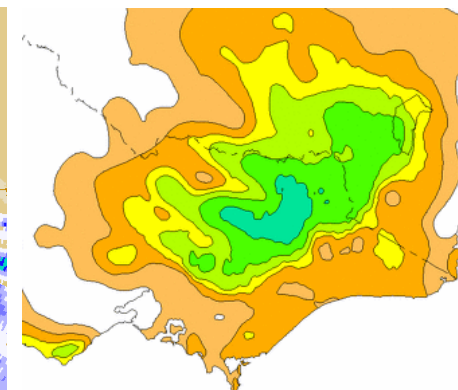
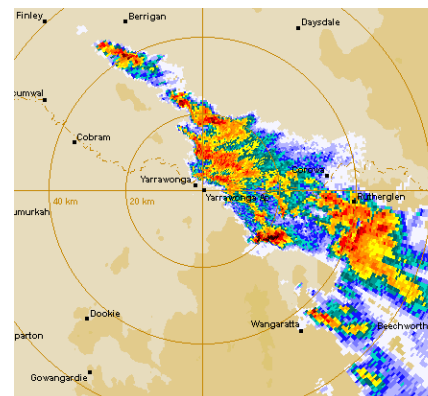
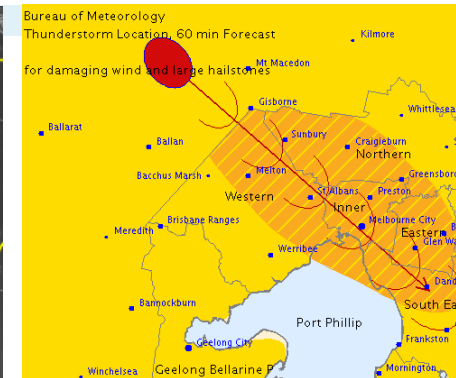
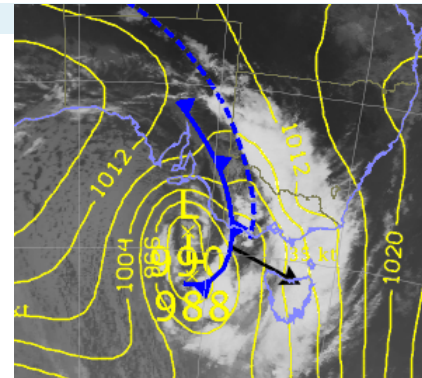
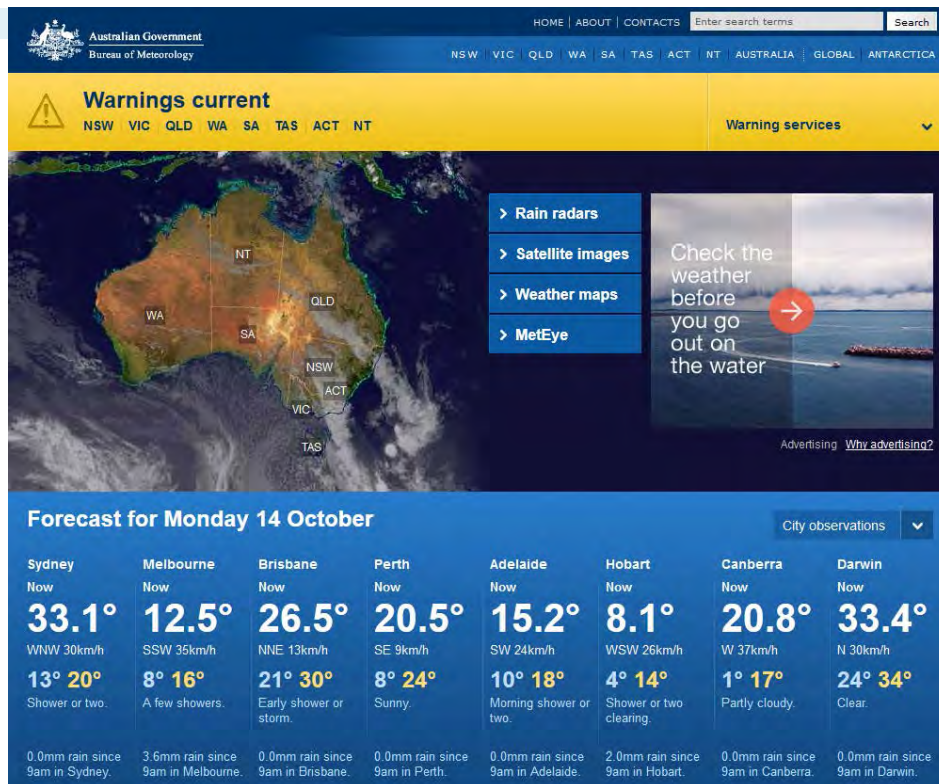


Mapping Weather Information

Robert Dahni
Bureau of Meteorology





Australian Government

Bureau of Meteorology

Bureau of Meteorology

The Bureau's mission

We provide Australians with environmental intelligence for safety, sustainability, well-being and prosperity.

ENVIRONMENTAL INTELLIGENCE

Conclusions drawn from environmental observations and models to guide decisions and actions by governments, businesses and individuals.

Dr Robert Dahni >30 years with BoM

Meteorologist
IT Officer
Programmer
Georabble

Data
Analyse
Visualise
GIS



Australian Government
Bureau of Meteorology



Australian Government
Bureau of Meteorology

www.bom.gov.au

20,000
daily average
users on site at
all times

Up to
90,000
during
severe events

45%
of visitors accessed
the website via a
mobile device
in March 2013

**Web
Advertising**
commenced
May 2013

10th
most visited
website in
Australia in
January 2013



In 2012-13, 52 million
individual users made
48 billion hits on website



Australian Government

Bureau of Meteorology

[Bureau Home](#) > [Australia](#) > [New South Wales](#) > [Forecasts](#) > [New South Wales 7-day Forecasts](#)

New South Wales 7-day Forecasts








For the full list of forecast locations see [Forecast Summary for New South Wales towns](#).

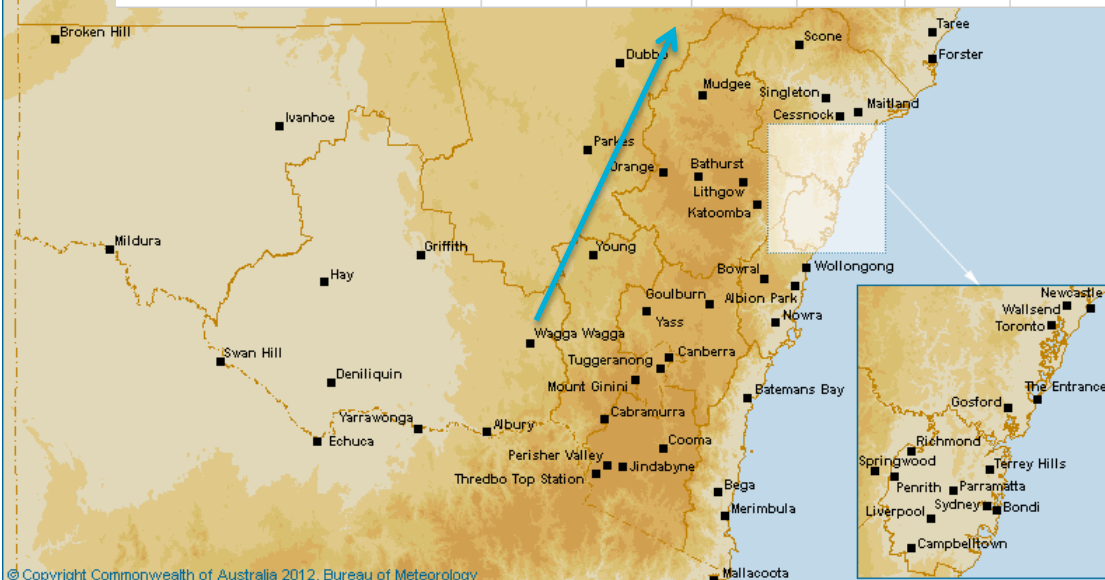
Click on the map to display the 7-day summary forecast for the location.

Wagga Wagga

Forecast issued at 4:00 pm EDT on Sunday 13 October 2013.

[Detailed Wagga Wagga Forecast](#)


	Sun. 13 Oct	Mon. 14 Oct	Tue. 15 Oct	Wed. 16 Oct	Thu. 17 Oct	Fri. 18 Oct	Sat. 19 Oct
	 Chance of a storm.	 Partly cloudy.	 Mostly sunny.	 Mostly sunny.	 Shower or two developing.	 Mostly sunny.	 Sunny.
Max. Temperature		15 °C	20 °C	26 °C	22 °C	21 °C	27 °C
Min. Temperature		3 °C	2 °C	5 °C	11 °C	2 °C	6 °C



© Copyright Commonwealth of Australia 2012, Bureau of Meteorology

Wagga Wagga 7-day Forecast

Wagga Wagga Forecast

 View the current warnings for New South Wales

Forecast issued at 4:58 pm EDT on Sunday 13 October 2013.

Forecast for the rest of Sunday



Chance of a storm.

Partly cloudy. A possible shower or thunderstorm this evening. Winds westerly 20 to 25 km/h tending southwesterly 20 to 30 km/h in the evening.

Monday 14 October



Min 3 Max 15
Partly cloudy.

Partly cloudy. Winds southwesterly 20 to 30 km/h becoming light in the evening.

Fire Danger - Low-Moderate

UV Alert from 9:40 am to 4:20 pm, UV Index predicted to reach 8 [Very High]

Tuesday 15 October



Min 2 Max 20
Mostly sunny.

Mostly sunny. Light winds.

Wednesday 16 October



Min 5 Max 26
Mostly sunny.

Mostly sunny. Winds north to northwesterly and light, increasing to 20 to 25 km/h during the day.

Thursday 17 October



Min 11 Max 22
Shower or two developing.

Partly cloudy. A shower or two in the afternoon and evening. Winds north to northwesterly 20 to 25 km/h turning westerly 20 to 30 km/h during the morning then tending southwesterly 15 to 20 km/h during the evening.

Friday 18 October



Min 2 Max 21
Mostly sunny.

