Survey Unit	**4aSU10 - Tankerton**
SMP Policy	Hold the Line

Author: ABG; Approved: CF

Tankerton is characterised by a dense groyne field for much of its length. The beach is made up of sand and gravel with a foreshore consisting of a thin layer of sand or sand and gravel resting on clay. Groyne refurbishment coupled with beach replenishment occurred in 1999 and 2004. Long Rock shingle spit, which encompasses the Swalecliffe Brook, marks the eastern boundary of the unit.

1. Introduction

Date of survey	01/12/2021
Reason for survey	Called by Canterbury City Council following a high level of wave activity recorded on the Herne Bay step gauge which exceeded the storm threshold on two consecutive tides; 27/11/2021 and 28/11/2021. The highest water level was observed on 27/11/2021 (2.32mAOD at 05:10). The highest wave height (Hs) was 0.93m.
Area surveyed	Approximately 400 metres of coastline on the northern face of Long Rock was surveyed using the continuous method between 4a00896 and 4a00905. Profile data was then interpolated from the digital ground model.
Flood warnings	No
Summary of beach operations	N/A
Areas flooded	None

2. Survey Results

2.1 Post Storm Profiles

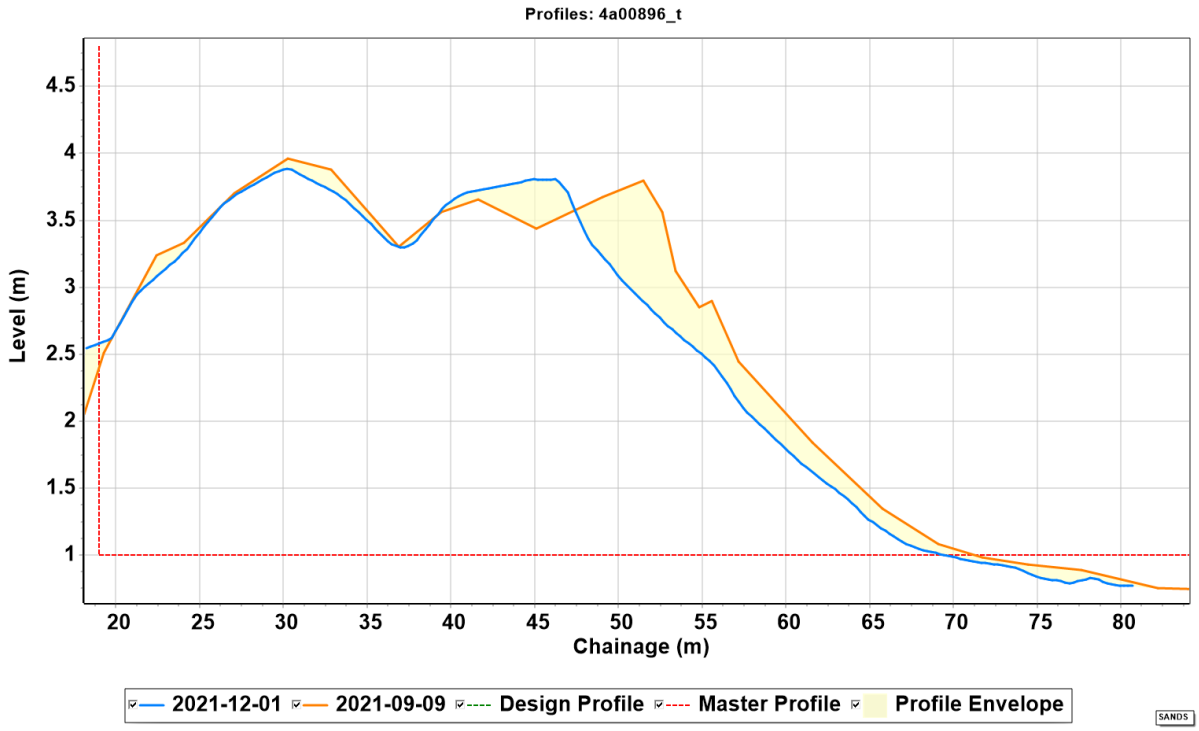


Figure 2.1 – Profile 4a00896 demonstrating a reduction of material compared to Autumn 2021.

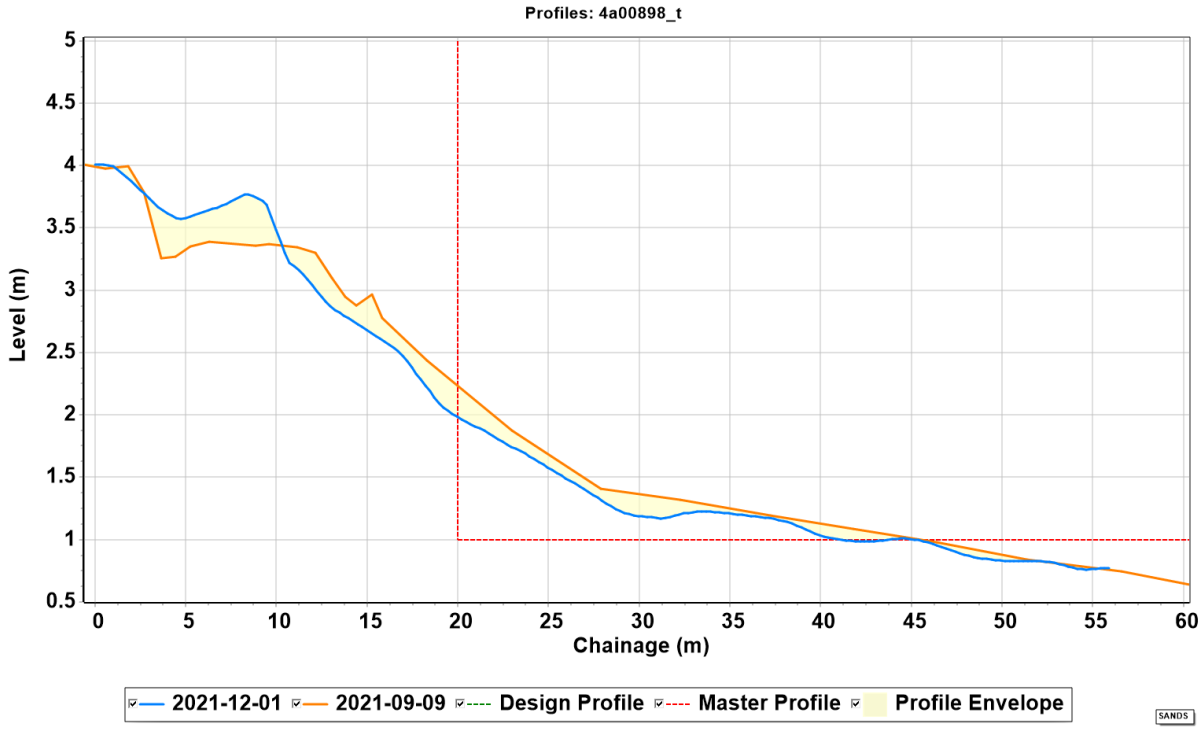


Figure 2.2 – Profile 4a00898 demonstrating a reduction of material compared to Autumn 2021.

