

## Purpose of this document

This document provides an update on the change to the southern section of Montrose Links, following a GPS survey on the 17<sup>th</sup> June 2025.

## Headlines

1. NatureScot undertook a high-precision GPS survey of the southern section of Montrose Links dunes, between Traill Drive access and 'the Pipey', in June 2025. The results have been compared with earlier surveys.
2. The edge of the dune remains erosional, however at a lower rate than recent years. Observed losses were on average -0.70 m over the last 9 months (max loss was -2.2 m).
3. The upper beach to the north of the 2<sup>nd</sup> tee defences, has returned to an erosional state. An average of 6 m has been lost in the 9 months (max loss was -16.5 m). These upper beach change rates are high, when compared to the recent record.
4. When contextualised alongside the earlier University of Glasgow and Dynamic Coast work (commissioned by Angus Council), **the beach and dune system appear to be returning towards its earlier state where erosion dominates**. This follows the short-term perturbation (or blip) where substantial dune erosion in winter 2023/2024 released large amounts of sediment onto the upper beach, which then built seaward. This pulse of sediment is being dispersed within the coastal environment, and the upper beach and dune appears to be returning to their earlier erosional state.

## Results: Change over 9 months (June 2025 versus September 2024)

The changes to the dune (vegetation edge) and upper beach (Mean High Water Springs) are shown in Table 1 and in Figure 1.

*Table 1 Changes to dune edge and upper beach between June 2025 and September 2024. Changes over 9 months noted (m), whilst annualised rates are in grey (m/yr). Landward erosion is shown as a negative value, whilst seaward accretion is shown as a positive value.*

Location	Vegetation Edge Ave	Vegetation Edge max / min	MHWS Ave	MHWS max / min
Pipey (*)	-0.55m (-0.72m/yr)	-0.6 to -1.7m (-0.04 to -2.18m/yr)	3.41m (4.37m/yr)	+6.6 to -1m (8.5 to -1.28m/yr)
3 <sup>rd</sup> Hole (*)	-0.42m (-0.53)	-0.1 to -0.84m (-0.13 to -1.08m/yr)	-7.05m (9.04m/yr)	-0.89 to -15.54m (-1.14 to -19.92m/yr)
2 <sup>nd</sup> fairway (*)	-0.61m (-0.79m/yr)	+0.02 to -1.3m (+0.03 to -1.67m/yr)	-8m/yr (10.26m/yr)	-3.41 to -13.84m (-4.37 to -17.74m/yr)
2 <sup>nd</sup> tee including defences	-0.69m (-0.88m/yr)	-0.26 to -1.12m (-0.33 to -1.44m/yr)	-15.46m (-19.82m/yr)	-14.69 to -16.49m (-18.83 to -21.14m/yr)
Access ramp beach (**)	-1.34m (-1.72m/yr)	-0.5 to -2.2m (-0.64 to -2.82m/yr)	+5.81m (7.45m/yr)	+0.88 to +8.16m (+1.13 to +10.46m/yr)
North of 2 <sup>nd</sup> tee defences (*)	-0.52m (-0.67m/yr)	+0.02 to -1.7m (+0.03 to -2.18m/yr)	-5.96m (-7.64m/yr)	-16.46 to 6.63m (+8.5 to -21.24m/yr)
South of 2 <sup>nd</sup> tee defences (**)	-1.34m (-1.72m/yr)	-0.5 to -2.2m (-0.64 to -2.82m/yr)	+5.81m (7.45m/yr)	+0.88 to +8.16m (+1.13 to +10.46m/yr)

## Methodology

The survey was in two parts. Firstly, a survey of the terrestrial vegetation edge using a high precision GNSS (GPS) receiver (Emlid Reach RX, with RTK corrections via SmartNet). The surveyor walked along and recorded points along the edge between the terrestrial vegetation and the (unvegetated) beach. Discretion was used whether to include or exclude small, isolated small patches (ie islands) of vegetation (often incipient new growth or slumped vegetation). The survey concentrated on the main seaward edge of vegetation and does not include paths and interior bare patches. Secondly, a survey of Mean High Water Springs (MHWS) using the same equipment as above. Points along a contour at 2.25mOD was surveyed.

Surveyed points were loaded into QGIS and compared to earlier surveys. Nearest neighbour analysis quantified the spatial changes, which were quality assured and converted into annualised rates taking into account the time period between surveys.

