Winds on the Derwent, the D'Entrecasteau Channel and Storm Bay

by Kenn Batt, Bureau of Meteorology, Sydney and
Alasdair Hainsworth, Bureau of Meteorology, Hobart

The rugged topography of southern Tasmania makes for extremely tricky wind conditions over this extremely attractive sailing area. To the west lies a range of mountains extending from Collins Cap and Mt Wellington (1460 metres) in the north which are only approximately 15 km west of the Sydney/Hobart finish line, to Adamsons Peak (approx 1200 metres) in the south, which is only 20 km from Cape Bruny. Even Federation Peak and Precipitous Bluff further south and west, may have an effect on winds over southern Storm Bay and they aren't even visible from Storm Bay itself. To the northwest lies the large elevated area of the Central Plateau, which on occasions will act to shelter Storm Bay from strong northwesterly winds and on others, cause very strong winds and gusts to descend on the area from a significant height in the atmosphere. Even to the east and northeast there are significant ranges of mountains that rise up to almost 800 metres, which sometimes have a significant effect on the winds. With such significant features so close to the shores of Storm Bay, it is easy to see why sailing can be very frustrating and wind forecasting on the Derwent and elsewhere a forecaster's nightmare.

The Derwent River drains not only water from Tasmania's Central Plateau, but it also drains cold air. Temperatures fall overnight, particularly over the Central Plateau, significant areas of which are above 800 metres. Air over higher ground is naturally cooler and overnight, temperatures inland become markedly colder than those on the coast. As the air cools, it becomes denser and this denser air flows down slopes into the valleys. Like its liquid counterpart, this heavier colder air flows down the valleys into the sea. Hence in the morning, summer or winter, it is most frequent that winds flow down the Derwent and Huon Valleys from the north and northwest. This flow, known as a "katabatic flow", extends out a considerable distance from the Derwent River mouth, typically 10-20 km, resulting in most of Storm Bay being influenced by this under most circumstances. The flow out of the Huon River affects an area west of about Gordon (in the D'Entrecasteau Channel, known locally as the "Channel") and out around the southern parts of Bruny Island. Areas of the Channel, east of Gordon to around Northwest Bay, can be plagued by very light winds overnight. The BIG secret in traversing this area successfully, especially overnight, is the state of the tide! Do your homework! The katabatic looses its influence over the winds, only when there is a strong (20 to 30 kts) SW through S to easterly gradient airflow. Thus, unless there is a 6 hPa pressure gradient or more across Tasmania from the SW, S or E, expect winds in the Derwent, Channel and Storm Bay to come from the N or NW. Over the eastern parts of Storm Bay, a NE wind is possible, but it quickly backs N to NW as one moves further towards the centre. That's the easy bit!

Once the sun comes out and warming commences, all sorts of different things have to be taken into consideration to determine which wind directions are going to be favoured in different areas.

Let's first examine the northwest quadrant – N through W. As long as the gradient wind does not exceed 23 knots, we would normally expect the morning NW wind to decrease and a SE seabreeze to develop over the Derwent around noon local summer time. It could occur slightly earlier if it is warm and skies are clear inland, or later if it is cool to cold or it's cloudy inland. If the maximum temperature inland is not expected to exceed 16 or 17C and it's cloudy, the

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seabreeze could fail altogether and light NW winds persist all day. The seabreeze in the Channel is likely to be more southerly and over the rest of Storm Bay, S to SW'ly. The strength is extremely difficult to quantify and will depend on the strength of the gradient and the temperature inland. Suffice to say, there will be areas where it funnels, particularly around headlands. The Dennes Point area is also affected in this way.

If the gradient strength is more than 23 knots, a seabreeze is unlikely and sailors can look forward to a lovely afternoon of shifting winds varying from very light to Kenn's favourites – "bullets". The shape of the Central Plateau is such that it can sometimes "drag" air down from a considerable height to the surface over southeastern Tasmania. More often than not, the wind well above the surface is stronger than that lower down and consequently, air that is brought down to the ground level results in strong gusts.
In this wind regime, it generally does not pay to be too close to western parts of the Derwent between Kingston and the John Garrow Light as winds can be extremely flukey.

We said above that in this circumstance, a seabreeze is unlikely, but it's not impossible.

In summer, SE Tasmania can become very hot in a NW gradient stream, causing pressures to fall even more strongly than they do as a normal lee trough forms over eastern and southeastern Tasmania. On rare occasions, pressures fall so strongly that a small low develops in the lee trough, effectively forming in Storm Bay, resulting in fresh to strong S/SE winds developing over the western Storm Bay, including the lower Derwent Valley. In this situation, it is not unusual for the winds to continue NW through Hobart airport and northerly down the eastern side of Storm Bay. This circulation may also enhance the northerly winds at the southern end of Tasmania's East Coast.

So much for northwesterlies!

Winds in the southwest quadrant can be almost as flukey. Because Mt Wellington acts as a giant cliff over Hobart in a southwesterly, a SW stream can often result in N/NE winds over western parts of the Derwent as a return flow (known as a rotor) develops (Figure 1).

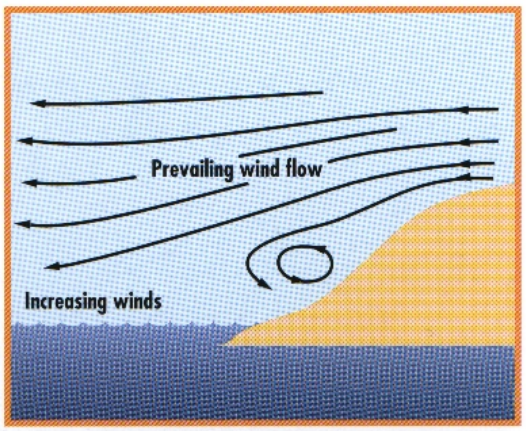

Figure 1 *(From Wind, Waves and Weather, Tasmania)*

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Further south however, S/SW winds tend to funnel northwards through the D'Entrecasteau Channel, particularly past Dennes Point and may be considerably accelerated in comparison to southwesterlies further out in Storm Bay or in the Derwent. Similarly, southwesterlies can be accelerated around the southern part of Bruny Island and if beating southwards along Bruny's east coast, expect much stronger southwesterlies upon rounding Tasman Head.

In south to southeast gradient wind situations, winds over Storm Bay and the Derwent are generally more uniform, although some acceleration can be expected near the more prominent points and headlands.

In an easterly gradient situation, surface winds over northern Storm Bay and the Channel are quite frequently light in the morning and turn SE during the afternoon. Over southern Storm Bay, winds more often turn northeasterly during the afternoon under the influence of Coriolis force, which is caused by the Earth's rotation.

The final quadrant, east to north, is again strongly affected by topography. Because of the steep sides of the Derwent Valley, northeast winds are generally uncommon on the River and during the morning, will more often than not result in light to moderate N/NW winds, while in the afternoon, they tend to veer into the east. In Storm Bay and the Channel, NE winds are possible and these may tend to freshen during the afternoon as the seabreeze from the East coast breaks through across the Tasman Peninsular and enhances the stream.

There are variations on all the above themes so obviously, take careful note of the forecast on the day. However, as we hope we have illustrated, there are so many variations possible and likely across Storm Bay, the Channel and the lower Derwent River, that forecasters have got little chance of describing them all. Indeed, would you be able to absorb a forecast that included every little nuance and shift?

References:

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Pendlebury. S.P. *Notes Accompanying the Derwent River Estuary Wind Frequency Analyses.* Bureau of Meteorology, 1987.