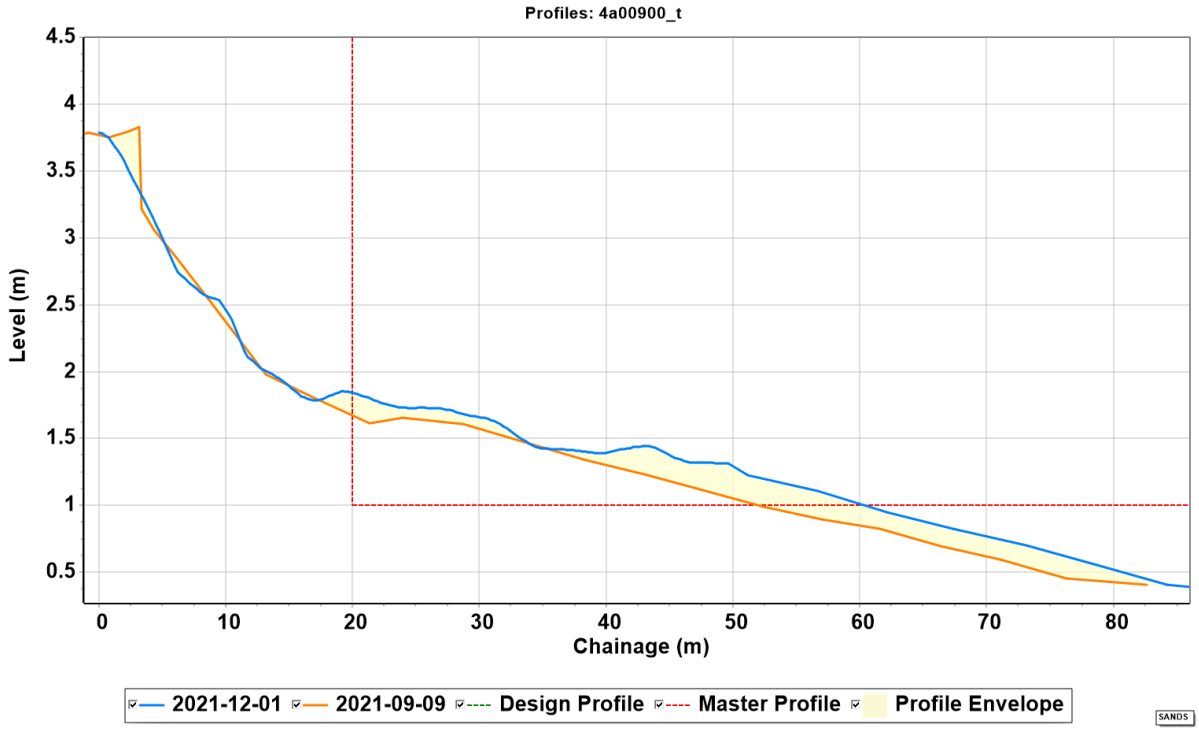


Figure 2.3 – Profile 4a00900 demonstrating an increase of material compared to Autumn 2021.

Figure 2.4 – Profile 4a00901 demonstrating a reduction of material compared to Autumn 2021. The brook has also been buried with pushed back material.

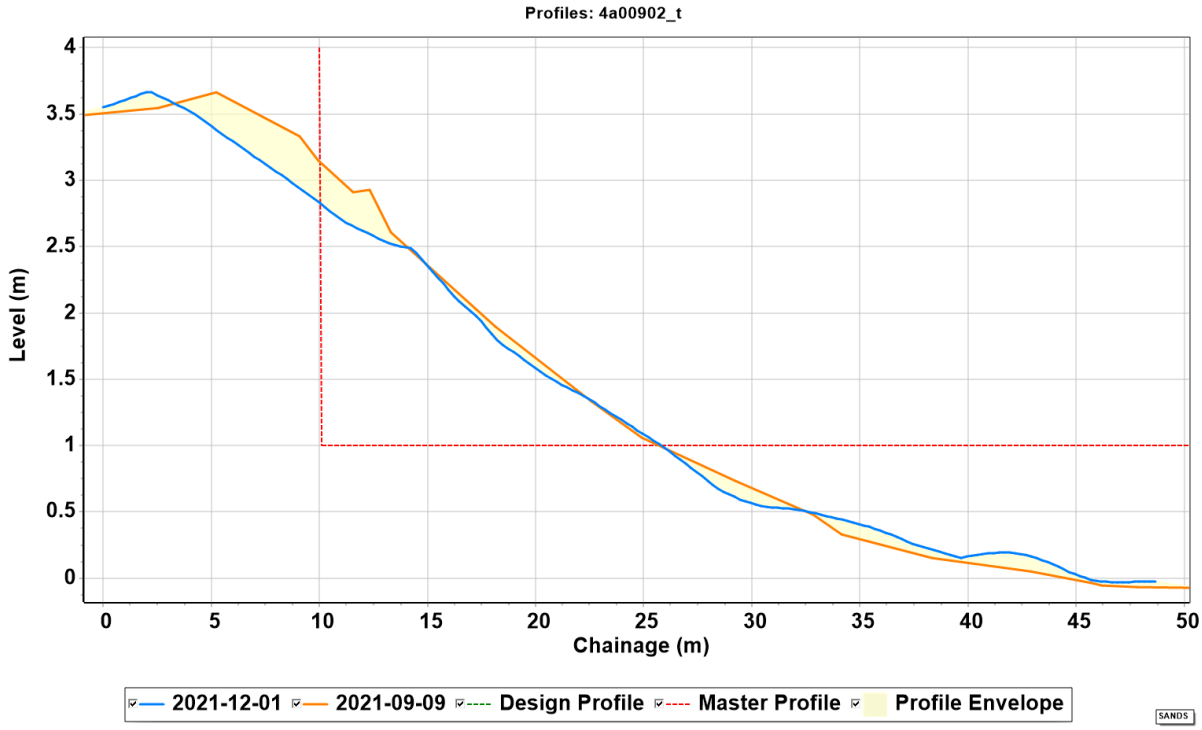


Figure 2.5 – Profile 4a00902 demonstrating a reduction of material compared to Autumn 2021.

