

IRRELEVANT - S.22



From: [Redacted]
Sent: Sunday, 7 March 2010 1:49 PM
To: [Redacted]
Cc: [Redacted]
Subject: RE: Severe Weather Summary 6 March 2010 [SEC=UNCLASSIFIED]

Sorry [Redacted]
correction to media/user comment section in attached.



[Redacted]
Supervising Meteorologist
Victoria Regional Office
GPO Box 1636 Melbourne Vic
3001 Australia
Phone [Redacted]
Mobile [Redacted]
Fax [Redacted]

From: [Redacted]
Sent: Sunday, 7 March 2010 13:09
To: [Redacted]
Cc: [Redacted]
Subject: Severe Weather Summary 6 March 2010 [SEC=UNCLASSIFIED]

[Redacted]
severe weather summary for TS event yesterday attached.



[Redacted]
Supervising Meteorologist
Victoria Regional Office
GPO Box 1636 Melbourne Vic
3001 Australia

Phone [REDACTED]
Mobile [REDACTED]
Fax [REDACTED]

Severe Weather Summary – Severe Thunderstorms 6 March 2010

Prepared 7 March 2010 by [REDACTED]

Event Summary

A developing low pressure system with an associated low pressure trough to the west of Victoria (refer Figure 1) combined with low level moisture and upper level forcing to generate showers and thunderstorms in the west of the State during the morning which spread eastward and intensified during the early afternoon. Severe thunderstorms developed to the northwest of the Melbourne Metropolitan Area and moved through the city from early afternoon progressing to the eastern suburbs and then into West Gippsland later in the afternoon.

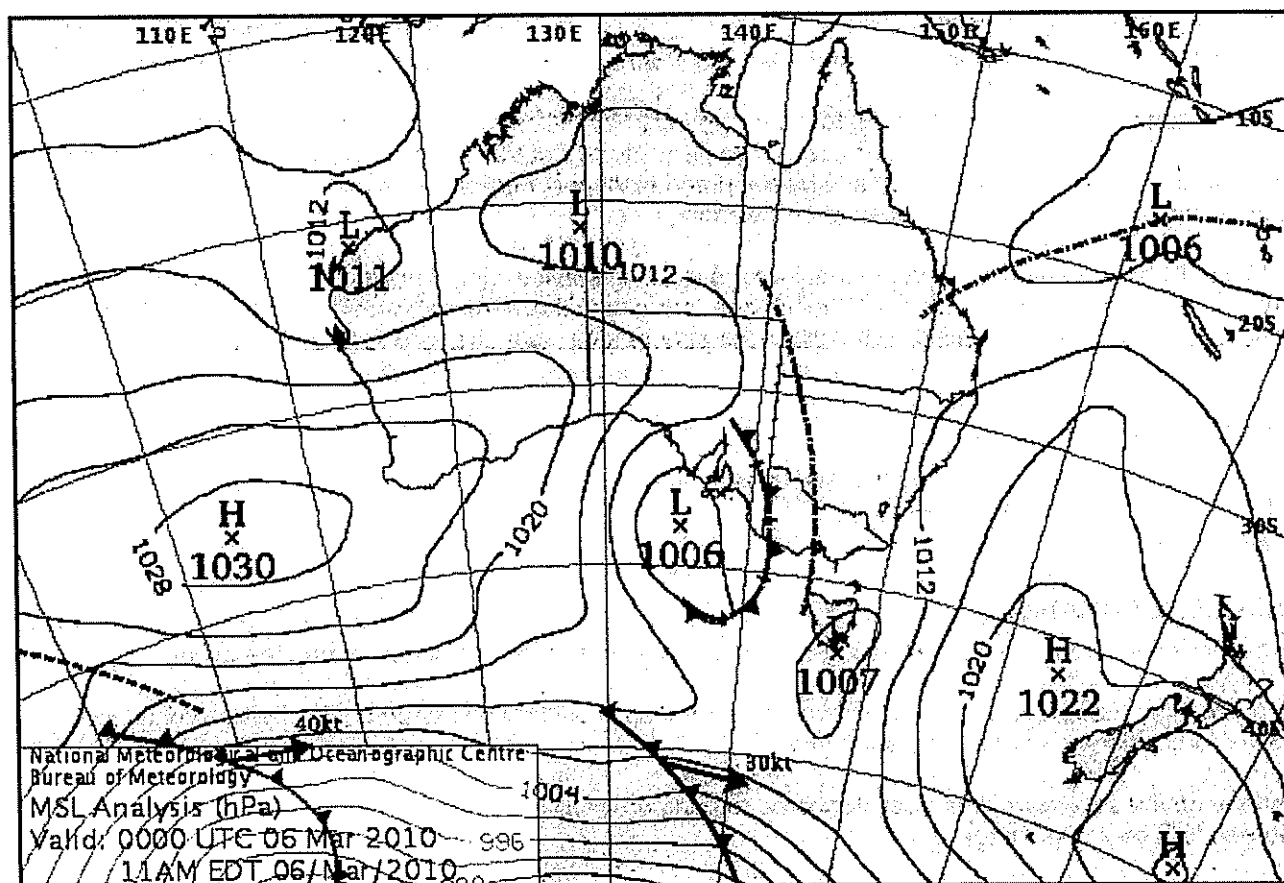


Figure 1: MSL Analysis 11am March 6 2010

The severe thunderstorms were associated with large hail and heavy rain resulting in widespread flash flooding and water and hail damage to property. There were some isolated severe wind gusts with the thunderstorms.

