

Interact with Us

Train



Navigation
 On Water Rip Tour
 Weather
 Foredeck Essentials

Race



Destination Races to:
 Devonport, King Island, Hobart
 Apollo Bay, Port Fairy,
 Coastal Sprints

Volunteer



Support
 Many Roles
 Race Management, Media,
 Training Support, Mentoring





1

House rules & explanation


The sessions will go for approximately 2 hours including presentations, chats and exercises
 There will be a 10 min break in the middle


Teams – protocols and tools


Chat – general chit-chat. Attendee participation is very much encouraged 


Q&A – specific Questions & Answers 

- o Moderator – might not raise a question to the presenter if they know the topic is coming up

Raise hand 

Audio and Video reactions 

Polls, Quiz's 

Select "View" to  Focus on content" will provide a better experience

2



Greg Patten



Simon Dryden

3

Weather for Sailors

Module 1, Fundamentals and planning for a 3+day Coastal Passage.

This is a resource page for those enrolled into the Weather for Sailors. Please bookmark this page as additional resources will be added throughout the course. For course dates, please [click here](#)

Teams Link

Join the course via this Team link which will be open 30 mins before the starting time of 7pm on each night of the course. Join early [via this link](#)


Pre Course Learning

We ask all students to complete some pre-learning prior to attending the instructor led sessions or alternative before the start on night 2 on June 18th. The ORCV uses Learnupon for delivery of this content with an email sent on how to login. Completing this online content is estimated to take roughly 3 - 4 hours.

4

Poll


What type boating do you do



5

Poll

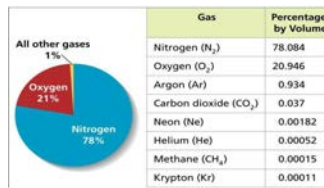
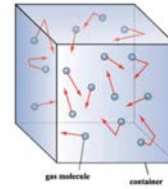
What are the most important things for you for a sail in the bay



6

Some Basic Concepts

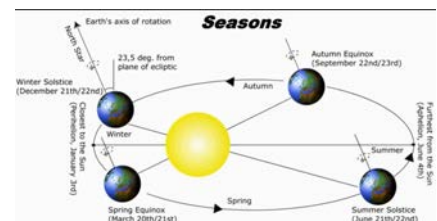
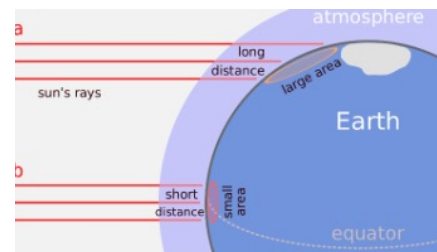
- Weather
- Climate
- Air
- Temperature
- Pressure
- Humidity
- Wind - speed and direction
- Force – causes things to
- accelerate



7

What Causes Changes in the Weather?

- Heating of the Earth by the Sun
- Uneven due to terrain, oceans, cities causing temperature differences
- Equatorial Regions heated more than the Polar Regions
- Night and Day Caused by the Earth's rotation about its axis
- Seasons caused by the Earth's tilt to its axis of rotation and the revolution about the Sun



8

Measurement of Weather Data is Key



Temperature



Air Pressure

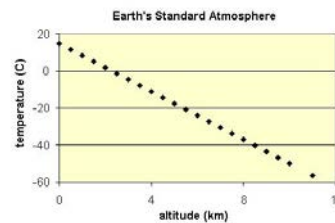
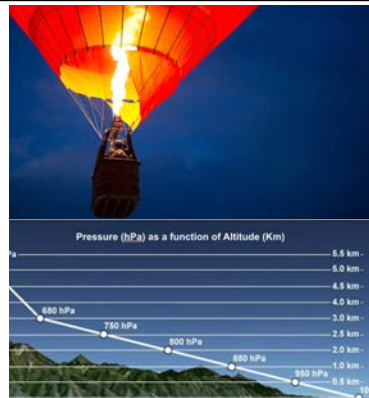


Wind Speed and Direction

9

More Basic Concepts

- Hot air rises – lower density
- Cold air descends - heavier
- Air Pressure decreases with altitude
- Air Temperature decreases with altitude in the Troposphere
- Air flows from regions of high pressure to lower pressure



10

Air Pressure

- Air pressure is the weight of the column of air above an area on Earth's surface
- Air pressure decreases with altitude
- Differences in air pressure key to wind speed and direction

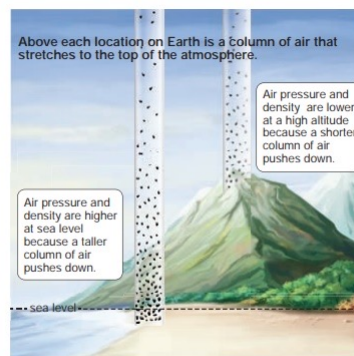


Figure 1.10 Atmospheric pressure acts like a column

11

Poll

Is the wind direction where it is coming from or where it is blowing to?

12

Poll

Does temperature increase or decrease with height in the Troposphere?



13

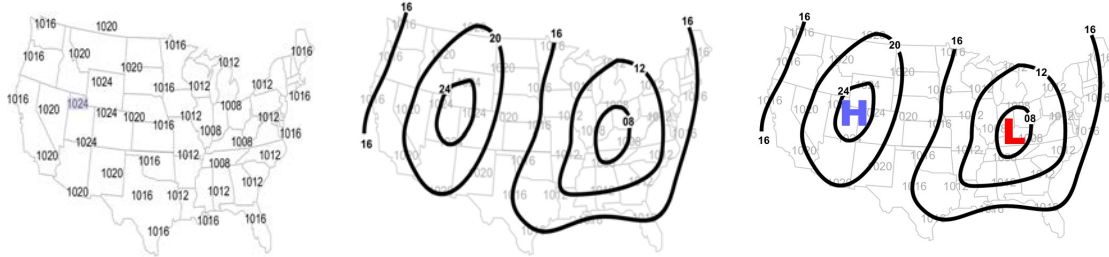
Poll

Are the seasons caused by the Earth's rotation on its axis or its revolution about the sun?



14

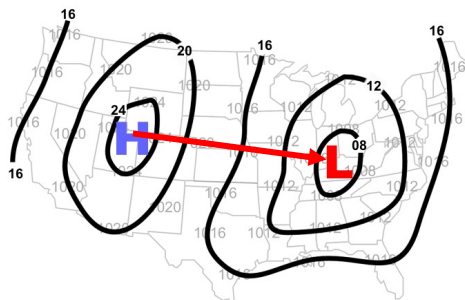
Measurement of Atmospheric Pressure



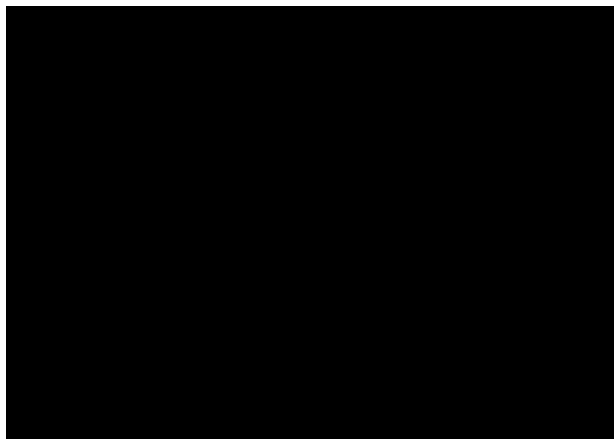
- Measure the pressure all over the country at sea level
- Join all the points with the same pressure to form isobars
- Identify the high and low pressure regions

15

Wind Direction?

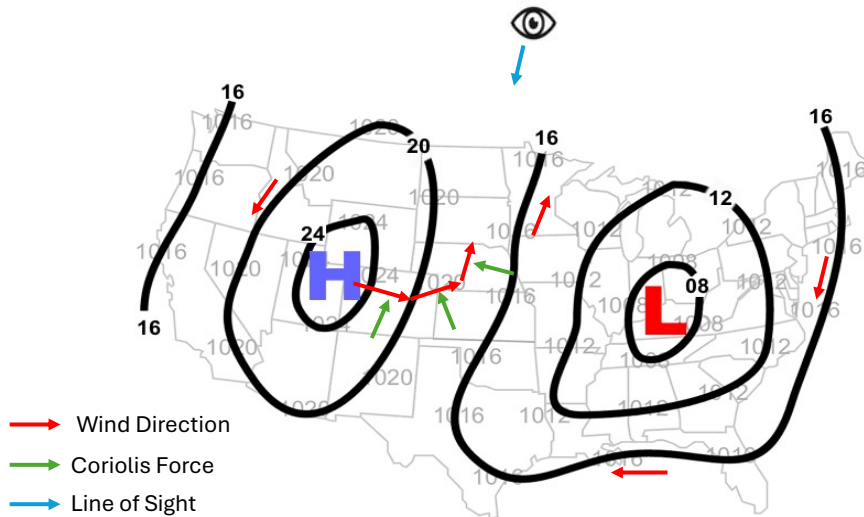


- Would expect the wind to blow directly from high to low pressure, but the Earth rotates!
- No Coriolis force at the Equator and maximum at the poles



16

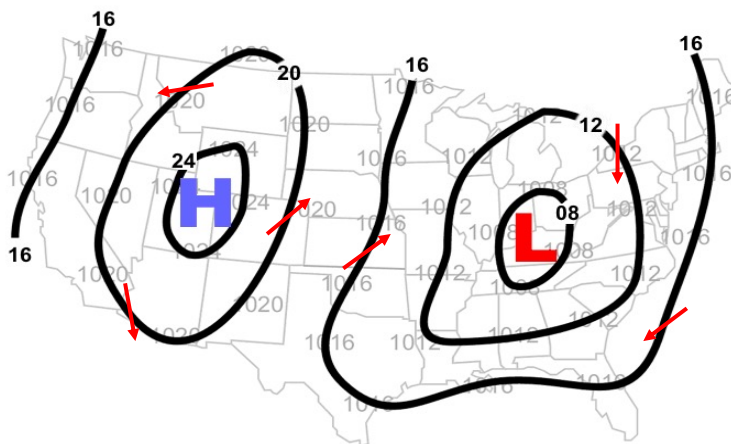
Effect of Coriolis on Wind Direction



- Wind starts off going from high to low pressure but is bent by the Coriolis force
- Wind direction parallel to the isobars in the upper atmosphere
- Shown for the Southern Hemisphere
- Clockwise around a low,
- Anticlockwise around a high
- Opposite Direction in the Northern Hemisphere
- Gives rise to Buys Ballots Law: face the wind and the high pressure is on the right (Southern Hemisphere)

17

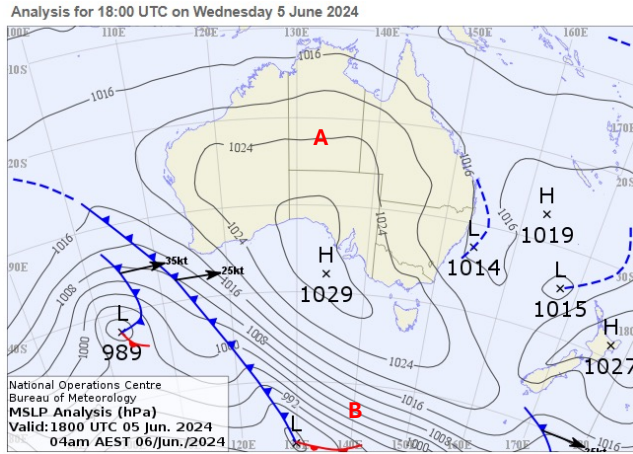
One Final Wrinkle!