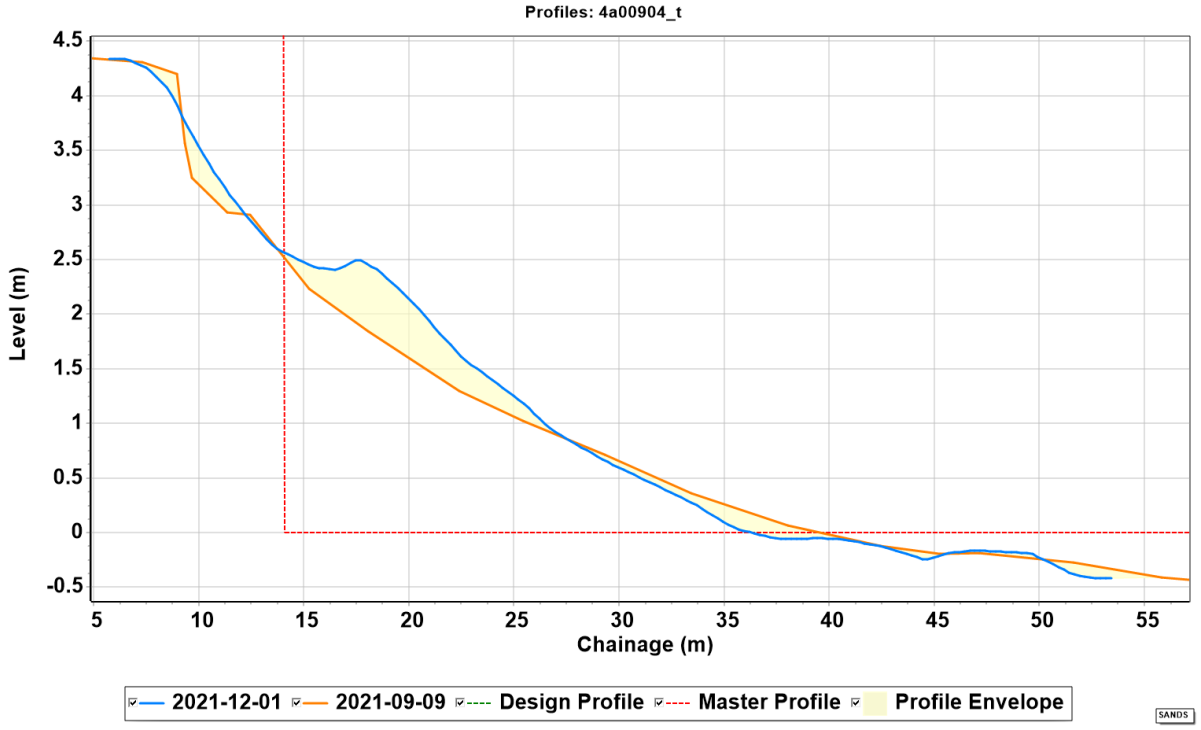


Figure 2.6 – Profile 4a00904 demonstrating an increase of material compared to Autumn 2021.

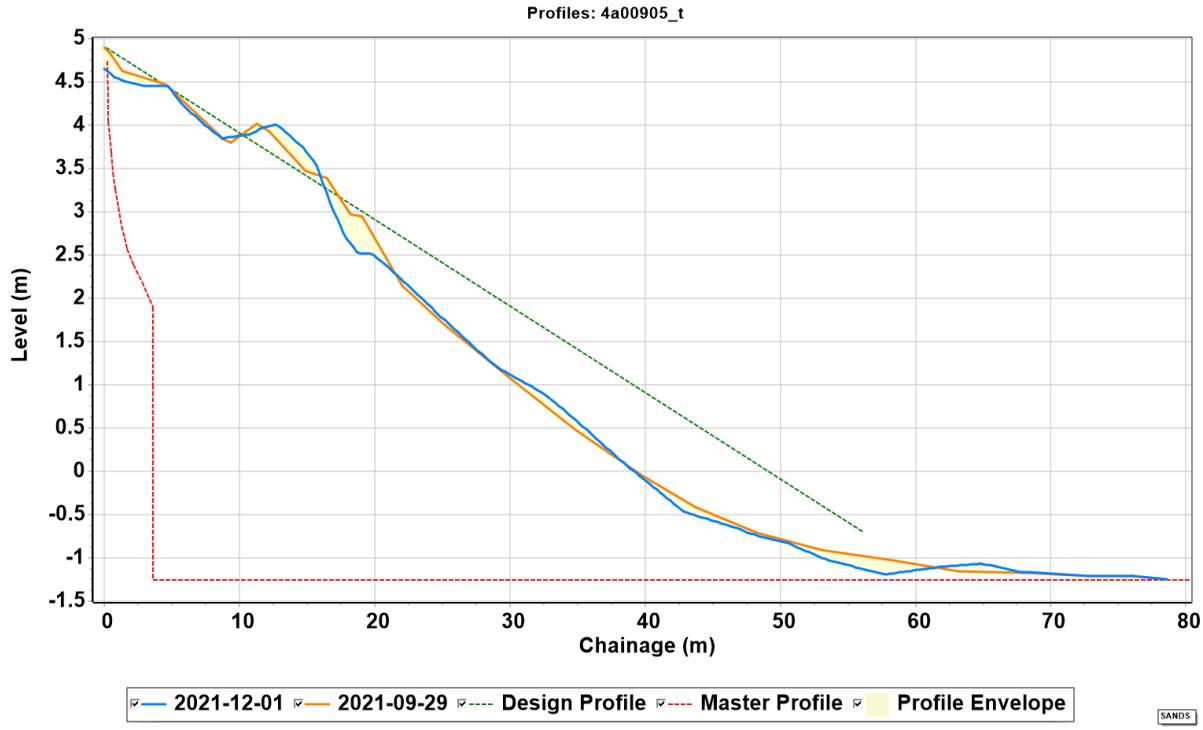


Figure 2.7 – Profile 4a00905 demonstrating a reduction of material compared to Autumn 2021.

2.2 General Observations

General observations	
Outflanking of timber groyne	The large groyne between the Tankerton and Swalecliffe unit boundary demonstrates some evidence of outflanking.
Exposed mattress	The mattress at the Tankerton and Swalecliffe survey unit boundary (between Profiles 4a00904 and 4a00905) has become more exposed as a result of beach material losses.
Brook blockage	The brook at Long Rock has been filled with beach material pushed inland, restricting drainage at the site.
Structure condition	Acceptable.
Damage assessment	Minor damage to sheet piling at boundary groyne.

Figure 2.8– Exposed mattress and outflanked timber groyne at the Tankerton and Swalecliffe survey unit boundary.

Figure 2.9 – Exposed mattress and outflanked timber groyne at the Tankerton and Swalecliffe survey unit boundary.

Figure 2.10 – Minor damage to sheet piling at boundary groyne.

Figure 2.11 – Swalecliffe Brook blocked by beach material pushed inland.

