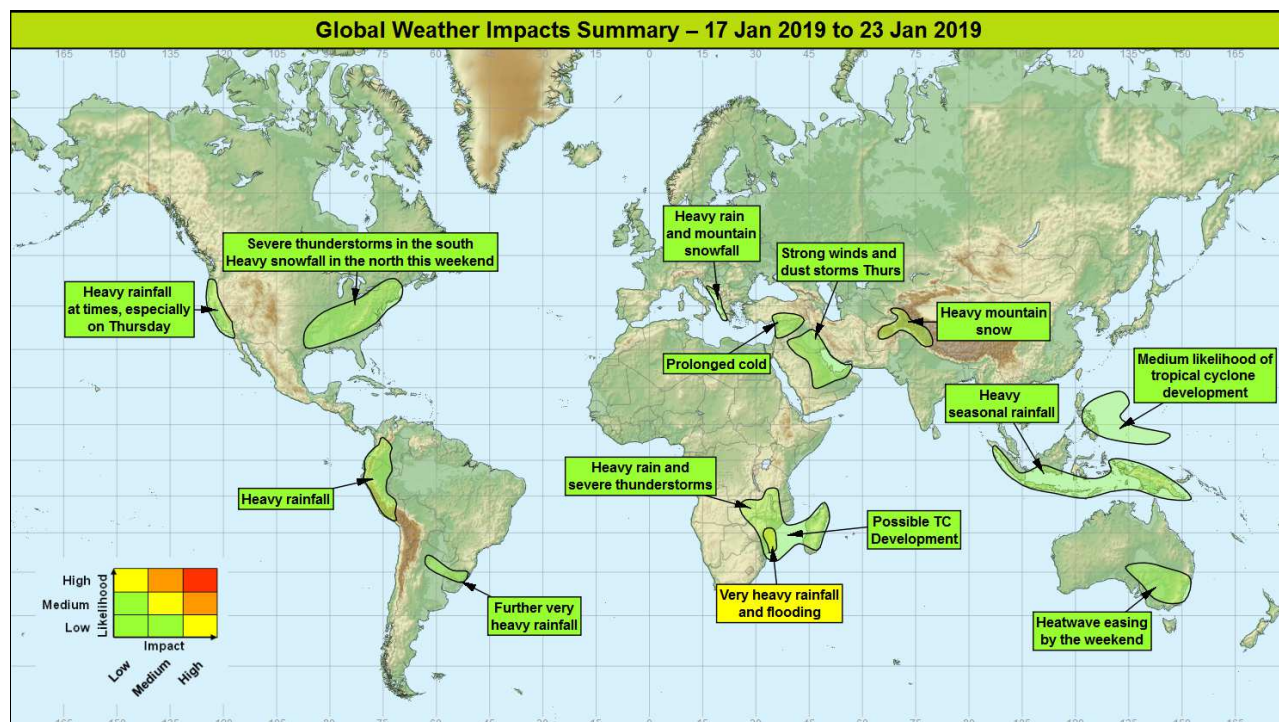


Global Weather Impacts – Thursday 17th to Wednesday 23rd January 2019

Issued on Thursday 17th January 2019

HEADLINES

- Very heavy rainfall with a risk of significant flooding across Mozambique.
- Potential for the development of a tropical storm in the Philippine Sea.
- A severe winter storm is expected to affect parts of the USA this weekend.



DISCUSSION

Tropical Cyclones

There are currently no named tropical cyclones. The following areas are being monitored:

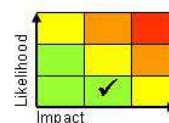
Northwest Pacific (Micronesia and southern Philippines)

Weather

An area of convection continues to progress west across the western Pacific Ocean. There is a good consensus for this system to develop into a tropical depression, possibly a tropical storm as it heads into the Philippines Sea. This system is likely to approach the Philippines on Sunday, with uncertainty whether it would continue westwards across the islands, or begin to turn to the northeast. However there is a risk of some strong winds and heavy rainfall for the southern and eastern Philippines later this weekend.

