

# FACT SHEET - WAVES & BEACHES 1 of 2

## How are waves formed?

Far out across the ocean winds increase in strength forming swells which sweep towards the coast. As waves approach the shallower water, they form crests which increase in steepness to crash forwards onto the sandy beach. If the sandy shore is steep then the waves will crash hard onto the shore, creating dumpers. A more gradual slope will cause waves to form a swash of shallow moving water up and down the beach.

## Definitions

**Swell** is formed by strong winds ruffling the ocean surface and heading onshore. They are usually 12-16 seconds apart.

A **swash** is the rush of water from breaking waves sweeping up or down the beach.

A **rip** is formed where the water rushes back out to sea between two incoming waves. It is best to swim across the rip rather than trying to swim against the flow.

A **swale** is the depression between two sand dunes.

A **dune blow-out** is caused by strong winds or trampling of dune vegetation. Wind then continues to blow the sand away widening the damage. Playing or walking on the dune can cause this damage. It can sometimes be repaired by spreading branches (brush matting) to hold the sand together and then planting seedlings amongst them.

A **storm surge** is a lift in sea levels caused by cyclonic low pressure systems.

## What is a tide?

The gravitational pull of the moon and the sun creates tides on the earth. Due to the cyclic rotation of the earth and moon, the tidal cycle is 24 hours and 52 minutes long. During this time, any point on the earth's surface experiences two high tides and two low tides.

The tidal bulge that occurs during high tide in the world ocean follows the revolution of the moon, and the earth rotates eastward through the bulge once every 24 hours and 50 minutes. The water of the entire world ocean is pulled by the moon's gravity. On the opposite side of the earth simultaneously there is a high tide due to the inertia of the ocean water and because the earth is being pulled toward the moon by its gravitational field, yet the ocean water remains left behind. This creates a high tide on the side of the earth opposite the high tide caused by the direct pull of the moon.



*Storm surge at Point Roadknight.*

## FACT SHEET - WAVES & BEACHES 2 of 2

### **What is a tide? (continued)**

When the sun, moon, and the earth are lined up, the sun and moon are exerting their strongest force together and tidal ranges are at their maximum. This is known as spring tide (spring tides are not named from the season but from "spring forward") This occurs twice each month, when the moon is full and new.

At the first quarter and third quarter moon, the sun and moon are at a 45° angle to each other and their gravitational energy is diminished. The lower than normal tidal range that takes place at these times is called neap tides.

Points on the sides of the earth between the two tidal bulges experience low tide. The tidal cycle can begin with high tide. For 6 hours and 13 minutes after high tide, the tide recedes in what is known as ebb tide. 6 hours and 13 minutes following high tide is low tide. After low tide, the flood tide begins as the tide rises for the next 6 hours and 13 minutes until high tide occurs and the cycle begins again.

Tides are most pronounced along the coastline of the oceans and in bays where tidal range (the difference in height between low tide and high tide) is increased due to the topography and other factors.

<http://geography.about.com>



*Split Point Lighthouse*