

'...I gain the cove with pushing prow,  
And quench its speed in the slushy sand.  
Then a mile of warm sea-scented beach;'

From *Meeting at Night* by Robert Browning.

For most people, the word 'beach' means simply that stretch of sand or shingle above low tide level where they can lay out their sun beds, erect the deckchairs and keep a wary eye on the rising tide while the children paddle or build sandcastles. In other words, their interest lies only in those mainly sandy areas of the shoreline which are exposed at some stage in the tidal cycle. Coastal oceanographers have a wider interest because processes involving water and sediment movement occur below low tide level, and these must be considered if the beach zone is to be understood. In this Chapter, therefore, we shall examine the much broader **littoral zone** which stretches between the seawards limit of land plants and the region below sea-level where sediment is not disturbed by wave action during fair weather conditions—i.e. around 10m to 20m water depth at low tide\*. Where cliffs are developed, they (rather than vegetation) limit the landwards extent of the coastal zone. Seawards of the littoral zone is the **offshore zone**.

As beaches are accumulations of loose sand or pebbles, they change shape rapidly in response to changes in wave energy, and the movement of beach sediment dissipates some of the energy of a wave breaking on the shore (Section 1.4.6).

## 5.1 THE DIVISIONS OF THE LITTORAL ZONE

Rather a large amount of terminology exists to describe the features of the littoral zone. The terminology used depends on whether oceanographers are concerned with the influence on the littoral zone of tidal currents, the effects of waves, or the sediment profile. Figure 5.1 draws all the terms together and shows how they are related.

The part of the littoral zone that is exposed at low water when the tide is out, but covered at high water when the tide is in, is known as the **foreshore** or **intertidal zone**. The **backshore** is above mean high tide and is only influenced by the sea when there are storm waves, or during exceptionally high tides. Sediment on the backshore dries out rapidly and, where the coastline is flat, it is easily worked by the wind into a series of coastal sand dunes. Seawards of the foreshore is the **shoreface** which is permanently covered by water, except at exceptionally low tides.

\*Note that marine ecologists use 'littoral' in a different sense, to mean only the intertidal zone.