- Friction at the Earth's surface due to land, seas, waves, cause the wind to be not quite parallel to the isobars
- Wind direction angled at about 15 degrees to the isobars as shown
- Clockwise about a low pressure system, towards the centre, anticlockwise about a high pressure system, away from the centre
- Opposite for the northern hemisphere

18

Australian Weather Map



Points to Notice

- Regions of high and low pressure (1013 mb is the reference pressure)
- Red and blue lines denote fronts, troughs and ridges to which we will return
- Closer spaced isobars mean stronger winds – latitude dependant
- Winds even stronger when isobars are really curved
- MSLP Analysis means current situation
- Prognosis means the future outlook

19

Poll

What is the wind direction at A on the weather map?



20

Poll

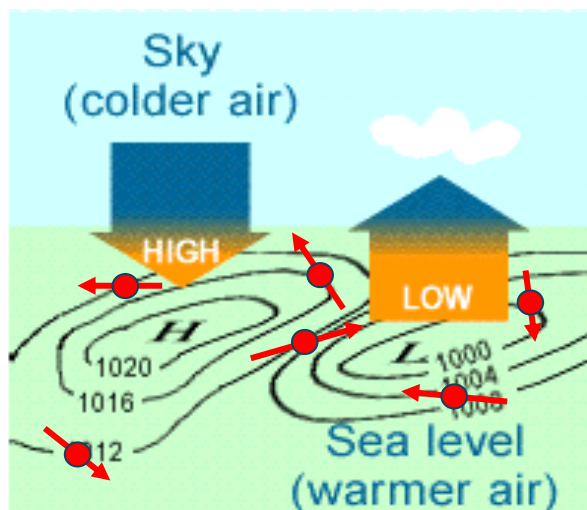
What is the wind direction at B on the weather map?



21

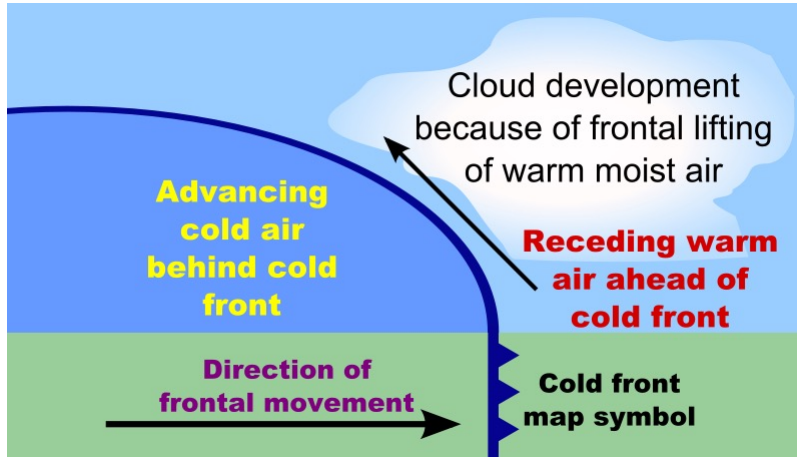
Highs and Lows

- High – High Pressure System. Descending, colder air (heavier), warming as it descends, any water droplets evaporate, clear skies
- Low – Low Pressure System. Rising, warmer air (lighter), air cools as it rises, water vapour condenses to form water droplets, cloudy skies
- Monitor changes in pressure by watching the barometer



22

FORMATION OF A COLD FRONT

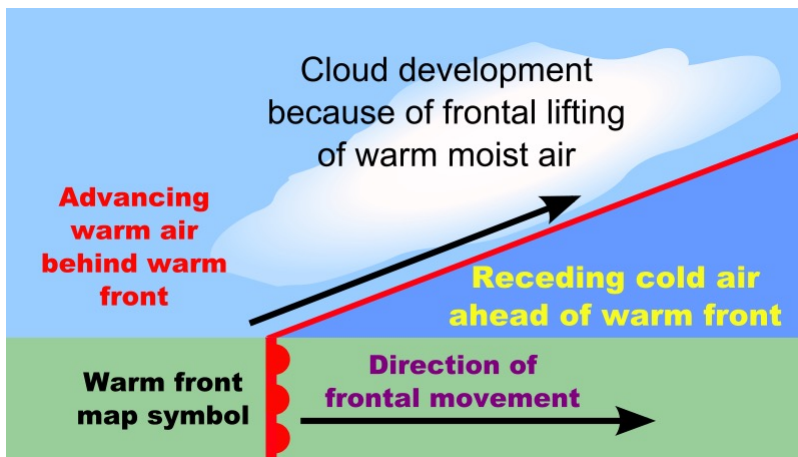


- Approaching cold air wedges under warmer air
- Warmer air rises, water vapour condenses, rain and even storms
- Change in wind direction with the passage of the front, gusty winds, can be quite violent
- Significant drop in temperature



23

FORMATION OF A WARM FRONT

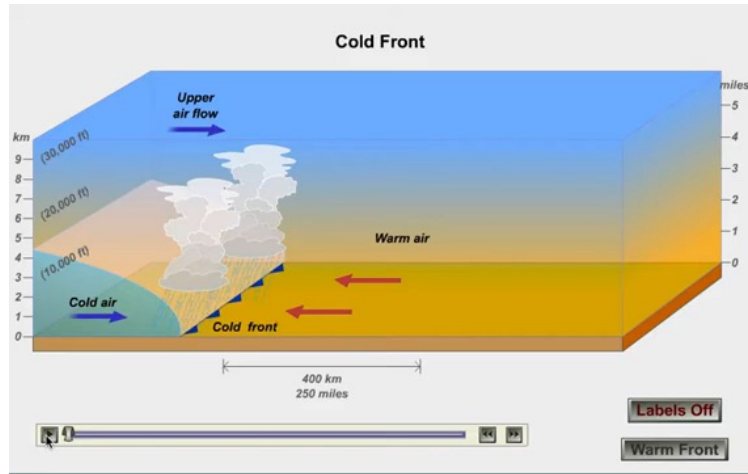


- Not common in Australia
- Tend to form south of the continent and move further south
- Usually slow moving and broad coverage
- Rising moist air produces clouds and usually rain
- Warmer temperatures behind the front



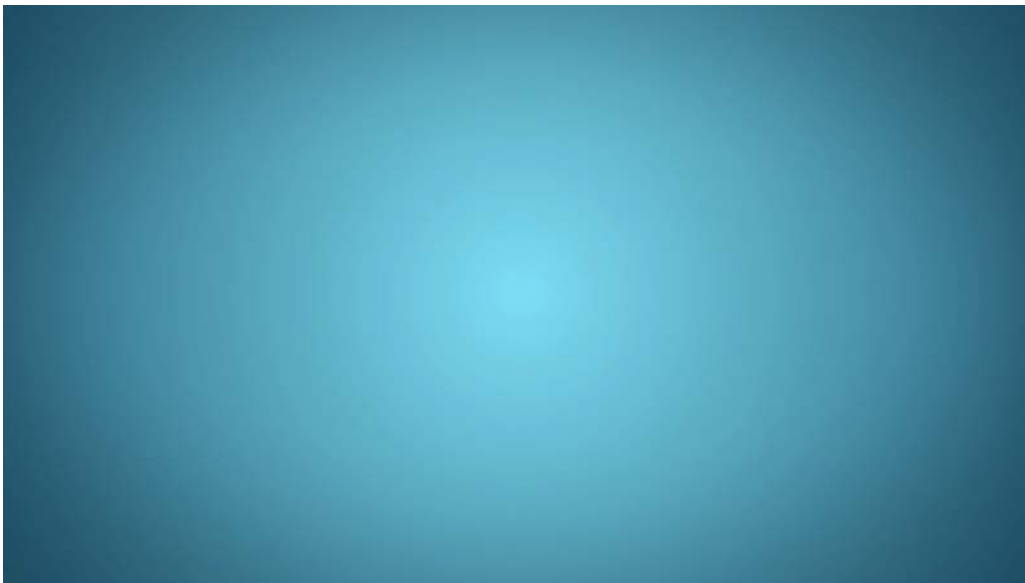
24

ANIMATION OF FRONT FORMATION



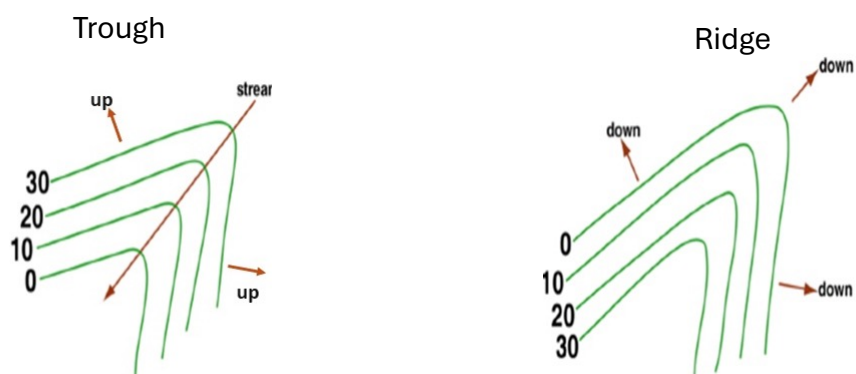
25

COLD FRONTS IN AUSTRALIA



26

Isobar Ridges and Troughs



27

RIDGES AND TROUGHS

- Conditions along the ridge, under the influence of the high-pressure systems dry and descending air, tend to be stable and drier.
- Troughs often result in increased cloud cover and precipitation. Rain, snow, or even thunderstorms can develop along and near the trough axis.

28

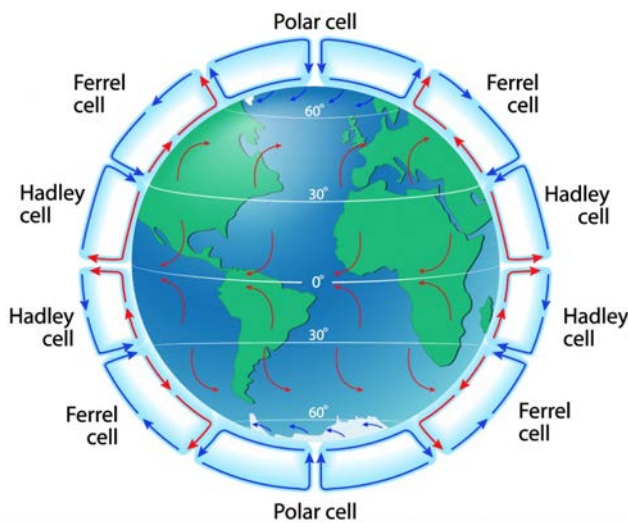
Poll

Does air rise or fall in a high-pressure system ?



