

Email from [redacted] (Bureau Training Centre)
0917 local time continued

I expect the odd low-topped supercell today along convergence boundaries in the insolation-rich parts of the deep moist boundary layers. I shall wait for the 23z/5 soundings to ponder on the low-level rotation potential in some of these storms.

Cheers, [redacted]

Response: email from [redacted] 10.18am

While the rest of us go about our daily business of a Saturday, it gives one a feeling of comfort and security to know that [redacted] is busy pondering the 23z soundings to determine whether threshold sources of rotation will be present.

It is a little disturbing, however, to know that [redacted] will be out orienteering in central Victoria instead of following his true role of monitoring statistics and records.... Hopefully, he has a GPS-Iphone-thingy that alerts him out in the bush whenever meteorological record falls.



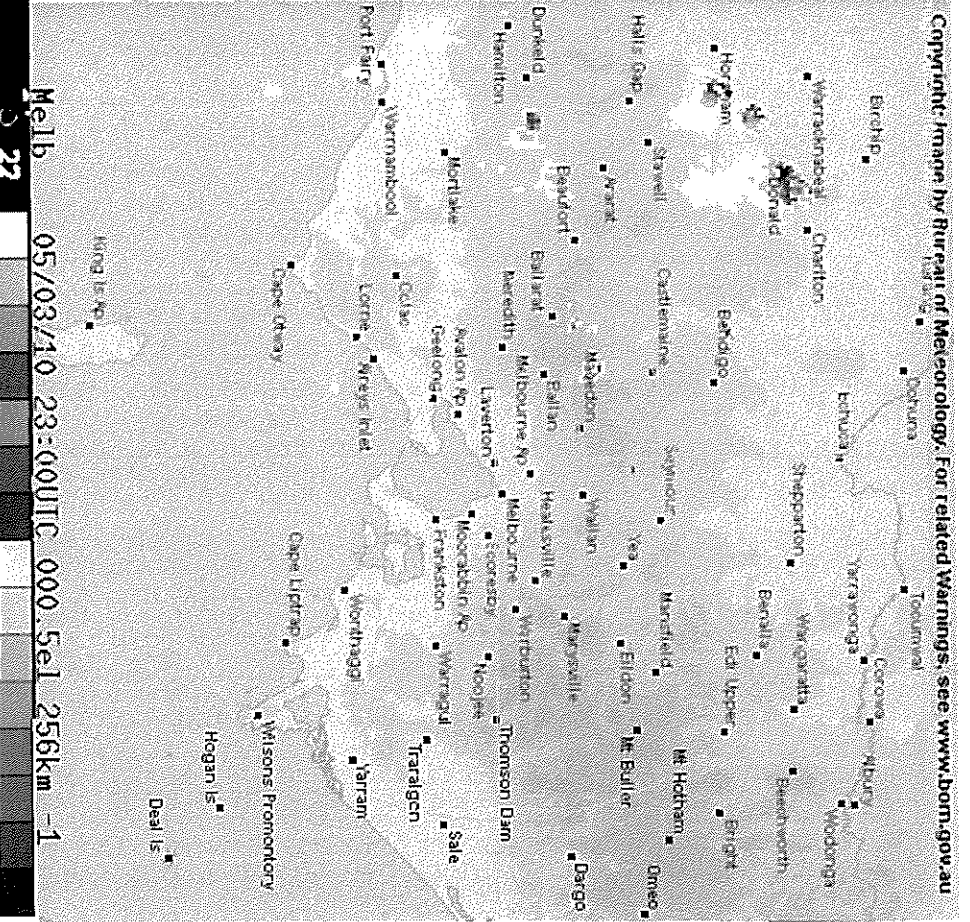
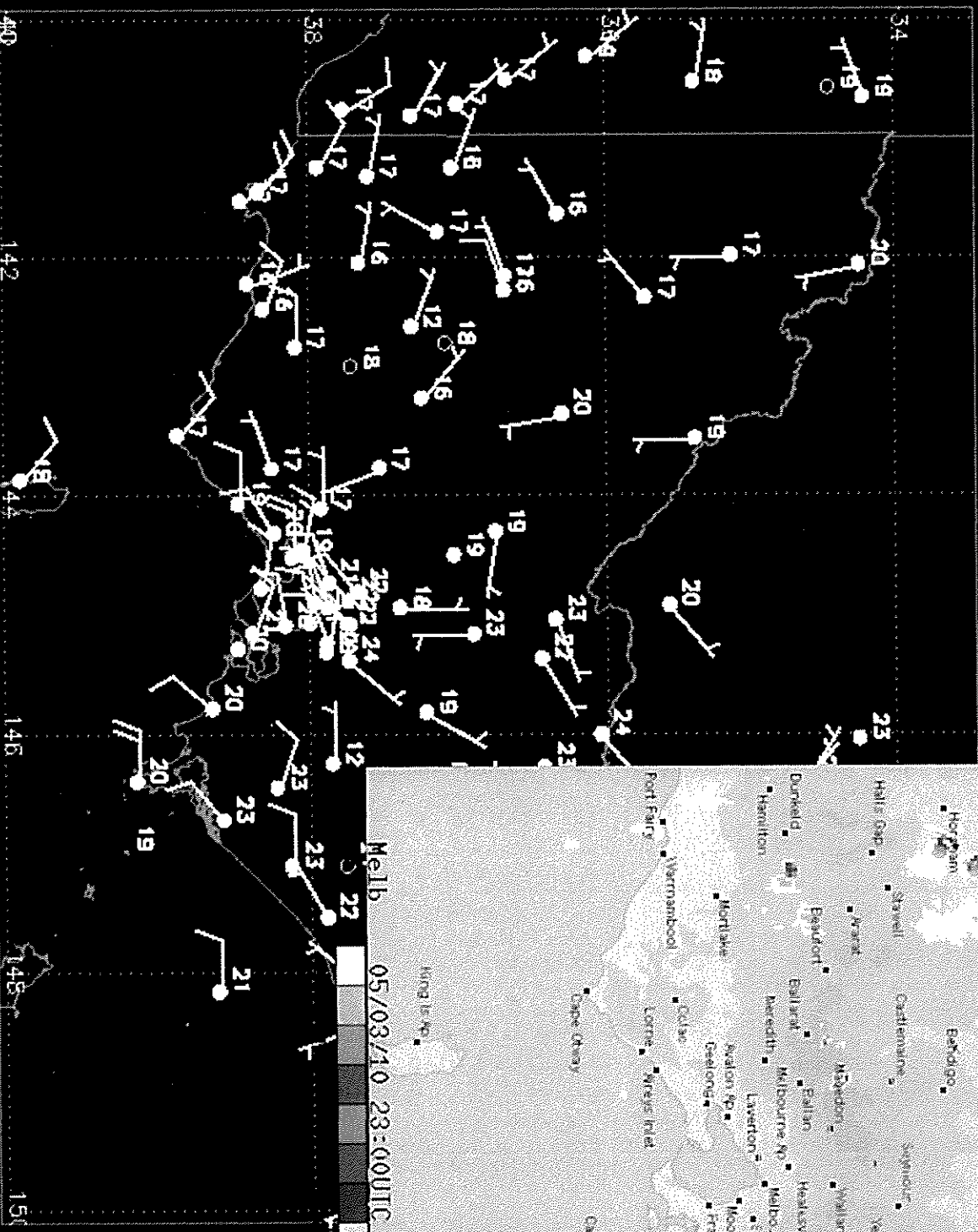
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Australian Government Bureau of Meteorology



2300 UTC
(10am)

Automatic Weather
Temp Valid:

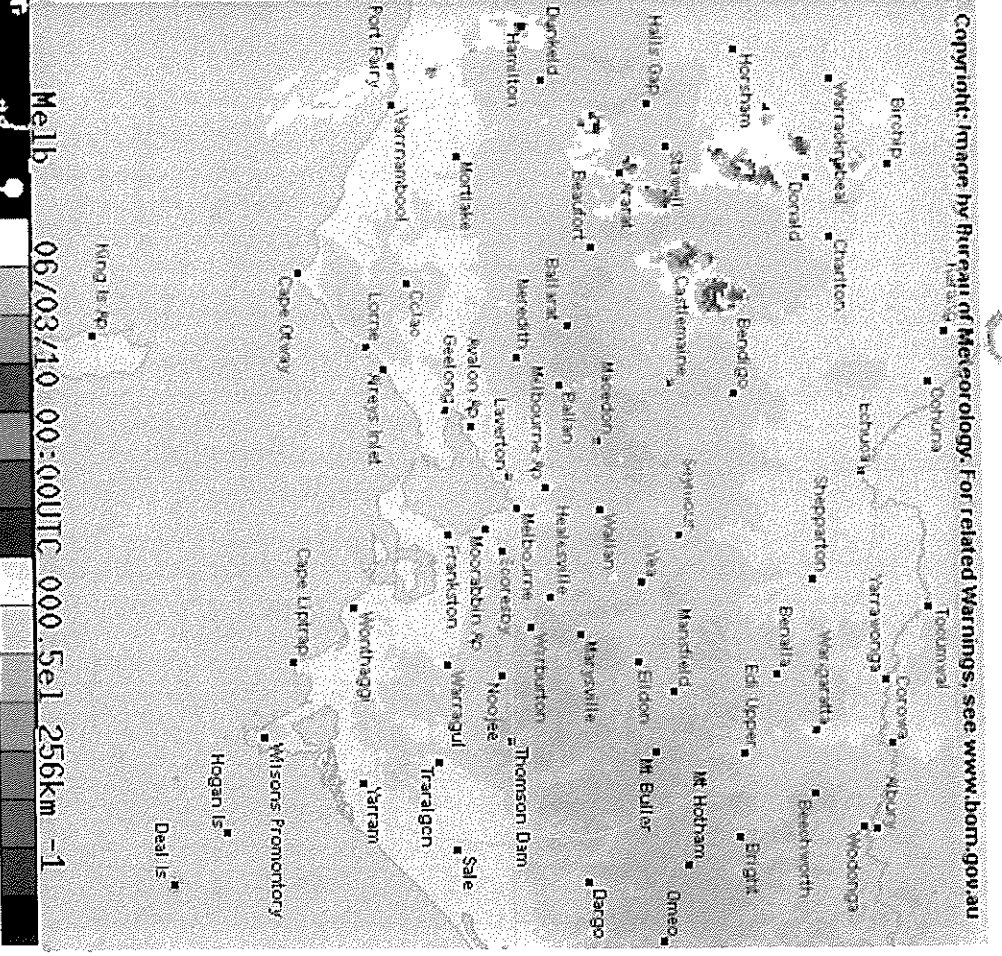
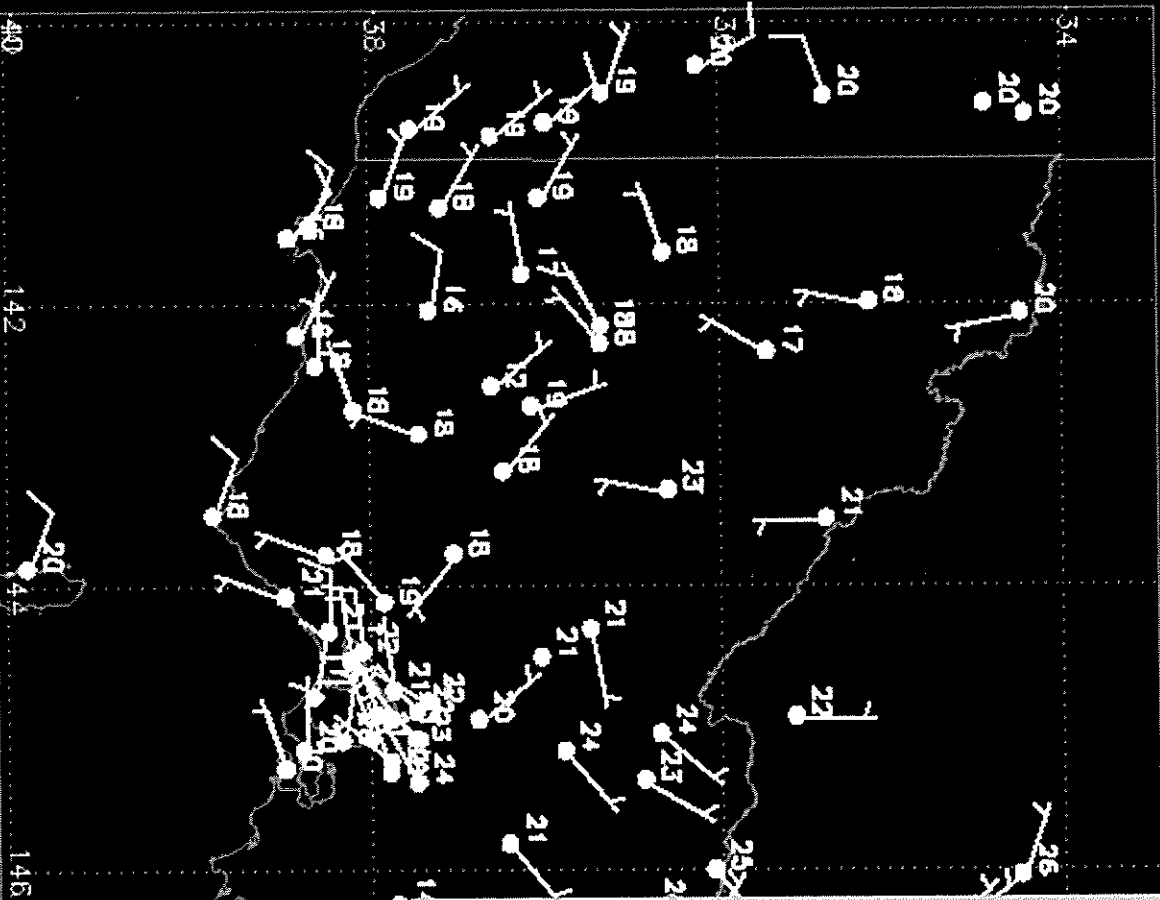


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0000 UTC

Parameter: Wind + Temp

Automatic Weather
Valid:



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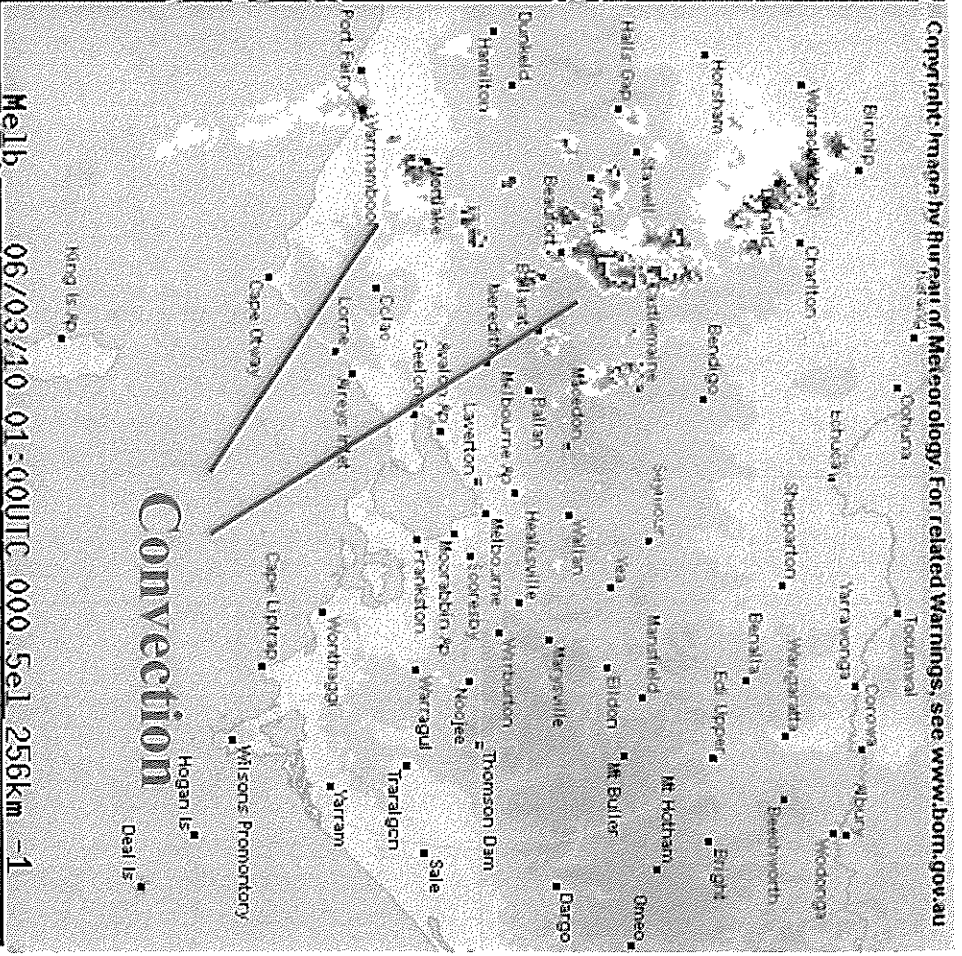
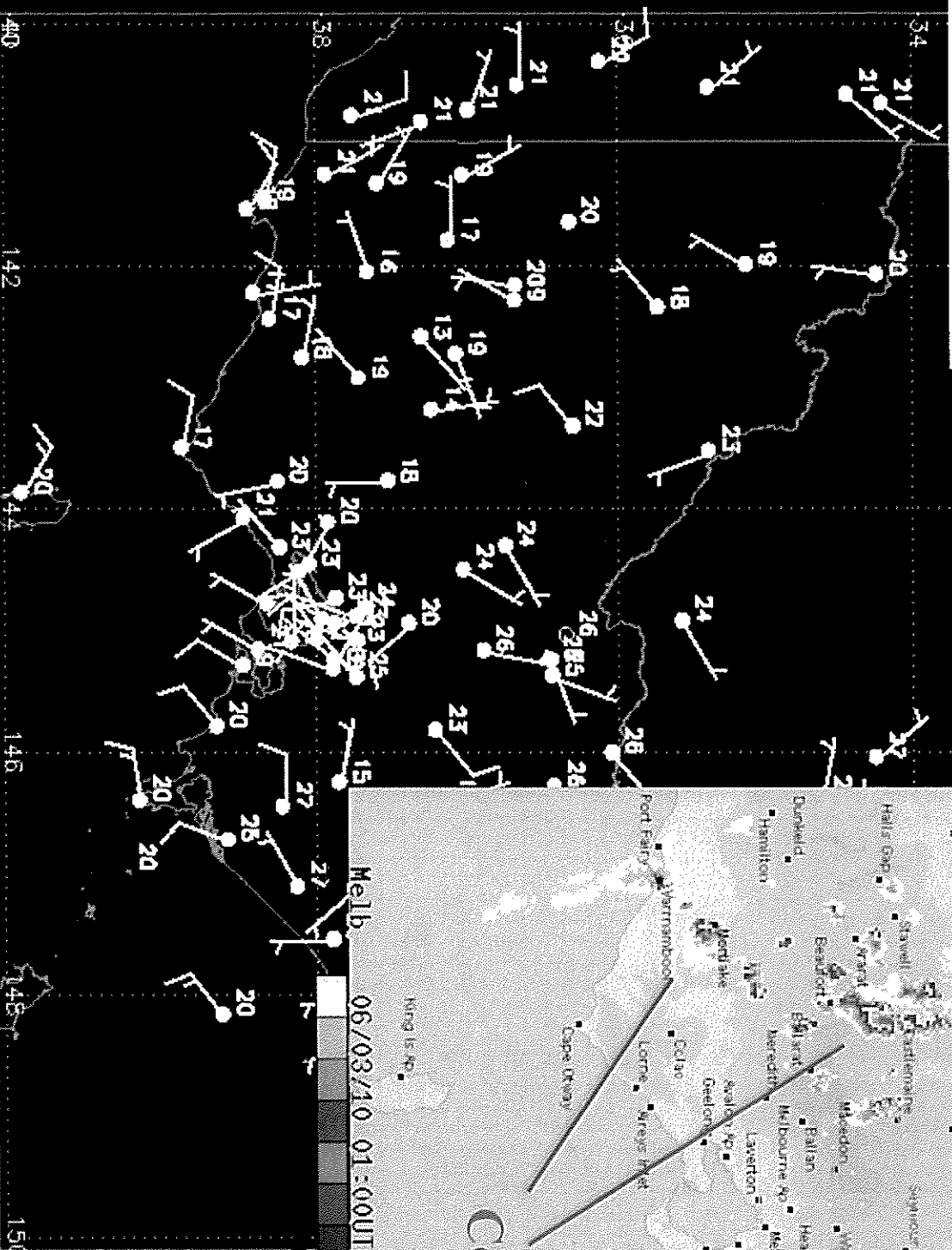
Heavy



Australian Government
Bureau of Meteorology

0100 UTC
 Midday Local
 time

Automatic Weather
 Temp Valid:



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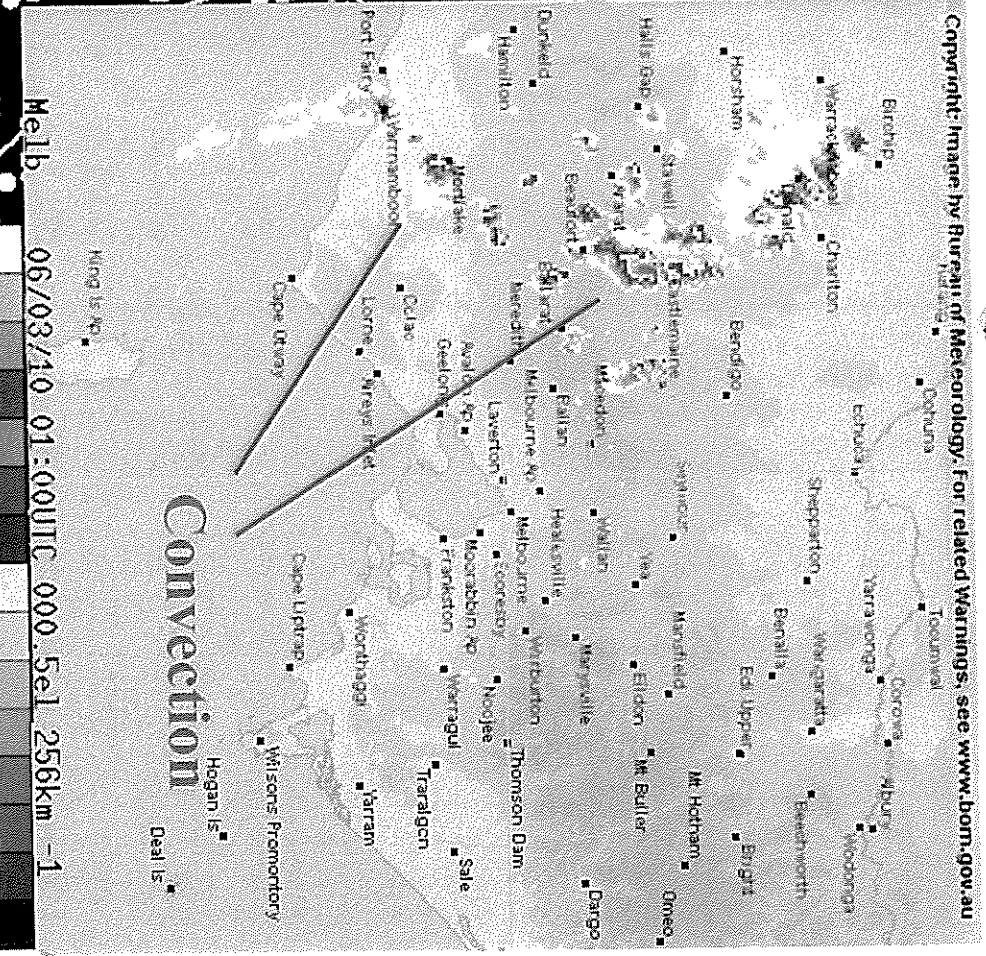
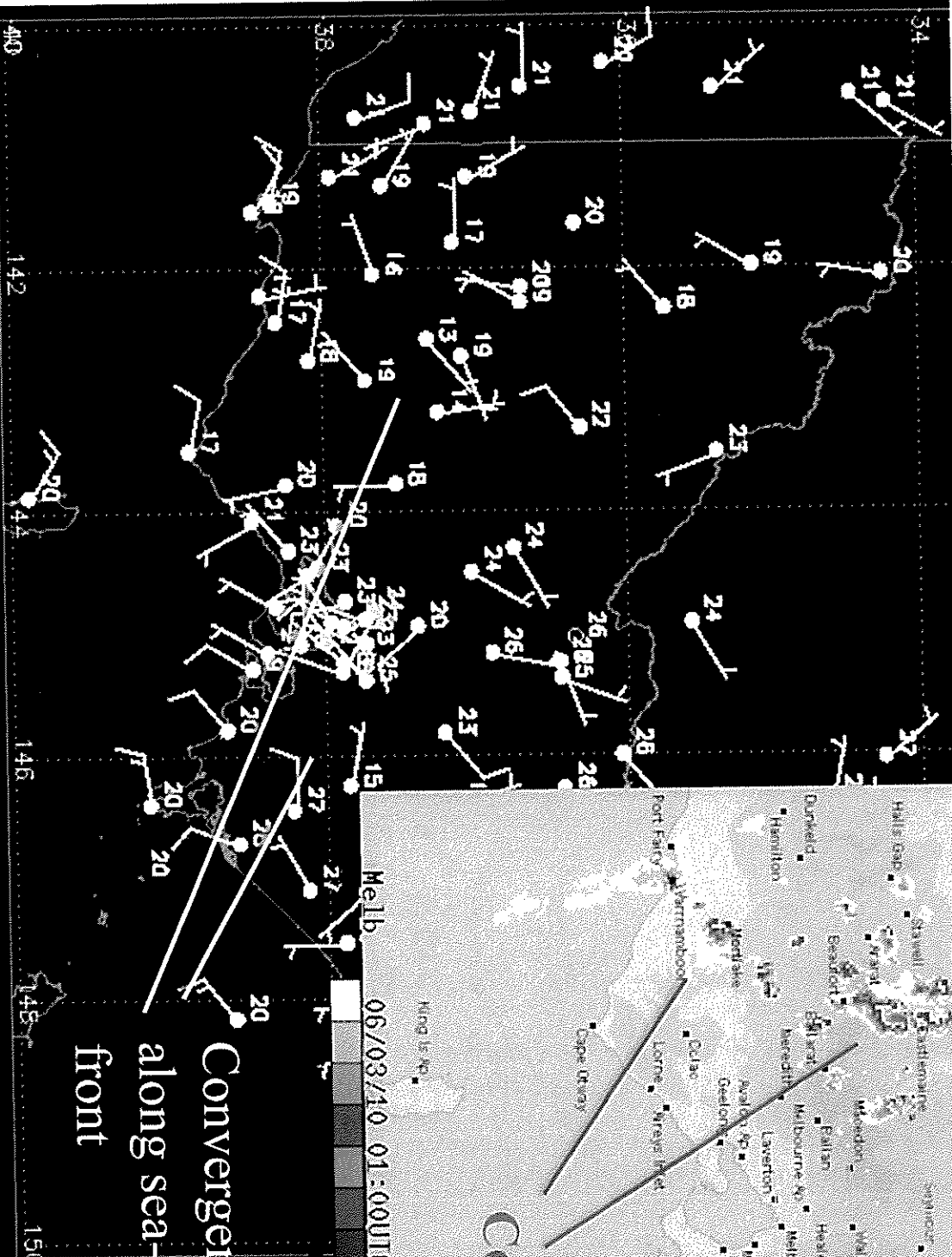
Heavy



Australian Government
 Bureau of Meteorology

0100 UTC
 Midday Local
 time

Automatic Weather
 Temp Valid:



Convergence
 along sea-breeze
 front

Convection

Heavy

06/03/10 01:00UTC 000.5el 256km -1

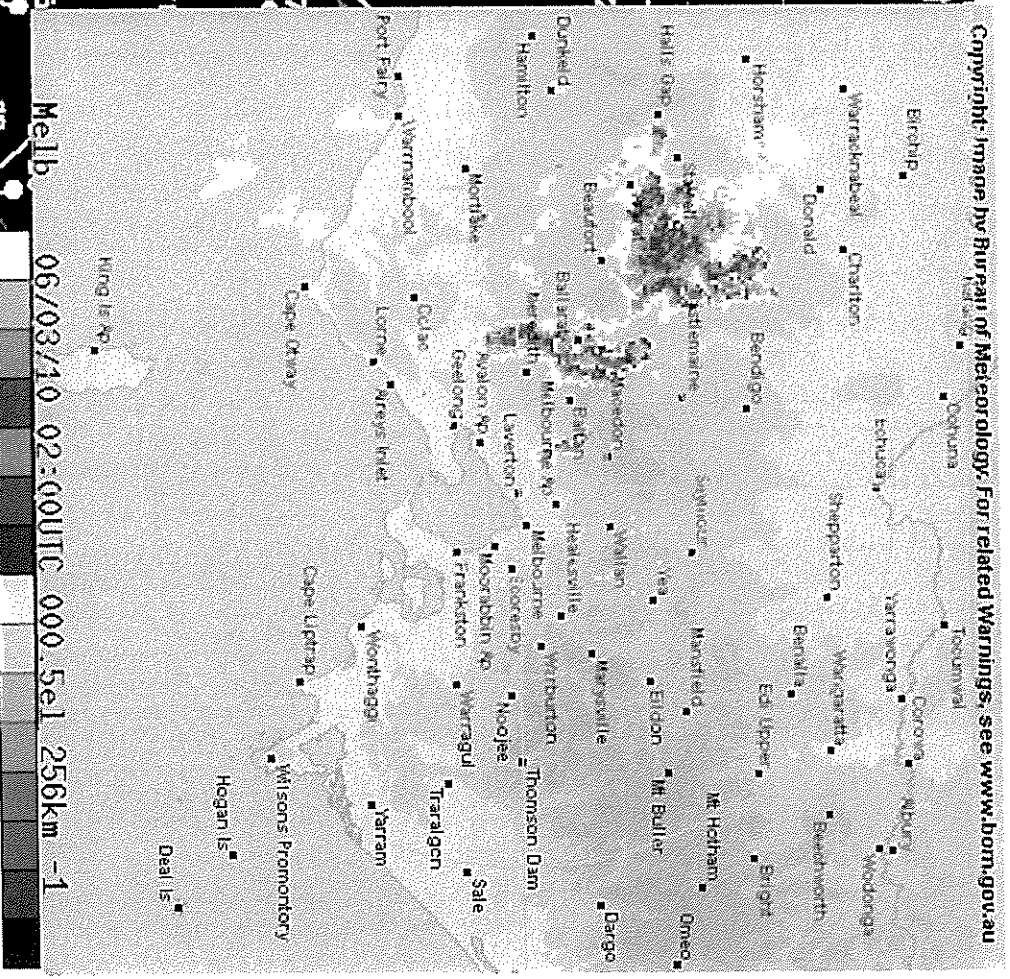
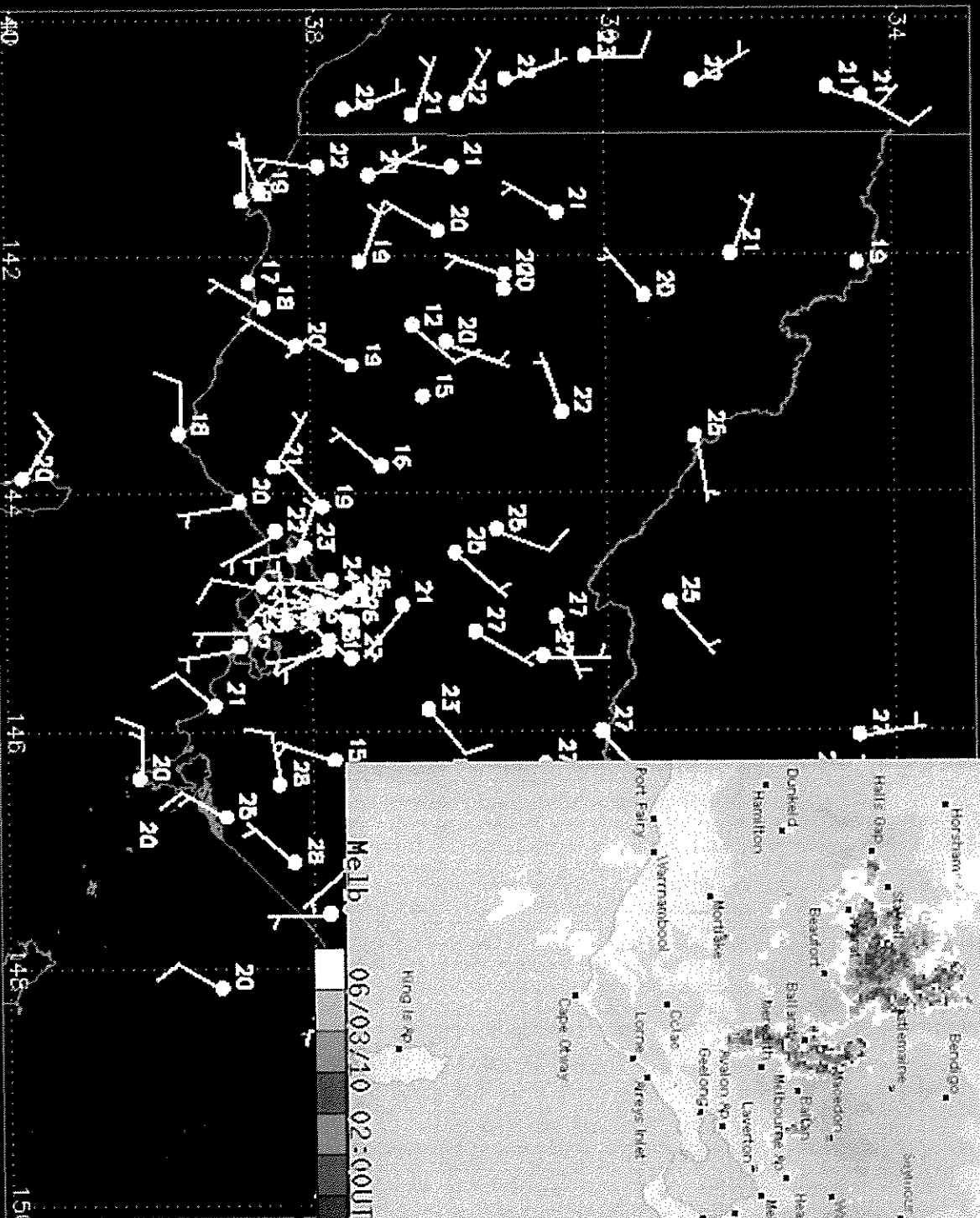
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0200 UTC
(1pm)

Automatic Weather
Temp Valid:



Melb 06/03/10 02:00UTC 000.5e1 256km -1

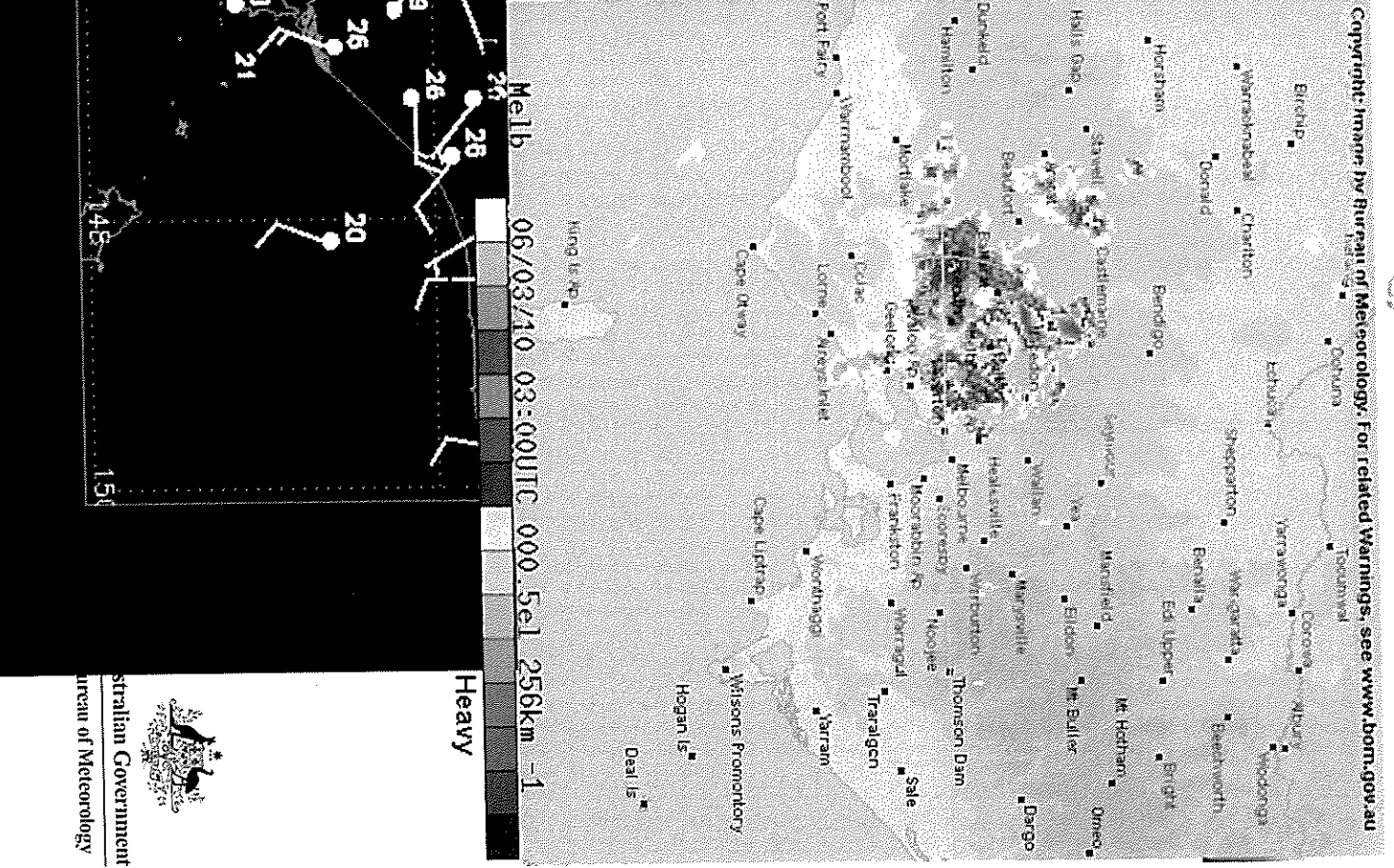
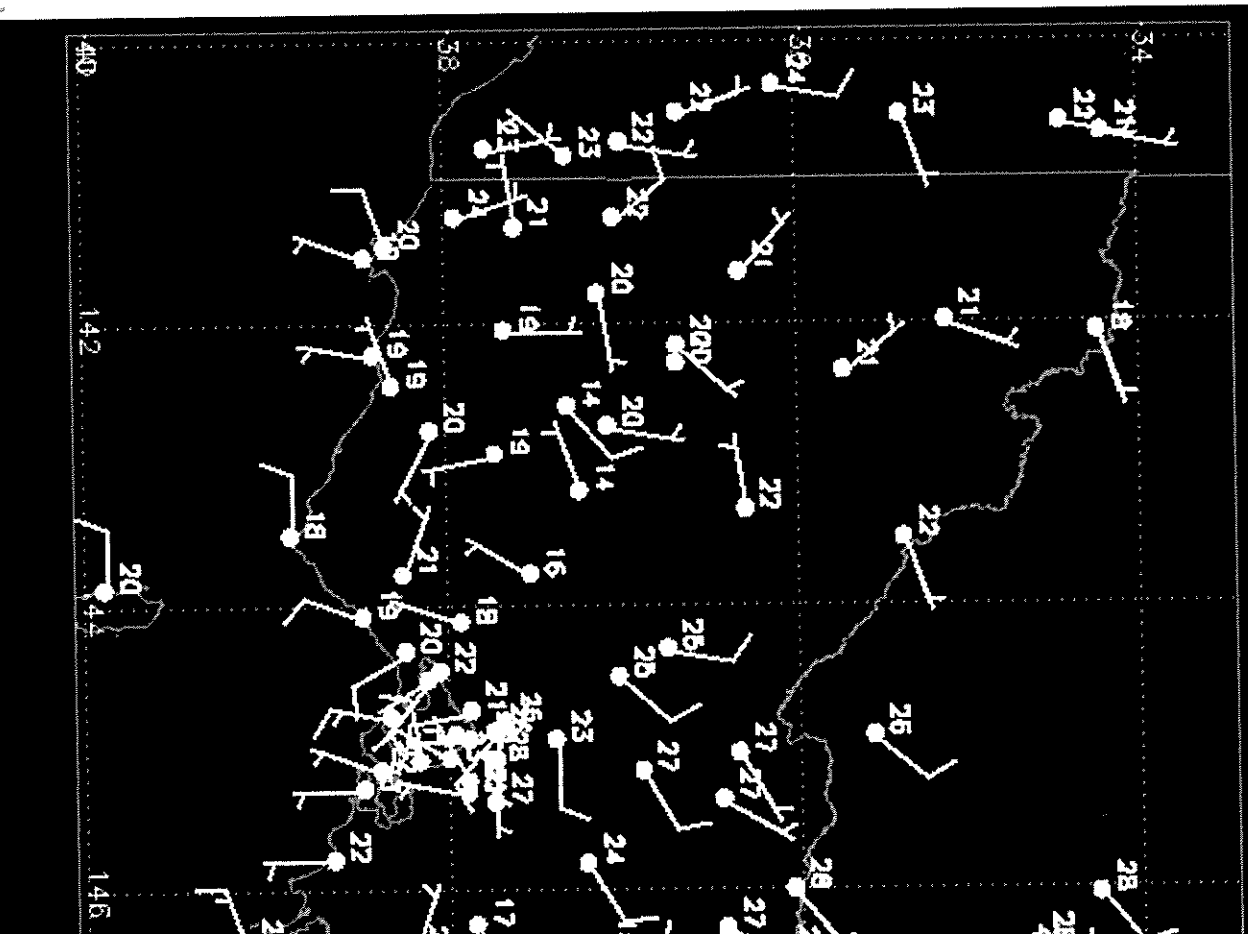
Heavy



