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

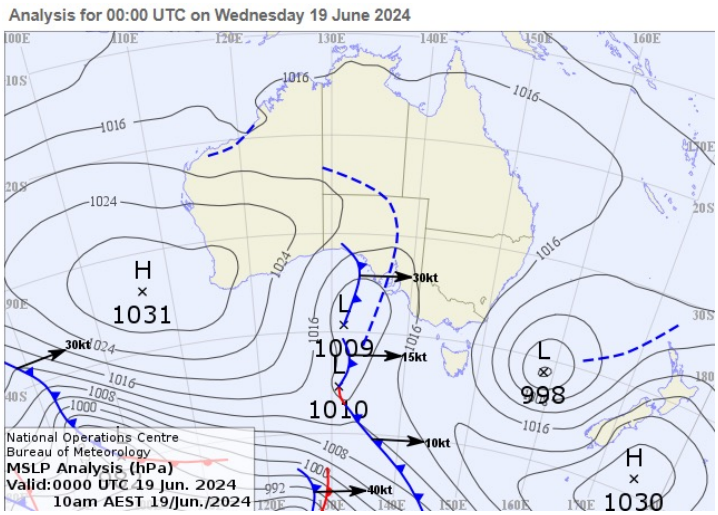
1

Greg Patten

Simon Dryden

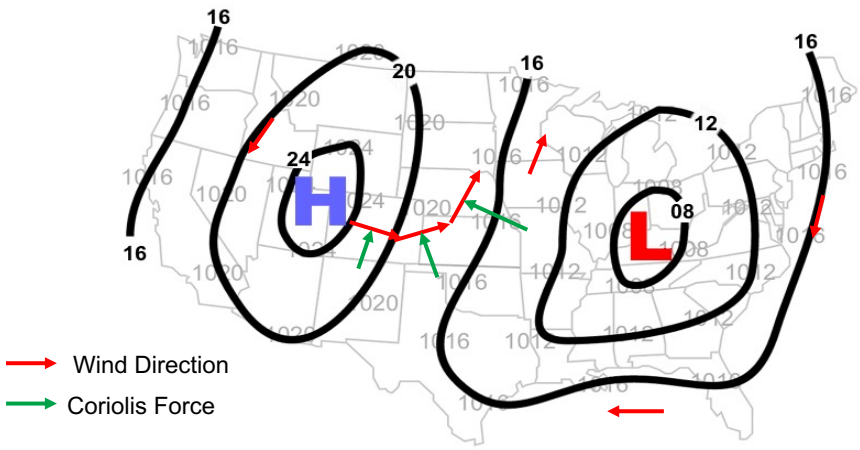
2

Isobar Spacing, Latitude and Wind Speed



- Isobar spacing is a measure of wind speed
- Only at the same latitude!

Isobar Spacing, Latitude and Wind Speed



- Closer isobars mean higher pressure force which means higher wind speed
- The Coriolis Force always acts at right angles to the direction of motion
- The magnitude of the Coriolis force is proportional to the wind speed
- The Coriolis force is also proportional to the angle of Latitude (actually the sine of the angle!)
- The atmosphere is in balance when the pressure force equals the Coriolis force

The balance condition is called the Geostrophic balance

Isobar Spacing, Latitude and Wind Speed

City	Latitude	Coriolis Factor
Melbourne	37.8	1.00
Townsville	19.3	0.54
Darwin	12.4	0.35

- The Coriolis Force at Darwin is a third of that at Melbourne
- This means that for the same isobar spacing, that is same pressure force, the wind at Darwin has to be three times as high to achieve the balance of pressure force and Coriolis Force
- This means that using isobar spacing as a measure of wind speed becomes problematic at lower latitudes

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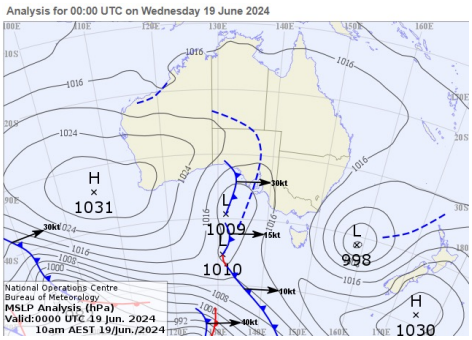
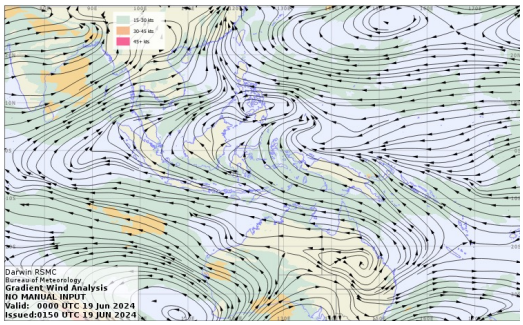
Isobar Spacing, Latitude and Wind Speed





- Gradient wind maps show streamlines showing the wind direction at 1000m altitude
- At that height, friction, and local effects (sea breezes, land effects) are minimal
- Gradient wind maps much more useful at lower latitudes to predict winds

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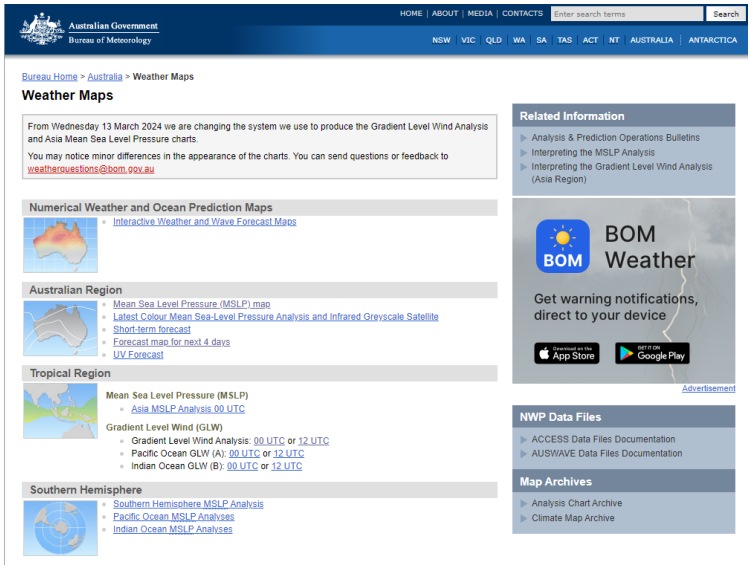
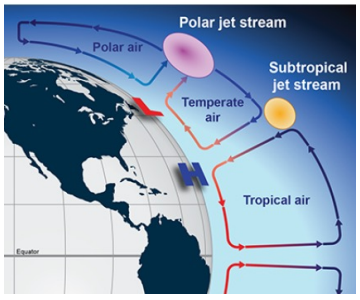
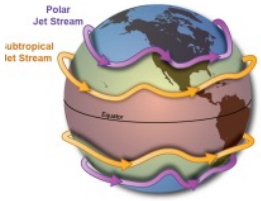
Isobar Spacing, Latitude and Wind Speed

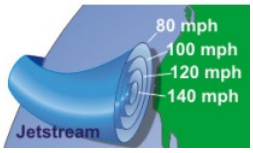


7

Jetstream







- High level (8000-1000km) narrow bands of high-speed air (up to 200 knots) circulating the globe
- Caused by the global temperature differences and the Earth's rotation
- More dominant in winter when the temperature differences are greater
- The faster moving air can draw air out of the rising in a low-pressure system intensifying the low producing more unsettled conditions, stronger winds
- A slower, more meandering Jetstream can strengthen high-pressure system giving more stable conditions

8

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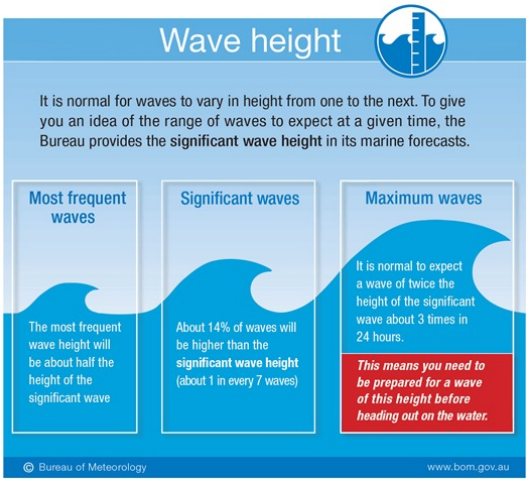
Waves

Sea Waves



- Generated by the prevailing wind
- Height depends on wind strength, fetch and time the wind has been blowing
- Reported wave height is the average of the highest third of the waves, so-called significant wave height
- A few times a day, waves will be twice that height
- Will break when the water depth approaches the wave height

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Waves

Swell

- Regular, longer period waves generated by distant weather systems
- Can travel thousands of kilometres
- Can be present even in calm wind conditions
- Can have swell from different directions giving more confused sea
- Sea state is the total of wind wave plus swell height

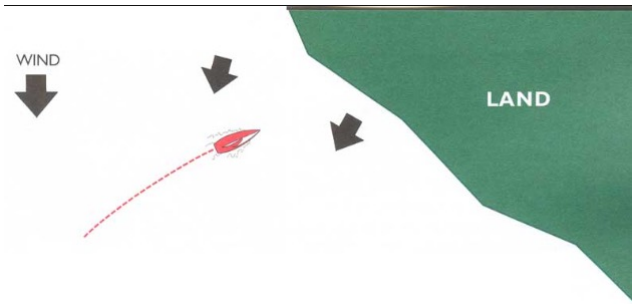
11

Coastal Fog

- Forms when warmer, most air passes over a cooler surface, (land or cold current)
- The warmer near the ground or cold current cools more than the warmer air above (a temperature inversion)
- Water vapour in the low, cooler air condenses to form (advection) fog which is trapped by the warmer air above
- In San Francisco, the warmer air rising inland “sucks” the fog through the only coastal opening at the Golden Gate, enveloping the city in fog

