Cover photograph: South Foreland cliffs
A. Jeffery, Canterbury City Council
# Contents

1.0 INTRODUCTION .................................................................................................................. 1

2.0 CONDITION OF SURVEY UNITS .................................................................................. 2

3.0 PROFILE CHANGE SUMMARY .................................................................................... 1

4.0 HYDRODYNAMIC DATA .................................................................................................. 28

5.0 TOPOGRAPHIC ANALYSIS ............................................................................................. 39

## 5.1 THANET

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1</td>
<td>4bSU01 North Foreland (Profile 4b00002A – 4b0014A)</td>
<td>39</td>
</tr>
<tr>
<td>5.1.2</td>
<td>4bSU02 Broadstairs (4b00017 – 4b00077)</td>
<td>39</td>
</tr>
<tr>
<td>5.1.3</td>
<td>4bSU03 Ramsgate (4b00086 – 4b00093)</td>
<td>40</td>
</tr>
</tbody>
</table>

## 5.2 PEGWELL BAY TO SOUTH FORELAND

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.1</td>
<td>4bSU04 Pegwell Bay</td>
<td>40</td>
</tr>
<tr>
<td>5.2.2</td>
<td>4bSU05 Sandwich (Profiles 4b00122 – 4b00361)</td>
<td>40</td>
</tr>
<tr>
<td>5.2.3</td>
<td>4bSU06 Deal (Profiles 4b00362 – 4b00540)</td>
<td>42</td>
</tr>
<tr>
<td>5.2.4</td>
<td>4bSU07 Hope Point</td>
<td>43</td>
</tr>
<tr>
<td>5.2.5</td>
<td>4bSU08 St Margaret’s at Cliffe (Profiles 4b00563 – 4b00475)</td>
<td>43</td>
</tr>
</tbody>
</table>
1.0 Introduction

Analysis in this annual report provides an overview of beach performance and wave and tidal measurements for East Kent (North Foreland to Dover Harbour), from the strategic regional coastal monitoring project, over the last year of data collection. Topographic surveys are conducted at all viable sites using land based RTK GPS in the spring and autumn of each year, covering predetermined designated profiles at intervals along the coast. This report looks specifically at the difference between the latest survey set (Spring 2015) and the comparable data from Spring 2014.

All profile data was imported into SANDS® for analysis. This enables cross sectional areas (CSA) to be calculated providing a representative beach between a landward point, master profile and beach toe location (Figure 1.1). Where available, seawalls are located spatially using a combination of design schematics and a sea defence survey conducted in 2007. Master profiles are set at the beach toe level or mean low water, which ever is deemed most appropriate. In some areas clay levels have also been established using the results from trial holes dug in beach, these have been incorporated to produce a more accurate master profile that calculates the actual beach area.

Data is presented at a number of scales, from an overview of the average change in each Survey Unit (SU), to changes and trends for each individual profile. The topographic analysis section of the report highlights notable changes, and areas for concern, for each of the MUs. While this provides an accurate portrayal of current beach conditions and changes over the preceding year it should be stressed that these are only short-term trends. In order to view the results in a meaningful light they should be compared to the full data set for each location.

Those areas that are designated beach management plan sites (Survey Units 05 & 06) benefit from a high-resolution beach plan survey every summer. These are utilised to produce a much more comprehensive beach analysis report, as such this report should be viewed as an interim update for those sites.
2.0 Condition of Survey Units

To provide an overview of the annual change in each survey unit the average change in beach profile CSA is calculated for each unit. These averages are expressed in terms of percentage difference and actual change (m²) and are presented in Table 2.1 for the past year. An overview of all profiles surveyed and the changes on each profile is given in Figure 2.1.

