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Dynamic Coast – Scotland's National Coastal Change Assessment

Site Summary

St Andrews West Sands (Site 15)

Scottish Government
Riaghaltas na h-Alba
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Scottish Natural Heritage
Dualchas Nàdair na h-Alba
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National Library of Scotland
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Ordnance Survey

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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.

St Andrews West Sands (Site 15)

Historic Change: St Andrews West Sands lie to the north of the town and encloses the Eden Estuary to the west. In 1896, the links were around 180 hectares, however by the early 1990s an additional 50 hectares had been gained and by 2009 a further seven hectares, all through natural processes (Figure 1.1). The additional area since 1896 has provided sufficient land for almost half of the Jubilee Course, the access road and several car parks. At the southern end of West Sands, the beach accreted some 150m in the intervening century, and towards the northern limit, Out Head had advanced seawards by over 250 m (2 m/yr). The eastward movement of Out Head has occurred in conjunction with erosion of its western edge, where some 60 m of retreat occurred over the same period. Along the Eden estuary coast some apparent accretion of the salt marshes as the shoreline turns towards the west is observed with MHWS advancing seawards some 50 m (0.5 m/yr).

Figure 1.1: MHWS position in 1890, 1970s, and Modern datasets at St. Andrews West Sands. Getmapping are our current providers of Scotland-wide digital aerial imagery© Getmapping plc.

Since the early 1990s a similar pattern of accretion has continued, although at half the rate. The southern end of the West Sands has advanced almost 20 m between 1993 and 2009 but again towards Out Head, the dunes had advanced eastward by up to 100m (approaching 3 m/yr) (Figure 1.1). The area of erosion just south of Out Head on the Eden coast continues within the recent change analysis. This is likely related to the increased effect of short westerly waves at high tide, this part of Out Head being increasingly the most exposed to such effects, although movement of the main channel of the River Eden cannot be ruled out. The last few decades have also seen some beach and dune erosion along the Eden Estuary coast of the Jubilee Course (managed by sloped gabion baskets and a now repeated beach feeding programme) and several blow outs have occurred along the dune cordon of West Sands. Despite the seaward movement of MHWS at the Swilcan Burn (at the southern end of West Sands), some dune reinstatement and dune grass planting has been carried out nonetheless. These works may reflect the considerable visitor pressure in this area alongside natural fluctuation and processes.

MHWS along the southern shore of the Eden Estuary, adjacent to the Old Course, moved seawards in the twentieth century; however this trend has reversed in the last few decades. MHWS in 1982 largely followed the vegetation edge of the current salt marsh, although today MHWS is located more than 20 m inland halfway up the marsh surface (Figure 1.2). In some areas of Scotland, the vegetation edge is plotted, in error, as coincident with MHWS. However, the 1982 mapping here depicts saltmarsh plants on both sides of the MHWS line suggesting the landward movement is correct.

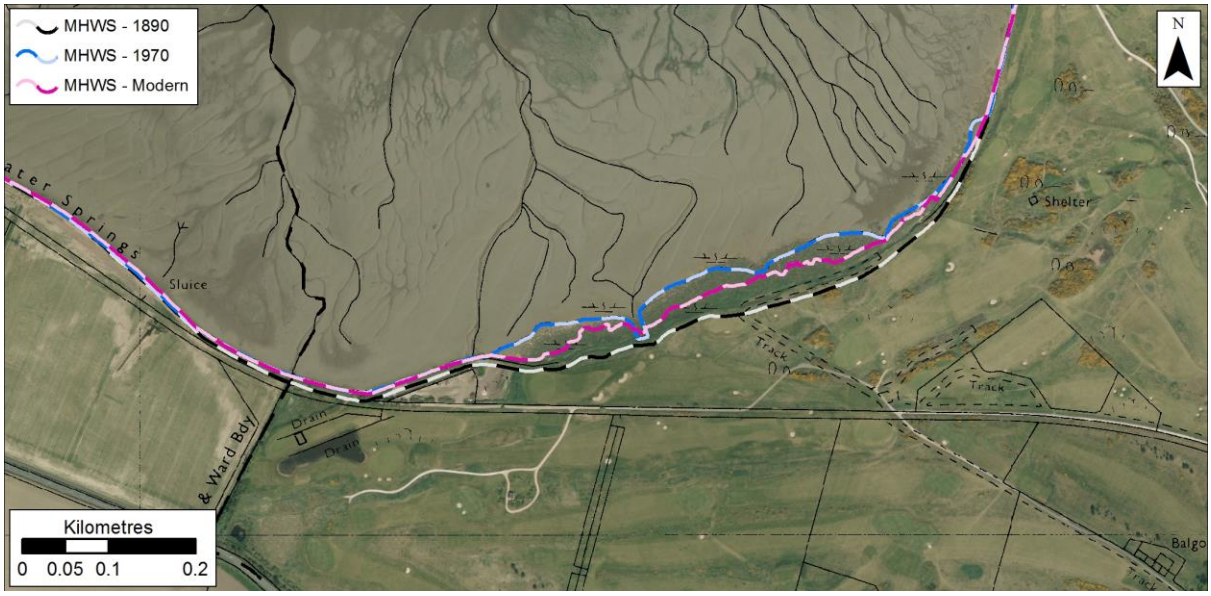

Figure 1.2: Position of MHWS in the 1890s, 1970s and Modern datasets at in the Eden Estuary, with the 1970s OS 1:10,000 map overlain the aerial photography. Getmapping are our current providers of Scotland-wide digital aerial imagery© Getmapping plc.

St Andrews links are part of a Potentially Vulnerable Area, a Garden of Designed Landscape and is notified as a part of the Firth of Tay and Eden Estuary Special Protection Area and Eden Estuary Site of Special Scientific Interest.

Figure 1.3: Possible future coastline position in 2050 based on rates between 1970 and Modern MHWS data at St. Andrews West Sands. 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. Within the dunes at St Andrews there are two areas where there has been significant erosion and/or landward migration of MHWS, firstly to the northern Eden Estuary coast and secondly to the south within the area of the salt marsh (Figure 1.3). If the past rates continue then the MHWS of 2050 is anticipated to move up to 40 m inland and will overlap onto areas of the golf course in the south. In the north, any anticipated erosional footprint is some 20 m away from any golf course assets. Both the West Sands and Eden Estuary are designated for their natural heritage interests and the erosion does occur within known areas of flood risk (200yr extent).

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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