

Weather Briefing

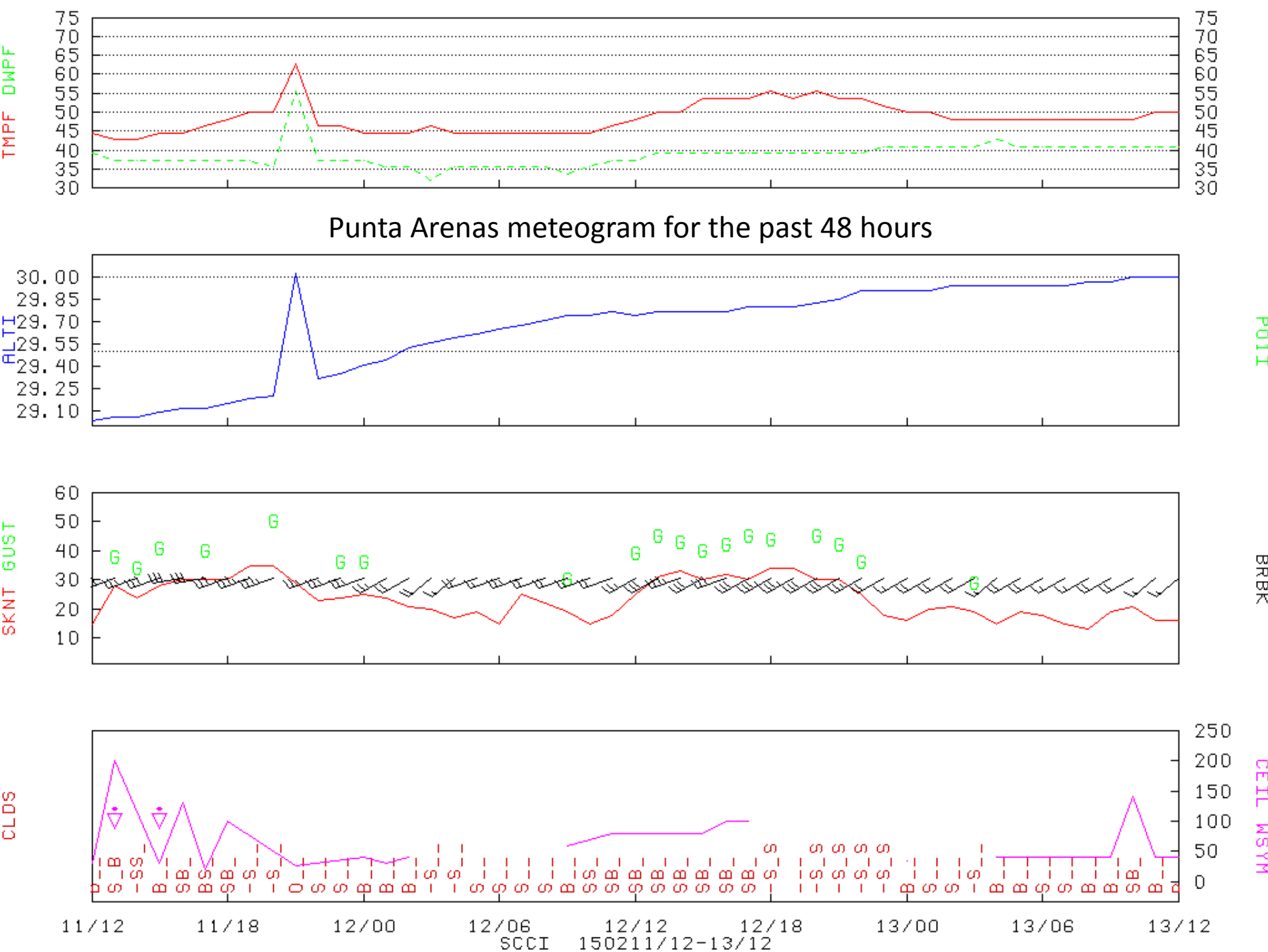
13 February 2015

Jim Bresch and Shawn Honomichl
ORCAS Forecast team

The weather for a lovely weekend.

Forecast issues:

- Location of (potentially) cloud free areas
- Where are the cyclones?
- Potential for a Lagrangian flight
- Takeoff and landing conditions



Punta Arenas: High: 56 Low: 48, No rain.

Sunrise: 6:38 AM

Sunset: 9:17 PM

Frontal passage with showers tonight followed by a stronger front and rain Sunday afternoon.

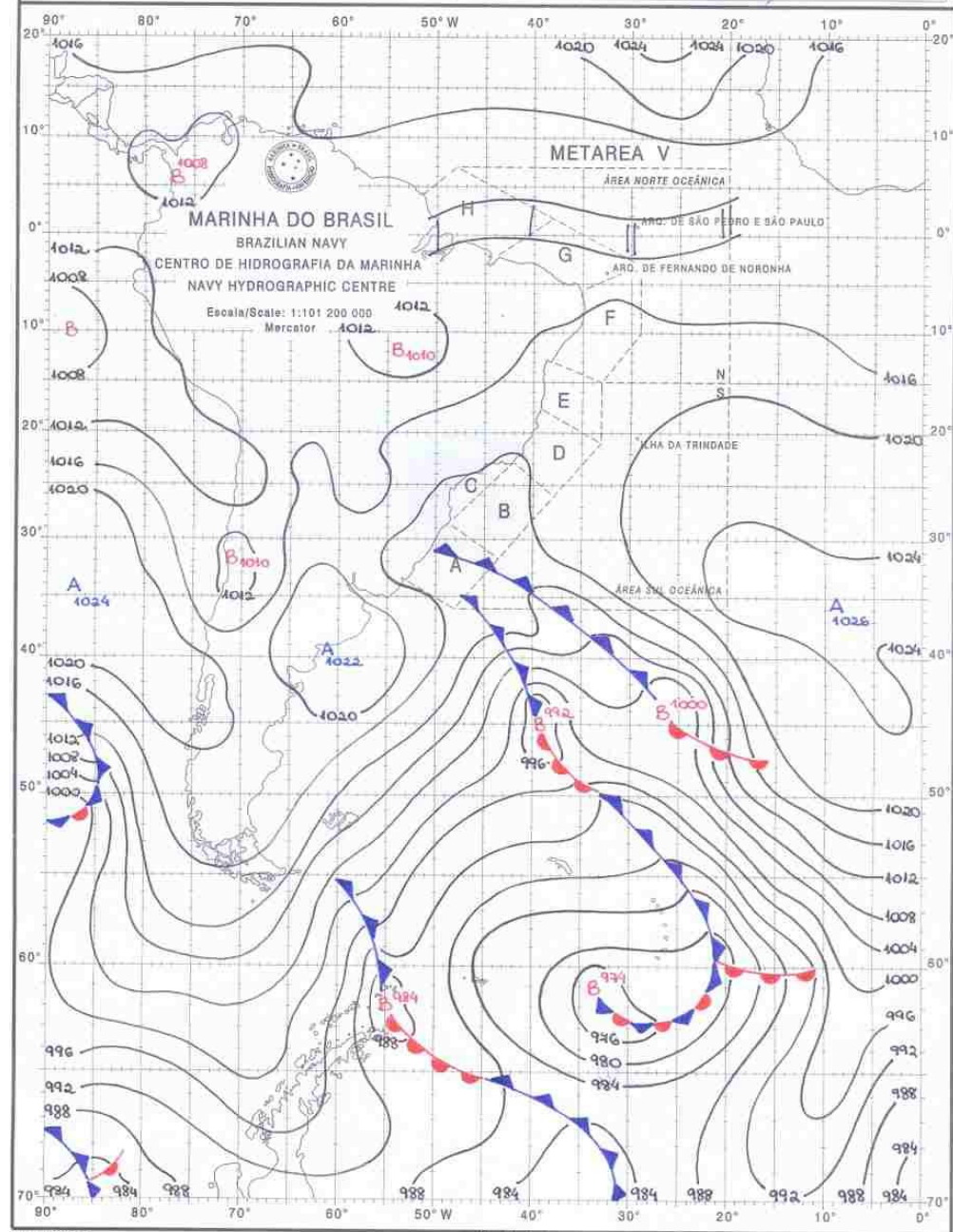
9 AM CST surface analysis

CARTA DE PRESSÃO AO NÍVEL DO MAR SEA LEVEL PRESSURE CHART

Referência/Reference: 131200Z / FEB / 2015

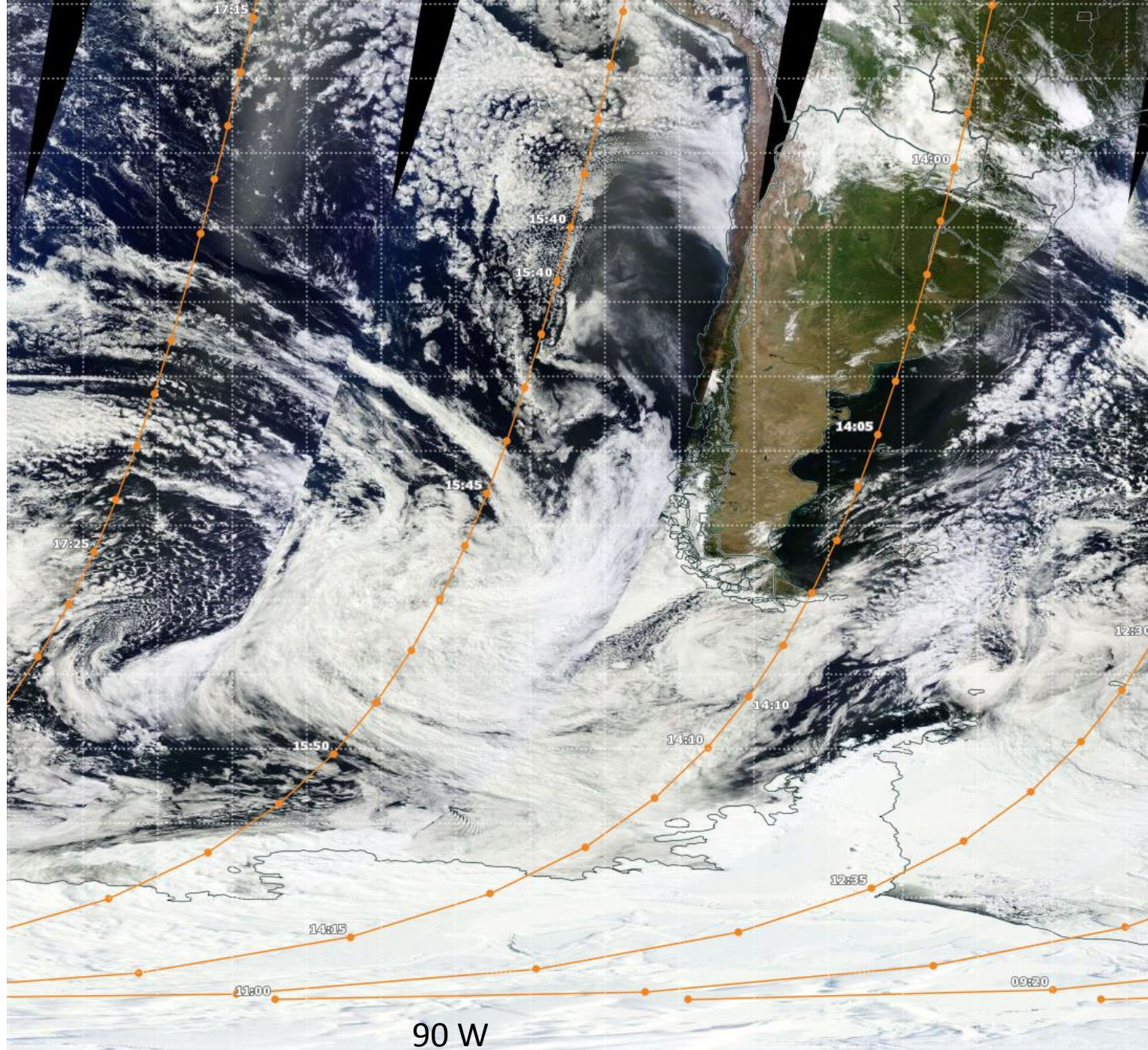
Solicita-se aos navios que informem sua posição, direção e intensidade do vento, altura das ondas e pressão atmosférica ao Centro de Hidrografia da Marinha/Serviço Meteorológico Marinho.

All ships are welcome to inform their position, wind direction and speed, waves height and atmospheric pressure to Navy Hydrographic Centre/Marine Meteorological Service.



Composite of
Terra's
morning
overpasses
13 February.