Mostly sunny. Winds south to southwesterly and light.

Saturday 19 October



Min 6 Max 27
Sunny.

Sunny. Light winds.

Sunday 20 October



Min 11 Max 33
Sunny.

Sunny. Light winds.

The next routine forecast will be issued at 5:00 am EDT Monday.



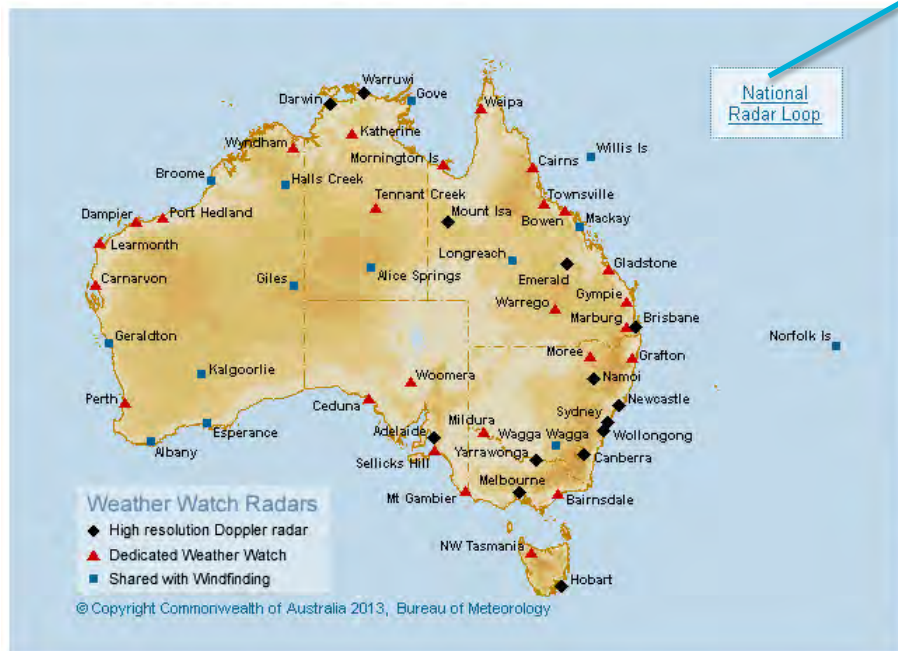
Australian Government

Bureau of Meteorology

[Bureau Home](#) > [Australia](#) > [Radar Images](#)

Radar Images

Select location to see its image (or use Radar sites tables: [NSW/ACT](#) | [VIC](#) | [QLD](#) | [WA](#) | [SA](#) | [TAS](#) | [NT](#))

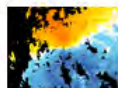


Dedicated Weather Watch Radars should be online at all times, with images updated approximately every 10 minutes, unless there are technical difficulties or scheduled maintenance.

Part-time Windfinding Radars have routine periods when weather watch coverage is not available [See availability table](#).

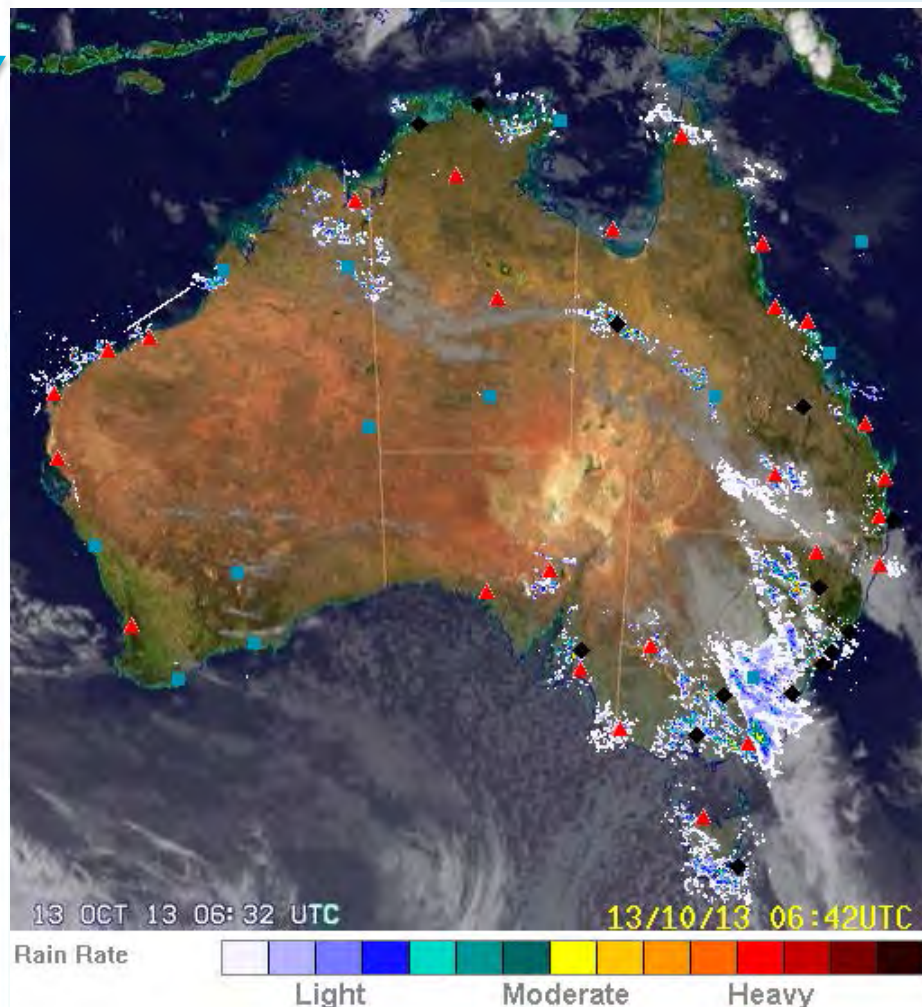


RND/SUP Radar Network and
Doppler Services Upgrade Project



SREP Strategic Radar
Enhancement Project

Radar Network





Australian Government

Bureau of Meteorology

Mapping Radar Coverage

-35.055093, 147.349251
Google Static Maps API



Radar Coverage Shapefile
"GIS" Programming
Mapper (application)
"Mercator" Map Projection

