

Zonation on terraced rocky shores

Long Bay and Goat Island Bay

The distribution of animals and plants up and down rocky shores is in bands or zones. This zonation reflects the tolerance of different species to stresses associated with the tide rising and falling.

Near the high tide mark shore life is only submerged for a short time, leaving it exposed to drying conditions and direct sunshine for long periods. Close to the low tide mark the marine life is seldom out of water for long. Wave disturbance is also generally greater near the top of the shore than the bottom.

Above the high tide mark where the rocks are only wetted by wave surges, splash or spray, the drying conditions are even harsher. These distinct zones are colonised by the most hardy plants, lichens and periwinkles.

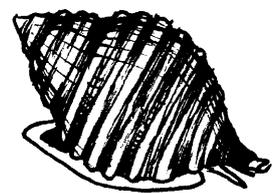
Zonation on sloping shores is frequently quite clear from a distance, but close up it can be confusing and difficult to interpret because of the unevenness of ridges, stacks, crevices, pools and boulders.

On a stepped or terraced rocky shore the different levels of tidal exposure are easier to understand and measure, and the distribution of some animals and algae are often conveniently limited to just one or two steps. The different compositions of the animals and plants on each step are usually easily observed for they are often fairly uniform right across and along the flat surface. There are sometimes slight differences along the edges of broad steps where lapping water and wave-break conditions differ from those at the back of each step.

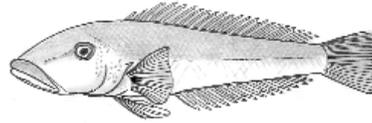
Long Bay has two terraced rocky shores that are excellent for class studies, one at each end of the main sandy beach. The outcrop at the southern end is just around from MERC (Marine Education and Recreation Centre) and the northern outcrop is between 'The Nook' and 'Granny's Bay'.

Classes can approach the southern outcrop via the beach from just inside Long Bay Regional Park or, with permission, from the MERC premises. The latter takes the students past a very useful shell exhibit behind the centre's picture windows which shows most of the molluscs commonly found in the Long Bay Marine Reserve. They are displayed as they would be found in the beach or at particular levels on the rocky shore and are fully labelled.

At Goat Island Bay the rocky platform shore is limited to the bottom half of the tidal range with a beach of coarse gritty sand extending from just above mid-tide level up to the cliff. Towards low tide the terraces are much wider and the steps smaller but levels with distinct communities are easy to identify.



When wave action breaks off a slab of these terraces the newly exposed rock is always perfectly smooth and flat but with time the surfaces of these soft rocks become eroded and worn. Therefore, for measuring biodiversity and abundance of the larger animals, such as grazing and predatory snails, it is best to use knotted rope quadrats (see page 124) when surveying larger areas (one or half metre square) as they lie better over an irregular surface.



The extracts describing the structure and biology of the shores at Goat Island Bay and Long Bay are taken from:

Margins of the Sea – exploring New Zealand’s coastline
by Ronald Cometti and John Morton
published by Hodder and Stoughton, 1985

As a starting point for class studies, schools that are located away from the focus of this educational resource would do well to refer to the chapters in *Margins of the Sea* that describe the structure and marine life of shores in their part of the country. This book is now out of print but is held by public libraries throughout New Zealand.

