

West Beach, Hayling Island

Coastal Change between Inn on the Beach and Hayling Golf Club – January 2020



West Beach looking towards Gunner Point, 23rd January 2019

1. Introductions
2. Overview of coastal processes past and present / Coastal Policy / Mapping (10 mins)
3. Erosion Risk Predictions – approach and limitations (30 mins)
4. ESCP coastal monitoring results (10 mins)
5. ESCP management of structures / design life etc (10 mins)
6. AOB (15 mins)

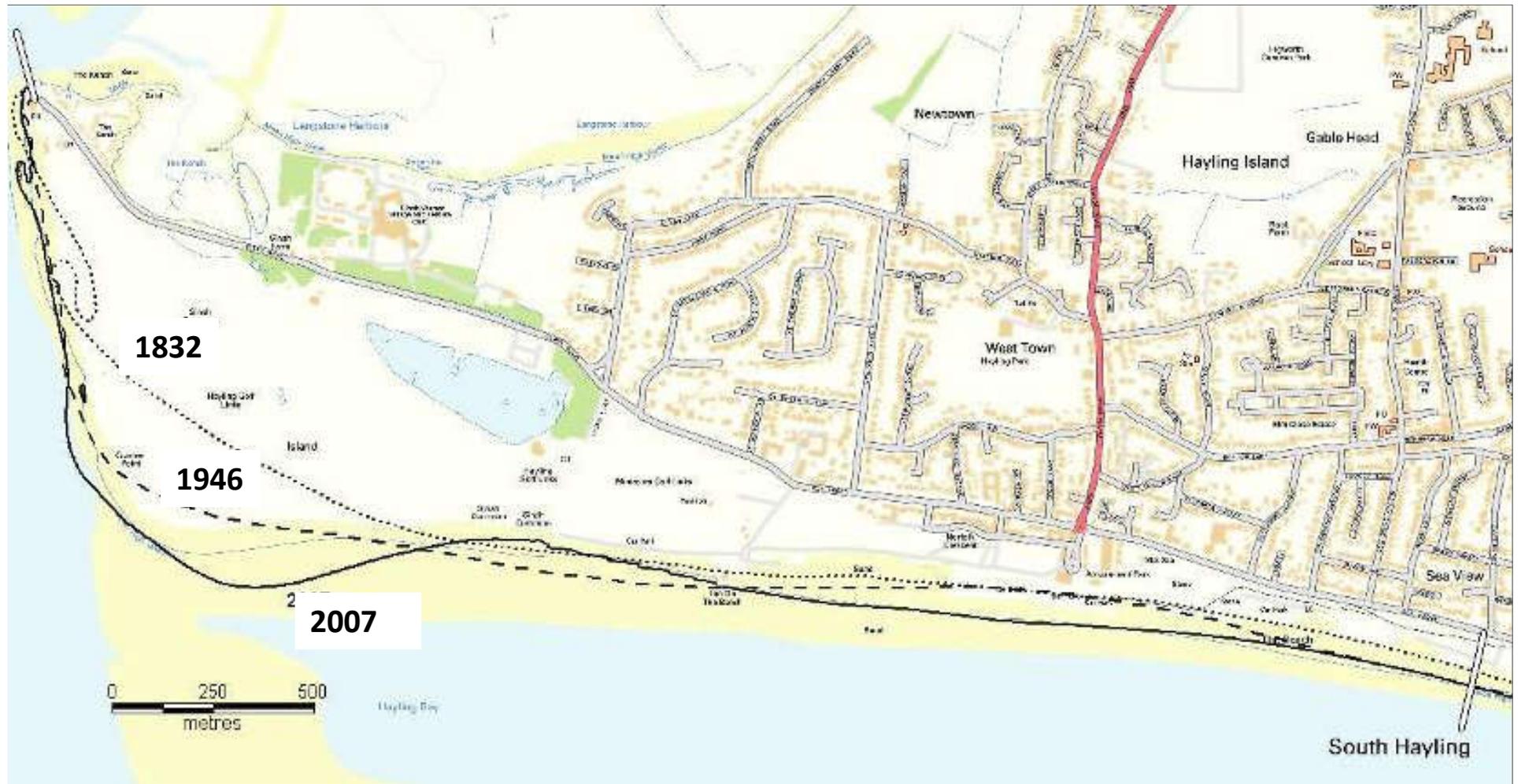
- West Beach sits between Inn on the Beach in the east, and the Hayling Golf Club in the west.
- The SMP2 Policy for this frontage is to “Hold the Line, with natural evolution at Gunner Point”.
- Inn on the Beach – to be relocated when vulnerable (landowner responsibility)
- The current Havant Borough Council policy for West Beach: *once the coastal defences reach the end of their serviceable life or become a health and safety risk, the structures should be removed and the beach allowed to evolve naturally.*
- This decision was taken in 2008, by Havant Borough Council.
- Currently half of the original coastal defences remain at West Beach.

