Severe Weather Assessment for Tropical Cyclone PAM

Issued on Sunday, 15th March 2015 at 1200 UTC

SummaryTropical Cyclone Pam is currently a Category 2 storm centred 600 km to the northeast of the coast of the North Island of New Zealand. Pam is moving southeastwards at around 30 knots, with sustained winds of around 80 knots, weakening to a Category 1 storm through today (Sunday – UK time), however sustained winds will remain very strong (around 60 knots) over the coming days. Good agreement between the Met Office Global Model (GM), EC, GFS and Ensembles for southeastwards track today (Sunday); Pam's centre is expected to pass within around 200km of New Zealand's East Cape Sunday evening (UK time).

Impacts - Vanuatu

Satellite derived rainfall estimates across Vanuatu show that an estimated 200-250mm fell across the islands over the past few days with the passage of Pam, though actual amounts could have been greater. The destruction across the islands is now becoming clear from news reports, with the major damage probably having been a result of the wind, likely over 130 knots during the peak of the storm, though no official surface observations were available. Reuters are reporting that up to 90% of the buildings in Port Villa were affected by the storm with no power or running water and limited information of the needs of other affected communities away from the capital. Media reports are suggesting there may be dozens of residents dead, which seems like a reasonable assumption considering the damage, however this is not officially confirmed.

Forecast - Vanuatu

Although Pam has passed well to the south of Vanuatu, it remains in an unstable airflow with further heavy showers and thunderstorms likely over the coming 24 hours, with the more northern islands likely to see the highest rainfall totals with another 40mm of rain possible locally through the rest of Sunday into Monday morning (UK time), becoming drier later on Monday. This improved weather situation is expected to continue through the rest of next week across Vanuatu helping the recovery efforts. There is a consistent signal amongst models for a settled period through the rest of next week.

Forecast – New Zealand

There is confidence that Cyclone Pam will track southeast-wards to the northeast of New Zealand through Sunday. However, gusts to 60kt are possible across the North Cape and East Cape, with up to 100mm of rainfall possible in this region in 24 hours. Very large waves are also expected for time around the north of North Island on Sunday and Monday. These conditions could produce local flood impacts, a risk of power loss and damage to buildings, but Auckland looks likely to escape the worst conditions, with only a low probability of Pam taking a track far enough south to produce high impact conditions in Auckland.

*Forecast – Other Tropical Cyclones – **not** expected to affect Vanuatu relief efforts*

Further west, Tropical Cyclone Nathan remains a Category 1 storm, located around 300nm northeast of Cooktown, Australia. Nathan is expected to move erratically south-southeastwards over the next 42 hours. The model consensus and official forecast track show Nathan intensifying Sunday and Monday before turning westwards again to make landfall over northern Queensland on Thursday/Friday. There is uncertainty over where Nathan will make landfall, but it is expected to be north of Mackay at this stage. The main impact is likely to come from heavy rainfall and flooding with 200-300mm or more where Nathan makes landfall. Although the model consensus is for Nathan to turn westwards, there are still a tiny minority of ensemble members that take Nathan east towards Melonesia. This is considered **very** unlikely, but tropical storms are more difficult to predict in this part of the world, and if it were to move eastwards could generate significant additional rainfall over areas affected by TC Pam, hampering relief operations in the region.

In the Northwest Pacific, Tropical Storm Bavi is around 120nm north of Guam, moving westwards over the next 5 days as a strengthening tropical storm. The GM and EC tracks are similar and take the storm to the northeast of Luzon as weakening feature on Thursday. In contrast, the GFS model and track guidance from Joint Typhoon Warning centre take Bavi west to make land fall over central Luzon on Friday. At this stage a solution between the deterministic EC, GM and GFS solutions is preferred. This would take the remnants of Bavi across northern Luzon on Thursday/Friday and is supported by the majority of ensemble members. The main impacts would be from heavy rainfall over eastern Luzon (~ 50-75mm) with localised flooding.

This forecast may be amended at any time
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Fig 1: 15/0900 Z colour enhanced IR imagery to show position of TC Pam. Imagery is colour enhanced to show coldest cloud tops, which can be thought of as a proxy for heaviest rainfall. Forecast tracks are from the Joint Typhoon Warning Centre.