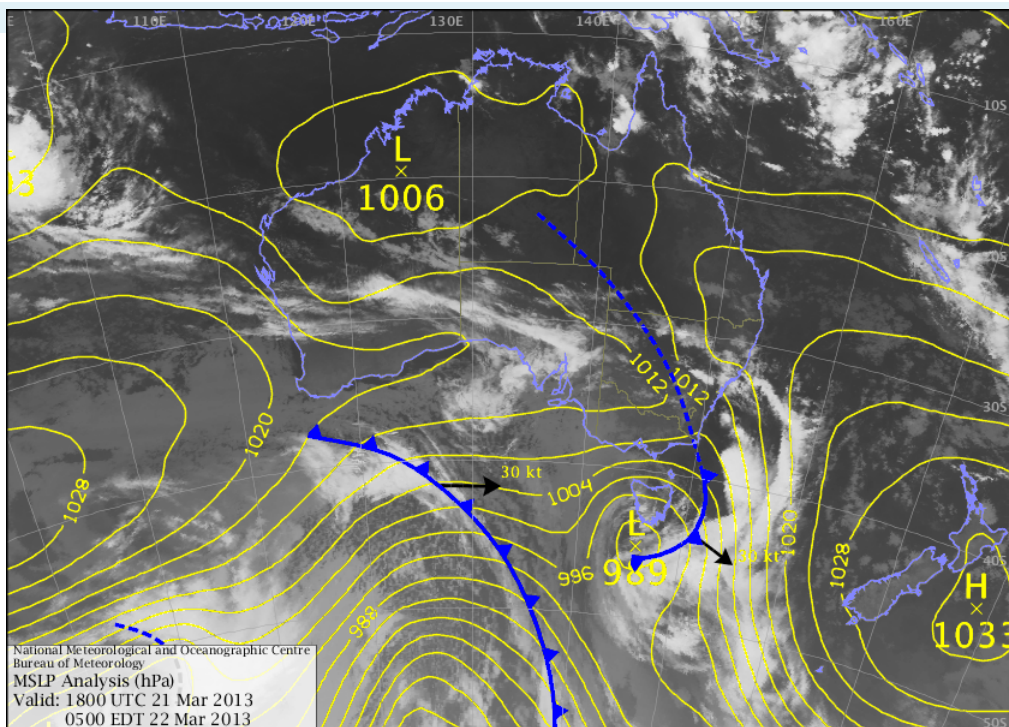




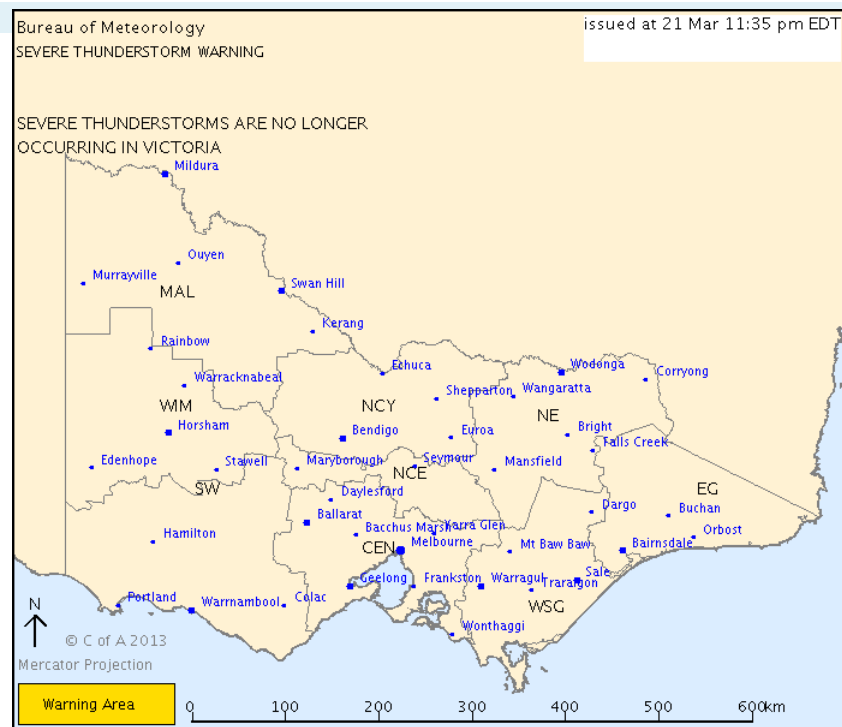
Australian Government

Bureau of Meteorology

Significant Weather Event



Synoptic Chart



Severe Thunderstorm Warning

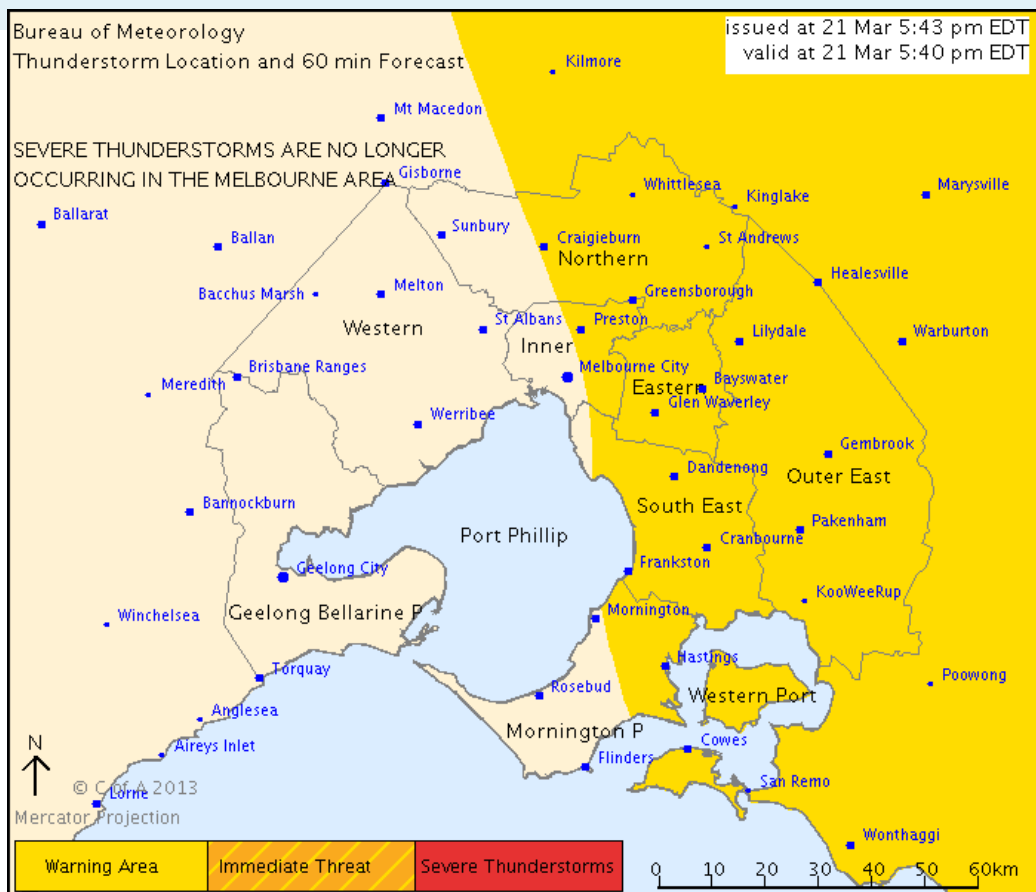
Cold front crossed Victoria. Widespread damaging winds were experienced.
The front also triggered numerous thunderstorms.