Australian Government
Bureau of Meteorology

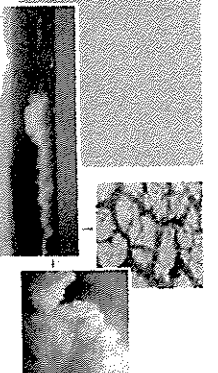
0300 UTC
2 pm local time

Automatic Weather
Temp Valid:

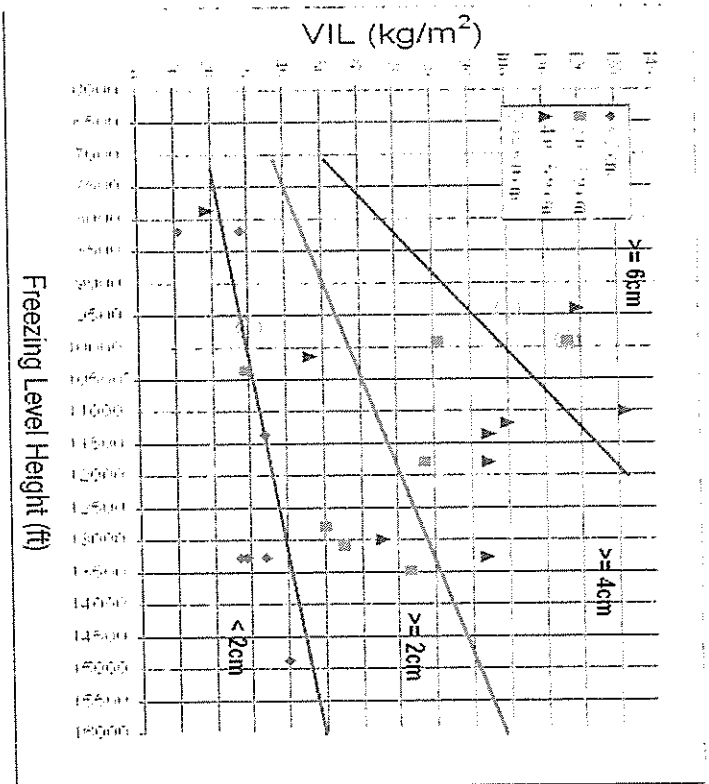
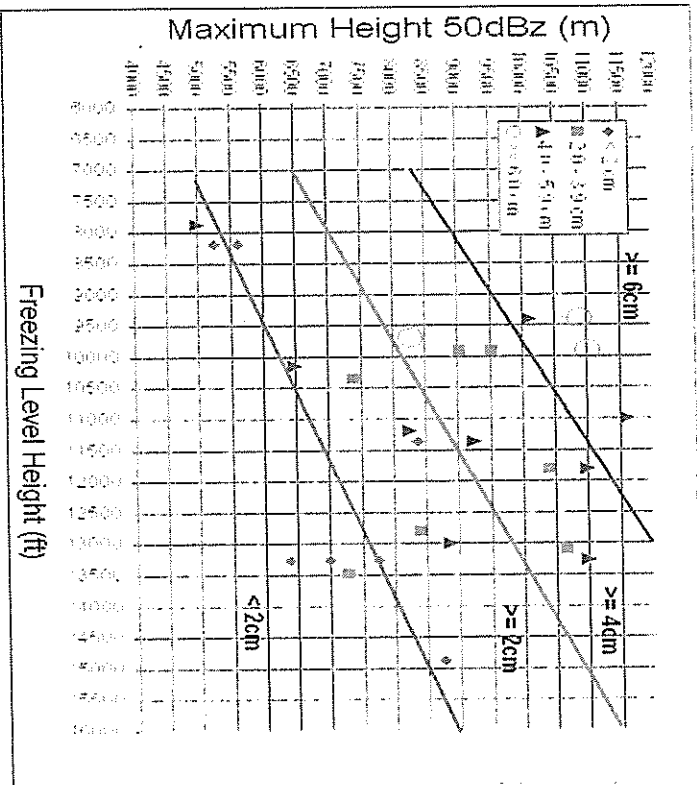


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Account by [REDACTED] - Duty Forecaster



Looking at the NSW hail size guidance and tuned to Vic radars etc



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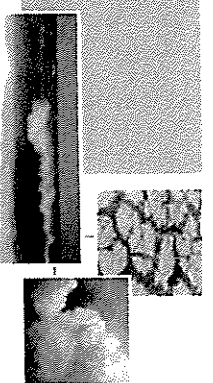


Account by [REDACTED] – Duty Forecaster

Looking at the NSW hail size guidance and tuned to Vic radars etc
The freezing level over Melbourne was around 12000ft.

Thus to get >6cm hail the guidance suggests VIL (vertical integrated liquid) needs to be >120. Well the VIL from the storm was consistently between 100 and 250..peaking at around 320 near Ferntree Gully (easily the highest value anyone in the office had seen). BTW, if anyone can create a 'VIL loop', this captured beautifully the path of the storm.

Thus to get >6cm hail the guidance suggests 50dbZ to >12km.
Well 50dbz was to around 10km in the cell...and it would have been pretty hard to get much higher than that given the tropopause was just above 10km!



CSIRO

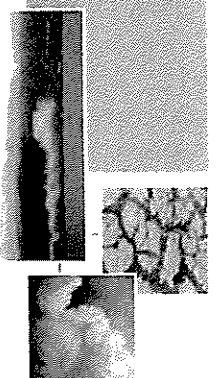
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Account by [REDACTED] – Duty Forecaster

Given the environment and radar evidence, as early as near Bacchus Marsh, it was pretty obvious to stick the 'Very dangerous thunderstorm' tag on the thunderstorm in the warning as it entered the outer western suburbs (I have never used this tag before, and I think it had only been used once or twice previously in VRO).



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Bureau of Meteorology

Australian Government Bureau of Meteorology
Victoria Regional Office

TOP PRIORITY FOR IMMEDIATE BROADCAST

SEVERE THUNDERSTORM WARNING - MELBOURNE AREA

FOR DAMAGING WIND, FLASH FLOODING and LARGE HAILSTONES

For people in the Inner, Western, Geelong and Bellarine Peninsula, Port Phillip and parts of the South East, Eastern, Northern and Mornington Peninsula Local Warning Areas.

Issued at 2:02 pm Saturday, 6 March 2010.

The Bureau of Meteorology warns that, at 1:55 pm, very dangerous thunderstorms were detected on weather radar near Geelong and Melton. These thunderstorms are moving towards the southeast. Very dangerous thunderstorms are forecast to affect Footscray, St Albans, Sunbury and Werribee by 2:25 pm and Caulfield, Craigieburn, Glen Waverley, Greensborough, Melbourne City and Preston by 2:55 pm.

Damaging winds, very heavy rainfall, flash flooding and large hailstones are likely.

The State Emergency Service advises that people should:

- * Keep clear of fallen power lines.
- * secure any loose objects in the vicinity of your home.
- * Keep away from creeks and drains.
- * do not drive vehicles through flooded areas.
- * stay indoors if possible.
- * Avoid using the phone during the storm.
- * if you are outside, avoid sheltering under trees
- * listen to the radio for storm updates
- * switch off your computer and electrical appliances

The next warning is due to be issued by 3:05 pm.



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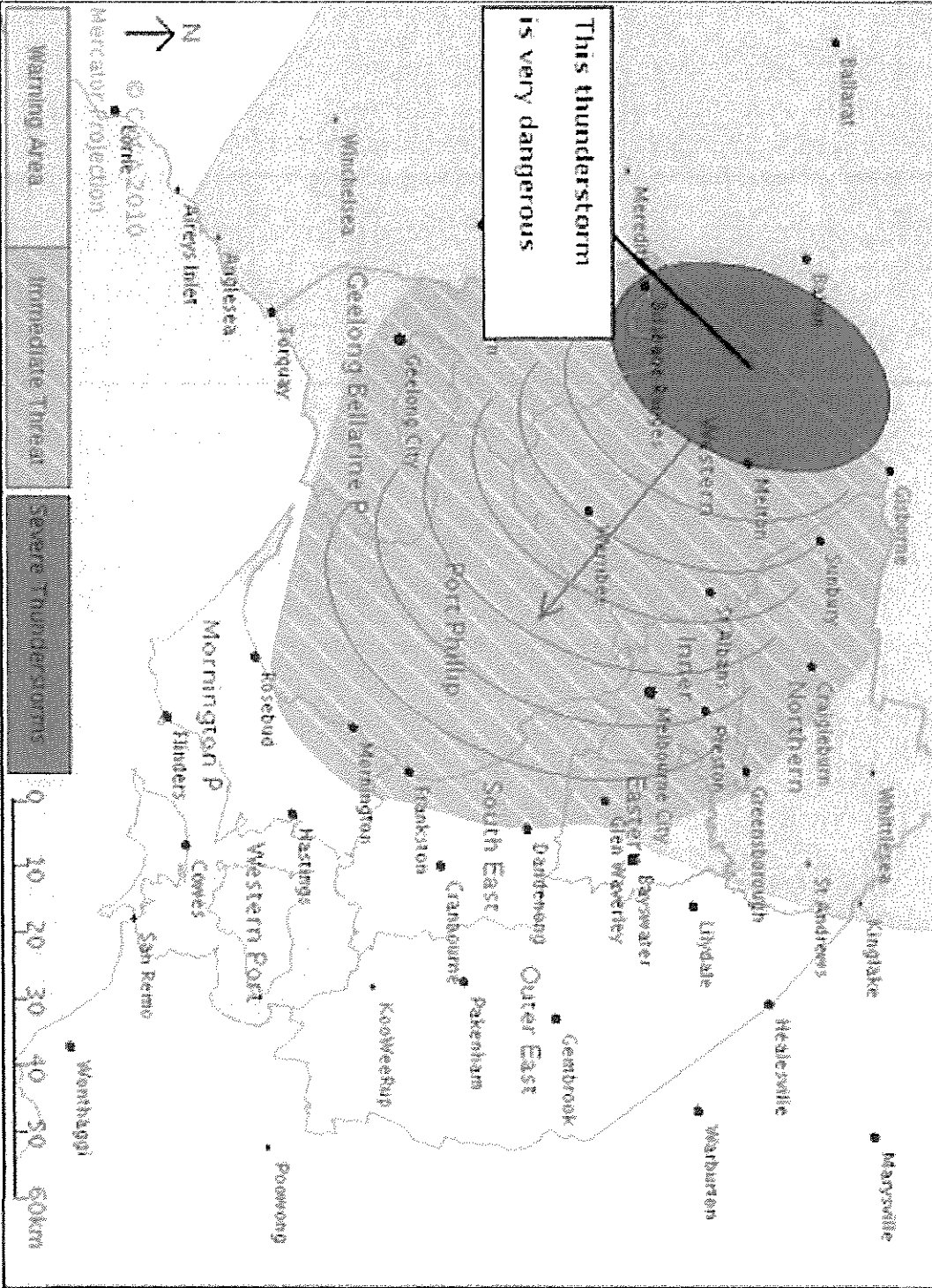


Australian Government
Bureau of Meteorology

Bureau of Meteorology
 Thunderstorm Location, 60 min Forecast
 For damaging wind, flash flooding and large hailstones.