Rainfall totals in a 15 minute to 30 minute period included:

- 46mm at Maribyrnong,
- 45mm at Latrobe Valley Airport,
- 43mm at Rockbank,
- 40mm at Melton,
- 33mm at Dear Park,
- And 25 mm at Melbourne Airport.

Hail:

- 10cm 3.30 pm Ferntree Gully,
- 4.5cm 3.20 pm Heathmont,
- 4cm 3.20 pm Glen Waverly,
- 4cm 2.45 pm North Melton.

Wind:

- 96 km/hr Melbourne Airport,
- 95 km/hr Latrobe Valley Airport,
- 91 km/hr Ben Nevis.

VICSES reported significant damage was in several areas of Melbourne and over 3200 requests for assistance were received between 1200 and 2300 hrs.

Warning and Forecast Summary

Severe Thunderstorm Warnings were issued at:

9.55 am for damaging wind, flash flooding and large hailstones. For the Mallee, Wimmera and parts of the Northern Country, North Central and Western forecast districts.

12.36 pm for damaging wind, flash flooding and large hailstones. For the North Central and parts of the Mallee, Northern Country, Wimmera, Western and Central forecast districts

2.18 pm for damaging wind, flash flooding and large hailstones. For the Northern Country, North Central, Central, and parts of the Mallee, Wimmera, West and South Gippsland and Western Forecast districts.

3.45 pm for damaging wind, flash flooding and large hailstones. For the Northern Country, North Central, West and South Gippsland, Central and parts of the Mallee, Northeast and Alpine Forecast districts.

5.21 pm for damaging wind, flash flooding and large hailstones. For the Northern Country, North Central, West and South Gippsland, Central and parts of the Mallee, Northeast, East Gippsland and Alpine Forecast districts.

7.55 pm for damaging wind, flash flooding and large hailstones. For the Northeast, East Gippsland, West and South Gippsland, Alpine and parts of the Northern Country North Central and Central Forecast districts.

9.00 pm for flash flooding. For the Alpine Areas, Western, North Central, Northern Country, Wimmera, Mallee, Central, West and South Gippsland, East Gippsland and Northeast Forecast districts.

9.38 pm Cancellation of the severe thunderstorm warning.

At 1.25 pm the Melbourne Area severe thunderstorm warning service commenced and was updated at least hourly until being cancelled at 7.59 pm. Phenomena included in the warnings were damaging wind, flash flooding and large hailstones until 6.10 pm when the phenomena were changed to flash flooding only.

Media/User comments

A negative web response concerning the lack of warning for the event.

Significant post event media interest.

Door stop with Premier at SCC 2, 7, 9, 10 - Kevin Parkyn provided met' input.

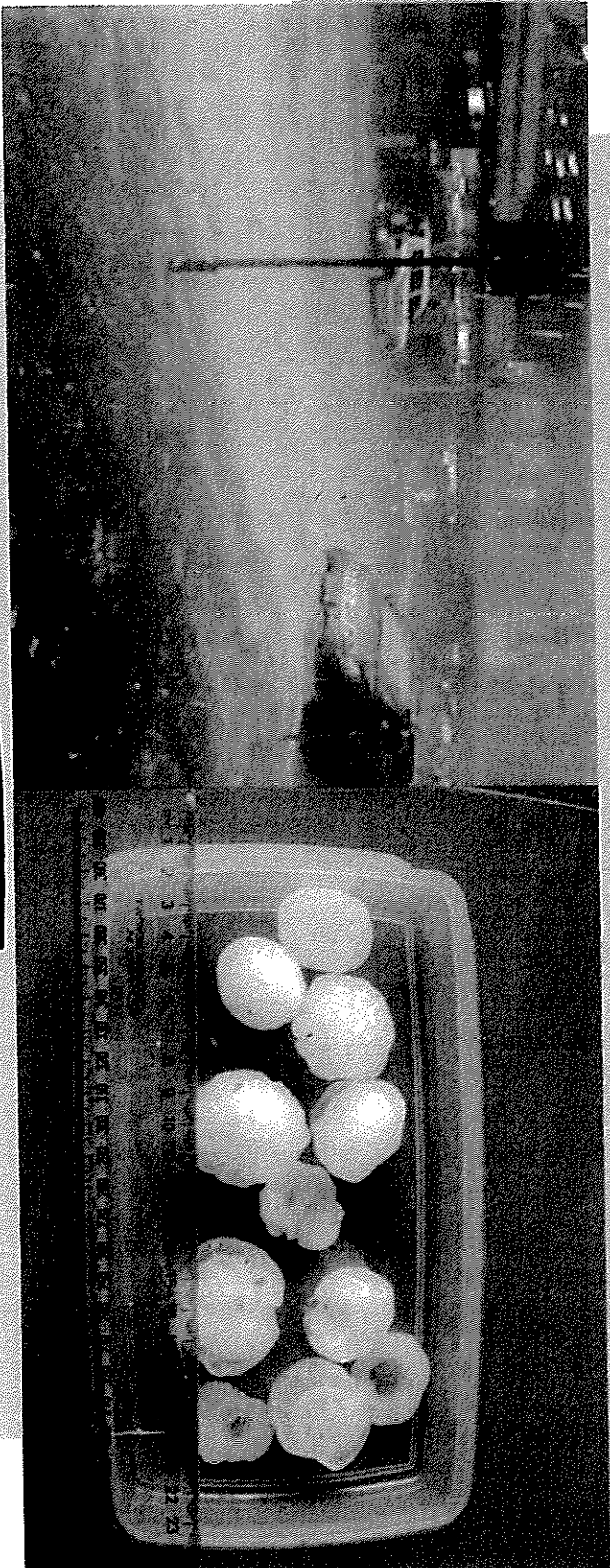
Facilities (Equipment)

