The 2016 Mawson Resupply and Grounding of the RSV Aurora Australis

24th February 2016
Mawson is windy since 1954 in m/s (gales are reached daily 54% /year)
Maximum wind gusts (3sec)
For February 197km/hr (106 knots), 134knots max
Land Fast Mooring Lines
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What we'll do

- Look at the synoptic environment;
- Consider the guidance; and
- Consider the appropriateness of the warning.
A tropical disturbance sets the scene
(cat 4 on the 17th, cat 1 on the 20th)

TERRA Visible image Feb 17th, courtesy of NASA
US gfs filtered long wave
500 hPa heights
23rd Feb
MSLP sequence

20th 00:00 UTC

21st 00:00 UTC

22nd 00:00 UTC

23rd 00:00 UTC

24th 00:00 UTC

25th 00:00 UTC
The AA enters Horseshoe Harbour for resupply on 20th Feb

Sitrep by Voyage leader:

"The weather outlook seems… variable. This one isn’t going to be easy but we’ll get there";
AMPS WRF +15hrs
MSLP and 10m wind forecast
AMPS winds at 2000ft
~65 knots
Forecast from the day before

Today, Tuesday 23rd February

Station: Cloud increasing. Snow showers increasing overnight.

Winds: S/SW 20/30 knots shifting SE during the afternoon and increasing SE 25/35 knots during the evening and 45/55 knots overnight. SFC: Good, degrading poor later. HZN: Good, degrading poor later.

Tomorrow, Wednesday 24th February

Station: Blizzard conditions easing in the evening. Becoming cloudy with snow showers and blowing snow overnight. **Winds: SE 50/65 knots**…

- PLEASE BE AWARE:

- * Wind gusts can be 40% stronger than the 10 minute averages given above.

- For additional weather support, contact us on x8881 (Casey), x6681 (Davis), e-mail antforecasters@bom.gov.au or see us in person.
23 Feb / 12 UTC model runs
1 min wind observed to 80 knots
(69kts for 10 min, 3 sec gust to 97 kts)
Shipboard winds
1 min wind to 86 knots
2 comments

- Surface guidance was underdone by ~15 knots, possibly from underestimating the depth/position of the low and more importantly the local pressure gradient;

- The forecasters experience and heightened sense of risk exposure lead to the forecast winds being "bumped" up by 10 knots;
2 days later
Once the Blizzard eased a little…
Sixty-eight expeditioners boated to Mawson 2 days later once the winds eased below 35 knots
Davis summering expeditioners were collected by the US LC130
9 days after the incident, the Shirase diverted from South Africa to retrieve the 70 passengers and 3 helo's, transferring them 2300km to Casey.
The Xuelong made an unscheduled stop at Davis research station to collect science samples and two expeditioners, dropping them off in Freemantle.
The RAAF C-17A and AAD's A319 retrieved the 3 helos and 70 passengers from Casey some 3 weeks later.
Helo's inside the C-17
The AA suffered extensive "minor damage" and was allowed to return to Australia with "crew only" and under sea state 5.
Final comments

• An extra 18000km of flying (C17 + A319 + LC130) and 27000km of shipping (Shirase + Xue Long + AA) occurred;

• Forecast 10 minute mean, but users verified with 1 minute mean wind speed observations:
  – Focus user attention on wind gust potential in forecasts;

• Consider climatological perspective and impact based warnings rather than pure wind strength warnings:
  – had the ship ever been exposed to these winds in the harbour?
4 mechanisms for the persistent strong winds at Mawson

- Gravitational Forcing (steep slope)
- Large Scale Pressure Gradient modulated by orography;
- Vertically propagating Internal Gravity Wave sets up SE'ly low level jet; and
- Barrier Wind sets up a low level E'ly jet.
The wind vane broke in a storm 2 days earlier