Extract from
Coastal Morphology Report
Holme-next-the-Sea, North Norfolk
RP009/N/2009
March 2009

Beach dewatering scheme

A trial beach dewatering scheme was installed at Holme in February 1997 to try to stabilise the beach levels without introducing permanent hard structures. The scheme operated for a period of seventeen weeks and covered a 200m length adjacent to the Firs. Beach Drainage Systems (BDSs) were originally designed by the Danish Geotechnical Institute (DGI) in the 1980s to combat problems on eroding beaches with a highwater table, where sediment transport is diminished by wet sand. The technique used in beach dewatering schemes attempts to drain the beach by lowering the water table in the swash zone, reducing sand fluidisation and therefore encouraging suspended sediments to be deposited more readily. A wet sandy beach erodes more quickly than a dry one partly because wave scour is more effective on saturated sand, whereas dry sand absorbs swash water. This system therefore aims to reduce the loss of material from the beach by reducing its mobility and encouraging accretion. The subsequent drying of the foreshore leads to available sand being blown inland with deposited sand forming an upper beach berm that protects the dune face during storm events that might otherwise cause erosion. A Beach Drainage System involves the insertion of perforated drainage pipes connected to a pump and discharge system buried beneath the upper beach surface. This system accelerates seepage and the sand will tend to accrete if the beach surface is permeable due to the artificially lowered water table .A successful beach drainage system will increase the elevation and width of the upper beach, providing an improvement to amenity value and encouraging the formation of foredunes. The raised upper beach will provide storm protection to the dunes. Recycling or nourishment can initiate beach level increases, and fencing, thatching and transplanting can encourage dune growth. The benefits of Beach Drainage Systems are, however, thought to be greatest in micro-tidal (<2m range) environments, and not effective during storms. The BDS at Holme was thought not to be effective due to increased exposure of wave attack on the frontage as a result of the eroding ebb delta; and not because of its high water table.

Holme Dunes (2004)

The aim was to protect sand dune habitat, freshwater habitat and one property by working with coastal processes. 'Dragon tooth' fencing was used to aid sand trapping in front of an eroding dune ridge which protects the freshwater area and property. Previous methods such as beach dewatering, geotextile matting, and hard engineered sand trapping measures had been less successful or destroyed by storms.