Image courtesy of Manual Hinge.

Coastal management at Milford on Sea

GCSE Resource

Produced as part of the Christchurch Bay & Harbour Flood and Coastal Erosion Risk Management Strategy, in collaboration with Geography Southwest and the project partners.

May 2023

Where is Milford on Sea?

(Source: BCP Council; https://twobays.net/wp-content/uploads/2022/11/SMZ_overview1-6-1200.jpg)

- Milford on Sea is a small town with a population of just under 5,000 people located at the eastern end of Christchurch Bay in Hampshire.

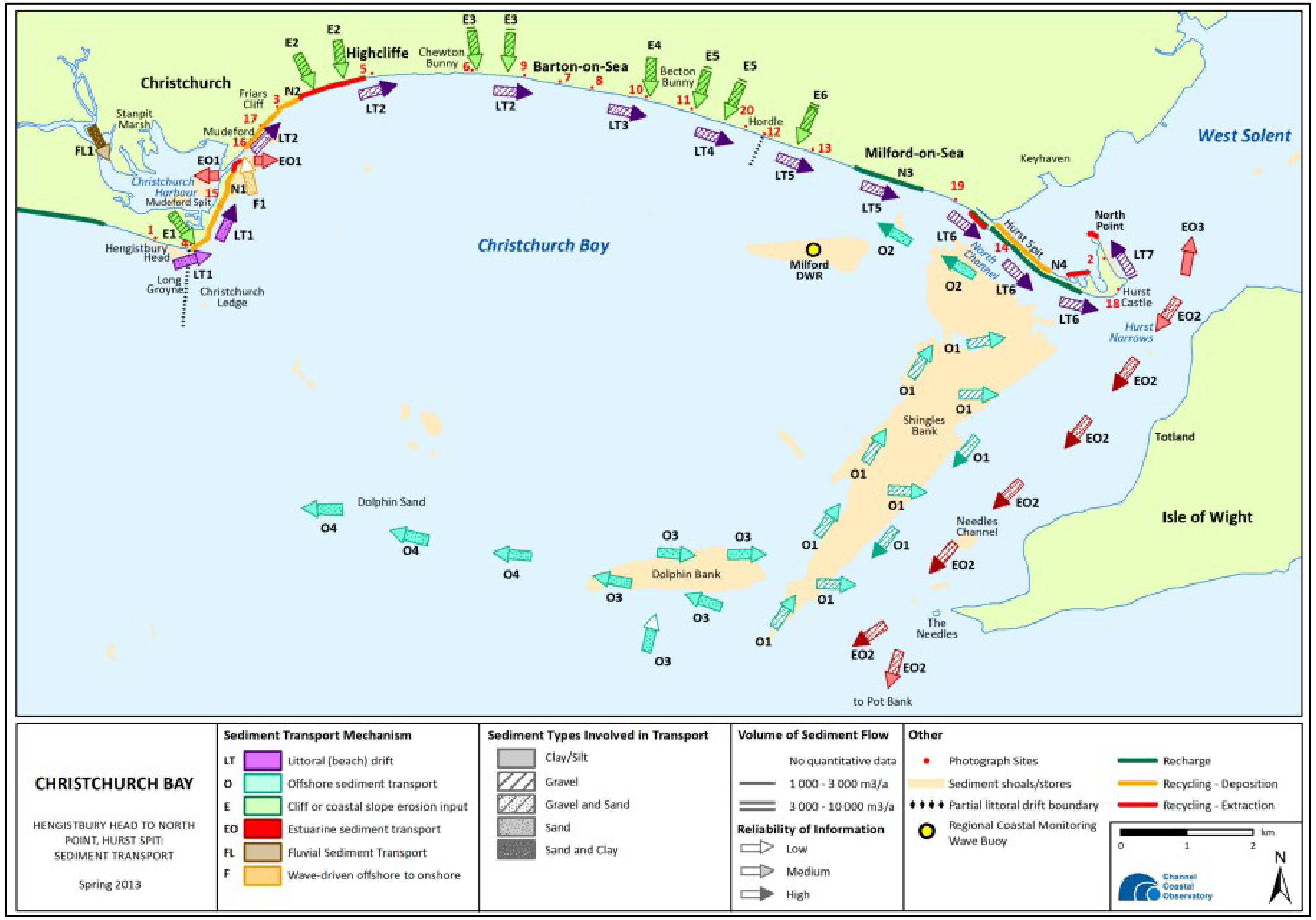
- It is a popular seaside resort with a long shingle beach and cliff top walks, affording spectacular views of Christchurch Bay and the Isle of Wight.