2.3 Whole Beach CSA

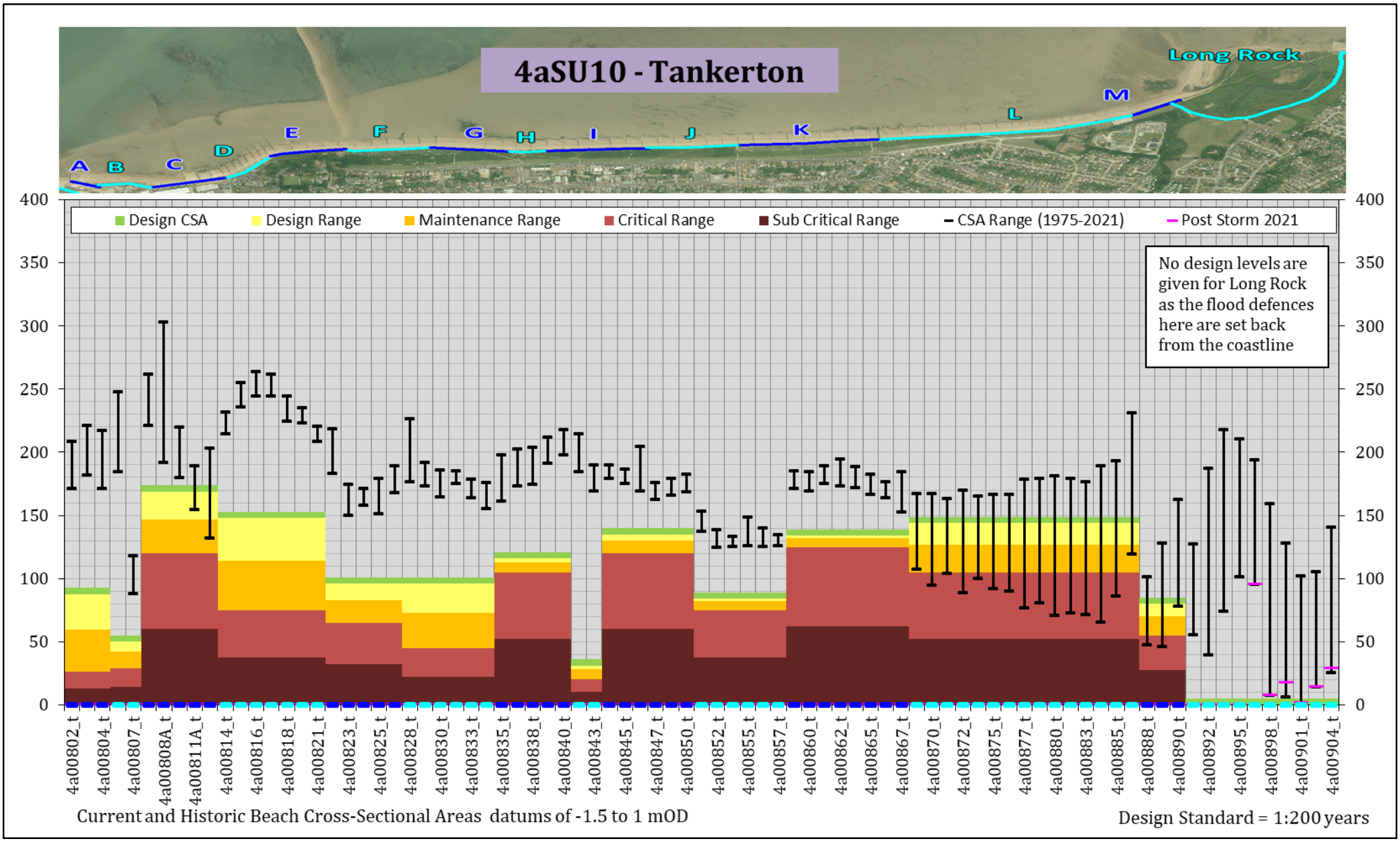


Figure 2.12 – Historical cross sectional areas of all profiles in Tankerton with the values of the post-storm profiles identified by the pink lines.