TIFS generated an alert (ALERT ORA-03114) during dissemination of all products during the event.

Warnings did not automatically populate warning summaries in public weather products; there is no manual facility for forecasters to edit warning summaries.

The phone on the severe weather desk appeared to hang on a call impeding attempts from the SES to contact the bureau for about 30 minutes.

High Impact Weather Event March 2010 Melbourne Hailstorm 06 March



Centre for Australian Weather and Climate Research (CAWCR)



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Acknowledgements

Many, many scientists and forecasters from throughout the Bureau – I and the synoptic-discussion email list received 78 emails on this thunderstorm, most containing maps, diagnostics, hail-stone reports, interpretation of radar imagery etc

Particular mentions to:

Forecast Offices: [REDACTED]

National Climate Centre: [REDACTED]

CAWCR: [REDACTED]

Training Centre: [REDACTED]

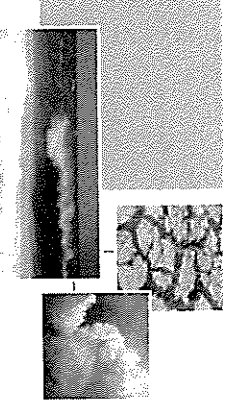
Atis

Precautionary Note

I have about an hour's worth of material here, and only 15 minutes or so to present it

So, I am going to go fast --- will slow down near the end when I talk about what caused the storm and whether we can forecast it