West Beach: Location Plan



West Beach	Structures		
	Aerial Photography: CCO (2016)		

West Beach: Position of the coastline





1946 © mosaic created from RAF
photography supplied by National
Monuments Record



1963 © Ordnance Survey



1984 © Hampshire County
Council



2002 © Channel Coastal Observatory

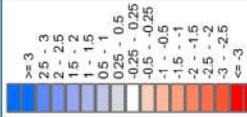


2013 © Channel Coastal Observatory

LONG TERM BEACH LEVEL CHANGES: SUMMER 2003 - SPRING 2019

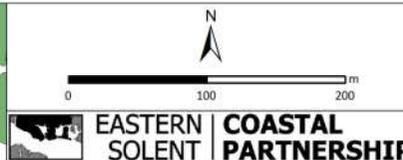


HAYLING
GOLF CLUB



Beach change (m)

Aerial Photography: CCO (2016)



The History



1970's



1987



1990



2011



2012



2012



2013



2013



2014



March 2018



March 2018



November 2018

Constructed: 1976
Original design life: 20 – 30 years
Form: Timber sloping breastwork,
sheet pile toe, timber groynes
Construction costs: £670,000
Maintenance costs: £490,000
TOTAL COSTS: £1.16 M
(ALL COSTS CORRECTED TO 2007 VALUES)



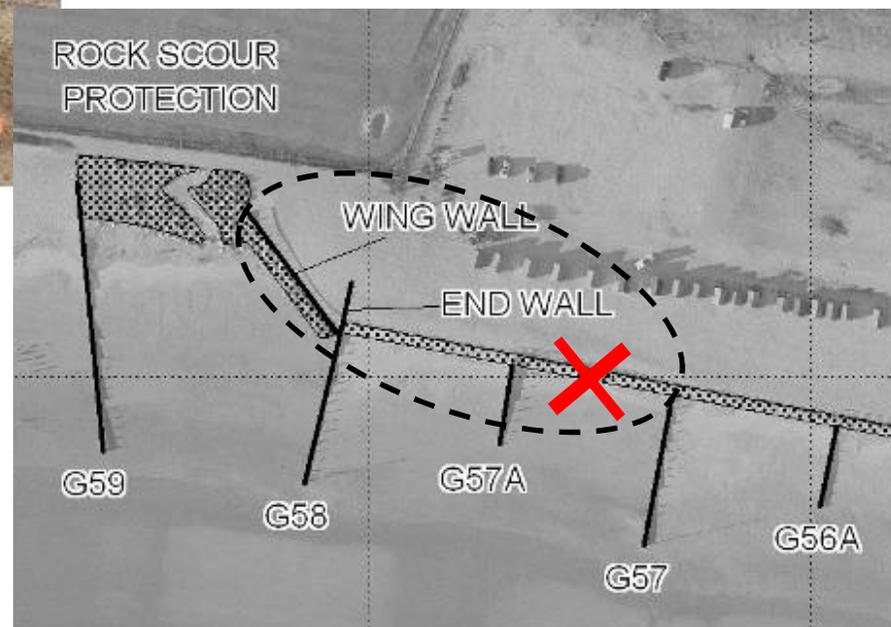
Annual average maintenance cost:	£15,000
Overall cost per metre per year:	£82.85
Eastoke Beach Management cost per metre per year:	£75.00

None of the previous works have benefitted from DEFRA / EA grant funding.
This situation is not expected to change.



- Remove damaged sections of breastwork
- Remove unsafe beach access points

- Remove sections posing Health & Safety risk to public
- Relocate vulnerable beach huts



- ESCP produced a Beach Management Plan (BMP) in 2017 which set out plans for beach management at Eastoke to protect 1700 properties, and proposed studies between 2017-2022.
- Based on this the Environment Agency allocated £3.3million for beach recycling at Eastoke, and for studies to look at wider coastal processes.
- We extract material from Gunner Point through Beach Recycling. The BMP proposed a study in to the coastal changes at West Beach, to better understand erosion and accretion rates at this location.
- The Hayling Island Taskforce/Regeneration Team identified West Beach as a potential regeneration zone, therefore the coastal process study was brought forward to assist the taskforce with their plans.