ISSUED AT 06 Mar 2:02 pm EDT
 Valid at 06 Mar 1:55 pm EDT

This thunderstorm
 is very dangerous

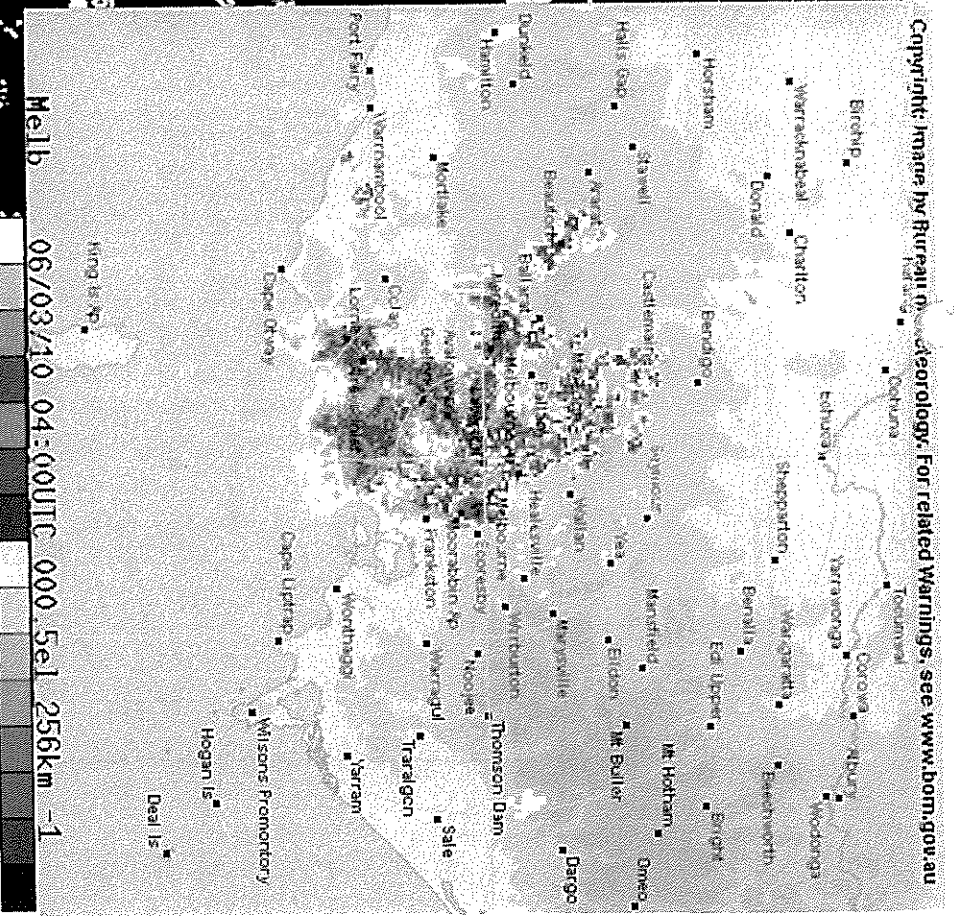
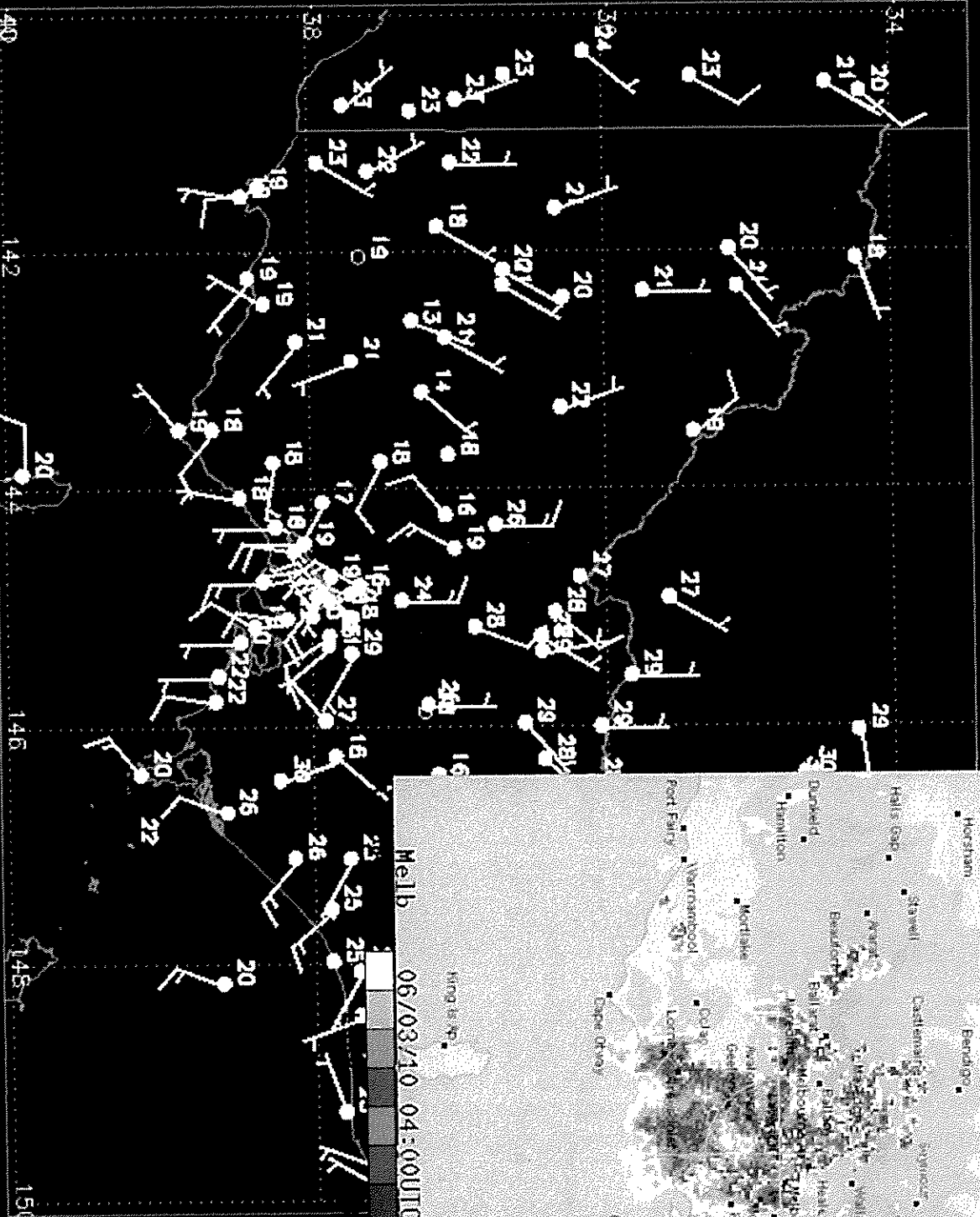


Warning Area Immediate Threat Severe Thunderstorms

Australian Government Bureau of Meteorology
 Victoria Regional Office

0400 UTC
(3 pm)

Automatic Weather
Temp Valid:



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Melb 06/03/10 04:00UTC 000.5e1 256km -1

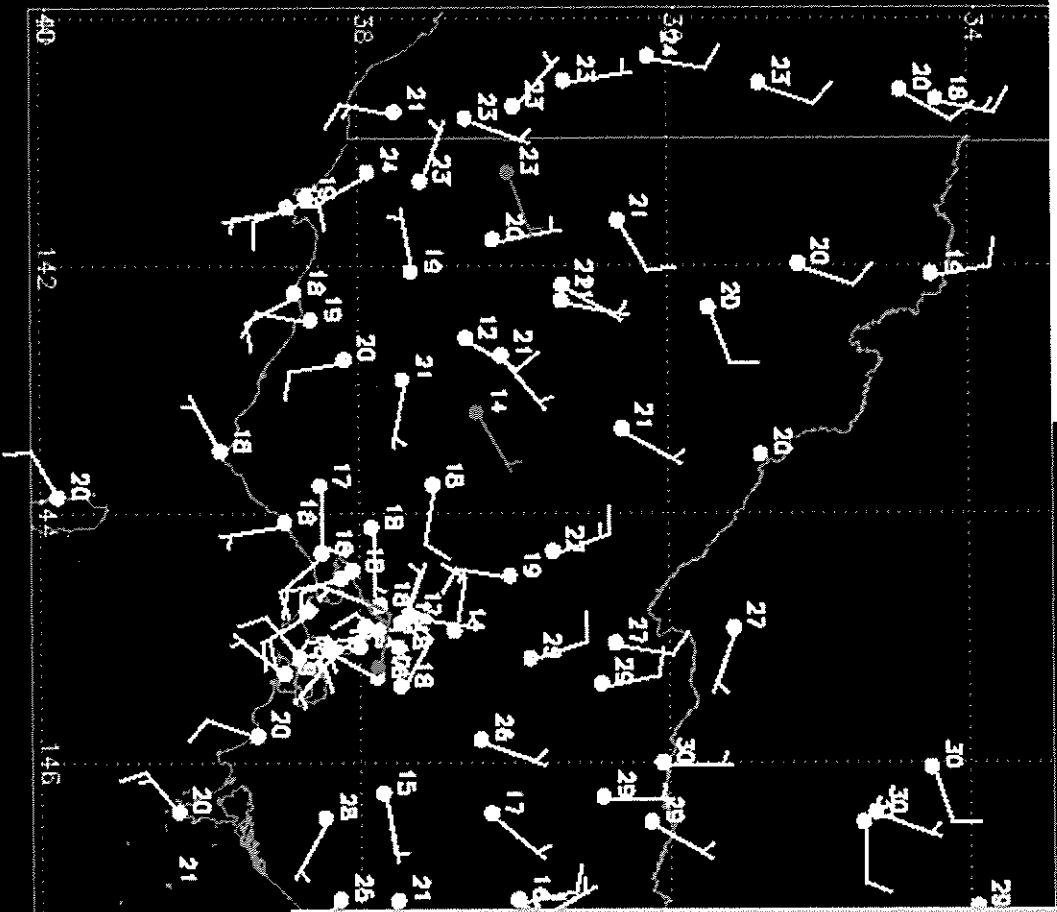
Heavy



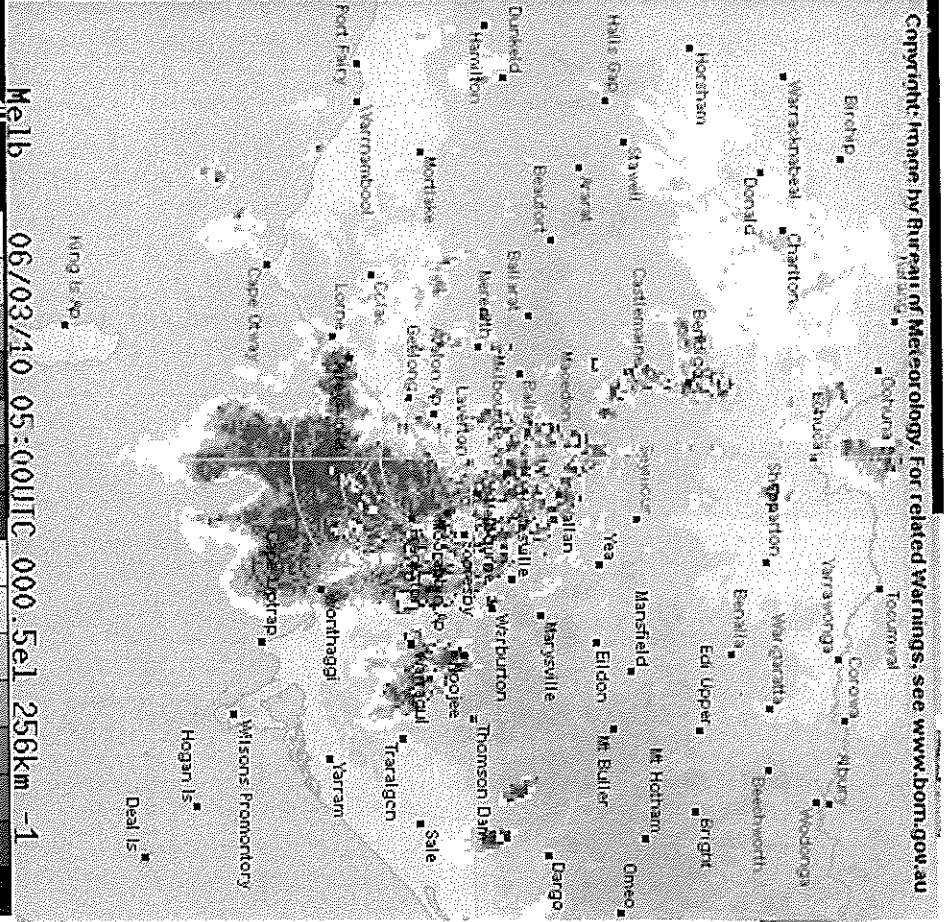
Australian Government
Bureau of Meteorology

0500 UTC
4 pm

Automatic Weather Station
Valid: 0500



Bureau of Meteorology
Victorian Regional Office



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Melb 06/03/10 05:00UTC 000.5e1 256km -1

