Narrowneck Artificial Reef: Construction

Our coastline is a dynamic system. Sand travels north via a process called longshore drift. At the same time, there is a cycle of erosion and accretion taking place, driven by wave action.

Narrowneck was identified as requiring coastal management works in the mid-1990s in order to retain a more permanent supply of sand on the visible portion of the beach to satisfy tourist and local demand, and to stabilise the coastline.

To achieve this objective, the Northern Gold Coast Beach Protection Strategy was established in 1999. Its objectives were to:

♦ Widen the beach and dunes along the Surfers Paradise Esplanade to increase the volume of sand within the storm buffer and provide more open space.
♦ To improve surf quality and recreational amenity at Narrowneck by the construction of a submerged reef to stabilise the nourished beaches.

Key concepts

Longshore drift is the movement of sand and other material by longshore currents in a direction parallel to the beach along the shore.

Erosion is the periodic movement of sediments from the visible portion of a beach (during rough weather) to the submerged nearshore region. Sand will subside in one of these nearshore bars or compartments for a time before returning to the visible portion of the beach (during calmer periods) through the process of accretion.
Design facts

Length: 450m
Width: 205m
Material: Prefabricated geo-textile bags
Depth: 1.5–10m below LAT (Lowest Astronomical Tide)
Cost: Approx. $A2.5m
Reef Designers: International Coastal Management (ICM)

Construction

Some 400 containers were filled with sand within a split-hull hopper dredge and then placed into position using standard Differential Global Positioning (DGPS) technology, see Figure 1. Reef construction began in August 1999 and was completed in December 2000. The reef’s split-V design reduces the velocity of incoming waves, delivers greater beach protection with a longer shore parallel footprint, and intercepts and retains the sand being transported northwards via longshore drift.

Coastal Monitoring reports based on the analysis of video images of the northern Gold Coast beaches are undertaken on a bi-annual basis. The data collected in monitoring the performance of the NGCBPS—and in particular, the artificial reef—confirms the strategy’s success and informs future shoreline management planning.