29

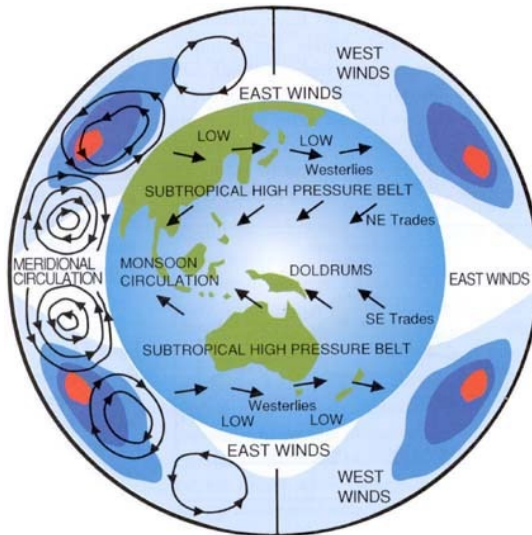
GLOBAL ATMOSPHERIC CIRCULATION



- Warm air rises, cools and falls back to Earth
- Formation of circulation cells
- Curvature of wind patterns due to the Coriolis Force
- Zones where winds converge or diverge

30

LOCAL GLOBAL CIRCULATIONS



- Doldrums region near the Equator
- Trade Winds in the mid-latitudes, direction (SE or NE) due to the Coriolis Force
- Westerly flows towards the polar regions

31

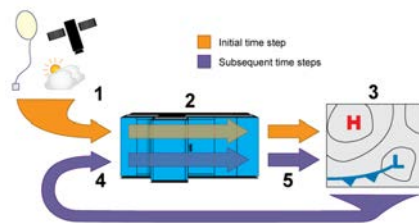
WEATHER FORECASTING

- It all starts with actual observations at a given point in time
- Data from ground stations, ships, balloons, planes, satellites
- The more observations the better
- Traditionally, the weather map is produced and past experience used to forecast future weather
- More modern approach is to use computer modelling

32

Computer Modelling

- Describe the atmosphere as a three-dimensional grid volume
- Collect all the data as usual for as many grid volumes as possible
- Use the laws of physics to determine how the air will move in a unit of time
- Take the result and feed it back into the computer to calculate the next time interval
- Produce the forecast



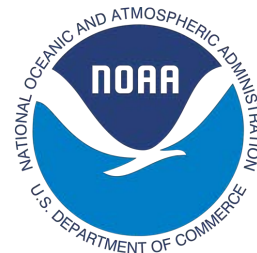
33

Computer Modelling

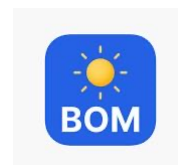
- Many different computer models from various countries
- Models very good in the short term (3-5 days)
- Model forecasts very sensitive to the input data quality (the Butterfly Effect)
- Vary the input data slightly and re-run the models to assess forecast sensitivity and improve longer term outlook



ECMWF MODEL



GFS MODEL



ACCESS MODEL

34

Poll

The best computer weather model is:

- ECMWF
- GFS
- ACCESS
- ALL OF THE ABOVE



35

Weather Technology

Short Term tools

Medium Term tools

Long Term Tools



36

Some of the Weather Tech that we will look at

- BOM
- BOM App
- MetEye
- ECMWF long range synoptic charts
- Windy LOTS OF models
- Predictwind 6 models
- Grib files

37

BlueWaterTracks
<https://portal.bluewatertracks.com/account>
 Bureau of Meteorology

HOME | ABOUT | MEDIA | CONTACTS Enter search terms Search

NSW VIC QLD WA SA TAS ACT NT AUSTRALIA ANTARCTICA

Warnings current
 NSW VIC QLD WA SA TAS ACT NT Warning services

> Rain radars
 > Satellite images
 > Weather maps
 > MetEye

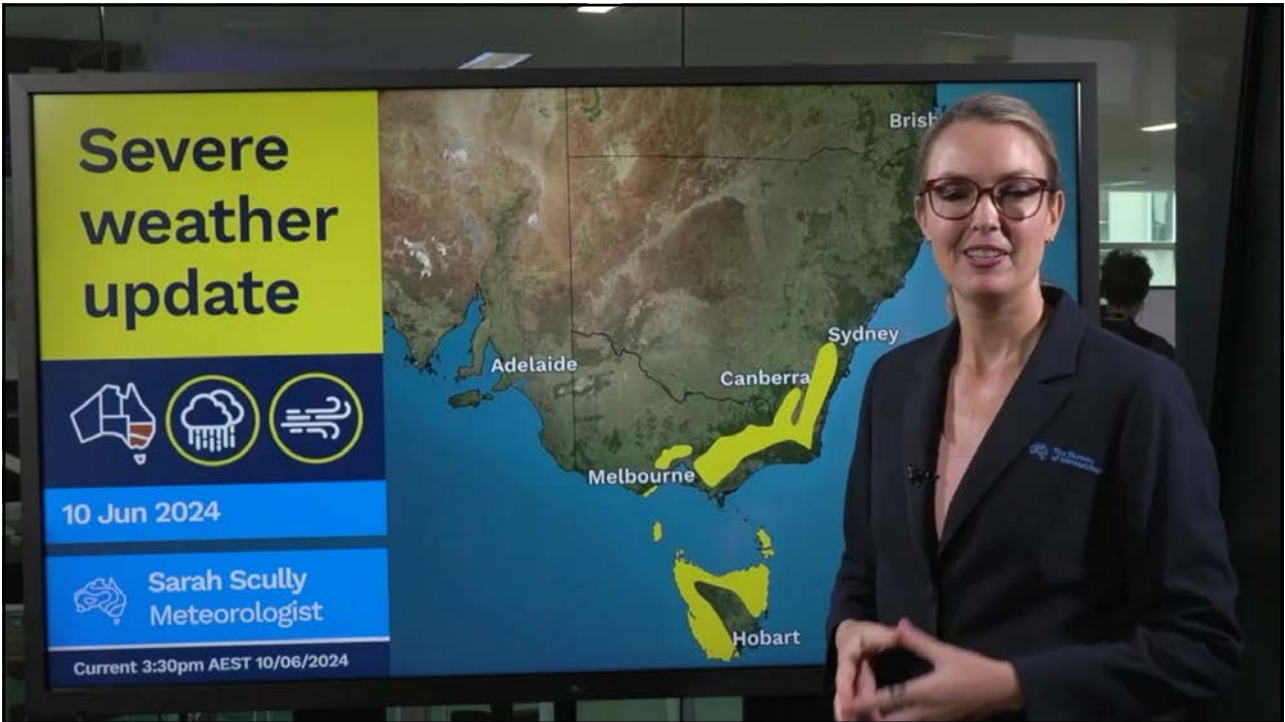
Severe weather update
 Severe Weather Update: Damaging winds for South East Australia, 10 June

BOM Weather
 Get warning notifications, direct to your device
 Download on the App Store GET IT ON Google Play

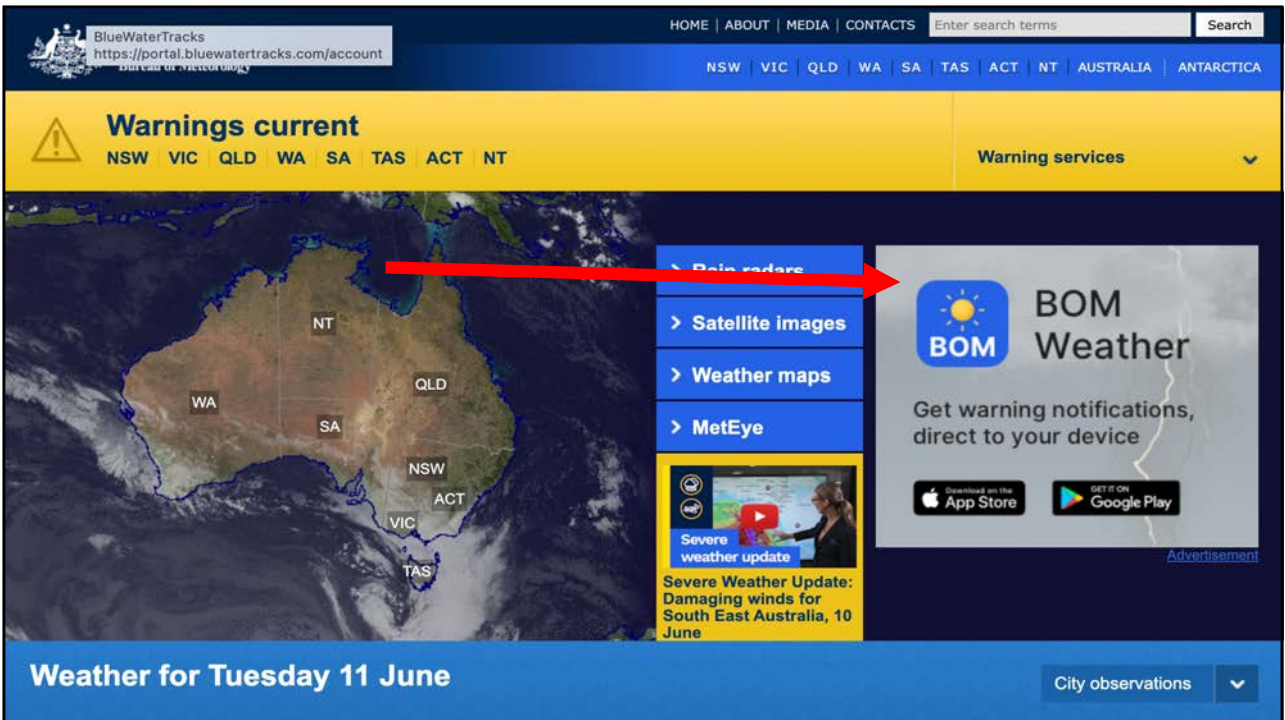
Advertisement

Weather for Tuesday 11 June City observations

38



39



40

Q Safety Beach, VIC

12.8°
Feels like 7.2°

15° 8° 2-15 mm
Max Overnight min Rain

⚠️ 2

Showers. Wind easing.

Show less about today

Current weather
NNW 28 km/h Wind 54 km/h Gust
77% Humidity 0mm Rain since 9am

Rain
75% (high) chance of at least 2mm
50% (medium) chance of at least 6mm
25% (low) chance of at least 15mm

Mornington Peninsula area
Cloudy. Very high chance of showers, becoming less likely this afternoon. The chance of a thunderstorm late this afternoon and evening, possibly severe. Winds northerly 30 to 45 km/h turning westerly 25 to 40 km/h in the early afternoon.