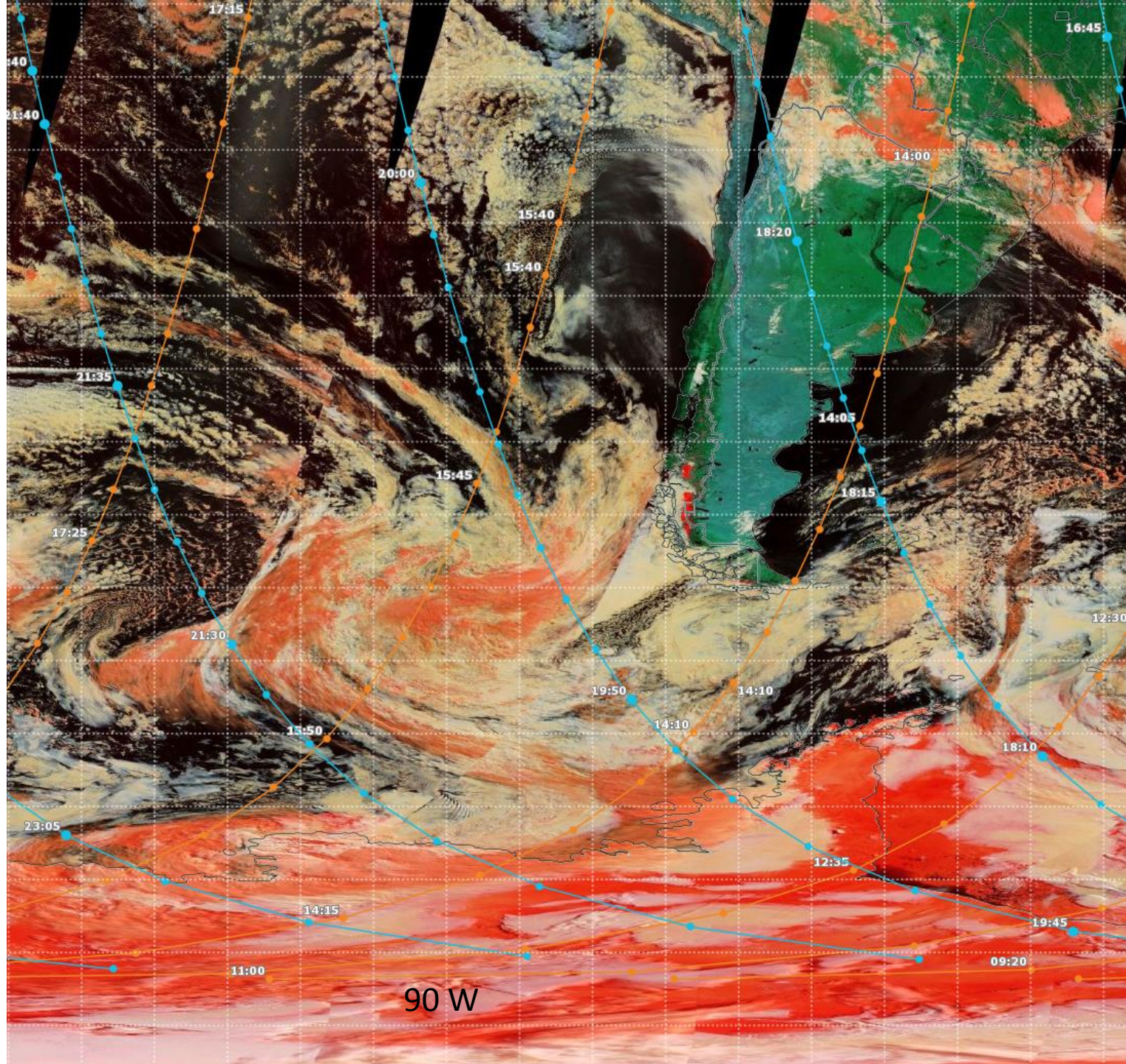
60 S

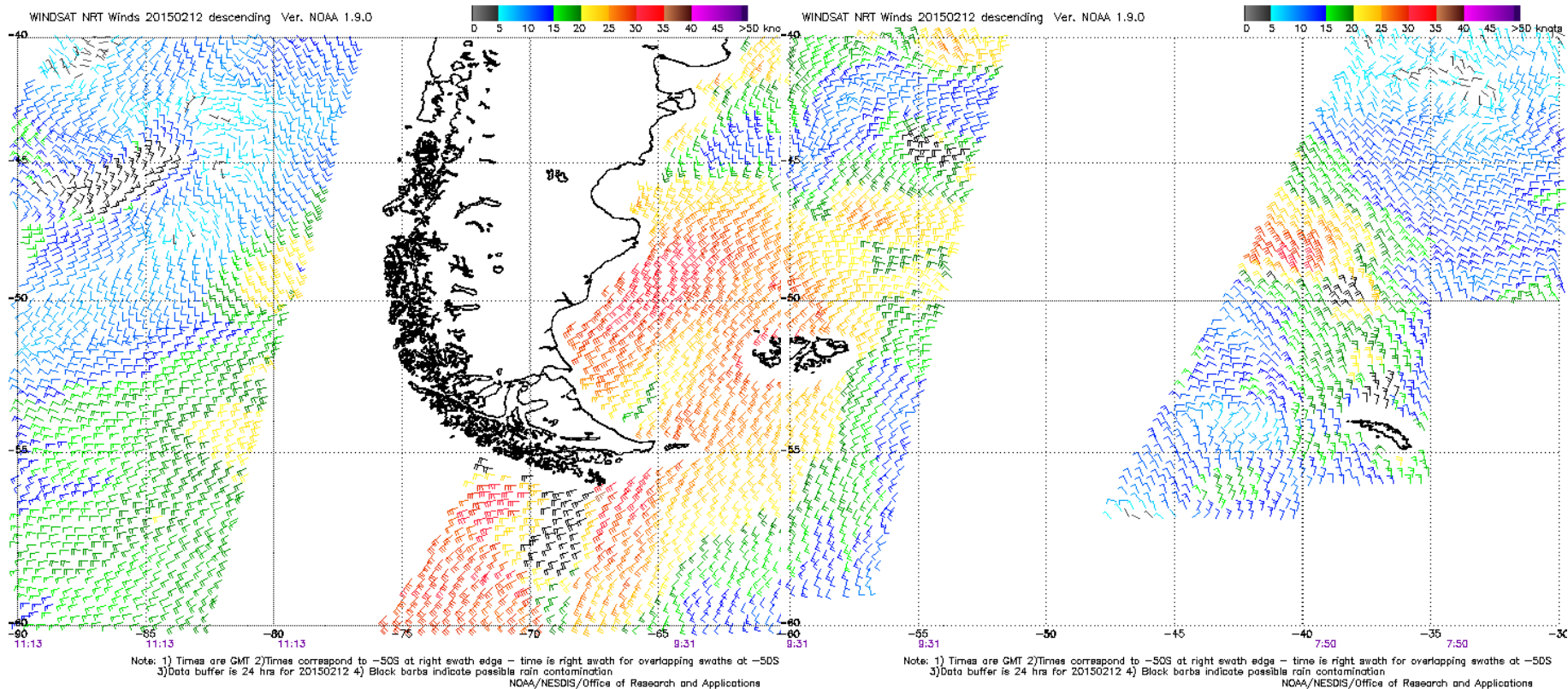


Terra Bands
3-6-7. Ice
clouds are
reddish,
water clouds
are white.
13 February.

60 S

90 W



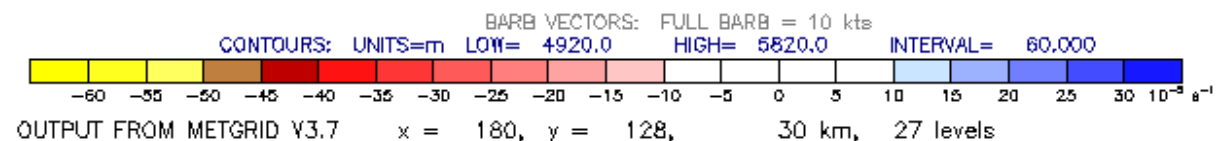
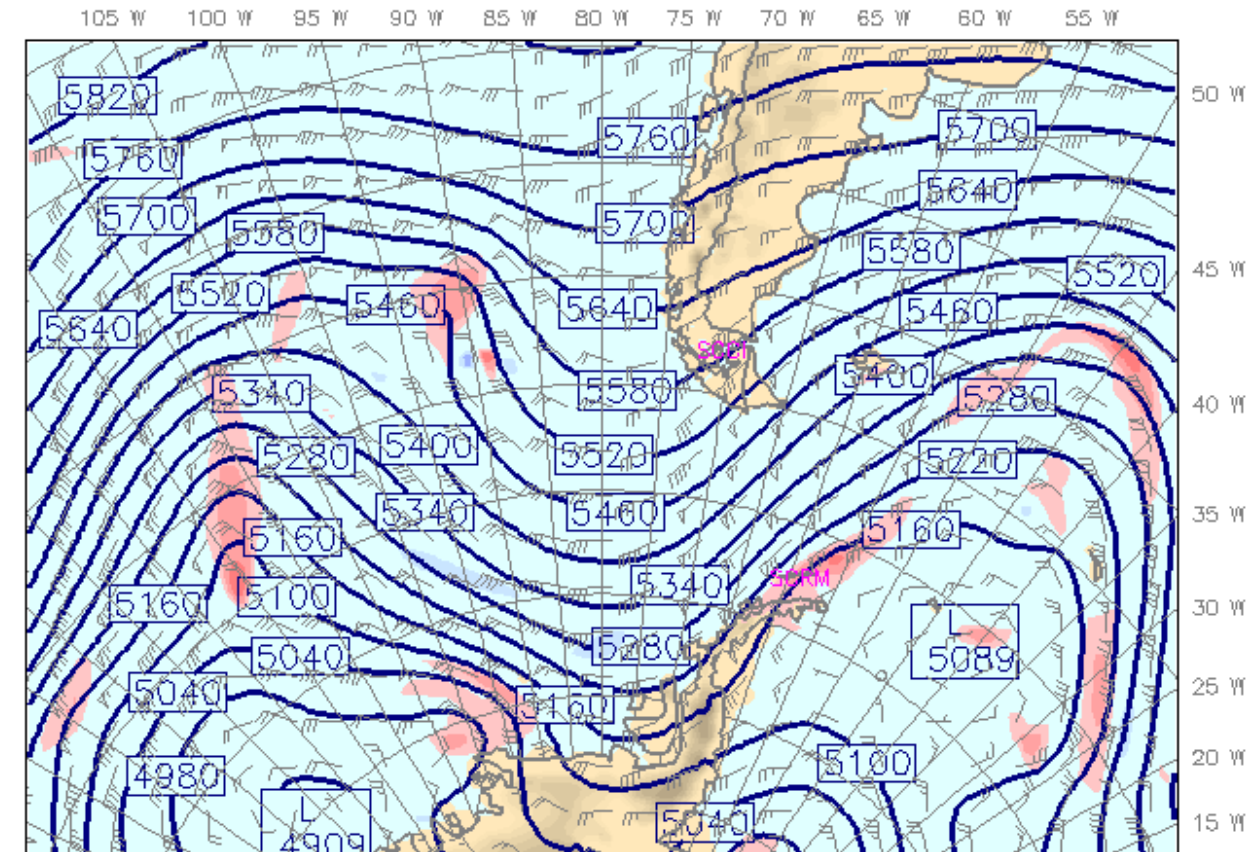


This morning's Windsat overpasses show relatively light winds west of 80W and a channel of strong SW'erlies from the Drake Passage to the Argentine Basin.

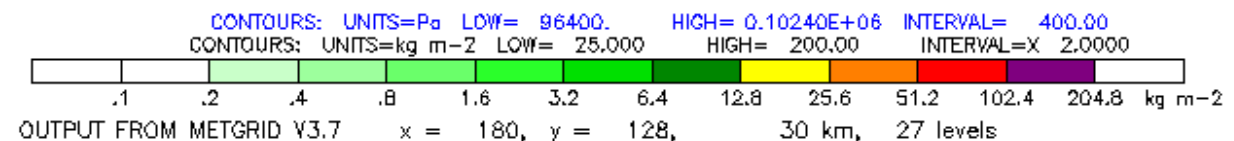
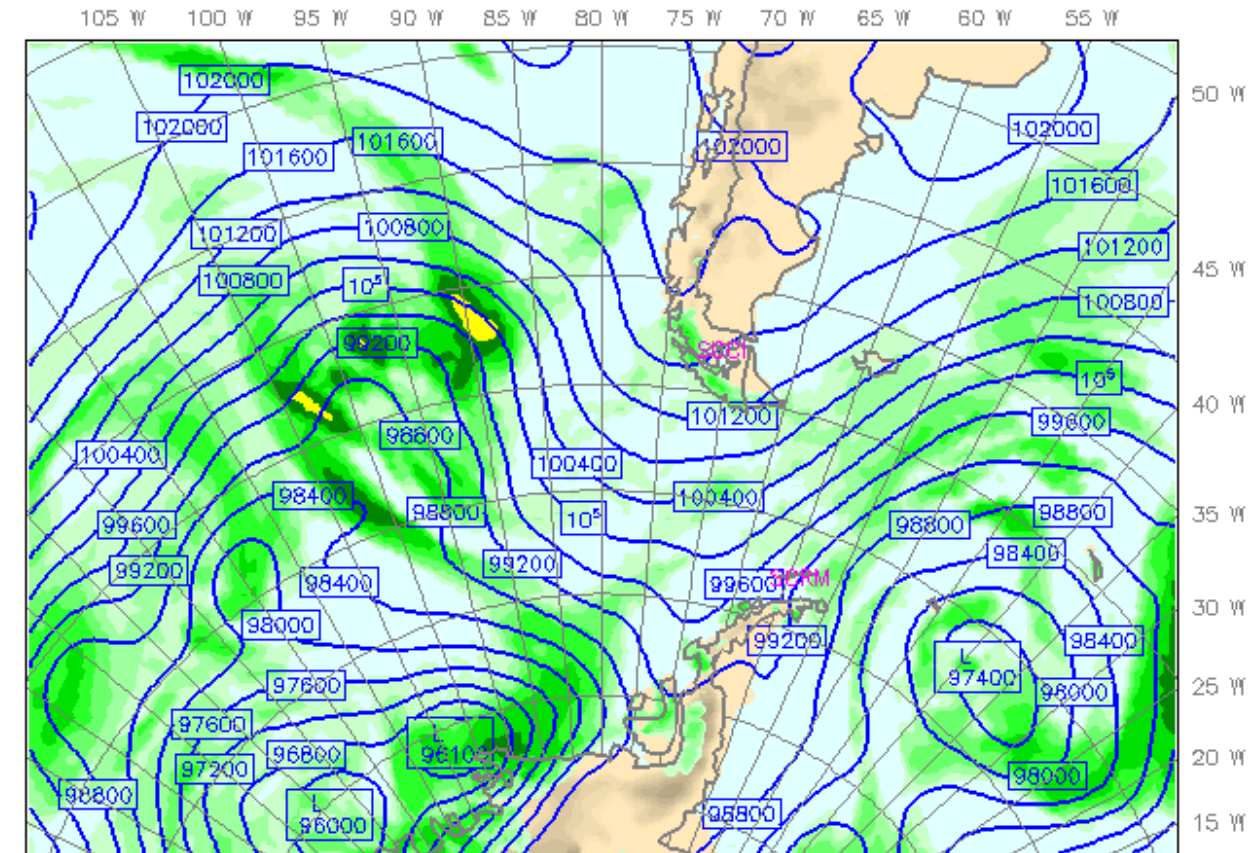
500 mb