Before then, I shall go fast

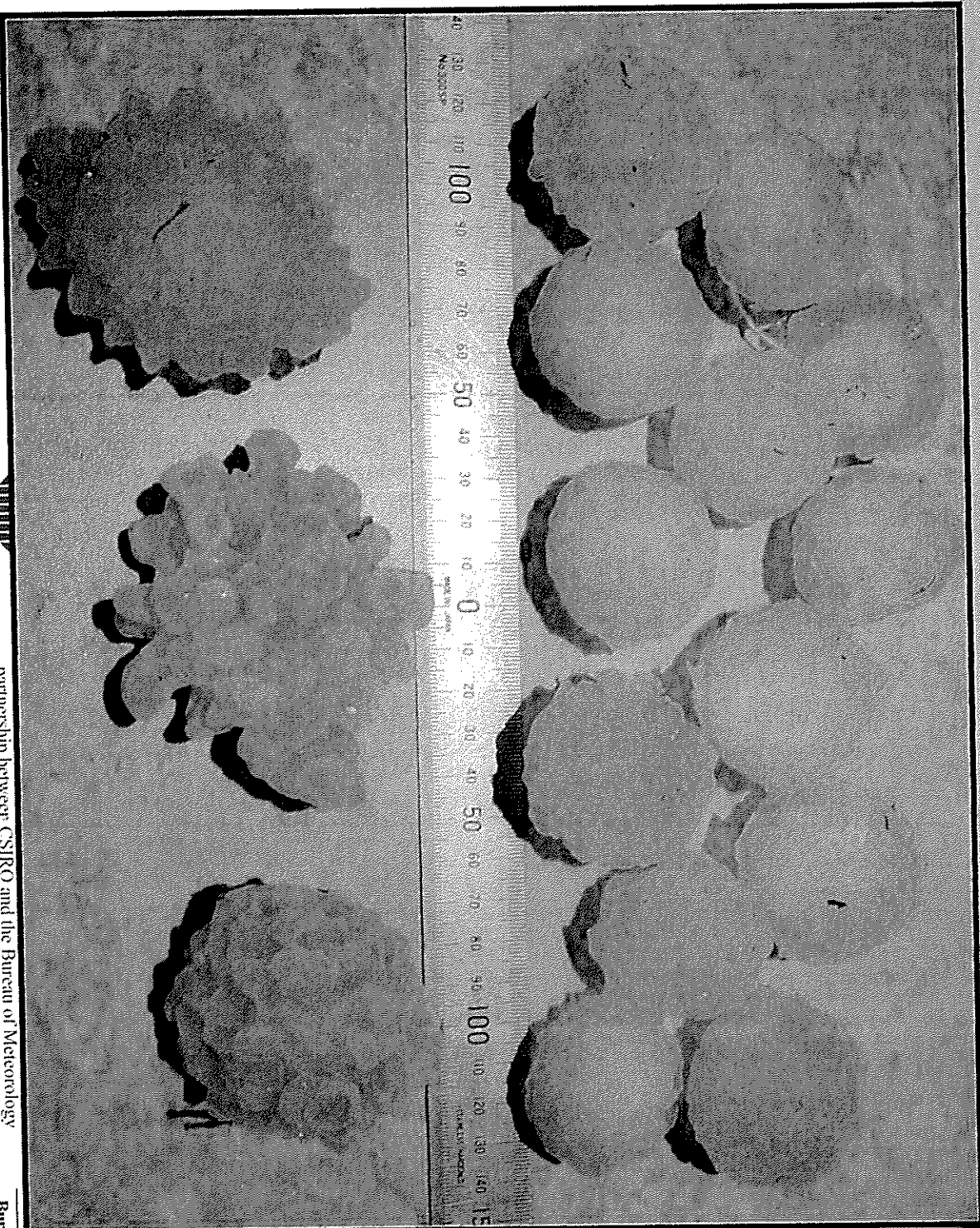


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Hail photos from Eastern Suburbs, courtesy [redacted]
composite stones around 9 – 10 cm. Probably a Victoria record



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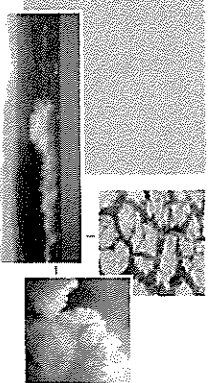
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Damage Bill

- Online International Business Times (17 March 2010): **The cost of Melbourne's hailstorm 10 days ago is moving past half a billion dollars, with close to 70,000 claims made to three major insurers.....Insurance Australia Group with over 24,000 claims, Suncorp with more than 35,000 and Allianz with over 8,300 claims, seems to have the bulk of the insurance costs.**
- Goauto.com.au 16 March 2010: "One of the state's biggest automotive insurers – **RACV Insurance – has logged 12,000 motor vehicle storm damage claims so far, while another, AAMI, has 10,000 claimants in the assessment queue.**"



CSIRO

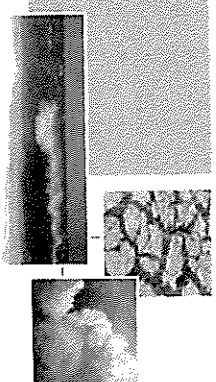
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Damage Bill

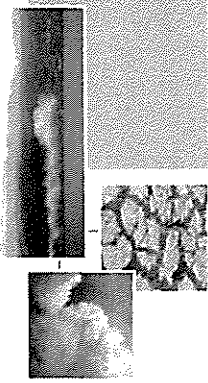
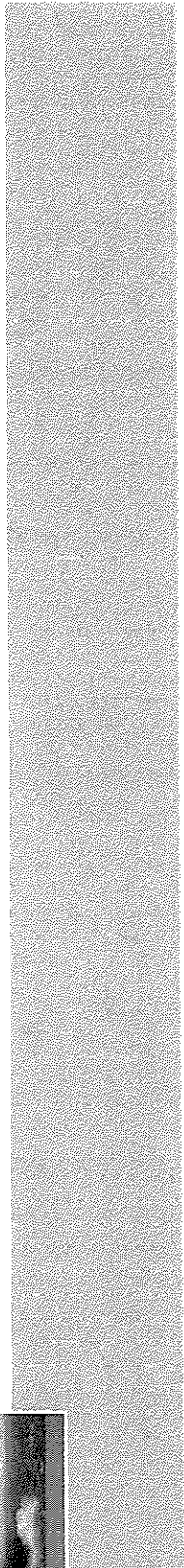
- **Channel Nine news online 8 March:** "State Emergency Service director of operations Trevor White says the organisation has received more than **6000 calls for help following the thunderstorm on Saturday**.
Hailstones measuring up to 10cm in diameter came down across metropolitan Melbourne causing hundreds of millions of dollars in damage to homes, cars and businesses..... More than 500 SES volunteers, supported by SES members from NSW and South Australia, have been cleaning up the damage.



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**The Race event was cancelled/
abandoned at Flemington**

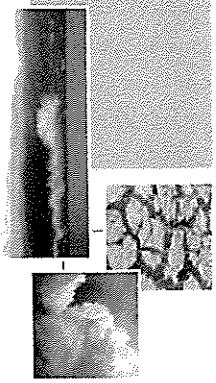
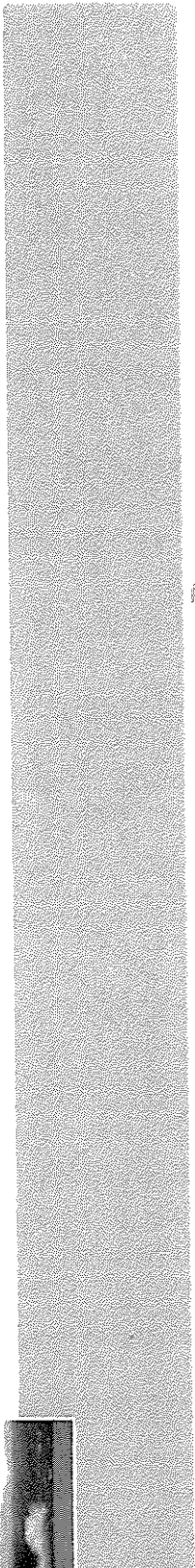
The Arts Centre roof was flooded

