

**ALLONBY BAY (MARYPORT TO DUBMILL POINT)****Baseline Information**

**Start co-ordinate:** 302966, 536857      **Finish co-ordinate:** 307650, 545742

**Total length:** 10.9km      **Defended length:** 4.8km

**Sea Wall:** 3.6km      **Rubble defence:** 1.2km

**Natural cliff:** 6.1km

**Environmental designations:**

- AONB

**Monitoring carried out:**

- 22 beach profiles
- Coastal defence inspection

**Site overview:**

The section of frontage lies within the embayment between Maryport harbour and Dubmill Point. Maryport is built on a sandstone outcrop with high cliffs rising above the shoreline. The history of Maryport harbour begins in the early 18<sup>th</sup> century when the first exports of coal were made. In 1836 a tidal dock was created. The Elizabeth Dock and Senhouse Dock were added in 1857 and 1884 respectively.

The shoreline between Maryport and Bank End is defended by a vertical sea wall, which is founded along parts of its length on underlying sandstone bedrock. The defences were originally built in the 1930s and reduced erosion but also led to beach levels dropping. The Maryport Golf Course frontage is defended by an informal revetment of tipped material comprising brick hardcore, broken concrete etc, which dates from the 1990s.

North of Bank End the cliffs which back the shoreline lower in height before rising to 15m at Swarthy Hill. Between Swarthy Hill and Dubmill Point low lying land is interspersed by sand dunes and shingle ridges providing protection to the highway and the village of Allonby. North of Oldkiln, across Dubmill Point, the shoreline has been artificially hardened to provide protection to the public highway, which runs adjacent to the coast here. These defences, constructed in 1955, comprised originally a sloping masonry revetment. Over time as beach levels dropped the original revetment has been encased with concrete forming a composite sloping/stepped revetment. More recently armour stone has been tipped along the toe of the structure. A timber groyne field was erected in 1955 in an attempt to control beach movement.

Across this section a number of becks discharge onto the foreshore. The discharge of the major beck at Allonby is dictated by the position of shingle banks on the foreshore. During storms the point of discharge is pushed northwards. Beach management is carried out by the Environment Agency to control the location of the discharge of the Beck and to prevent it backing up and causing flooding to the village.

Across Dubmill Point, the defences are in fair to poor condition, with some holes in the facing and the lower stepped sections of the wall in particular in a poor state of repair. Additional armour stone was placed along the toe of the concrete defences in 2010. In addition in 2011 re-facing of a short section of upper sloping revetment had been carried out. The timber groyne field is largely ineffective in controlling beach movement and is generally in poor condition with numerous missing or damaged planks. Overall there are a number of defects (holes, missing facing etc.), which if not addressed, could cause significant damage.

**The Current (SMP2) Policy:**

- **Maryport Harbour to Roman Fort (Maryport):** Hold the Line in the short term (0-20yrs), medium term (20-50yrs) and long term (50-100yrs);
- **Roman Fort to Bank End (Maryport Promenade):** Hold the Line in the short term (0-20yrs), No Active Intervention in medium term (20-50yrs) and long term (50-100yrs);
- **Maryport Golf Course to Allonby:** Managed Realignment in the short term (0-20yrs), medium term (20-50yrs) and long term (50-100yrs);
- **Allonby:** Hold the Line in the short term (0-20yrs), medium term (20-50yrs) and long term (50-100yrs).
- **Allonby to Seacroft Farm:** No Active Intervention in the short term (0-20yrs), medium term (20-50yrs) and long term (50-100yrs); and
- **Seacroft Farm to Dubmill Point:** Hold the Line in the short term (0-20yrs), No Active Intervention in medium term (20-50yrs) and long term (50-100yrs).

The plan overleaf summaries the above information graphically:



### **Summary of behaviour**

The indentation and shape of Allonby Bay is dictated by the juxtaposition of the controlling features and the incident wave climate. The southern part of the bay is sheltered from the south west by the headland and harbour at Maryport with the predominant waves approaching the shoreline less obliquely but still able to induce longshore movement of shingle. Moving northwards the bay becomes more indented with a wider foreshore and consequently reduced exposure. Exposure conditions increase between Allonby and Dubmill Point as the shoreline move seaward again.

The predominant drift direction in this section is northerly. The bay receives inputs of sediment from the south that by-passes the harbour at Maryport and from erosion of the shoreline between Maryport Golf Club and Oldkiln. At Dubmill Point the artificial reinforcing of the promontory to protect local infrastructure acts to provide a strategic control on process behaviour but the form of defences have created conditions that induce localised beach erosion.