FL180

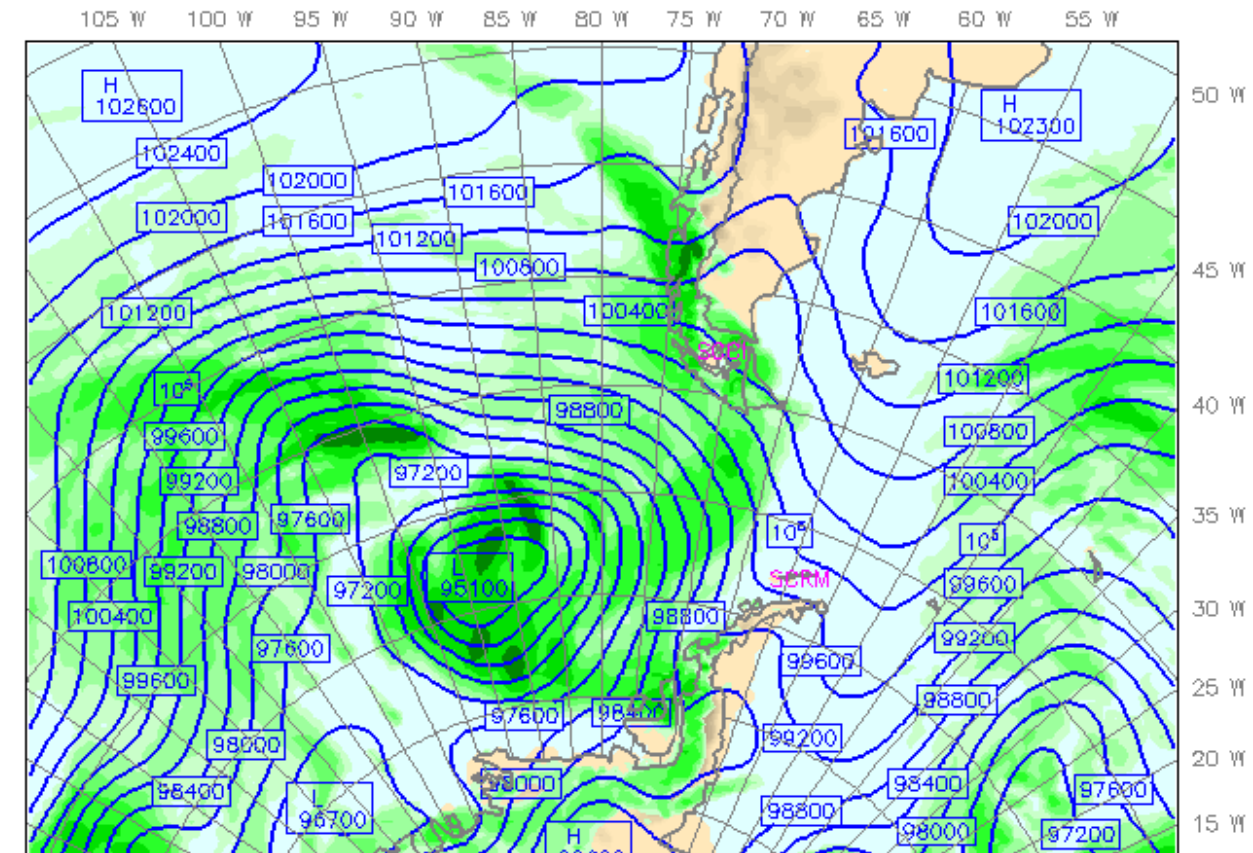
At 12z, the GFS shows two major troughs, one along 45W and the other roughly 110W. A shortwave is near 50S, 90W moving SE towards the ridge axis along 80W. Extensive clouds are found downstream of the trough towards the ridge axis.



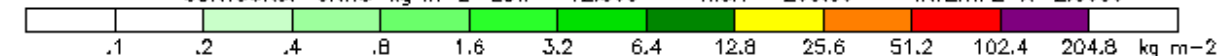
At the surface,
 cyclones are
 located along the
 ice edge at 70S
 and at 62S, 40W.
 Significant precip
 is indicated along
 90W.



By takeoff time Saturday, the shortwave has induced strong cyclogenesis near 64S, 95W and is pushing a front through the Drake Passage.



CONTOURS: UNITS=Pa LOW= 95200 HIGH= 0.10240E+06 INTERVAL= 400.00
 CONTOURS: UNITS=kg m⁻² LOW= 12.500 HIGH= 200.00 INTERVAL=X 2.0000



NCEP GFS 0.25 degree

NCAR/MMM

Init: 06 UTC Fri 13 Feb 15

Fcst: 30 h

Valid: 12 UTC Sat 14 Feb 15 (09 LST Sat 14 Feb 15)

Relative vorticity

at pressure = 500 hPa

Geopotential height

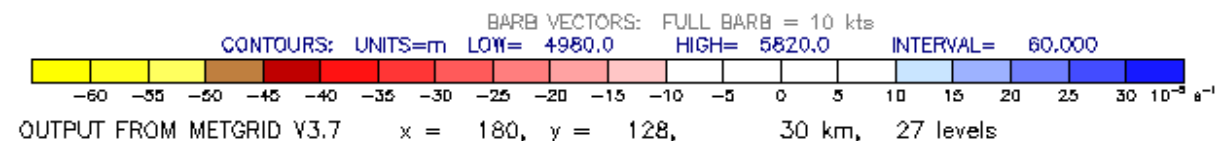
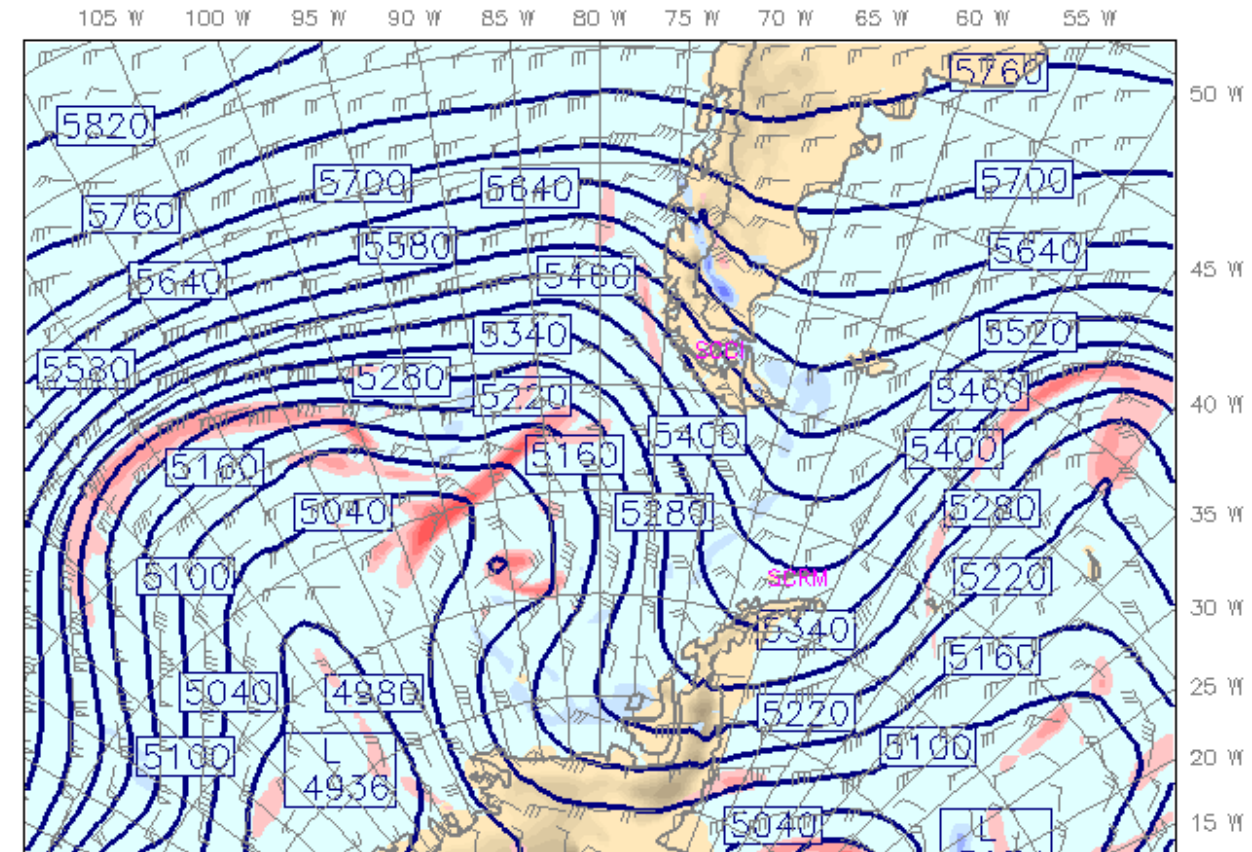
at pressure = 500 hPa

Horizontal wind vectors

at pressure = 500 hPa

sm = 1

At 500 mb the ridge axis has shifted to near 64W with a large area of cyclonic flow west of 80W.



NCEP GFS 0.25 degree
Fcst: 30 h
Low cloud fraction
Horizontal wind vectors

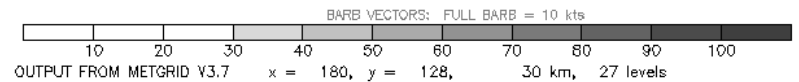
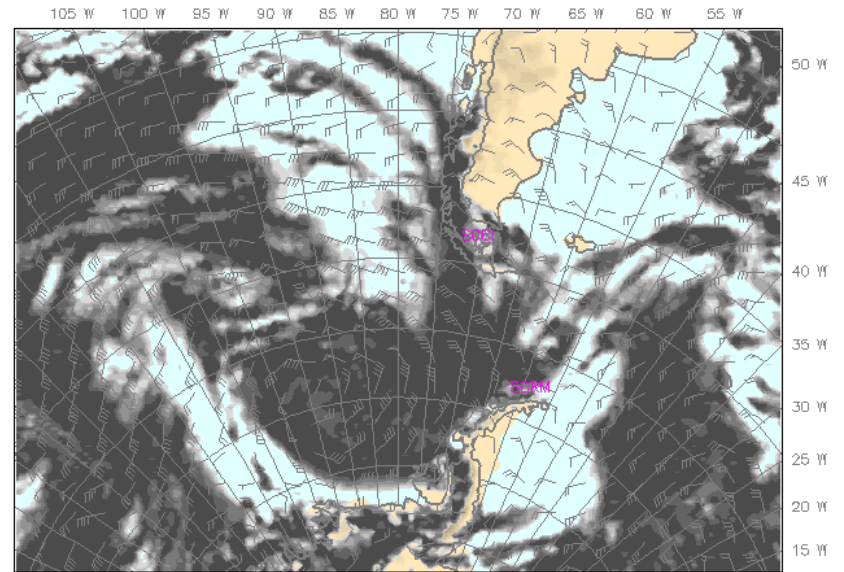
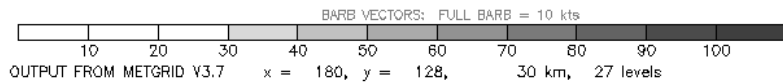
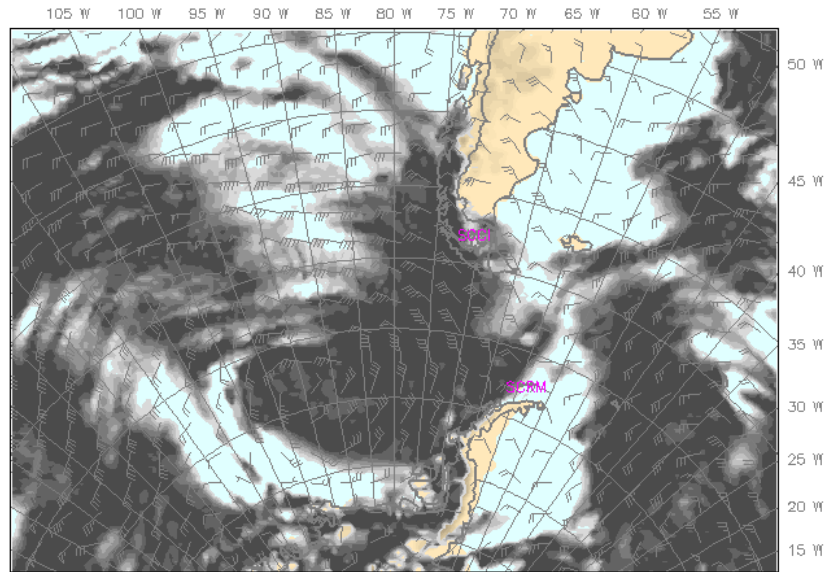
NCAR/MMM
Valid: 12 UTC Sat 14 Feb 15 (09 LST Sat 14 Feb 15)
at pressure = 900 hPa