West Beach: Erosion Risk Projections

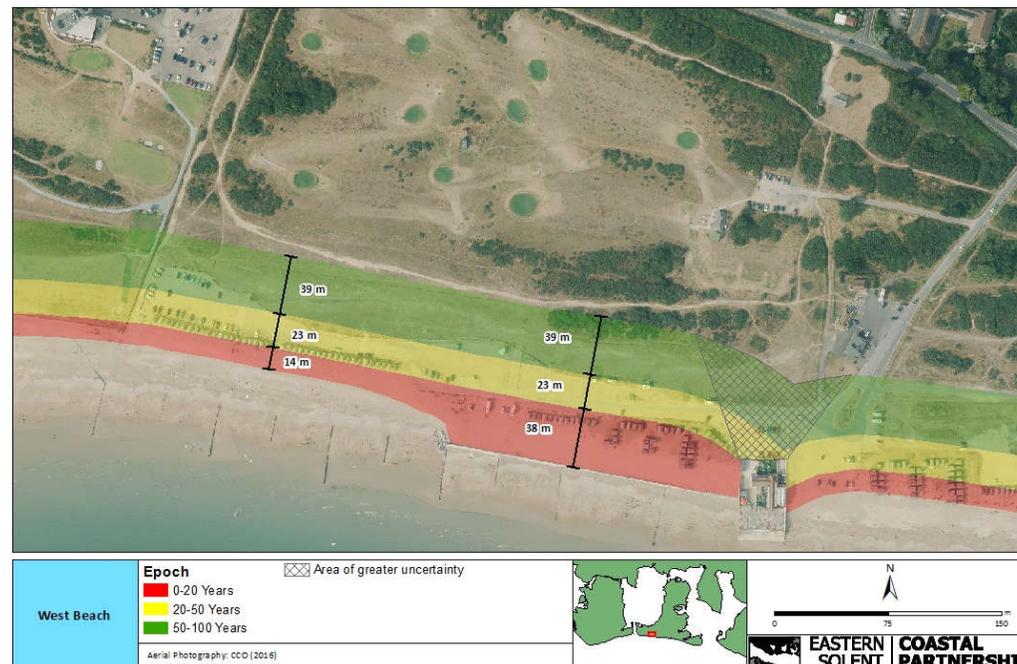
EASTERN SOLENT | COASTAL PARTNERSHIP



Photography: February 2019 (ESCP)

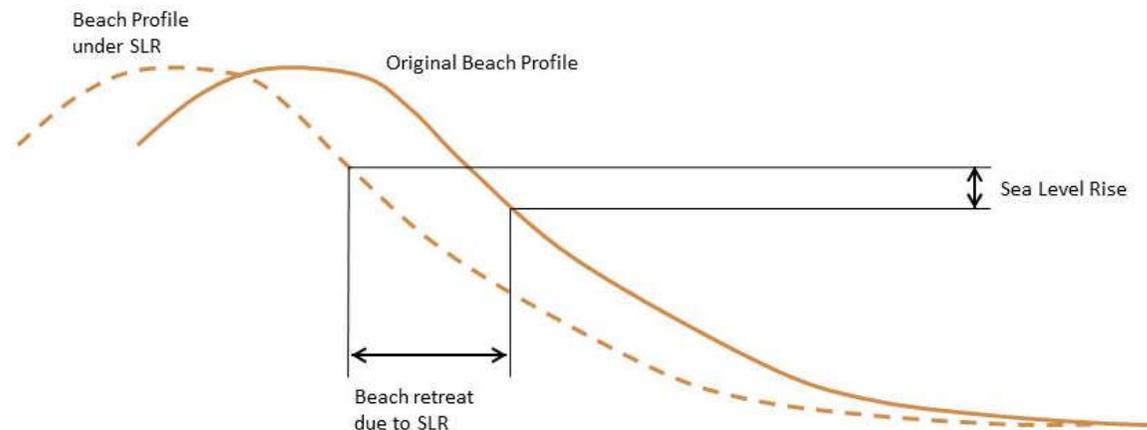
Basis for the 2017 erosion study:

- Predict the evolution of the coastline at West Beach to inform future planning.
- A desk based approach using known erosion rates (with a initial period of retreat then an erosion rate similar to the adjacent coastline).
- Over three Risk epochs (0-20 years, 20-50 years and 50-100 years).
- Consider continued beach management at Eastoke using materials sourced from Gunner Point via haul road & Inn-on-the-Beach remains in place.