2.4 Difference Model – Spring 2021 to Post Storm 2021

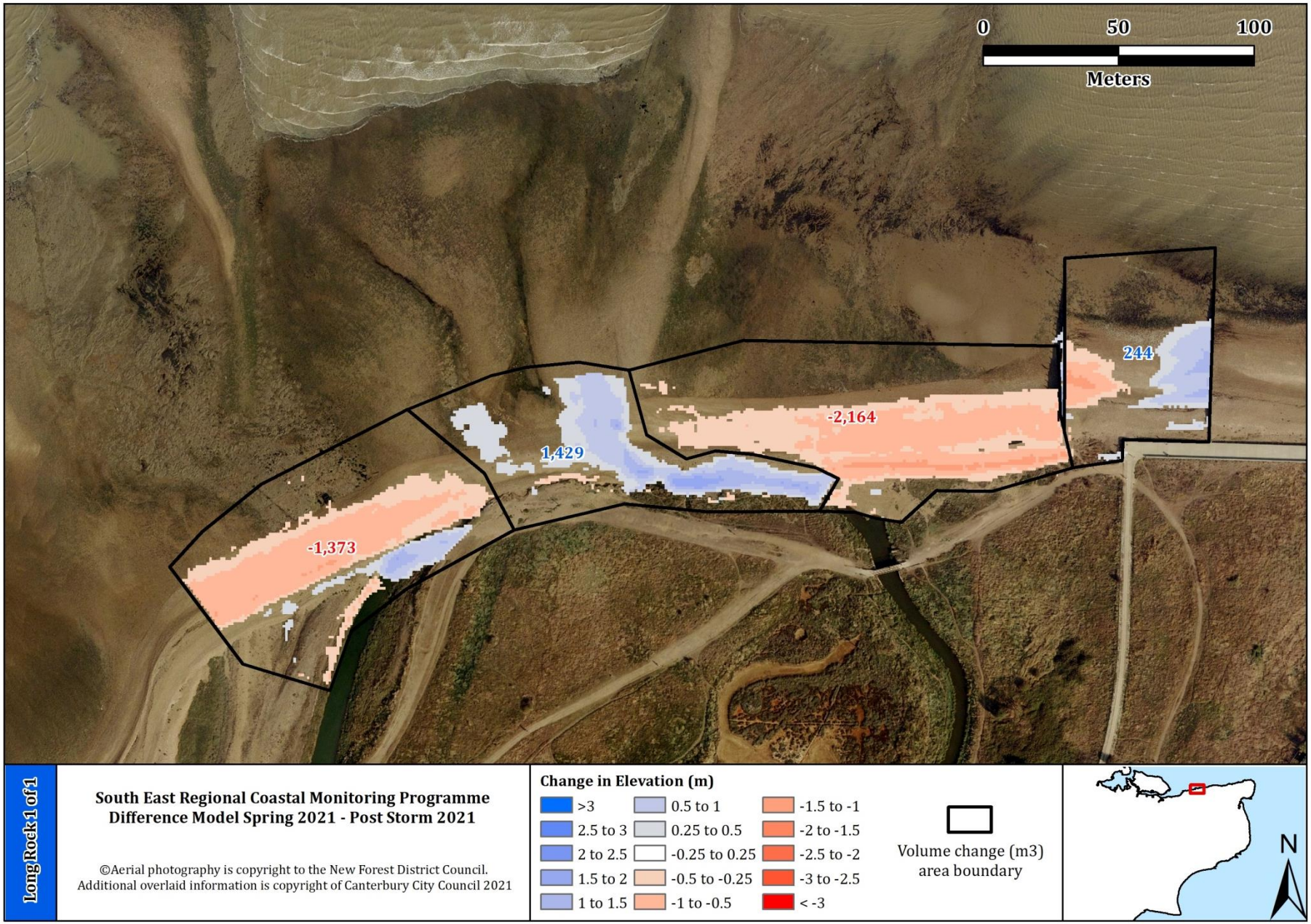


Figure 2.13 – Difference model comparing beach levels between Spring 2021 and Post Storm 2021

3. Hydrodynamics

Table 3.1 – Highest Recorded Storms

Highest storms at Herne Bay	
Date	Significant wave height (m)
23-Dec-10	2.4
07-Jan-10	2.02
31-Jan-11	1.95
14-Feb-05	1.94
02-Mar-11	1.9
23-Jan-09	1.88
04-Mar-11	1.85
09-Jan-10	1.84
22-Nov-08	1.74
05-Jan-09	1.73
03-Mar-05	1.73