Discussion

The remnants of TD01 move into an area favourable for development as they track towards the Philippines (high SSTs, low vertical wind shear and good upper level outflow). All deterministic output from shows this area becoming more organised, with a tropical depression, perhaps a tropical storm forming. There remains some uncertainty as to the maximum intensity and track of any development, with solutions split between a landfall in the Philippines on Sunday and others (such as the GM) continuing to system turn to the northeast before reaching the Philippines.



This forecast may be amended at any time

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Expected Impacts

Flash flooding affecting some of the small Micronesian Islands (such as Palau) over the next day or so. On Sunday and Monday, strong winds, rough seas and heavy rainfall may disrupt transport and utilities, and damage some property and crops in the Philippines. This region of the Philippines was adversely impacted in late December by the system that went on to become Tropical Storm Pabuk.

South West Indian Ocean around Madagascar

Weather

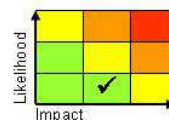
There are signals from some models for the possibility of a tropical storm developing close to Madagascar in the coming days, although there are considerable differences at this time. Should a tropical storm develop it will bring strong winds, in addition to the enhanced rainfall already affecting this region. (See Africa section below)

Discussion

The strongest signal for development is from the GM, which takes a pre-existing low currently over Mozambique east into the Mozambique Channel, where it subsequently develops. EC and GFS are slower to take this low east, so while both show development, this is complicated by the approach of a cold front from the south-west. There are also signals, notably from GFS, for development to the north-east of Madagascar, support for this from other models is limited.

Expected Impacts

In addition to the ongoing heavy rainfall, strong winds are signalled by models this weekend onwards. Some disruption to shipping through the region is possible, with a risk of damage to property and infrastructure should any system impact Madagascar.



Europe

Turkey, Lebanon, north and west Syria and northern Iraq

Weather

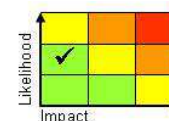
The low which brought thunderstorms and strong winds to this region on recent days will move away to the east today (Thursday), with any shower activity today confined to eastern Iraq. However cold air drawn south in its wake will lead to a prolonged period of below average temperatures across the region. As winds ease some particularly low overnight temperatures look likely.

Discussion

The cold air will remain in place for several days, only gradually being warmed by the relatively strong sun at these low latitudes, combined with a slow incursion of less cold air next week.

Expected Impacts

Below average temperatures are likely to affect vulnerable populations in parts of southern Turkey and the Levant region.



Albania, Montenegro, Bosnia Herzegovina, Croatia and Greece

Weather

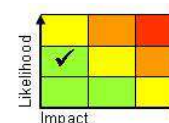
Heavy precipitation in the form of showers and thunderstorms will affect this region from Friday. These could locally produce 50 to 100 mm per day, with this falling as snow on high ground (generally above 500 M in elevation).

Discussion

A series of weak upper troughs will maintain instability (showers) over the Adriatic and Ionian Seas. At low levels the southwesterly flow will steer these showers toward the coastlines of this region, where orographic uplifted will allow the release of further potential instability and increase precipitation totals on the windward hills. There is a signal from some models for a significant depression to affect Italy early next week. If confidence improves this may require a westward extension of the area.

Expected Impacts

This region has been very unsettled over recent weeks, so the rainfall could cause some localised flooding issues, and increase the risk of landslides. Currently snow lies across the mountains of this region, so additional snowfall will increase the risk of avalanches.



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North America
California and Oregon
Weather

Further Pacific weather systems are expected to affect the region through the next week, producing spells of heavy rainfall, falling as snow above roughly 2000 metres thus giving further significant falls over the Sierra Nevada range. The main precipitation event looks likely to be on today when up to 150 mm of precipitation could fall, with weekly totals of up to 300-400 mm of rainfall in the Sierra Nevada. Some lower laying and more populated parts of California (such as Los Angeles) and Oregon could see in excess of the January average rainfall on Thursday alone.