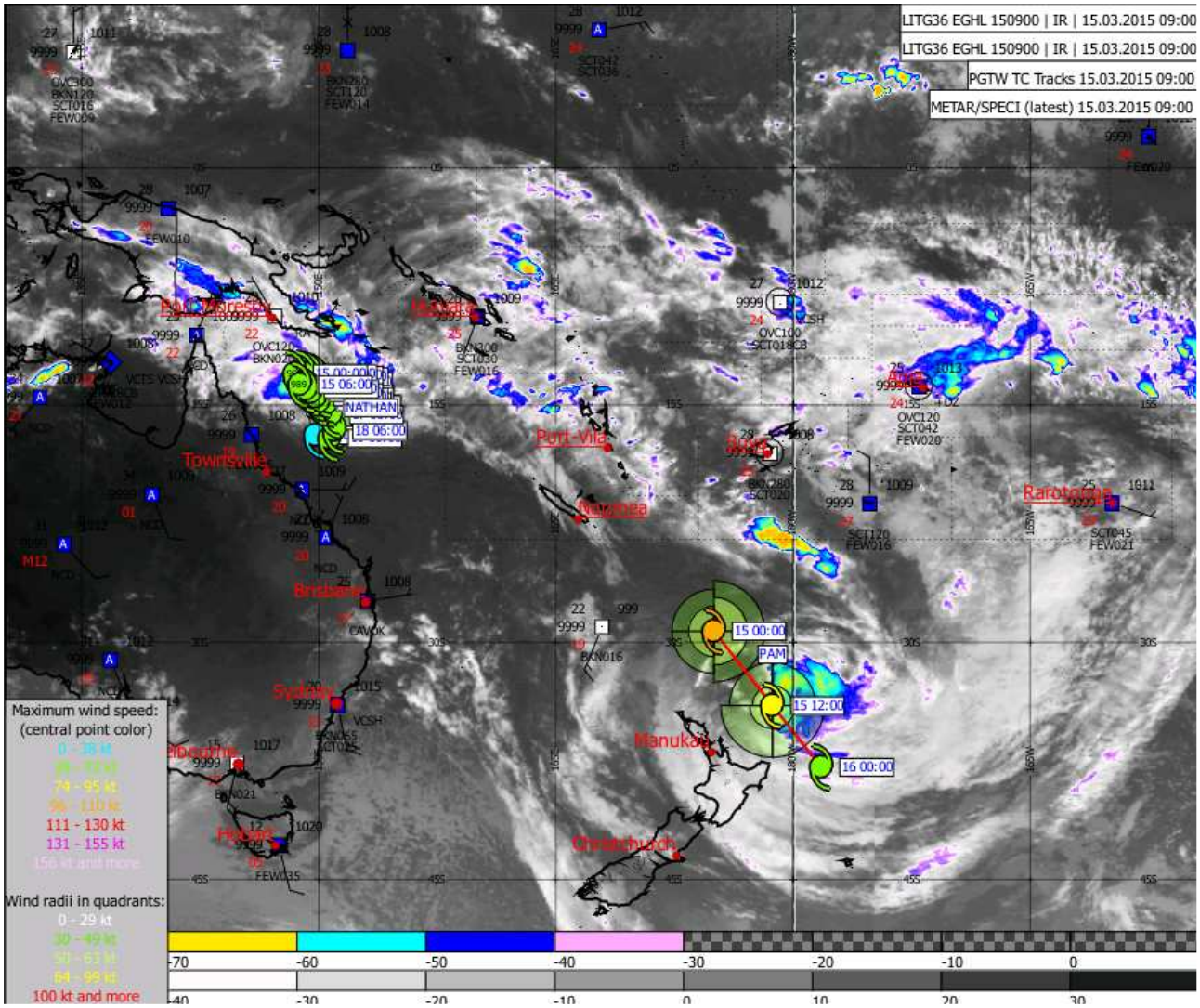
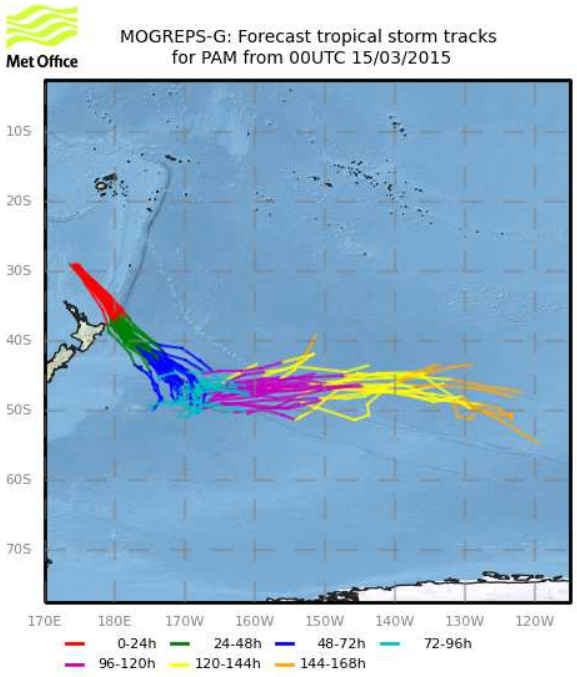