Init: 06 UTC Fri 13 Feb 15
sm= 1

NCEP GFS 0.25 degree
Fcst: 33 h
Low cloud fraction
Horizontal wind vectors

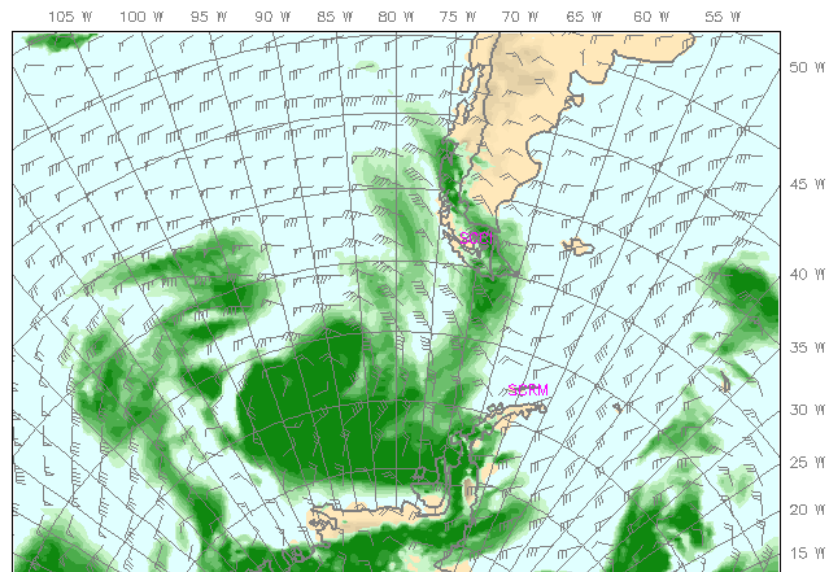
NCAR/MMM
Valid: 15 UTC Sat 14 Feb 15 (12 LST Sat 14 Feb 15)
at pressure = 900 hPa

Init: 06 UTC Fri 13 Feb 15
sm= 1

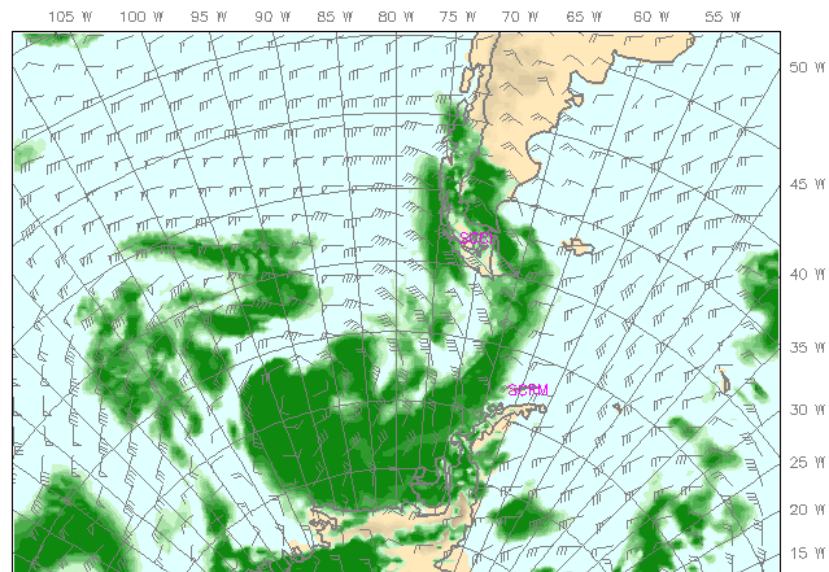


The GFS low-cloud fraction shows extensive cloud between the trough and ridge axes with a clear slot, indicative of synoptic-scale subsidence, moving SE toward 60S80W. Frontal clouds are suggested from the central DP to the west coast of Chile. Clear skies are predicted for the AB.

NCEP GFS 0.25 degree Init: 06 UTC Fri 13 Feb 15 NCEP GFS 0.25 degree Init: 06 UTC Fri 13 Feb 15
 Fcst: 30 h Valid: 12 UTC Sat 14 Feb 15 (09 LST Sat 14 Feb 15) Fcst: 33 h Valid: 15 UTC Sat 14 Feb 15 (12 LST Sat 14 Feb 15)
 Middle cloud fraction Middle cloud fraction
 Horizontal wind vectors Horizontal wind vectors
 at pressure = 650 hPa sm= 1 at pressure = 650 hPa sm= 1



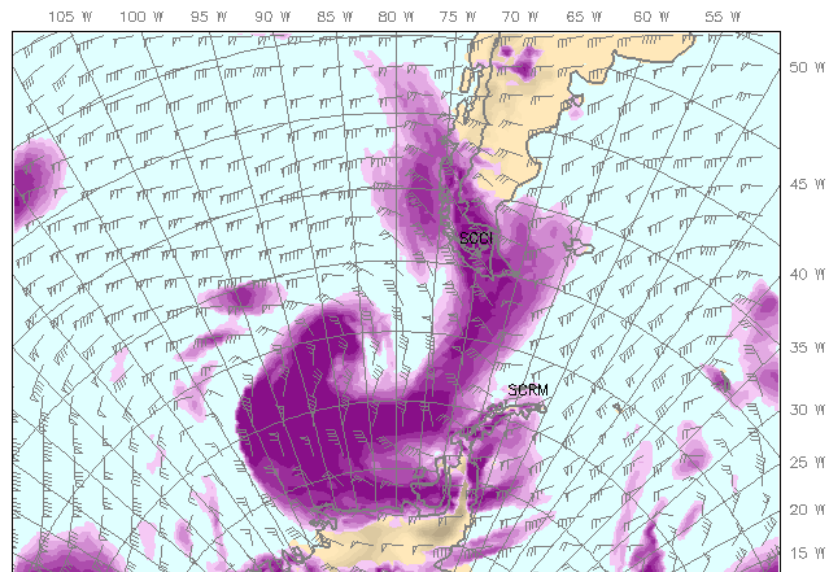
BARB VECTORS: FULL BARB = 10 kts
 10 20 30 40 50 60 70 80 90 100
 OUTPUT FROM METGRID V3.7 x = 180, y = 128, 30 km, 27 levels



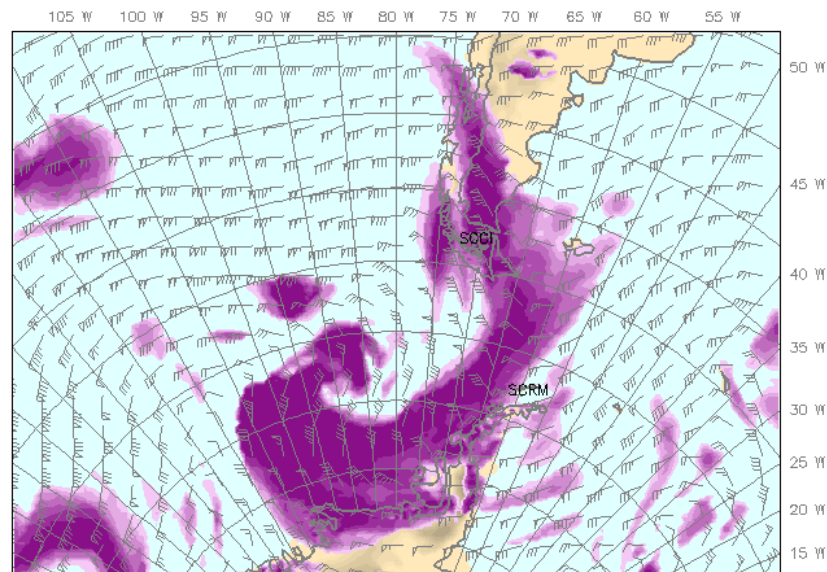
BARB VECTORS: FULL BARB = 10 kts
 10 20 30 40 50 60 70 80 90 100
 OUTPUT FROM METGRID V3.7 x = 180, y = 128, 30 km, 27 levels

The GFS middle-cloud fraction indicates likely clouds near the cyclone center, just ahead of the frontal zone along 65W and along the west coast of Chile. Clear areas are east of 65W and in the occlusion/dry slot entering 80W.

NCEP GFS 0.25 degree Init: 06 UTC Fri 13 Feb 15 Fcst: 30 h High cloud fraction Horizontal wind vectors
 NCAR/MMM Valid: 12 UTC Sat 14 Feb 15 (09 LST Sat 14 Feb 15) at pressure = 250 hPa sm= 1
 NCEP GFS 0.25 degree Init: 06 UTC Fri 13 Feb 15 Fcst: 33 h High cloud fraction Horizontal wind vectors
 NCAR/MMM Valid: 15 UTC Sat 14 Feb 15 (12 LST Sat 14 Feb 15) at pressure = 250 hPa sm= 1



BARB VECTORS: FULL BARB = 10 kts
 OUTPUT FROM METGRID V3.7 x = 180, y = 128, 30 km, 27 levels

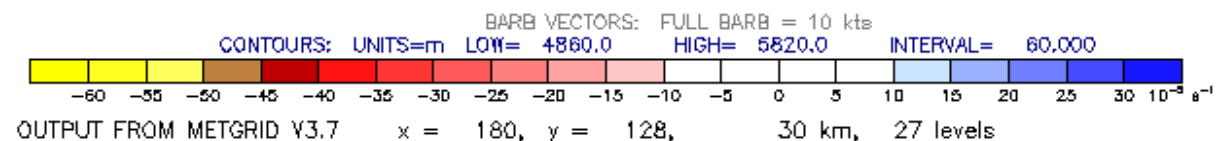
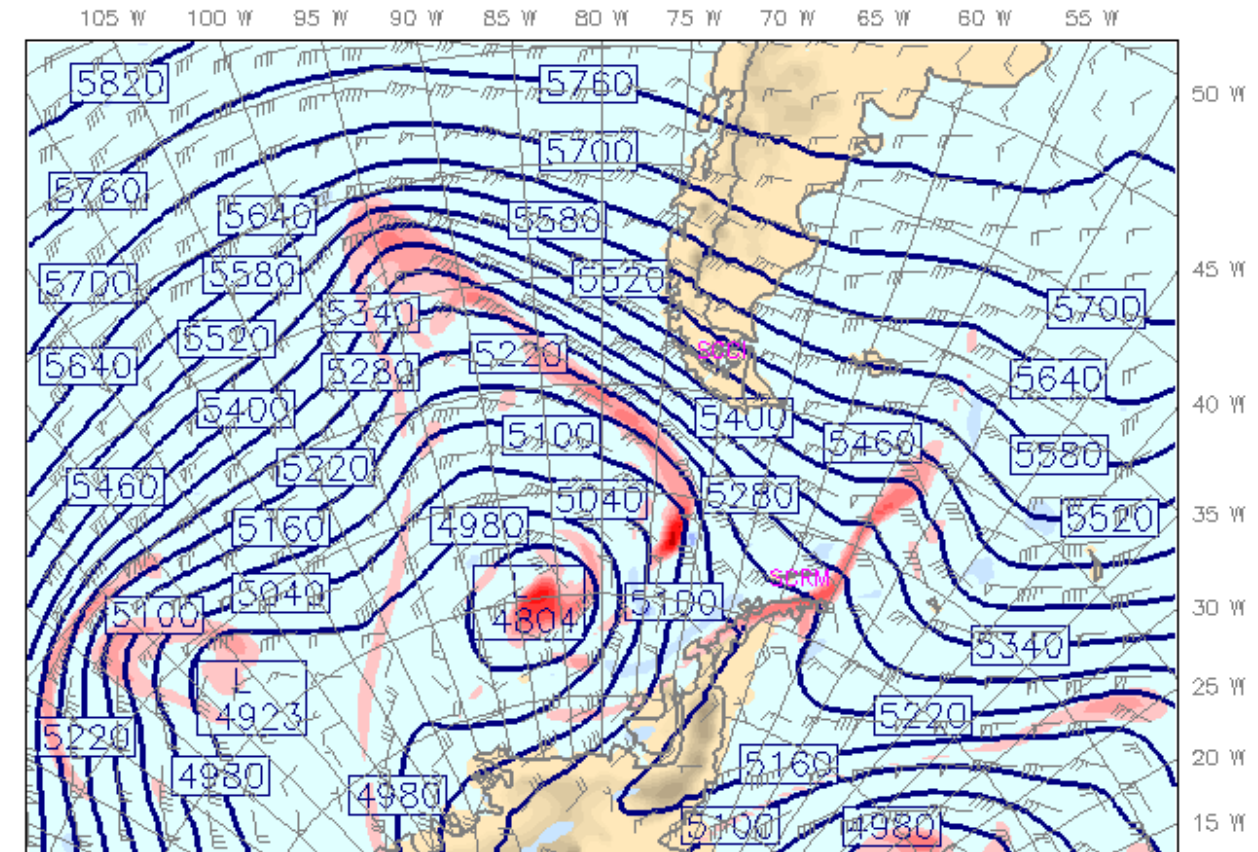


BARB VECTORS: FULL BARB = 10 kts
 OUTPUT FROM METGRID V3.7 x = 180, y = 128, 30 km, 27 levels