12

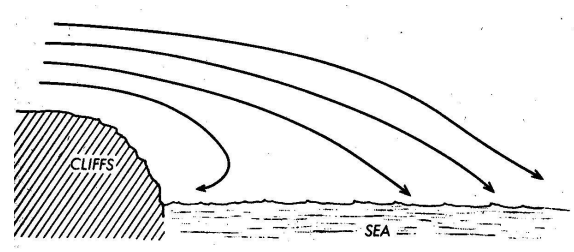
Land Effects



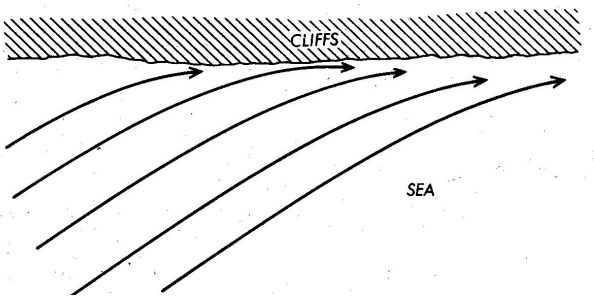
- Wind slows down over the land
- Coriolis causes the wind direction to shift to be more perpendicular to the coast
- Boat steadily headed as it approaches the land

13

Land Effects



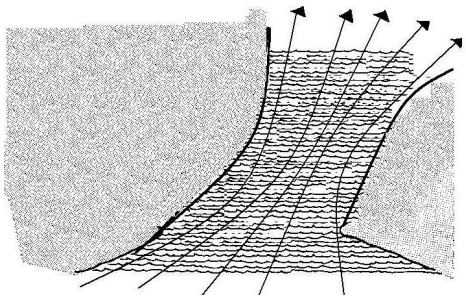
- Mechanical obstructions can modify the prevailing wind speed and direction
- Off-shore breeze and hilly coastline
- Eddies near the shore



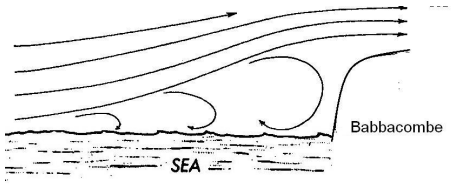
- On-shore breeze and hilly coastline
- Change in both speed and direction

14

Land Effects



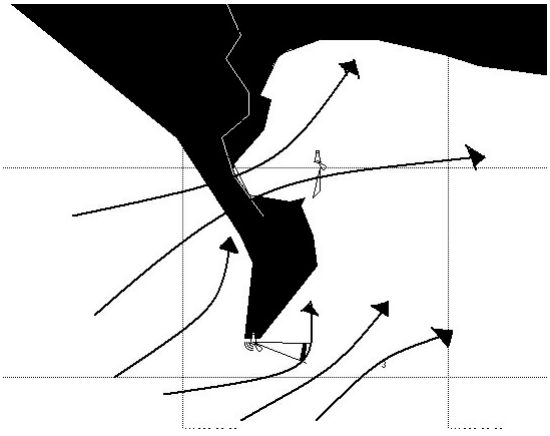
- Wind funnelling through a narrow opening
- Wind accelerates through an opening



- Winds eddies close to the coast

15

Land Effects



- Wind effects around a headland or promontory

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Break/Questions

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

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Long Range Weather forecasting 12 days

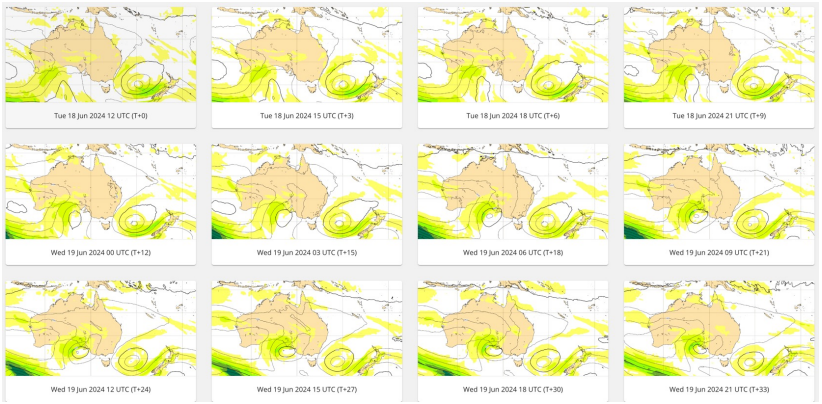
ECMWF (European Centre for Medium-Range Weather Forecasts) Long Range forecast

15 days ECMWF's operational forecasts aim to show how the weather is most likely to evolve. To do this, the Centre produces an ensemble of predictions.

Predictwind

Windy

18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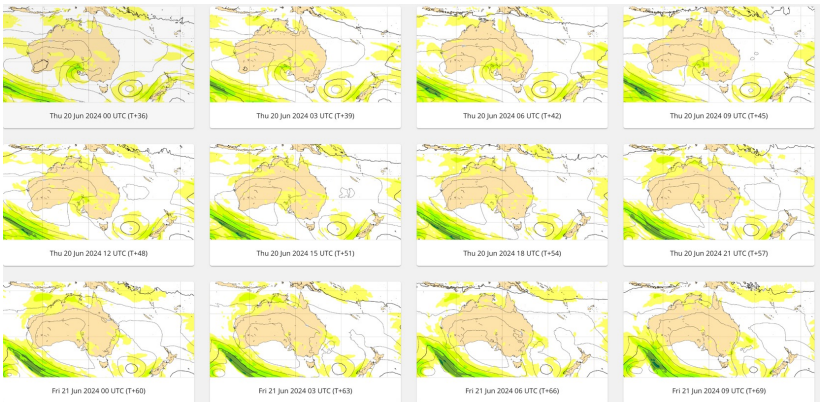
Tue 18 Jun 2024 15 UTC (T+3)
Tue 18 Jun 2024 18 UTC (T+6)
Tue 18 Jun 2024 21 UTC (T+9)
Wed 19 Jun 2024 00 UTC (T+12)
Wed 19 Jun 2024 03 UTC (T+15)
Wed 19 Jun 2024 06 UTC (T+18)
Wed 19 Jun 2024 09 UTC (T+21)
Wed 19 Jun 2024 12 UTC (T+24)
Wed 19 Jun 2024 15 UTC (T+27)
Wed 19 Jun 2024 18 UTC (T+30)
Wed 19 Jun 2024 21 UTC (T+33)

19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Thu 20 Jun 2024 18 UTC (T+54)
Thu 20 Jun 2024 21 UTC (T+57)
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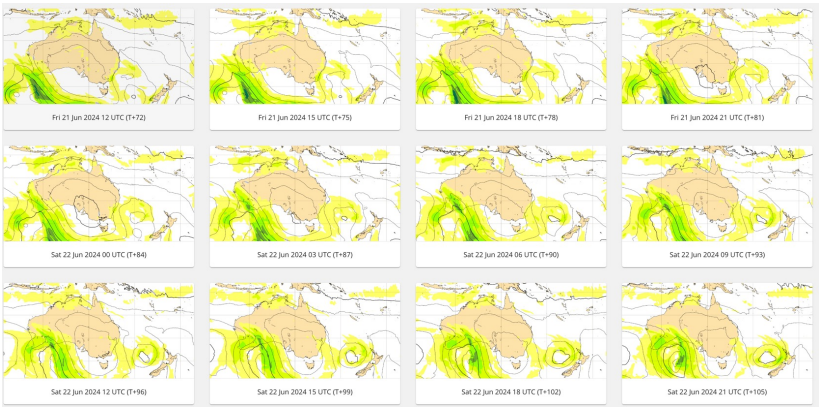
Fri 21 Jun 2024 09 UTC (T+69)

20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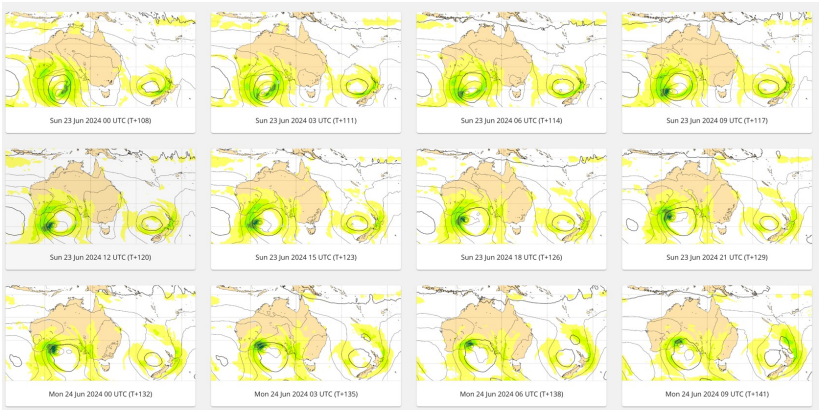
Sat 22 Jun 2024 03 UTC (T+87)
Sat 22 Jun 2024 06 UTC (T+90)
Sat 22 Jun 2024 09 UTC (T+93)
Sat 22 Jun 2024 12 UTC (T+96)
Sat 22 Jun 2024 15 UTC (T+99)
Sat 22 Jun 2024 18 UTC (T+102)
Sat 22 Jun 2024 21 UTC (T+105)

21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Sun 23 Jun 2024 06 UTC (T+114)
Sun 23 Jun 2024 09 UTC (T+117)
Sun 23 Jun 2024 12 UTC (T+120)
Sun 23 Jun 2024 15 UTC (T+123)
Sun 23 Jun 2024 18 UTC (T+126)
Sun 23 Jun 2024 21 UTC (T+129)
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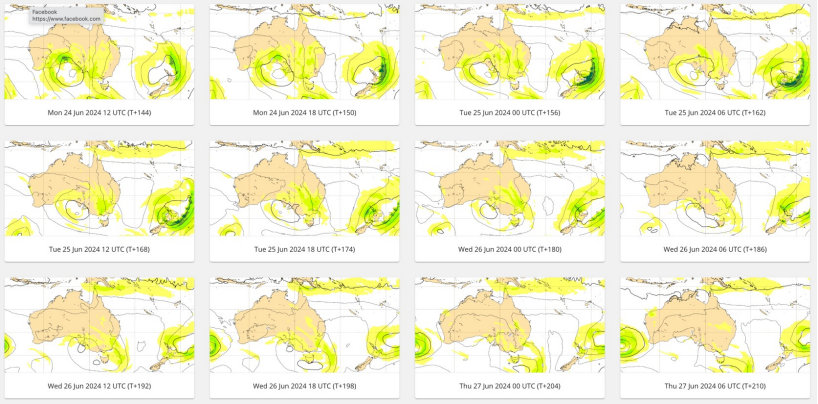
22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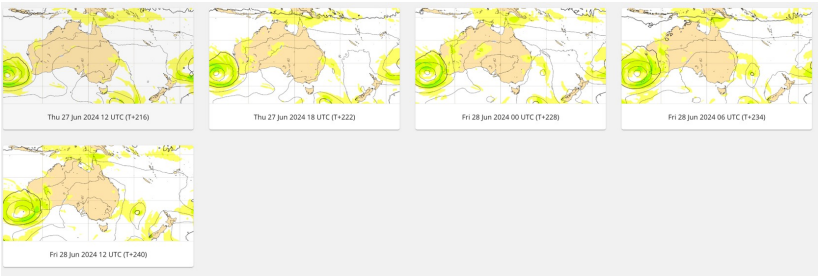
23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Fri 28 Jun 2024 06 UTC (T+234)
Fri 28 Jun 2024 12 UTC (T+240)