**Trains cancelled across entire
network**



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Show video

If it doesn't work, it is available on You-tube

http://www.youtube.com/watch?v=acJ0JzyyP_I



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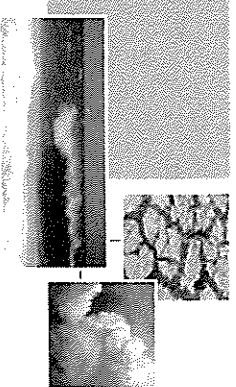
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The sequence of events

Will show maps of surface wind and temperature 1-hour apart, and the Melbourne radar plan-view

Sequence from 1800 UTC (5 am)
To 0700 UTC (6 pm)

13 hours – a self-organised long-lived Supercell thunderstorm



CSIRO

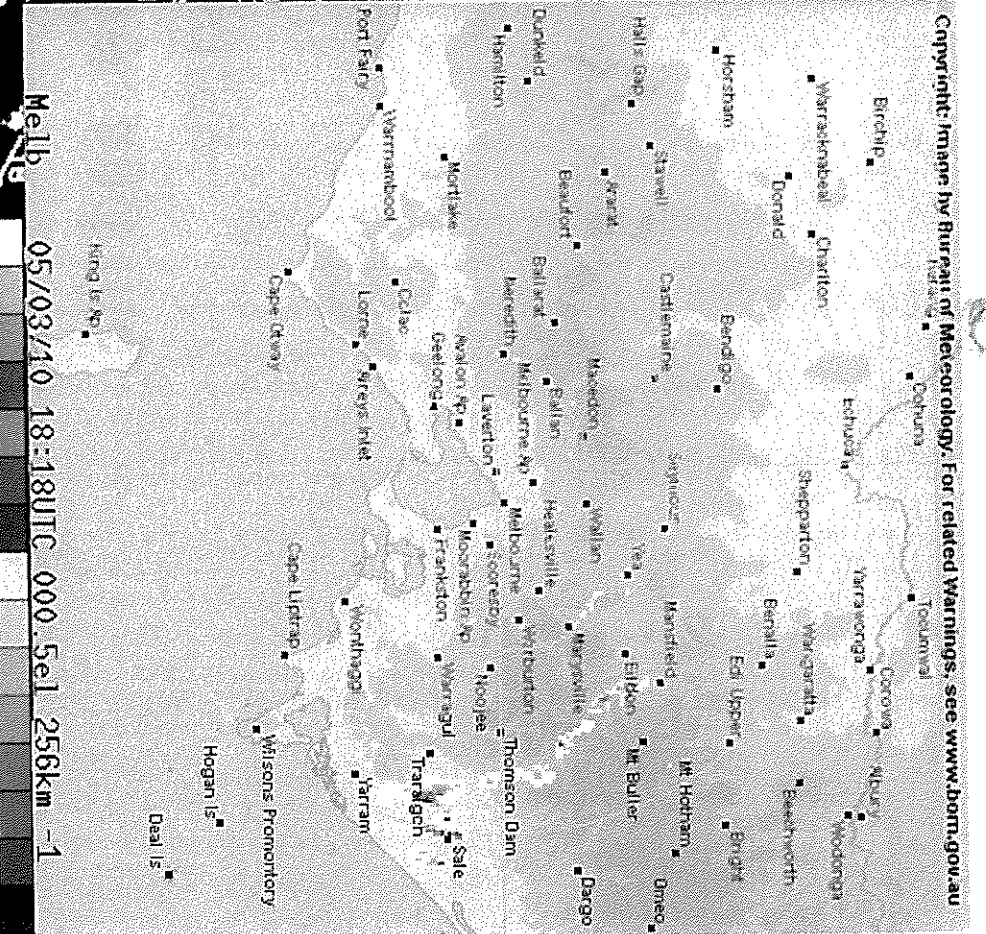
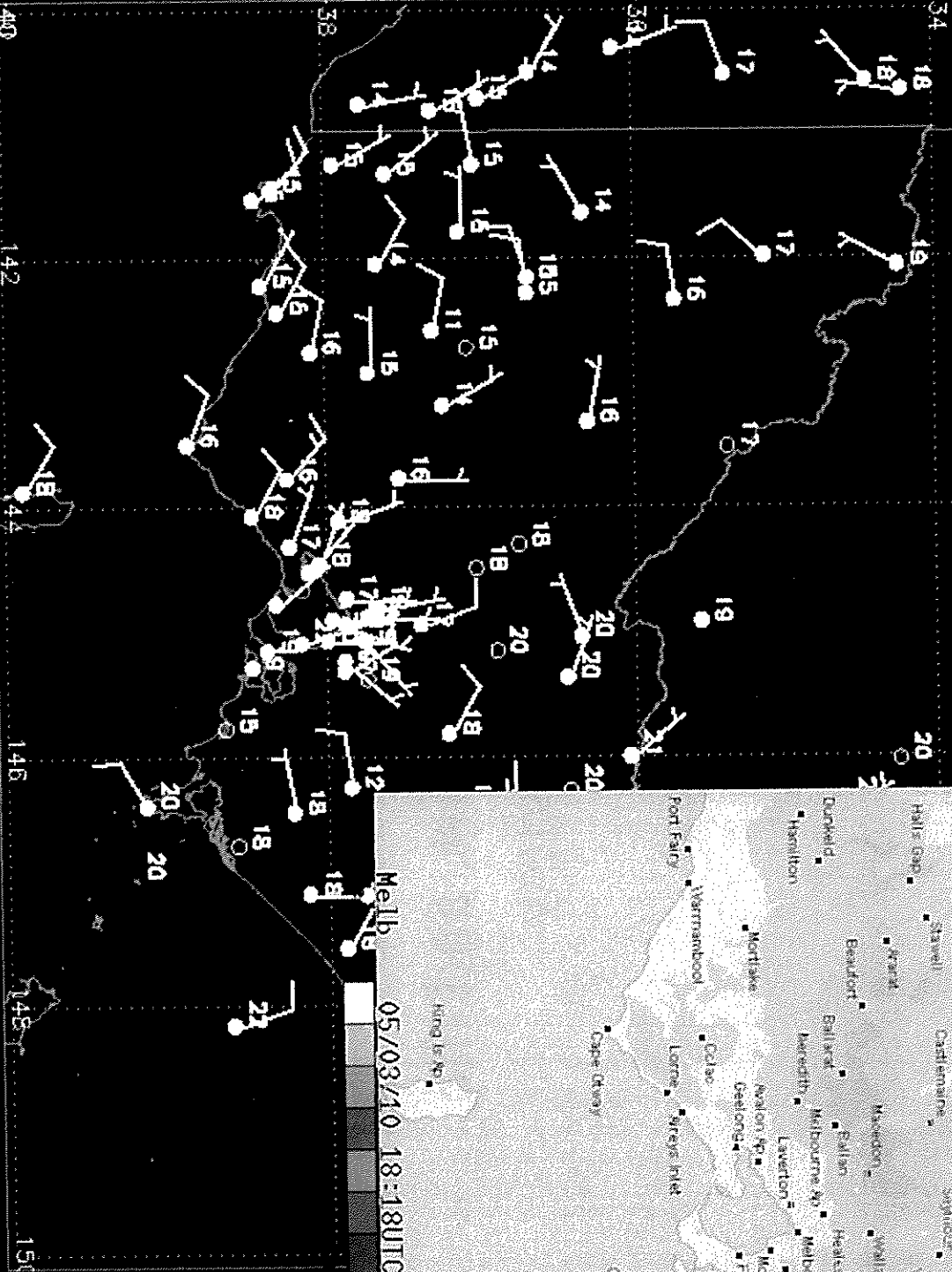
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1800 UTC
5 am local time