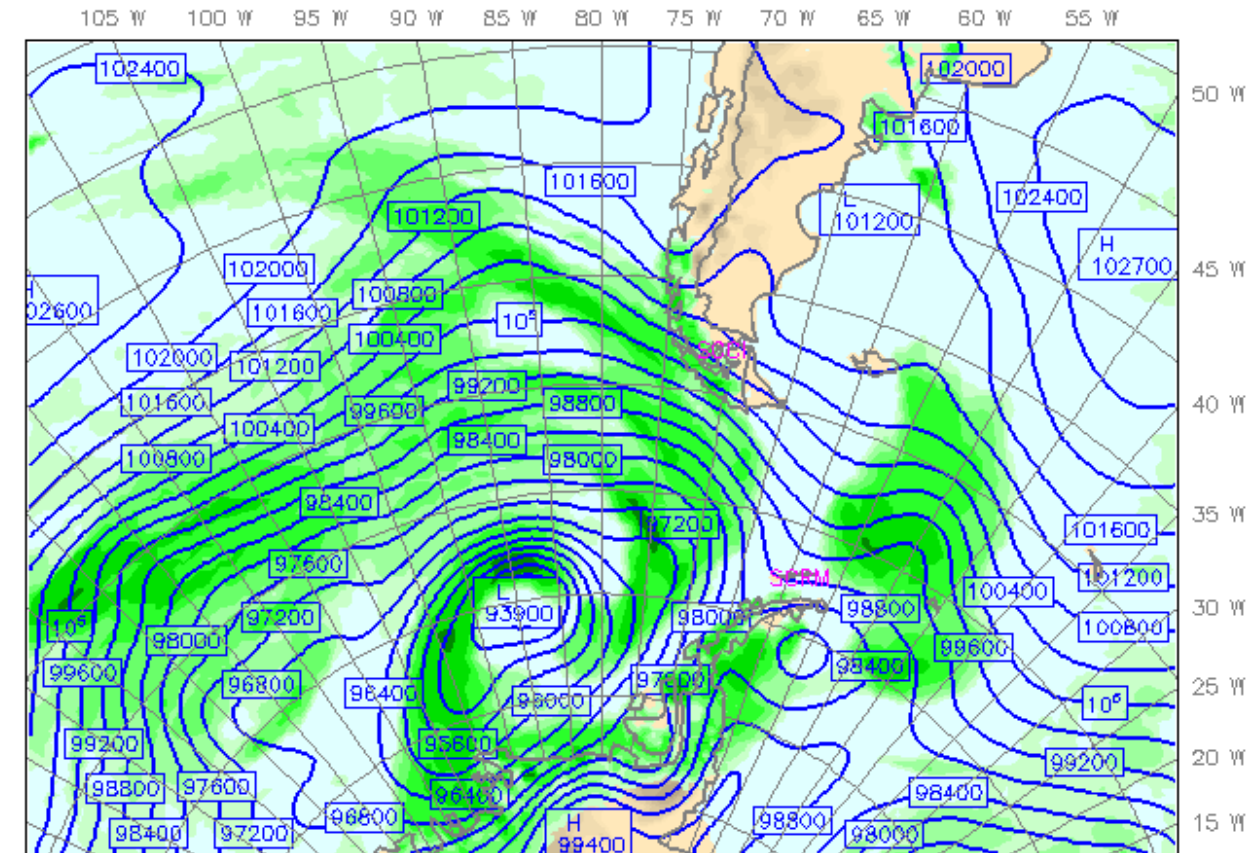
The GFS high-cloud fraction shows a very pretty occluded cyclone. The dry slot along 80W has few clouds. Meanwhile, over the AB, high clouds are indicated south of 55S.

NCEP GFS 0.25 degree NCAR/MMM Init: 06 UTC Fri 13 Feb 15
 Fcst: 54 h Valid: 12 UTC Sun 15 Feb 15 (09 LST Sun 15 Feb 15)
 Relative vorticity at pressure = 500 hPa
 Geopotential height at pressure = 500 hPa
 Horizontal wind vectors at pressure = 500 hPa sm = 1

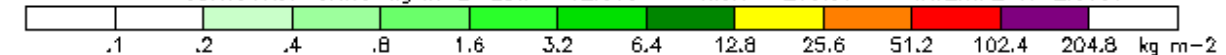
By Sunday morning the monster low over the western ocean has deepened and moved east with a trough along 93W moving towards Chile. Elsewhere to the east, flow is fast, but mainly zonal.



At the surface, the cyclone is centered at 65S90W with light precipitation over much of the ocean and west coast. No rain is predicted along 62W and north of the FI.



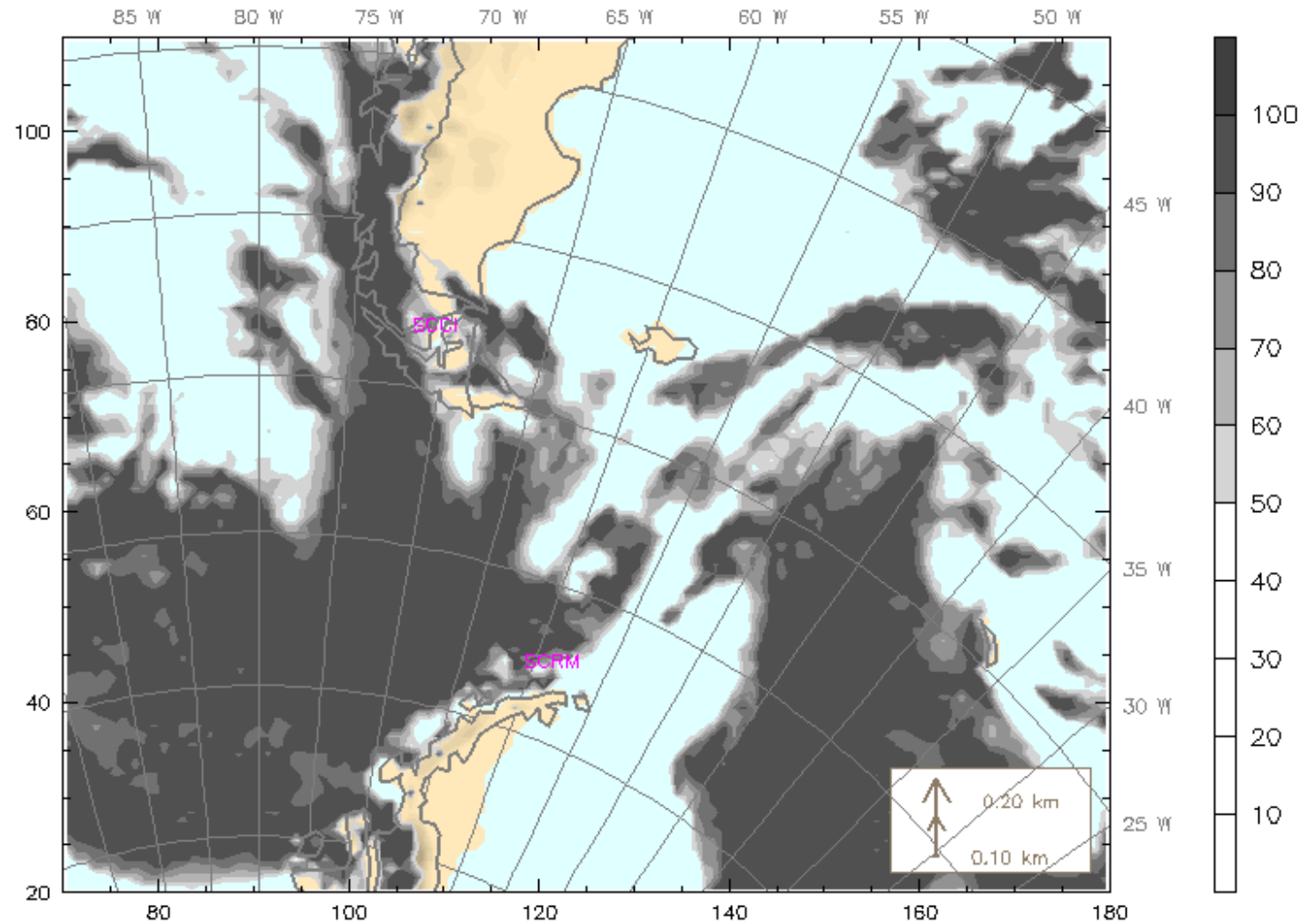
CONTOURS: UNITS=Pa LOW= 94000. HIGH= 0.10240E+06 INTERVAL= 400.00
 CONTOURS: UNITS=kg m⁻² LOW= 12.500 HIGH= 200.00 INTERVAL=X 2.0000



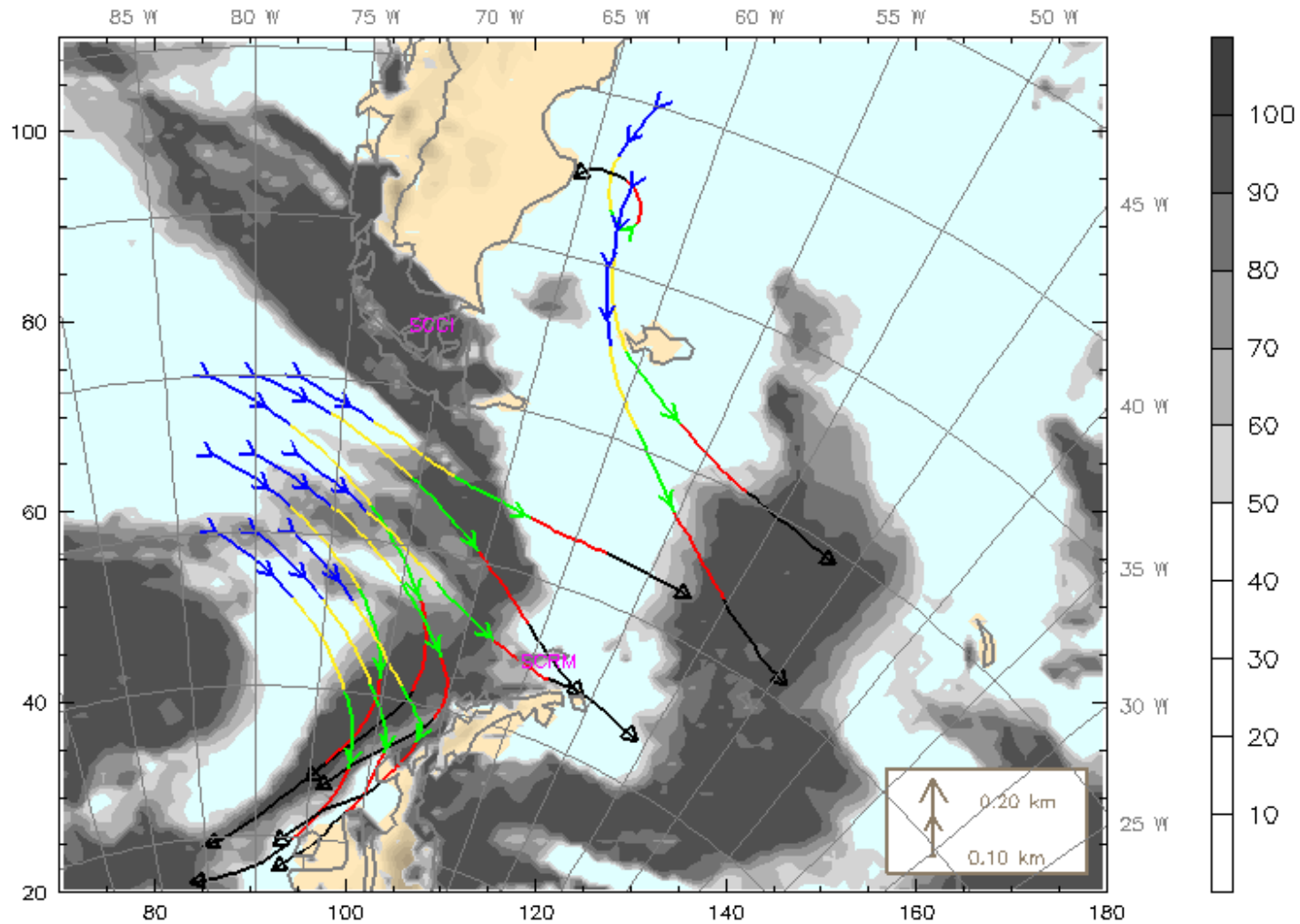
NCEP GFS 0.25 degree NCAR/MMM Init: 06 UTC Fri 13 Feb 15
Fcst: 33 h Valid: 15 UTC Sat 14 Feb 15 (12 LST Sat 14 Feb 15)
Low Cloud Fraction 500 ft Forward trajectories
Trajectories from hour 33.000 to 33.000

Lagrangian flight prospects:

