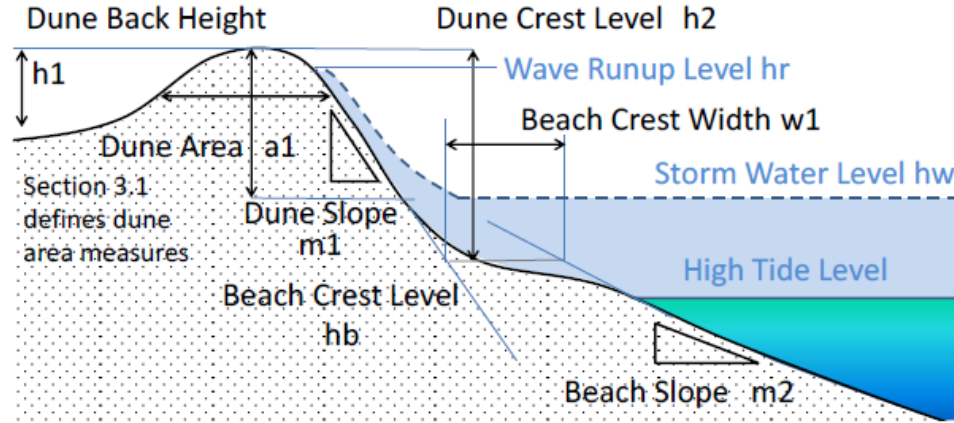


Natural Dunes as Coastal Protection

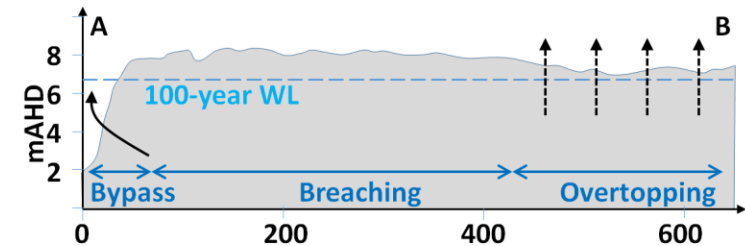
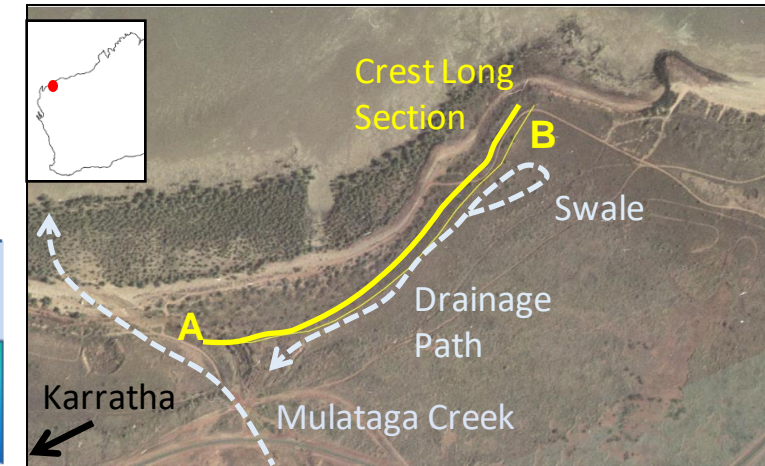
Coastal barrier dunes are commonly occurring features along all parts of the Western Australian coast. They are semi-continuous ridges, almost parallel to the shoreline, with a dune crest above tide and wave action.

Dunes can act as effective barriers against storm inundation, and during severe events, they may supply sediment to the beach, offsetting erosion.

Dunes develop through trapping of landward wind-blown sand drift. As this is a slow process, dune growth requires long-term coastal stability, which may be disturbed by erosion or vegetation loss (e.g. by trampling).



Most dunes are very old features, which have developed over centuries. Many were built when sea levels were 1-2m higher than today, and they often have a harder lithified core (in the southwest) or storm-built rubble core (in the northwest). This typically contributes to modern stability.



Barrier dune stability is usually parameterised by the cross-sectional area above storm water level. However, overall stability is influenced by multiple processes, which can be three-dimensional, with varying influence over a site:

- Overtopping*: going over the dune
- Breaching*: cutting through the dune
- Bypass*: flowing around the dune
- Drainage*: flow from behind the dune

Projected sea level rise will reduce the protection provided by coastal dunes, with increased overtopping and a tendency for erosion of the front face. Some active dunes may be capable of rising with sea level. However, this requires the adjacent beach can continue to supply wind-blown sand at a greater rate than is lost from storm erosion.

