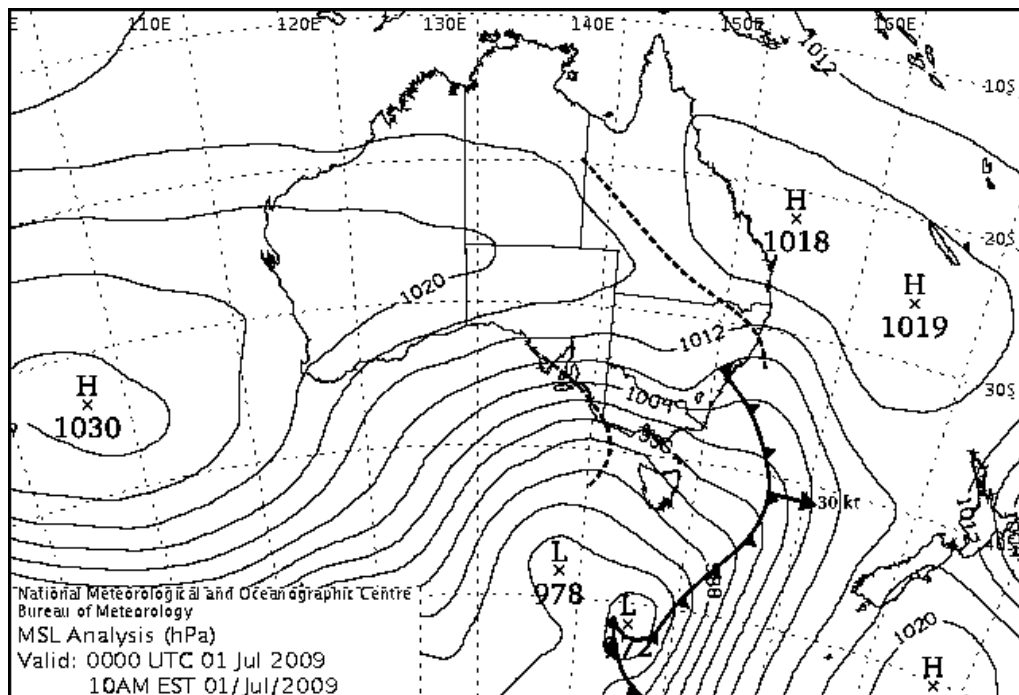


The Weather Along the Australian East Coast during the Cooler Months

Sailing along the east Australian coast during winter and spring can be either a pleasure or a pain depending upon where you are in relation to the sub-tropical high pressure ridge (STR).

The Australian continent lies in the path of mobile high-pressure systems (sub-tropical ridge) which move eastwards at mean latitude varying with the season. The ridge reaches its most northern position in winter and most southern in summer. The ridge crosses the West Coast of Australia at about 25° south and the East Coast at about 29° south during winter and spring. In summer it is located around 40° south.



Typical Winter Surface Weather Map

These high-pressure systems move with variable speeds and are separated by troughs of low pressure. To the south of the ridge, cold fronts are swept along in the westerly airflow. To the north, easterly flow dominates. In the middle of the high there are generally very light winds with local wind flows such as the sea and land-breeze tending to dominate within the coastal zone.

The key to successfully forecasting the winds for your race or cruise along the coast is that of keeping a very close eye on the position of the sub-tropical ridge and the resulting general wind flow, in conjunction with your knowledge of local winds. This study should be commenced at least a week before you set out utilising surface weather maps.

Now, for a closer look at the **typical** wind and weather patterns that can affect the NSW and Queensland coasts during the winter and spring period

New South Wales

Winter

If the highs are moving through to the north of the state a westerly wind regime will exist over most of the state. These can be quite strong at times, especially if cold fronts are moving through to the south.

If the high is over the state the weather is generally dry and the winds quite light. Weak sea-breezes can develop during the day but generally die out during the late afternoon. These are the days that many yachts do not finish races.

Cold, strong south-west winds can develop with the passage of a cold front and associated low-pressure system at NSW latitudes. Brief, heavy snow can fall on the tablelands as a result of this situation. A better time for skiing than for sailing.

Spring

If low pressure systems are passing through to the south of the state with associated cold fronts moving rapidly eastwards across NSW then strong westerlies will persist for several days. Mountain or lee waves are often observed. These can at times locally enhance surface wind speeds.

Strong south-westerly flow can develop when an intense low-pressure system is situated in the central Tasman Sea. Strong winds or gales can often develop in coastal and ocean waters and may last for several days.

Very warm to hot north to north westerly winds can develop on occasions ahead of an eastward-moving cold front which extends northwards from an intense low pressure system situated in the Southern Ocean to the south-west of Tasmania.

Some potential weather problems can be:

An unusual, but very dangerous situation that may develop during this time of year is the east-coast-low. It is common for low-pressure development to occur in the central Tasman Sea during late winter and spring. Occasionally, however, small intense lows can develop close to the NSW/Qld coasts and cause strong to gale force winds to develop over a relatively short period of time. These are also known as cut-off-lows, meteorological bombs, or explosive cyclogenesis.

As we move into late spring the possibility of a severe thunderstorm occurring over coastal NSW increases. Large hail and very strong short-period wind gusts are possible with these.

Funnelling and channelling, and hence stronger than normal winds which can be coupled with a change of direction due to valley orientation, will occur with river valleys, the best examples being the Shoalhaven and the Hunter.

Queensland

The sub-tropical ridge can be situated over southern Qld at this time of the year. This means that light winds will prevail within the high. As such local winds (sea/land breezes) will dominate the coastal zone.