(https://en.wikipedia.org/wiki/Milford_on_Sea)

Milford on Sea and Christchurch Bay

Image courtesy of Dan Amos, South East Regional Coastal Monitoring Programme

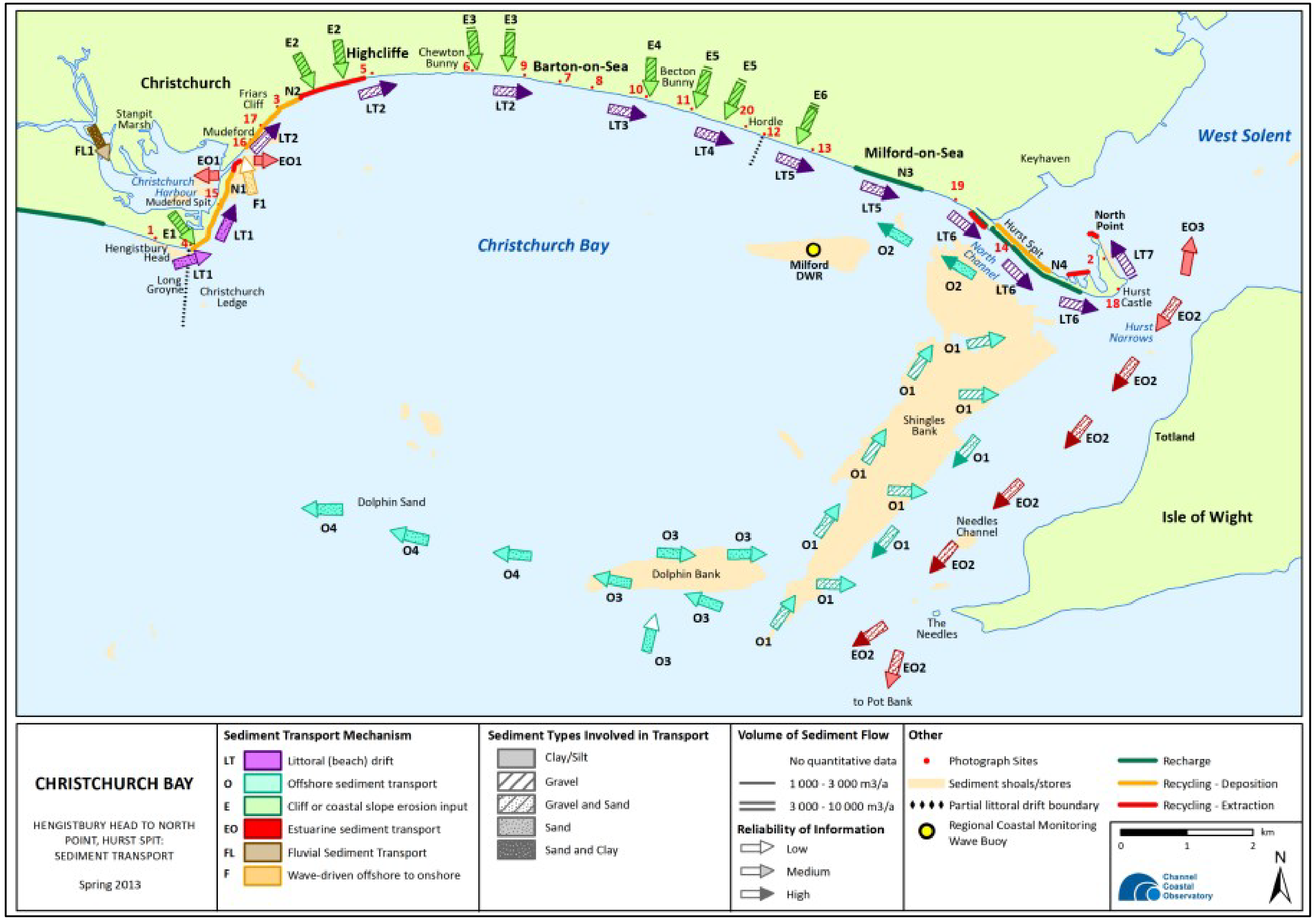
Coastal processes at Milford on Sea



Source: https://www.scopac.org.uk/sts/christchurch-bay.html

- This diagram shows sediment transport in Christchurch Bay.
- The arrows indicate the dominant direction of sediment transport. Notice that there is a large-scale circular pattern of sediment transport in the bay - this is known as a sediment cell.
- Notice that in Christchurch Bay, sediment moves from west to east along the coast.