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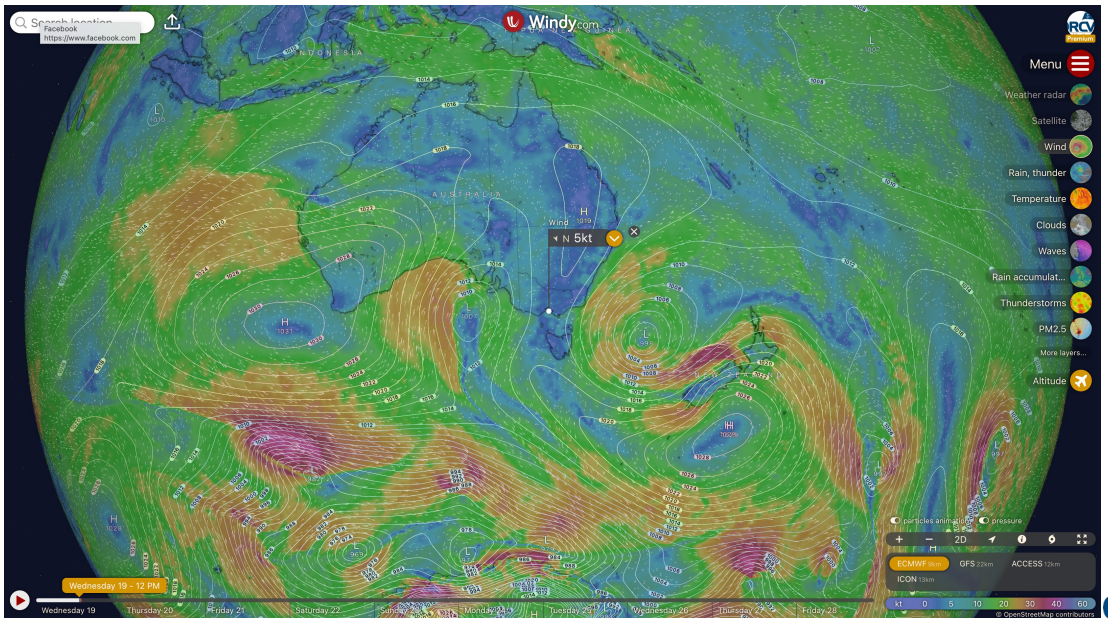
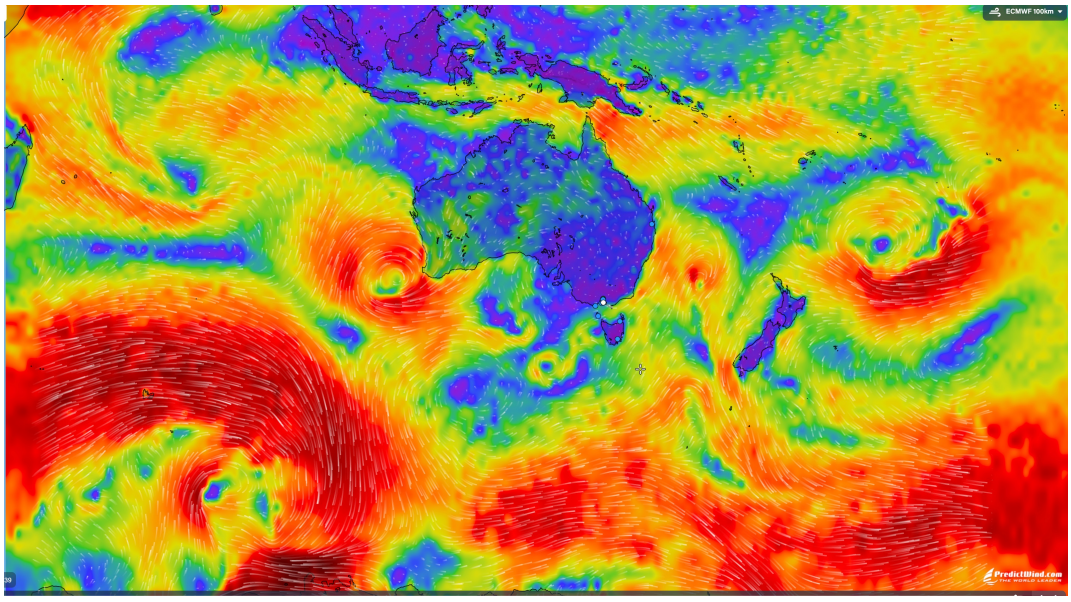
Windy 9 Day



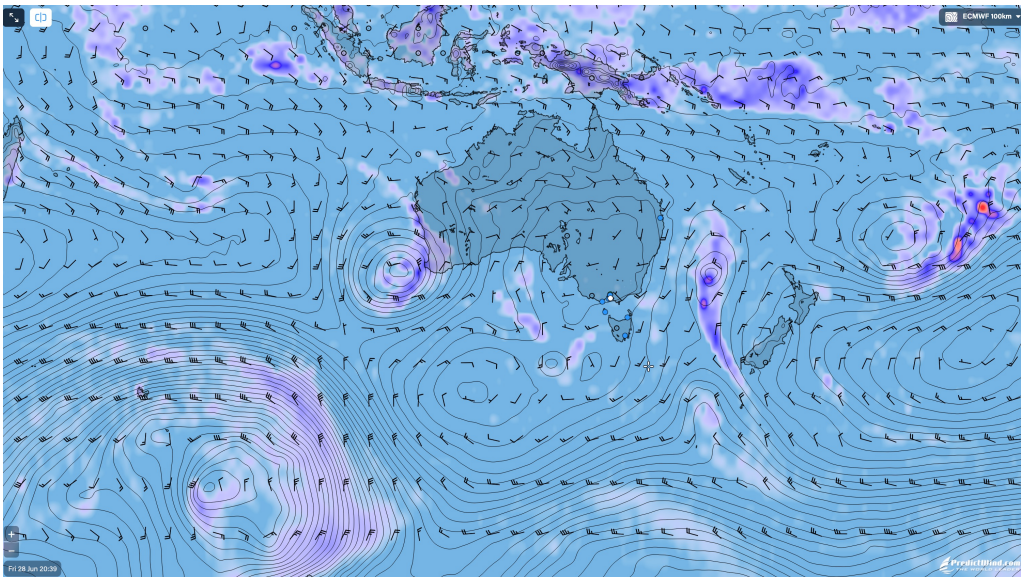
25

PredictWind ECMWF 9 days



26

PredictWind Isobar Map 100km resolution



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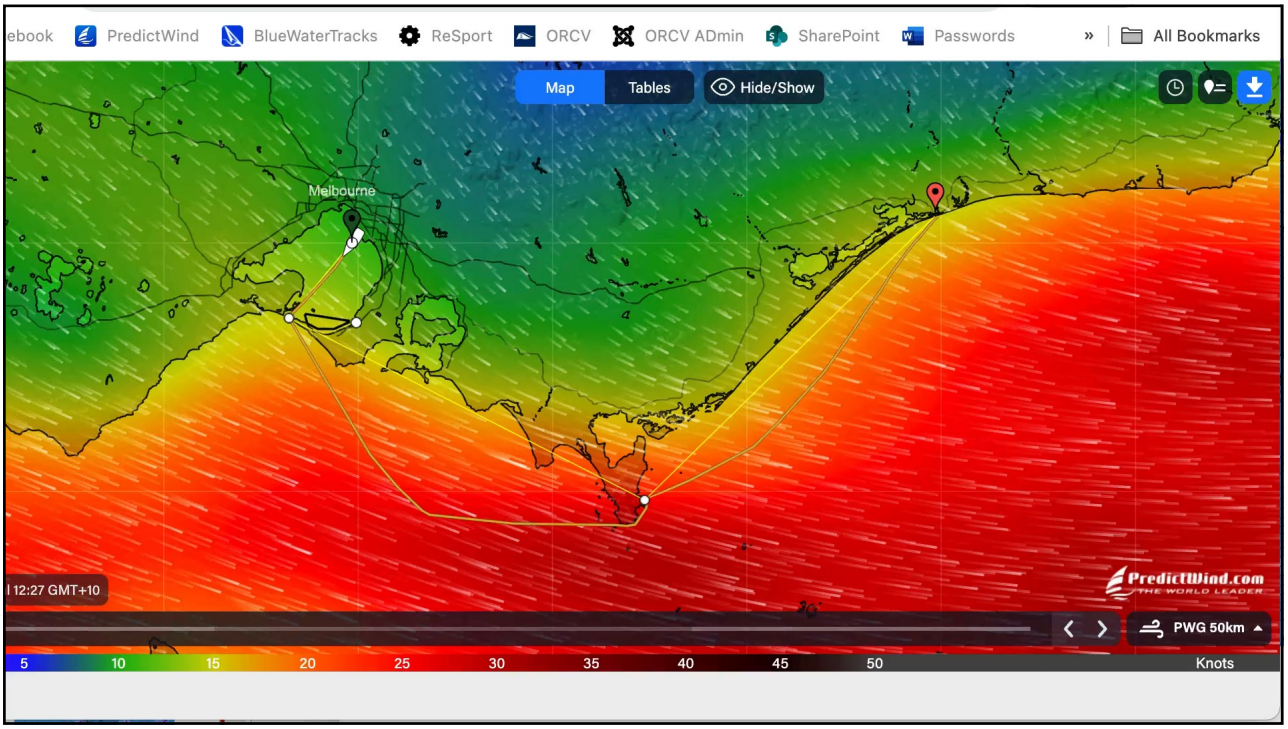