Automatic Weather
Temp Valid:



Heavy



Australian Government
Bureau of Meteorology

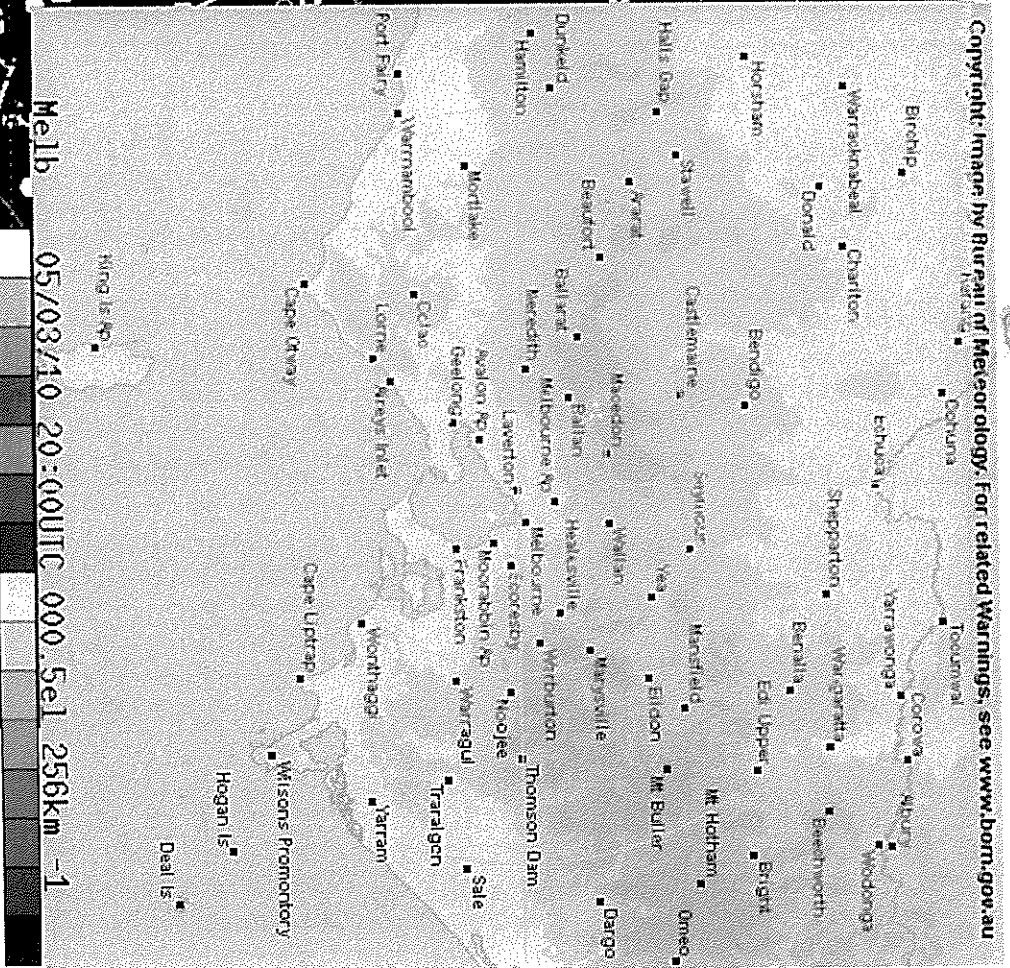
2000 UTC

Parameter: Wind + Temp

Valid:

Automatic Weather

Copyright: Image by Bureau of Meteorology. For