Coastal processes at Milford on Sea



Source: https://www.scopac.org.uk/sts/christchurch-bay.html

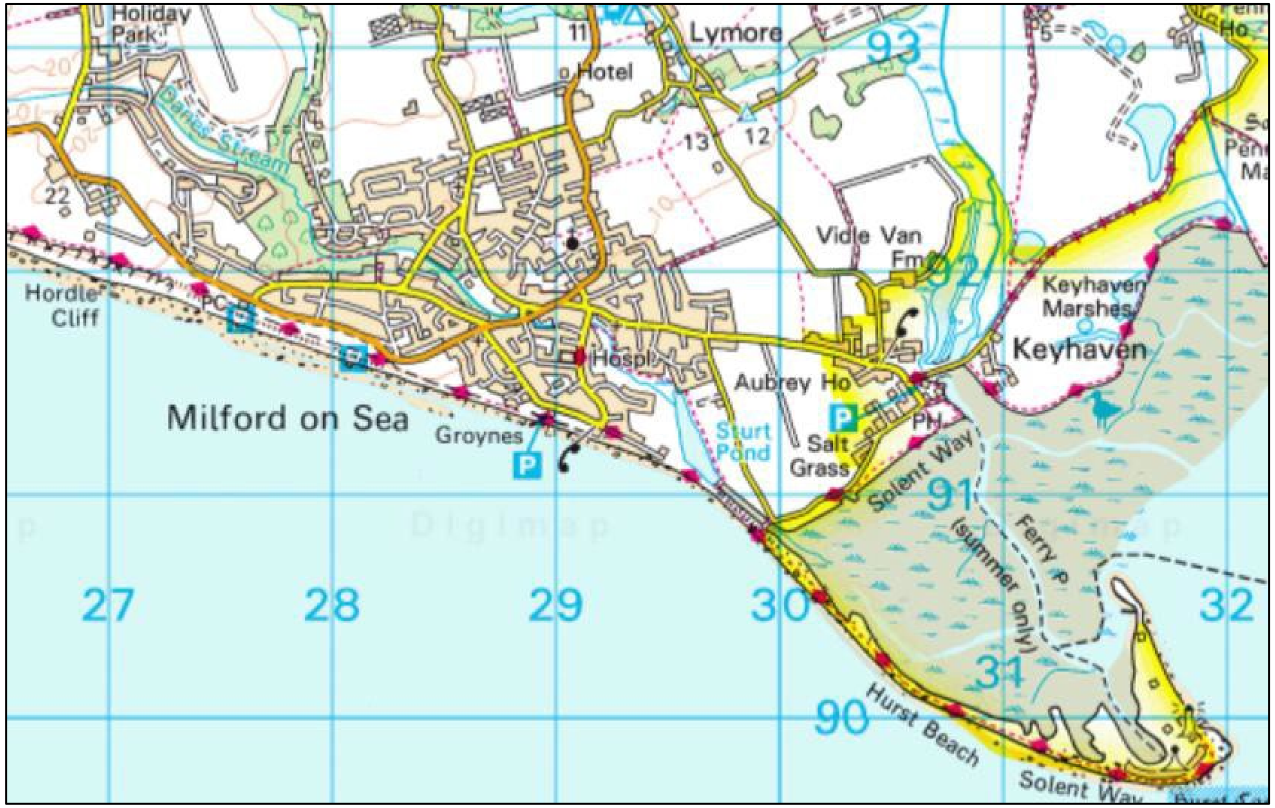
Look closely at the key.

- The colours indicate the type of transport mechanism, for example, cliff erosion and longshore (littoral) drift.
- Each arrow is shaded according to
- the sediment type, mostly gravel.
- The volume of sediment transported is also indicated.

An interactive version of this map is available at: : https://www.scopac.org.uk/sts/christchurch-bay.html

What are the issues at Milford on Sea?

- In Christchurch Bay, the cliffs at the back of the beach are weak and easily eroded. They are mostly sands, gravels and clays.
- Between Hordle and Milford on Sea, natural cliff erosion is an issue which affects the beach huts. *[Hordle Cliff is labelled on the map alongside.]*
- Further east, as the cliff drops down to sea level, ageing sea defences and low beach levels offer limited protection to the sea wall and to seafront properties.



(With kind permission from Digimap for Schools)

Winter storms

- In the winter of 2020, storms severely damaged a 270-metre section of the concrete seawall threatening more than a dozen properties.

- A report commissioned by New Forest District Council warned that, if nothing is done, property worth £38m is at risk.

- The beach at Milford on Sea has been retreating by about 0.8m/year reducing its ability to protect cliffs and sea defences from the power of the sea. This is a key issue.

<< Damage to beach huts caused by 14/02/2014 storm

(Photo Copyright: New Forest District Council, https://www.scopac.org.uk/sts/hh-hs-photos.html#cb-17-20)

<< Failing 270m Westover Wall in 2020

(Photo Copyright: New Forest District Council)