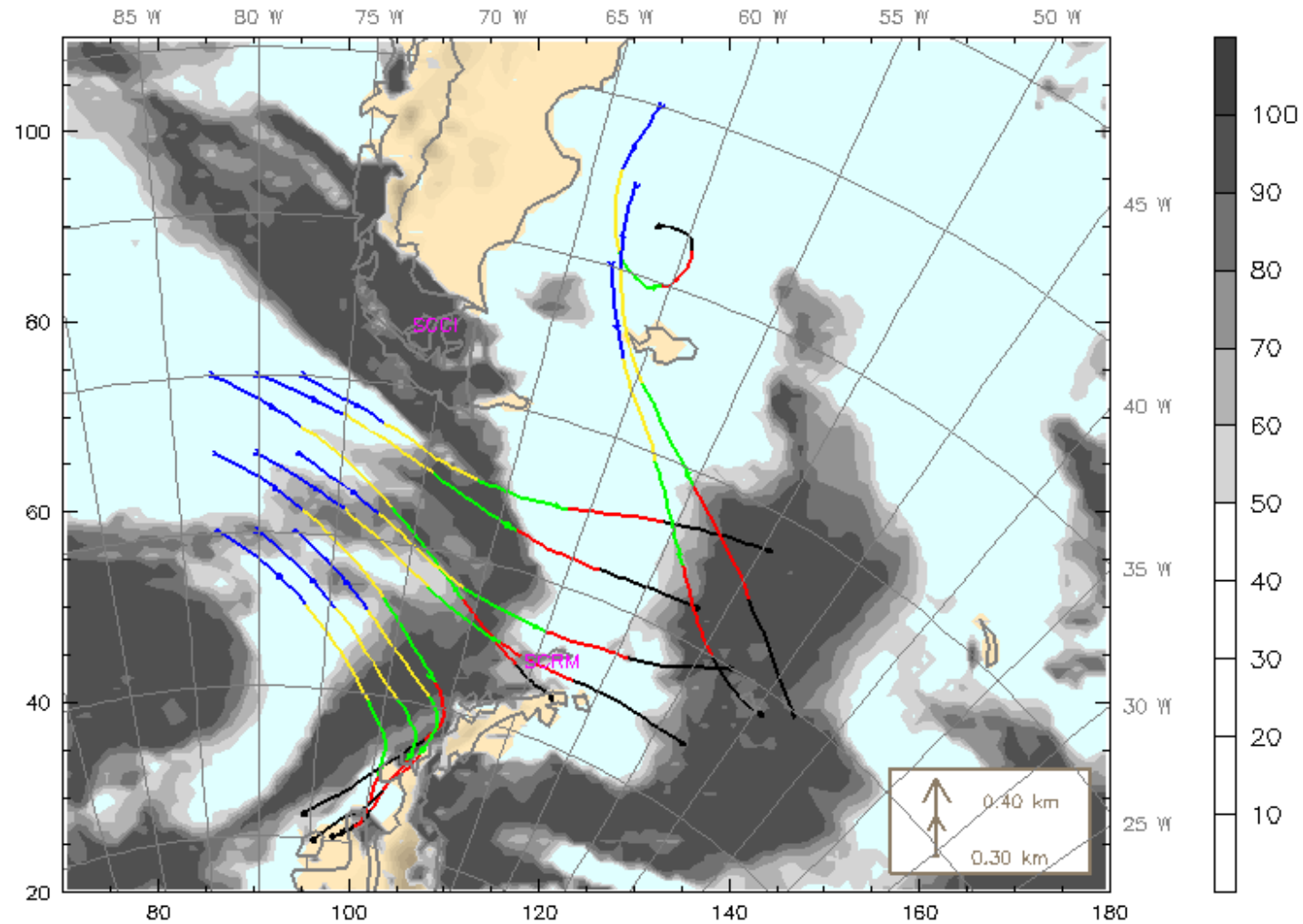
Likely clear/scattered cloud BL is found in the post-frontal airmass around 57S82W and in the AB. Assuming the G5 samples the region around noon, compute forward trajectories.



By Sunday afternoon, only a couple of trajectories are candidates for sampling based on the low cloud potential. The southern trajectories travel along the Antarctic coast toward the cyclone center. The AB trajectories head into a cloudy/rainy area. The remaining trajectories are in a clear zone near 57W.



The 1000' trajectories are similar, but travel farther. It would be necessary to takeoff earlier in order to intercept these parcels in the clear zone.



Sun



NCEP GFS 0.25 degree

NCAR/MMM

Init: 06 UTC Fri 13 Feb 15

Fcst: 33 h

Valid: 15 UTC Sat 14 Feb 15 (12 LST Sat 14 Feb 15)

Horizontal wind speed

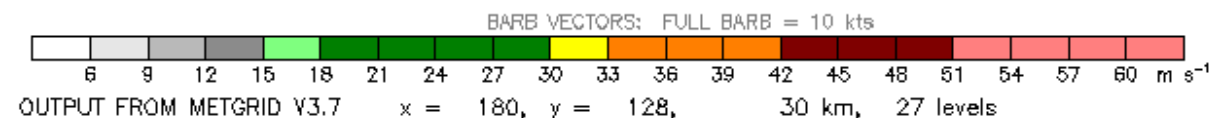
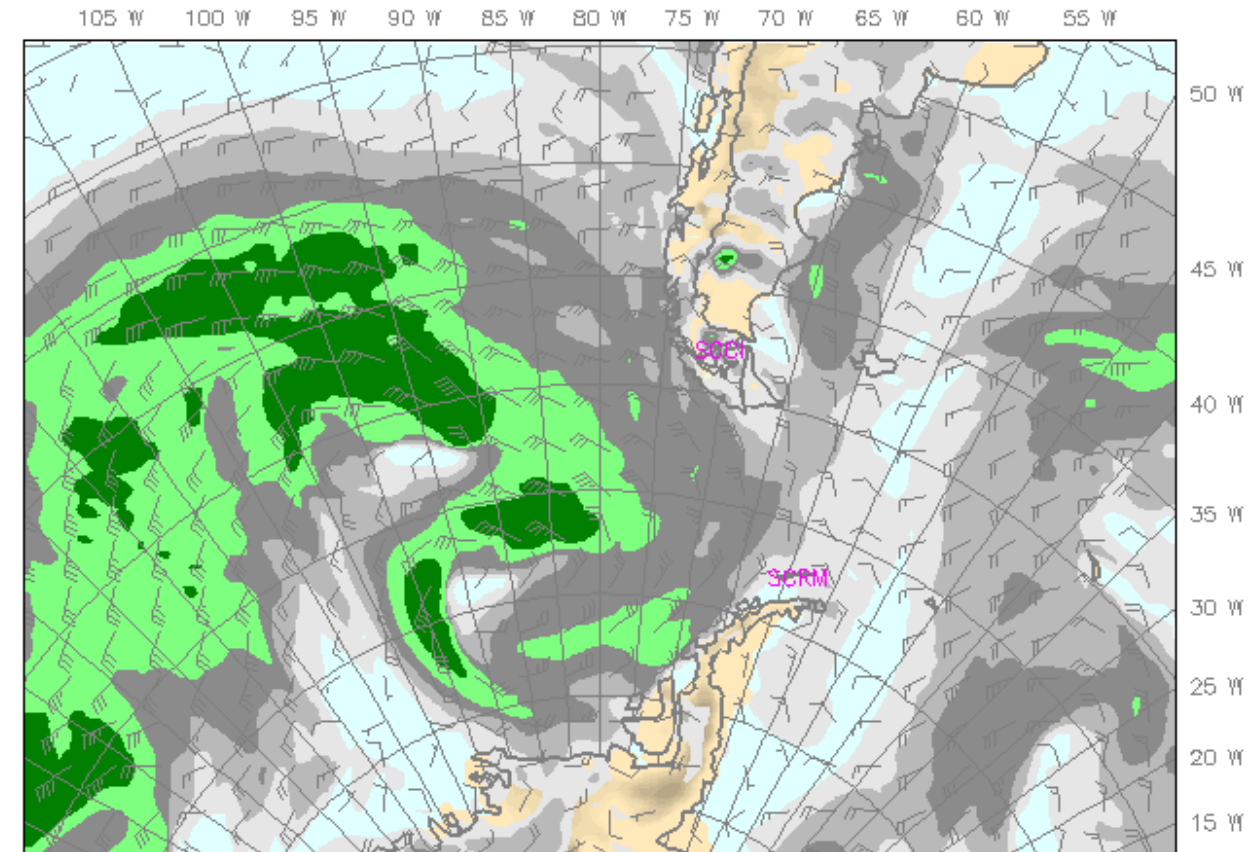
at k-index = 26

Horizontal wind vectors

at k-index = 26

sm= 1

BL winds in the western sample region are 30 to 35 kts (light green) and less than 15 kts in the AB.



Init: 06 UTC Fri 13 Feb 15

Valid: 18 UTC Sun 15 Feb 15 (15 LST Sun 15 Feb 15)

at k-index = 26

at k-index = 26

$$sm = 1$$

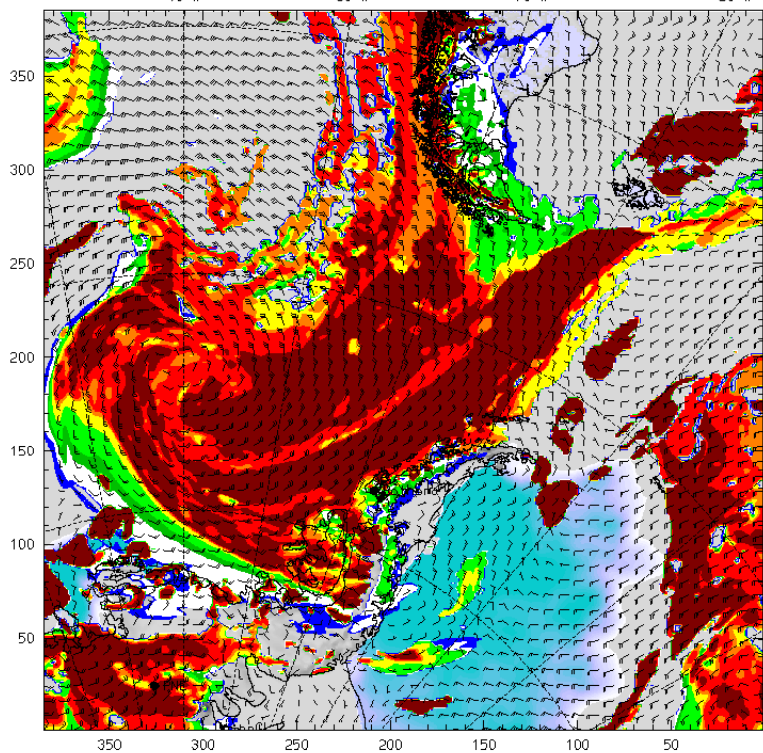
6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 m s⁻¹

OUTPUT FROM METGRID V3.7 x = 180, y = 128, 30 km, 27 levels

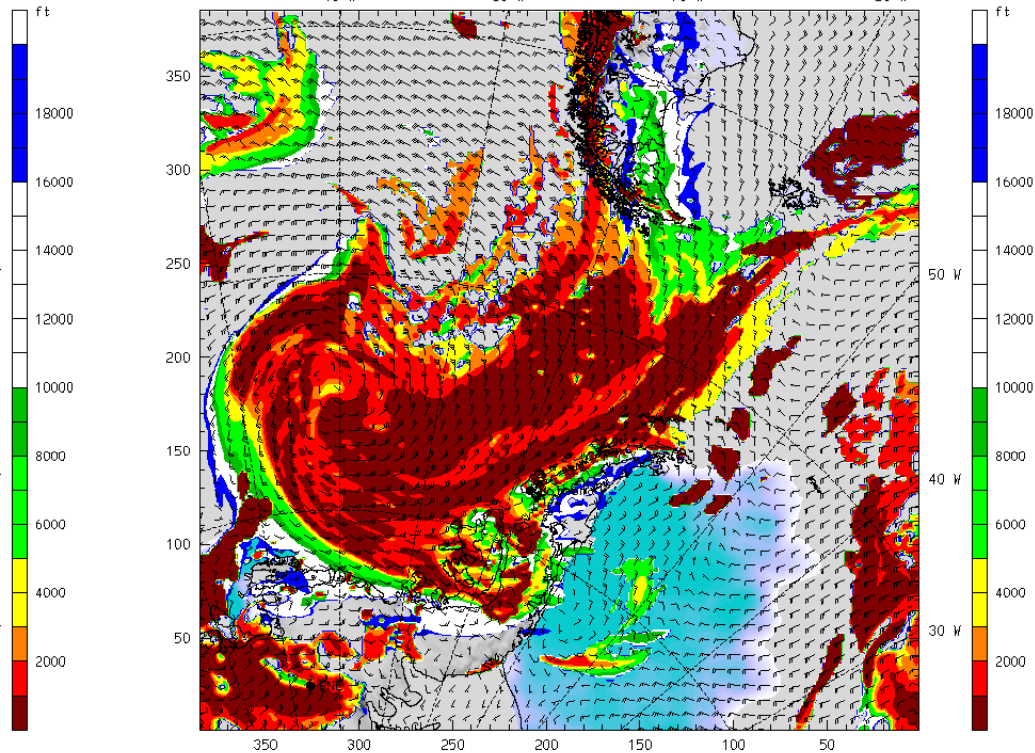
AMPS -- Palmer 9-km nest Init, 00 UTC Fri 13 Feb 15 AMPS -- Palmer 9-km nest Init, 00 UTC Fri 13 Feb 15
Fcst, 36 h Valid, 12 UTC Sat 14 Feb 15 Fcst, 39 h Valid, 15 UTC Sat 14 Feb 15

Cloud ceiling at k-index = 60
Horizontal wind vectors at k-index = 21
Relative humidity (w.r.t. ice) at k-index = 21

Cloud ceiling at k-index = 60
Horizontal wind vectors at k-index = 21
Relative humidity (w.r.t. ice) at k-index = 21