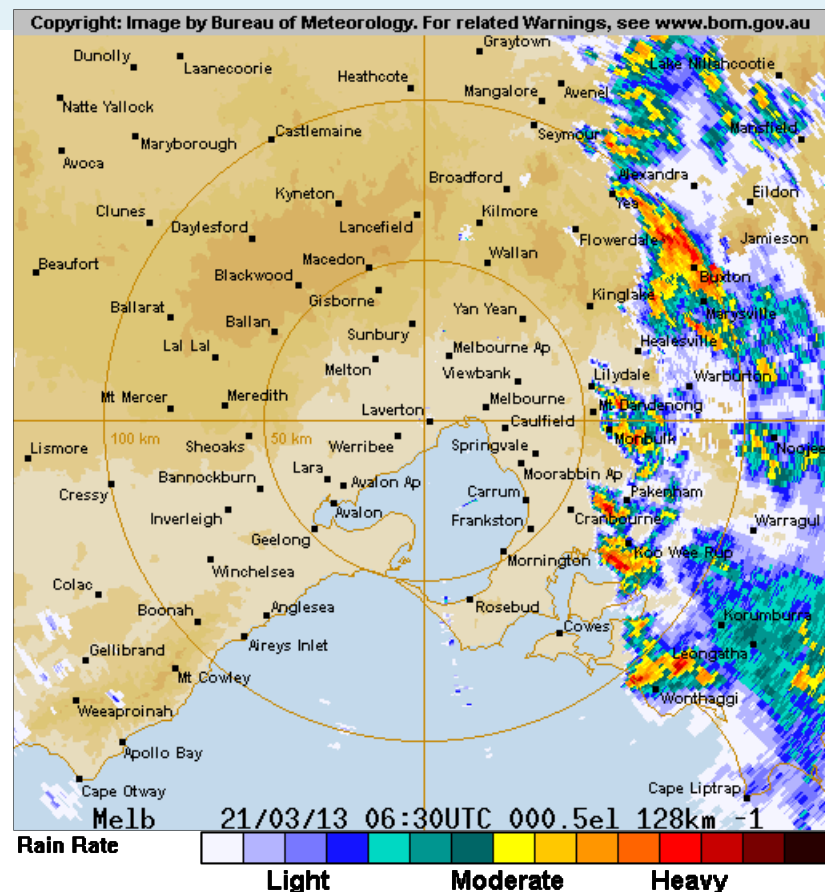
Australian Government

Bureau of Meteorology

Thunderstorms - Melbourne



Severe Thunderstorm Forecast



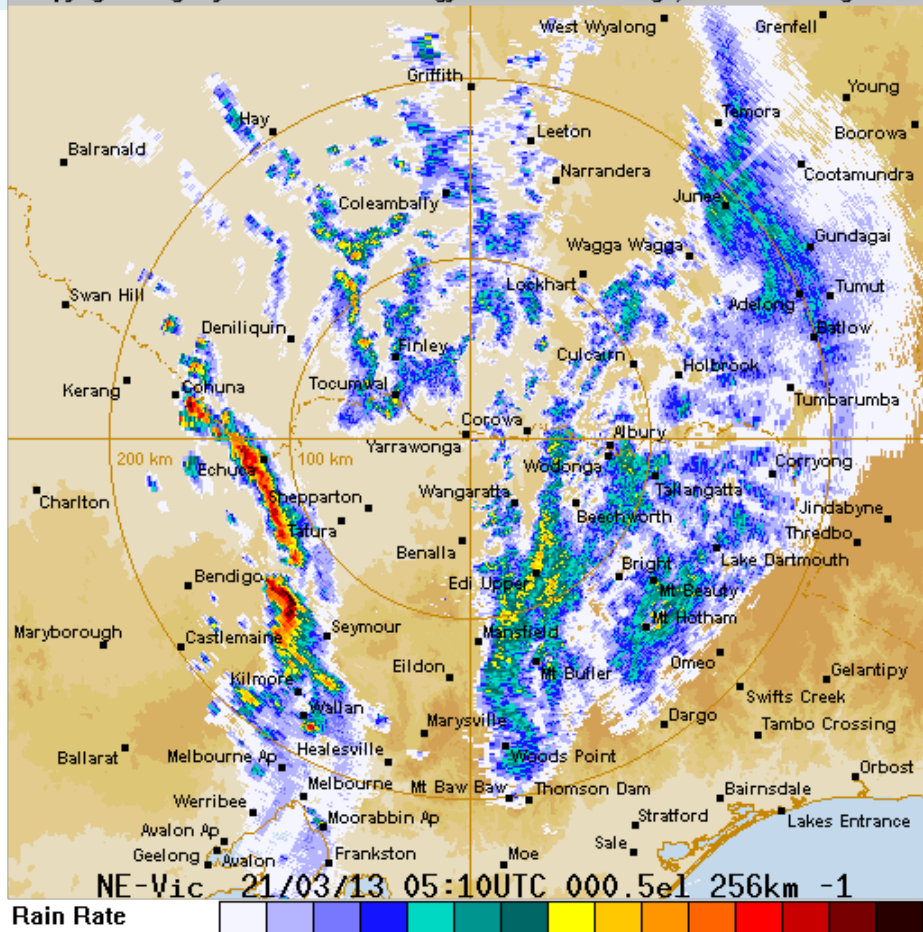
Melbourne Radar



Australian Government
Bureau of Meteorology

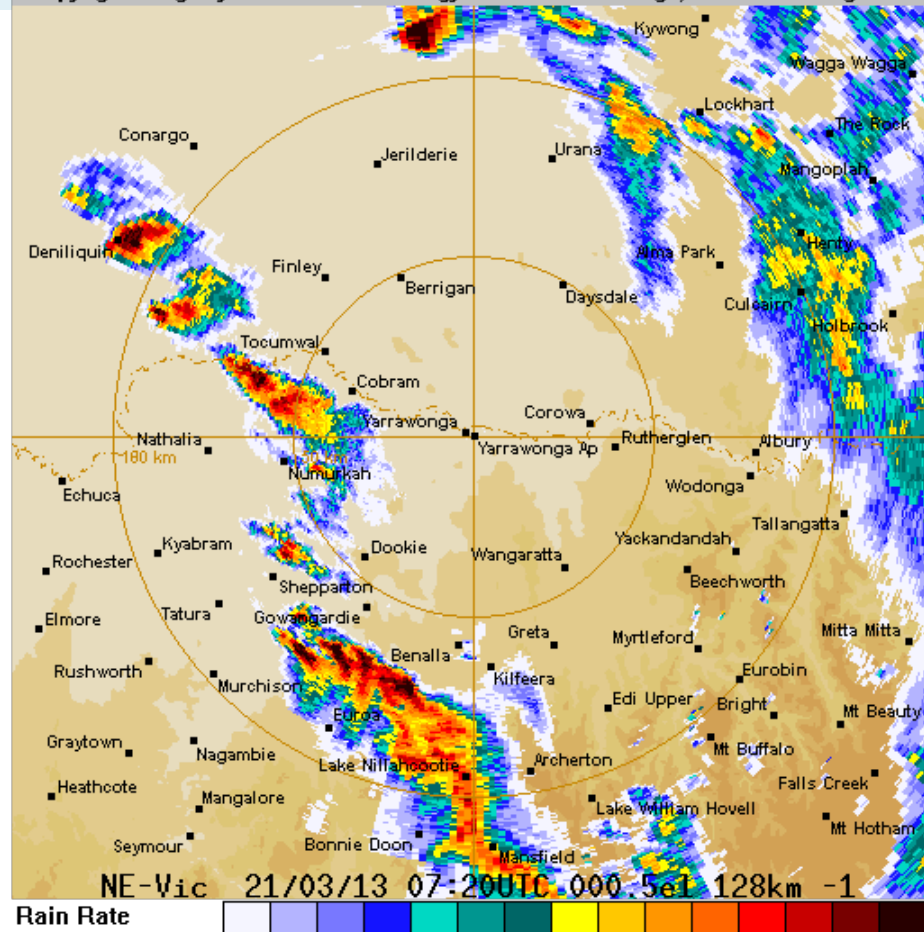
Supercells - Yarrawonga

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



Rain Rate
Light Moderate Heavy
256km

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



Rain Rate
Light Moderate Heavy
128km



Australian Government

Bureau of Meteorology

Spatial Radar Data

Radar Archive

Yarrawonga

0720 UTC

21 March 2013

Radar Data

Polar Data Format

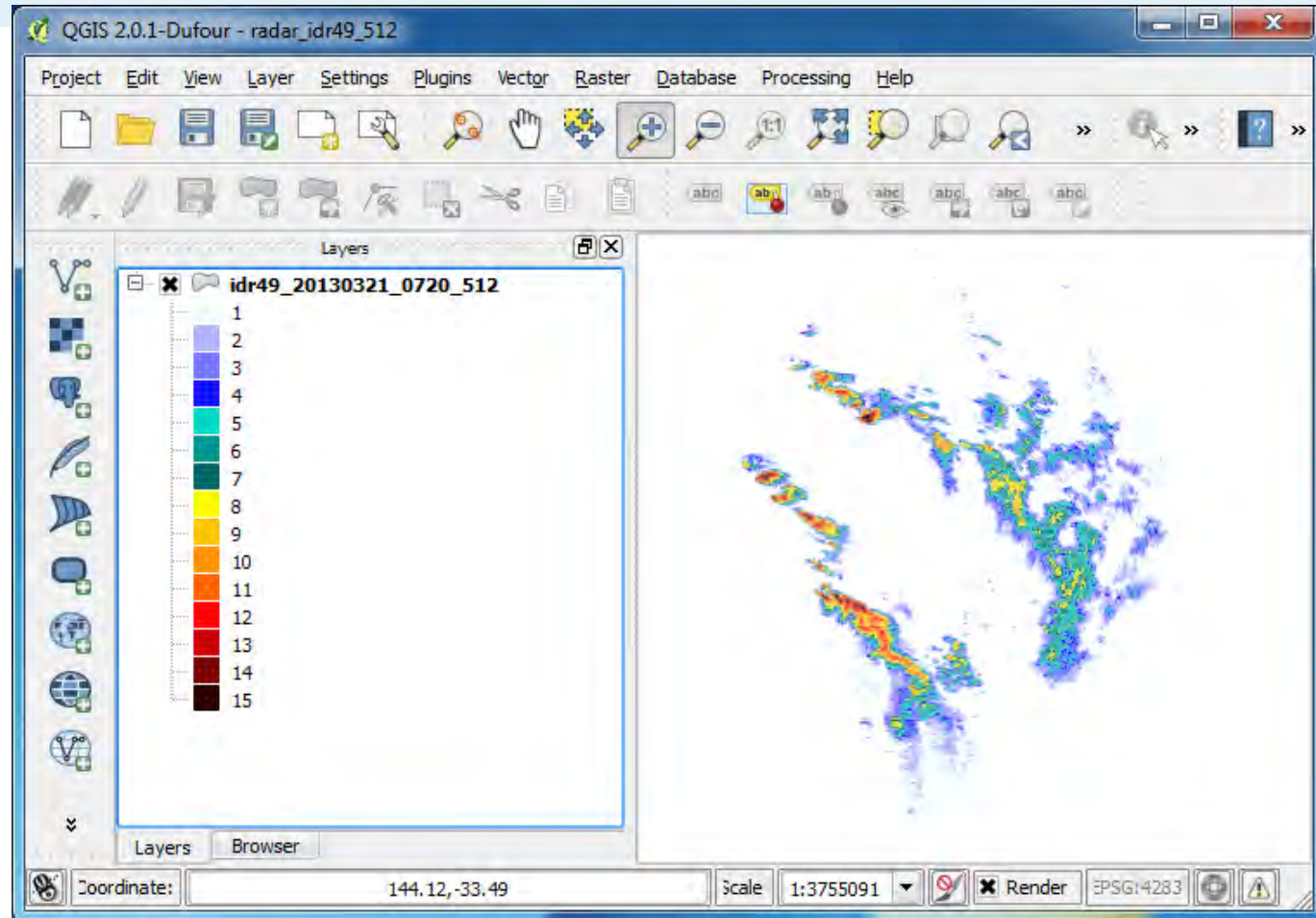
Programming

Polygon Shapefile

QGIS 2.0

Radar Symbology

Validate Data





Australian Government

Bureau of Meteorology

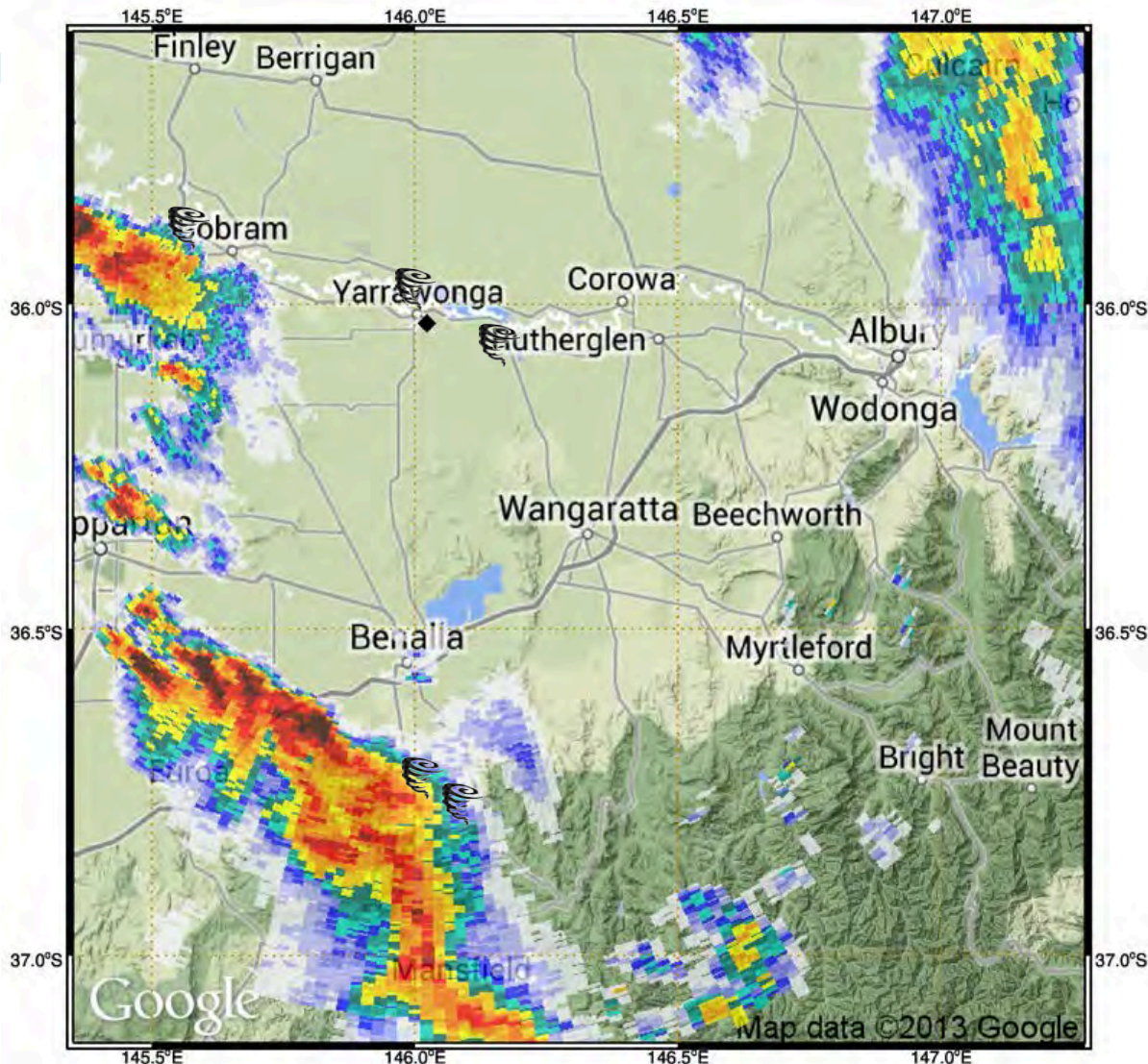
Mapping Radar Data

Map Centred at Wangaratta
No Elevation Background
Revised Location Names
"GIS" Programming
Mapper (application)
"Mercator" Map Projection

 Tornadoes Observed

Yarrawonga Radar Image

Google Map Background
(radar image transparency)