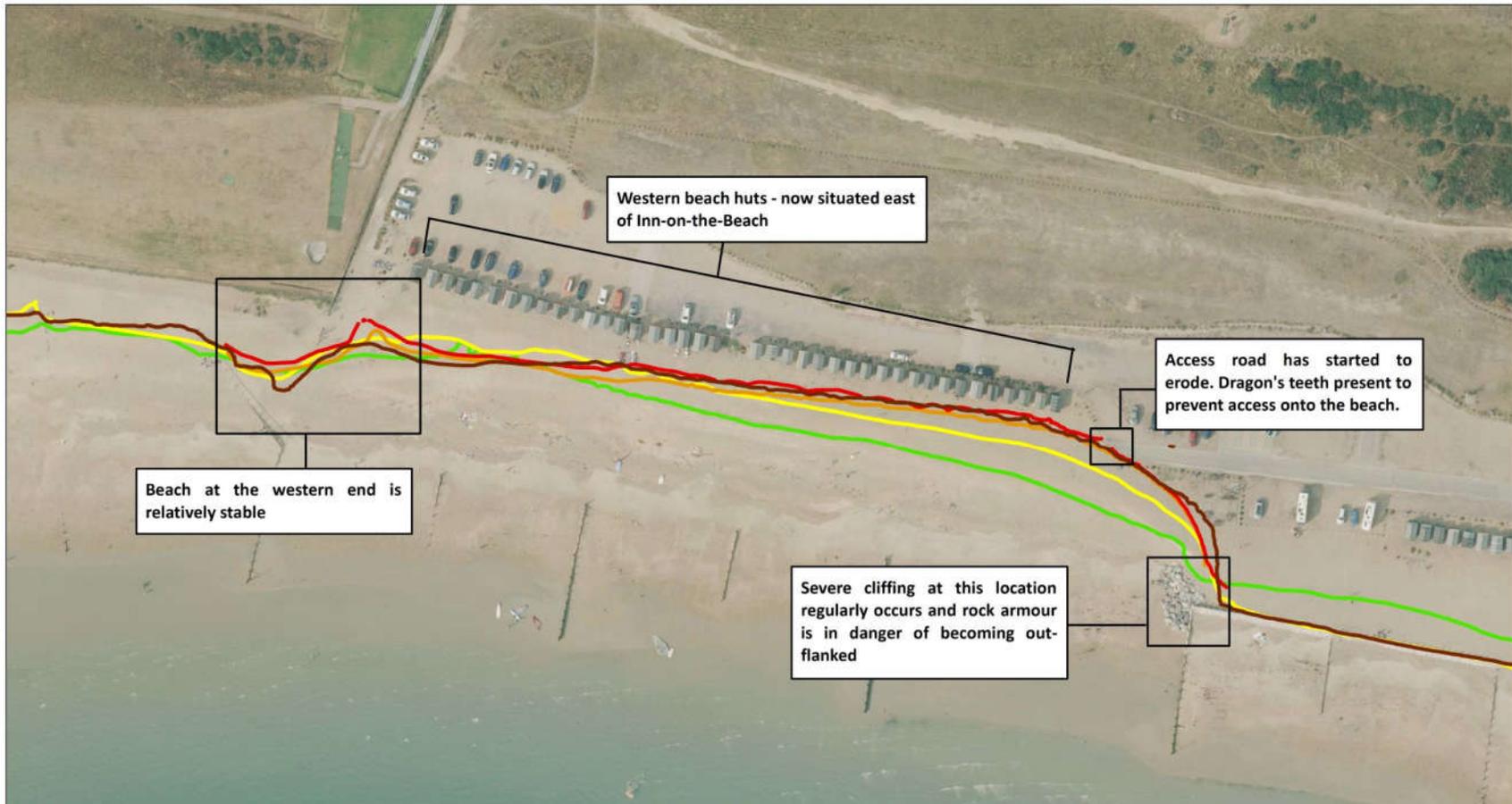
- Aerial photography, mean high water contours and beach profiles were analysed to determine the erosion rate at West Beach.
- The 'rebound' rate of erosion was determined from removal of revetment between 2012 - 2017
- A 'managed' erosion rate (assuming beach management continues) of 0.56m/year was established.
- The 'rebound' and 'managed' erosion rates were projected landward, using the 2017 beach crest as a baseline.
- Environment Agency sea level rise projections were incorporated in to the projections.

Bruun rule



West Beach: Current High Tide Line

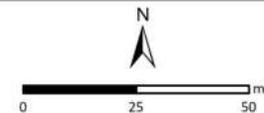
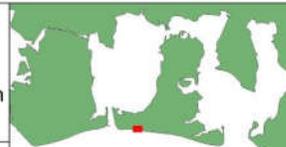
Beach Crest Position