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>Designated Profiles</th>
<th>Average Change (%)</th>
<th>Average Change (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4bSU01 – North Foreland</td>
<td>6</td>
<td>6</td>
<td>9.5</td>
</tr>
<tr>
<td>4bSU02 – Broadstairs</td>
<td>16</td>
<td>24.63</td>
<td>-1.81</td>
</tr>
<tr>
<td>4bSU03 – Ramsgate</td>
<td>2</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>4bSU04 – Pegwell Bay</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>4bSU05 – Sandwich</td>
<td>42</td>
<td>2.57</td>
<td>6.38</td>
</tr>
<tr>
<td>4bSU06 – Deal &amp; Kingsdown</td>
<td>43</td>
<td>0.65</td>
<td>-1.37</td>
</tr>
<tr>
<td>4bSU07 – Hope Point</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>4bSU08 – St Margaret’s Cliffe</td>
<td>3</td>
<td>8.3.</td>
<td>6.3.</td>
</tr>
</tbody>
</table>

These results are also illustrated as coloured thematic maps in Figures 2.1 & 2.2. As with the detailed profile maps, the colour scheme illustrates erosion (red), accretion (blue) and no significant change (grey).

The results also reflect a short-term trend through just a snapshot in time, these figures can be viewed as a starting point, but individual profiles should be examined in those areas of interest. Crucially the significance of any results should be put in context with previous fluctuations in beach CSA since the start of the project in 2004, or even further back where reliable historic data exists.
South East Strategic Regional Monitoring Project

Actual Profile Change Summary
Spring 2014 - Spring 2015

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Annual Change in Cross-Sectional Area (m²)
- \( >30\% \)
- \( 15-30\% \)
- \( 5-15\% \)
- \( <5\% \) (no change)
- \( >30\% \)

Scale 1:10 000
3.0 Profile Change Summary

Changes along individual profiles within each survey unit are summarised in a series of thematic maps on the following pages. The maps show the location of each beach profile, superimposed on aerial photography (note the lines have been extended for clarity). Where possible the annual change in cross-sectional area (CSA) has been calculated from Spring 2014 to Spring 2015.

In order to put these changes into context, thematic maps are also included illustrating the change from the first spring survey in 2003/2004 and the most recent spring survey (2015). Figure 3.1 is a key to understanding the Annual Report diagrams as these profiles help to establish if recent changes in beach morphology are consistent with medium-term trends or an anomaly that has occurred in the past year.

![Annual Change in cross sectional area](image)

Figure 3.1 – Profile Key
South East Strategic Regional Monitoring Project

Profile Change Summary
Spring 2014 - Spring 2015

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Annual Change in Cross-Sectional Area (m²)
- >30%
- 15-30%
- 5-15%
- >30%
- Less than 5% (no change)
South East Strategic Regional Monitoring Project
Profile Change Summary
Spring 2014 - Spring 2015
© Aerial photography is copyright to the Channel Coastal Observatory. Additional overlaid information is copyright of Canterbury City Council 2015.

Annual Change in Cross-Sectional Area (m²)
- **ACCRETION**: >30%
- **15-30%**
- **5-15%**
- **EROSION**: 15-30%
- **>30%**
- Less than 5% (no change)
South East Strategic Regional Monitoring Project
Profile Change Summary
Spring 2014 - Spring 2015

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Annual Change in Cross-Sectional Area (m²)

- **ACCRETION**
  - >30%
  - 15-30%
  - 5-15%
  - Less than 5% (no change)

- **EROSION**
  - 15-30%
  - >30%
South East Strategic Regional Monitoring Project

Profile Change Summary
Spring 2014 - Spring 2015

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Annual Change in Cross-Sectional Area (m²)

- **ACCRETION**
  - >30%
  - 15-30%
  - 5-15%
  - Less than 5% (no change)

- **EROSION**
  - 15-30%
  - >30%
South East Strategic Regional Monitoring Project

Profile Change Summary
Spring 2014 - Spring 2015

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Annual Change in Cross-Sectional Area (m²)

ACCRETION

- >30%  - 5-15%
- 15-30%  - 15-30%
- 5-15%  - >30%

EROSION

Less than 5% (no change)
South East Strategic Regional Monitoring Project

Profile Change Summary
Spring 2004 - Spring 2015

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South East Strategic Regional Monitoring Project