Australian Government

Bureau of Meteorology

Climate Maps - Recent Conditions

SE Australian Rainfall Totals (mm) 22nd March 2013

Product of the National Climate Centre

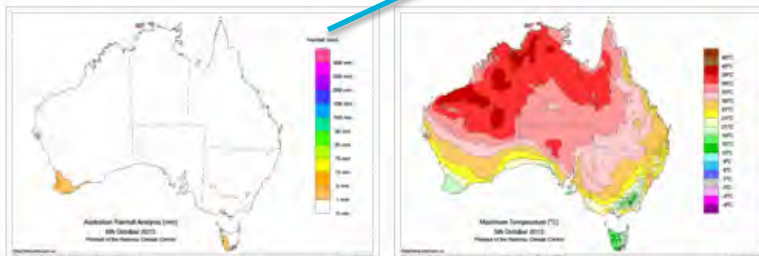
[Bureau Home](#) • [Climate](#) • [Maps - Recent & Past Conditions](#)

Maps - Recent & Past Conditions

Maps

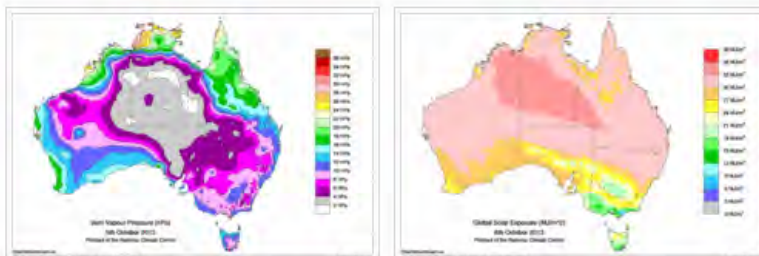
About Maps & Data

High resolution maps and data, ranging from the most recent day, back to 1900 for rainfall



► Rainfall

► Temperature



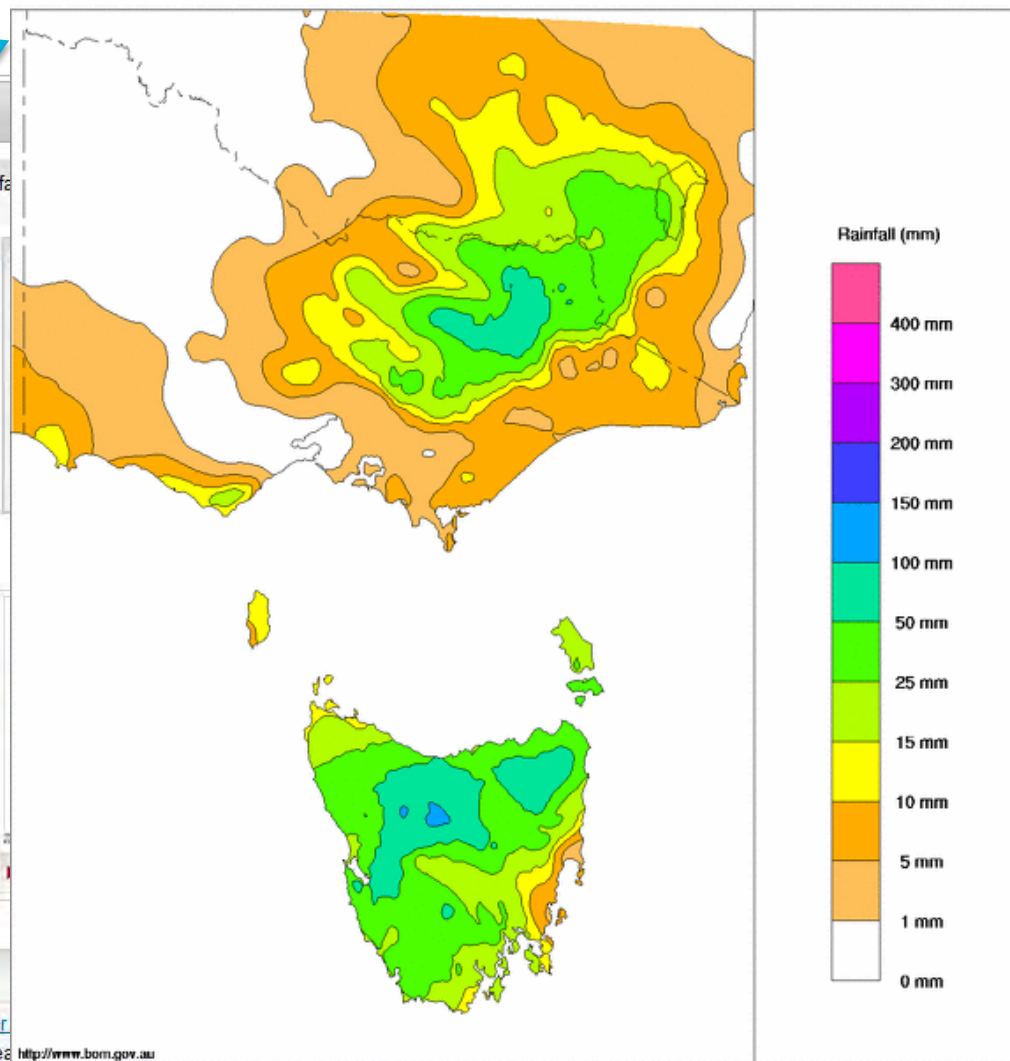
► Humidity (Vapour pressure)

► Solar exposure

Australian Water Availability Project

The system used to produce this information was developed under the [Australian Water](#)

This project was part supported by the National Heritage Trust with partners in the Bureau of Meteorology <http://www.bom.gov.au>





Australian Government

Bureau of Meteorology

[Bureau Home](#) > [Climate](#) > [Maps of average conditions](#)

Maps of average conditions

[About climate maps](#)

Use these maps to explore the variability of Australia's size, geography and location across the continent and its nearby islands about average as well as more extreme conditions.

Rainfall & temperature



Rainfall

- Mean rainfall
- Decadal & multi-decadal rainfall
- Rainfall percentiles
- Rainfall percentages
- Rainfall variability
- Days of rain

Related maps

- Recent & historical rainfall
- Rainfall and river information

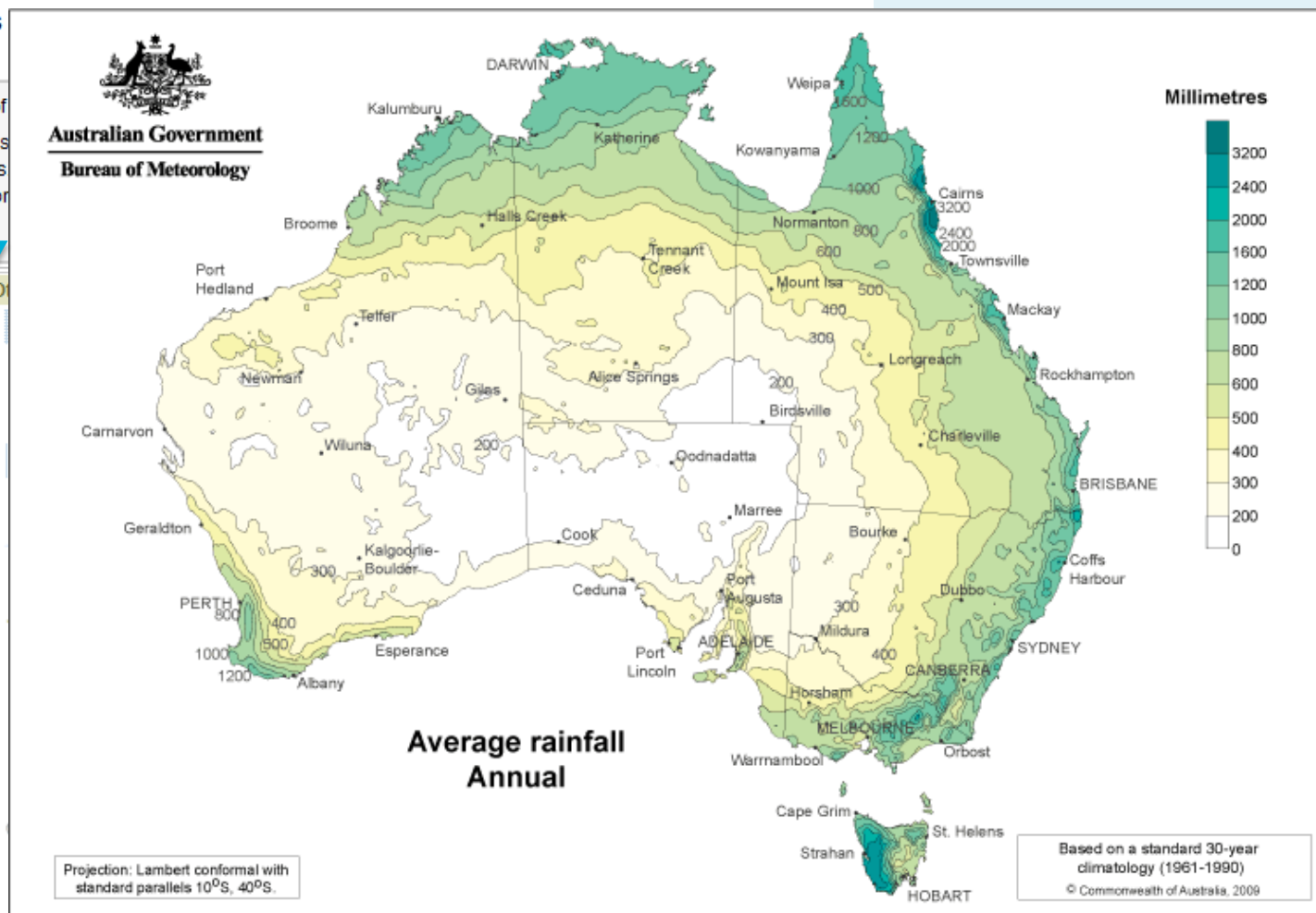


Temperature

- Average max, min & mean temperature
- Decadal & multi-decadal temperature
- Indoor apparent temperature
- Temperature percentiles
- Potential frost days
- Heating & cooling degree days