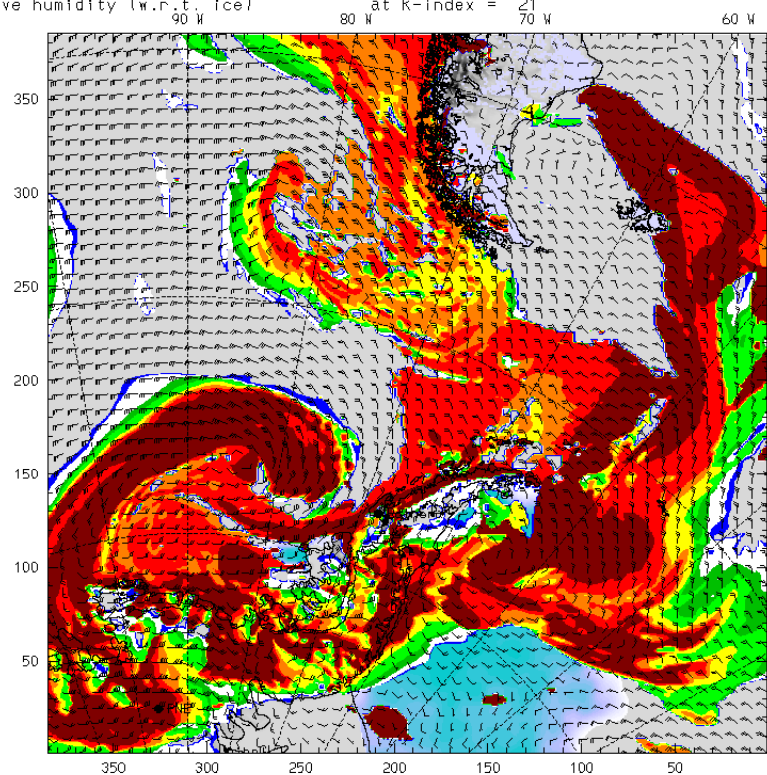
CONTOURS: UNITS=% LOW= 90.000 HIGH= 90.000 INTERVAL= 90.000
Model Info: V3.3.1 KF MYJ PBL WSM Scatss Noah LSM 9.0 km, 60 levels,
LW: RRTM SM: Goddard DIFF: simple KM: 2D Smagor



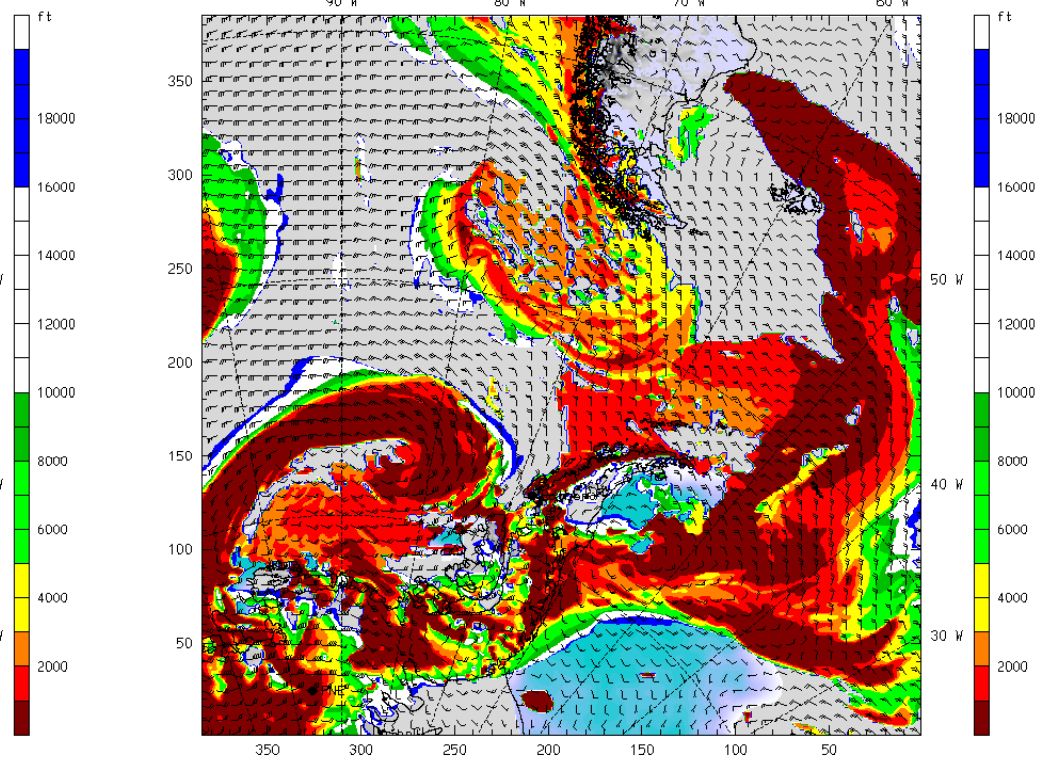
CONTOURS: UNITS=% LOW= 90.000 HIGH= 90.000 INTERVAL= 90.000
Model Info: V3.3.1 KF MYJ PBL WSM Scatss Noah LSM 9.0 km, 60 levels,
LW: RRTM SM: Goddard DIFF: simple KM: 2D Smagor

Like the GFS, AMPS shows clouds decreasing on Saturday along 80W. However, the clearest skies are farther west toward 55S 87W.

AMPS -- Palmer 9-km nest Init: 00 UTC Fri 13 Feb 15 AMPS -- Palmer 9-km nest Init: 00 UTC Fri 13 Feb 15
 Fcst: 60 h Valid: 12 UTC Sun 15 Feb 15 Fcst: 63 h Valid: 15 UTC Sun 15 Feb 15
 Cloud ceiling at k-index = 60 Cloud ceiling at k-index = 60
 Horizontal wind vectors at k-index = 21 Horizontal wind vectors at k-index = 21
 Relative humidity (w.r.t. ice) at k-index = 21 Relative humidity (w.r.t. ice) at k-index = 21



CONTOURS: UNITS=% LOW= 90.000 HIGH= 90.000 INTERVAL= 90.000
 Model Info: V3.3.1 KF MYJ PBL WSM 5class Noah LSM 9.0 km, 60 levels,
 LW: RRTM SH: Goddard DIFF: simple KM: 2D Smagor



CONTOURS: UNITS=% LOW= 90.000 HIGH= 90.000 INTERVAL= 90.000
 Model Info: V3.3.1 KF MYJ PBL WSM 5class Noah LSM 9.0 km, 60 levels,
 LW: RRTM SH: Goddard DIFF: simple KM: 2D Smagor

For Sunday, AMPS shows more clouds than the GFS, but does have a small area of clear skies near 62S 57W.

AMPS -- Palmer 9-km nest
Fcst. 39 h

PBL HEIGHT

Horizontal wind vectors

at pressure = 900 hPa

sm= 1

Init: 00 UTC Fri 13 Feb 15 AMPS -- Palmer 9-km nest
Valid: 15 UTC Sat 14 Feb 15

Fcst. 66 h

PBL HEIGHT

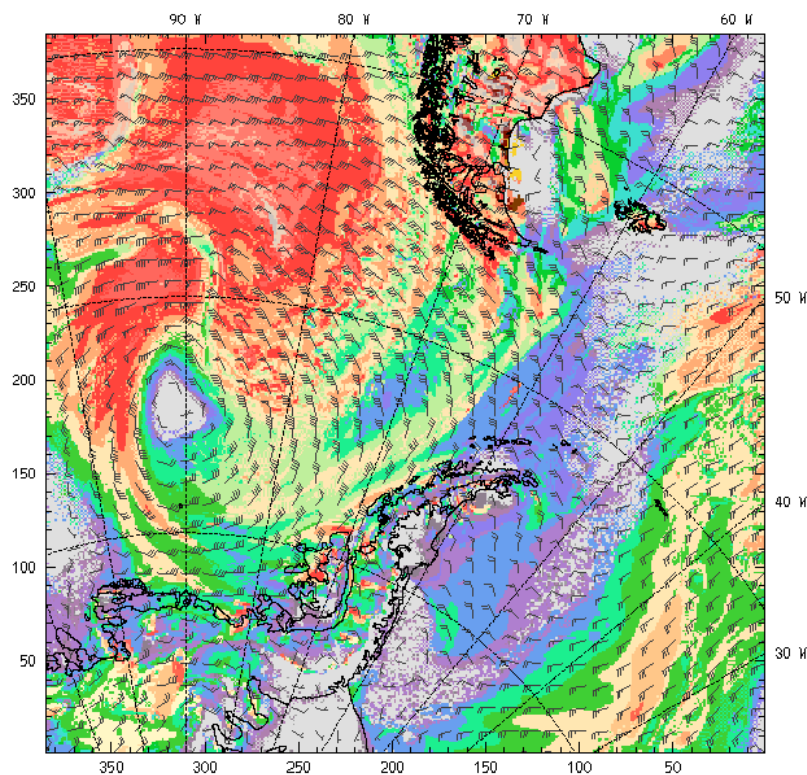
Horizontal wind vectors

at pressure = 900 hPa

sm= 1

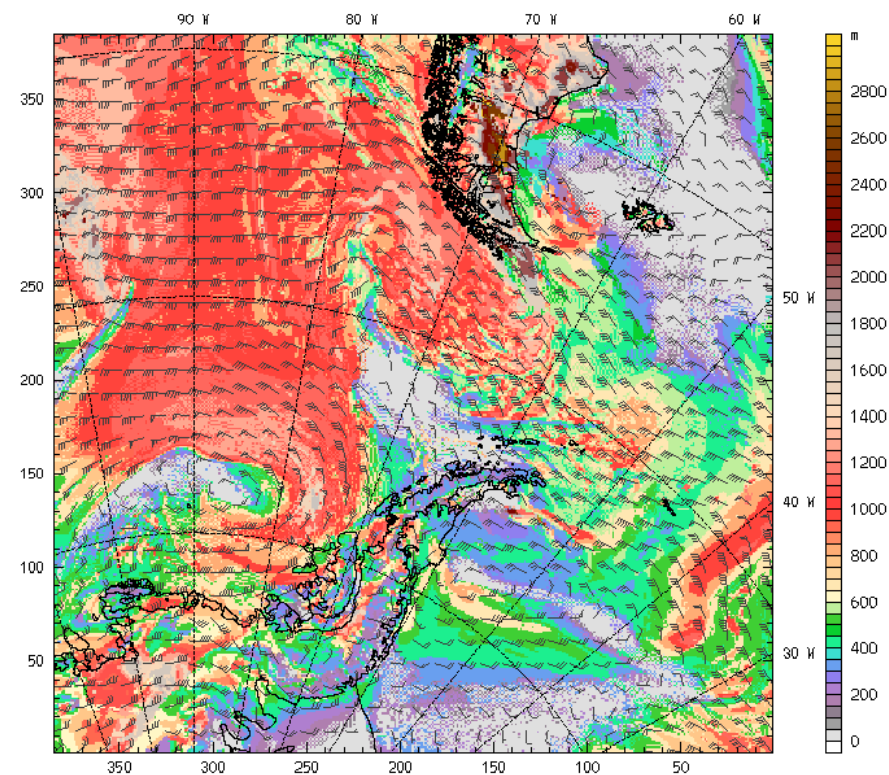
Init: 00 UTC Fri 13 Feb 15
Valid: 18 UTC Sun 15 Feb 15

Fcst. 66 h



Model Info: V3.3.1 KF MYJ PBL WSM 5class Noah LSM 9.0 km, 60 levels,
LW, RRTM SH, Goddard DIFF, simple KM, 2D Smagor

Saturday



Model Info: V3.3.1 KF MYJ PBL WSM 5class Noah LSM 9.0 km, 60 levels,
LW, RRTM SH, Goddard DIFF, simple KM, 2D Smagor

Sunday

AMPS forecast PBL height. On Saturday PBL heights in excess of 1000m are found west of 78W where there is substantial heating from the ocean surface. On Sunday afternoon, the PBL heights through the DP toward 50W extend up to 1000m in places. Low PBL heights are expected near the FI.