Profile Change Summary
Spring 2004 - Spring 2015

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Annual Change in Cross-Sectional Area (m²)

- >30%
- 5-15%
- 15-30%
- 5-15%
- >30%
- Less than 5% (no change)
South East Strategic Regional Monitoring Project

Profile Change Summary
Spring 2004 - Spring 2015

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South East Strategic Regional Monitoring Project

Profile Change Summary
Spring 2004 - Spring 2015

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4.0 Hydrodynamic Data

<table>
<thead>
<tr>
<th>Location</th>
<th>Deal Pier Wave Radar</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>638145 E 152700 N</td>
</tr>
</tbody>
</table>
| WGS84    | Latitude: 51° 13.428' N
                        Longitude: 01° 24.556' E |
| Instrument type | Rosemount WaveRadar REX |
| Water depth | N/A     | Radar in situ on Deal Pier. Photo courtesy of Fugro EMU Limited |
|            |         | Location of wave radar (Google mapping) |

Summary
During this reporting period from April 2014 to March 2015, only two storms exceeded the 1.6m storm threshold, of typical magnitude for the site although several came close in December. Although the second largest storm had a maximum significant wave height 0.24m lower than the largest storm, it occurred around High Water on a spring tide.

Data Quality

<table>
<thead>
<tr>
<th>Recovery rate (%)</th>
<th>Sample interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>92</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>

Monthly Averages – 2014/15

<table>
<thead>
<tr>
<th>Month</th>
<th>$H_s$ (m)</th>
<th>$T_p$ (s)</th>
<th>$T_z$ (s)</th>
<th>Dir. (°)</th>
<th>SST (°C)</th>
<th>No. of days</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>0.24</td>
<td>5.0</td>
<td>3.2</td>
<td>-</td>
<td>-</td>
<td>24</td>
</tr>
<tr>
<td>May</td>
<td>0.27</td>
<td>5.2</td>
<td>3.3</td>
<td>-</td>
<td>-</td>
<td>28</td>
</tr>
<tr>
<td>June</td>
<td>0.25</td>
<td>5.0</td>
<td>3.2</td>
<td>-</td>
<td>-</td>
<td>27</td>
</tr>
<tr>
<td>July</td>
<td>0.25</td>
<td>4.6</td>
<td>3.2</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>August</td>
<td>0.25</td>
<td>5.0</td>
<td>3.5</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>September</td>
<td>0.25</td>
<td>4.8</td>
<td>3.3</td>
<td>-</td>
<td>-</td>
<td>29</td>
</tr>
<tr>
<td>October</td>
<td>0.31</td>
<td>5.1</td>
<td>3.6</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>November</td>
<td>0.37</td>
<td>5.0</td>
<td>3.5</td>
<td>-</td>
<td>-</td>
<td>28</td>
</tr>
<tr>
<td>December</td>
<td>0.42</td>
<td>6.1</td>
<td>4.3</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>January</td>
<td>0.38</td>
<td>5.9</td>
<td>4.1</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>February</td>
<td>0.35</td>
<td>5.4</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>March</td>
<td>0.31</td>
<td>5.2</td>
<td>3.6</td>
<td>-</td>
<td>-</td>
<td>25</td>
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</tbody>
</table>
Storm Analysis

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>$H_s$</th>
<th>$T_p$</th>
<th>$T_z$</th>
<th>Dir.</th>
<th>Water level elevation* (OD)</th>
<th>Tidal stage (hours re. HW)</th>
<th>Tidal range (m)</th>
<th>Tidal surge* (m)</th>
<th>Max. surge* (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-Dec-2014</td>
<td>1.87</td>
<td>-</td>
<td>7.0</td>
<td>-</td>
<td>0.83</td>
<td>HW -2</td>
<td>4.6</td>
<td>-0.4</td>
<td>0.0</td>
</tr>
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<td>06-Feb-2015</td>
<td>1.63</td>
<td>-</td>
<td>5.3</td>
<td>-</td>
<td>-</td>
<td>HW</td>
<td>~4.9</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Distribution plots

The distribution of wave parameters are shown in the accompanying graphs of:

- Percentage of occurrence of $H_s$, $T_p$ and $T_z$ from April 2014 to March 2015
- Monthly time series of $H_s$ (red line is 1.6 m storm threshold)
- Incidence of storms during the reporting period and for all previous years. Storm events are defined using the Peaks-over-Threshold method. The highest $H_s$ of each storm event is shown.