The following key points arise from analysis of the contemporary monitoring data:

#### ***Offshore Wave Climate:***

Historic wave data from the Met Office (St Bees):

- Approximately 70% of waves are < 1 metres high and approximately 1.5% of waves are > 3 metre high.

#### ***Wind Climate:***

Historic wind data from the Met Office (St Bees) identifies:

- 40-45% of winds are greater than 9 metres per second (Force 5 and above) & 45% of wind comes from offshore directions (SW to N)

#### ***Sea Levels:***

- Maximum tide level recorded at Workington in the last 20 years = +5.76 (m ODN) in February 1997, which also equates to approximately a 1 in 50 return period; and
- The following predicted extreme tide levels apply (m ODN):

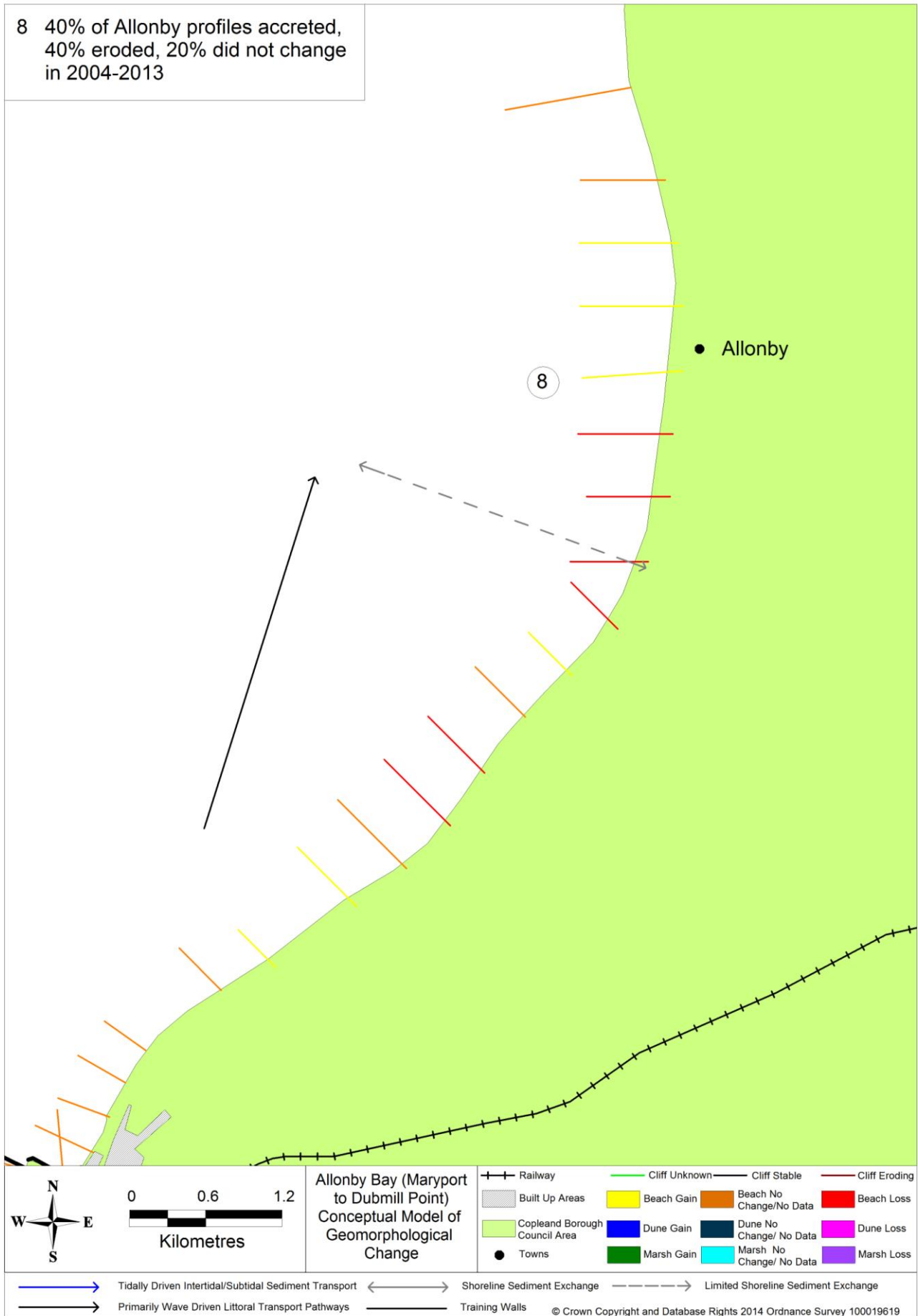
Return Period (years)	Workington	Maryport	Allonby
10	5.49	5.62	5.68
100	5.84	5.97	6.05
1000	6.18	6.31	6.43