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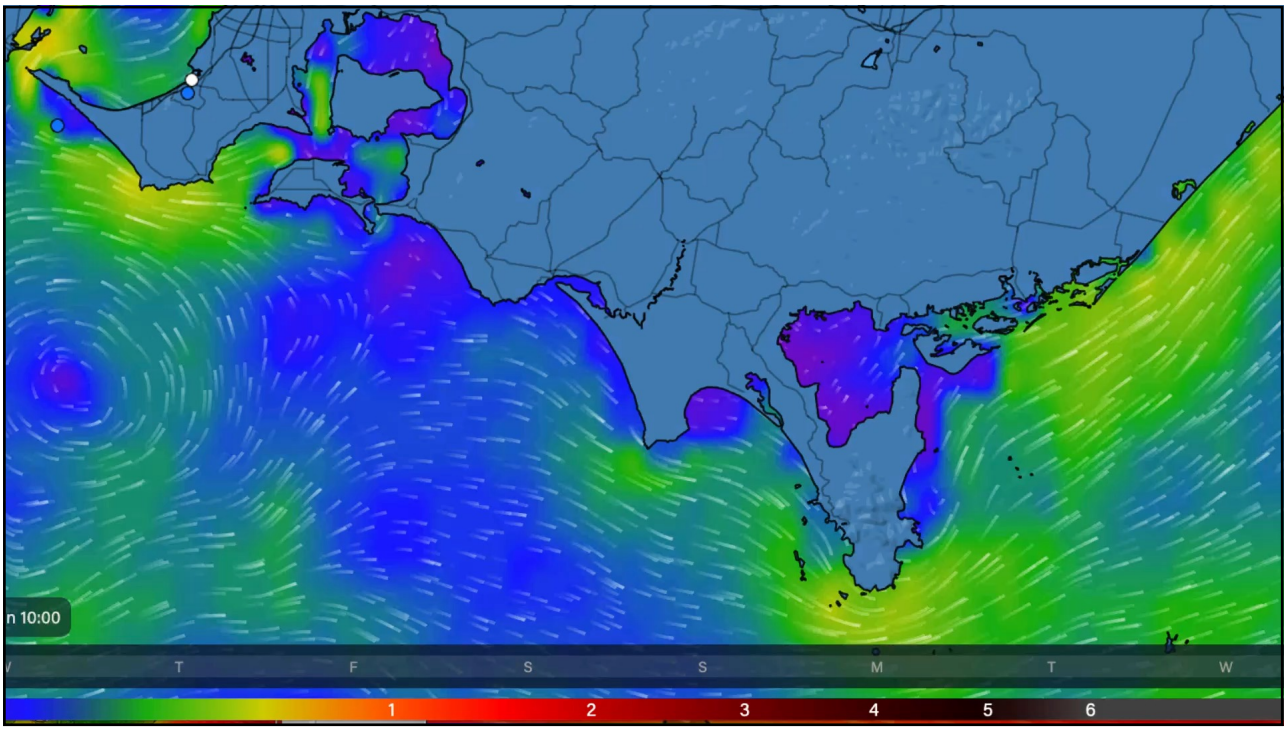

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7 Day forecasting

Bom

Access Model 3 to 6km

Windy

Access 12km, GFS 22km, ECmWF 9km, ICON 18km

Predictwind

1, 8, 50 and100km resolution models

PWG, PWE, ECMWF,GFS, SPIRE,UKMO

30

Weather Gribs for the computer specialists

Saildocs:

•Saildocs provides GRIB files via email requests. You send an email request with specific parameters, and they send back the GRIB file.

NOAA (National Oceanic and Atmospheric Administration):

•NOAA provides free access to GFS model GRIB files among other data. You can download these directly from their servers or use tools to fetch the data.

ZYGRIB:

•ZYGRIB offers a user-friendly way to download GRIB files through their software. It's popular among sailors and provides access to multiple weather models.

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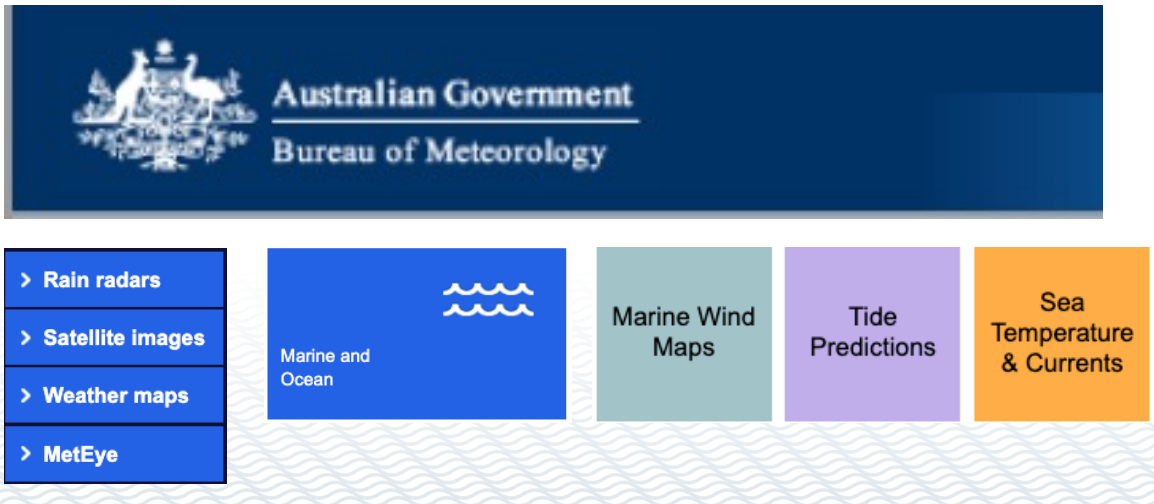
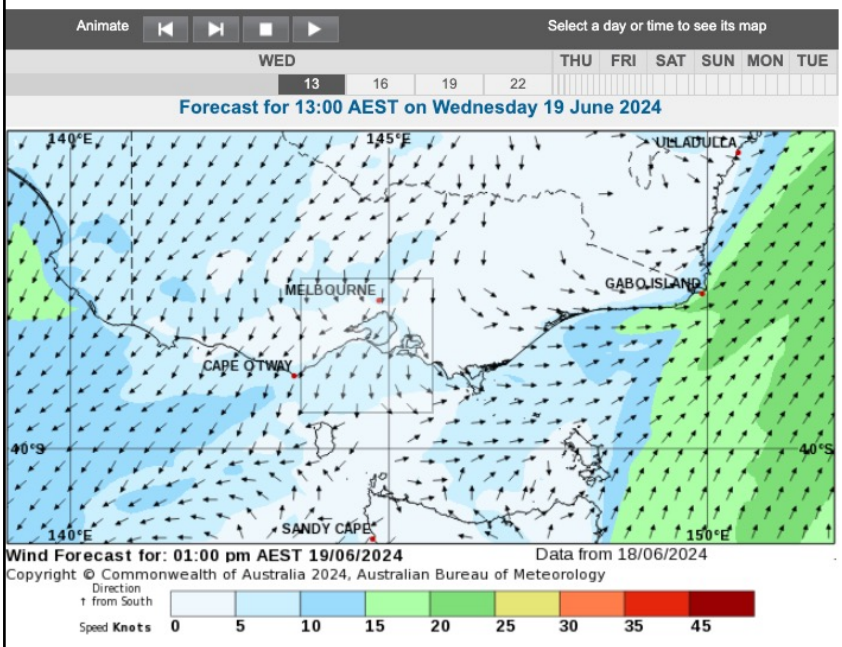


32



Marine Wind Maps

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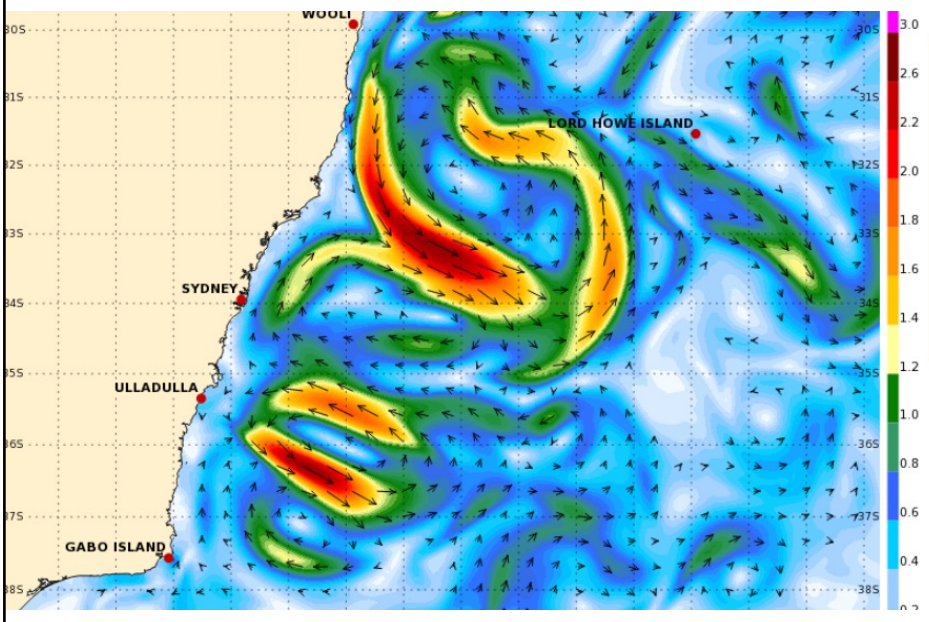

Sea Temperature & Currents

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Australian Government
Bureau of Meteorology

Marine Weather Services (lite)

Please refresh page for latest warnings

WARNINGS

OCEAN WIND WARNINGS

- Ocean Wind Warning 3 - Metarea 10
- Ocean Wind Warning 4 - Metarea 10
- Ocean Wind Warning 5 - Metarea 10
- Ocean Wind Warning 6 - Metarea 10
- Ocean Wind Warning 7 - Metarea 10

QLD WARNINGS

No Warnings Current

NSW WARNINGS

- Marine Wind Warning Summary for New South Wales

VIC WARNINGS

No Warnings Current

TAS WARNINGS

No Warnings Current

SA WARNINGS

- Marine Wind Warning Summary for South Australia

FORECASTS

High Seas forecast

- North Eastern
- South Eastern
- Western
- Northern
- Southern

Bass Strait forecast

Bass Strait and Approaches
Cape Otway to Sandy Cape and St Helens to Gabo Island

QLD forecast

Gulf Waters Coastal Waters Zones
QLD/NT border to Crab Island

North Queensland Coastal Waters Zones
Torres Strait to St Lawrence

South Queensland Coastal Waters Zones
St Lawrence to Point Danger

CHARTS

- Australia MSLP Analysis
- Pacific Ocean MSLP Analysis
- Indian Ocean MSLP Analysis
- All wind and wave charts for 7 days

SA forecast

All Coastal Waters Zones
WA/SA border to SA/VIC border

Adelaide Metropolitan Waters
Sellicks Beach to St Kilda

WA forecast

Northern Coastal Waters Zones
NT/WA border to North West Cape

Western Coastal Waters Zones
North West Cape to Cape Naturaliste

Southern Coastal Waters Zones

Marine Lite

35

Central Coast: Cape Otway to Wilsons Promontory

Forecast for Thursday 20 June until midnight

Winds: Variable about 10 knots tending southeasterly later in the day. Seas: Below 1 metre. Swell: West to southwesterly around 1 metre, increasing to 1 to 1.5 metres in the west around midday. Weather: Becoming cloudy.