General

The WaveRadar REX was installed on 26 August 2005.

Acknowledgements

TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.

*Tidal information is obtained from the nearest recording tide gauge (the radar also provides tidal data). 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.*
### Location

**Goodwin Sands**

**Directional Waverider Buoy**

<table>
<thead>
<tr>
<th>OS</th>
<th>643171 E 155848 N</th>
</tr>
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<tbody>
<tr>
<td>WGS84</td>
<td>Latitude: 51° 14.996' N</td>
</tr>
<tr>
<td></td>
<td>Longitude: 01° 28.994' E</td>
</tr>
</tbody>
</table>

### Instrument type

Datawell Directional Waverider Mk III

### Water depth

~10m CD

Buoy in situ over the Goodwin Sands. Photo courtesy of Fugro EMU Limited

Location of buoy (Google mapping)

### Summary

During this reporting period from April 2014 to March 2015, four storms of typical magnitude for the site exceeded the 2.5m storm threshold. The three largest storms all occurred within an hour of High Water although only the 07 November 2014 storm occurred on a spring tide.

### Data Quality

<table>
<thead>
<tr>
<th>Recovery rate (%)</th>
<th>Sample interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>

### Monthly Averages – 2014/15

*All times are GMT*

<table>
<thead>
<tr>
<th>Month</th>
<th>(H_s) (m)</th>
<th>(T_p) (s)</th>
<th>(T_z) (s)</th>
<th>Dir. (°)</th>
<th>SST (°C)</th>
<th>No. of days</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>0.49</td>
<td>4.9</td>
<td>3.5</td>
<td>127</td>
<td>10.8</td>
<td>30</td>
</tr>
<tr>
<td>May</td>
<td>0.56</td>
<td>5.2</td>
<td>3.5</td>
<td>130</td>
<td>12.7</td>
<td>31</td>
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<tr>
<td>June</td>
<td>0.46</td>
<td>4.8</td>
<td>3.4</td>
<td>113</td>
<td>15.6</td>
<td>29</td>
</tr>
<tr>
<td>July</td>
<td>0.52</td>
<td>4.6</td>
<td>3.3</td>
<td>121</td>
<td>18.1</td>
<td>30</td>
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<tr>
<td>August</td>
<td>0.60</td>
<td>5.0</td>
<td>3.4</td>
<td>162</td>
<td>18.3</td>
<td>30</td>
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<tr>
<td>September</td>
<td>0.46</td>
<td>4.8</td>
<td>3.4</td>
<td>99</td>
<td>18.0</td>
<td>30</td>
</tr>
<tr>
<td>October</td>
<td>0.73</td>
<td>5.1</td>
<td>3.6</td>
<td>170</td>
<td>16.6</td>
<td>30</td>
</tr>
<tr>
<td>November</td>
<td>0.79</td>
<td>5.1</td>
<td>3.6</td>
<td>138</td>
<td>14.1</td>
<td>29</td>
</tr>
<tr>
<td>December</td>
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<td>151</td>
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<td>January</td>
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<td>3.8</td>
<td>166</td>
<td>8.5</td>
<td>30</td>
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<tr>
<td>February</td>
<td>0.73</td>
<td>5.3</td>
<td>3.7</td>
<td>137</td>
<td>6.1</td>
<td>27</td>
</tr>
<tr>
<td>March</td>
<td>0.69</td>
<td>5.1</td>
<td>3.5</td>
<td>140</td>
<td>7.6</td>
<td>30</td>
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</table>
## Storm Analysis