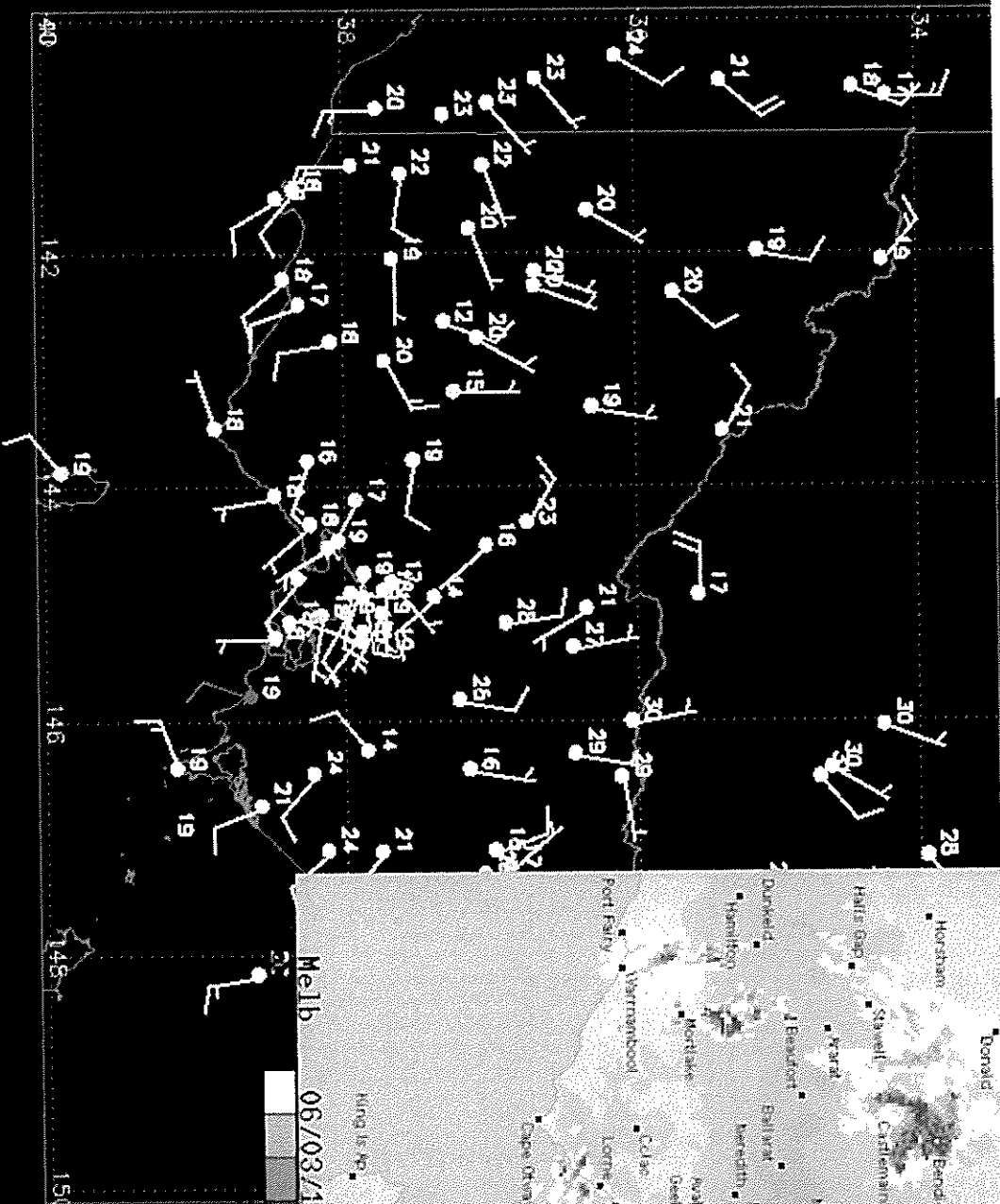
Moderate Heavy

Research A
Bureau of Meteorology
Australian Government
Bureau of Meteorology

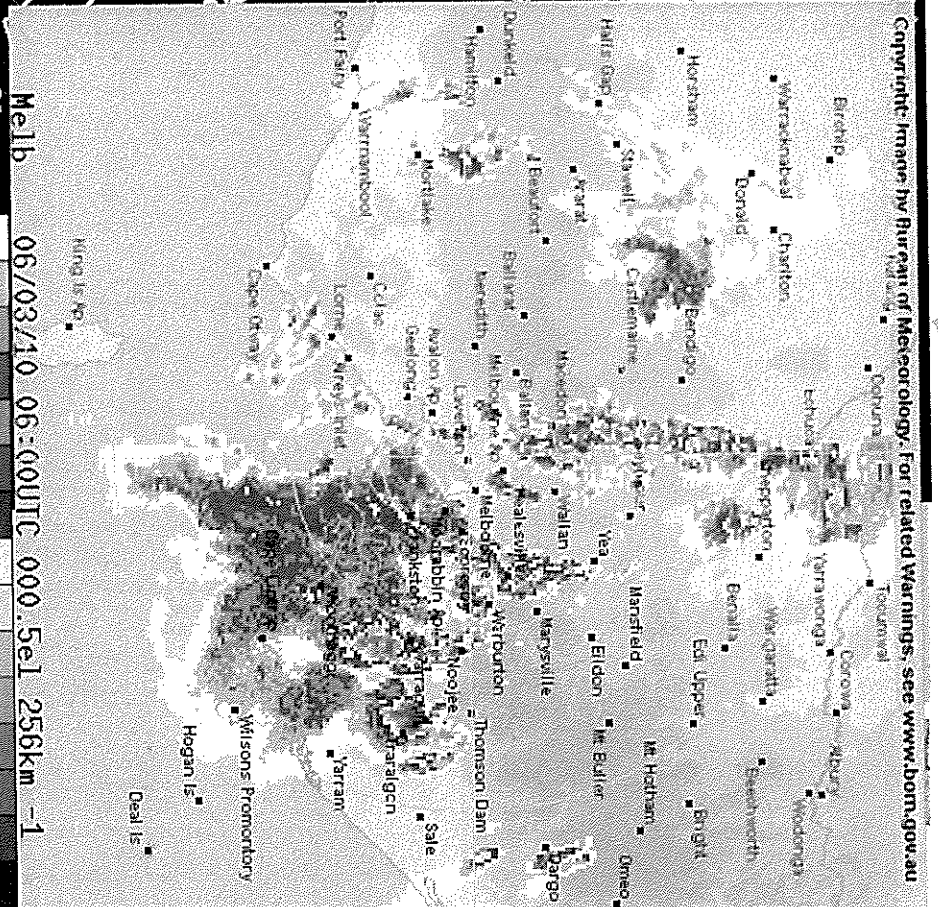


0600 UTC
5pm

Automatic Weather Station
Valid: 0600 UTC



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Victorian Regional Office



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Melb 06/03/10 06:00UTC 000.5e1 256km -1

Moderate Heavy

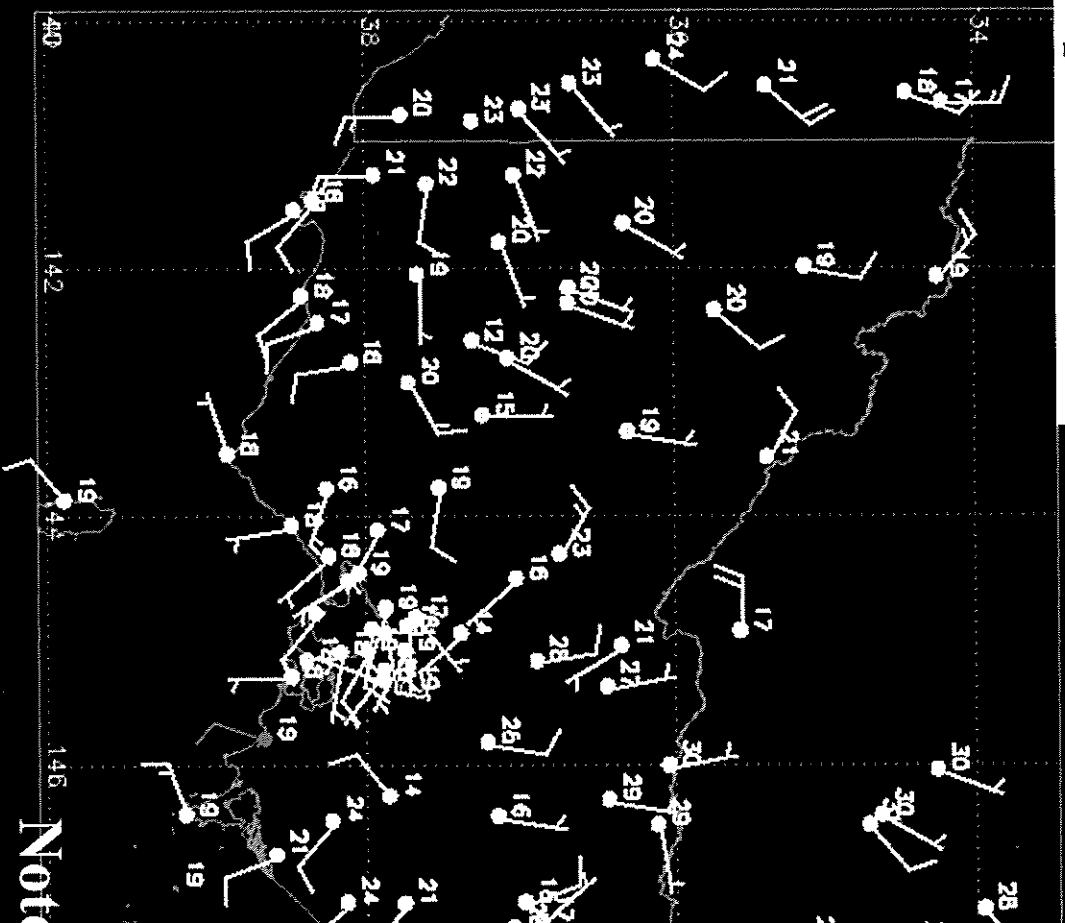
Search A
Bureau of Meteorology
Australian Government
Bureau of Meteorology



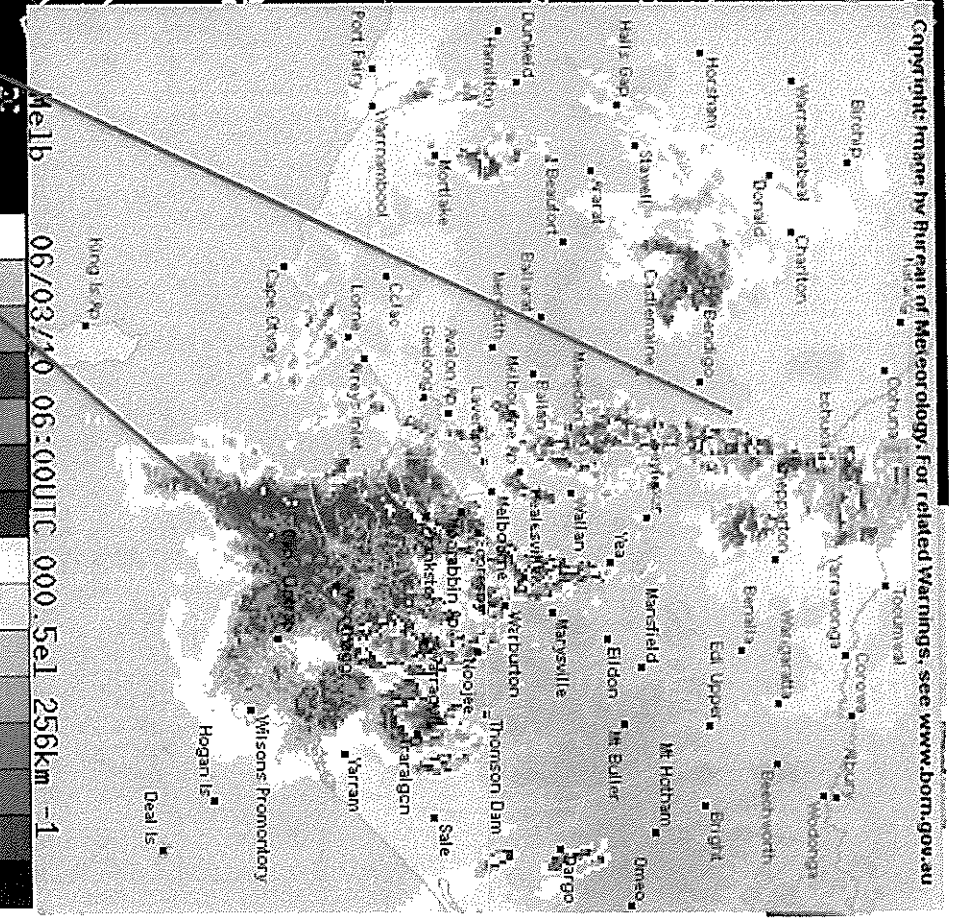
0600 UTC
5pm

Automatic Weather Sta
Valid: 0600 U

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Note - I-shaped structure



06/03/10 06:00UTC 000 5e1 256km -1

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Victorian Regional Office

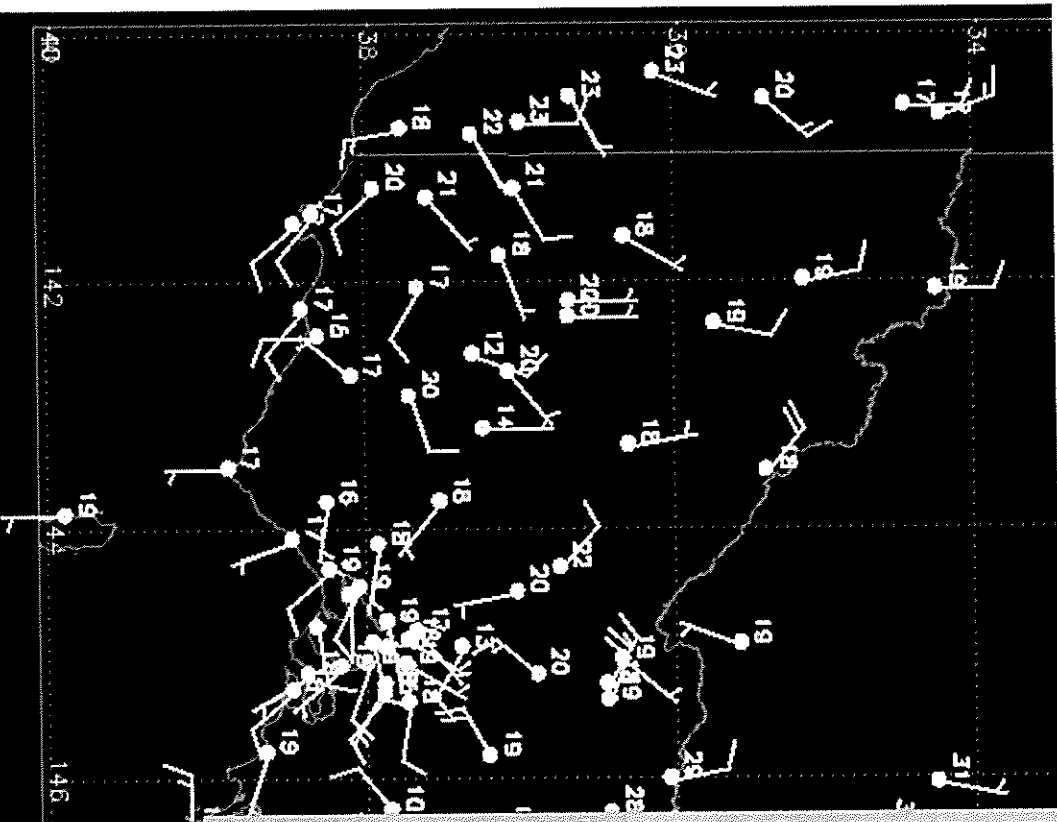
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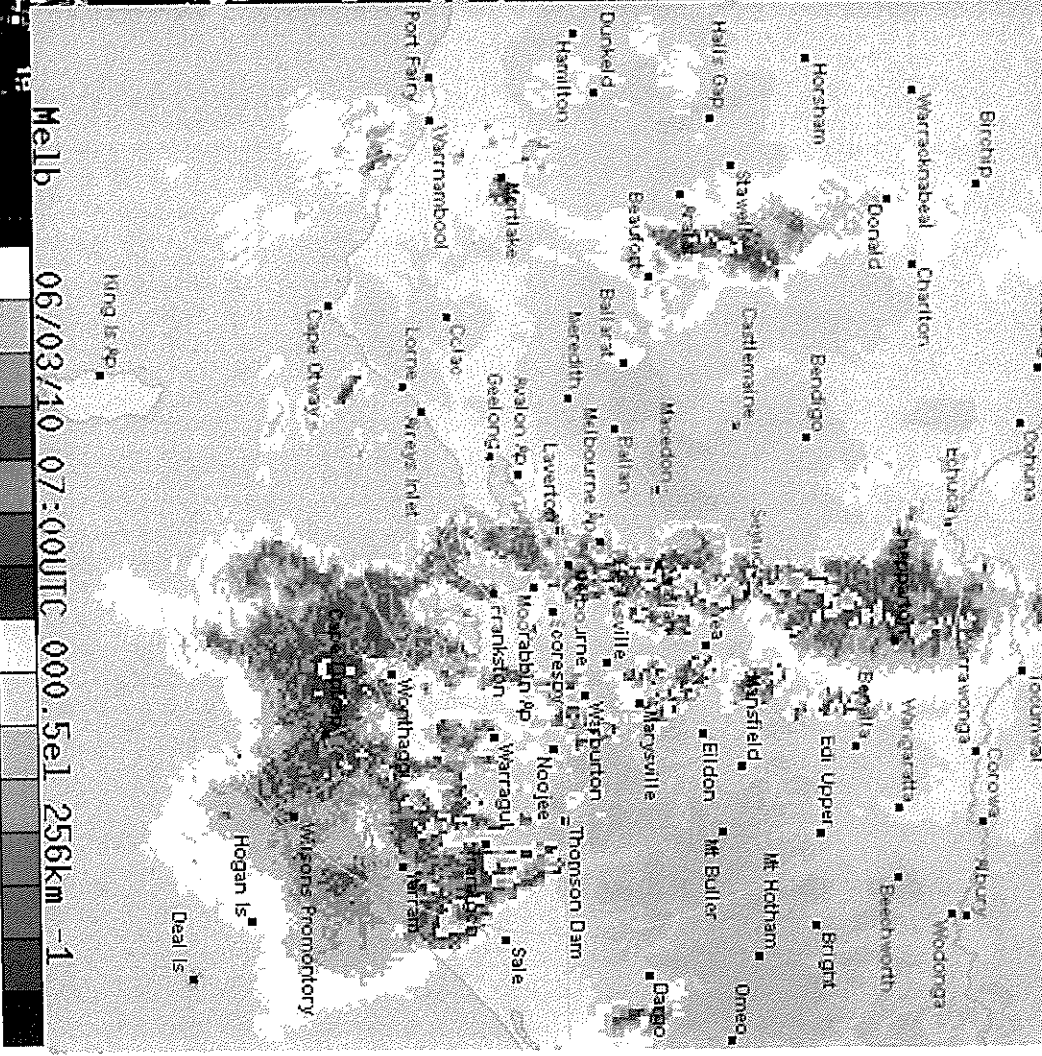
0700 UTC
6pm

