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* Presented on the CD accompanying printed copies of this report distributed by the Plymouth Coastal Observatory.
Summary

This report contains changes to beach and wave conditions from measurements recorded by the South West Regional Coastal Monitoring Programme. Comparisons are made from the last year, and from the beginning of the Programme in 2007.

Over the last year, the majority of survey units in this report have gained material. Start Bay has predominantly experienced accretion, however, Beesands and Hallsands have lost material in some areas. Accretion at the eastern end of the beach and erosion at the western end is still the dominant trend along Slapton Sands.

Torbay beaches have remained stable with little change or low level accretion dominating in the majority of survey units.

Between Teignmouth and Dawlish Warren there has been a mix of accretion and erosion over the last year. Erosion is most notable along profiles at both the mouth of the Teign and the Exe. Survey units 6bSU18-1 (Teignmouth) and 6bSU18-2 (Teign Estuary) have experienced material recycling events, with the removal and deposition of material from one area of the unit to another by the local authority.

Since 2007, the majority of survey units in Start Bay have experienced erosion with the exception on the most easterly end of both Slapton Sands and Beesands and the entirety of Blackpool Sands. These areas have all experienced accretion since 2007.

The Torbay area has experienced some low level erosion but predominantly profiles here show little change since 2007. There are two exceptions; the westerly ends of Goodrington Sands and Meadfoot Beach, have both lost material.

The majority of survey units between Teignmouth and Dawlish Warren have also experienced erosion, with only some low level accretion occurring in the eastern extent of Teignmouth and Dawlish beaches. Dawlish Warren has experienced predominantly erosion 2007, losing over 30 m$^2$ of material along most profiles.

The Repeat Baseline site 6bSU16-3 (Dawlish Warren) has lost 3% of beach volume in the last year, and 29% since 2007.

The Repeat Baseline site 6bSU26-1 (Slapton Sands) has gained 2% of its beach volume in the last year, but lost 21% since 2007.

The Repeat Baseline site 6bSU26-2 (Beesands) has lost 3% of its beach volume in the last year, and lost 14% since 2007.

The Repeat Baseline site 6bSU26-3 (Hallsands) has gained 3% of its beach volume in the last year, but lost 14% since 2007.
Of the storms recorded by the Dawlish Directional Waverider Buoy between April 2014 and March 2015, five exceeded the 2.5m threshold. The majority of waves were recorded coming from the south east.

The Torbay Directional Waverider Buoy recorded three storms with waves exceeding the 2.0m threshold, with the majority of waves coming from the east or south east.

The Start Bay Directional Waverider Buoy recorded three storms with waves that exceeded the storm threshold of 3.0m. Wave direction recorded from 2007 to 2015 shows the majority of waves coming from the South or East.
South West Regional Coastal Monitoring Programme

Annual Survey Report 2015 – Dawlish Warren to Start Point

Introduction

Analysis presented in this report provides an overview of beach changes and wave and tidal measurements since the commencement of the South West Regional Coastal Monitoring Programme. The first beach surveys took place during the spring of 2007 and changes are reported until spring 2015.

Data are presented at the following levels:

- **Process Cell**
  - Process cell summary of percentage and actual profile change from Spring 2014 to Spring 2015.
  - Process cell summary of percentage and actual profile change from Baseline 2007 to Spring 2015.

- **Survey Unit**
  - Detailed beach profile change from Spring 2014 to Spring 2015.
  - Detailed beach profile change from Baseline 2007 to Spring 2015.
  - Topographic difference model change from Repeat Baseline 2014 to Repeat Baseline 2015 (where available).
  - Topographic difference model change from Baseline 2007 to Repeat Baseline 2015 (where available).
  - Change in position of Mean High Water contour (where available).
  - Beach sediment distribution (where available).
  - Time series of beach profile graphs*.
  - Trend analysis of beach cross-sectional area*.

*Note that beach profile graphs and cross-sectional area charts are presented on the CD accompanying hard copies of this report distributed by the Plymouth Coastal Observatory.

The process cell summary maps provide an at-a-glance summary of the changes during the past year and over the longer term. It is recommended that the user should use the maps to identify areas of interest and then examine the individual profile plots and trends. Colour-coded lines highlight areas of maximum change and identify profiles which might need closer examination.

Lines are colour-coded based on actual change; percentage change is displayed in brackets following the profile name on each line. Please note that lines on the map have been extended for clarity and therefore may not represent the actual distance surveyed.