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>$H_s$ (m)</th>
<th>$T_p$ (s)</th>
<th>$T_z$ (s)</th>
<th>Dir. (°)</th>
<th>Water level elevation* (OD)</th>
<th>Tidal stage (hours re. HW)</th>
<th>Tidal range (m)</th>
<th>Tidal surge* (m)</th>
<th>Max. surge* (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Jan-2015 04:30</td>
<td>2.98</td>
<td>7.7</td>
<td>4.9</td>
<td>193</td>
<td>-</td>
<td>HW -1</td>
<td>~3.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>03-Nov-2014 07:00</td>
<td>2.75</td>
<td>6.7</td>
<td>5.0</td>
<td>184</td>
<td>2.27</td>
<td>HW -1</td>
<td>3.7</td>
<td>~0.3</td>
<td>~0.4</td>
</tr>
<tr>
<td>07-Nov-2014 10:30</td>
<td>2.58</td>
<td>7.1</td>
<td>4.9</td>
<td>188</td>
<td>2.31</td>
<td>HW -1</td>
<td>5.1</td>
<td>-0.55</td>
<td>-0.09</td>
</tr>
<tr>
<td>09-Dec-2014 23:30</td>
<td>2.57</td>
<td>7.1</td>
<td>5.2</td>
<td>181</td>
<td>0.51</td>
<td>HW -2</td>
<td>4.0</td>
<td>-0.99</td>
<td>-0.78</td>
</tr>
</tbody>
</table>

### Distribution plots

The distribution of wave parameters are shown in the accompanying graphs of:

- Wave rose (percentage of occurrence of Direction vs. $H_s$) for all measured data
- Percentage of occurrence of $H_s$, $T_p$, $T_z$ and Direction from April 2014 to March 2015
- Monthly time series of $H_s$ (red line is 2.5 m storm threshold)
- Incidence of storms during the reporting period and for all previous years. Storm events are defined using the Peaks-over-Threshold method. The highest $H_s$ of each storm event is shown.

### General

The buoy was first deployed on 4 June 2008, at which time the magnetic declination at the site was 1.3° west, changing by 0.14° east per year.

### Acknowledgements

The shore station for the Waverider is kindly hosted by Ramsgate Harbourmaster. TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.

* Tidal information is obtained from the nearest recording tide gauge (the Wave Radar REX at Deal 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.
Offshore Wave Hs (m)
Goodwin Sands WB: 13/06/2008 - 31/03/2015
Storms at Goodwin Sands from Apr 2014 to Mar 2015

- Storms between 2014-2015: H = 2m

- Dates:
  - 21/04/2014
  - 31/05/2014
  - 20/07/2014
  - 06/09/2014
  - 28/10/2014
  - 17/12/2014
  - 05/02/2015
  - 27/03/2015

- Storms at Goodwin Sands - all years

- Dates:
  - Jan 09
  - Jan 10
  - Jan 11
  - Jan 12
  - Jan 13
  - Jan 14
  - Jan 15

- Missing data

- (w) $S_H$
5.0 Topographic Analysis

This section describes any significant changes that have taken place in each unit, highlighting any areas of concern, and putting the results in context with previous surveys. Where appropriate plots of different surveys are overlaid and included to illustrate the changes described in the text.

5.1 Thanet

1.1.1 4bSU01 North Foreland (Profile 4b00002A – 4b00014A)

Survey Unit 4bSU01 was surveyed for the first time in Summer 2012. Long-term analysis will commence from the 2018 Annual Report onwards – until then yearly analysis will be carried out only.

Since monitoring began, the Profiles at North Foreland have been accreting by an average of 5.65m\(^2\) (1.7%) annually. Overall the profiles experienced a slight gain in sediment of 6% between Spring 2014 and Spring 2015. Most profiles did not lose or gain significant amounts of sediment; however Profile 4b00005A gained 45m\(^2\) of sediment increasing its overall cross sectional area by 18%. This profile is located within a sandy cuspate bay. Also in the same bay Profile 4b00008A gained 20m\(^2\) of sediment and increased in size by 20%. Profile 4b00010A experienced the greatest loss in the Survey Unit: 18m\(^2\) (4%) of its material.