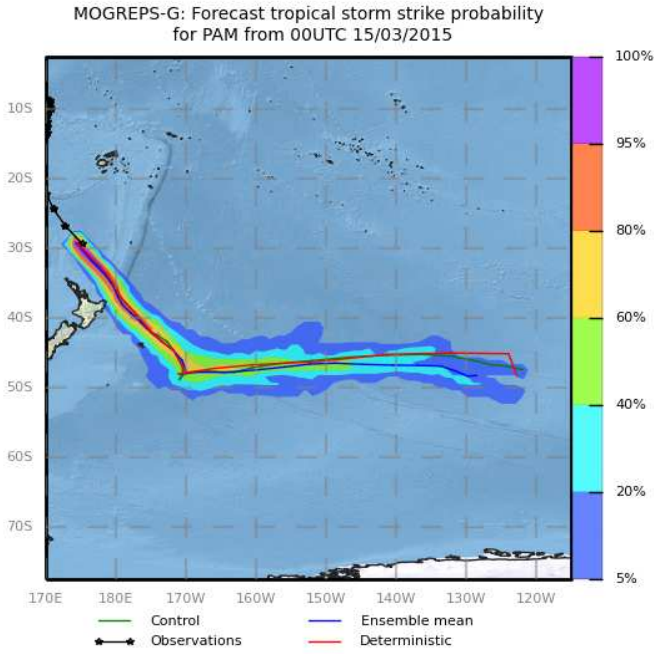
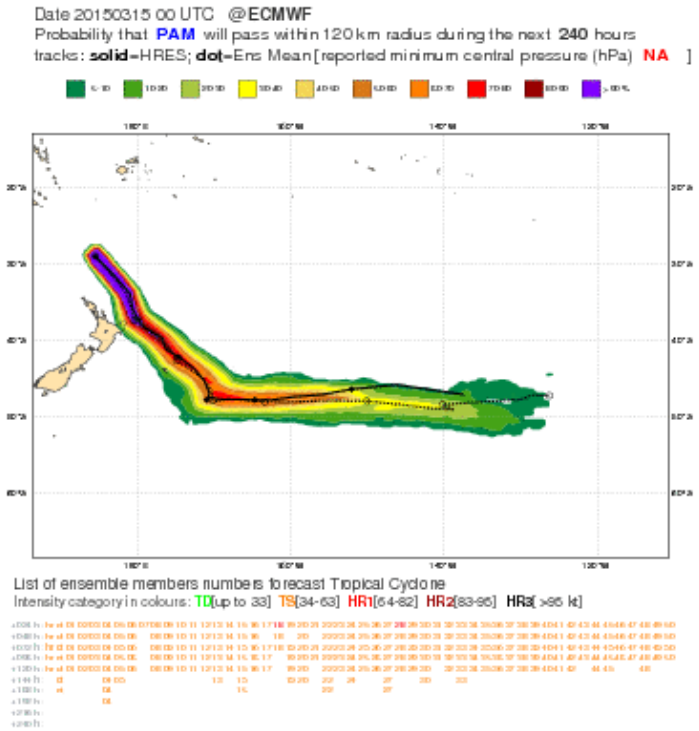