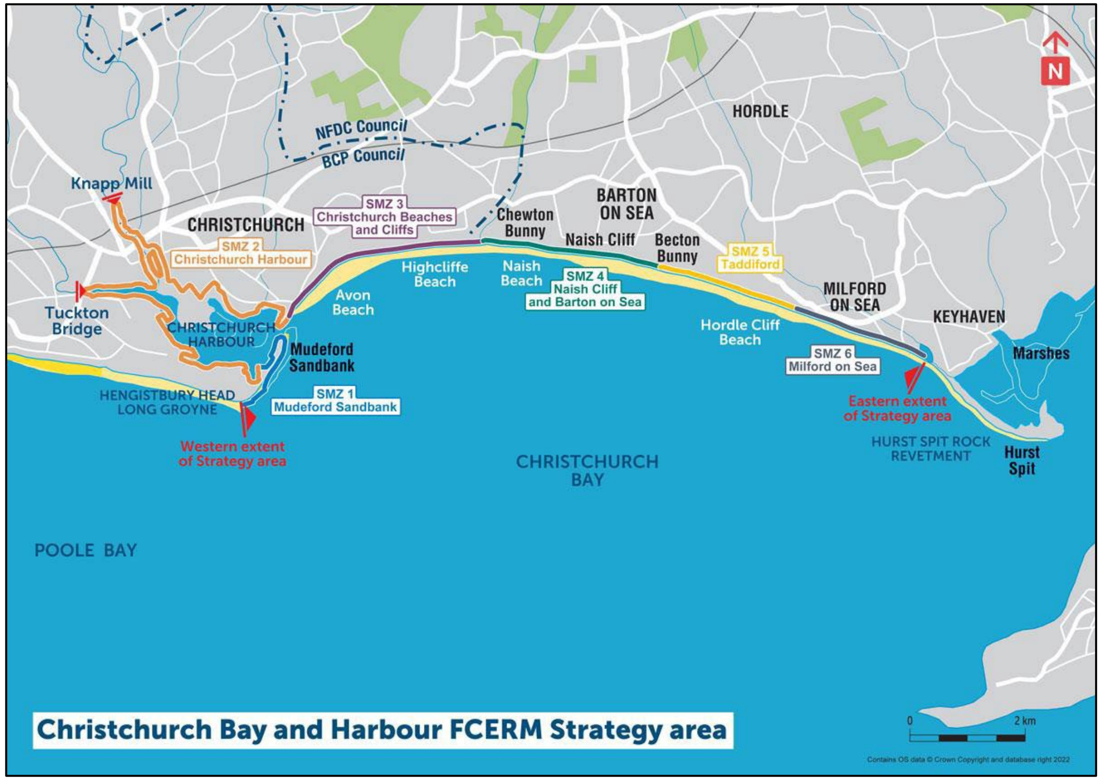
Coastal management in Christchurch Bay

- Christchurch Bay is managed in the west by Bournemouth, Christchurch and Poole (BCP) Council and in the east by New Forest District Council.

- In 2020, BCP Council secured government funding of £525,000 to devise a strategy to manage the bay sustainably for the next 100 years.

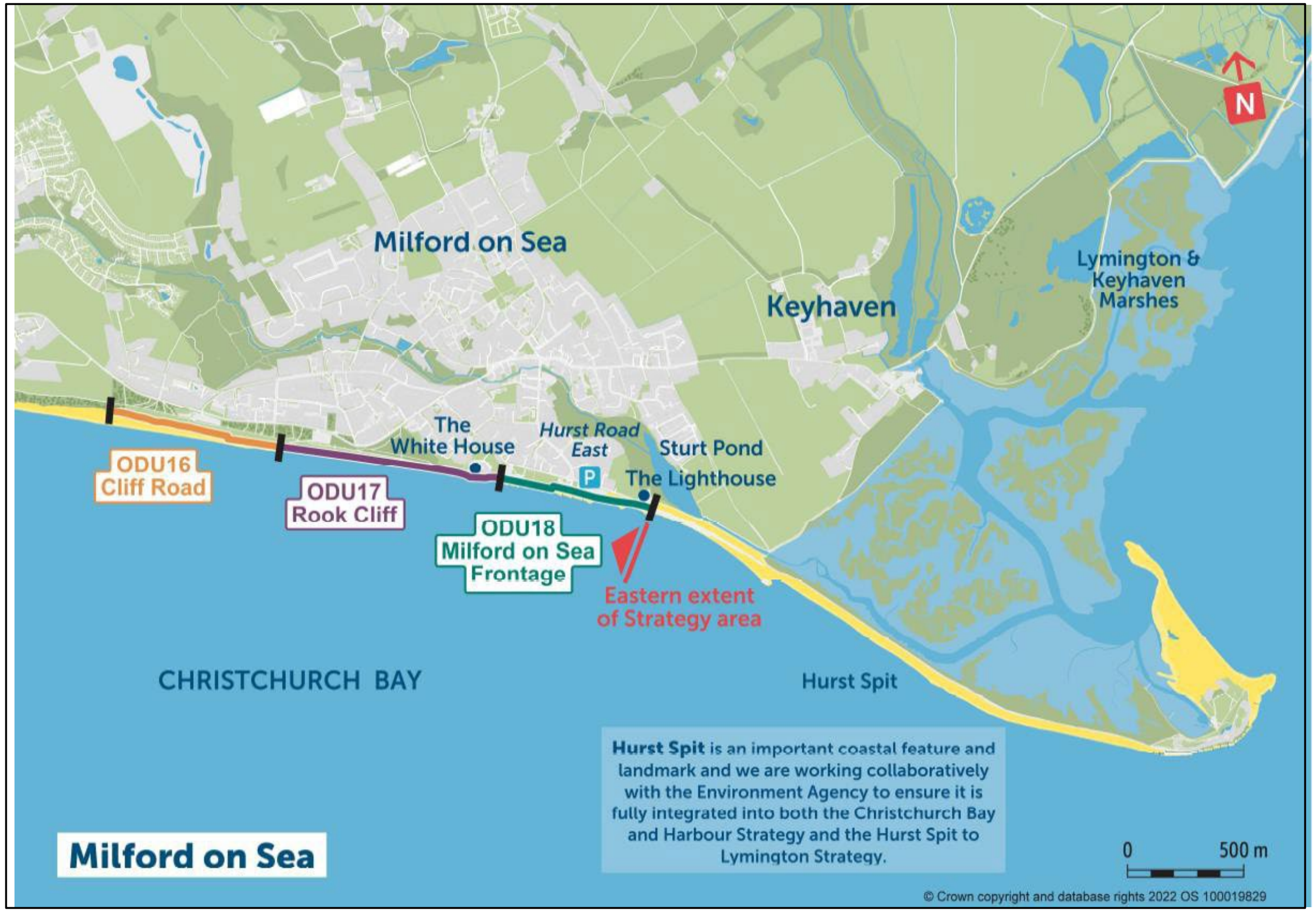
- The Christchurch Bay and Harbour Flood and Coastal Erosion Risk Management (FCERM) Strategy will identify the measures needed to manage the risks of coastal flooding and erosion.

