Mountains from Bolivia northwards through the next week. Up to 300 mm of rainfall is expected in places (around twice the average December rainfall).

Discussion

With the South American Monsoon now extending well southward, daily rounds of showers and thunderstorms are expected to form to the west of the Andes of Colombia and Ecuador, and to the east of the Andes further south. The region highlighted has seen above average rainfall during the past weeks.

Expected Impacts

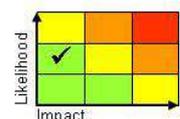
Enhanced likelihood of flash flooding and landslides



North-east Argentina and Uruguay

Weather

Intense areas of thunderstorms that have developed are expected to continue through today as the larger scale system that is responsible for them slowly drifts out to sea. Further torrential rainfall (some places seeing 50-100mm in a few hours), large hail, frequent lightning and risk of tornadoes are likely to bring further localised impacts.



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Discussion

The airmass over this region remains very unstable today with forecast profiles showing locally high CAPE and significant wind shear (strong turning in the low-levels too) that will allow for the development/maintenance of thunderstorms and MCS events with a risk of the odd tornado. Synoptically, a minor trough in the sub-tropical jet is interacting with the leading edge of a monsoon plume drawn southwards, a combination of dynamical and thermodynamical factors leading to slow cyclogenesis as the whole system progresses E'wards and eventually out to sea. Some places saw 50-100mm today (for example several locations saw in excess of 50mm in 6 hours on Monday), and similar values are likely today before the event ends.

Expected Impacts

Flash flooding along with the potential for property and crop damage from strong wind and large hail. Lightning strikes could lead to power outages in places.

Africa

Mauritius – See *Tropical Cyclones* section.

Madagascar, Mozambique eastwards to Angola.

Weather

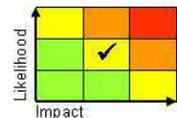
More widespread / frequent thunderstorms than is usually expected will affect this region of eastern Africa at times through the next week, producing up to 300 mm of rainfall in places during the next 7 days (around twice the average December rainfall). Some parts of western Madagascar could see over 500mm.

Discussion

Strong model signal for the ITCZ to be active across this region of Eastern and South-eastern Africa through the next week, in part likely due to ERW activity (highlighted on the tropical analysis).

Expected Impacts

There will be an enhanced likelihood of some flash flooding and landslides given the already wet conditions.



Middle East

Western Syria, Lebanon and Israel – See *Europe* section.

Asia

Afghanistan and northwestern Pakistan

Weather

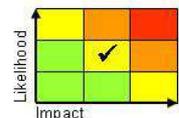
A spell of heavy rain is likely to affect the southeast of the country through Wednesday and Thursday with some locations (including Kandahar) at risk of receiving 50-75 mm of rain over two days. This would be equivalent to a third of the annual average rainfall (190 mm) falling in 48 hours. Further north, heavy snow is likely to fall above 1800 metres (including the area surrounding Kabul).

Discussion

A diffluent upper trough associated with a strong jet left exit is expected to engage the weak baroclinicity across the country during Wednesday, generating heavy precipitation over the Hindu Kush and Central Highlands. Warm air drawn northeastwards on the forward side of weak cyclogenesis initiated by said jet left exit, from the Arabian Peninsula, will destabilise across the south with embedded thunderstorms.

Expected Impacts

The main hazard is expected to be flash flooding causing property and infrastructure damage, as well as posing a risk to life across parts of southeast Afghanistan. Further north, heavy snow will cause transport disruption, increase the risk of avalanche in areas where terrain is steep and unusually low temperatures will pose a risk to vulnerable population groups.



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North India and eastern Pakistan

Weather

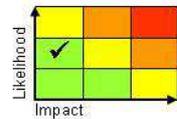
Below average temperatures are expected to persist across northern India and eastern Pakistan through today before steadily recovering. Over the previous weekend, several locations recorded minima close to freezing. These below average temperatures have been accompanied by areas of dense fog and poorer than normal air quality.

Discussion

The succession of Western Disturbances originating from the Mediterranean and reaching south Asia has resulted in a protracted period of below average temperatures across northwestern parts of the Indian subcontinent. The colder than average temperatures have also contributed to poorer than average air quality due to a stronger surface inversion and increased demand for heating.

Expected Impacts

Poor visibility has already, and will continue to, affect air, road and rail networks in the region. Below average temperatures are also likely to have a human health impact to vulnerable people exposed to near freezing overnight temperatures.



Central and eastern Maritime Continent

Weather

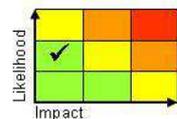
Scattered heavy showers and thunderstorms will be more frequent than usual over the next week. Some places are likely to receive up to 100-150 mm per day although rainfall amounts will be highly variable from location to location.

Discussion

Anomalously warm SST's and an active ITCZ are key ingredients for the consistent signal for above average rainfall in this part of the world from the models over the past few days. Whilst we are entering the wet season for this part of the world, impacts from flash flooding and landslides have already been reported in the past week in Indonesia.

Expected Impacts

Increased likelihood of flash flooding and landslides.



Australasia

Tonga and Niue – See *Tropical Cyclones* section

Southern and eastern Australia

Weather

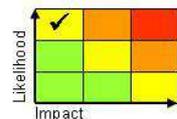
Numerous bush fires continue across parts of Victoria, eastern New South Wales, south-eastern Queensland and Australian Capital Territory with dry conditions persisting across much of the region. Following a respite from the severe heat through the middle of this week, a further burst of heat from the northwest looks likely, with maximum temperatures rising above 45 °C in some places (15 °C above average).

Discussion

A cold front moving across south-eastern Australia today will steadily ease the dangerous fire conditions ahead of it from recent days. Rainfall along the front is unlikely to provide much respite and thunderstorms could even trigger further bushfires. Nevertheless, the sheer size of wildfires across the Blue Mountains in New South Wales will mean considerable rainfall will be required to limit further progress. A return of further hotter conditions looks likely towards the mid to latter part of this week.

Expected Impacts

The sheer size of many ongoing fires will continue to produce large amounts of small particulates that will contribute to hazardous air quality for several weeks to come, affecting heavily populated areas such as Sydney.



This forecast may be amended at any time

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Additional Information

Nil.

Issued at: 310815 UTC **Meteorologists:** D J Harris and Nick Silkstone **Global Guidance Unit**

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