

Weather over the water

Predicting changes and future developments to weather patterns over the ocean is an invaluable, albeit complex, science that is continually conducted in Australia by the Bureau of Meteorology. The Bureau's forecasts and warnings are extremely beneficial, enabling mariners to make appropriate plans and take precautions for the expected weather conditions. However, a broad understanding of weather patterns, particularly in the area where a vessel is usually operated, is a valuable skill for crew members to have. Weather predictions should be used as a guide only and mariners should always proceed with caution, drawing from their local knowledge and experience. However, if the Bureau has predicted bad weather, mariners should take note and not risk the safety of the vessel and crew.

The Synoptic Chart

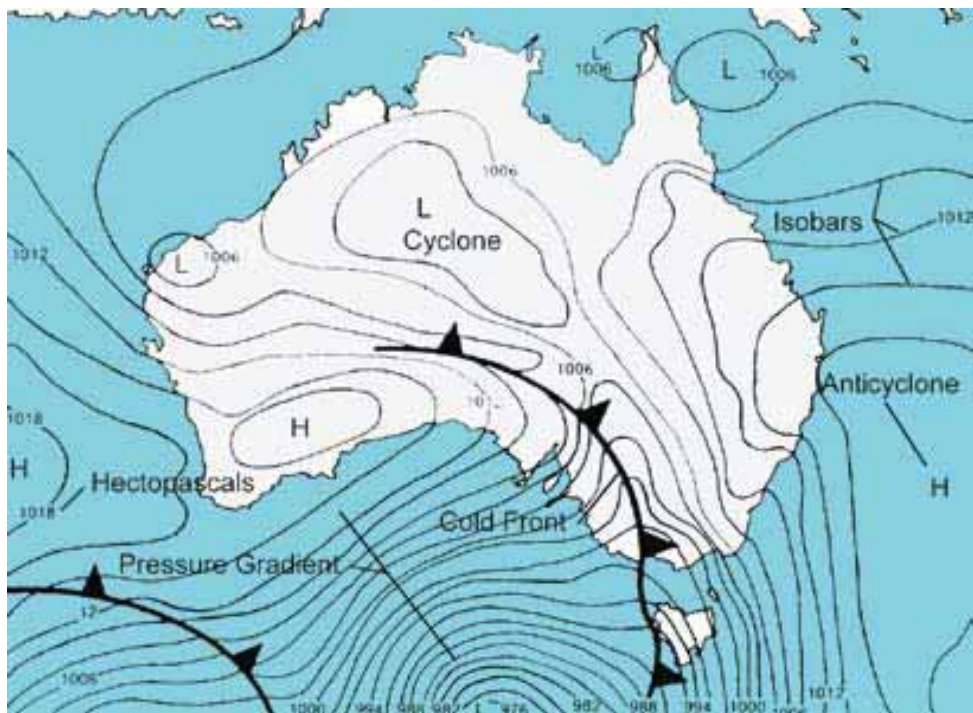
A synoptic chart is a map of a geographical region and represents atmospheric conditions that have been analysed or forecasted for a given time period. They are also known as weather charts, pressure charts or mean sea level pressure charts and are periodically prepared by the Bureau of Meteorology based on the latest observations (surface and satellite) around Australia.

Isobars depict the locations of the main pressure systems located in the region — isobars are the lines on the chart and join places that have equal atmospheric pressure. The arrangement of the isobars define the areas of high pressure (known as anticyclones or ridges) and low pressure (known as cyclones or troughs). When the isobars are close together, there is a strong pressure gradient and therefore stronger winds. As the lines move further apart, the pressure gradient weakens which produces lighter winds. These pressure differences are the principal causes of winds and a mariner can make useful judgements about the strength and direction of the wind following analysis of the isobar patterns.

There are two basic rules that govern wind direction in the southern hemisphere:

- Winds tend to flow outwards from and anticlockwise around a high pressure system (where the isobars are close together).
- Winds tend to flow into and clockwise around low pressure systems (where the isobars are further apart).

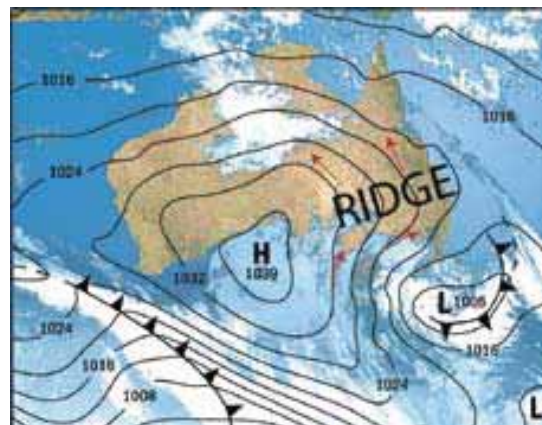
	<p>QPort Marine Services Est. 21 years Contract and Charter of Commercial Marine Floating Plant, Services and Logistics. Phone: 07 3893 0066 Email: info@qportmarine.com.au www.qportmarine.com.au</p>	
---	---	---



