Coastal Erosion from Space

In-situ information for validation – Ireland

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Contents

1 Introduction

The coastline of Ireland is a long-varied coastline which is characterized by bays separated by rock heads. The bays are cut into glacial drift deposits, and the coastal area include sand spits, dunes, single and sand bars and intertidal flats. Several estuaries are also present along this varied coastline.

The coastline of Ireland is vulnerable to coastal flooding, erosion and to sea level rise and submerged landscapes. These phenomena have increased the environmental awareness, as Ireland coastal area is present important productive natural habitats and important infrastructures.

2 Dublin Bay

Dublin bay is a large sandy bay located in a urban area enclosed within seawalls. It is bisected by the estuary of the River Liffey, which is also largely retained within quays and seawalls.

Dublin Bay is highly vulnerable to marine inundation and sea level rise. Shows notable potential for shoreline erosion and here remobilisation of coastal sediment could also promote the infilling of estuaries bringing further changes to the hydrodynamic regime. Erosion rates of 0.2-0.5 m/y have been observed.

6-7 mm sea level rise per year in Dublin Bay was recorded between the years 2000 and 2016. Previous data show the increas of the sea-level change rate, as for the period 1938-1951, the value was +0.5 mm/yr and for the period 1938-1980 the value was of +0.3 mm/yr.

3 Rush

The Fingal coast is a soft coastline that is particularly susceptible to coastal erosion and is characterised by a series of dune complexes which act as a natural buffer between the land and the sea.

The Rogerstown estuary exerts a strong influence on the sediment regime of the area while wind and tidal conditions have considerable influence on the beach and fore dunes.

The extent of shoreline changes from 1935 to 2005 has been most pronounced at the southern and northern extremes of the Beach with erosion of over 25m and 30m being recorded over this period respectively. The overall coastline position in middle sections has remained relatively stable with alternating periods of erosion and accretion leading to limited net change. Accretion (5 to 6m) has occurred over the 2000 to 2005 time period and overall accretion appears to be the dominant trend along the Rush coastline during the 2000 to 2005 period.

4 Ballyconnigar & Raven's point

Raven's point is the north spit enclosing the Wexford harbour. The erosion of the 10 to 50 m high cliffs along the northern shore of Wexford harbour (1m/yr) are the major source of sediment supply for this and the Rosslare spit. Raven's point is characterized by an accretionary tendency as a response to convergent littoral drifts. This barrier is capped by a substantial dune cover stabilized by a pine forest. The foreshore slope is very gentle (<1%) and the sediment is well sorted fine sand (0.24 – 0.34 mm). The accretionary tendency that characterizes this barrier is particularly evident at the distal end of the spit where land-ward-migrating swash bars weld onto the beach face.

In the northern sector of the Wexford Harbour, erosion rates between 0.8 and 1.15 m/yr have been observed in the sand and gravel coastal areas of Ballyconnigar, respectively.

5 Rosslare

Rosslare area, at the south of the Wexford harbour, is characterized by cliffs up to 10 m. The erosion of this cliffs, up to 1 m/y, is the major source of sediment supply of the second sandy spit that characterizes the Wexford bay, Rosslare point. In this case, this spit is characterized by a recessional evolution. The foreshore material is well sorted fine sand, but here a series of groynes occur on the 5 km long Rosslare beach. A net erosion characterizes the upper foreshore and the backshore, except at the northern extremity.

6 Waterford estuary

The Waterford estuary has a length of ~50 km and includes areas of intertidal mudflats, low cliffs, marsh and a large reedbed. Therefore, Waterford Harbour area is vulnerable to marine inundation. During the period 1935 to 1958, Waterford estuary was characterized by an erosion rate of 0.61 m/y.

7 Cork harbour

Cork harbour is a natural harbour and river estuary of around 110 km length. It contains many river estuaries with extensive mudflats and salt marshes.

8 Smerwick harbour

Smerwick harbour is a small closed embayment characterized by sandy beaches separated by rock heads. This embayment presents 4 different beaches, which on a scenario of sea-level rise will suffer erosion

9 Brandon Bay

Brandon Bay is a large open bay on the west coast of Ireland situated between Brandon Point and the extremity of a sandy peninsula that separates it from Tralee Bay, Co. Kerry. The length of the longest beach is 8.2 km and a rocky headland is located at the northeast side of the beach.

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