Fig 2: Latest ensemble output from MOGREPS-G (top) and ECMWF (bottom), both showing high confidence for the track across the SW Pacific away from the areas affect by Pam. However, both models have a minority of ensemble members that clip the East Cape region of the North Island, New Zealand.







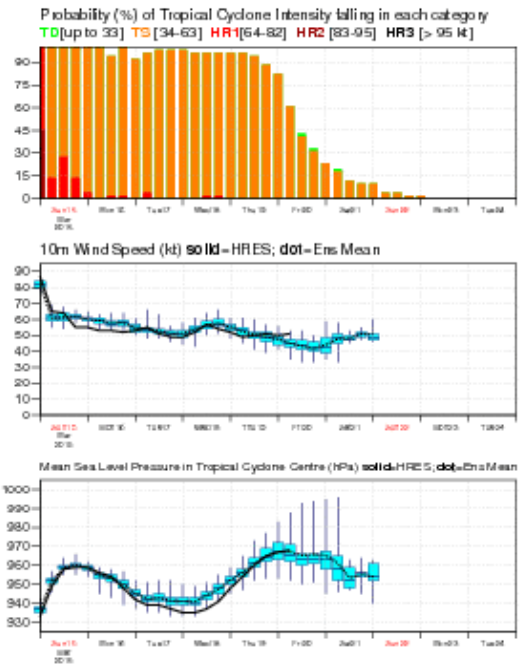


Fig 3: Latest ensemble output for TC Nathan from MOGREPS-G (top) and ECMWF (bottom), both showing Nathan remaining in the Coral Sea with the vast majority of the solutions showing it then moving westwards.