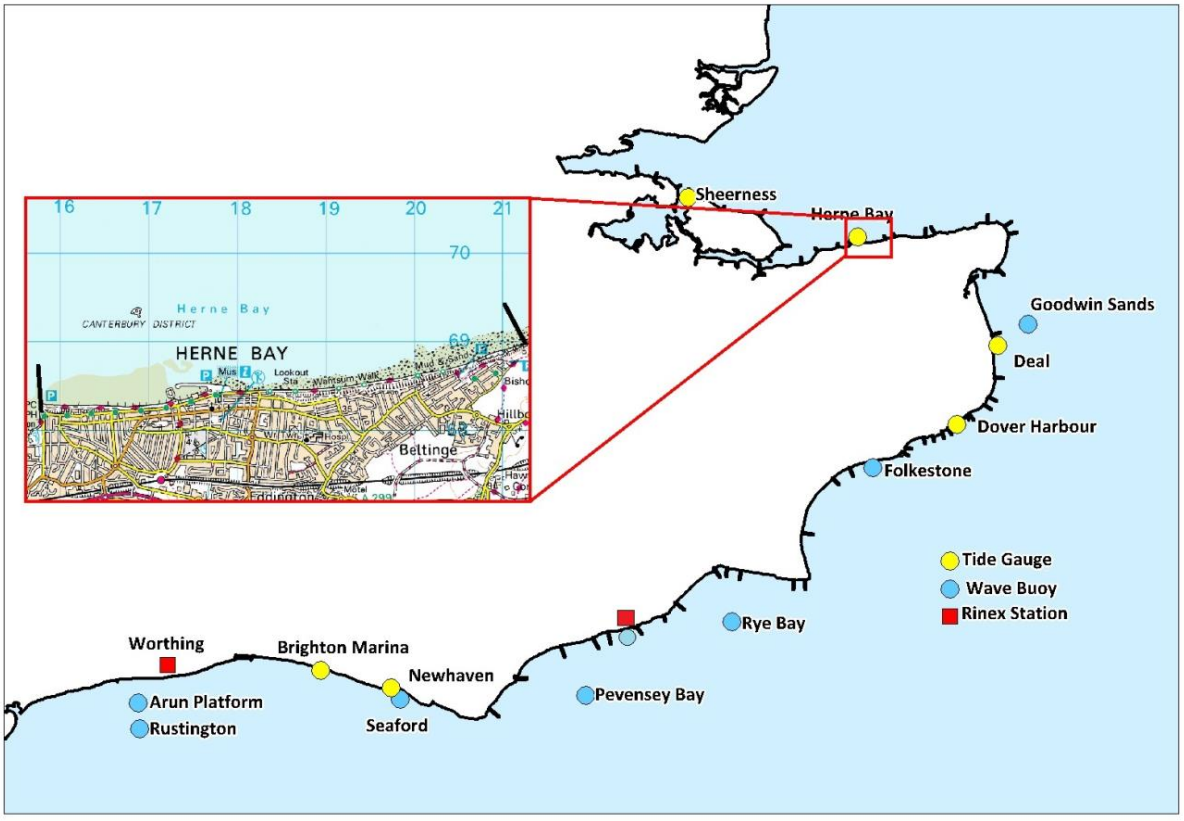


Figure 3.1- Map of Tide and Wave Gauges

3.1 Joint Return Periods

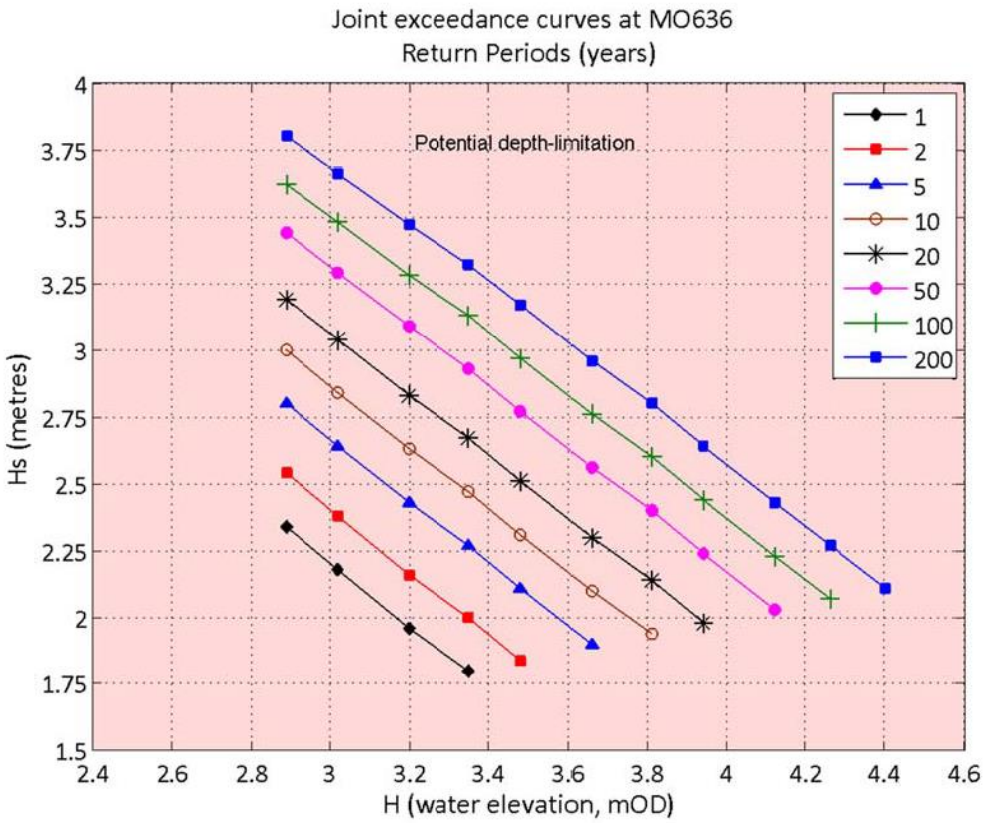


Figure 3.2 – Joint Exceedance Curves at MO636 (Source Mason, 2014)

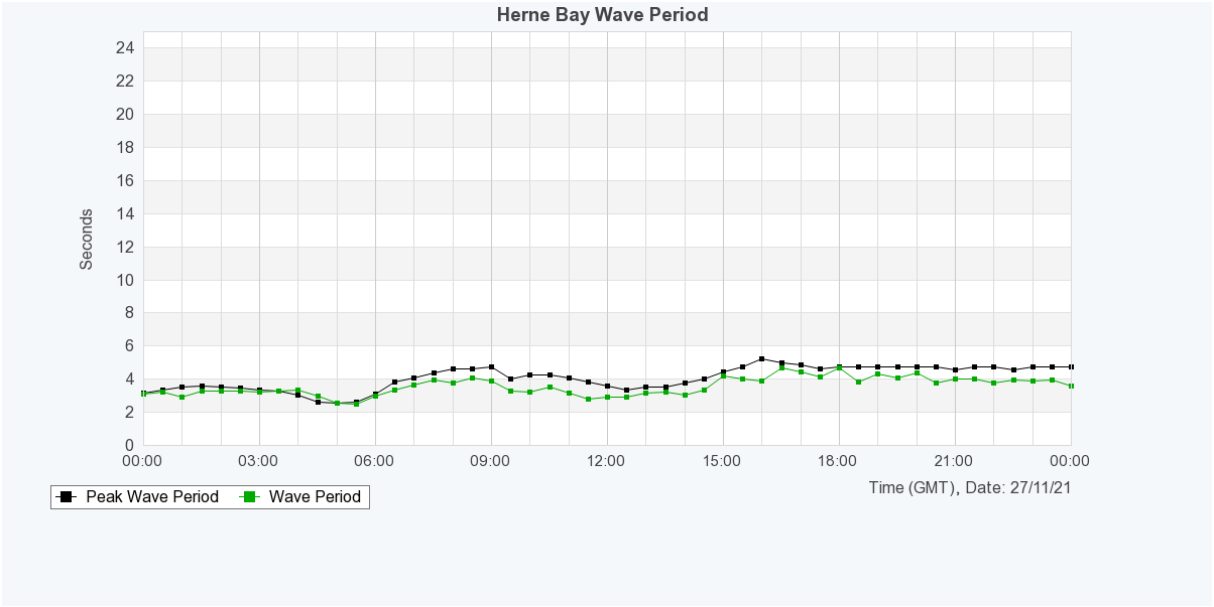
Table 3.2 – Water and Wave Levels during the event

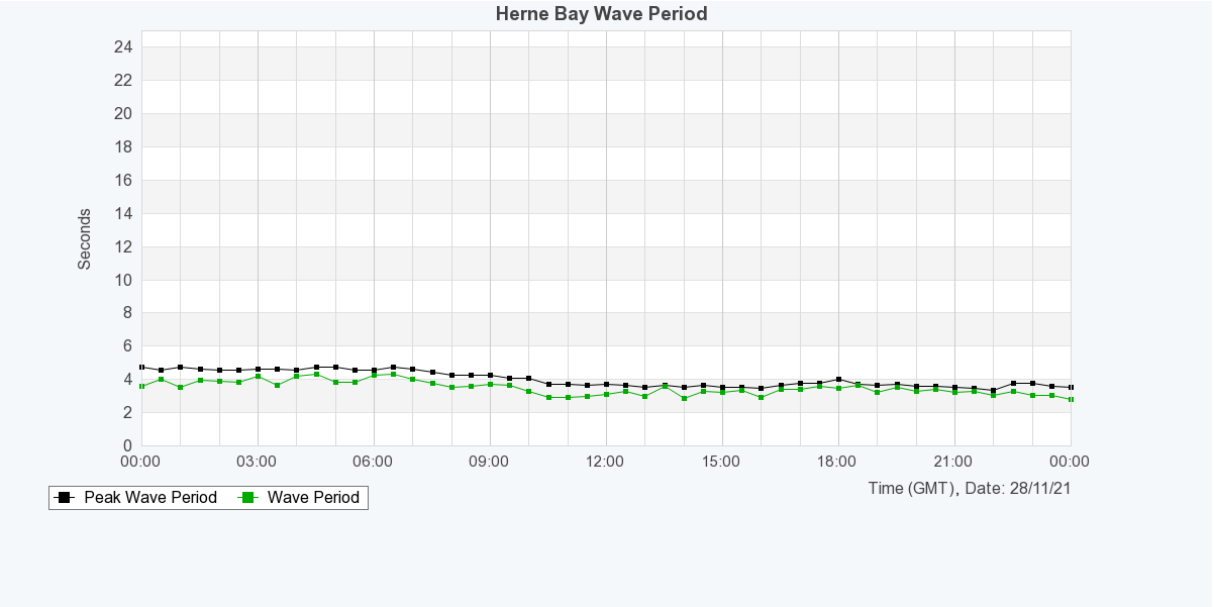
	Date/Time	Tidal elevation (mOD)	Hs (m)	JRP
At time of maximum water elevation	27/11/2021 at 05:10	2.32	0.16	>1 in 1
At time of highest wave height	27/11/2021 at 16:30	1.96	0.93	>1 in 1
At time of maximum water elevation	28/11/2021 at 18:50	1.79	0.37	>1 in 1
At time of highest wave height	28/11/2021 at 03:30	1.00	0.81	>1 in 1