Forecast for Friday 21 June

Winds: Southerly about 10 knots increasing to 10 to 15 knots in the early afternoon. Seas: Around 1 metre. Swell: West to southwesterly 1 to 1.5 metres, increasing to 1.5 to 2 metres in the far west. Weather: Partly cloudy.

Forecast for Saturday 22 June

Winds: Southerly 10 to 15 knots becoming variable below 10 knots during the evening. Seas: Below 1 metre. Swell: Southwesterly 1 to 1.5 metres, increasing to 1.5 to 2 metres in the far west. Weather: Partly cloudy.

Central Gippsland Coast: Wilsons Promontory to Lakes Entrance

Forecast for Thursday 20 June until midnight

Winds: West to southwesterly below 10 knots becoming south to southeasterly in the late afternoon. Seas: Below 0.5 metres. Swell: East to southeasterly 1 to 1.5 metres. Weather: Mostly cloudy.

Forecast for Friday 21 June

Winds: Southerly 10 to 15 knots. Winds reaching up to 20 knots in the east during the morning. Seas: Below 1 metre, increasing to 1 to 1.5 metres in the east during the morning. Swell: East to southeasterly 1 to 1.5 metres. Weather: Partly cloudy. 70% chance of showers.

Forecast for Saturday 22 June

Winds: Southerly 10 to 15 knots turning west to southwesterly below 10 knots during the day. Seas: Around 1 metre. Swell: East to southeasterly around 1 metre, increasing to 1 to 1.5 metres in the east. Weather: Mostly sunny.

Bass Strait Forecast

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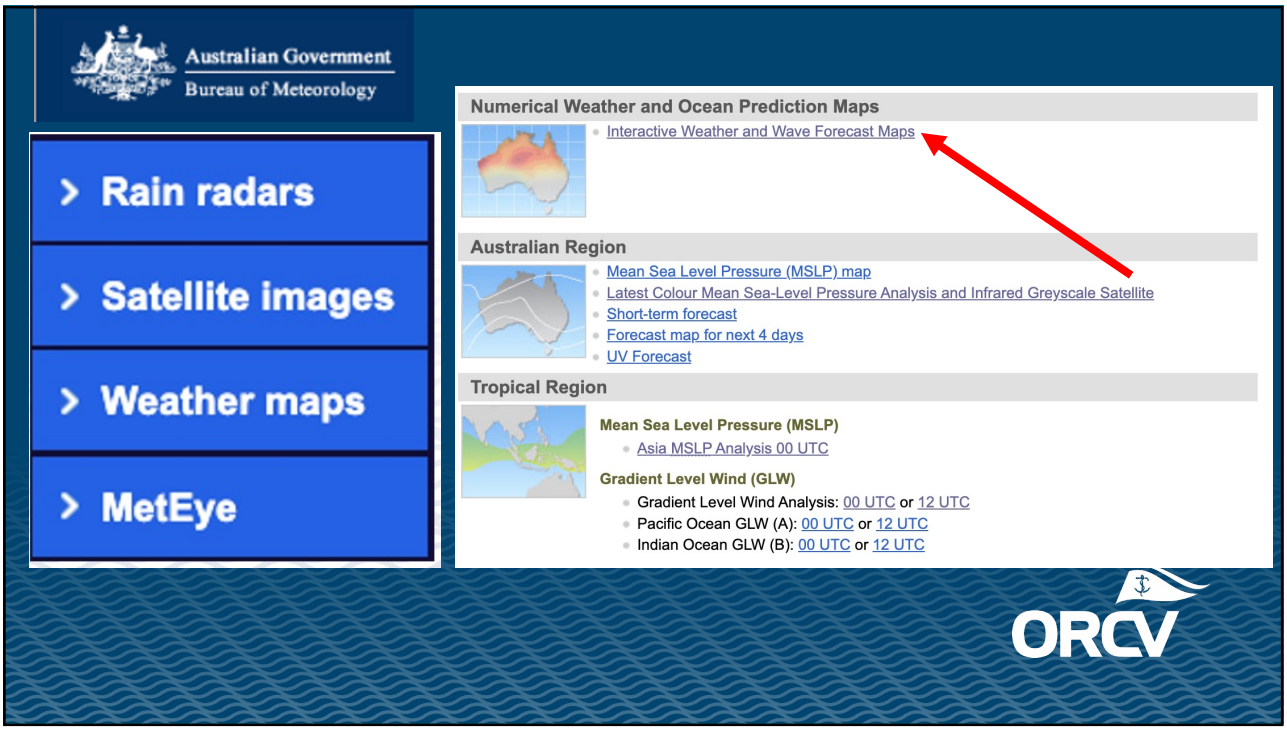
Australian Government
Bureau of Meteorology
Rain radars
Satellite images
Weather maps
MetEye
Numerical Weather and Ocean Prediction Maps
Interactive Weather and Wave Forecast Maps
Australian Region
Mean Sea Level Pressure (MSLP) map
Latest Colour Mean Sea-Level Pressure Analysis and Infrared Greyscale 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
ORCV

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Predictwind

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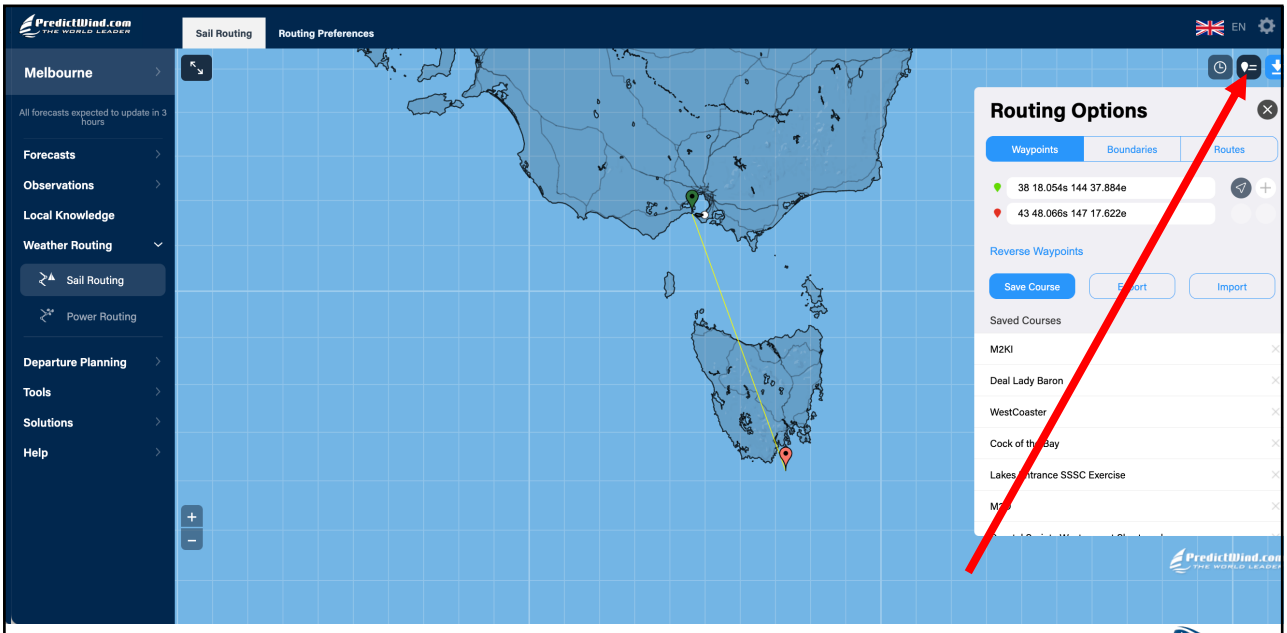

