

# The formation and function of coastal dunes

## Formation of sand beach ridges and cheniers

### Beach ridges

Sand beach ridges are common features along the Queensland coastline. They are generally less than 10m above sea level and are largely restricted to parts of the coastline and sand islands where wave action is only moderate. In these situations, the sandy sediments are less liable to storm wave and wind erosion. They accumulate as the coastline advances, forming a series of low sandy ridges and swales, often enclosing some lagoon and swamp areas.

Berms can form the nucleus for the construction of sand beach ridges. In calm weather, low-energy waves move sand up the beach to build a berm parallel to the shoreline. Berms may also be produced

by storm waves which deposit sand at the peak of wave run-up. The berm is increased in size by the addition of windblown sand which has been trapped by debris and vegetation. During periods of shoreline advance, the beach grows seaward to a point where waves do not reach the former berm and another berm is constructed seaward. A broad barrier consisting of series of parallel beach ridges separated by low swales may be constructed in this manner.

Beach ridges perform the same function as foredunes. They act as a buffer against wave attack and are a source of sand to supply the beach during periods of coastline erosion.



Foredunes backed by parallel beach ridges with remnants of old dune blowouts to the north of Cattle Point, near Yeppoon.



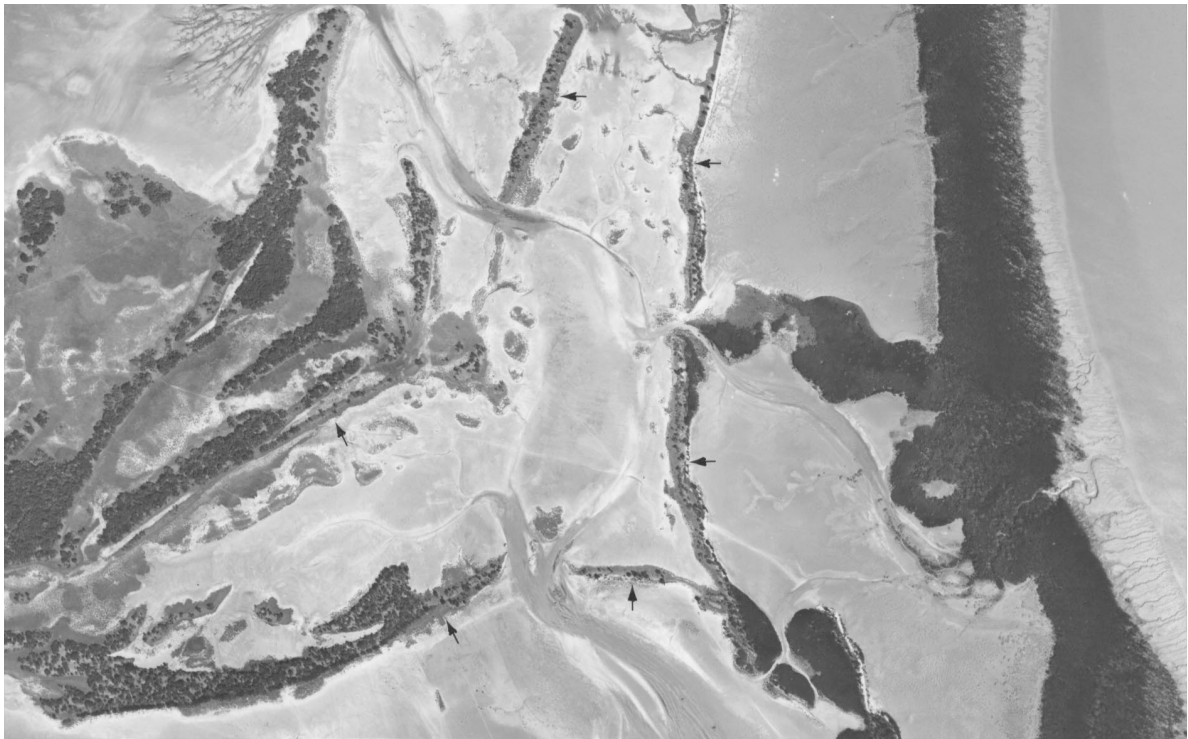
## Cheniers

Cheniers are water-deposited ridges resting on clay or mud along a seaward-facing tidal shore. They also occur on one or both sides of a major river that passes through a delta. Cheniers differ from beach ridges in that they commonly rest on marsh clay and mangrove mudflats with their bases near high water mark, whereas normal beach ridges and coastal barriers have sandy bases extending below high water mark.

Chenier plains form on relatively stable sections of coast having low to moderate wave energy. The cheniers run parallel with or at small angles to the shoreline. Cheniers may also overlap or run into each other.

Cheniers vary in height and width but are usually not more than 1-2m high and up to 50m wide. They can be increased in height and width by accumulations of windblown sand. Bare sand dunes and blowouts rarely occur on cheniers.

An example of a seaward-advancing chenier plain is to be found on the west side of Broadsound, south of Mackay. The plain is up to 5km wide and individual cheniers are up to 5km long. The Broadsound cheniers are low ridges about 2m high and 50m wide. They probably formed during periods of low sediment supply from adjacent rivers and estuaries. Decrease in sediment supply resulted in erosion exceeding the rate of deposition. After the finer mangrove deposits were eroded by wave and tidal action, the cheniers then developed from the concentration of coarser sand, gravel and shell fragments washed from the mud. Elsewhere, cheniers may be formed when storm waves remove coarser sediment from offshore sources and deposit it as a ridge within the mangroves or on the high tidal mudflats landward of the mangrove zone.



Cheniers on tidal mudflats on the west side of Broadsound, south of Mackay.