

WHAT ARE BEACHES AND HOW ARE THEY FORMED?

Beaches are dynamic coastal environments and many within the Waikato region are both beautiful and popular as recreational resources. Beaches are generally thought of as sandy, but beach sediment can be any combination of sand, gravel, cobble or boulder sized sediment.

Beach sediment is sourced from the erosion of landforms such as sea cliffs and river catchments and from deposits of sediment located offshore. Beaches are inherently changeable as the loose sediment is easily moved around by currents, waves and wind. Sediment can move offshore, onshore and alongshore. Depending on the coastal processes, the beach sediment can be exchanged with dunes as well as the seabed offshore and other beaches.

The beaches along the west coast of the North Island are formed from a combination of black and lighter coloured sands and are a good example of the complex process of sediment exchange. Most of the black sand sediment comes from Mount Taranaki where the sediment is eroded and transported in a northerly direction along the coast. The lighter sand sediments are derived from eroding sea cliffs and from the Taupō volcanic zone, transported to the west coast beaches from rivers.



Onemana Beach, Coromandel



Ngarunui Beach, Raglan

WHAT CAUSES BEACH EROSION?

Typically, stormy weather erodes beaches and fair weather builds them up resulting in distinct seasonal changes in beach shape. Beaches form a dynamic buffer between the ocean and the land, but severe erosion during storms can remove the protective barrier of sand from the beach allowing waves to reach and erode coastal features behind the beach such as dunes or cliffs.

Erosion events are part of the natural cycling of sediment between land and sea. As decades can pass between significant erosion events, the false impression that a beach is stable can encourage the development of land behind the beach. Where existing development is at risk of coastal erosion, 'hard' coastal defences such as sea-walls and groynes can be built to hold the sediment in place. However, hard coastal defences can actually exacerbate beach erosion and even cause erosion on adjacent beaches and dunes by restricting sediment supply.



Coastal Erosion, Mokau

Once hard structures are in place, more structures are sometimes required to mitigate the effects of the previous structures. The end result is an unnatural shoreline and likely restrictions to beach amenity such as reduced beach area at high tide and limited public access. A preferable approach is to manage both existing and future development with a natural buffer seaward of development. A buffer area allows for the natural erosion cycle and dune formation which is beneficial for coastal biodiversity and also increases the amenity and aesthetic value of a beach.



Kaawa Stream Mouth, West Waikato

WAIKATO REGIONAL COUNCIL'S BEACH MONITORING PROGRAMME

Monitoring of beach level and location is essential to understand how our coastline is changing. By establishing how the coast changes, we can begin to understand what to expect and manage in the future. Waikato Regional Council monitors coastal change on beaches using a combination of beach profiles and cameras. Beach profiles are measured from the land to the water using surveying equipment to measure the height of the beach.

Some beach profiles on the Coromandel have been measured since 1978, giving a record of beach change over a wide range of different wave and weather conditions. Cameras are situated at Raglan and Tairua and photos are automatically taken every 30-60 minutes which can be viewed at waikatoregion.govt.nz/beach-cam. The images can be processed using specialist software to give a position of the water line which can be used to show how the shape of the beach changes over time.

MORE INFORMATION

Contact

Call our Coastal Science Team on 0800 800 401 or email info@waikatoregion.govt.nz.

Web

waikatoregion.govt.nz/beach-cam