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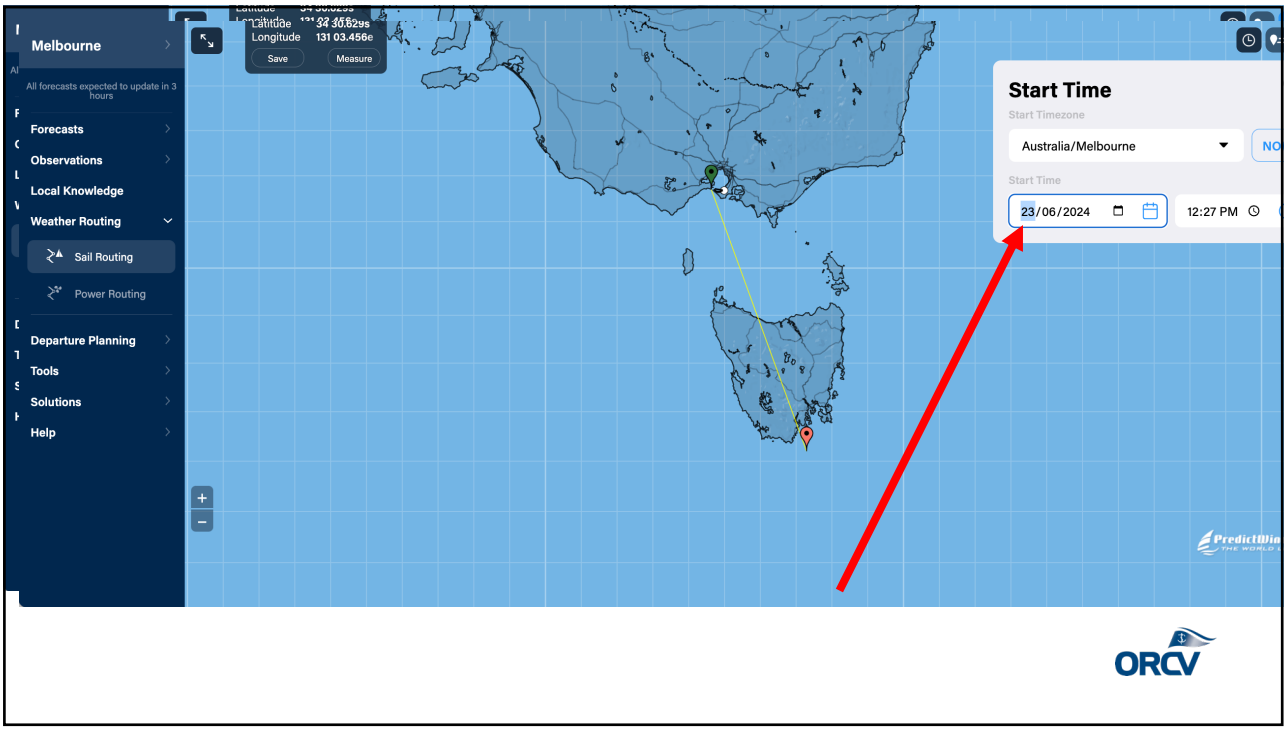
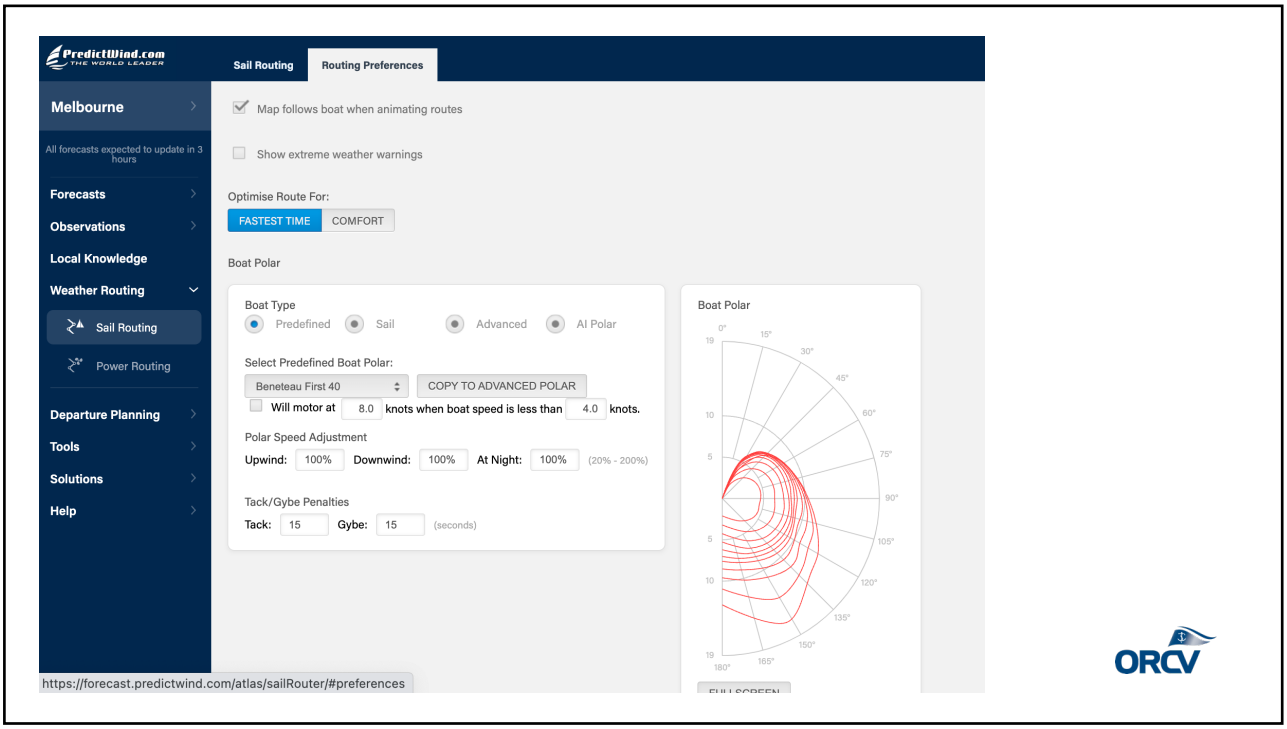

Melbourne
All forecasts expected to update in 3 hours
Forecasts
Observations
Local Knowledge
Weather Routing
Sail Routing
Power Routing
Departure Planning
Tools
Solutions
Help
Latitude
Longitude 131 03.456e
Save
Measure
Start Time
Start Timezone
Australia/Melbourne
Start Time
23/06/2024
12:27 PM

41


PredictWind.com
THE WORLD LEADER
Sail Routing
Routing Preferences
Melbourne
All forecasts expected to update in 3 hours
Forecasts
Observations
Local Knowledge
Weather Routing
Sail Routing
Power Routing
Departure Planning
Tools
Solutions
Help
Map follows boat when animating routes
Show extreme weather warnings
Optimise Route For:
FASTEST TIME
COMFORT
Boat Polar
Boat Type
Predefined
Sail
Advanced
AI Polar
Select Predefined Boat Polar:
Beneteau First 40
COPY TO ADVANCED POLAR
Will motor at 8.0 knots when boat speed is less than 4.0 knots.
Polar Speed Adjustment
Upwind: 100% Downwind: 100% At Night: 100% (20% - 200%)
Tack/Gybe Penalties
Tack: 15 Gybe: 15 (seconds)
Boat Polar
https://forecast.predictwind.com/atlas/sailRouter/#preferences

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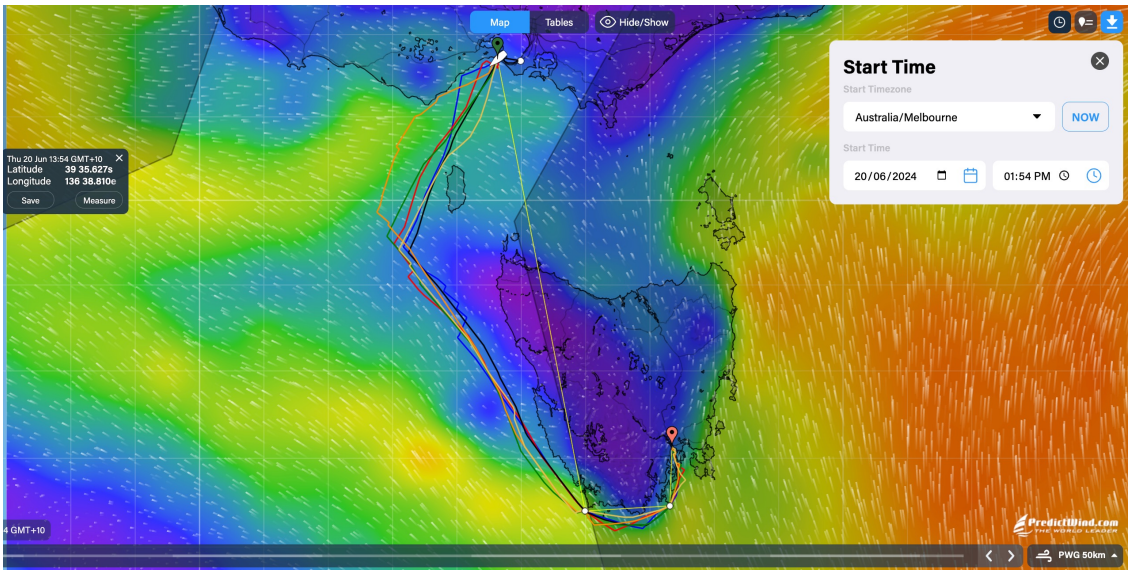
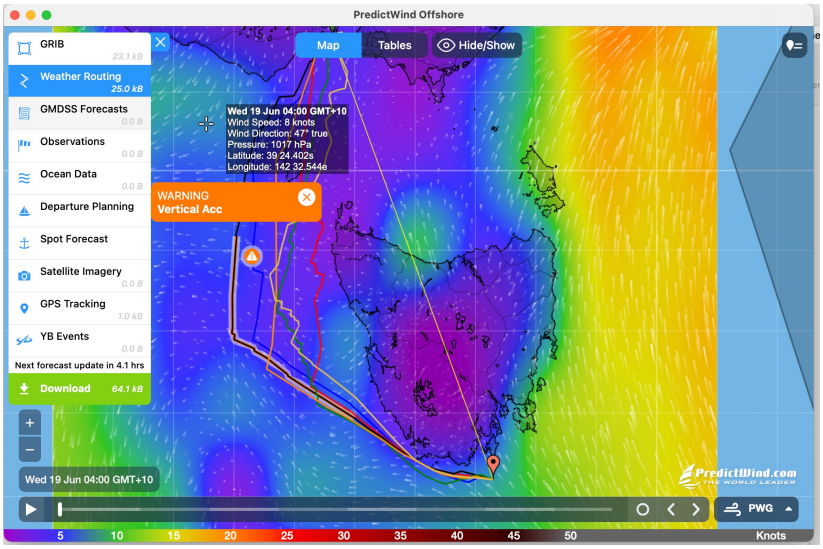
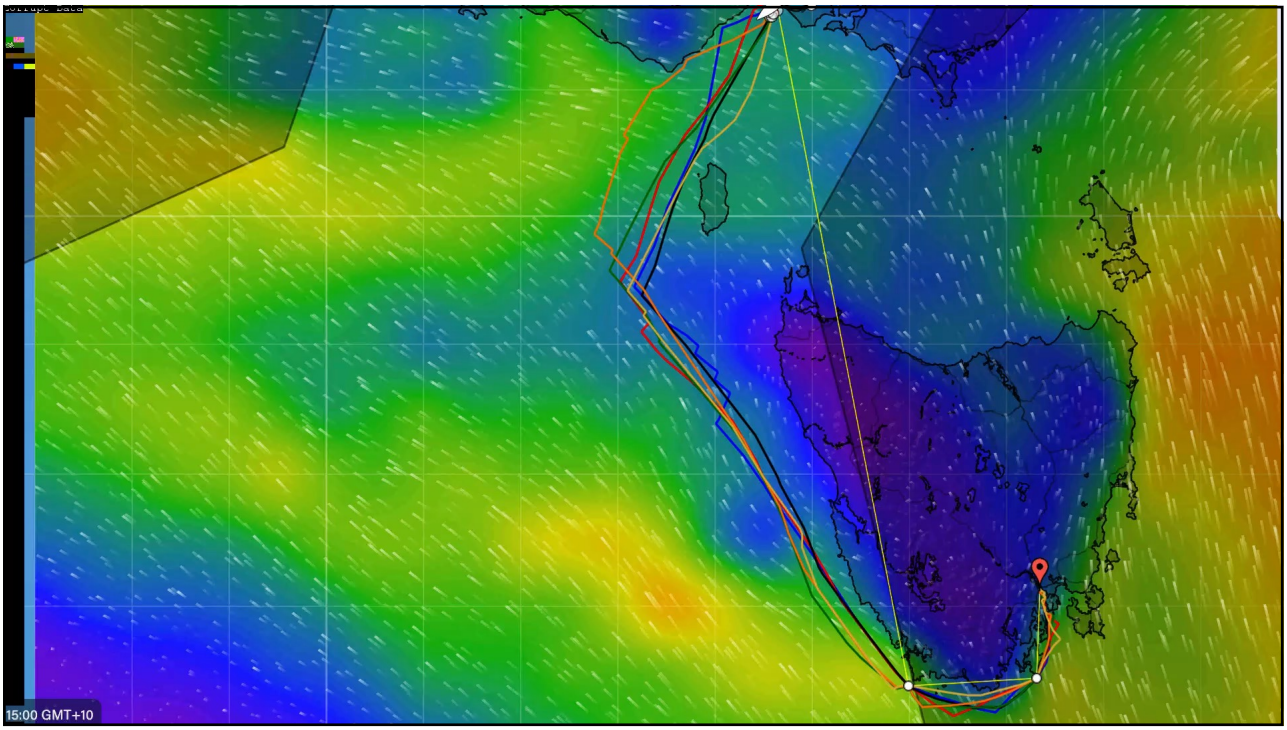
Four Models


