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Dynamic Coast – Scotland's National Coastal Change Assessment

Site Summary

Montrose (Site 23)



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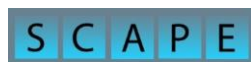
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Ordnance
Survey



Adaptation
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Disclaimer

The evidence presented within the National Coastal Change Assessment (NCCA) must not be used for property level of scale investigations. Given the precision of the underlying data (including house location and roads etc.) the NCCA cannot be used to infer precise extents or timings of future erosion.

The likelihood of erosion occurring is difficult to predict given the probabilistic nature of storm events and their impact. The average erosion rates used in NCCA contain very slow periods of limited change followed by large adjustments during storms. Together with other local uncertainties, not captured by the national level data used in NCCA, detailed local assessments are unreliable unless supported by supplementary detailed investigations.

The NCCA has used broad patterns to infer indicative regional and national level assessments to inform policy and guide follow-up investigations. Use of these data beyond national or regional levels is not advised and the Scottish Government cannot be held responsible for misuse of the data.

Montrose (Site 23)

Historic Change: Montrose Bay extends from Scurdie Ness in the south to St Cyrus in the north. The River South Esk flows into the Montrose basin, past the harbour and exits at the southern limit of the Bay at Montrose Harbour. In the northern part of the Bay, the River North Esk enters and deposits its sediment along the northern section. When the position of the MHWS line in 1903 and 1984 are compared, the central section of Kinnaber Links and the golf course frontage appear to have experienced erosion (up to 20 m or 0.3 m/yr); which has occurred whilst both the north and south ends of the bay have advanced (Figure Error! No text of specified style in document..1). This suggests, along with the orientation of the River North Esk that sediment has been transported both north and south from the central section of the bay (this is termed a drift-divide). The industrial development at Montrose Harbour has led to the coastline being hardened and defences extended onto the open coast and northwards over the later part of the twentieth century. Towards the north of Traill Drive the shoreline advanced up until 1982 and has then been cut back aggressively, losing 50 m by 2014 (1.6 m/yr). It is unclear to what extent these changes result from natural changes to sediment supply or human induced changes, including harbour dredging and the construction of coastal defences. It is clear that erosion has increased markedly at the northern end of the town defences between 1982 and 2011 reaching 52 m just beyond the northern end of the two short rock groynes that were inserted in the 1990s to arrest the rate of recession. The local authority has plans to remove the northern most groyne to allow the coast to realign northwards. They are proposing to re-use the rock armour to the south, maintaining the access from Traill Drive.

The northern half of the bay is dominated by accretion as sediments are moved from the south to the north and augmented by sediment from the North Esk. Hansom et al. (2004) have documented recent changes to this section of coast. The 1903 map shows two exits for the River North Esk which reflect the cyclical movement of the river's mouth. Before 1903, sediment from the south deflected the North Esk northwards, until a point when the river breached and regained its southerly position. The former channel silted up and is still evident within air photography. Whilst this has led to cyclic changes at the North Esk, it has in-filled the northern part of the bay, resulting in substantial seaward migration of 50 m in the north and 130 m at the river exit. The links at Montrose are within

the Montrose Basin Potentially Vulnerable Area and the northern half of Montrose Bay contains a Site of Special Scientific Interest.