Discussion

In line with the expected boreal winter conditions during a developing El Niño event, the Aleutian Low will remain displaced southeastward of its usual position, and deeper than average this next week. This results in a strong south-shifted Pacific polar front jet stream that can feed a succession of frontal systems into the western states of the USA, bringing very heavy rainfall and snowfall to the high mountains.

Expected Impacts

Flash flooding has already affected California in recent days with the risk remaining elevated this week, particularly on Thursday. Mudslides are a significant threat in burn scar regions of California from the forest fires of recent months. Heightened avalanche threat is also likely in the Sierra Nevada.

**Central and eastern USA and SE Canada**
Weather

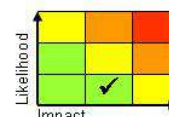
Related to the system that will bring heavy rainfall to California and Oregon this week, a deep area of low pressure will develop to the lee of the Rockies on Friday, and sweep northeastwards across the US this weekend. Southeast of the low centre warm air drawn up from the Gulf of Mexico will allow the development of some severe thunderstorms across southeastern states. To the northwest of the low cold air undercutting the system will result in widespread heavy snowfall and some regions of freezing rain. For the major cities of the eastern seaboard the signal is that much of the precipitation will fall as rain, although it is likely to turn to snow before clearing as extremely cold air drawn south from Canada engages the back of the system.

Discussion

A marked confluent upper trough is expected to drive a developing frontal (later surface low) wave northeastwards across the central and eastern part of the USA at the weekend. On and just ahead of the cold front forecast profiles show the potential for severe thunderstorms, while the northern side of this system will engage the very cold Arctic airmass that will have been dragged well southwards. There is still some timing and track uncertainty between models, but there is high confidence for a significant winter storm with some very heavy snowfall this weekend, latest indications suggest the major east coast cities will see a period of heavy rainfall, turning to snow before it clears. Boston is at greater risk of a major snow event.

Expected Impacts

Significant disruption to travel and utility networks are likely from heavy rainfall strong winds, with a threat to life from winter hazards. Severe storms across southeastern states may bring (large hail, strong winds, tornadoes, frequent lightning, flash flood) impacts.

**Central America and Caribbean**

Nil significant.

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South America

Northern Argentina, far south of Brazil and northern Uruguay

Weather

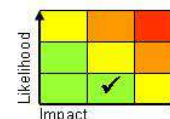
Further episodes of frequent heavy showers and severe thunderstorms are expected to affect this area over the next few days, producing a combination of torrential, short-period rainfall, large hail, damaging wind gusts and a tornado threat. Storms will develop during most afternoons, persisting well into the night time. These storms are capable of producing up to 200 mm of rainfall in 24 hours (with much of this potentially falling in a much shorter time period). Thursday and Friday look to be the days when this zone is most active over the coming week before a drier interlude develops this weekend.

Discussion

Successive rounds of severe convection are expected as the seasonal warm plume is drawn south and engaged by shortwave upper troughs crossing South America. A combination of large CAPE and vertical wind shear will support the development of MCS and supercells. The northward advance of a cold front looks set to bring some relief to the region this weekend.

Expected Impacts

This region of South America has seen several times the average rainfall during the past month. So the impacts from the continued very wet weather could be severe, with river flooding as well as flash flooding. Additionally, large hail, frequent lightning and strong winds/tornadoes are likely to cause some damage to property and utilities infrastructure.



Western Colombia, Ecuador and Peru

Weather

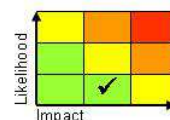
Enhanced rainfall, in association with frequent showers and thunderstorms, is expected this week across the region. There is the potential for 50-100 mm in places each day with up to 300 mm of rain across part of the Andes over the next week. This is likely to equate close to the average January rainfall in places.