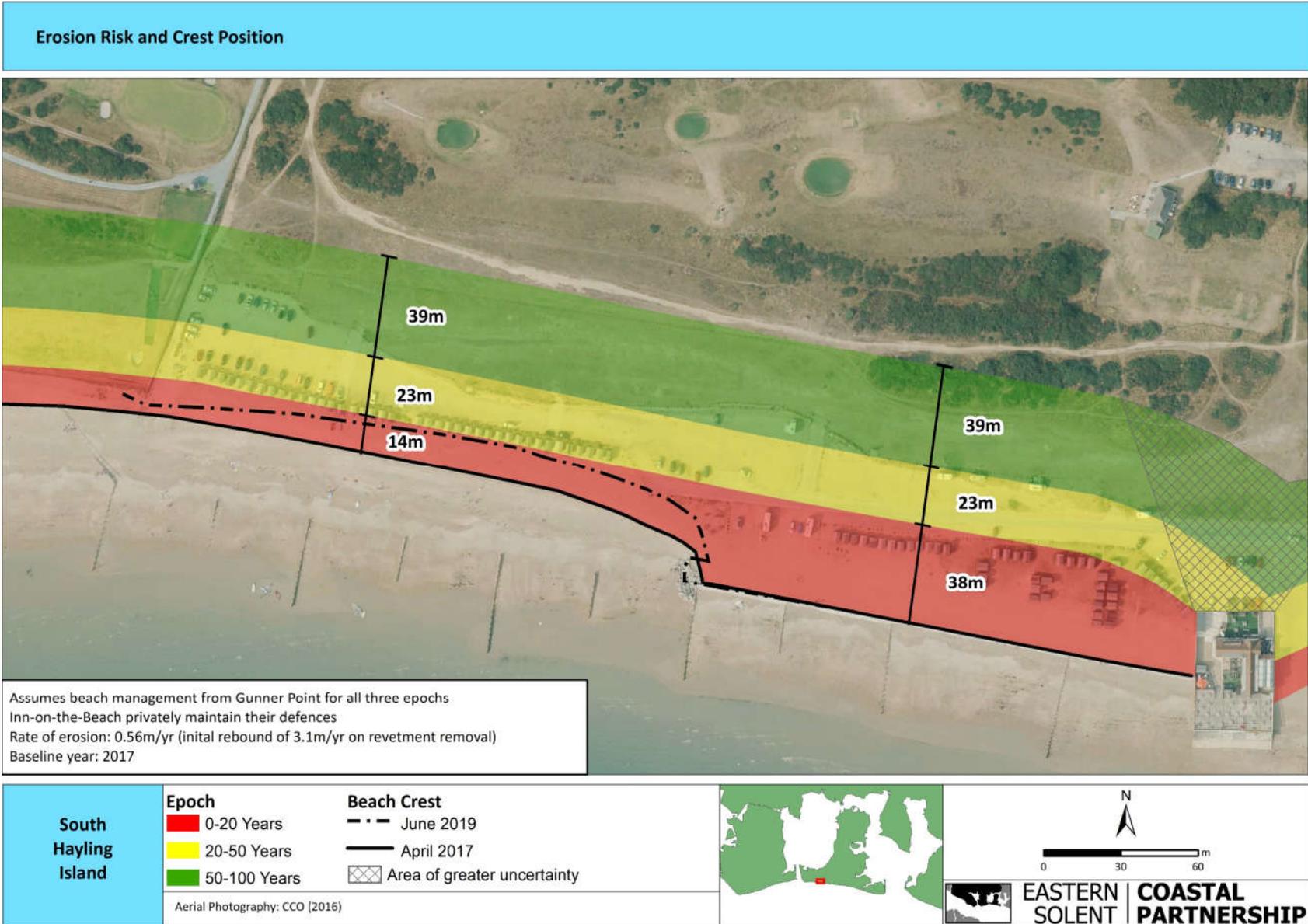
South Hayling Island

- June 2019
 - January 2019
 - November 2018
 - April 2018
 - April 2017
- The beach crest is assumed to have an elevation of 4.3mOD.

Aerial Photography: CCO (2016)