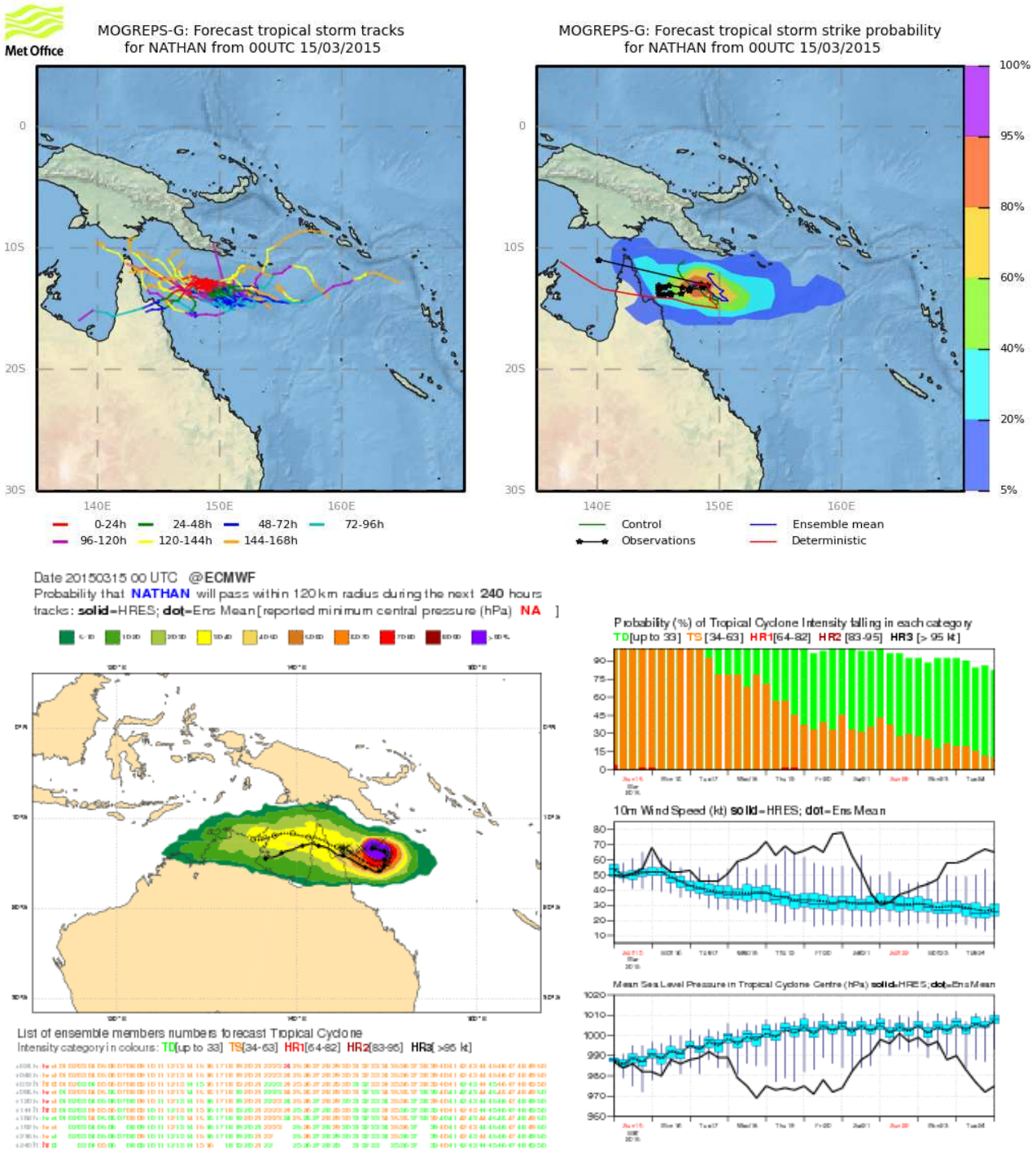


Fig 5: 15/00Z 12 hourly rainfall accumulations from the GM for the 12 hours up to the time shown on each plot.

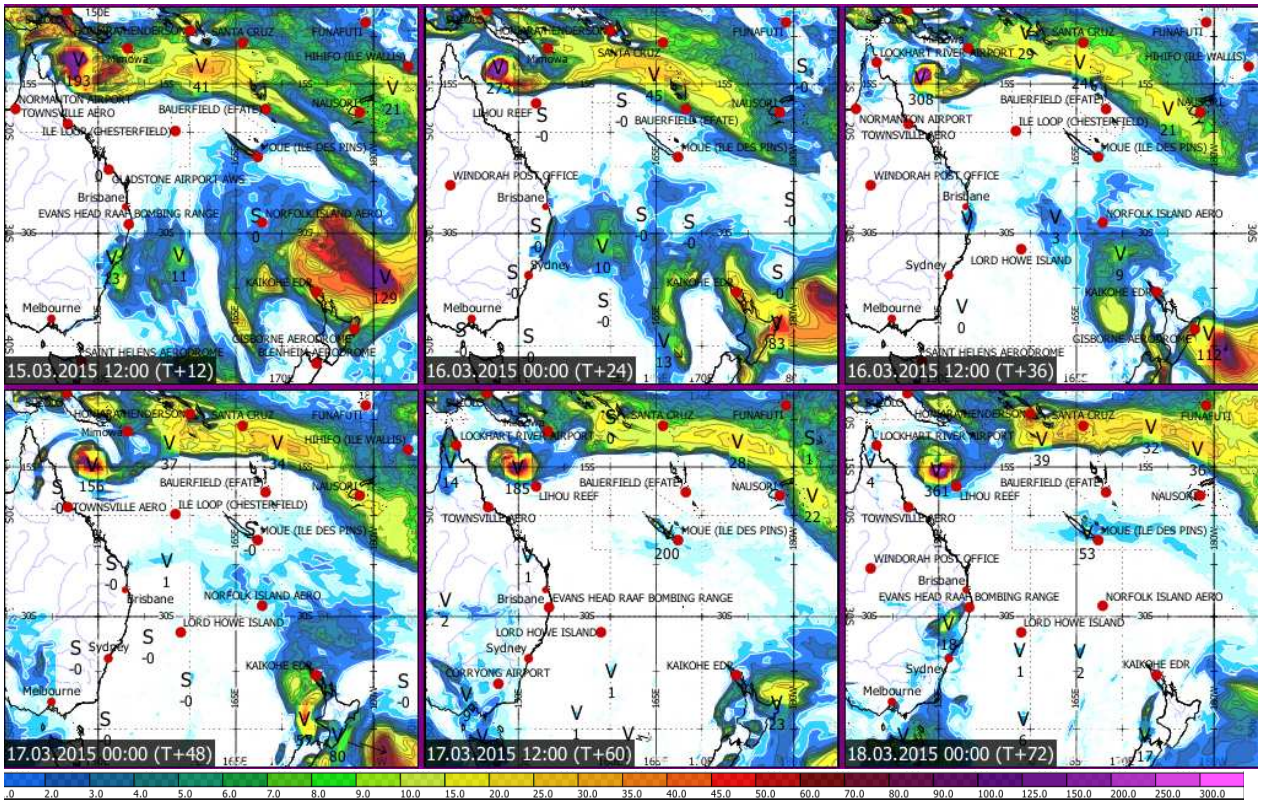


Fig 6: 15/00Z 6 hourly 10m wind barbs and gust speeds (knots) from the GM.