Sun, moon and UV
7:34 am Sunrise
5:07 pm Sunset
Waxing crescent Moon phase
First quarter, 14 June Next moon phase

Home Past Map Warnings

41

Q Safety Beach, VIC

12.8°
Feels like 7.2°

15° 8° 2-15 mm
Max Overnight min Rain

⚠️ 2

Showers. Wind easing.

Show more about today

Temperature and rain Wind and waves Humidity Show all

Today												Tomorrow			
10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	12am	1am
14°	14°	15°	15°	15°	15°	15°	14°	13°	12°	11°	11°	10°	10°	10°	10°
7°	8°	8°	9°	9°	10°	10°	9°	8°	7°	6°	5°	5°	5°	5°	4°
Rain 50% (medium) chance of at least															
1mm			0mm			0mm			0mm			0mm		1mm	

Daily forecast

Home Past Map Warnings

42

Q Safety Beach, VIC

12.9°
Feels like 5.6°

15° 8° 2-15mm
Max Overnight min Rain

Showers. Wind easing.

Show more about today

Temperature and rain Wind and waves Humidity Show all

Today													Tomorrow			
10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	12am	1pm	
Wind																
NNW	NNW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	
48 km/h	52 km/h	48 km/h	50 km/h	44 km/h	37 km/h	41 km/h	33 km/h	33 km/h	35 km/h	43 km/h	39 km/h	41 km/h	43 km/h	43 km/h	41 km/h	
Gust																
63 km/h	69 km/h	65 km/h	67 km/h	59 km/h	50 km/h	56 km/h	44 km/h	46 km/h	46 km/h	48 km/h	57 km/h	54 km/h	54 km/h	57 km/h	57 km/h	
Total wave height																
Varied 2.1m			Varied 2.1m			Varied 1.7m			Varied 1.3m			Varied 1.4m			Varied 1.3m	

Home Past Map Warnings

43

BOM Weather ×

Notifications →

Settings →

Support

About →

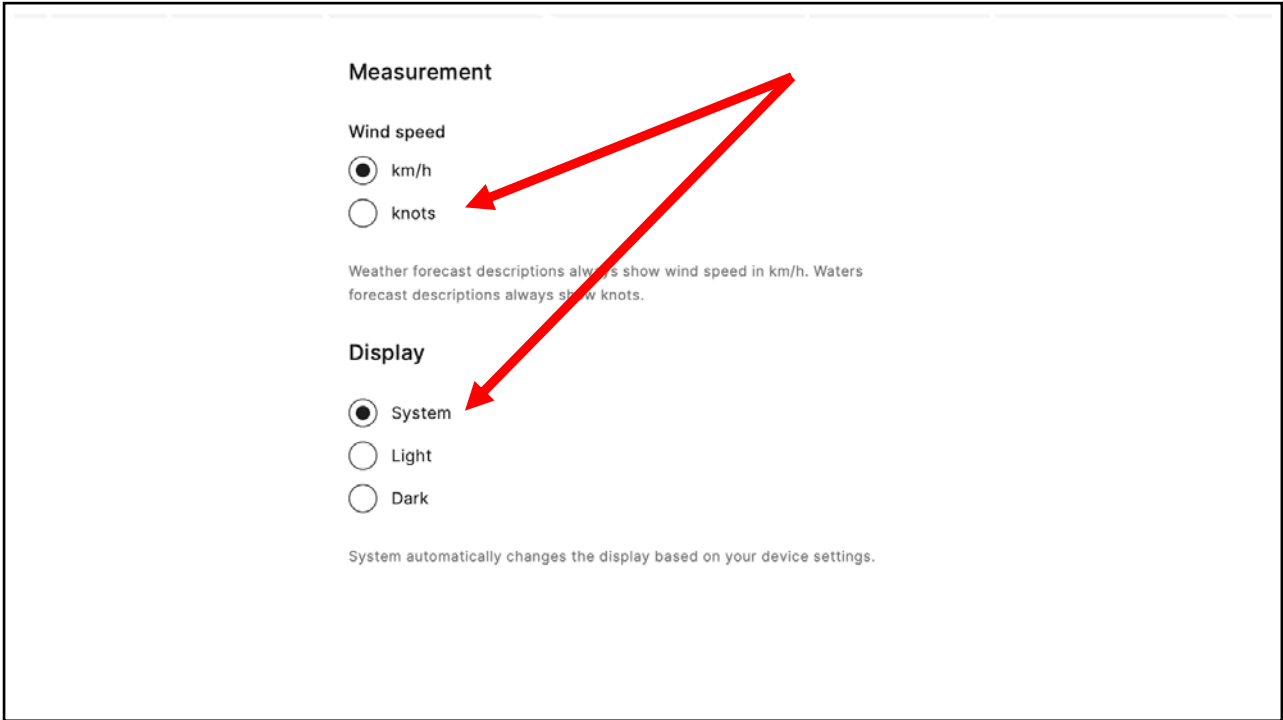
Accessibility →

Privacy →

Feedback →

Australian Government
Bureau of Meteorology

44



45

Show more about today ▼

Temperature and rain | **Wind and waves** | Humidity | Show all


Today														Tomorrow		
10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	12am	1am	
Wind																
NNW	NNW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	
26 knots	28 knots	26 knots	27 knots	24 knots	20 knots	22 knots	18 knots	18 knots	18 knots	19 knots	23 knots	21 knots	22 knots	23 knots	23 knots	
Gust																
34 knots	37 knots	35 knots	36 knots	32 knots	27 knots	30 knots	24 knots	25 knots	25 knots	26 knots	31 knots	29 knots	29 knots	31 knots	31 knots	
Total wave height ⓘ																
Varied 2.1m			Varied 2.1m			Varied 1.7m			Varied 1.3m			Varied 1.4m			Varied 1.6m	

46

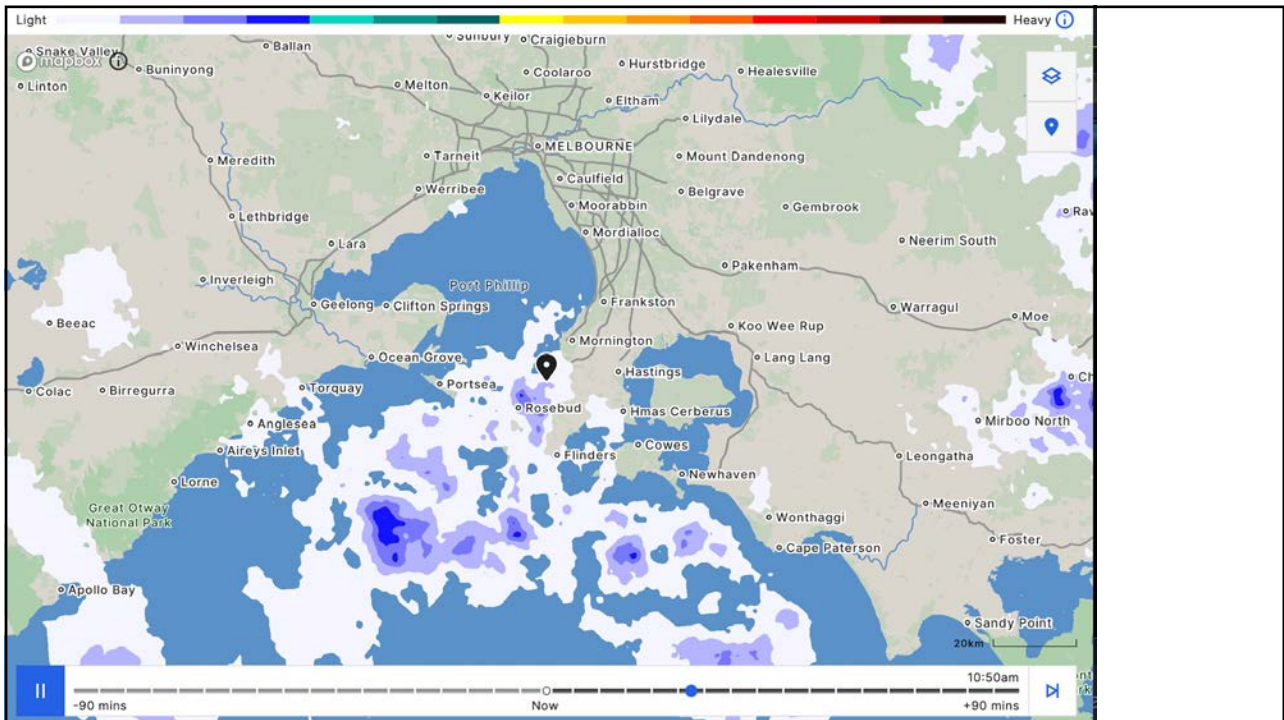
Daily forecast

Weather | **Waters and tides**

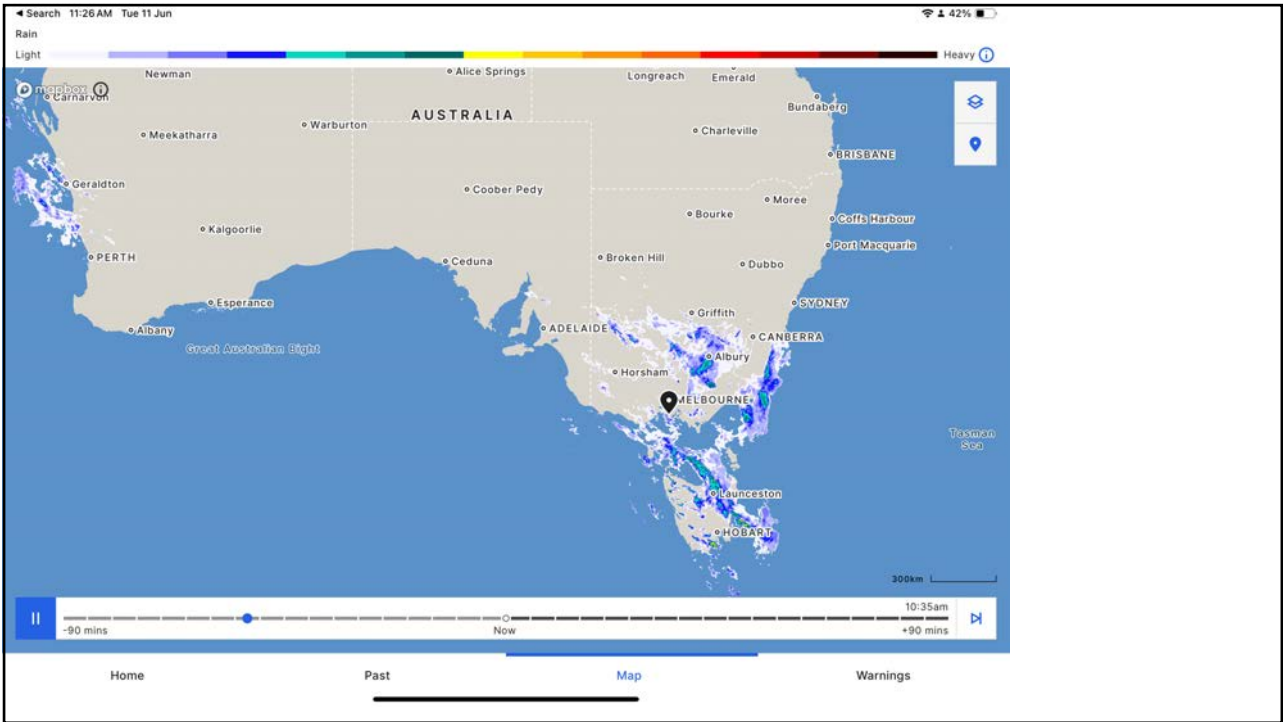
Port Phillip

Today	11 June
	Gale warning
Wind	Northwesterly 20 to 30 knots, reaching up to 35 knots in the morning. Winds tending westerly 15 to 25 knots in the late afternoon then increasing to 20 to 30 knots in the late evening.
Seas	1 to 2 metres, decreasing to 1 to 1.5 metres during the afternoon.
Weather	Cloudy. 80% chance of showers.
Tides	Hovell Pile ↓ 12:00 am, 0.69 m Low ↑ 5:07 am, 0.99 m High ↓ 11:49 am, 0.41 m Low ↑ 7:01 pm, 1.07 m High