- The strategy will be published in 2024.



Source: BCP Council ; https://twobays.net/wp-content/uploads/2022/11/SMZ_overview1-6-1200.jpg

Coastal management at Milford on Sea



Source: BCP Council

The map identifies three management units (ODUs):

- Cliff Road – risk of erosion threatening the road.
- Rook Cliff – risk of cliff collapse affecting the cliff top and beach huts.
- Milford on Sea frontage – wave overtopping and flooding is a risk to properties. The recent trend of beach erosion has increased pressure on defences at the back of the beach.

Existing defences at Milford on Sea

No existing defences at Hordle Cliff and Cliff Road

Rock armour, revetments and groynes protecting Rook Cliff

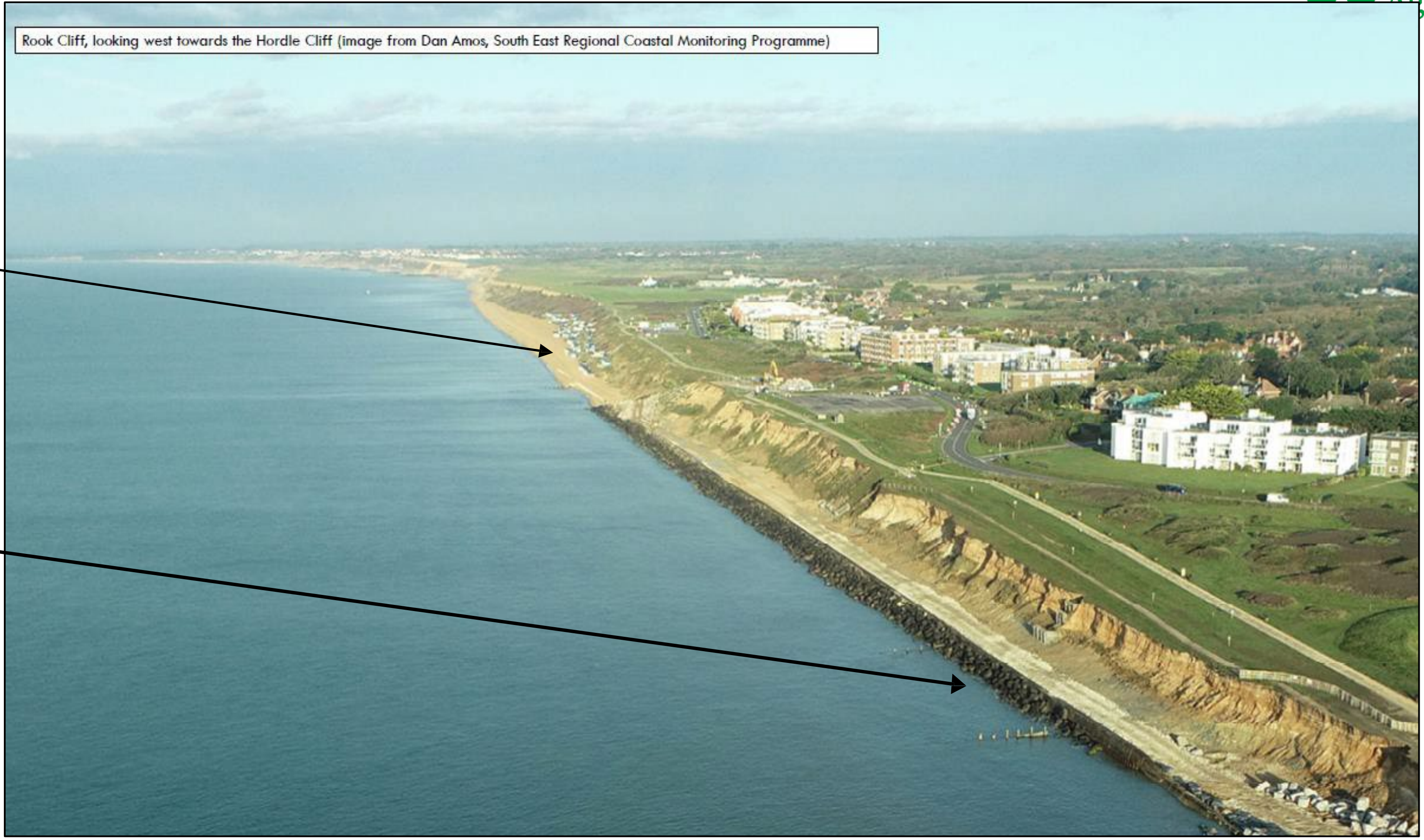
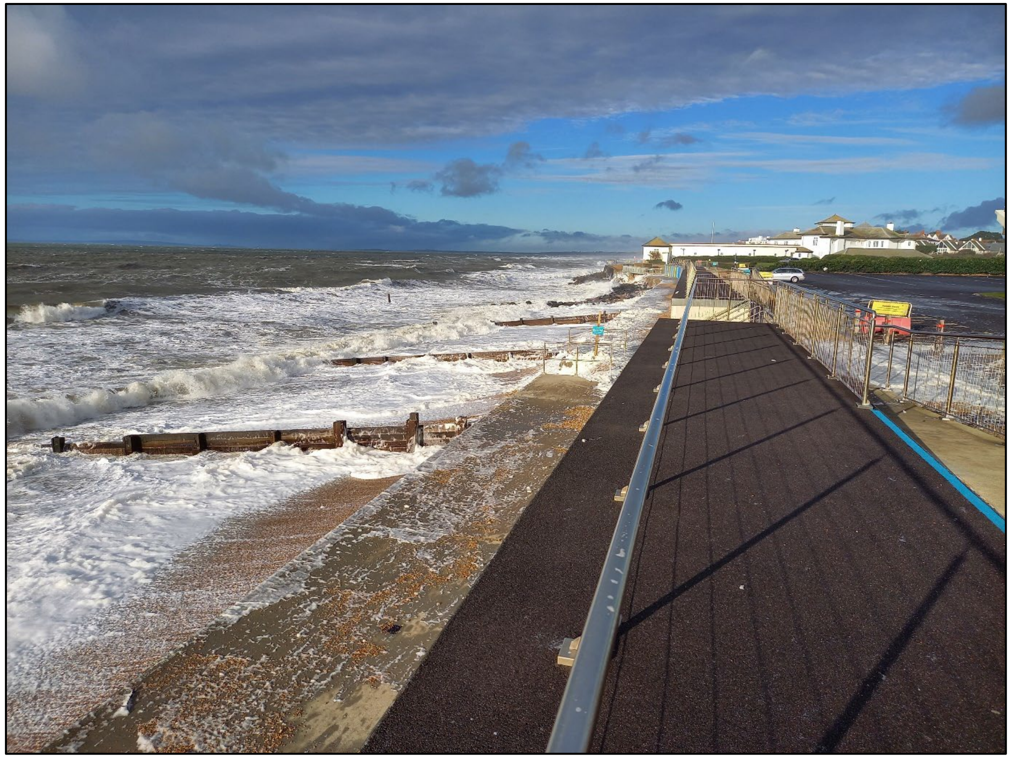


Image courtesy of Dan Amos, South East Regional Coastal Monitoring Programme

Existing defences at Milford on Sea

- The beach frontage is protected by a series of rock and timber groynes (constructed in the 1930s), a low sea wall and rock armour.
- The groynes, designed to retain the beach, are now largely ineffective with beach sediment being transported eastwards to Hurst Castle.
- Beach huts and seafront properties are at increasing risk from flooding and the sea wall is at risk from erosion.
- The current defences are expected to be effective for less than 10 years.



(Photo Copyright: BCP Council)

Shoreline management plan

- In England and Wales, a shoreline management plan (SMP) sets policies for managing flood and erosion risks.
- The Poole and Christchurch Bays SMP covers the 190km (118 miles) of open coast, harbours, estuaries and headlands between Durlston Head in the west and Hurst Spit to the east.
- Launched in 1999, the SMP was updated in 2010 (SMP2). This considers policies for 20, 50 and 100 years.

There are four SMP policy options:

1. Hold the line – use defences to retain the current position of the coast.
2. Managed realignment – manage coastal processes to allow the coast to naturally realign.
3. Advance the line – construct sea defences seaward to increase protection.
4. No active intervention – do nothing (see below).