related warnings, see www.bom.gov.au



Melb 05/03/10 20:00UTC 000 5el 256km -1

Heavy



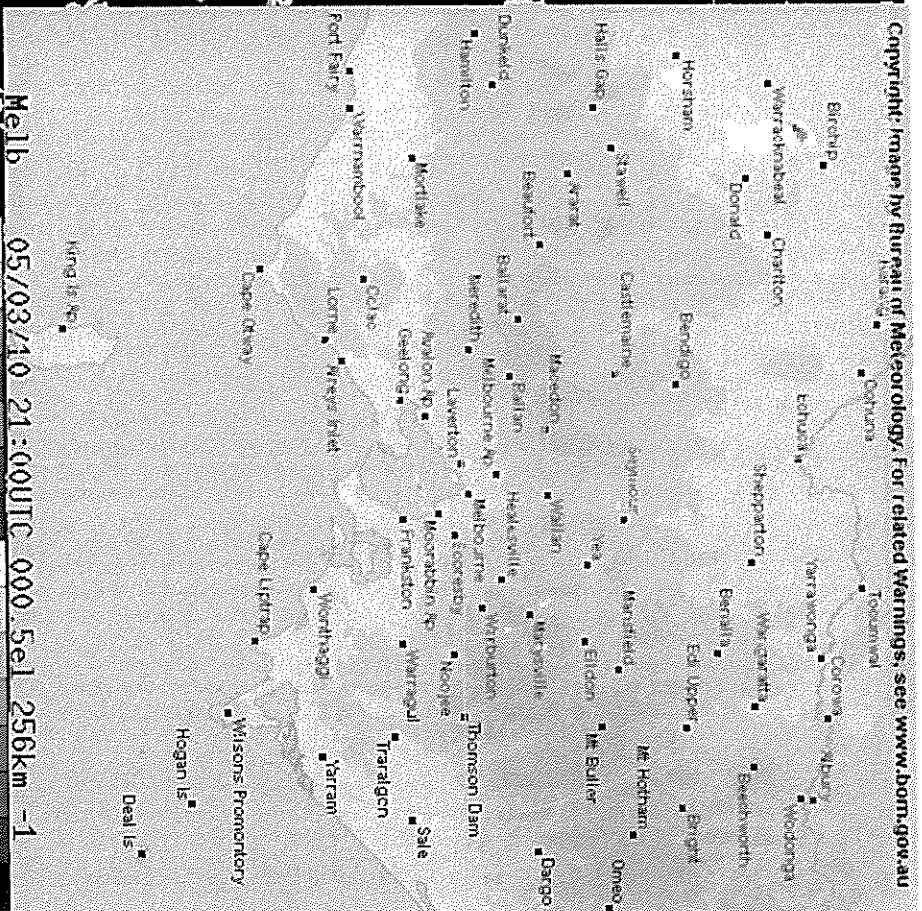
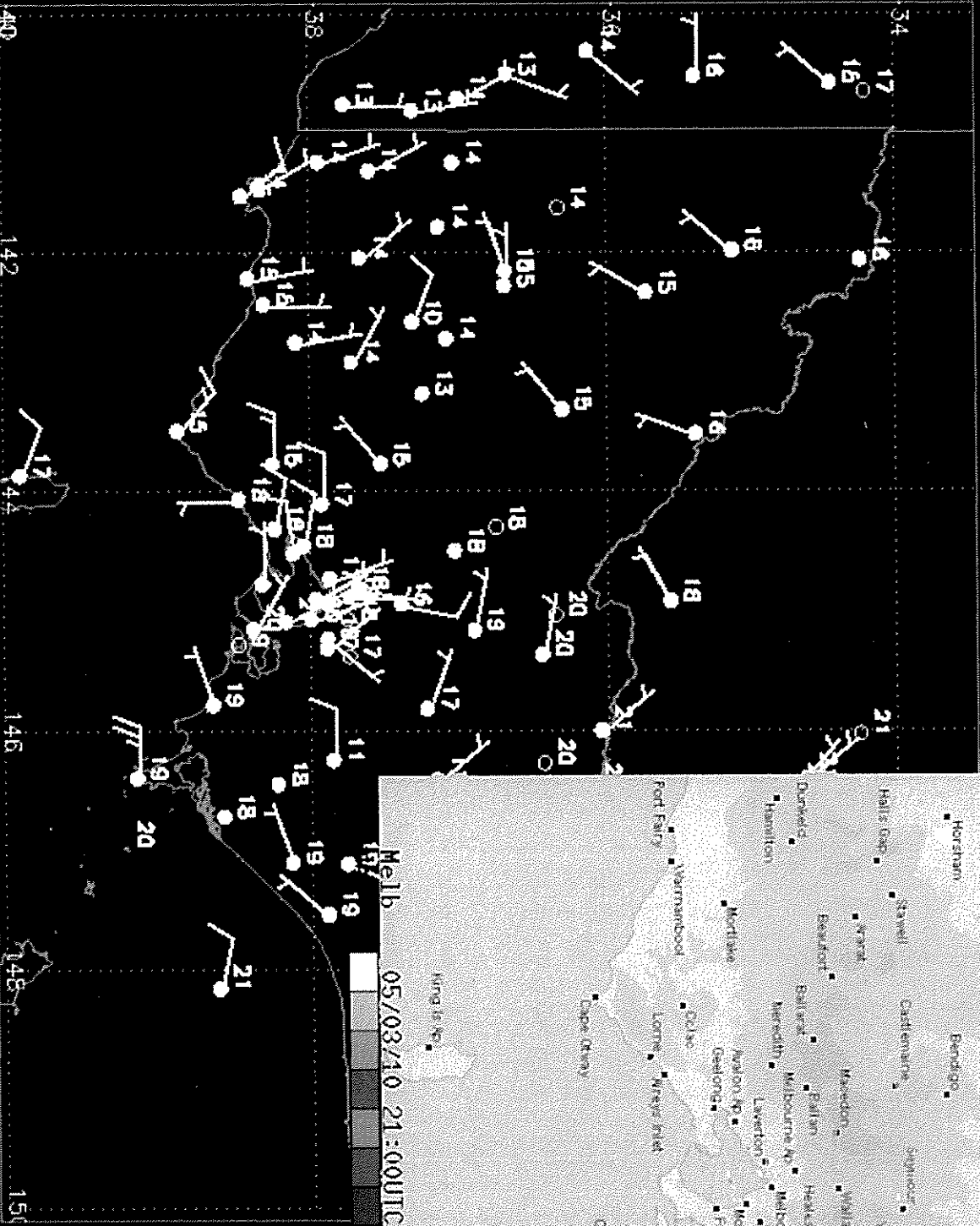
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2100 UTC