47



48



49

← Victoria

⚠ 3 warnings

- **Severe weather warning**
For North Central, North East, Central, West and South Gippsland and East Gippsland forecast districts →
- **Sheep graziers warning**
For North Central, North East, Central, West and South Gippsland and East Gippsland forecast districts →
- **Marine wind warning** →

Last updated now

Home Past Map Warnings

50

← **Marine wind warning**

Issued at 10:00 am EST on Tuesday 11 June 2024 (1 hour ago).

Updated Marine Wind Warning Summary for Victoria for the period until midnight EST Wednesday 12 June 2024.

Wind Warnings for Tuesday 11 June

Gale Warning for the following areas: Port Phillip, West Coast, Central Coast, Central Gippsland Coast and East Gippsland Coast

Strong Wind Warning for the following area: Western Port

Wind Warnings for Wednesday 12 June

Gale Warning for the following areas: West Coast, Central Coast, Central Gippsland Coast and East Gippsland Coast

Strong Wind Warning for the following areas: Port Phillip, Western Port and Gippsland Lakes


The next marine wind warning summary will be issued by 4:40 pm EST Tuesday.

Check the latest [Coastal Waters Forecast](#) or [Local Waters Forecast](#) for information on wind, wave and weather conditions for these coastal zones.

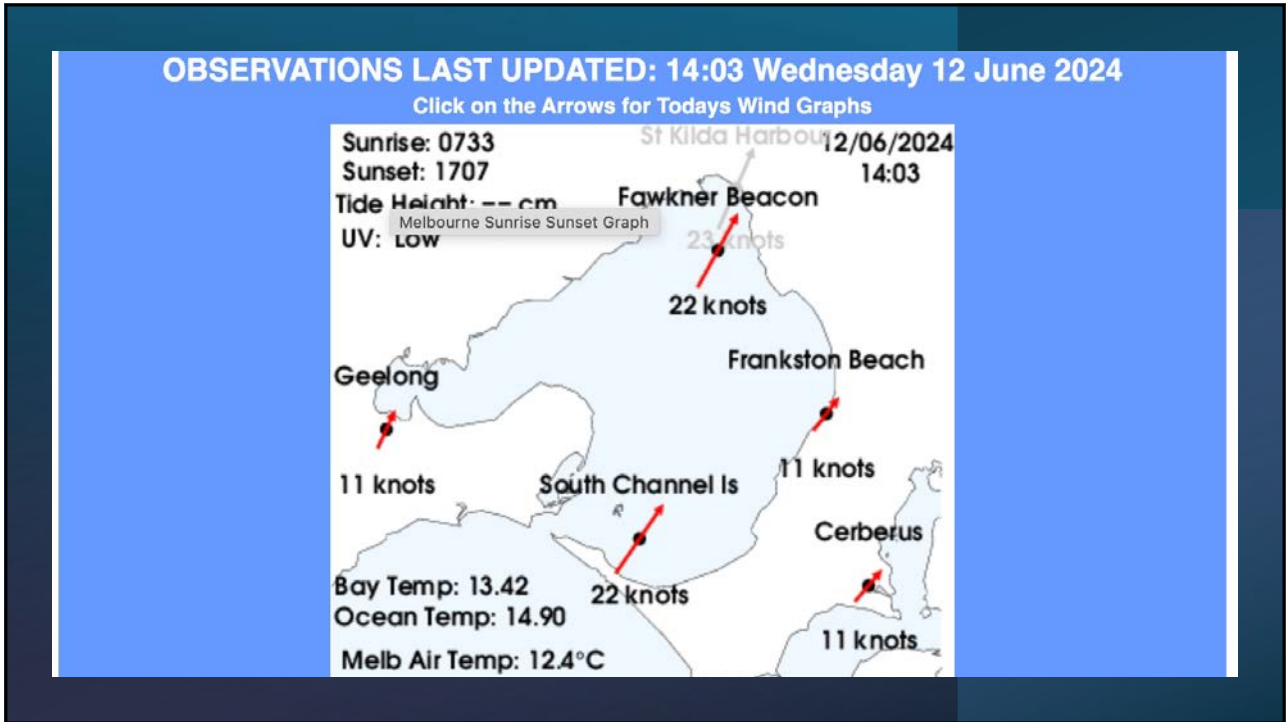
51

Poll

What are the advantages of the BOM App?



52



53

Australian Government
Bureau of Meteorology

HOME | ABOUT | MEDIA | CONTACTS | Enter search terms | Search

NSW | VIC | QLD | WA | SA | TAS | ACT | NT | AUSTRALIA | ANTARCTICA

Warnings current
NSW | VIC | QLD | WA | SA | TAS | ACT | NT | Warning services

Our services

- Agriculture
- Climate and Past Weather
- Water Information
- Aviation Weather Services
- Marine and Ocean
- UV and Sun Protection
- Environmental Information
- Registered Users and Data Services

54

Bureau Home > Marine & Ocean

Marine & Ocean

NSW VIC QLD WA SA TAS NT

Warnings Select state using the tabs above.

Current:

- Marine Wind Warning Summary for Victoria.

Reference points used in Coastal Wind Warnings

Forecasts	Observations
Port Phillip	Latest weather for the Melbourne area
Western Port	Live wind map for Victoria
MetEye forecast wind and wave maps for Port Phillip and Western Port	Latest coastal weather
Gippsland Lakes	Coastal observations via clickable map
Local & coastal waters forecasts via clickable map	Latest weather graphs via clickable map
Bass Strait and approaches	Radar Viewer
MetEye forecast wind and wave maps	

Marine Weather Knowledge Centre

- About marine forecasts
- Boating safety
- Rock fishing safety
- Communication services
- MarineLite

Winter 2024

Climate and water long-range forecast

Find out more >

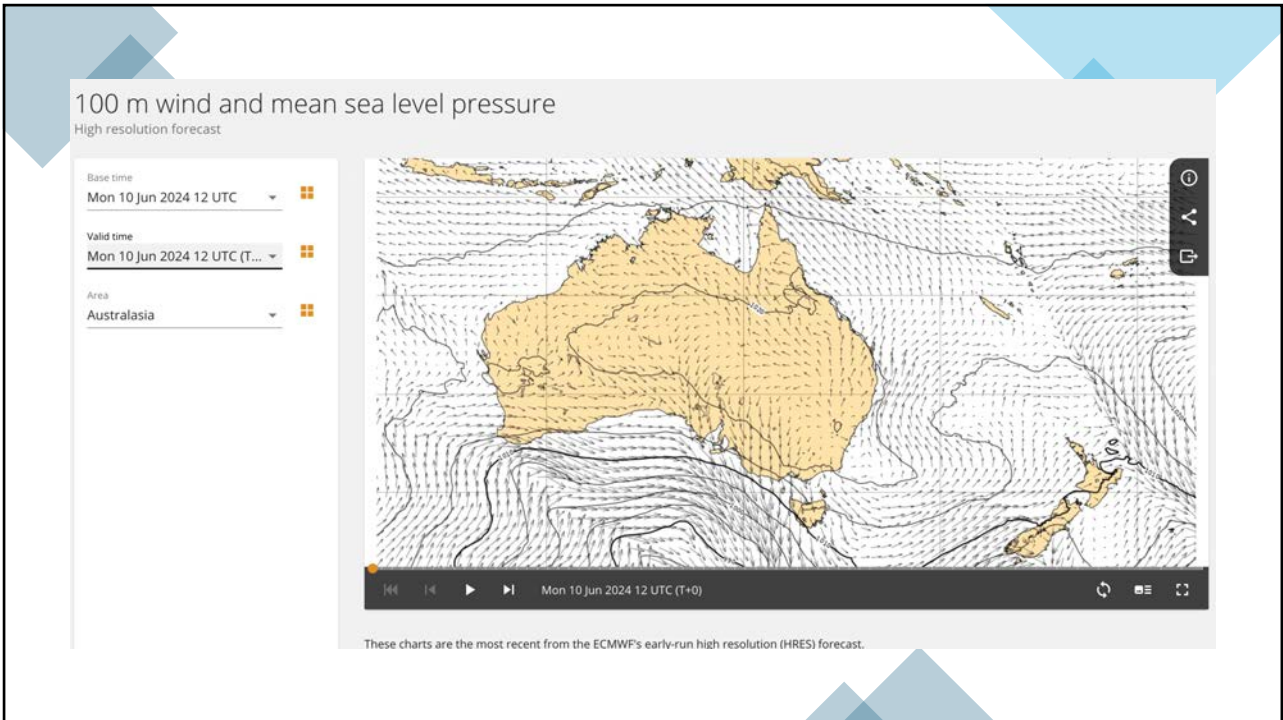
Advertisement

55

WEST COAST																
	Date/Time EST	Wind			Highest Wind Gust		Sea Height m	Swell			Vis km	Cloud	Weather	Temp °C	Press MSL hPa	Rain since 9am mm
		Dir	Spd kts	Gust kts	Dir	kts time		Height m	Period s	Dir						
Portland Airport	11/11:30am	WNW	17	25	NNW	37	04:25am	-	-	-	10	Partly cloudy	-	14.9	1007.9	0.2
Portland Harbour	11/11:01am	WNW	16	27	-	-	-	-	-	-	-	-	-	16.0	1007.1	-
Cape Nelson	11/11:30am	WNW	22	33	NNW	42	04:32am	-	-	-	-	-	-	15.6	1007.0	0.0
Port Fairy	11/11:30am	WNW	15	22	NNW	31	01:54am	-	-	-	-	-	-	16.3	1006.9	0.0
Warrnambool	11/11:30am	NW	21	27	NNW	41	02:18am	-	-	-	10	Partly cloudy	-	15.9	1007.3	0.0