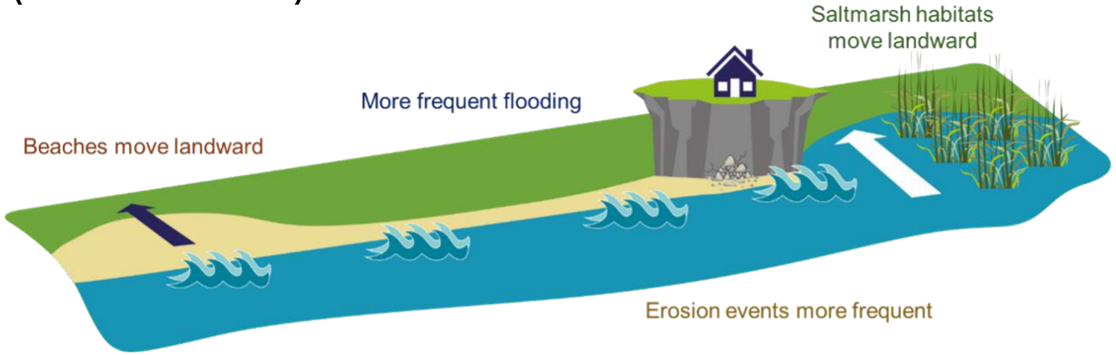


Image courtesy of Coastal Partners (https://coastalpartners.org.uk/coastal-management-approaches)

Future coastal management at Milford on Sea

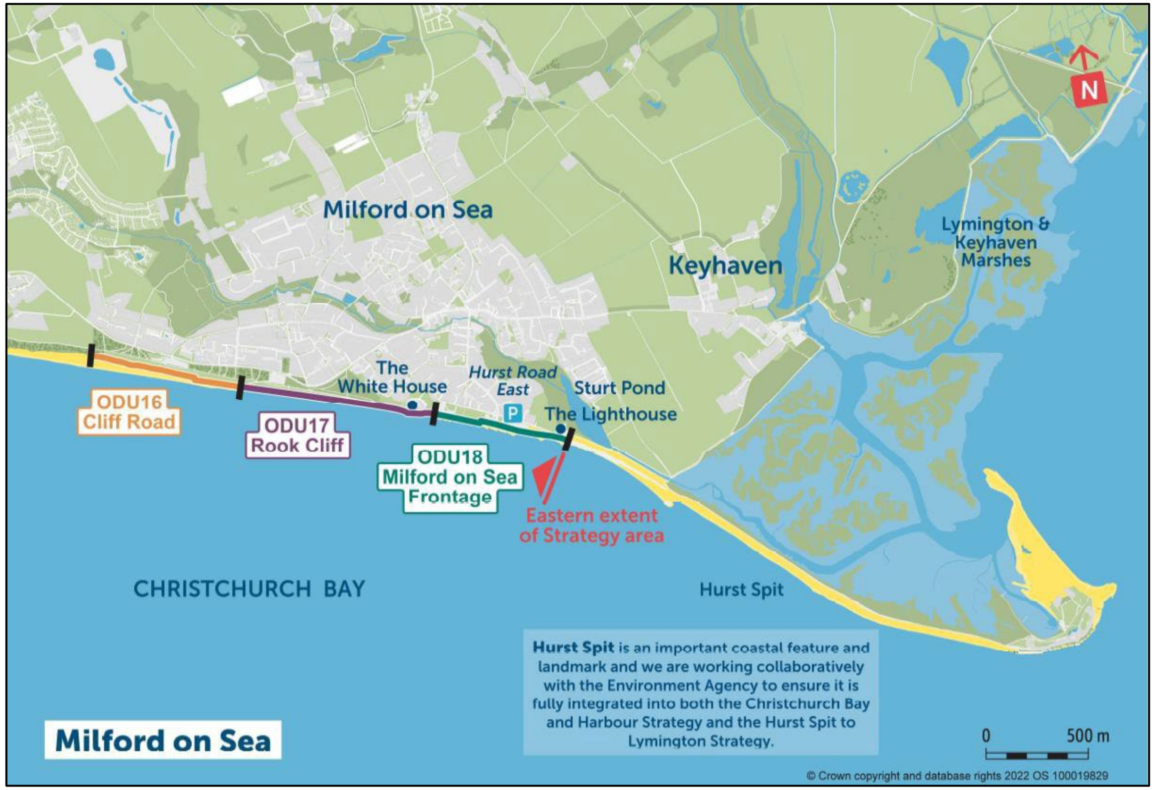
- The Christchurch Bay and Harbour FCERM Strategy will be published in 2024.

- It will outline the strategies for delivering the SMP(2) policies for Milford on Sea:

Cliff Road – managed realignment to 2105

Rook Cliff – hold the line to 2105

Milford on Sea frontage – hold the line to 2025; then managed realignment to 2105



Source: BCP Council

Coastal management options

Location	SMP(2) policy	Management options
Cliff Road	Managed realignment to 2105	1. Repair and maintain 2. Beach nourishment 3. Rock/timber groynes 4. Cliff stabilisation and drainage 5. Rock revetment
Rook Cliff	Hold the line to 2105	
Milford on Sea frontage	Hold the line to 2025; then managed realignment to 2105	

Management option 1: repair and maintain

- This involves repairing and strengthening the existing defences.

- This could include repairing timber and rock groynes, replacing eroded rocks (rock armour) and repairing damaged sea walls.