3.2 Wave, Tide and Weather Conditions

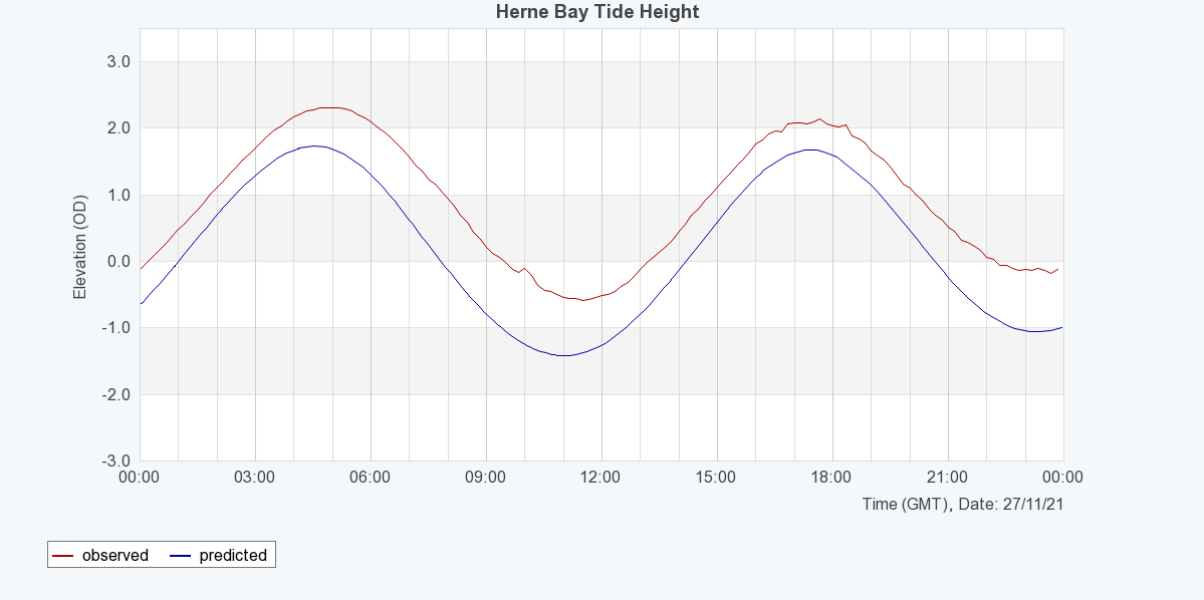
Nearest wave buoy	Herne Bay
Wave height	Significant wave height reached 0.93m on 27/11/2021 Significant wave height reached 0.81m on 28/11/2021

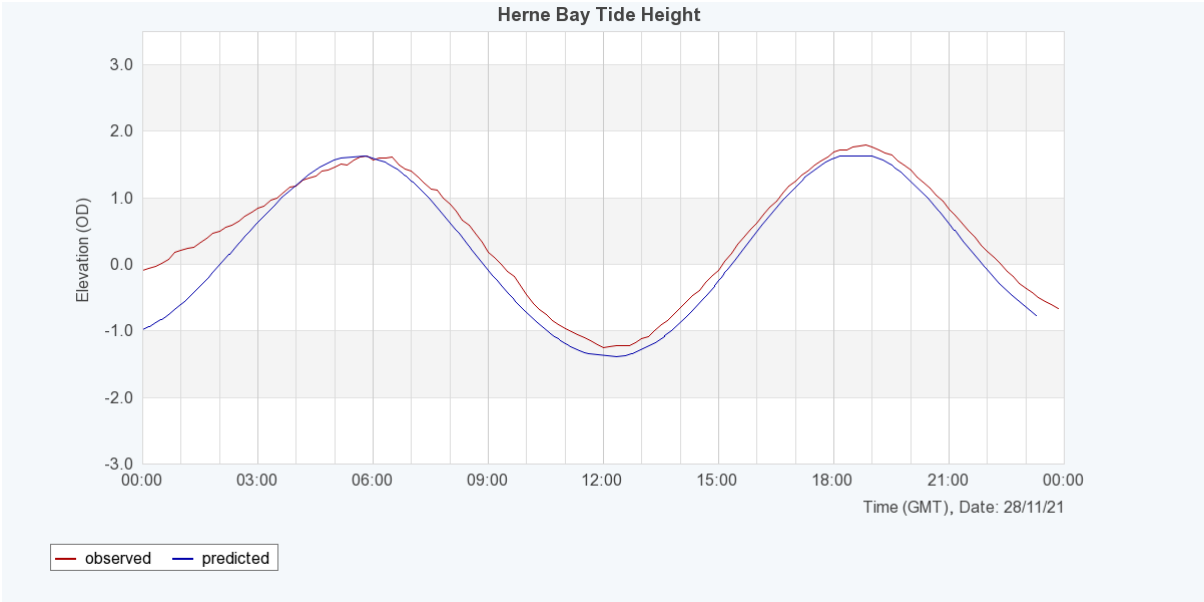
Wave period	The peak wave period reached 5.3 seconds on 27/11/2021 The peak wave period reached 4.8 seconds on 28/11/2021