Synoptic chart

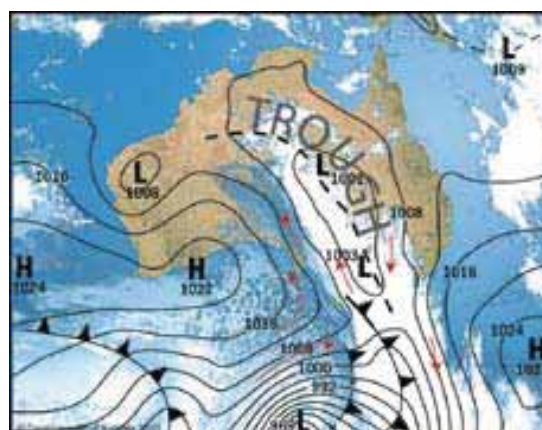
Ridges

An elongation of isobars in a high pressure system is called a ridge. In Queensland they normally extend from the southwest across inland Australia or from the southeast extending along the Queensland coast from highs in the Tasman Sea.



Troughs

Troughs are shown on the synoptic chart as dashed lines across the isobars. They indicate an area of lower pressure compared to the immediate surroundings. A change in wind direction will generally be observed as you cross from one side of the trough to the other. Troughs are usually associated with a discontinuity in the winds, showers and thunderstorms in Queensland.

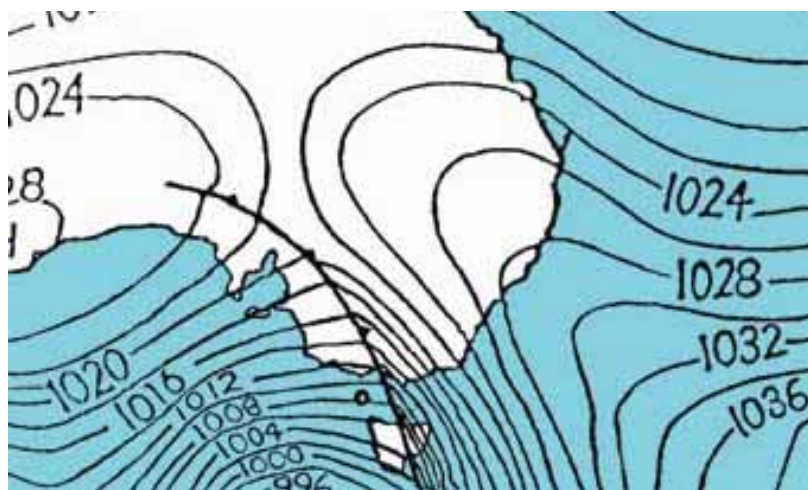


Specific weather systems

The weather systems in this section are those that are relevant to Queensland coastal and offshore waters. It is important for mariners to know these systems to understand the weather patterns on the water when making decisions regarding the safety of the ship and crew members.

Cold front

The progression of lows across southern Australia during the winter months tend to bring together two very different air masses — a relatively warm, moist air mass from over the continent or warmer waters off the east coast and a very cold and saturated air mass from over the southern ocean. As the cold air invades the warm air, a relatively narrow, often fast moving, frontal band of intense condensation and turbulence generally develops.



A cold front synoptic chart

Before the cold front conditions tend to be relatively warm with winds freshening generally out of the north. A long, low, black 'roll cloud mass' often accompanies the approach of the front from the west.

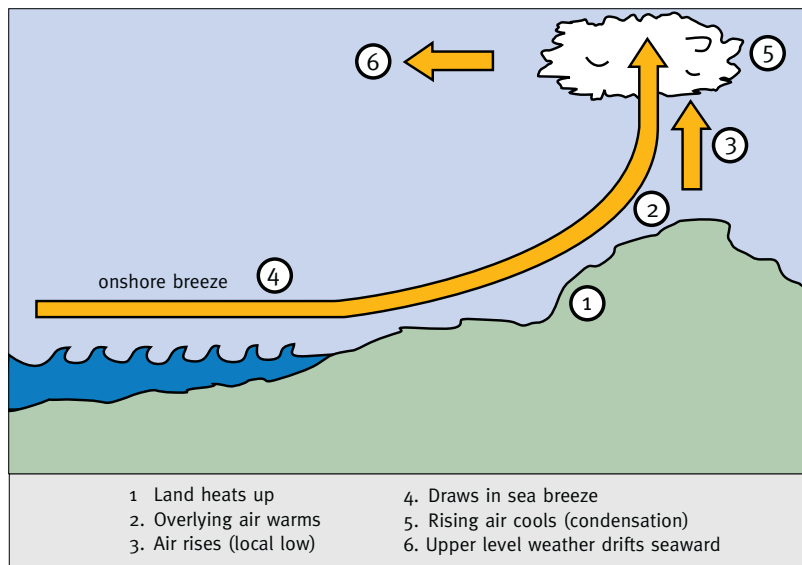


A cold front

As the front passes over, conditions usually include extremely strong and gusty winds. Once the front has passed over, cold and vigorous wind out of the west/southwest may persist for a few hours.