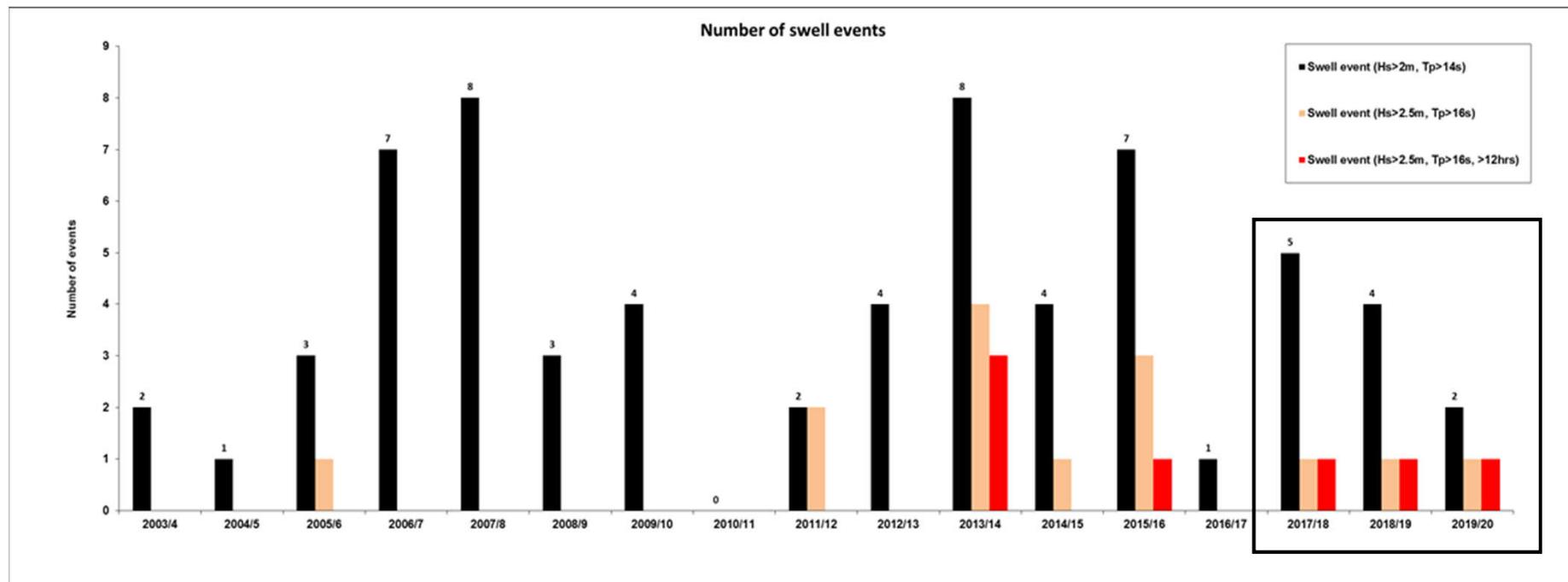


West Beach: Current Situation



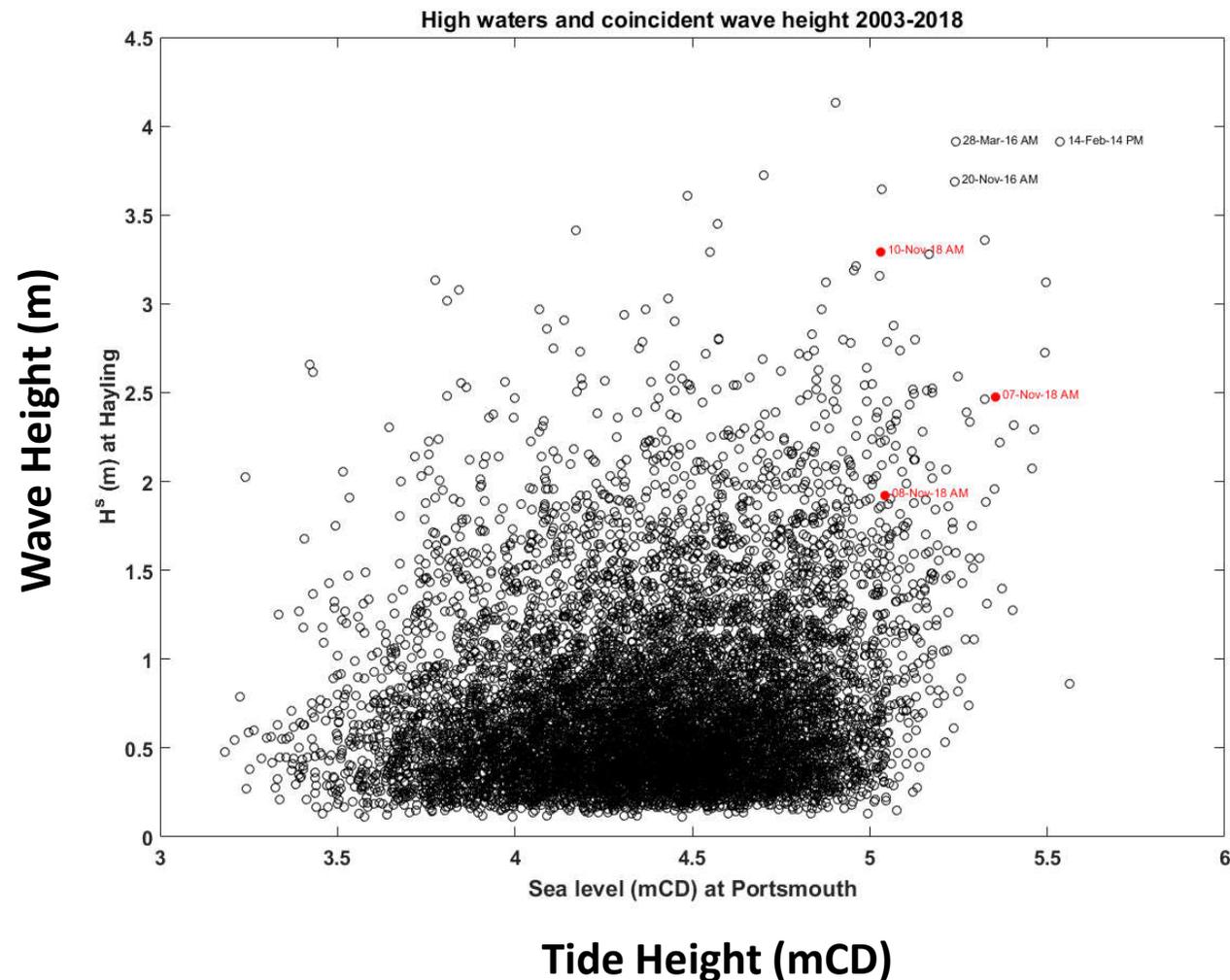
West Beach: Why so different?

1. The 'managed erosion' scenario considered an **annual recycling campaign from Gunner Point**, thereby building a haul route in front of West Beach. This wasn't possible in 2019.
2. **Recent storm events:**
Emerging evidence from the SCOPAC Storm Analysis project that **swell events (Red Bars) increased in frequency and severity since 2013/14**, thereby causing increased erosion at sites such as West Beach.



West Beach: Why so different?

- **2017/18: x3 named storms (Brian, Emma and Eleanor) resulting in largest run up and sea level in 15 years.** By 22nd Feb 2018 beach crest had retreated by <6m since 2017 baseline.
- **2018/19: Storm clustering and consistently bi-modal.** 6-10th November 2018 with 3.3 H_s; 28th/29th November 2018 significant bi-modal event; Storm Deirdre 15th and 18th December 2018 notable swell/bi-modal events.