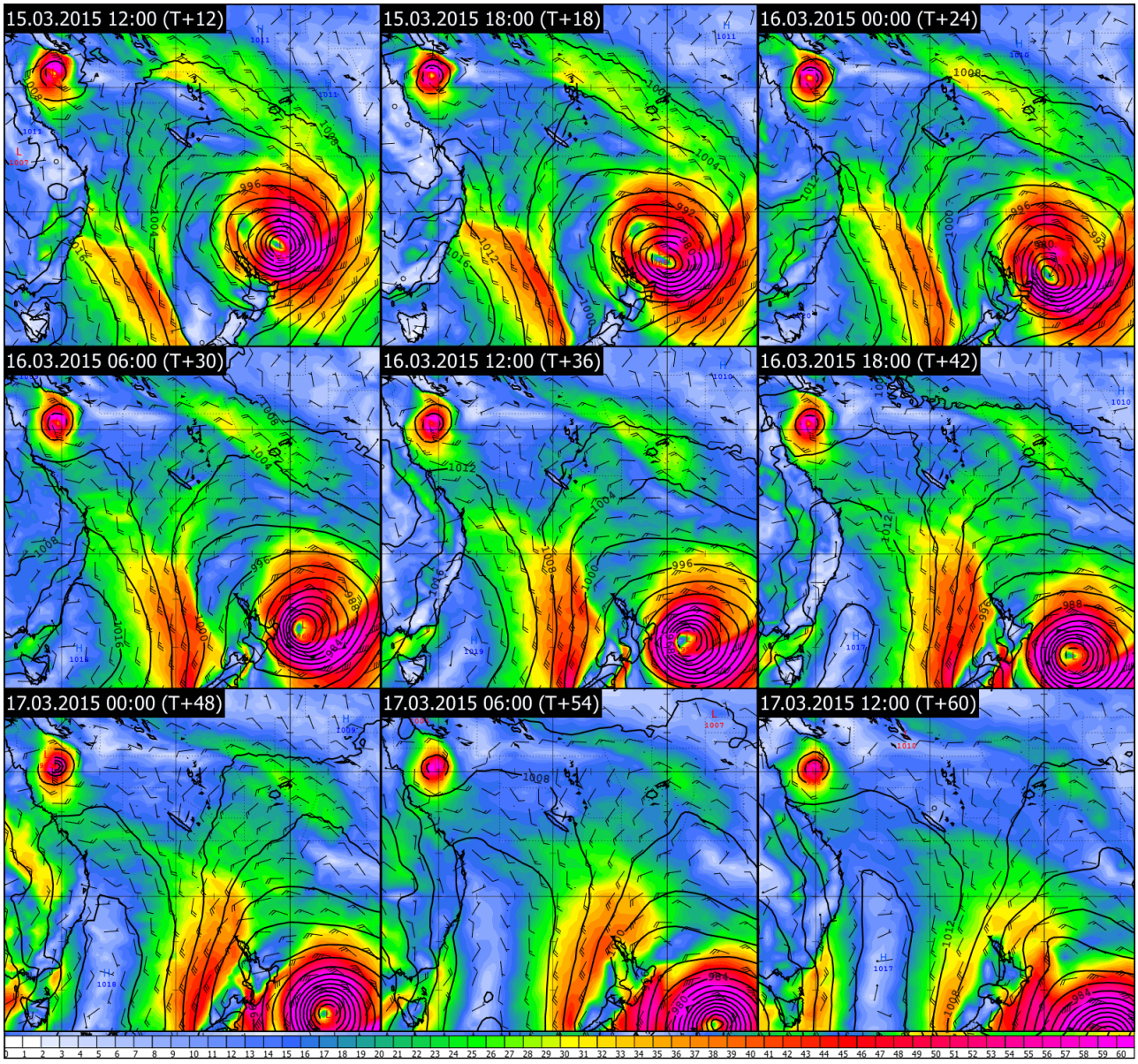


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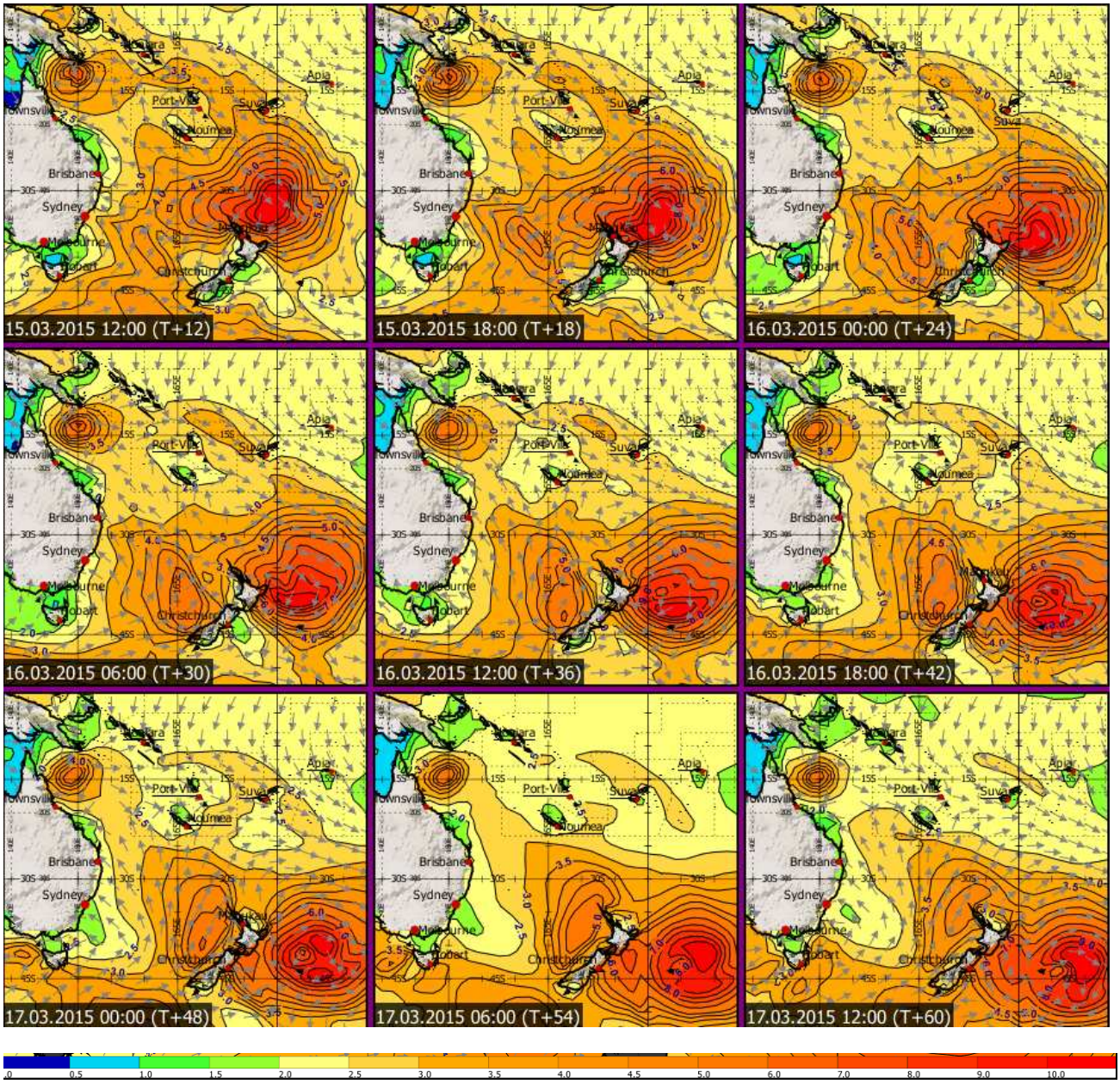
Fig 7: 15/00Z 6 hourly GM significant wave heights.



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