Coastal land and sea breezes

Seawater temperatures change very slowly on a seasonal basis, whereas land temperatures rise and fall substantially in a day/night cycle. By afternoon, the air over land is heated from the warm land. This warmed air tends to rise thereby producing a localised low pressure



Onshore breeze

system that draws in the cooler air from offshore (the sea breeze). The resultant onshore breezes may be vigorous by late afternoon, particularly in the summer months.

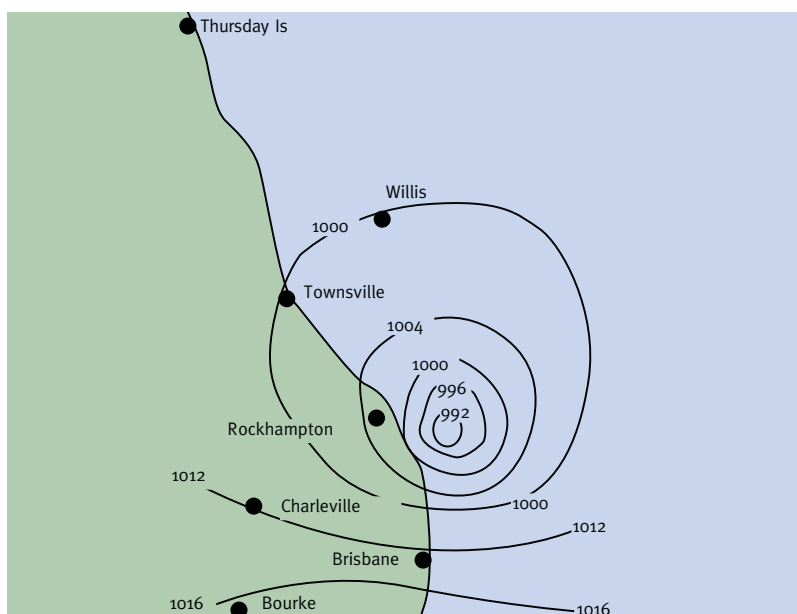
The rising air along coastal hinterlands, particularly where the higher land reinforces the uplift of air, may produce heavy cloud build-ups and possible storms that are likely to drift seaward during the late afternoon.

The coastal sea breeze effects generally occur over a narrow (15 nautical miles) band along the coast. They may affect the direction of and reinforce or counter the strength of prevailing synoptic winds.

Tropical cyclones

A cyclone is a complex low system that develops over tropical waters located near the equator. Australia's tropical cyclone season is between November and April, mostly occurring in the northern region due to the tropical climate. They are usually small but very intense and, as a direct result, may contain very high and destructive winds.

In the warm, tropical oceans cyclones are formed through a combination of high sea temperatures, high humidity and low level winds. They form as the result of a collision of



Tropical revolving storm (TRS) synoptic chart

warm and cold air. As the warm air rises, the cold air rushes in to take its place and, at the same time, a rotation is imparted to the path of cold air by the effect of the earth's rotation.

Cyclones require vast amounts of water vapour to maintain intensity and tend to decay into rain depressions over land. However, cyclones can reform if they move out over warm seas again.

In Australia, the tropical cyclone warning centre (TCWC) tracks cyclones by satellite and weather radar in an attempt to track the cyclone's potential path, which are typically erratic and therefore hard to predict. Mariners should be aware of warning signs of an advancing tropical cyclone in order to take action to avoid them. Early warning signs of a tropical cyclone include:

- a long, heavy swell radiating up to 900 nautical miles from the centre
- diurnal pressure pattern ceases
- unsteady or falling barometer
- strengthening and (probably) shifting winds.

Action to avoid cyclones

Mariners should take prepare for a cyclone by:


- Finding a safe haven — shallow mangrove creeks away from exposed winds are suitable.
- Secure hatches, clear decks, stow loose equipment and board or tape up large windows.
- Centralise weight distribution and keep heavy objects low down in the vessel.
- Check the bilge pump is operating correctly.
- If possible, remove the motor from the tender and fill it with water to prevent it being blown around in the strong winds.

Keep up to date with

FORECASTS
and **WARNINGS**
WHEN ON THE WATER

HF • VHF • Satellite • Internet

For more information on broadcast frequencies and schedules go to:
www.bom.gov.au/marine

 Australian Government
Bureau of Meteorology

EXPERTS IN MARINE INSURANCE
Established in 1986

 **OCEANIC INSURANCE**
BROKERS

The Oceanic Principles

- ✓ We work for you
- ✓ We listen to you
- ✓ We care about your business
- ✓ We care about our business

Marine Insurance

- Bareboats
- Commercial Vessels
- Private Vessels
- Blue Water Cruising
- Marine Liability
- Marine Trades
- Diving Liability (Commercial and Recreational)
- Personal Accident for Divers
- Travel Insurance
- Skippers' Liability

General Insurance

- Travel Insurance
- Body Corporate's
- Business
- Home & Contents
- Motor Vehicle
- Professional Indemnity
- Trade Liability
- Contract Works & Construction

Oceanic Insurance Brokers Pty Ltd
ABN 82 01 671 851
Ph: 07 4946 7555
AFS License No. 238271
Website: www.oceanicinsure.com.au

 **STEADFAST**
The Group

Member of
 N I B A