Map
Tables
Hide/Show
Start Time
Start Timezone
Australia/Melbourne
NOW
Start Time
20/06/2024
01:54 PM
Thu 20 Jun 13:54 GMT+10
Latitude 39 35.627s
Longitude 136 38.810e
Save
Measure
PredictWind.com
PWG 50km


PredictWind Offshore
GRIB
Weather Routing
GMDSS Forecasts
Observations
Ocean Data
Departure Planning
Spot Forecast
Satellite Imagery
GPS Tracking
YB Events
Next forecast update in 4.1 hrs
Download
Map
Tables
Hide/Show
Wed 19 Jun 04:00 GMT+10
Wind Speed: 8 knots
Wind Direction: 47° true
Pressure: 1017 hPa
Latitude: 39 24.402s
Longitude: 142 32.544e
WARNING
Vertical Acc
Wed 19 Jun 04:00 GMT+10
PredictWind.com
PWG
5 10 15 20 25 30 35 40 45 50
Knots



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Map | Tables

Graph | Wind | Summary | Route | Wave | Current | Atmosphere

Units				Polar Settings	
Speed	Knots	Pressure	hPa	Polar	Beneteau First 40
Direction	True	Temperature	Celsius	Polar Speed Adjustment	Upwind 100% — Downwind 100%
Wave Height	Meters	Rainfall	mm/hr	Motoring	False
Period	Seconds	CAPE	J/kg	Ocean Current	Mercator
				TWD Adjustment	0°
				TWS Scale Factor	100%

	PWG	PWE	ECMWF	GFS	SPIRE	UKMO
Warnings	⚠	⚠	⚠	⚠	⚠	⚠
Timezone	GMT+10:00	GMT+10:00	GMT+10:00	GMT+10:00	GMT+10:00	GMT+10:00
Start Time	20 Jun 13:54	20 Jun 13:54	20 Jun 13:54	20 Jun 13:54	20 Jun 13:54	20 Jun 13:54
Finish Time	23 Jun 07:37	23 Jun 17:54	23 Jun 04:53	23 Jun 16:44	23 Jun 20:19	23 Jun 21:31
Time Taken	2 days 17h 42m 38s	3 days 3h 59m 59s	2 days 14h 58m 26s	3 days 2h 50m 19s	3 days 6h 24m 30s	3 days 7h 36m 30s
Motoring Time						
Distance Traveled	502.1 NM	515.5 NM	477.0 NM	507.0 NM	523.1 NM	495.4 NM
Average Speed (kts)	7.6	6.8	7.6	6.8	6.7	6.2
Passage Time (days)	2.74	3.17	2.62	3.12	3.27	3.32
Motoring Time (days)	0.00	0.00	0.00	0.00	0.00	0.00
Max Wind Speed (Knots)	14.6	11.2	16.3	14.9	13.6	13.8
Min Wind Speed (Knots)	2.6	1.4	4.6	2.2	2.0	2.4
Avg Wind Speed (Knots)	11.0	8.0	10.5	9.2	8.6	7.4
Max Gust (Knots)	17.3	17.3	21.0	16.2	18.4	18.4

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PredictWind Offshore App

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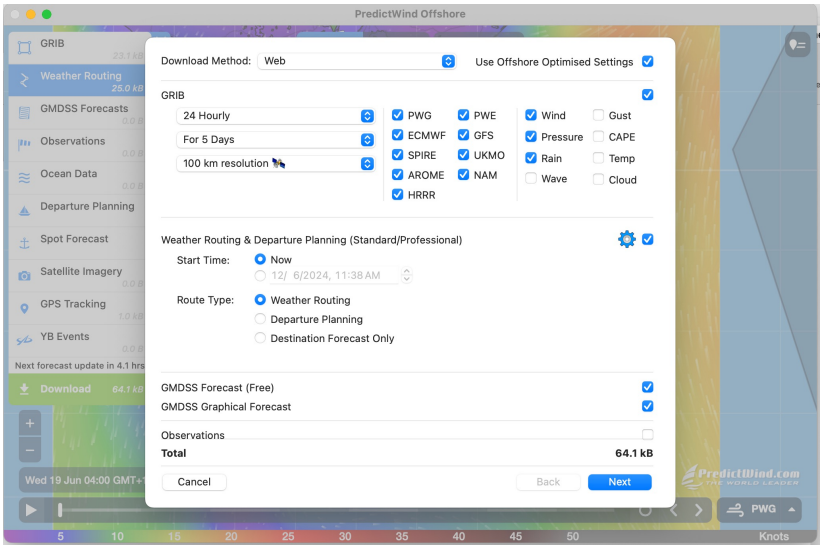

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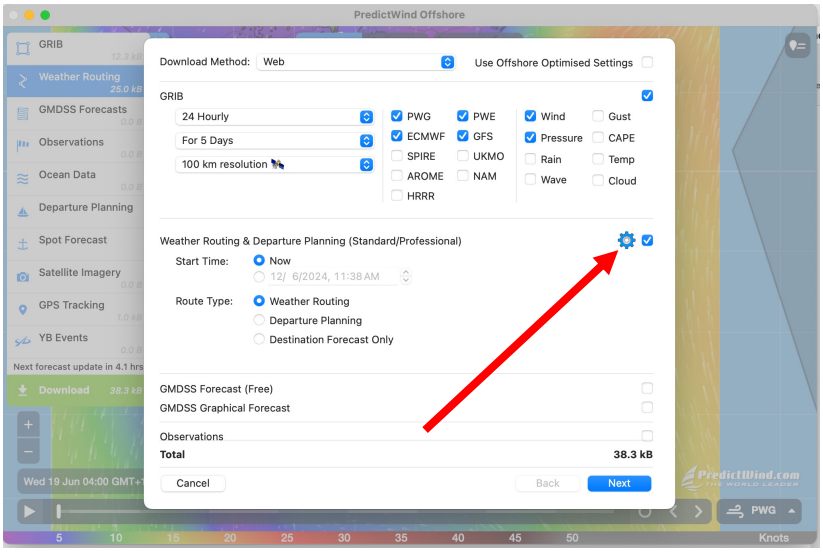
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Spot Forecast
Satellite Imagery
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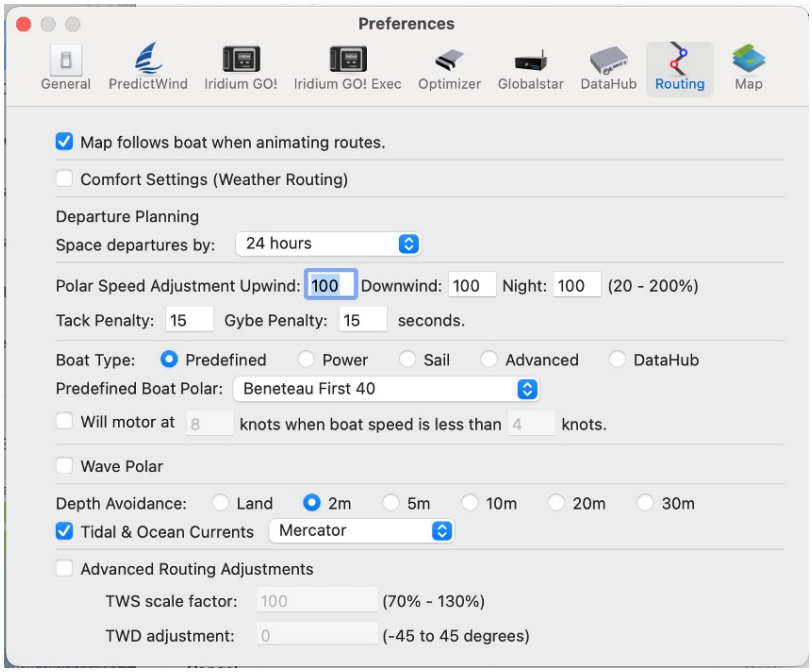
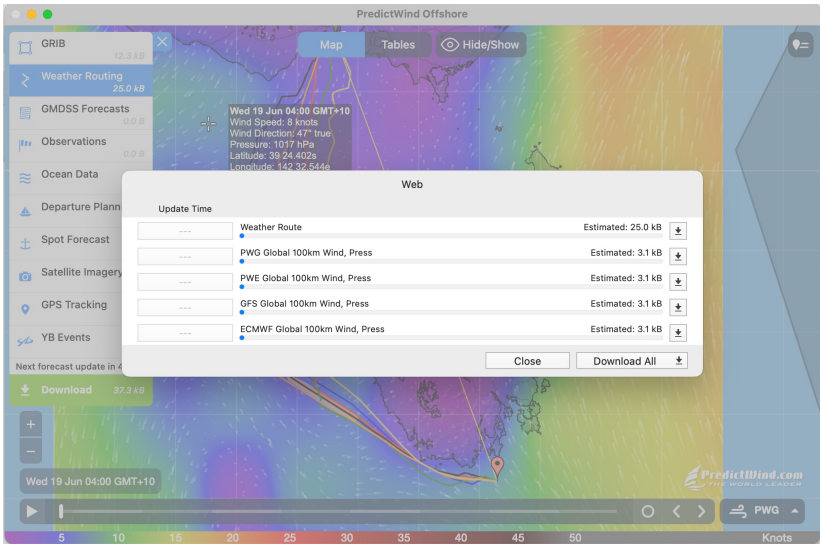
YB Events
Download
Download Method: Web
Use Offshore Optimised Settings
GRIB
24 Hourly
For 5 Days
100 km resolution
PWG
ECMWF
SPIRE
AROME
HRRR
PWE
GFS
UKMO
NAM
Wind
Pressure
Rain
Wave
Gust
CAPE
Temp
Cloud
Weather Routing & Departure Planning (Standard/Professional)
Start Time:
Now
Route Type:
Weather Routing
Departure Planning
Destination Forecast Only
GMDSS Forecast (Free)
GMDSS Graphical Forecast
Observations
Total
38.3 kB
Cancel
Back
Next
PWG
Knots