#### ***Foreshore & Shoreline Changes:***

- Accretion at Maryport Bank End.
- Erosion south of Allonby
- Accretion north of Allonby
- For the profiles with more than one survey (15 No.) change: 40% – accretion, 40% – erosion, 20% – no change

This behaviour is illustrated graphically on the plan overleaf.

Note: Where profile change is shown for individual profiles on the pictorial summaries, beach gain or loss is identified, where the magnitude of change in cross sectional area is greater than 2%. Where the magnitude of change is less than or equal to 2% this is denoted as no change.



**Risk Assessment**

The primary risks arising from the behaviour of coastal forcing processes (wind, waves and tides) and the reaction of the shoreline (beach and cliff changes, artificial defence conditions) across this frontage are:

- Overtopping of artificial defences causing flooding of the hinterland;
- Breaching of artificial coastal defences, causing erosion of the shoreline; and
- Erosion of natural frontages providing potential pathways for water penetration into the hinterland.

The primary consequences of this behaviour are:

- Damage to and/or loss of property and infrastructure; and
- Potential impact on AONB.

The table below shows the overall risk rating(s) that apply within this section of frontage. Overall risk is defined from the probability of conditions/behaviour occurring and the consequences the conditions/behaviour would have.

<b>Allonby Bay Overall Risk Rating</b>					
<b>Policy Unit (11e)</b>	<b>Section of Frontage</b>	<b>Exposure</b>	<b>Probability Index</b>	<b>Consequence Index</b>	<b>Overall Risk Rating</b>
4.1	Maryport Harbour to Roman Fort (Maryport)	High	Medium	High	Medium
4.2	Roman Fort to Bank End (Maryport Promenade)	High	Low	Medium	Low
4.3	Maryport Golf Course to Allonby	High	Medium	Medium/High	Medium
4.4	Allonby	High	Medium	High	Medium
4.5	Allonby to Seacroft Farm	High	Medium	Medium/High	Medium
4.6	Seacroft Farm to Dubmill Point	High	Medium	Medium/High	Medium

**Current Behaviour**

Analysis of the monitoring data collected in 2013 provides the following key points:

**Offshore Wave Climate:**

- No new data available for analysis.

**Wind Climate:**

- No new data available for analysis.

**Sea Levels:**

- Maximum tide level recorded on Workington tide gauge = +4.808m (m ODN), this level would be expected to be exceeded at least once a year.