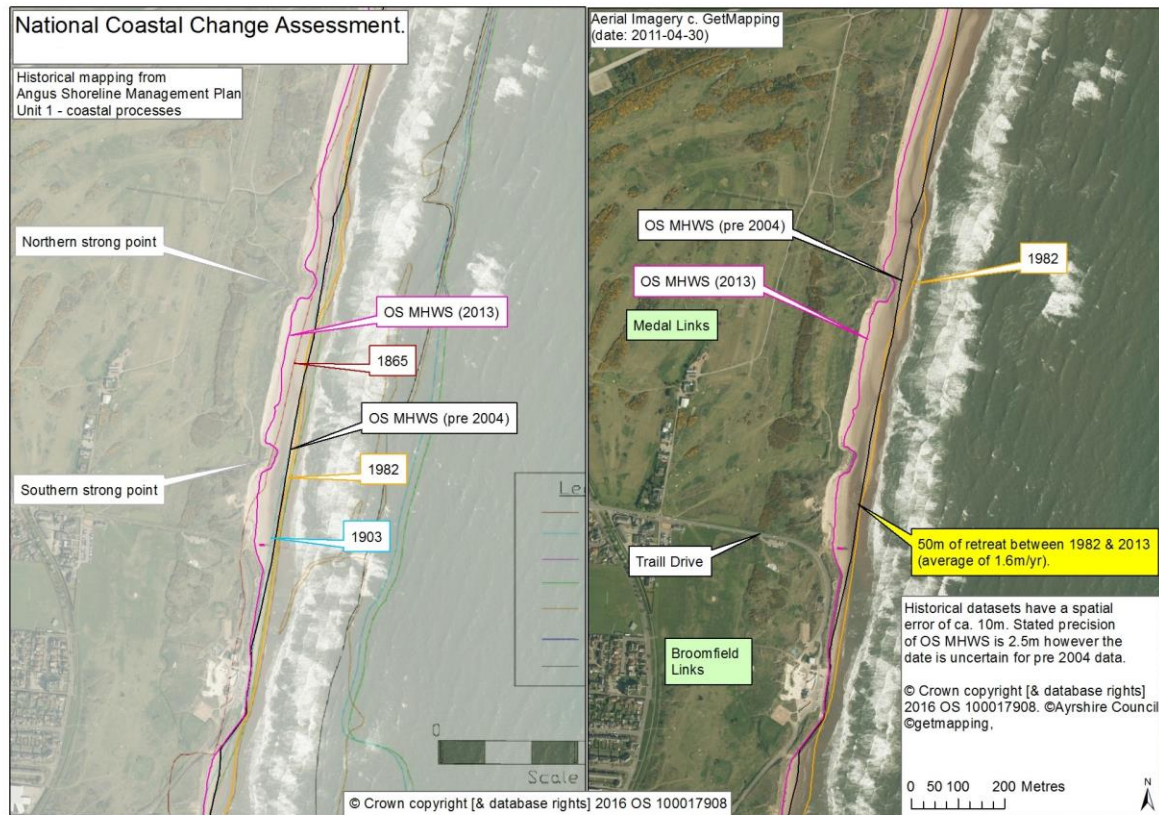


Figure Error! No text of specified style in document..1: Analysis of the coastal change at Montrose combining Shoreline Management Plan data and NCCA data.



Figure Error! No text of specified style in document..2: Possible future coastline position in 2050 based on rates between 1970 and Modern MHWS data at Montrose. Getmapping are our current providers of Scotland-wide digital aerial imagery© Getmapping plc.

Vulnerability Assessment: The vulnerability assessment projects the past rates into the future to give a sense of the potential impact in areas of increased risk by 2050. Whilst there are faster areas of retreat elsewhere in Scotland, few exist along such a lengthy stretch of soft and susceptible shore as along the Montrose golf course fronting the northern part of the town itself (Figure Error! **No text of specified style in document.**2). Close to the end of the seawall the future erosion zone reaches a maximum of 80m inland although this zone narrows to the north as the recent erosion rate drops off. The assets that are potentially affected are restricted to the golf course frontage, although the access road to the play park behind the seawall lies within the erosion vicinity zone. Crucially, the main areas of golf course fronting the suburban areas are low lying and protected from erosion and inundation by an ever-narrowing cordon of high dunes along the Montrose Bay frontage.

References

This is an extract from:

Fitton, J.M., Rennie, A.F., and Hansom, J.D. (2017) Dynamic Coast - National Coastal Change Assessment: Cell 2 - Fife Ness to Cairnbulg Point, CRW2014/2.

The full version of this report and others are available at:

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