Discussion

In line with the developing El Nino, the southeasterly trade winds in the southeast Pacific are weaker than usual, this prevents the upwelling of cold water along the coastline and allows the build up of warm Pacific waters along the coastline (currently positive SST anomalies of 2 to 4°C). These weaker trades allow heating of the South American Continent to setup strong sea breezes along the coastline, drawing in this moist low-level air and allowing heavy showers and thunderstorms to form over the Andes, and also in the usually very dry areas to the west of the mountains.

Expected Impacts

Increased likelihood of further flooding similar to that reported from Peru earlier this week and landslides.

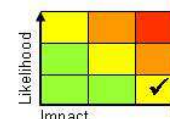


Africa

Mozambique and eastern Zimbabwe

Weather

Very heavy seasonal rains in the form of torrential showers and thunderstorms are likely to affect this region for several more days with daily thunderstorm activity typically bringing 50-100 mm of rainfall in places each day, with some locations perhaps seeing in excess of 250mm of rainfall. There is a low-medium risk over the coming days that some locations in the east of the Mozambique could see a further 750 mm (totalling around 1000mm when added to the precipitation that has already fallen). On Tuesday 15th January an observation from Vilanculos (one of only a handful of observation in the country) received 210mm of rainfall within 24 hours, with the same site recording a further 96mm on Wednesday.



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Discussion

Enhanced seasonal rainfall associated with monsoon plume is forecast to continue for several more days, although a degree of uncertainty has developed due to the signal from GM for a tropical storm type development in the Mozambique Channel (see above) potentially dragging the heaviest rainfall just offshore. Other models, notably ECMWF, maintain the torrential rainfall across much of Mozambique (especially eastern parts). All models do eventually bring a cold front north next week, which should bring an end to this episode. Mozambique is a country that has experienced severe flooding in the past. Looking back on the most recent event in January 2013 when the EU estimated 213,000 people were impacted by the floods, records from the handful of meteorological reporting sites in the country states that many locations sat between 250-450mm of rainfall through the month, with the wettest location seeing 623mm.

Expected Impacts

The largest and most densely populated settlements in the areas highlighted virtually all tend to lie on flood plains and river deltas, where the majority of the agriculture occurs. Meaning that the region is highly vulnerable to flooding. This event could lead to significant flooding related impacts in this region (hence assignment to the high impacts column), with a Save, Pungoe and Buzi river basins most likely to be badly affected. The low-medium likelihood solution becomes favoured (over a 1000mm of rainfall for some locations); this event could be nudged into the amber box in the high impacts column. In addition large hail, frequent lightning and strong winds are likely to cause some damage to property, crops and infrastructure.

Remainder of Mozambique, Zimbabwe, Zambia, Malawi, Madagascar, northern South Africa and southern Tanzania

Weather

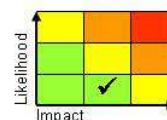
Enhanced seasonal rains are expected to continue in the form of more frequent thunderstorms. These could locally bring 50-100 mm of rainfall in 24 hours, with some significant totals perhaps falling in a short period. Some locations could see 200-300 mm over the next week, with these values close to the January average. In addition to heavy rainfall, these will likely produce frequent lightning, strong downdraughts and possibly large hailstones too.

Discussion

Enhanced seasonal rainfall associated with monsoon plume is forecast to continue over the next week, with significant rainfall anomalies signalled. Showers will mainly be focussed by the (at times diffuse) axis of high WBPT and enhanced low level convergence. An advancing cold front should bring some respite from the south later this weekend.

Expected Impacts

The majority of the area highlighted is sparsely populated; however there are a few large densely populated cities within it. Impacts will be fairly localised given the nature of showers, but flash flooding from heavy rainfall is possible. Additionally, large hail, frequent lightning and strong winds are likely to cause some damage to property, crops and infrastructure.



Middle East

Lebanon, north and west Syria and northern Iraq – See *Europe* section.