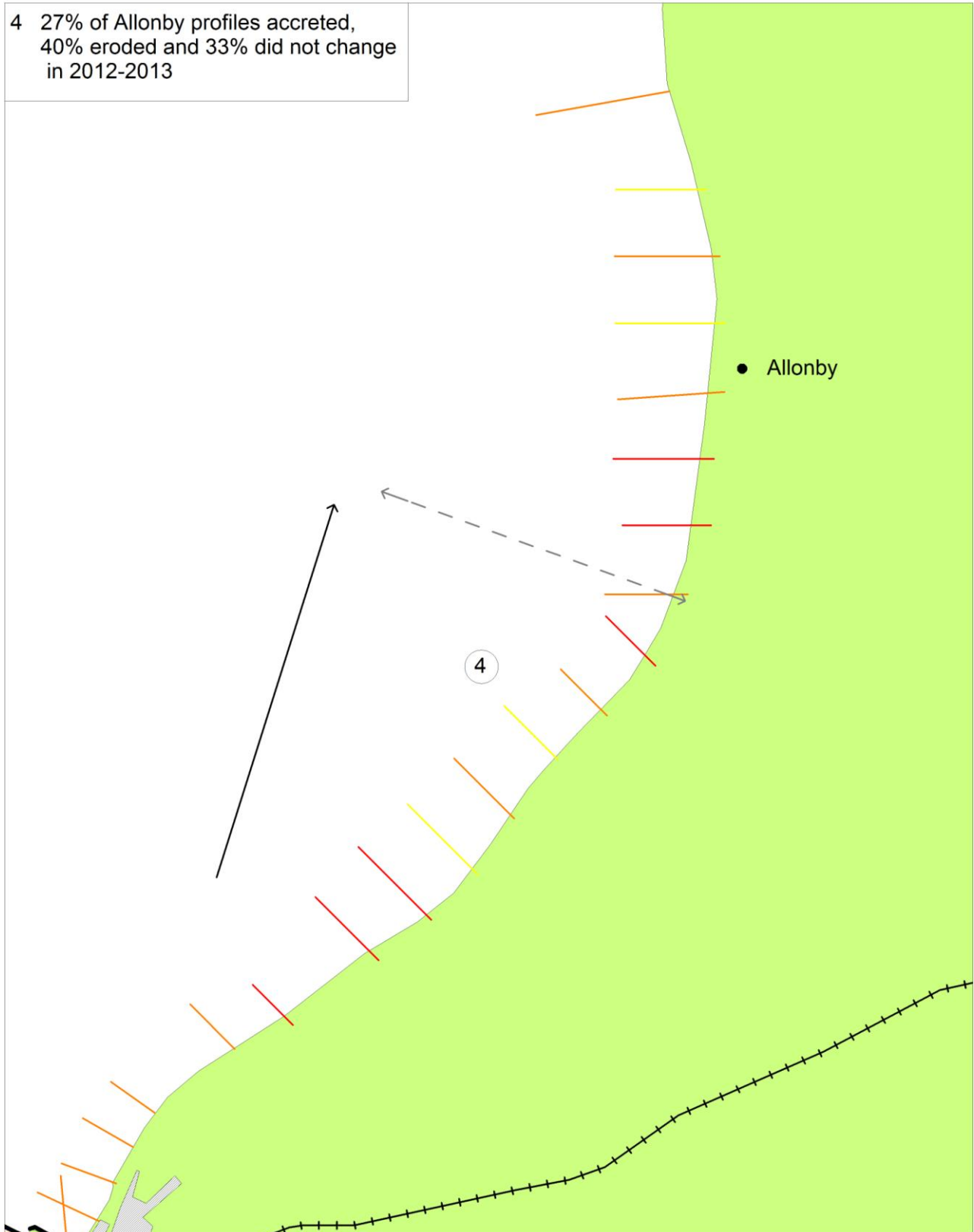
**Beach Changes:**

- Change generally the same as overall trend; and
- For the profiles with more than one survey (15 No.) change: 27% – accretion, 40% – erosion, 33% – no change.

Note: Where profile change is shown for individual profiles on the pictorial summaries, beach gain or loss is identified, where the magnitude of change in cross sectional area is greater than 2%. Where the magnitude of change is less than or equal to 2% this is denoted as no change.

The plot overleaf summarises the results from the monitoring data analysis for this section in 2013.

4 27% of Allonby profiles accreted, 40% eroded and 33% did not change in 2012-2013



0 0.6 1.2  
Kilometres

**Allonby Bay (Maryport to Dubmill Point)**  
Geomorphological Change in 2013

—+— Railway	— Cliff Unknown	— Cliff Stable	— Cliff Eroding
■ Built Up Areas	■ Beach Gain	■ Beach No Change/No Data	■ Beach Loss
■ Copleand Borough Council Area	■ Dune Gain	■ Dune No Change/ No Data	■ Dune Loss
● Towns	■ Marsh Gain	■ Marsh No Change/ No Data	■ Marsh Loss

→ Tidally Driven Intertidal/Subtidal Sediment Transport	← Shoreline Sediment Exchange	--- Limited Shoreline Sediment Exchange
→ Primarily Wave Driven Littoral Transport Pathways	— Training Walls	

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**Uncertainties & Issues**

The following uncertainties have arisen from the data monitoring programme and analysis of the data collected:

- Quantities of sediment arriving on the beach from offshore;
- Wave conditions occurring directly in front of shore currently unknown; and
- Dune and artificial cliff erosion rates.

**Future Management Actions**

The following monitoring and management actions are recommended:

- Continue current monitoring regime;
- Improve additional remote sensing e.g. LiDAR;
- On-going monitoring of condition of artificial defence structures; and
- Carry out remedial works to maintain integrity of defences, as required.

**Linkage(s) to Decision Making**

The monitoring provides information to support:

- Implementation of SMP2 policies, particularly; identification of timing for future capital works or capital maintenance works for artificial defences;
- Continued maintenance and operation of coastal highway; and
- Decision making process in relation to development planning control.