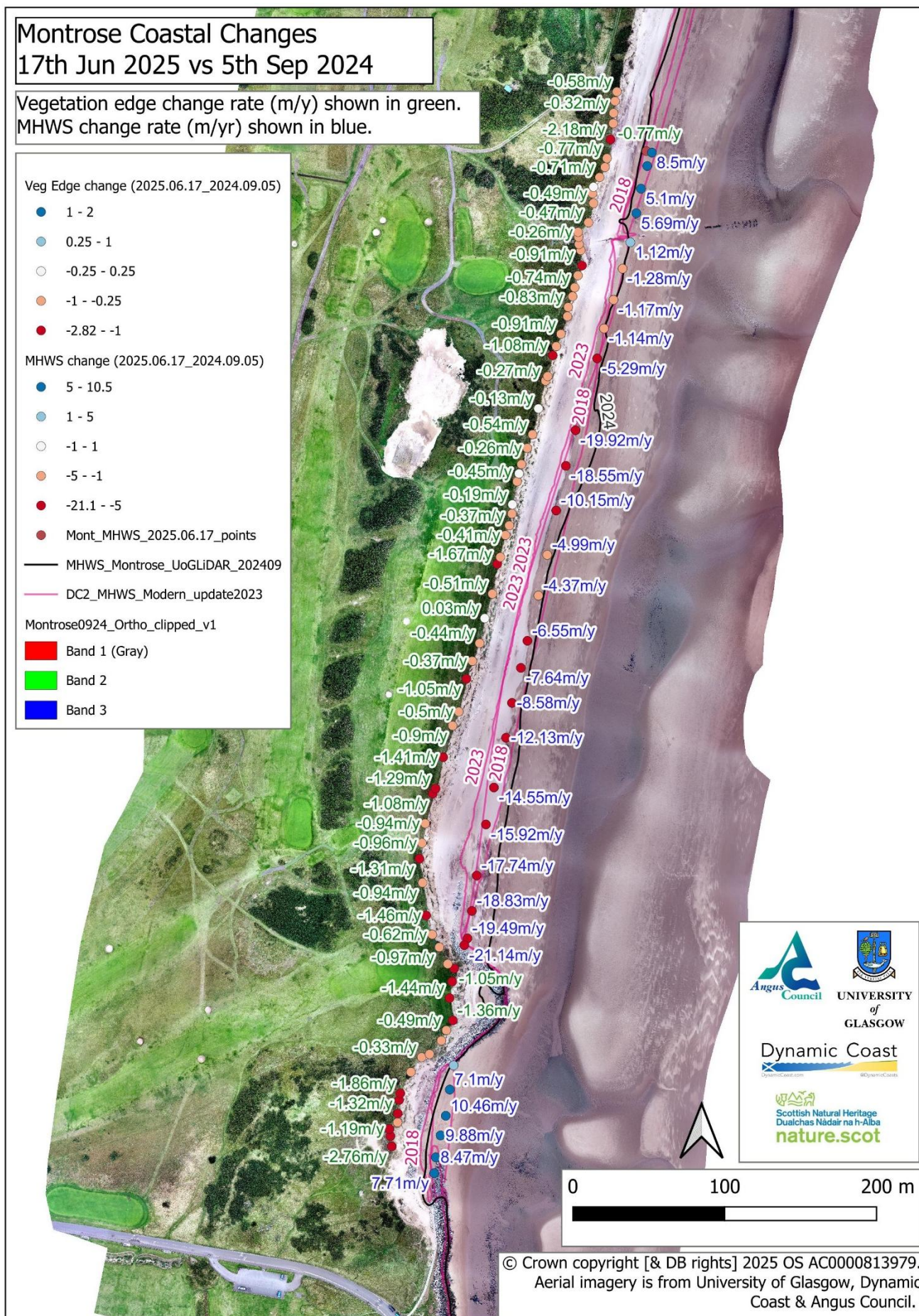


Figure 1 Map of coastal changes in m/yr, comparing June 2025 with September 2024.



## Data sets

Table 2 List of data informing this assessment.

Year	Date	Name	Type	Source	Horizontal accuracy
2024	05/09/2024	Orthomosaic and Digital Surface Model	Drone survey	University of Glasgow	<0.1m
2025	17/06/2025	Vegetation Edge survey	GPS/GNSS survey	NatureScot	<0.1m
2025	17/06/2025	MHWS survey	GPS/GNSS survey	NatureScot	<0.1m

## Discussion

Fastest changes to both the dune edge (vegetation edge) and the upper beach (MHWS) are located to the north of the defences at the 2<sup>nd</sup> tee. These losses taper off towards the north, which would be consistent with a northerly net movement of sediment within this part of the beach. The inflection point (where accretion is being replaced by erosion) appears to be at the location of the Pipey, at present.

The surveyor noted that for these sections of the coast, there was evidence that much of the recent loss was expected to have occurred in the proceeding months (ie spring 2025), based on the relatively fresh appearance of the collapsed turf blocks on the dune face, though there is some uncertainty here.

The access ramp beach (to the south of the 2<sup>nd</sup> tee defences) shows reasonable seaward accretion of the upper beach and landward erosion of the dune edge. Unfortunately, the absence of CoastSnap post hinders our interpretation of these sorts of observations.

Since the September survey, the Council have repositioned some of the rock armour at the 2<sup>nd</sup> tee, effectively shortening the length of the defences and replacing the rocks which moved a little towards the west.

## Sensitivities

Erosion has been noted at Montrose for decades. This update confirms the continuation of recent changes. As a result, this is not expected to be controversial or contentious.

## Next steps

This update will be shared with Angus Council to support their ongoing coastal adaptation work. It will also be made available to wider partners, in support of their interest.

End.