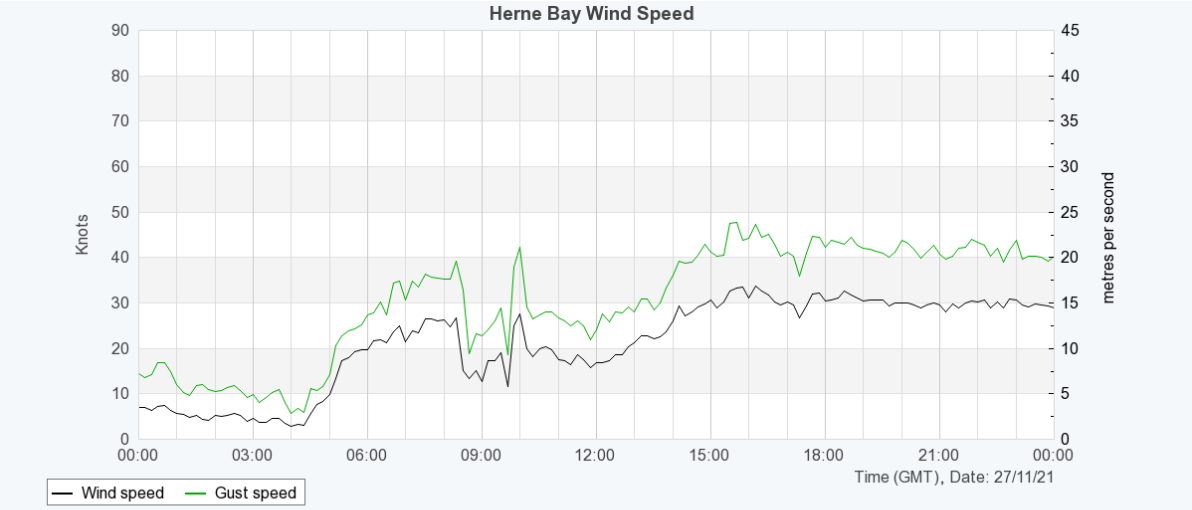


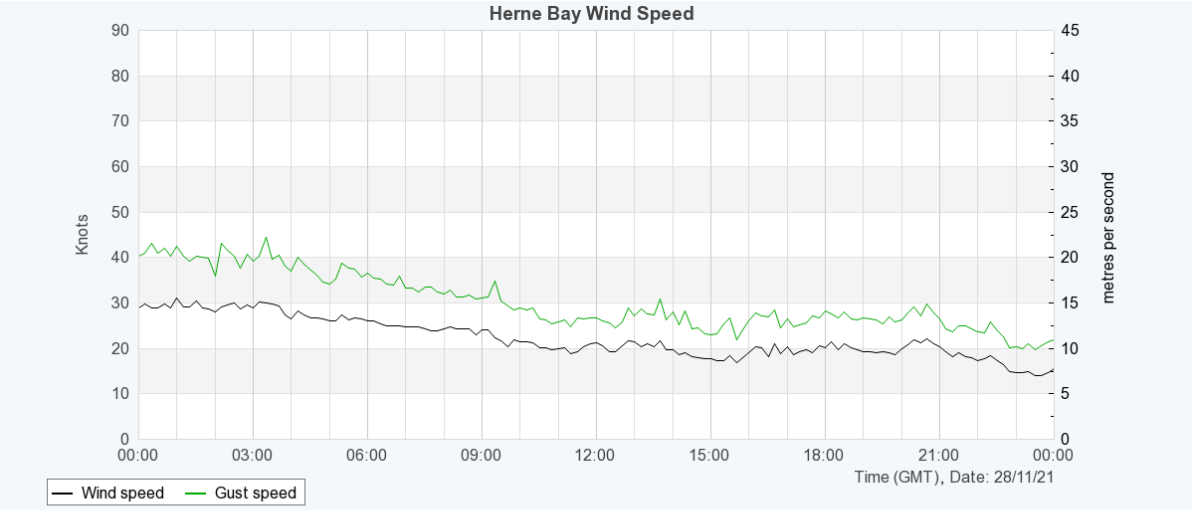
Nearest tide gauge	Herne Bay
Tidal range	Measured at 2.32mOD on 27/11/2021 Measured at 1.79mOD on 28/11/2021

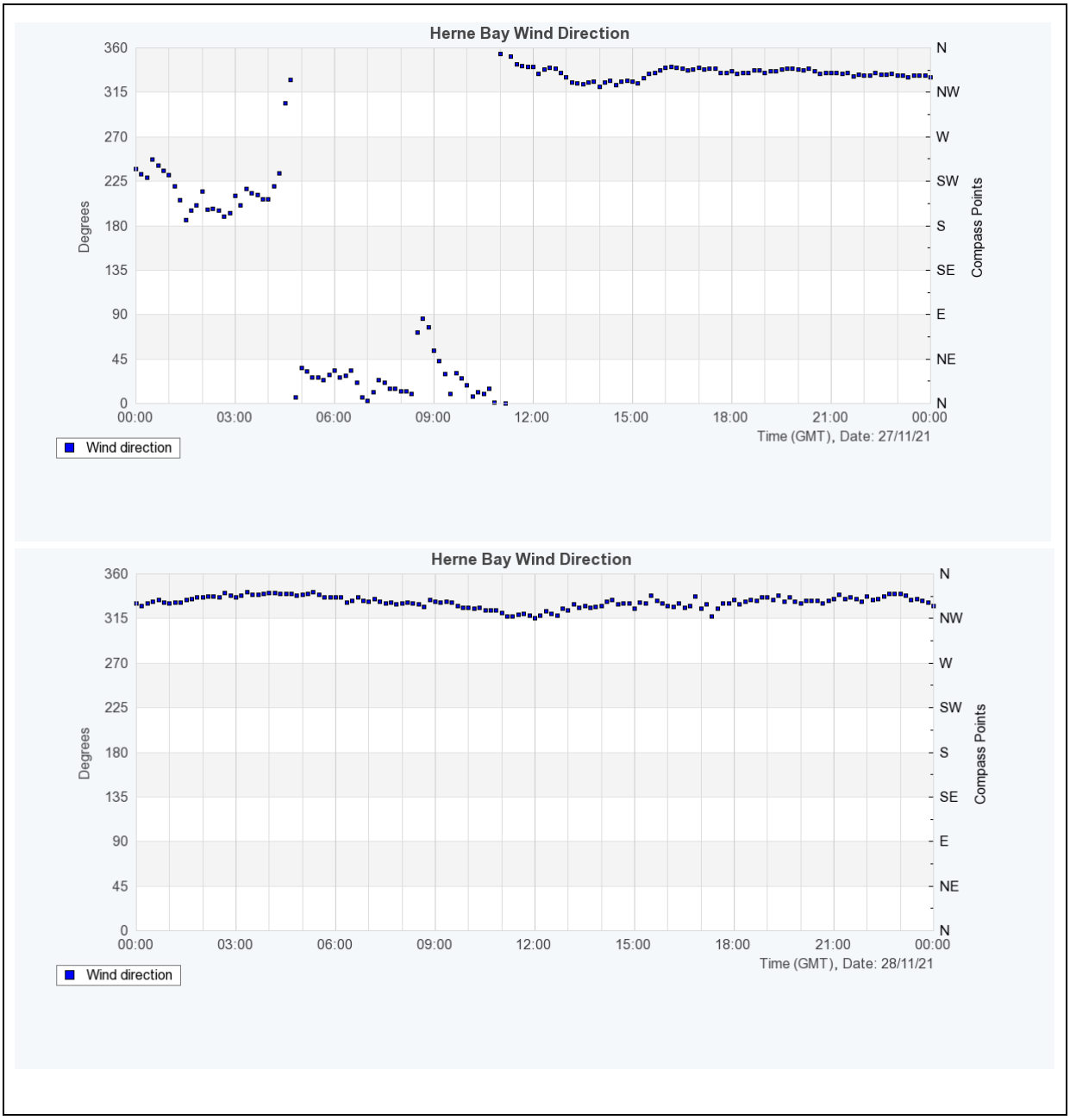




Nearest Met Station	Herne Bay
Wind Speed and direction	Maximum wind speed reached over 15m/s on 27/11/2021, the majority of which came from the north-west. Maximum wind speed reached over 15m/s on 28/11/2021, the majority of which came from the north-west.






Herne Bay Wind Direction
Degrees
360
315
270
225
180
135
90
45
0
N
NW
W
SW
S
SE
E
NE
N
Compass Points
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time (GMT), Date: 27/11/21
Wind direction
Herne Bay Wind Direction
Degrees
360
315
270
225
180
135
90
45
0
N
NW
W
SW
S
SE
E
NE
N
Compass Points
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time (GMT), Date: 28/11/21
Wind direction