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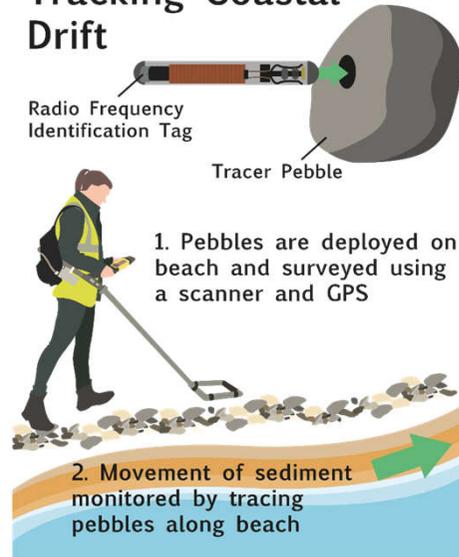
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- **2019/20: 10th August 2019 significant bi-modal event; 2nd November 2019 was notable: 8th highest H_s and 7th most powerful storm in 15 years, plus prolonged and bimodal; x2 named storms (Storm Atiyah 8-10th December 2019; Storm Brendan 14th/15th January 2020 3.6m H_s, long period swell).**

Date/Time	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	Water level elevation* (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
02-Nov-2019 14:30	3.67	14.3	7.1	183	2.17	~HW	3.24	0.50	0.64
10-Dec-2019 16:00	2.83	7.7	5.6	190	-1.23	~HW -6	~3.15	~0.00	~-0.45
30-Jul-2019 12:30	2.83	7.7	5.6	180	0.95	HW -3	3.07	0.32	0.41
10-Aug-2019 06:30	2.78	13.3	6.1	190	1.39	HW	2.15	0.27	0.27
08-Feb-2019 16:00	2.78	7.7	5.9	193	0.74	HW +3	3.12	0.16	0.28

* Tidal information is obtained from the National Network gauge at Portsmouth and/or from the WaveRadar REX on Sandown Pier. The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest surge during the storm event.

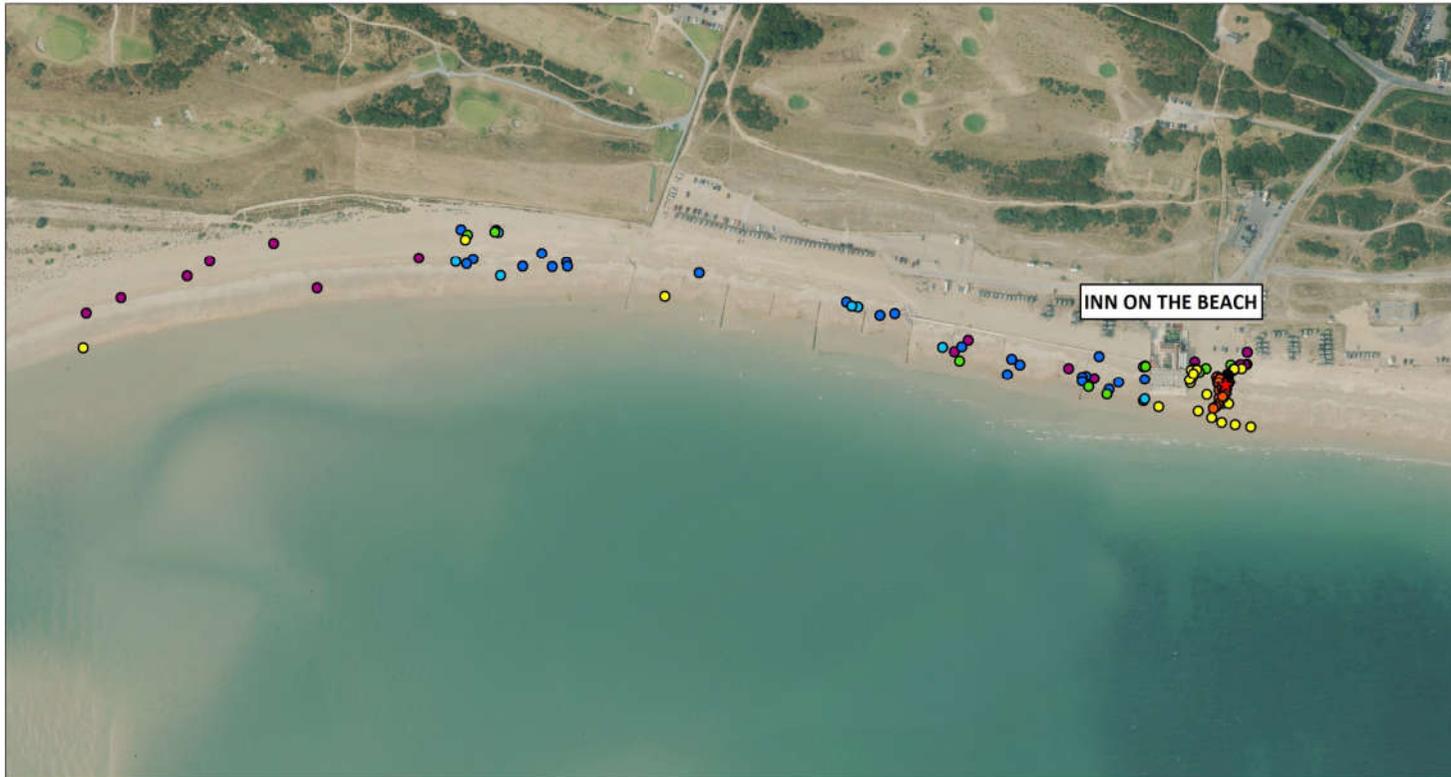


Tracking Coastal Drift



- Cutting edge tracer pebble technology.
- Validation of longshore transport patterns and rates.
- Supported by annual beach monitoring surveys.