Related maps

- Recent & historical temperature





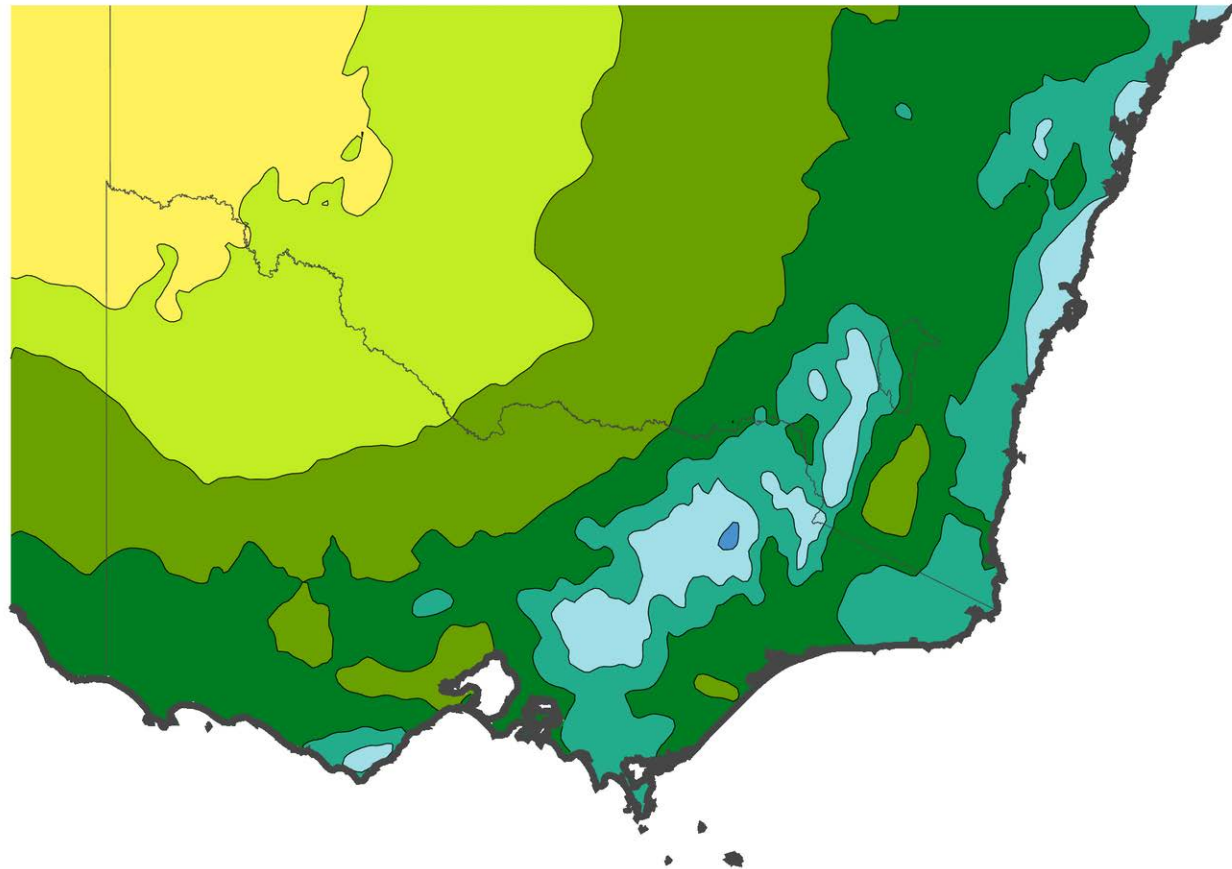
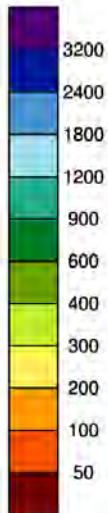
Australian Government

Bureau of Meteorology

Mapping Climate Data

AWAP Data
"GIS" Programming
Climate Averages
Colour Scale
(NZ Climate Maps)

Average Annual (1961–1990)
Rainfall (mm)





Australian Government
Bureau of Meteorology

[Bureau Home](#) > [Water and the Land](#) > Rainfall: Feature - Forecast Rainfall

Rainfall: Forecast Rainfall

Forecast for Thursday 17 October 2013

[About forecast rainfall](#)

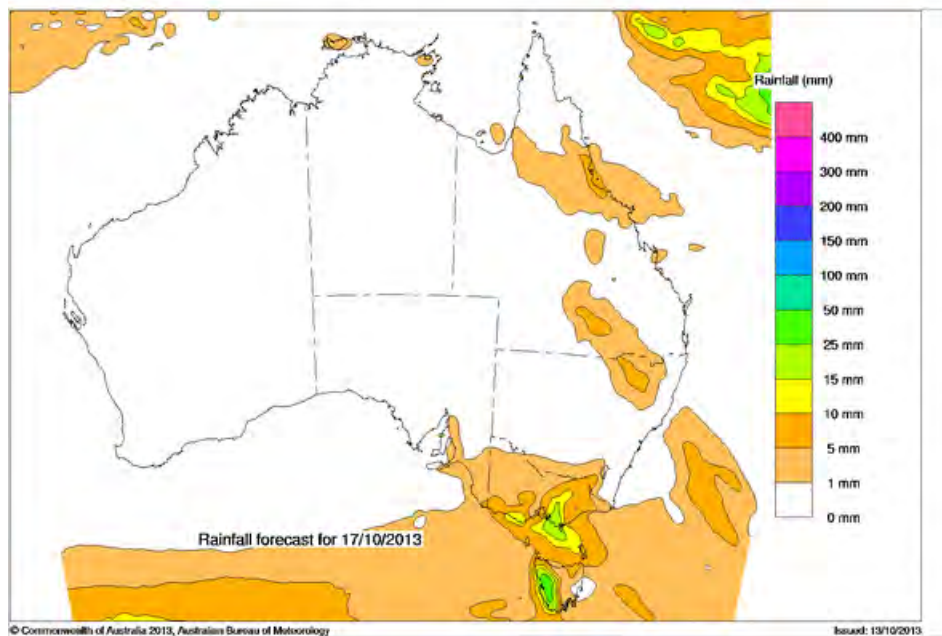
These rainfall forecasts are produced from computer models. As they contain no input from weather forecasters, it is important to also check the Bureau's local forecasts and warnings.

Controls

Map ☒ Forecast Rainfall ☐ Chance of Rainfall ☐ Total Forecast Rainfall

Date 17/10/2013 - Thursday

Location

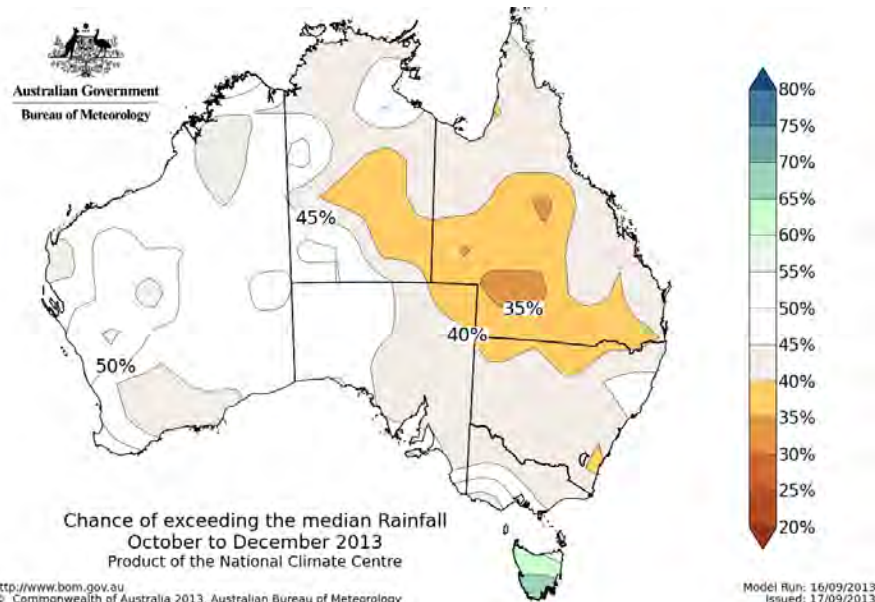


© Commonwealth of Australia 2013, Australian Bureau of Meteorology

Issued: 13/10/2013

Issued at: 06:23 pm EST Sunday 13 October 2013

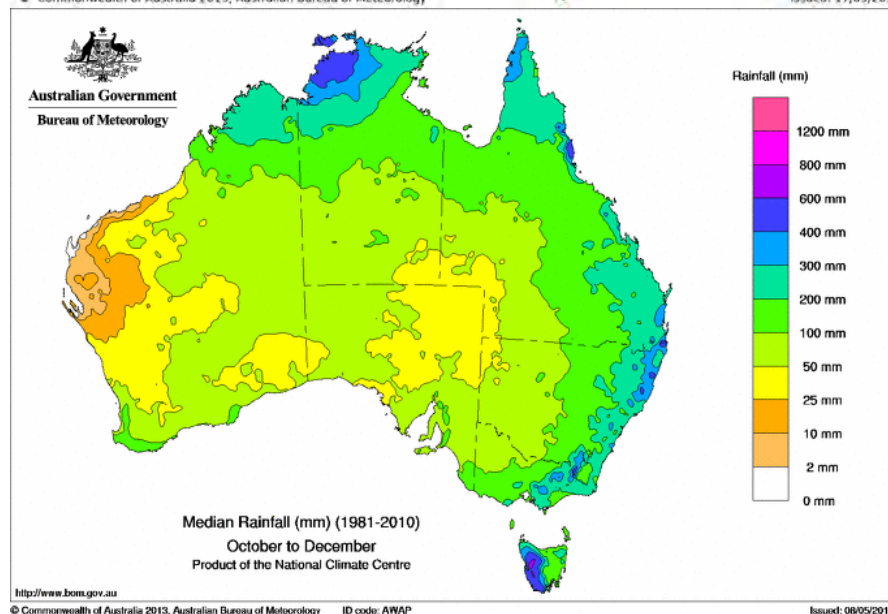
Rainfall Forecast - Outlook



Chance of exceeding the median Rainfall
October to December 2013
Product of the National Climate Centre

<http://www.bom.gov.au>
© Commonwealth of Australia 2013, Australian Bureau of Meteorology

Model Run: 16/09/2013
Issued: 17/09/2013



Median Rainfall (mm) (1981-2010)
October to December
Product of the National Climate Centre

<http://www.bom.gov.au>

© Commonwealth of Australia 2013, Australian Bureau of Meteorology ID code: AWAP

Issued: 06/05/2013



Australian Government
Bureau of Meteorology

MetEye

[Bureau Home](#) > [Australia](#) > [MetEye](#)

MetEye - you

MetEye™ Disclaimer [experimental service]

Cancel I Accept

View the current

For official forecasts and latest observations, the Bureau advises you to [check the Bureau website directly](#). MetEye™ does not provide any warnings. See the [warnings pages on the Bureau website](#). For Tropical Cyclone warnings in the Australian region please see the [Current Tropical Cyclones](#) page and the [Bureau website](#).