Automatic Weather
Valid:



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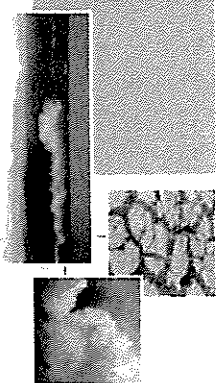
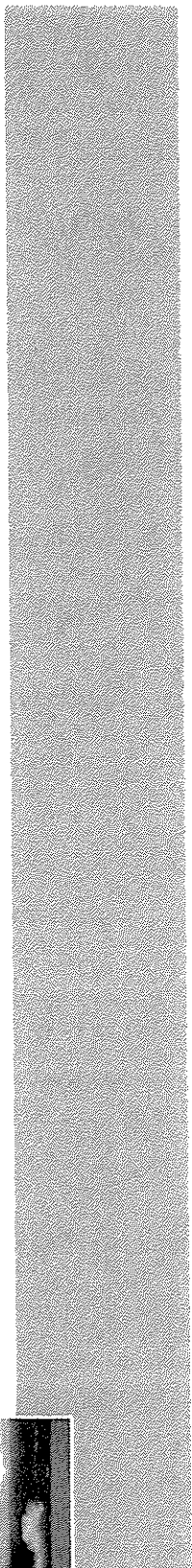
Melb 06/03/10 07:00UTC 000.5e1 256km -1

erate Heavy

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Very long-lived thunderstorm complex

A supercell – characterised by rotation within the thunderstorm complex

Next two slides – some 3-d rapid snaps (courtesy )

I will not talk about these due to lack of time – but note 70 dBz echoes (meaning large hail) and note rotation --- supercell

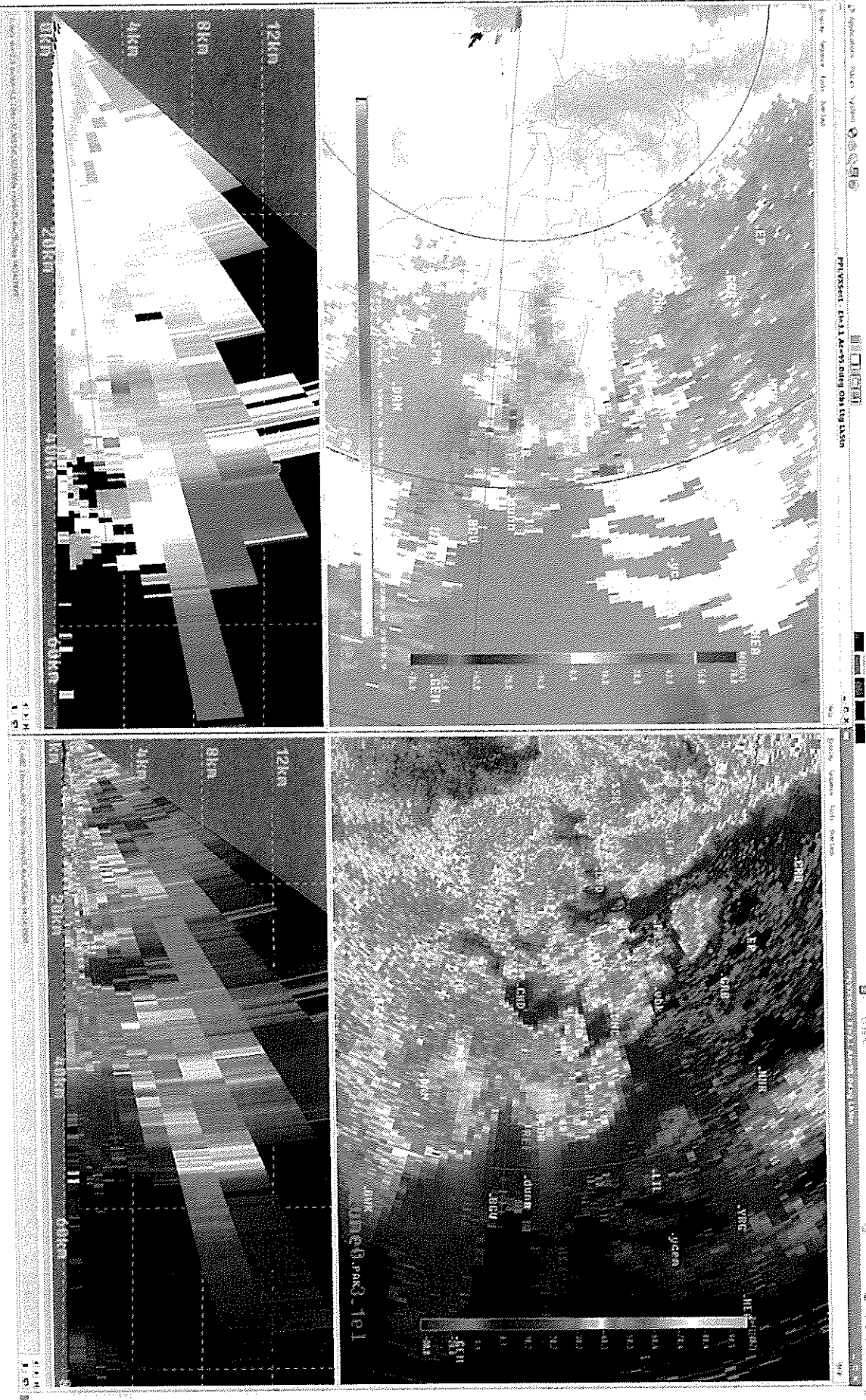
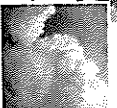
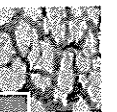


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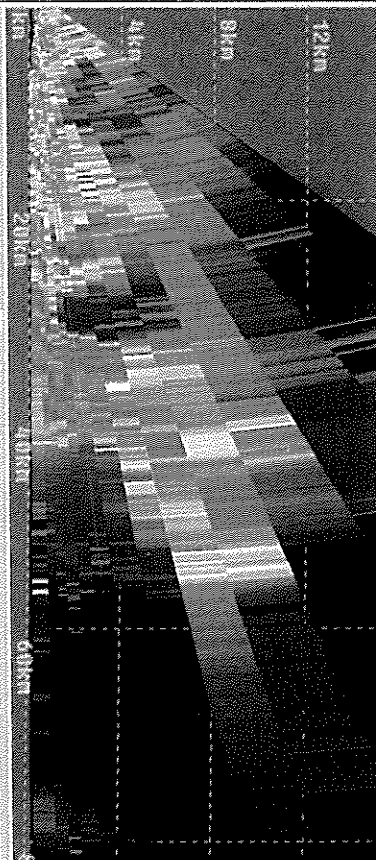
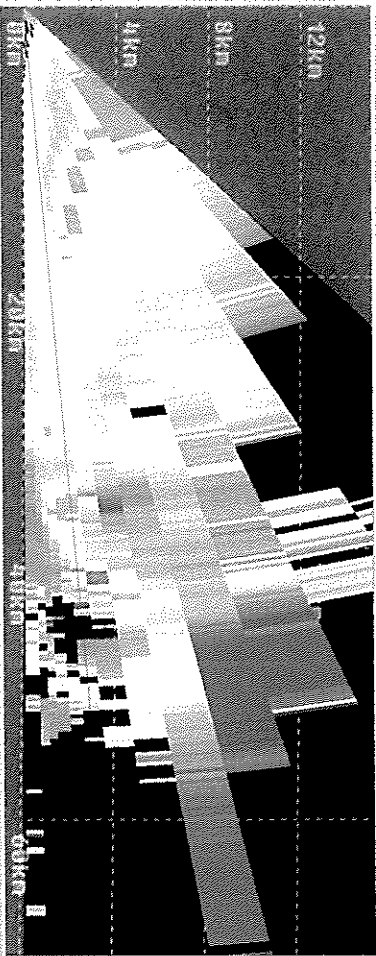
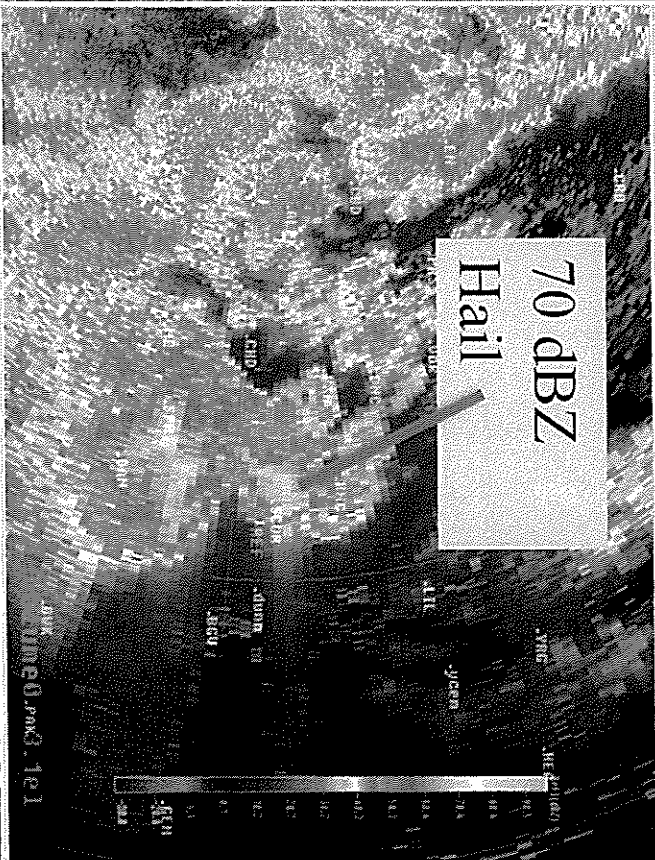
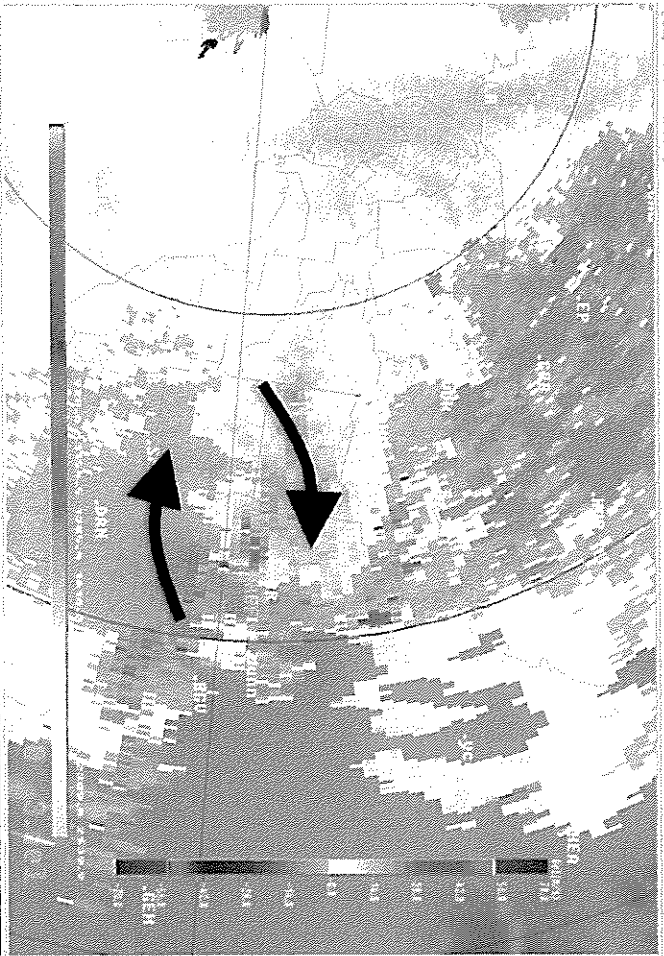


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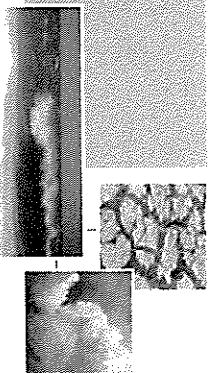
0414 UTC Tilt 31



