

39: where waves come from

WAVES ARE FORMED by wind blowing across the surface of the **ocean**. Swell lines are visible expressions of wave energy. Wave energy moves faster in deep water & moves at great speed in the open ocean. Big swells are caused by **storms** at sea. In southern Australia these storms are generated by “cyclonic” depressions that continually move around the Southern Ocean.

WAVES BREAK when they meet obstacles such as reefs, points or beaches. There are 3 types of waves: **spilling** (preferred by surfers); **plunging** or dumpers; & surging, which don't really break. Waves tend to come in uniform **sets** of 3 or 4 waves. In a given swell, if the third wave of a particular set is the biggest wave, the third wave will be the biggest wave of each set. The period between sets is known as a

THE HIGHEST POINT OF A WAVE is called the **peak** or crest. The lowest point, below the face of the wave, is called the **trough**. The height of the wave is determined by measuring the distance between the peak & trough. Waves break in water that is 50% deeper than their depth. (So a 1m wave will break in 1.5m deep water.) Ocean waves have been measured at over 30 metres. These mega waves rarely break.

RIPS are currents that help the sea level equalise. They are like invisible rivers in the surf. Rips that run out to sea are potentially very dangerous. They can occur every 40 or 50 metres along surf beaches in between the wave **zone** where the biggest waves are breaking. Feeder currents that run parallel to shore are sometimes called drifts or sweeps. The bigger the waves, the stronger the rips. You can identify rips by channels of discoloured sandy &/or frothy water extending out to sea, or objects floating out to sea. Rips are difficult to identify in messy surf. You will **tire** quickly & get nowhere if you try to swim or paddle against a rip. It is better to move sideways out of the rip, & catch a wave back into the shore. Use points of reference on the land to continually check your position.

WIND THAT BLOWS from the sea on to the land is called **on-shore**. Wind that blows off the land to the sea is called **off-shore**. If the wind is on-shore, the surf tends to be **messy**. If the wind is off-shore, the surf tends to be **clean**. Surfers prefer off-shore wind for the best waves. In settled **conditions**, on-shore sea breezes often pick up during the day as the air over the land heats up more than air over the sea. Whitecaps are a sign of on-shore breezes.

SURF CONDITIONS continually **alter** with changes in wind speed & direction, changes in the size of the swell & the rise & fall of the tide. Tides affect surf in different ways. For example in a given swell, waves that break over a reef or sandbar in low tide may not break at all in high tide. High tides take place approximately every 12¼ hours (or twice a day). The highest tides take place in Spring. Tides are caused by the gravitational pull of the moon. In northern Australia, the tide can rise & fall up to eight metres. Rock fishermen & women are most at risk from turning tides. Tide charts are both readily available & accurate.

SURFERS & others who spend time on or alongside our coastal waters need to be aware of a range of other dangers. These other dangers include the damaging rays of the sun, dehydration, waves breaking on rocks, marine creatures that bite or sting & the effects of immersion in cold water for a long time. Loss of body heat is aggravated by **windchill**. Dangers can be minimised by following **safety** rules, by using proper equipment (such as leashes), by avoiding stunts & never going out alone.

SURFERS can choose the most protected beach. They can protect themselves from the sun by wearing full-length wetsuits & rash vests, & applying sunscreen or zinc cream. They can protect themselves from rocks, shallow water & other surfboards by wearing helmets. Surf reports are available on the internet. There is a saying that “the sea is a cruel **mistress**.” This means that if you don't respect it, you will pay the **price** .