HAYLING ISLAND TRACER STUDY - 2018



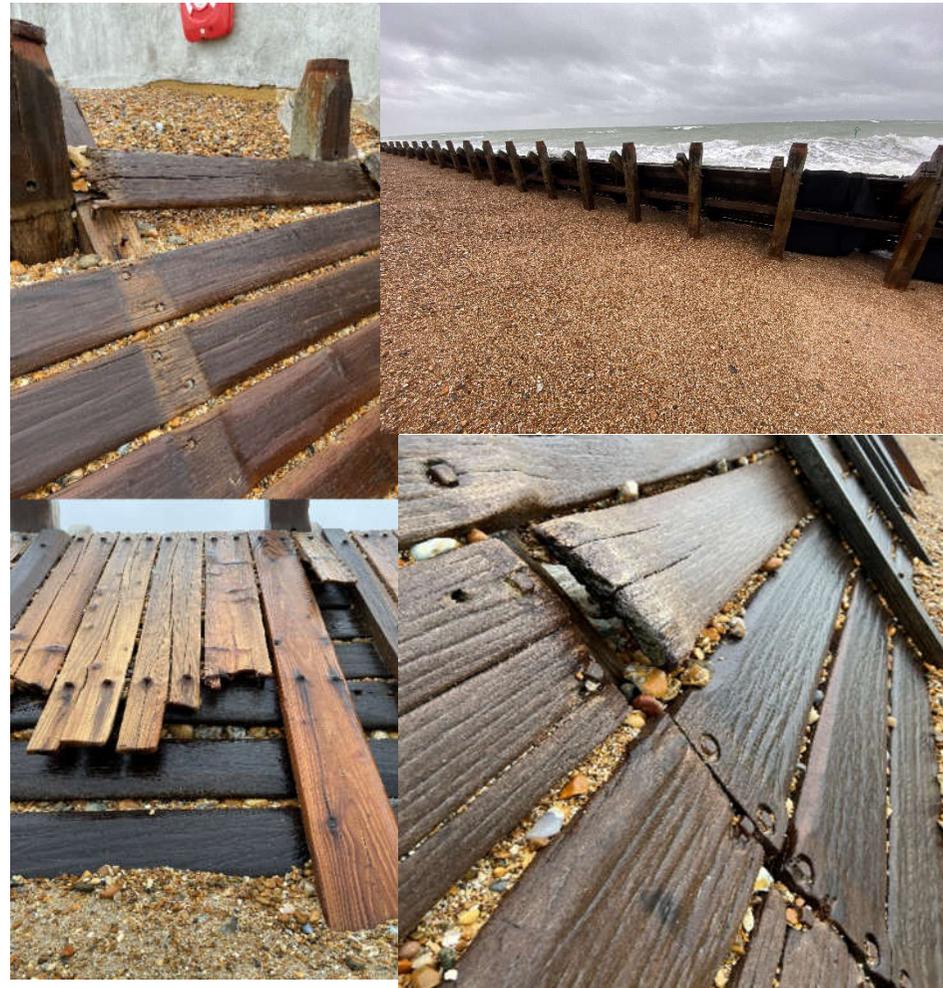
WEST BEACH	★ 16/04/2018 (Deployment)	● 11/06/2018
	● 18/04/2018	● 15/08/2018
	● 25/04/2018	● 25/02/2019
	● 17/05/2018	

Aerial Photography: CCO (2016)

0 100 200 Metres

EASTERN SOLENT | COASTAL PARTNERSHIP

- Revetment constructed in 1976 (44 years ago).
- CIRIA (2004) guidance Tropical Hardwood: “Minimum expected life expectancy of 25 years”.
- West Beach is an aggressive environment. Despite maintenance, the structure has far exceeded its design life.
- HBC conducts routine inspection and maintenance of coastal assets.
- Repairs are now limited to H&S measures.
- Structure vulnerable to future storm damage.



HBC Policy:

- Once the coastal defences reach the end of their serviceable life or become a health and safety risk, the structures should be removed and the beach allowed to evolve naturally.

Beach Erosion:

- Erosion has occurred at a greater rate than predicted in 2017. We are well into the Red Risk Zone. Monitoring is ongoing.
- The beach has remained more stable at the western end at the Hayling Golf Course.
- Beach material could not be recycled from Gunner Point in 2019, therefore a haul route was not established along West Beach. This was not considered in the predictions.
- Increase in high magnitude swell events and largest run-up in 15 years recorded since 2017.

Timber Revetment Structures:

- Constructed in 1976. Maintained by HBC but now past its design life. Partial collapse in 2012.
- Remaining Revetments – while functional and not of a H&S concern they will remain. They are routinely inspected.
- When this situation changes (which would be expected in the next 2-5 years, or in response to a significant storms) the affected sections will be removed.

Thank you for listening



Photography: February 2019 (ESCP)