1.1.2 4bSU02 Broadstairs (4b00017 – 4b00077)

Broadstairs is split into two sections; the northern section surrounds Broadstairs harbour and a section along an open beach adjacent to Ramsgate Harbour in the south. The northern section consists of a large sand amenity beach which is regularly re-profiled, with a storm bund created to increase the level of protection in the winter. The southern bay is much smaller and is primarily sand foreshore to the seawall. Six profiles were added to the northern section in summer 2012, and the first full year of results are now available for analysis. Long-term analysis will commence from the 2018 Annual Report onwards – the existing profiles will continue to be analysed as normal.

There is a disparity between the average percentage change, 24.63% and the average physical change, -1.81 m\(^2\). This is a result of large beaches losing a little material and small beaches gaining a little – reflecting a high percentage gain, but in real terms little sediment has been exchanged. The greatest gain was found along Profile 4b00037, which increased by 42% from last year, gaining 27m\(^2\). The greatest loss was found in nearby Profile 4b00022; 50% (10m\(^2\)) of its material was eroded, although there is no clear pattern.

The long term trends for Broadstairs show that the area is generally accretive with the exception of the aforementioned Profile 4b00022 - since 2004 it has lost 130m\(^2\) which is equivalent to 30% of its total cross sectional area (Figure 5.1). The largest gains have been between Profiles 4b00034, 4b00057 and 4b00061 with a maximum of 224% gain by 4b00057. The high percentages are slightly misleading as they have resulted from relatively small gains of 12, 20 and 40 m\(^2\) respectively, as opposed to the 130m\(^2\) lost at 4b00073.
1.1.3 4bSU03 Ramsgate (4b00086 – 4b00093)

Ramsgate beach consists of a 300m stretch of groyned sandy beach immediately west of Ramsgate Port. The sand provides a fairly thin covering to a chalk platform which limits the amount of material available for movement within the unit; a negligible amount can enter or leave which is reflected in both the short and long term trends.

There has been little change in 4bSU03 over the last year; Profile 4b00093 did not experience significant change and Profile 4b00086 gained 3% - 5m$^2$ of material. In terms of the long term change, Ramsgate has been slowly losing sediment; the two profiles have an average loss of 2% since records began.

1.2 Pegwell Bay to South Foreland

1.2.1 4bSU04 Pegwell Bay

This survey unit is not currently surveyed as part of the Strategic Regional Coastal Monitoring Topographic Survey Programme. Instead, data is collected using Lidar remote sensing.

1.2.2 4bSU05 Sandwich (Profiles 4b00122 – 4b00361)

The coastline of 4bSU05 is an 8.5km length of open mixed shingle and sand beach with a sandy spit in the north. Recent construction works at the southern end have involved additional rock defences at Sandown Castle and extending a rock revetment of the castle.

Over the past year, with the exception of Profile 4b00131 (-6%, -23m$^2$) which lies at the mouth of the river Stour, bordering Pegwell Bay, all profiles experienced sediment gain. On average the profiles gained 6m$^2$, increasing in size by 2.6%. The largest gains were prominent at the south of the survey unit, topped by Profile 4b00360 who gained 47m$^2$ of sediment.
material and increased in size by 23% (Figure 5.2). This is not typical throughout the unit however as 37 out of 42 profiles did not experience change ±5%.

Figure 5.2 Beach Profile 4b00360 Spring 2014-2015

The long term trends suggest that the unit is generally accretive, with a few profiles showing no significant change. The trend does not indicate that there are any significantly erosive profiles however a few have experienced minor losses. The greatest long term growth occurred at Profile 4b00147 which increased by 63%. Key areas of growth include the area adjacent to Pegwell Bay and the area to the southern extent of the unit, just north of Deal.

Figure 5.3 – Beach Profile 4b00139 Spring 2003, 2014 & 2015.