Preferences
General
PredictWind
Iridium GO!
Iridium GO! Exec
Optimizer
Globalstar
DataHub
Routing
Map
Map follows boat when animating routes.
Comfort Settings (Weather Routing)
Departure Planning
Space departures by: 24 hours
Polar Speed Adjustment Upwind: 100 Downwind: 100 Night: 100 (20 - 200%)
Tack Penalty: 15 Gybe Penalty: 15 seconds.
Boat Type: Predefined Power Sail Advanced DataHub
Predefined Boat Polar: Beneteau First 40
Will motor at 8 knots when boat speed is less than 4 knots.
Wave Polar
Depth Avoidance: Land 2m 5m 10m 20m 30m
Tidal & Ocean Currents Mercator
Advanced Routing Adjustments
TWS scale factor: 100 (70% - 130%)
TWD adjustment: 0 (-45 to 45 degrees)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Spot Forecast
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GPS Tracking
YB Events
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Map
Tables
Hide/Show
Wed 19 Jun 04:00 GMT+10
Wind Speed: 8 knots
Wind Direction: 47° true
Pressure: 1017 hPa
Web
Update Time
Weather Route
Estimated: 25.0 kB
PWG Global 100km Wind, Press
Estimated: 3.1 kB
PWE Global 100km Wind, Press
Estimated: 3.1 kB
GFS Global 100km Wind, Press
Estimated: 3.1 kB
ECMWF Global 100km Wind, Press
Estimated: 3.1 kB
Close
Download All
PWG
Knots

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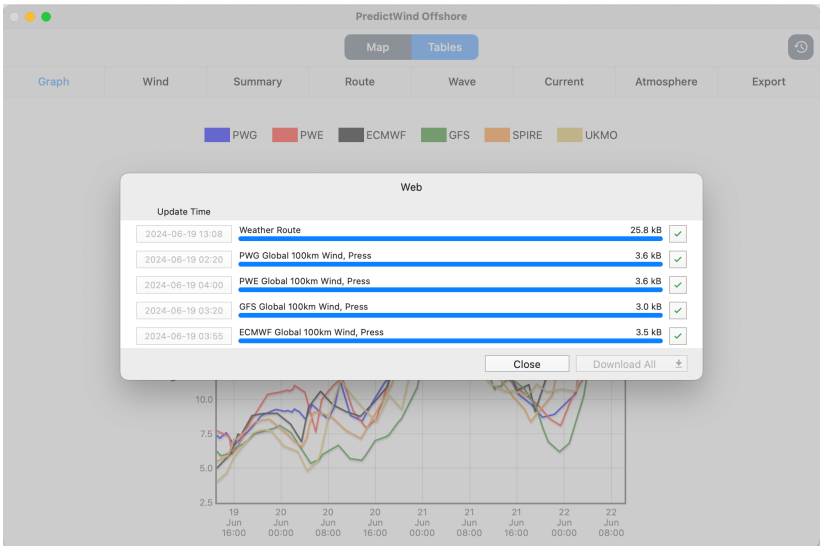
PredictWind Offshore
Map
Tables
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Wind
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Route
Wave
Current
Atmosphere
Export
PWG
PWE
ECMWF
GFS
SPIRE
UKMO
Web
Update Time
2024-06-19 13:08
Weather Route
25.8 kB
2024-06-19 02:20
PWG Global 100km Wind, Press
3.6 kB
2024-06-19 04:00
PWE Global 100km Wind, Press
3.6 kB
2024-06-19 03:20
GFS Global 100km Wind, Press
3.0 kB
2024-06-19 03:55
ECMWF Global 100km Wind, Press
3.5 kB
Close
Download All

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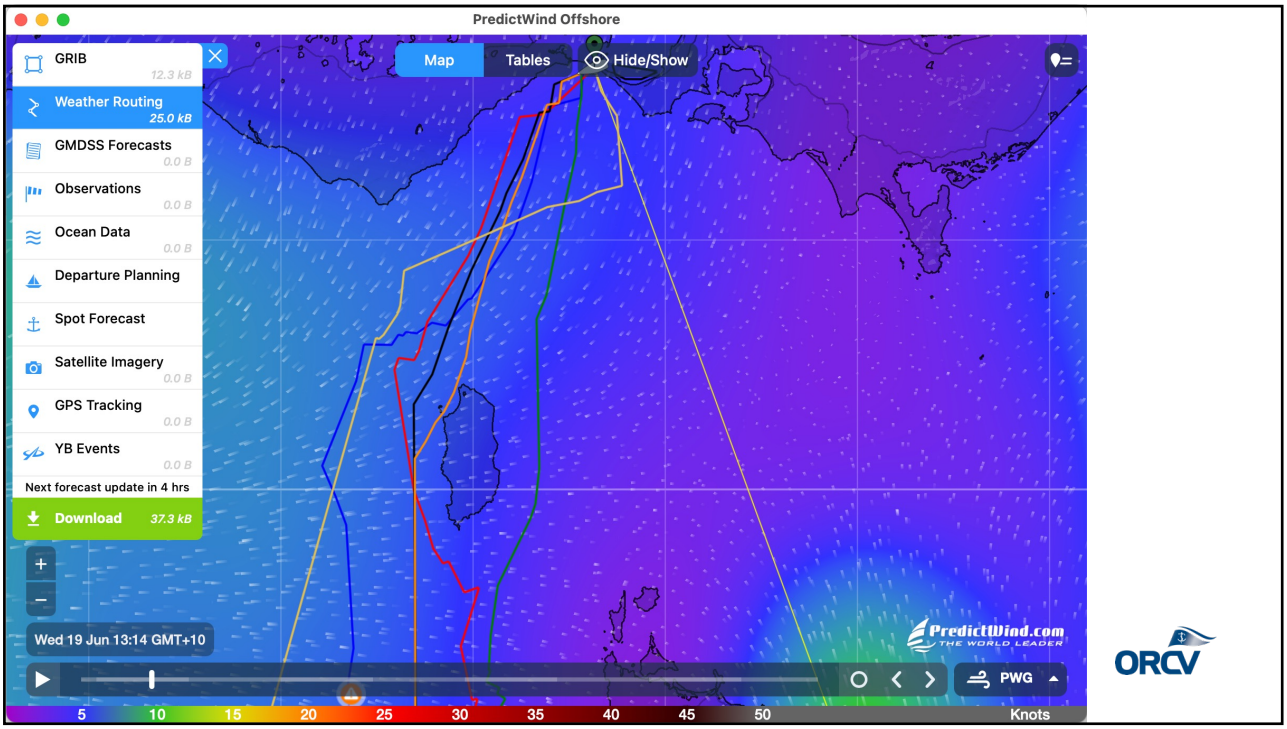

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Weather Planning things to Remember

- Advance weather planning will make a safer trip
- Your Weather journey has just started
- Pick the tools that are right for you level of interest
- Get to know the tools that you choose
- When delivering or cruising always choose a window rather than a date
- Make sure that you have the ability to constantly update your weather while you are on the move
- In closing we have given you a lot
- Please maximize the benefit of this course by making your own weather bible

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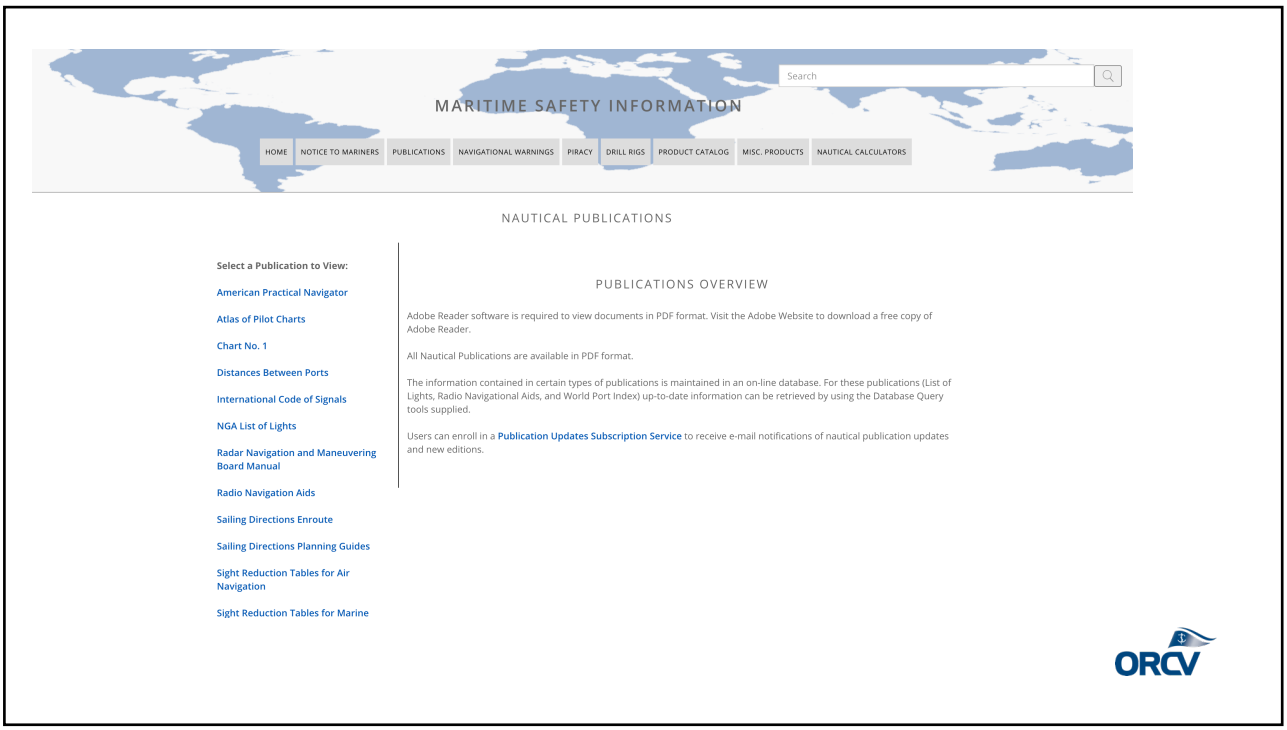
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Thu 19 - 5 PM
Thursday 19
Friday 20
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Questions

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Thank you

Our next training course is Fundamental Navigation with the first of three sessions on Tuesday 15th July, 7.00pm. Note there is also an eLearning component of this course.

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