LATEST WEATHER

Current Temp, Rain

- ☒ Current temperature
Updated 10 Oct 20
- ☐ Current relative humidity
- ☐ Rainfall since 9am
- ☐ Rainfall in the last 24 hours
- ☐ Wind speed and direction
- ☐ Wind speed and direction
- ☐ Current Sea Surface Temperature

Clear Info

Overlay

- ☒ Latest rain radar
Light Mod Heavy
Updated 10 Oct 20
- ☐ River conditions
- ☐ Current cloud cover

FORECASTS

Rainfall Forecasts

Temperature Forecasts

Storms, Snow, Fog

Humidity Forecasts

Wind Forecasts

Waves Forecasts

What is MetEye™? MetEye™ is an online mapping tool or Geographic Information System (GIS), used to visualise weather data for Australia. MetEye™ contains information about Bureau Forecasts and Observations. It is provided as a public service and data should be used entirely at your own risk. MetEye™ does not replace the Bureau's [official forecasts and warnings](#). It is an experimental service and should not be used for critical decision making.

- The Bureau accepts no responsibility for any loss or damage which may arise from using the data.
- The Bureau cannot guarantee the accuracy or completeness of all data contained, all information should be considered illustrative and indicative.
- Data for individual locations may not have been individually quality controlled.
- For observational data sets (i.e. sea surface temperature, satellite imagery and weather station observational data etc.) the "time of update" is provided as an indicative guide to the currency of the data elements.
- Data sets included here do not necessarily represent the official Bureau forecasts and they are not all routinely verified.
- The Bureau does not warrant that functions contained in MetEye™ content will be uninterrupted or error free, that defects will be corrected, or that the Bureau or the server that makes it available are free of viruses or bugs.
- Geographic names used in this viewer may not be aligned to geographic names of Australia provided by members of the [Committee for Geographic Names in Australasia](#) as the Bureau use location information based on the placement of its observational instrumentation.

Additionally, as the forecasts and [warnings](#) for each state and territory are prepared by the responsible Regional Forecast Centre, located in each capital city, some inconsistencies may also appear at the borders. The Bureau can not ensure continuity over all data types especially at three hourly intervals, so some discrepancies will usually be apparent. The Bureau is introducing procedures and tools to improve cross-border consistency.

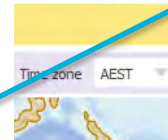
Access the Service

By pressing 'I Accept' you:

- are deemed to have read and accepted the conditions described here and
- also noted the conditions set out in the Bureau's [Copyright Notice](#) and [Disclaimer](#) statements relating to the use of the information on this site and
- acknowledge that the pages contained are experimental and
- acknowledge that MetEye should not be used for critical decision making.

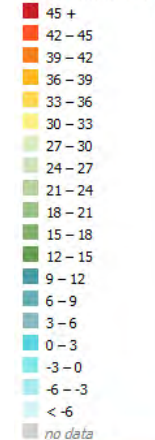
Cancel I Accept

TEXT VIEWS



LEGEND

Temperature (°C)



What is MetEye™?

MetEye™ is an online mapping tool or Geographic Information System (GIS), used to visualise weather data for Australia.

Front-end
OpenLayers
ExtJS
GeoExt
jQuery

Back-end
MapServer
MapCache
PostGIS



Australian Government
Bureau of Meteorology

MetEye - Wagga Wagga

Wagga Wagga Weather (beta)

MetEye - your eye on the environment™

View the current warnings for Australia

LATEST WEATHER

Current Temp, Rain, Wind ...

- ☒ Current temperature (°C)
Updated 13 Oct 2013, 3:52 PM AEST
- ☐ Current relative humidity (%)
- ☐ Rainfall since 9am (mm)
- ☐ Rainfall in the last 10 minutes (mm)
- ☐ Wind speed and direction (km/h)
- ☐ Wind speed and direction (knots)
- ☐ Current Sea Surface Temperature

Clear Info

Overlay

- ☒ Latest rain radar
Light Mod Heavy Offline
Updated 13 Oct 2013, 3:50 PM AEST
- ☐ River conditions
- ☐ Current cloud cover

FORECASTS

Rainfall Forecasts

Temperature Forecasts

Storms, Snow, Fog, Frost ...

Humidity Forecasts

Wind Forecasts

Waves Forecasts

FAQ | MetEye Disclaimer | Metadata



TEXT
VIEWS

Forecast for Wagga Wagga

See text views for location

Save location

	Sun. 13 Oct	Mon. 14 Oct	Tue. 15 Oct	Wed. 16 Oct	Thu. 17 Oct	Fri. 18 Oct	Sat. 19 Oct
Max (°C)	-	15	20	26	22	21	27
Min (°C)	-	3	2	5	11	2	6
Chance of rain (%)	-	5	5	5	40	5	5
Rainfall range (mm)	-	0	0	0	0 to 1	0	0
Issued 13 Oct 2013	Detail	Detail	Detail	Detail	Hide	Detail	Detail

Thursday: Shower or two developing.

	2.00 AM	5.00 AM	8.00 AM	11.00 AM	2.00 PM	5.00 PM	8.00 PM	11.00 PM
Temperature (°C)	14	14	13	17	22	18	11	7
Wind Direction	NNW	NNW	W	WSW	WSW	WSW	WSW	WSW
Wind Speed	26	26	20	24	26	31	19	17
<input checked="" type="radio"/> km/h <input type="radio"/> knots								

Wagga Wagga

Tumut

35.16°S, 148.08°E

View the current warnings for New South Wales

Change location Start typing, then select from list (town, city, postcode or lat/lon)

Locate

Find Me

Forecast

Issued at 4:00 pm EDT on Sunday 13 October 2013.

Rest of
Sunday

Chance of a storm.

When will it rain?

	Chance of any rain	Expected Rainfall
2:00 pm	10%	0.2 mm
5:00 pm	10%	0.2 mm
8:00 pm	5%	0 mm
11:00 pm	5%	0 mm
2:00 am	0%	0 mm
5:00 am	0%	0 mm

Mon 14 Oct 3°C 15°C Partly cloudy.

Chance of any rain: 5% Rainfall amount: 0 mm

The days ahead

Tue 15 Oct 2°C 20°C Mostly sunny.

Chance of any rain: 5% Rainfall amount: 0 mm

Wed 16 Oct 5°C 26°C Mostly sunny.

Chance of any rain: 5% Rainfall amount: 0 mm

Thu 17 Oct 11°C 22°C Shower or two developing.

Chance of any rain: 40% Rainfall amount: 0 to 1 mm

Fri 18 Oct 2°C 21°C Mostly sunny.

Chance of any rain: 5% Rainfall amount: 0 mm

Sat 19 Oct 6°C 27°C Sunny.

Chance of any rain: 5% Rainfall amount: 0 mm



Australian Government

Bureau of Meteorology

MetEye - Radar

MetEye - your eye on the environment™

[i](#) [?](#) [🗨](#) [FAQ](#) | [MetEye Disclaimer](#) | [Metadata](#)

[TEXT VIEWS](#)

View the current warnings for Australia

LATEST WEATHER

Current Temp, Rain, Wind ...

- ☐ Current temperature (°C)
- ☐ Current relative humidity (%)
- ☐ Rainfall since 9am (mm)
- ☐ Rainfall in the last 10 minutes (mm)
- ☐ Wind speed and direction (km/h)
- ☐ Wind speed and direction (knots)
- ☐ Current Sea Surface Temperature

Clear

Info

Overlay

☒ Latest rain radar

☐ Light ☐ Mod ☐ Heavy ☐ Offline

Updated 13 Oct 2013, 3:40 PM AEST

☐ River conditions

☐ Current cloud cover

FORECASTS

Rainfall Forecasts

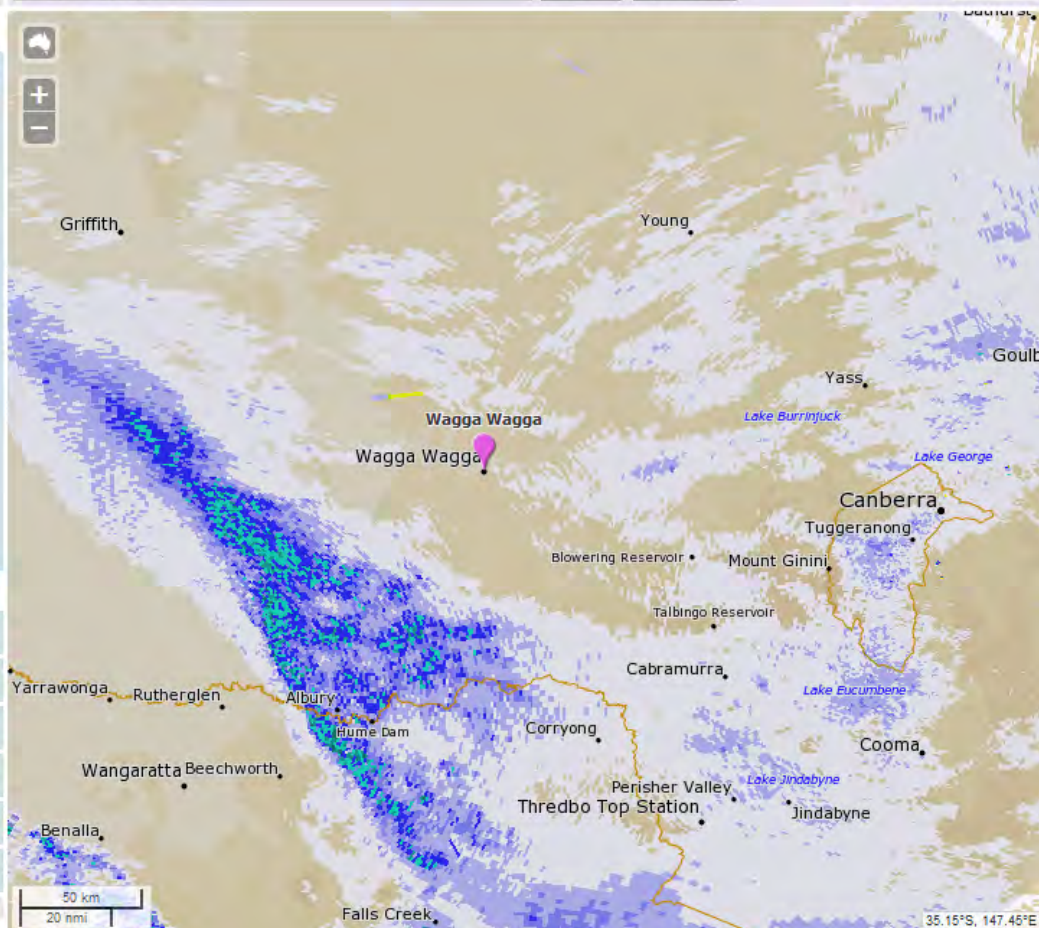
Temperature Forecasts

Storms, Snow, Fog, Frost ...