CENTRAL COAST																
	Date/Time EST	Wind			Highest Wind Gust		Sea Height m	Swell			Vis km	Cloud	Weather	Temp °C	Press MSL hPa	Rain since 9am mm
		Dir	Spd kts	Gust kts	Dir	kts time		Height m	Period s	Dir						
Cape Otway	11/11:30am	WNW	18	27	N	41	01:01am	-	-	-	-	-	-	13.5	1001.6	1.6
Aireys Inlet	11/11:30am	NW	16	19	NNW	42	08:09am	-	-	-	-	-	-	12.0	-	2.4
Geelong Racecourse	11/11:30am	NW	21	29	NW	34	08:53am	-	-	-	-	-	-	14.1	-	0.6
Point Wilson	11/11:30am	NW	30	34	NW	36	11:26am	-	-	-	-	-	-	-	-	-
Avalon	11/11:30am	NW	24	30	NNW	45	05:15am	-	-	-	7	Partly cloudy	-	13.9	1007.8	0.0
Point Cook	11/11:30am	N	16	27	N	42	03:52am	-	-	-	10	Partly cloudy	-	15.8	1007.3	0.2
Laverton	11/11:30am	NW	15	21	N	32	02:55am	-	-	-	75	Mostly clear	-	15.7	1007.9	0.0
Melbourne (Olympic Park)	11/11:30am	N	11	17	N	33	07:15am	-	-	-	10	-	-	13.9	1008.4	0.0
Fawkner Beacon	11/11:30am	N	21	25	N	51	03:54am	-	-	-	-	-	-	-	-	-
South Channel Island	11/11:30am	NW	26	32	N	48	04:58am	-	-	-	-	-	-	-	-	-
St Kilda Harbour RMYS	11/11:30am	N	12	16	NNE	41	06:06am	-	-	-	-	-	-	-	-	-
Moorabbin Airport	11/11:30am	NNW	22	29	N	41	04:24am	-	-	-	10	Partly cloudy	-	13.4	1007.9	0.0

56



57

PredictWind
https://forecast.predictwind.com/login/ | **act**

HOME | ABOUT | MEDIA | CONTACTS | Enter search terms | Search

Bureau of Meteorology

NSW | VIC | QLD | WA | SA | TAS | ACT | NT | AUSTRALIA | ANTARCTICA

Warnings current

NSW | VIC | QLD | WA | SA | TAS | ACT | NT

Warning services

- > Rain radars
- > Satellite images
- > Weather maps
- > MetEye

Severe weather update

Severe Weather Update: Damaging winds for South East Australia, 11 June

Northern wet season 2023-2024

Climate summary out now

58

Australian Government
Australian Government - Bureau of Meteorology

HOME | ABOUT | MEDIA | CONTACTS | Enter search terms | Search

NSW | VIC | QLD | WA | SA | TAS | ACT | NT | AUSTRALIA | ANTARCTICA

Bureau Home > Australia > Weather Maps

Weather Maps

From Wednesday 13 March 2024 we are changing the system we use to produce the Gradient Level Wind Analysis and Asia Mean Sea Level Pressure charts.
You may notice minor differences in the appearance of the charts. You can send questions or feedback to weatherquestions@bom.gov.au

Numerical Weather and Ocean Prediction Maps

- [Interactive Weather and Wave Forecast Maps](#)

Australian Region

- [Mean Sea Level Pressure \(MSLP\) map](#)
- [Latest Colour Mean Sea-Level Pressure Analysis and Infrared Greyscale Satellite](#)
- [Short-term forecast](#)
- [Forecast map for next 4 days](#)
- [UV Forecast](#)

Tropical Region

- Mean Sea Level Pressure (MSLP)**
 - [Asia MSLP Analysis 00 UTC](#)
- Gradient Level Wind (GLW)**
 - [Gradient Level Wind Analysis: 00 UTC or 12 UTC](#)
 - [Pacific Ocean GLW \(A\): 00 UTC or 12 UTC](#)
 - [Indian Ocean GLW \(B\): 00 UTC or 12 UTC](#)

Related Information

- ▶ Analysis & Prediction Operations Bulletins
- ▶ Interpreting the MSLP Analysis
- ▶ Interpreting the Gradient Level Wind Analysis (Asia Region)

Winter 2024

Climate and water long-range forecast

Find out more >

Advertisement

NWP Data Files

- ▶ ACCESS Data Files Documentation
- ▶ AUSWAVE Data Files Documentation

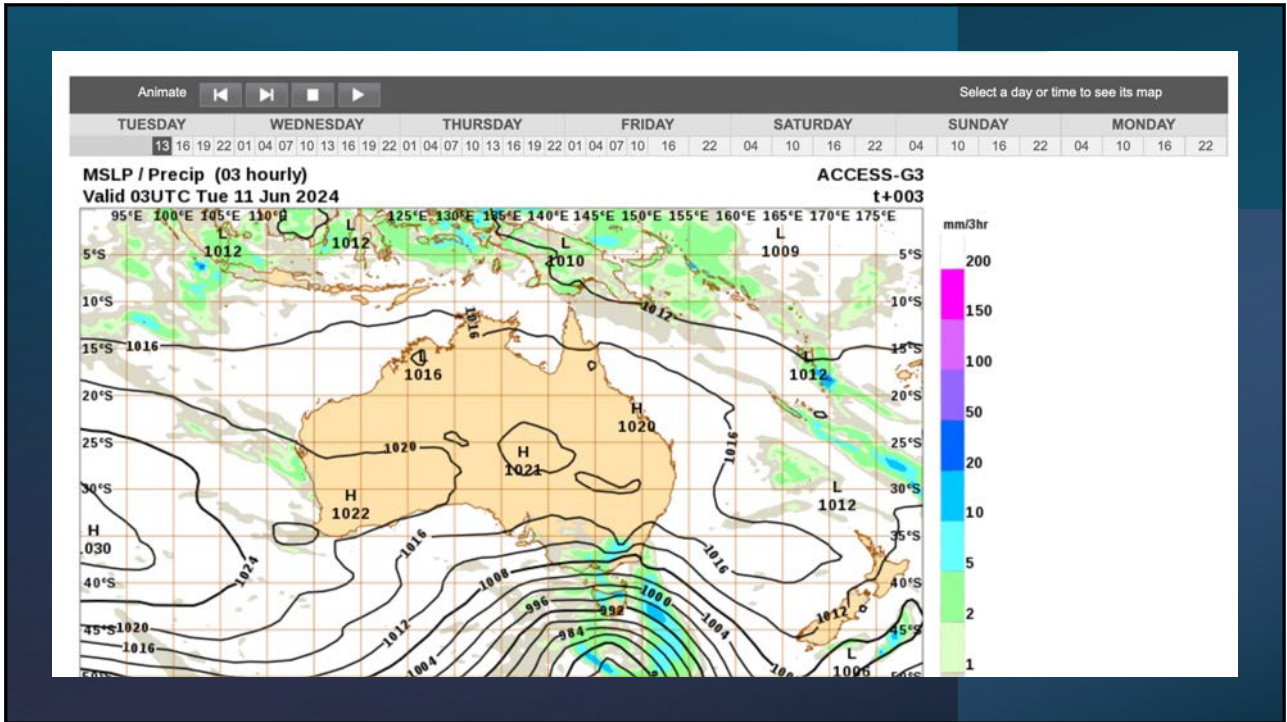
59

The diagram illustrates various weather front types and their associated cloud patterns:

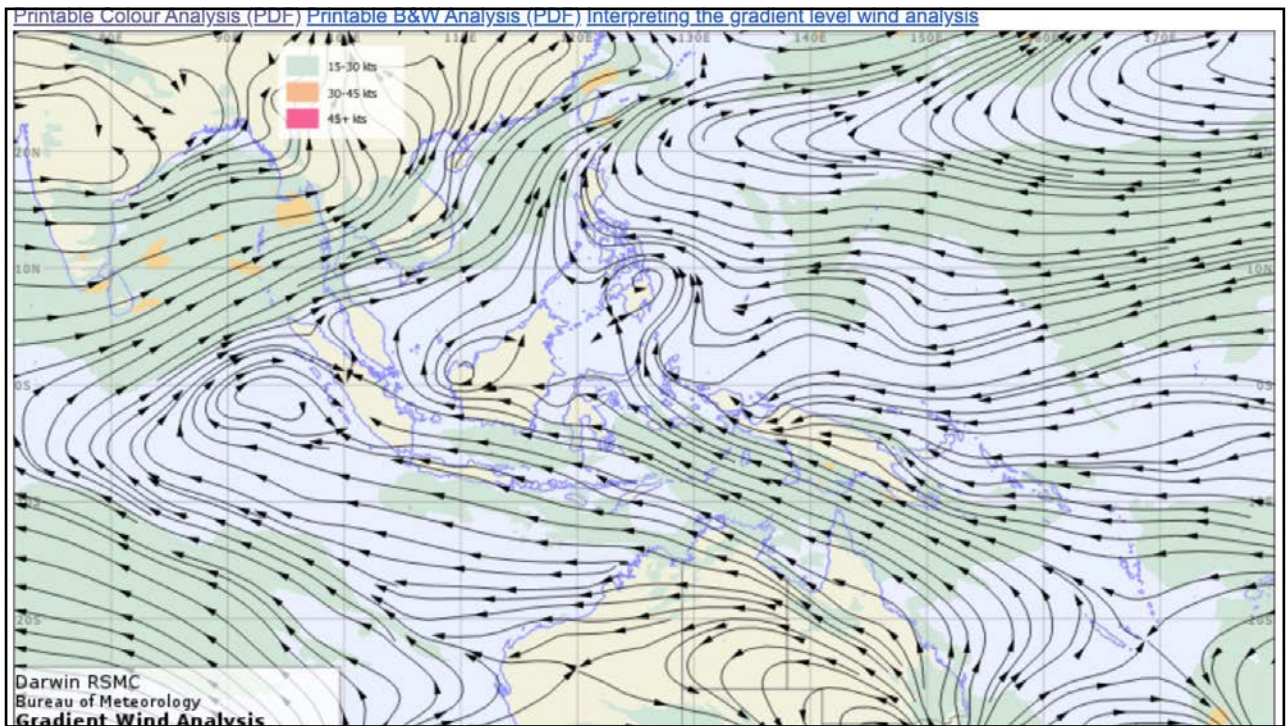
- Cold front:** A wedge-shaped cloud mass with a blue top and red bottom.
- Developing cold front:** A wedge-shaped cloud mass with a blue top and red bottom, showing a more complex structure.
- Warm front:** A wedge-shaped cloud mass with a red top and blue bottom.
- Developing warm front:** A wedge-shaped cloud mass with a red top and blue bottom, showing a more complex structure.
- Stationary front:** A wedge-shaped cloud mass with a blue top and red bottom, showing a more complex structure.
- Occluded front:** A wedge-shaped cloud mass with a purple top and blue bottom.