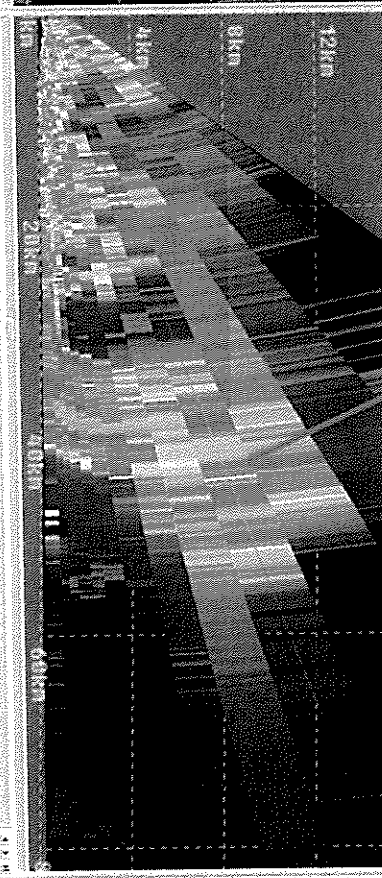
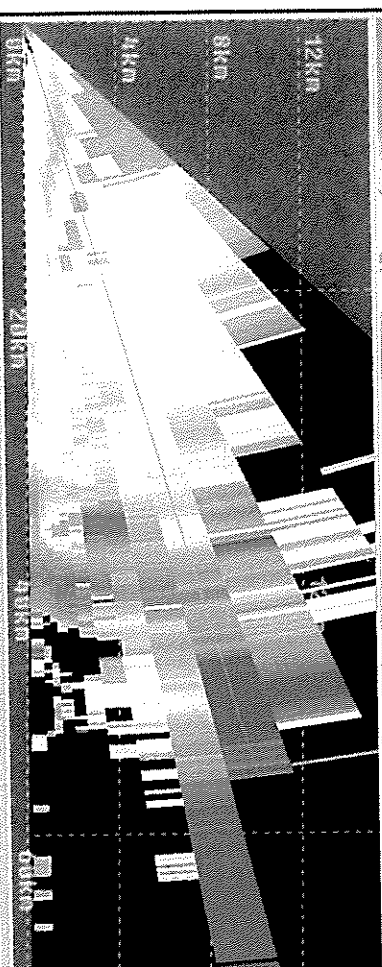
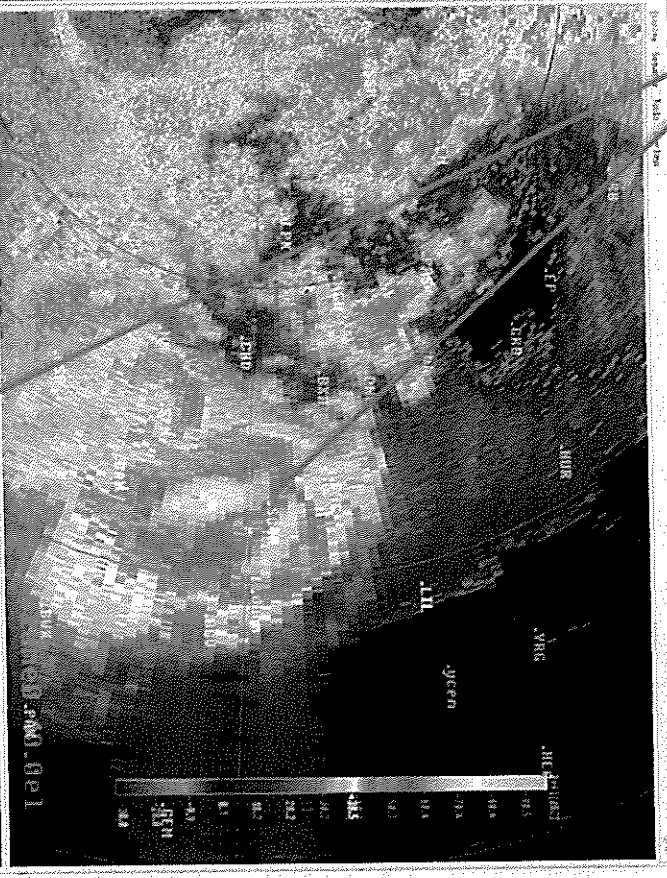
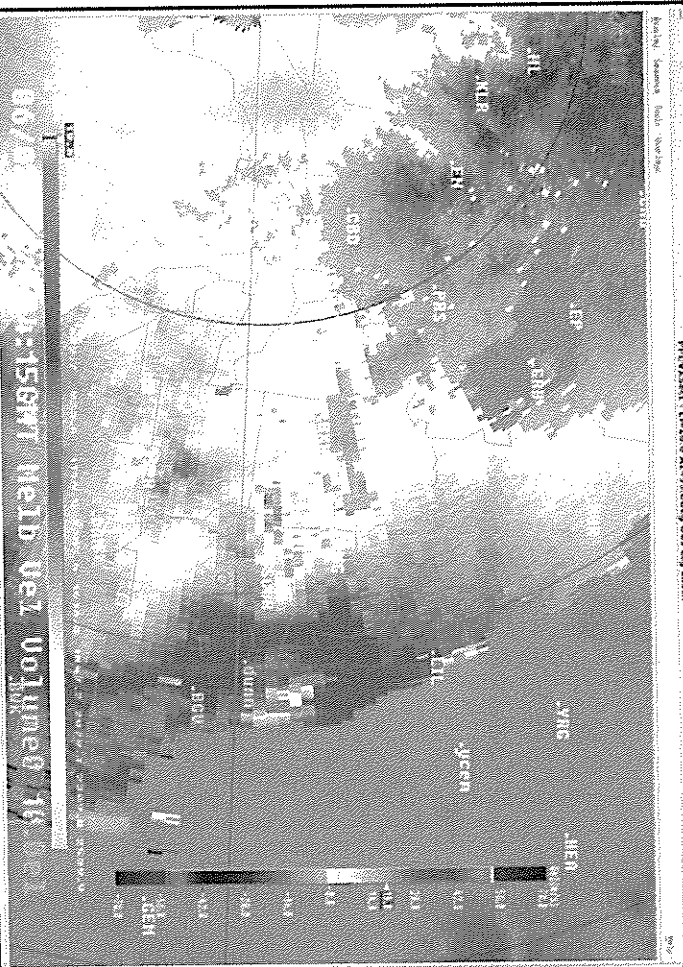
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CSIRU

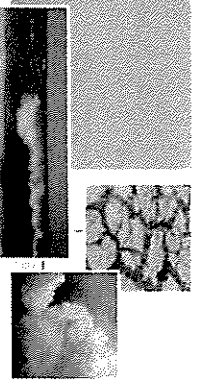
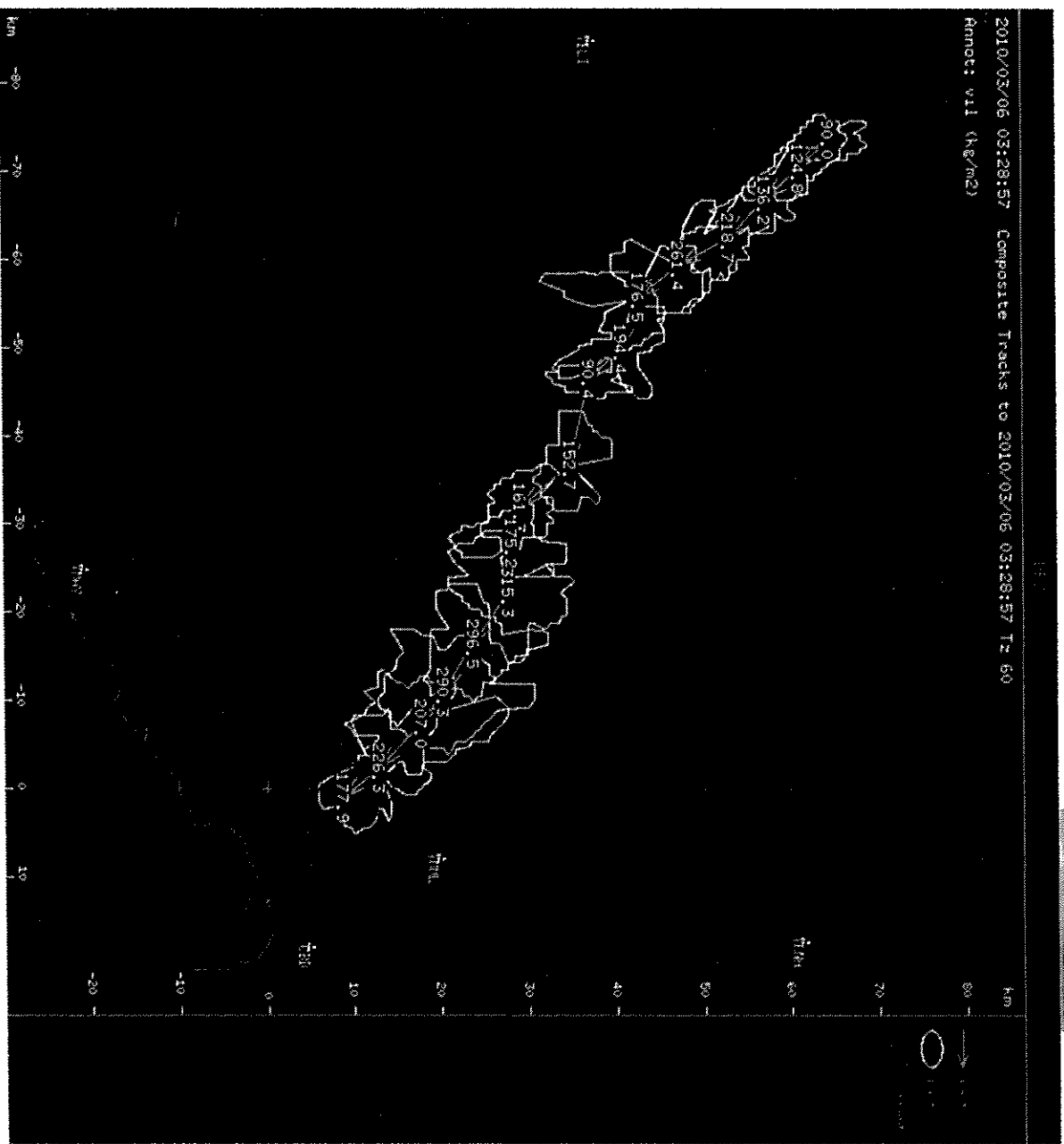


Same time – higher tilt
 Note Bounded Weak Echo Region – designating
 strong updraft at about 8km height

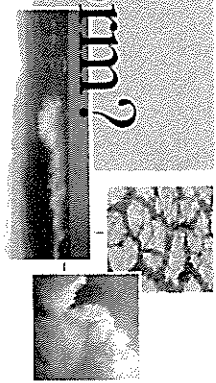


Path of the storm
as measured by
Volume integrated
liquid water
(radar
measurement)

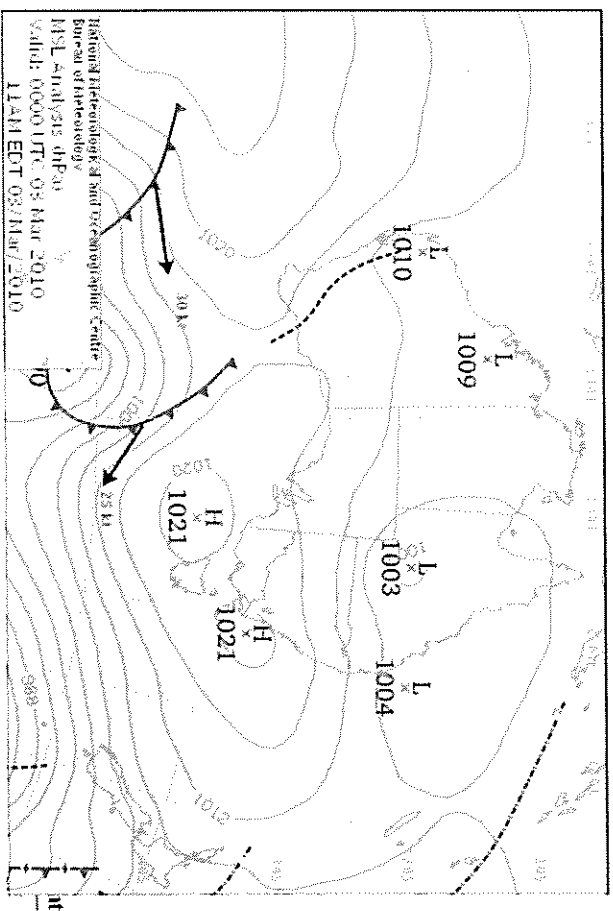
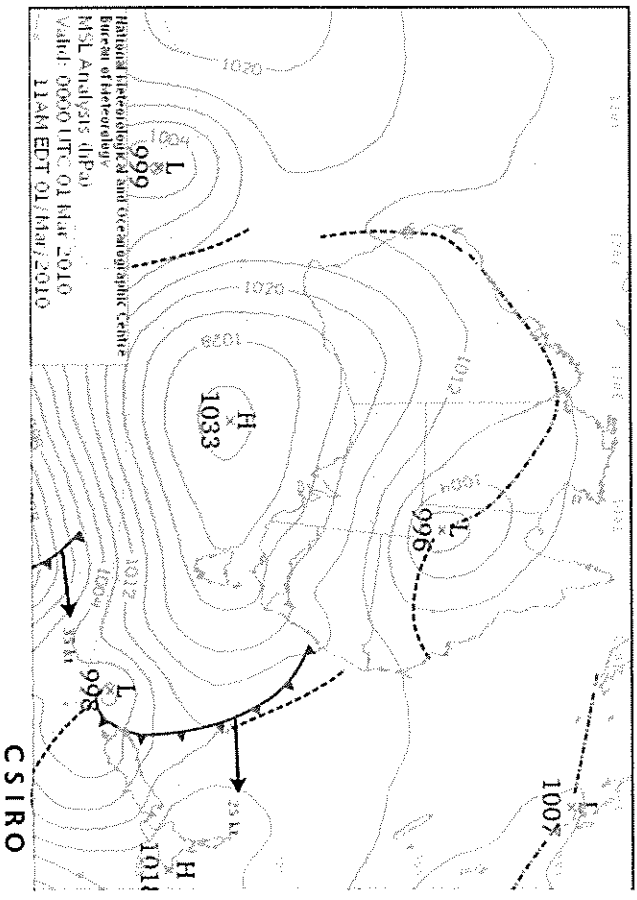
Thanks [redacted]



What caused the thunderstorm-hailstorm?



1. Instability – There was the remains of a large scale monsoon low causing large scale rainfall and flooding across Southern Queensland and Northern New South Wales. This left major regions of very moist low levels across south east of Australia



What caused the thunderstorm-hailstorm?

1. Instability – There was the remains of a large scale monsoon low causing large scale rainfall and flooding across Southern Queensland and Northern New South Wales. This left major regions of very moist low levels across south east of Australia

Email to Synoptic Discussion from [REDACTED] 02 March 5.38pm
Something rather special is forecast to happen, in the next couple of days, to the monsoon low that has been bringing large areas of heavy rainfall across Queensland.

Attached is a sequence of mean sea level pressure progs for the next 5 days.

You will see the low moves southward, loses its structure, then reforms in association with a low forming from a higher latitude westerly trough.



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