Humidity Forecasts

Wind Forecasts

Waves Forecasts



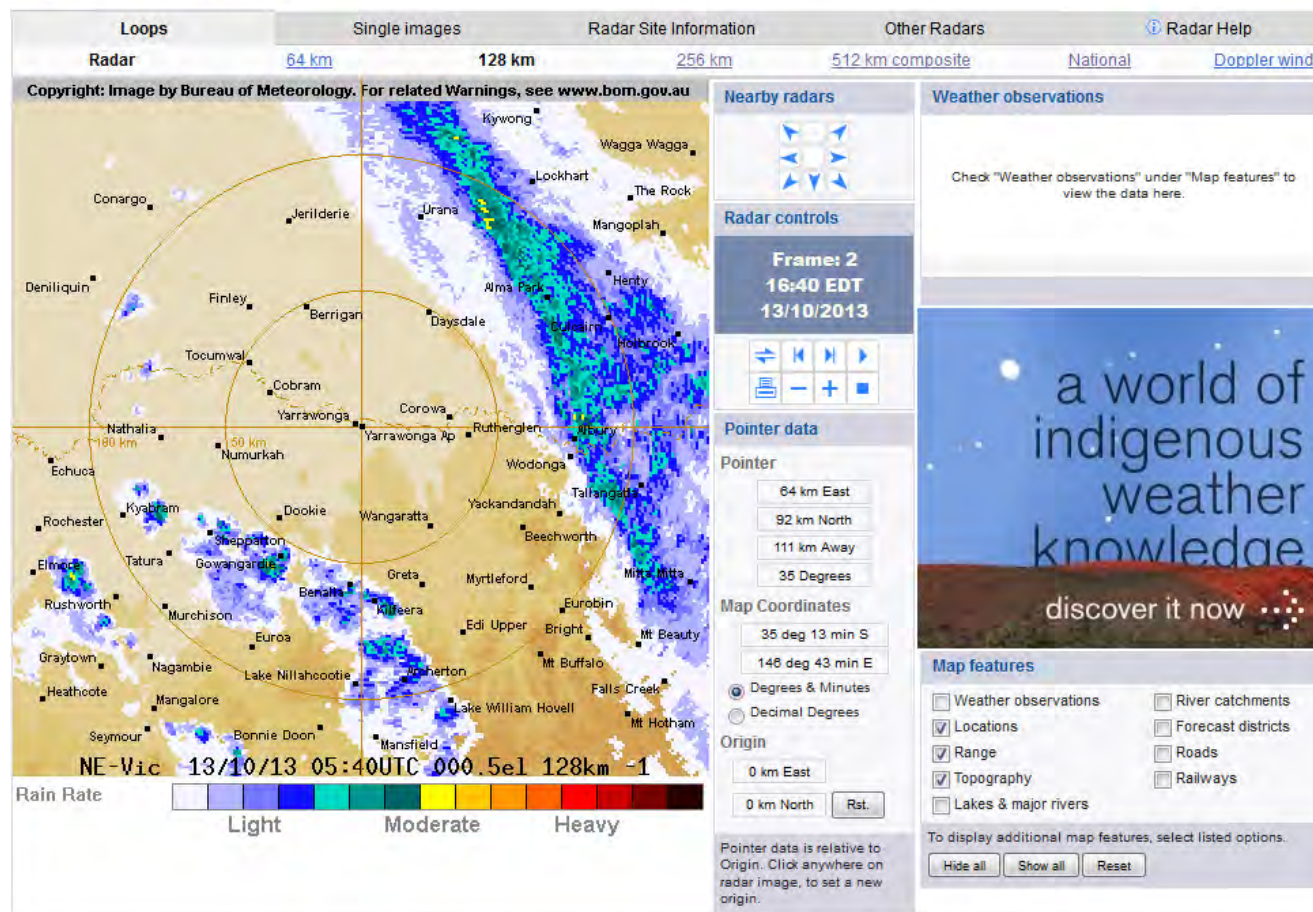


Australian Government
Bureau of Meteorology

Radar Viewer

128 km Yarrawonga Radar Loop

[View the current warnings for Victoria](#)



Geo-referencing
Gnomonic Projection
Lat/Lon Corner Points

Australia-wide Mosaic
6-10 min Updates
Overlapping Radars
Radar Outages
High-Resolution

Do-It-Yourself
Radar Images
Polar Radar Data
Volumetric Data



Australian Government

Bureau of Meteorology

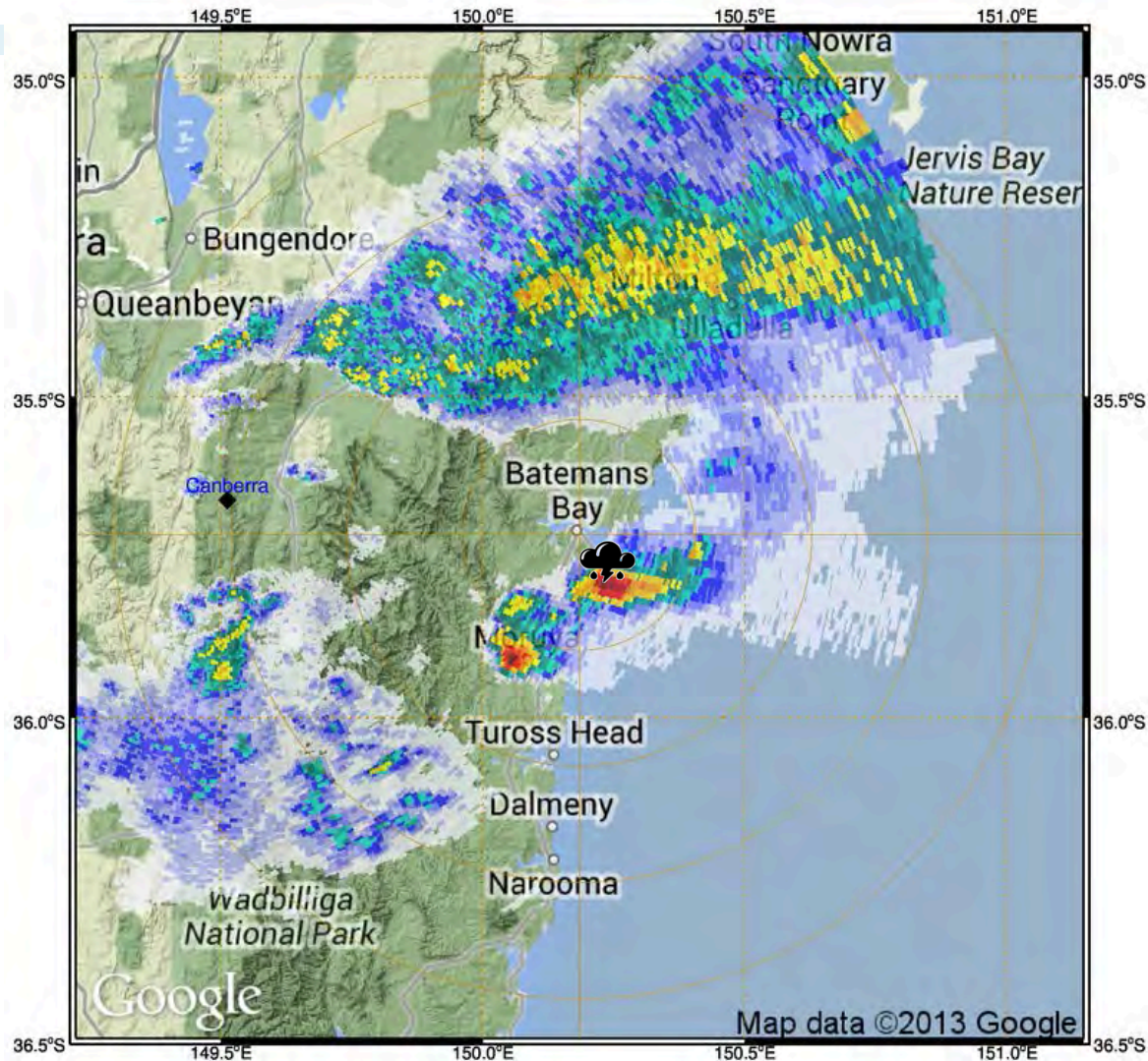
Hail Storm Hits Malua Bay

Map Centred at Batemans Bay
No Elevation Background
Revised Location Names
"GIS" Programming
Mapper (application)
"Mercator" Map Projection

 Hail Storm Observed

Canberra Radar Image
0706 UTC 14 October 2013

Google Map Background
(radar image transparency)





Australian Government

Bureau of Meteorology

Thank you...



Rain?



Pocket Weather



Rain Brain



Don't Get Wet

Robert Dahni
(03) 9669 4213
r.dahni@bom.gov.au

Robert Dahni
0416 053 835
rdahni@metvis.com.au