Further south the majority of beach has accreted although the levels vary; no recycling works have been undertaken along this frontage so all gains are a result of material coming through Deal or fines along the foreshore.
1.2.3 4bSU06 Deal (Profiles 4b00362 – 4b00540)

Deal beach is a mix of open and groyned stretches of coast where the majority of sediment is coarse shingle. The long term trend identifies that the southern section of this unit, between Oldstairs bay and Kingsdown is extremely erosive whilst the northern section, roughly between Walmer and Deal is highly accretive. It was not possible to gather data for the beach at Deal north of the Pier (Profiles 4b00397 to 4b00370) since sieving works have made the beach inaccessible.

The long term changes show a dichotomy between accretive Deal and erosive Kingsdown. Between Profiles 4b00529 and 4b00474 (Kingsdown) every profile, with the exception of 4b00515 and 4b00520, has had a loss of sediment between 5 and 38 % of its size when the original baseline survey was undertaken. The trend for profile 4b00514 shows that Kingsdown is eroding at a rate of 1.78m per year. In contrast north of Profile line 4b00416 there is a positive growth in all profiles. This is due to the south to north transport of sediment by the longshore drift process. Thus the profiles in the north such as Sandwich Bay and Deal (which are constantly accreting) are fed by those in the south (constantly eroding). The profiles in the south of this unit are eroding because they are starved of sediment; the construction of Dover Harbour in the mid 1800's has prevented the natural transport of sediment into this region.

The 2014 winter storms called for emergency works to be carried out on the sea defences at Kingsdown, largely the replanking of groynes (between Profiles 4b00520 to 4b00508) and repair of the sea wall. A beach recharge was also undertaken – bringing in sediment from Walmer beach to the area north of the Kingsdown groyne bays. These works improved the ability of the groynes to hold sediment.

The storms diminished the beach at Oldstairs and exposed the underlying chalk bedrock – on average the CSA as Kingsdown is 40m$^3$ – in comparison, the beach at Walmer is roughly 9 times larger. From the profile line analysis the short term changes seem to be positive however this is most likely the realignment of sediment within the bay without any real gains. This is possible because the beach levels are so low in the first place – a gain of 8m$^2$ for example is the equivalent to 29% increase in CSA.

![Figure 5.4 Beach Profile 4b00520 Spring 2014-2015](image)
At the beach in front of Kingsdown, parallel to South Street, Profile 4b00520 lost approximately 20m² (12%) of its material (Figure 5.4). The level of erosion in this area is of much concern as residential homes are very close to the sea front and the defences are not adequate. The repairs did improve the groyne field’s ability to hold onto material, which accounts for the sediment gains at Profiles 4b00508 and 4b00511. However the area to the north of the groyne field where the beach recharge material was deposited experienced a loss. Approximately 12,435m³ of material was deposited in this area.

This area of coastline is ineffective at holding onto beach material and this should be monitored carefully as the risk is that the sea wall may fail due to low beach levels and once the sea wall has failed the beach behind the sea wall will erode rapidly, followed by the loss of homes to the sea.

Deal, in the north of the survey unit, fluctuated between significant gains and losses however there were no distinct areas which were targeted by erosion/accretion. The CSAs also revealed that there is a substantial beach along the frontage at Deal. The largest gain was at the southern side of Deal Pier; Profile 4b00413 recorded a 13% (27m²) gain. The largest loss was 10% at Profile 4b00416.

1.2.4 4bSU07 Hope Point

This survey unit is not currently surveyed as part of the Strategic Regional Coastal Monitoring Programme’s Topographic Survey Programme. Data is collected instead using remote sensing techniques such as Lidar.

1.2.5 4bSU08 St Margaret’s at Cliffe (Profiles 4b00563 – 4b00475)

St Margaret’s at Cliffe is a 540m stretch of timber groyned shingle beach monitored through three designated profiles. During 2014 to 2015 two profiles lost material (22m² and 23m²) and the third accreted 5m². Profile 4b00565 experienced the largest losses in comparison to previous years where it had been steadily accreting.

The long term monitoring shows that Profile 4b00565 has accreted 18 m² or 28% since 2004 whilst Profile 4b00573 has lost 8% (7.3m²). No significant change occurred within Profile 4b00569.