To the north of the high-pressure centre a ridge will extend along the coast and this will ensure a broad easterly onshore flow. However, local winds can still operate.

If the high-pressure centre is situated to the south of the state and in the Tasman Sea, a south-east to east flow will be observed over the coastal strip.

West to south-west changes are most common during the winter and spring months over Qld. These changes are basically associated with cold fronts, but these fronts are modified by the long passage across the Australian continent. The best development occurs over southern Qld but occasionally extends well into the tropical north. Strong north winds may develop about the southern Qld coast well ahead of the cold front. A low-pressure system to south of the state will usually reinforce this situation.

Some potential weather problems can be:

East-coast-lows (as described above).

South-east winds through Torres Strait are often much stronger than expected during the morning.

Sea fog can occur along most of the coast south from about Cardwell. The most common occurrence is during the winter months between the Whitsunday Islands and St Lawrence.

Following the passage of a cold front south-west to south winds of the Curtis coast across Hervey Bay are stronger during the morning hours than indicated by surface pressure gradients (isobar spacing).

When strong south-west to west winds are observed over south east Qld, surface winds along the Gold Coast are often light and variable due to the turbulence and mountain wave effects induced by the mountain ranges to the west.

A south-west land-breeze usually develops at night (after midnight) along the Qld south coast and northern NSW coast. This will oppose the prevailing south-east winds to form a zone 0.5 to 1 mile across, with some showers and light winds a few miles offshore. To seawards of this zone south-east flow will prevail. This situation will break up over the morning and by mid-day the south-east flow will dominate.

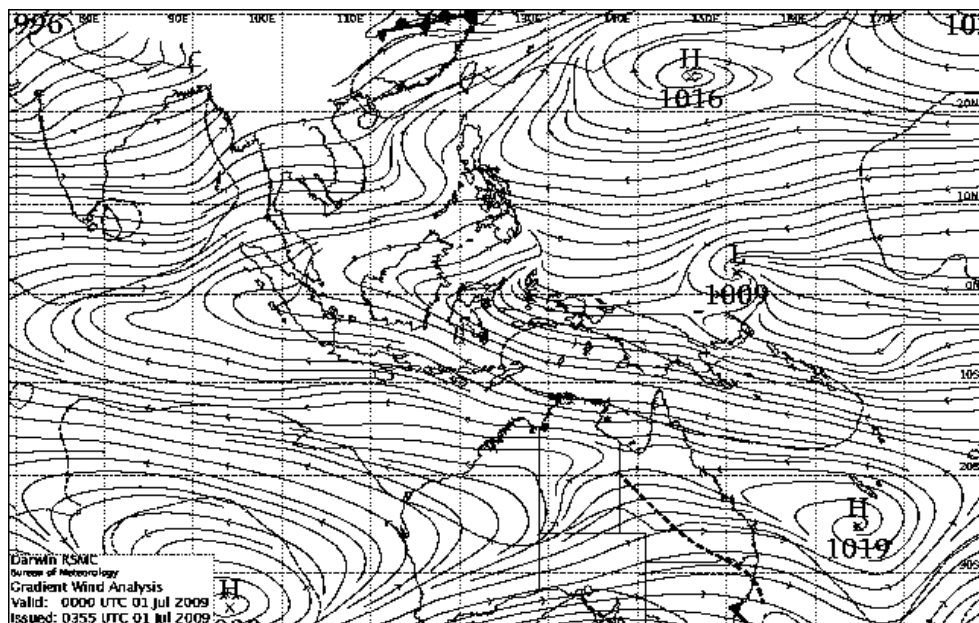
Fresh to strong north to north-east winds can persist well into the evening and early morning along the central and south coasts especially south of Fraser Island.

The odd thunderstorm could pose problems during spring.

Finally some words of caution.

Trade wind surges. These arise from the sudden strengthening of the STR, normally following the passage of a moderate or strong frontal system. Watch the weather maps regularly because these surges may arrive along the Queensland coast a day or two after the cold front has passed through well to the south. There will seldom be a well defined change marked on the weather maps, but you should notice the isobar spacing tighten to the south of you before the surge arrives.

Tracking changes in the weather in the tropical regions requires a different approach to that used elsewhere in Australian waters. The synoptic weather map commonly used by you is an analysis of pressure fields. However, the pressure changes in tropical areas are mostly slight, making these charts of limited use. Note that for equal isobaric spacing, the wind will be stronger in the tropics than outside of the tropics (extra-tropics). An old rule of thumb used by tropical mariners goes like this- Take the last two digits of the central pressure of the high pressure system extending the ridge along say, the tropical Queensland coast, and that will roughly be the average surface wind speed. For example, if the central pressure is 1030hPa, then the average wind speed should be around 30 knots. Wind field charts, called streamline charts, which show the prevailing wind flows, are normally used instead of isobaric charts. These are available from the Bureau of Meteorology's web-site and are broadcast as a part of the radio facsimile weather chart product set.



A Typical Streamline Analysis Chart

With quite a number of automatic weather stations dotted along the eastern coastline and very few offshore observing points, it's often assumed that coastal stations are representative of conditions at sea. This assumption

may be far from the truth as wind speeds may be 25 to 50 per cent stronger over the sea than over the land particularly with offshore winds.

The East Australian Current (EAC) which brings warm water from the Coral Sea into the cooler Tasman Sea can run with speeds up to 4 knots around the continental shelf and can spawn a number of eddies to the south of the main current. A knowledge of its flow can either assist or not your voyage along the east coast. Any situation where this current opposes the local wind wave, can see awful sea conditions being generated off the coast.

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