Parameter: Wind + Temp

Valid:

Automatic Weather



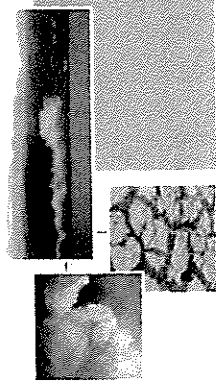
Copyright: Image by Bureau of Meteorology. For related warnings, see www.bom.gov.au

Heavy



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



Hi folks,

I see a notable setup for today in VIC and S NSW. A big broad jet around the SA cutoff low sets up upper-level diverging flow over W and central VIC (read: lift). Current storms in W VIC, W NSW and SE SA provide further evidence that the inferred lift aloft is real. **Said jet also overspreads the area with good strong flow needed for deep layer shear.**

Underneath all this very **deep moisture resides with mixing ratios of 12 g/kg through a depth of ~200 hPa** in CEN VIC into S NSW. This moisture is not going to mix out in a hurry. Lapse rates in last night's soundings from Melbourne and Wagga are pretty poor (dare I say [(C) D. Williams], monsoonal), but in the cloud free areas today we might achieve something like a 28/17 parcel that will contain some **CAPE through the lower and mid-troposphere.** This should create thermals strong and long-lived enough for the deep shear to take effect and create storm-scale rotation.

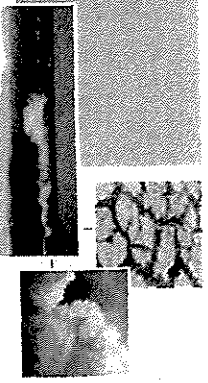


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Email from [REDACTED] (Bureau Training Centre)
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**Note: Ingredients of a major super-cell thunderstorm --
Instability (moisture at low levels with high surface
temperatures)**

**And Vertical shear (change of wind with height) at low
levels**



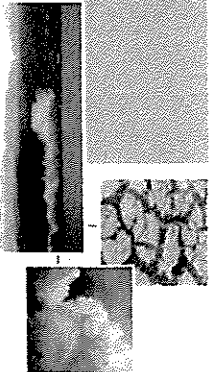
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Email from [REDACTED] (Bureau Training Centre)
0917 local time continued

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]



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