The weather map on the right shows a low-pressure system (L) over the Indian Ocean, with high-pressure systems (H) over Australia and the Pacific. Contour lines indicate pressure values such as 1018, 1020, 1021, and 1022. The map also displays cloud cover and satellite imagery.

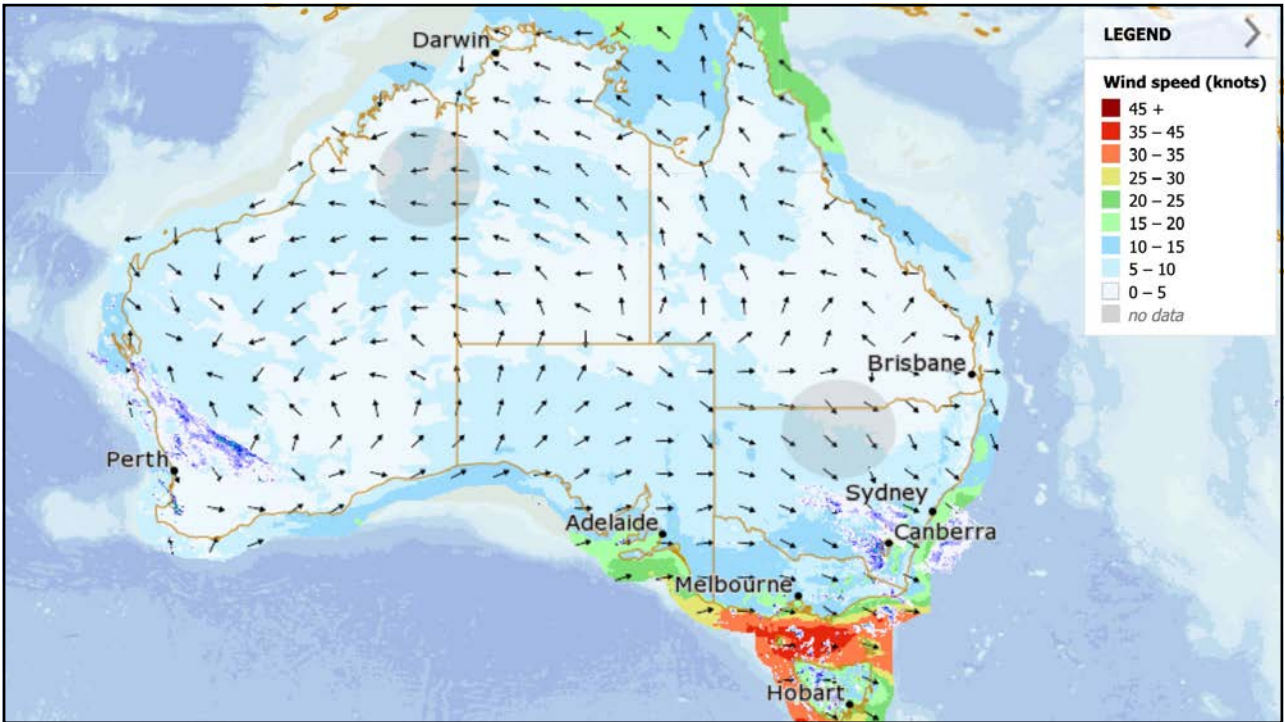
60



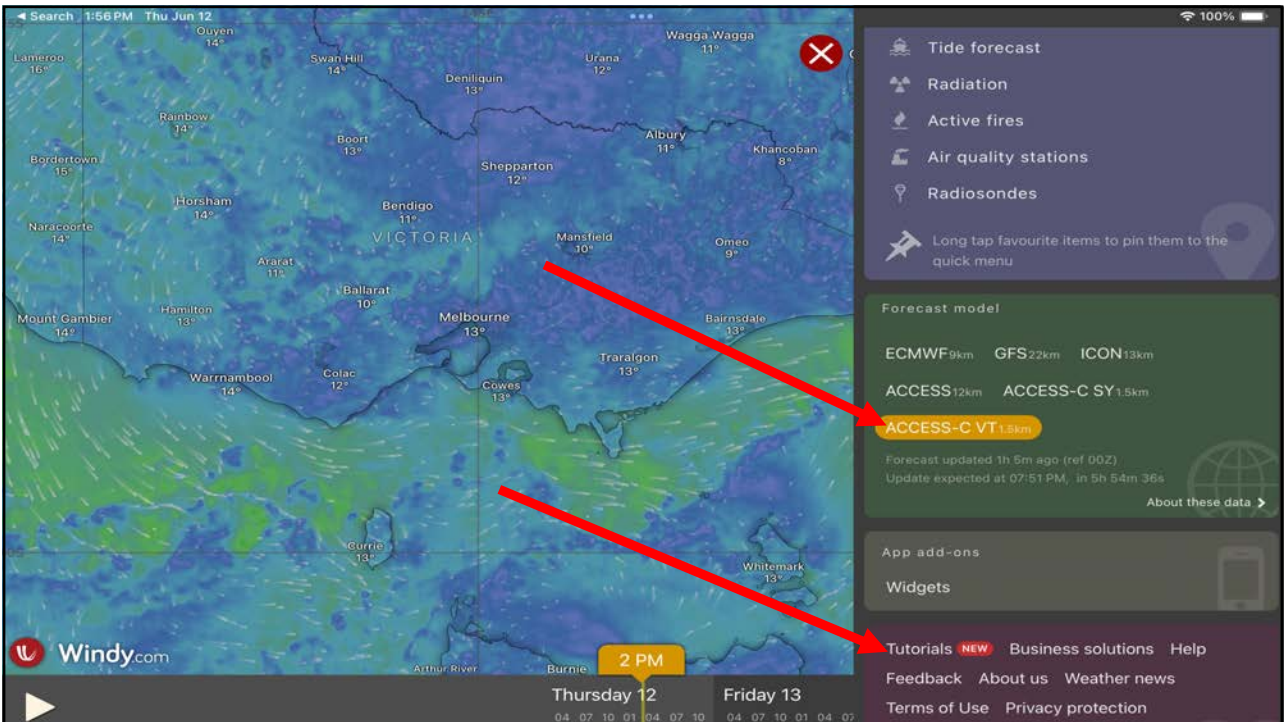
61



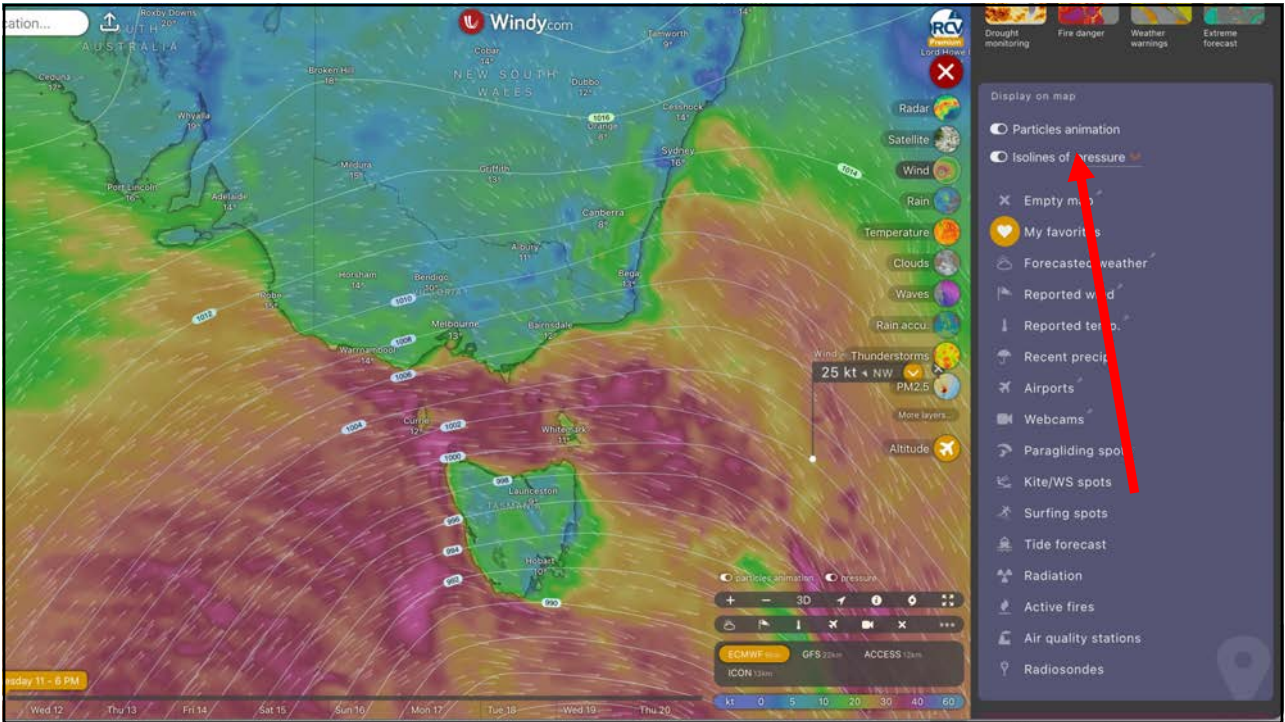
62



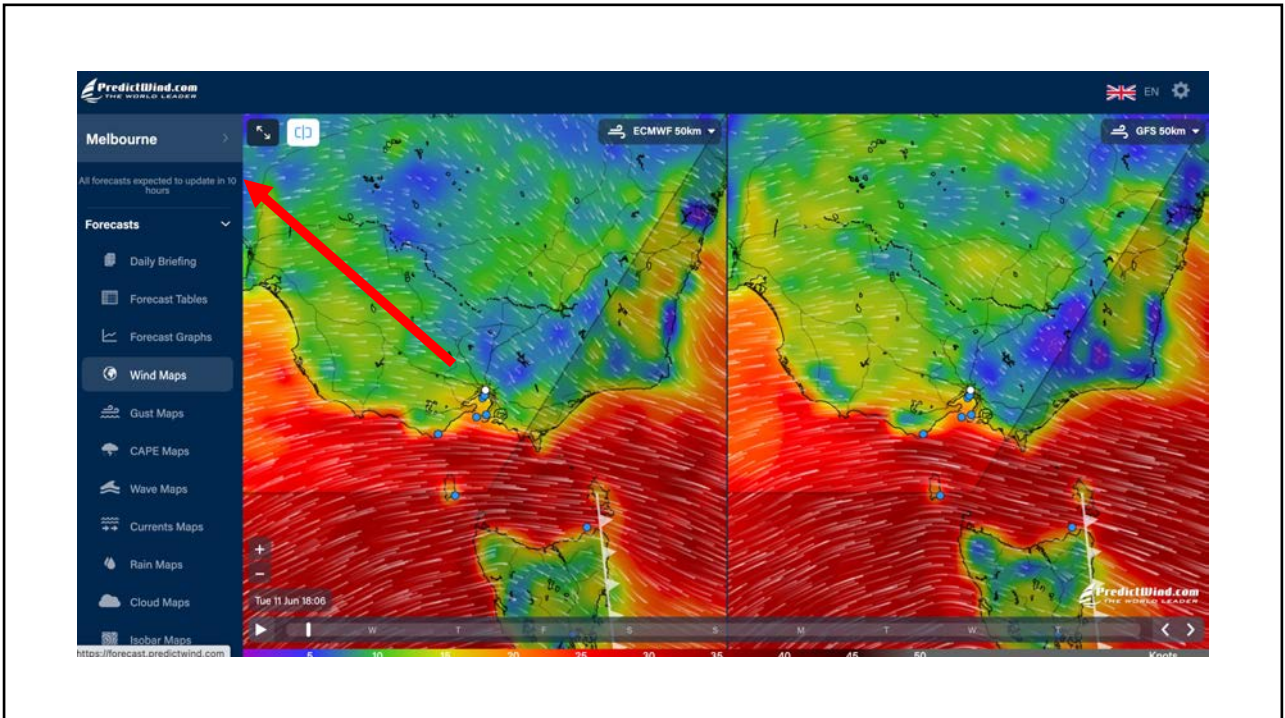
63



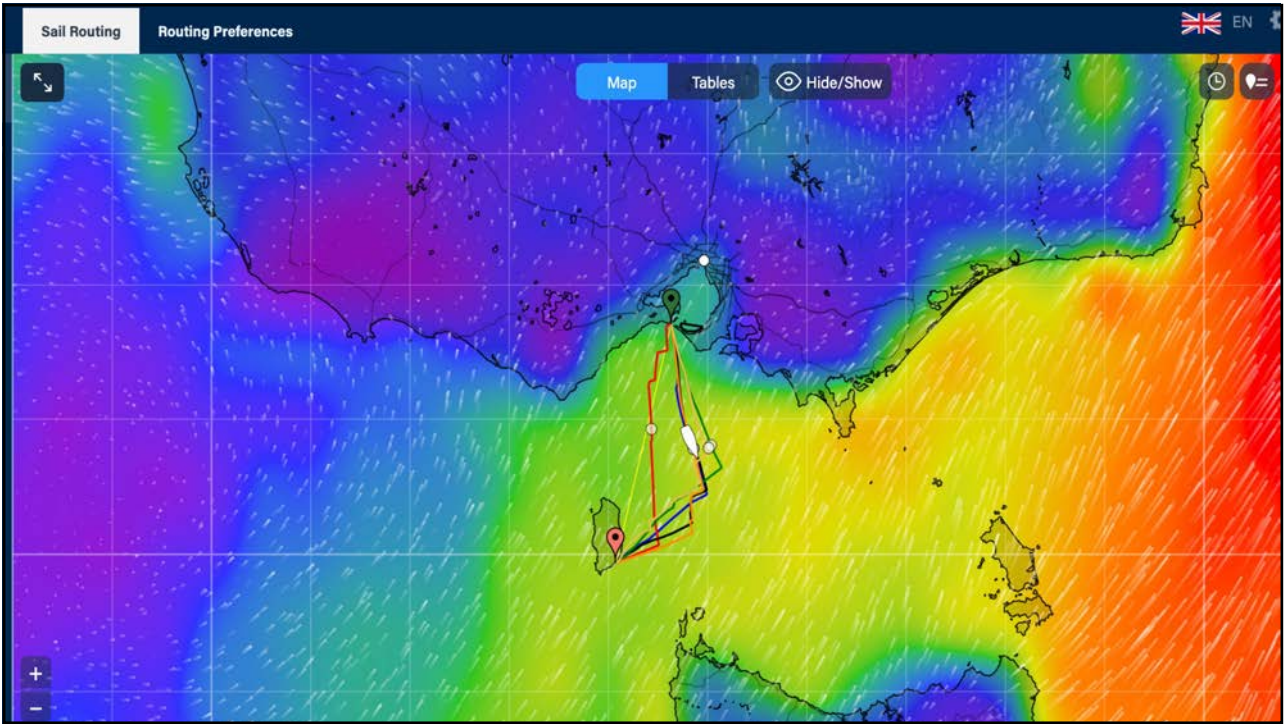
64



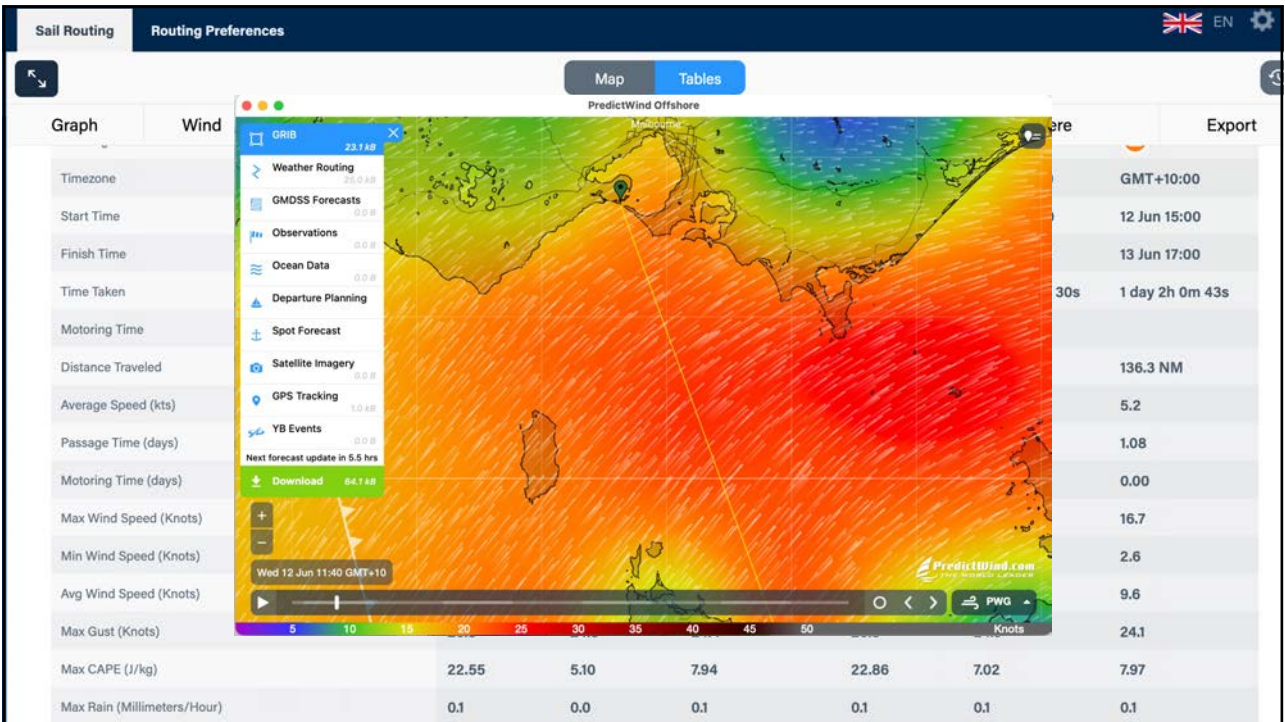
65



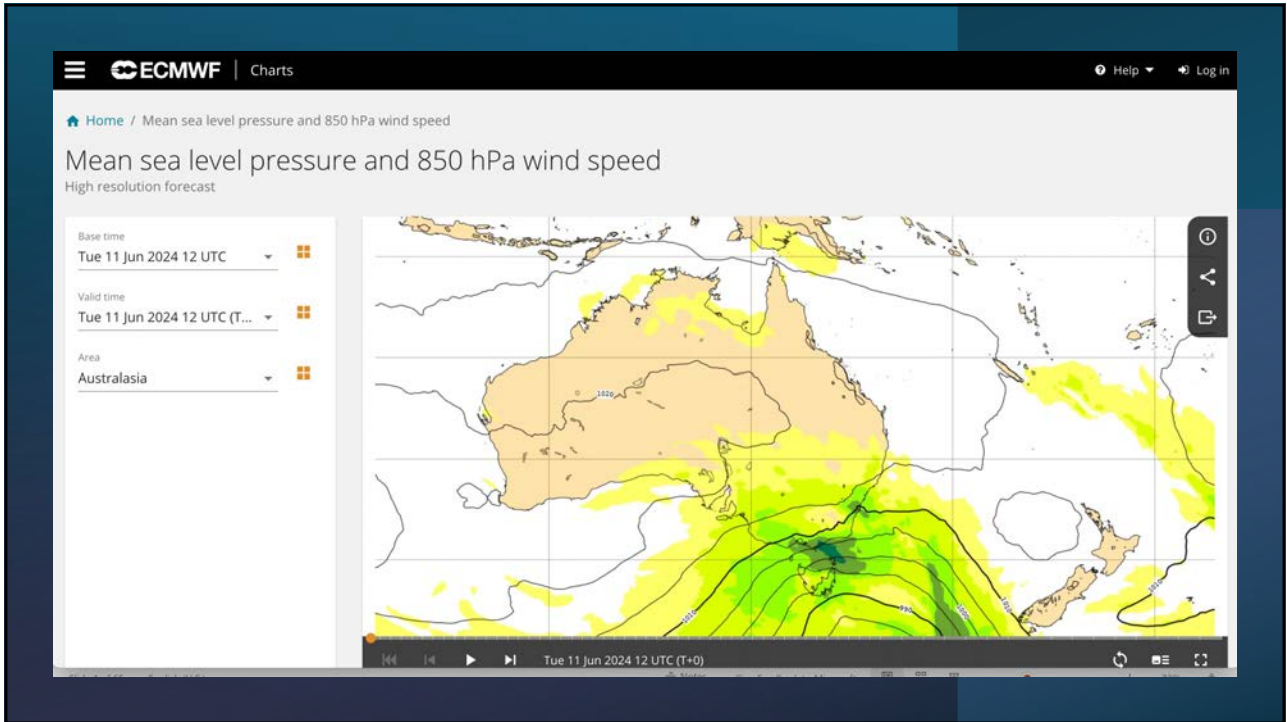
66



67



68



69

Interact with Us

Train



Navigation
On Water Rip Tour
Weather
Foredeck Essentials

Race



Destination Races to:
Devonport, King Island, Hobart
Apollo Bay, Port Fairy,
Coastal Sprints

Volunteer



Support
Many Roles
Race Management, Media,
Training Support, Mentoring



70

Home Work

- Complete your online course
- Complete the knowledge books 1 and 2
- Familiarize yourself with all links
- Upload the GPX file to Windy and plan that you will be leaving on Friday the 21 June on you journey to Lakes Entrance
- **Contact Ray and Simon students@orcv.org.au**