Much of Syria, Iraq, Jordan, Kuwait, eastern Saudi Arabia, Bahrain, Qatar and the UAE

Weather

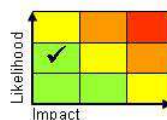
Strong or gale force winds will extend southeast through and around the Persian Gulf through Thursday. These winds will likely lift some dense dust storms across a large area.

Discussion

This event is linked with the depression which swept across the eastern Mediterranean and Levant earlier this week. There is good model agreement for this event that will generate a strong Shamal through the Persian Gulf.

Expected Impacts

Dense dust storms can have an adverse impact on human and animal health, and disrupt land and air transport links.



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Asia

Micronesia and southern and eastern Philippines – See *Tropical Cyclone* section.

Much of Indonesia and Papua New Guinea**Weather**

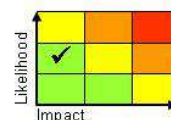
This is the wet season in southern Indonesia and Papua New Guinea, but the seasonal rainfall could be more intense and more widespread than usual this week. Up to 100 mm of rain could fall in a few hours, perhaps with strong winds or even a tornado (as seen in western Java recent days). Rainfall totals of up to 300 mm could accumulate in places, which would be around the average January rainfall.

Discussion

A combination of Kelvin waves, equatorial Rossby waves, a strengthening cross equatorial northerly and an emerging Indian Ocean MJO is likely to result in enhanced seasonal rains this coming week.

Expected Impacts

Flash flooding possible in places, with some wind damage possible near severe storms. There will also be an increasing threat of landslides and river flooding.

**Afghanistan, Tajikistan, southern Turkmenistan, northern Pakistan and north-western India****Weather**

Further snow is expected to affect the region through the next week with many places seeing a further 15-25 cm of snow during this time. Isolated accumulations of up to a metre are likely, particularly over western Tajikistan and southeast Uzbekistan, then later the Kashmir region of Pakistan and India as well as the easternmost Hindu Kush.

Discussion

A mobile westerly pattern will extend eastward into southwest Asia through the coming week, engaging a series of WBPT plumes. This will lead to widespread snow on the abundant elevated topography of the region.

Expected Impacts

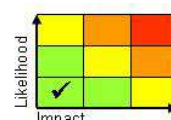
This follows another snowfall event last week affecting a similar region. Fresh snowfall is expected to disrupt air and land-based transport networks in the region whilst power supplies could be interrupted. Cold temperatures may also have adverse impacts on human and animal health. Given the mountainous nature of these regions, there will also be an increased likelihood of avalanches.

**Australasia****Southeastern Australia****Weather**

The ongoing heatwave which has seen many local records broken, is expected to continue across south-eastern Australia until the end of the week. Maximum temperatures are expected to hit the high 30s to low 40s°C towards some of the more populated areas, including Canberra with some inland locations into the high 40s°C (Tarcoola, South Australia reached 49.1°C on Tuesday, within two degrees of the Australian record). This is some 8-12°C above normal and many more local records are likely to be broken. The heat could trigger wildfires in parts of southeastern Australia. At the end of the week a cold front will bring an end to the extreme temperatures, and could spark some severe thunderstorms.

Discussion

High temperatures are not unusual for Australia in the last decade. The Bureau of Meteorology recently announced that 2018 was the 3rd warmest year on record. These heatwaves tend to develop over NW Australia, where the town of Marble Bar has now exceeded 40 degrees Celsius for almost a whole month, then spread south and east across the interior, then on to affect the more populous areas of south-eastern Australia. The Tarcoola temperature is within two degrees of the Australian record of 50.7, set at Oodnadatta, South Australia in January 1960.



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Daily Global Weather Impacts Assessment

Expected Impacts

Extreme heat can impact the health of the more vulnerable people and can adversely impact on the availability of water and the power network. The Australian Open tennis takes place this week in Melbourne and may impact both players and spectators alike. The heat, combined with prolonged dry weather will also lead to an increased risk of wildfires developing.

Additional information

Nil.

Issued at: 170845 UTC **Meteorologist:** Mark Sidaway

Global Guidance Unit

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