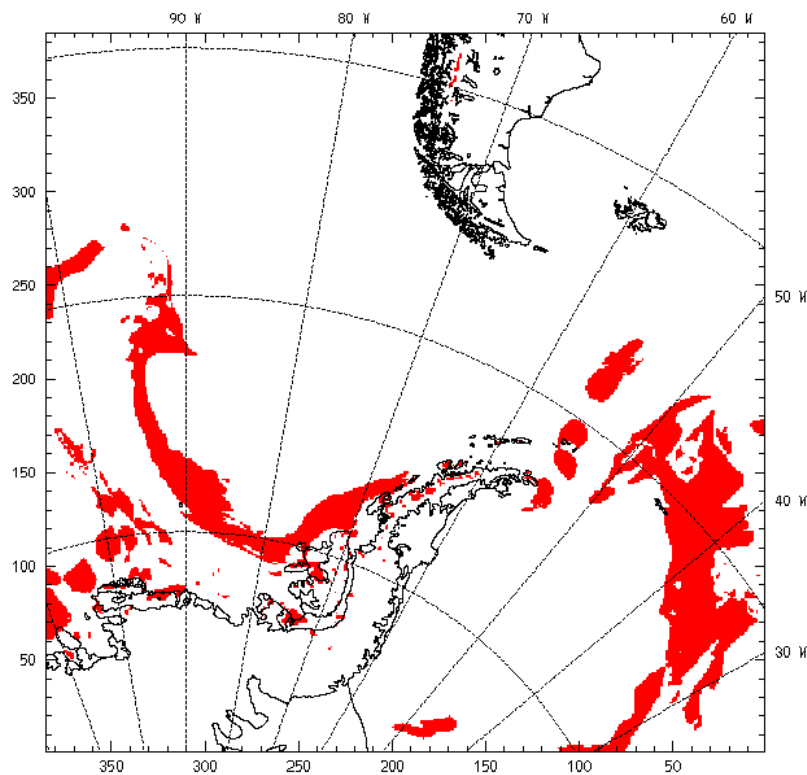
AMPS -- Palmer 9-km nest
Fcst. 36 h
Supercooled liquid water

Avg. k-index = 60 to 54

Init: 00 UTC Fri 13 Feb 15 AMPS -- Palmer 9-km nest
Valid: 12 UTC Sat 14 Feb 15 Fcst. 66 h
Supercooled liquid water

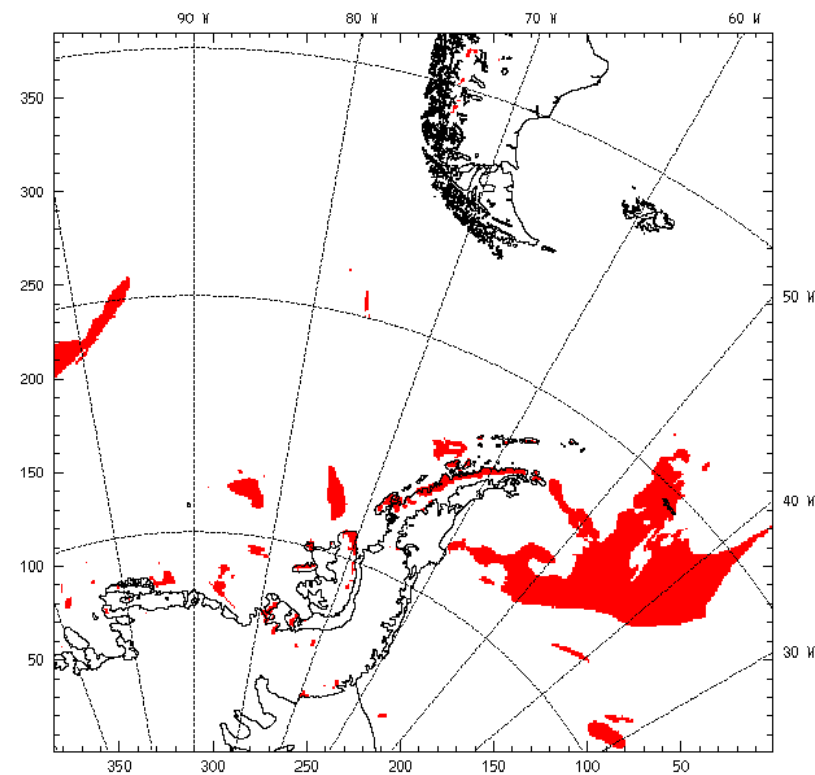
Avg. k-index = 60 to 54

Init: 00 UTC Fri 13 Feb 15
Valid: 18 UTC Sun 15 Feb 15



Model Info: V3.3.1 KF MYJ PBL WSM 5class Noah LSM 9.0 km, 60 levels,
LW, RRTM SH, Goddard DIFF, simple KM, 2D Smagor

Saturday



Model Info: V3.3.1 KF MYJ PBL WSM 5class Noah LSM 9.0 km, 60 levels,
LW, RRTM SH, Goddard DIFF, simple KM, 2D Smagor

Sunday

Experimental AMPS plot of supercooled liquid water below 1000 feet MSL. Both plots indicate little threat in the possible sampling regions. (Either temperatures are too warm or there are ice clouds). Some caution may be needed if sampling is needed east of 50W.

Punta Arenas: lat/lon = (-53.0000, -70.8500)

Grid Point (310, 159) lat/lon = (-53.0328, -70.8775)

AMPS WRF Forecast Cycle:

2015-02-13 / 00 Z

AMPS 9km

Rain likely Saturday morning, ending midday as it becomes windy.

Wind chill of -5C before takeoff on Sunday. Light rain developing during the afternoon.

Model Grid ΔX:
9.000 km

Temperature (°C)

RH (% WRT liq. wat.)

Cloud/Precip Outline

Wind Barbs (kts) (true)

RH > 70%
RH > 80%
RH > 90%

Local Weekday
Wind at 10 m

Wind Spd (kts)

Wind Barbs (true)

Wind Barbs (grid)

Precip (mm)

liq. equiv.

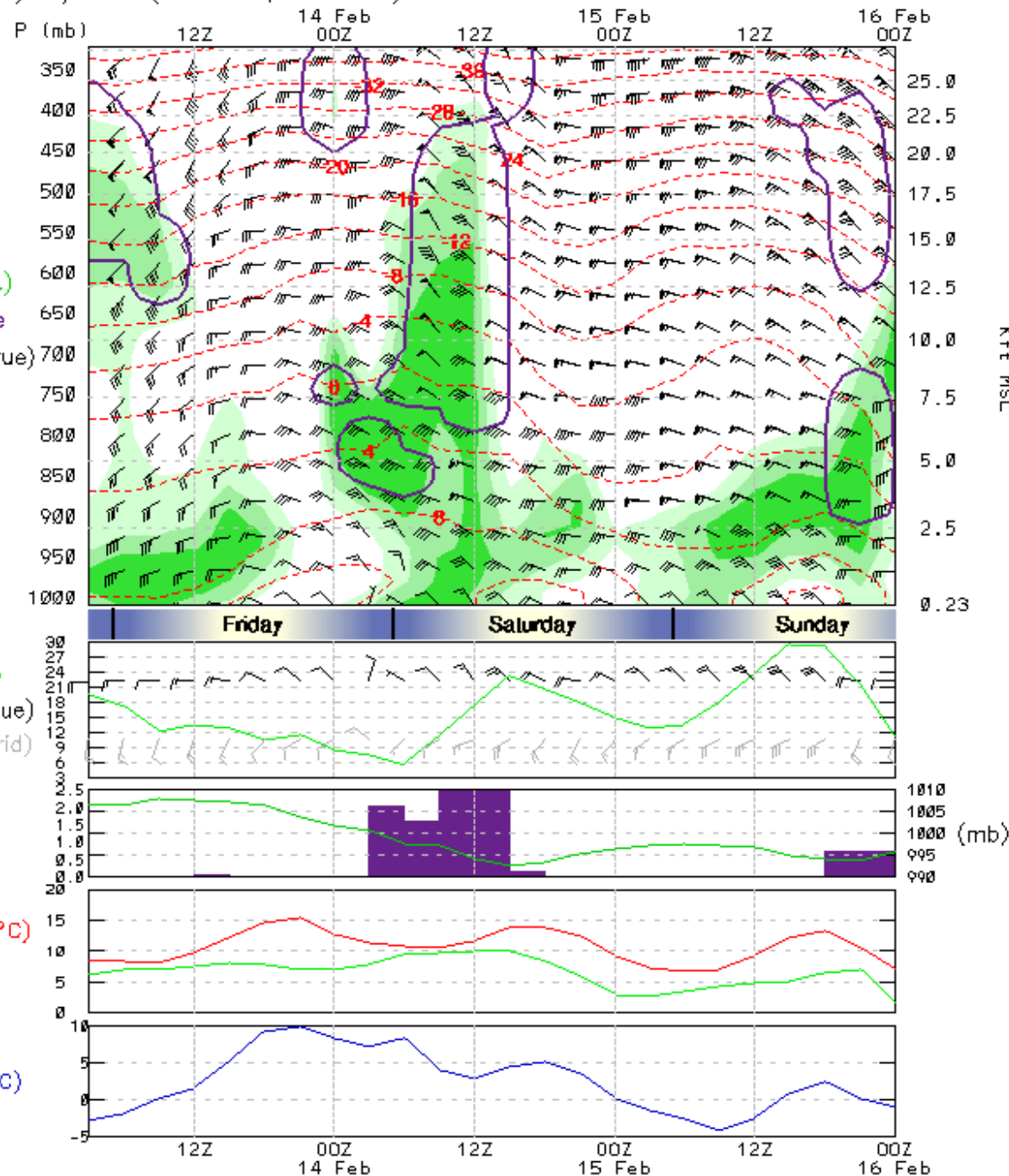
3-hr accum

Pressure (mb)

Temperature (°C)

Dewpoint (°C)

Wind Chill T (°C)



Eduardo Frei: lat/lon = (-62.1900, -58.9900)

Grid Point (167, 134) lat/lon = (-62.2022, -58.9427)

AMPS WRF Forecast Cycle:

2015-02-13 / 00 Z

AMPS 9km

Weather at SCRM

Light rain possibly
mixed with snow on
both Saturday and
Sunday. Icing
possible below 5 kft
on Sunday.

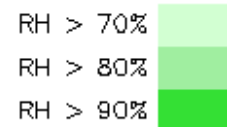
Model Grid ΔX :
9.000 km

Temperature ($^{\circ}\text{C}$)

RH ($\%$, WRT liq. wat.)

Cloud/Precip Outline

Wind Barbs (kts) (true)



Local Weekday
Wind at 10 m

Wind Spd (kts)

Wind Barbs (true)

Wind Barbs (grid)

Precip (mm)

liq. equiv.

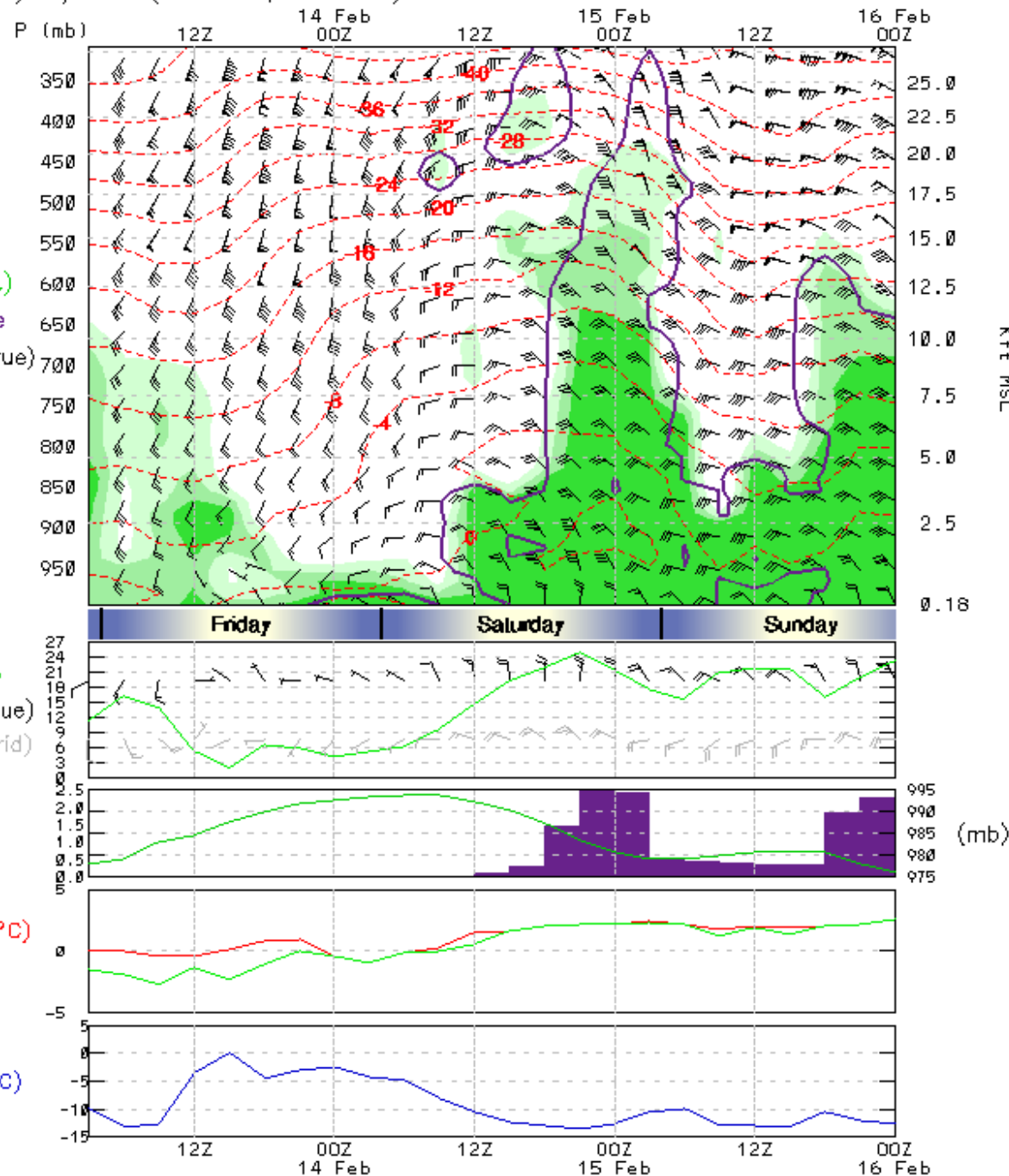
3-hr accum

Pressure (mb)

Temperature ($^{\circ}\text{C}$)

Dewpoint ($^{\circ}\text{C}$)

Wind Chill T ($^{\circ}\text{C}$)



Summary:

- The parade of fronts continues.
- An upstream 'clear' area develops during the day on Saturday that could be sampled.
- Clear skies should exist in the AB north of the FI.
- Forecast trajectories and cloud forecasts indicate a Lagrangian flight is possible.
- A flight to the Palmer coast is not recommended due to the strong cyclone in that vicinity.
- Takeoff weather on Saturday will be wet. Landing weather should be windy, but fair. Pre-takeoff weather on Sunday will be windy and cold with light rain developing by landing time.