- The cost is about £1,000-£3,000 per metre.

Source: BCP Council

Management option 2: beach nourishment

- This involves the addition of beach material to a location with the aim of widening the beach and protecting the cliff toe and beach defences.
- Sediment (sand or pebbles) is typically transported by barge and then reprofiled by machines on the beach.
- Costs vary between £350-£6,450 per metre.

Source: BCP Council

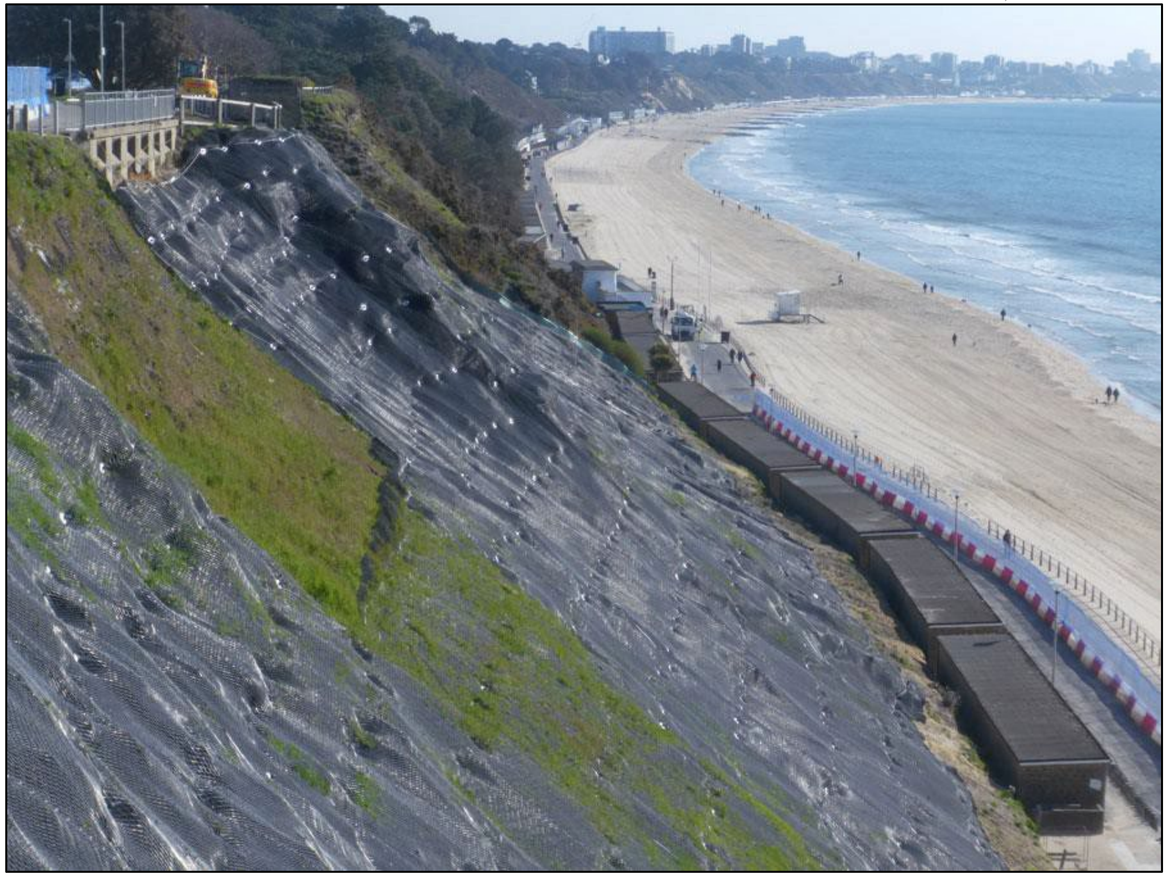
Management option 3: rock/timber groynes

- Rock or timber groynes are constructed at right angles to the beach.
- They interrupt longshore drift, retaining or increasing the width of the beach creating a protective buffer to the waves.
- Typically a series of groynes are constructed along a length of coastline.
- Groynes cost between £10,000 and £100,000 each.

Source: BCP Council

Management option 4: cliff stabilisation and drainage

- Cliff stabilisation is appropriate where the cliffs are weak and vulnerable to collapse.
- Options include wire mesh, the use of large nails or pins and reprofiling to reduce the risk of collapse. Rocks in wire cages (gabions) can be used to increase stability.
- Drainage pipes help to reduce waterlogging which is often a cause of collapse.
- Costs range between £5,000 and £11,500 per metre.



Source: BCP Council

Management option 1: repair and maintain

- A revetment is an apron of rock or concrete constructed at the base of a sea wall or the foot of a cliff.
- Forced to break early, wave energy is absorbed and erosion reduced.
- Piles of large, resistant rocks – rock armour – perform a similar function.
- Rock revetments cost about £650-£2,850 per metre.
- Rock armour costs £1,350-£6,000 per metre.

Source: New Forest District Council