Difference models have been produced where there are at least two baseline surveys to compare. Where available, the most recent LiDAR data has been used to extract the level of Mean High Water (MHW) for each survey unit, and where possible, sediment distribution maps are produced from the latest topographic baseline survey information.
It must be appreciated that the accuracies of each measurement system must be taken into account when drawing conclusions, particularly from the difference models. In the case of topographic difference models from RTK GPS surveys, the accuracy of each data point is ±0.03m and therefore differences of ±0.06m can generally be considered as "real", whilst smaller changes may be an artefact of the measuring system, and are considered to be "No Change". Difference plots show changes >±0.25m, which should be indicative of areas of genuinely measurable change. Smaller changes may also be present but these are filtered from the analysis to provide clarity. This report displays difference models only where detailed analysis suggests that the changes are real but, nevertheless, the user should approach the results as indicative, unless reinforced overtime or with other information.

Where LiDAR has provided the source data sets, the modelling is less precise. Each LiDAR cell value has a plan position representative of a 1m² grid. It is not reasonable to expect to observe changes with positional accuracy of better than 1-2m therefore. Profiles of steep slopes may suggest that the changes "bounce" back and forth. This is an artefact of the accuracy of the source data. LiDAR is particularly ineffective at identifying sharp edges or steep slopes e.g. cliffs, seawalls. Despite these limitations in accuracy the changes shown indicate an overview of profile change, but to a lower precision than the RTK data. The location of the regularly surveyed profiles superimposed on the difference plots indicates how representative these profiles might be of overall changes.

It must be emphasised that this is only the seventh report of a series and that changes identified are indicative only of relatively short-term trends.
Dawlish Directional Waverider Buoy

Location

OS 299740 E 76510 N
WGS84 Latitude: 50° 34.781’ N Longitude: 03° 25.046’ W

Instrument type

Datawell Directional Waverider Mk III

Water depth ~11 m CD

Buoy in situ off Dawlish beach. Photo courtesy of Fugro EMU Limited

Location of buoy (Google mapping)

Summary

During this reporting period from April 2014 to March 2015, there was a high frequency of storms, particularly in November, of typical magnitude for the site.

Data Quality

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<thead>
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<th>Recovery rate (%)</th>
<th>Sample interval</th>
</tr>
</thead>
<tbody>
<tr>
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Monthly Averages – 2014/15

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<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>
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All times are GMT
Storm Analysis

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<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>
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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 wave buoy at Dawlish was deployed on 07 December 2010, at which time the magnetic declination at the site was 2.7° west, changing by 0.15° east per year.

Acknowledgements

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

* Tidal information used to be obtained from the WaveRadar REX on Teignmouth Pier but this was put out of action on 03 Feb 2014 by damage to the pier. Accordingly, the maximum tidal surge during the storm event is that measured at the next closest tide gauge (the step gauge at West Bay Harbour).
Annual Survey Report

Dawlish Warren to Start Point 2015

Offshore Wave Hs (m)
Dawlish WB: 07/12/2010 - 31/03/2015

- >= 0.00 < 0.50 (m)
- >= 0.50 < 1.00 (m)
- >= 1.00 < 1.50 (m)
- >= 1.50 < 2.00 (m)
- >= 2.00 < 2.50 (m)
- >= 2.50 < 3.00 (m)
- >= 3.00 < 3.50 (m)
- >= 3.50 < 4.00 (m)
- >= 4.00 < 4.50 (m)
- >= 4.50 < 5.00 (m)
- >= 5.00 < 5.50 (m)
- >= 5.50 < 6.00 (m)
- >= 6.00 < 998.00 (m)
Tor Bay Directional Waverider Buoy

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<td>Instrument type</td>
<td>Datawell Directional Waverider Mk III</td>
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<td>Water depth</td>
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<tr>
<td>Buoy in situ in Tor Bay. Photo courtesy of Fugro EMU Limited</td>
<td></td>
</tr>
<tr>
<td>Location of buoy (Google mapping)</td>
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Summary

During this reporting period from April 2014 to March 2015, three storms exceeded the 2.0m storm threshold. Large surges of up to almost 1m were measured during the November storms in Lyme Bay (the nearest working tide gauge at West Bay Harbour).

Data Quality

<table>
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<th>Sample interval</th>
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Monthly Averages – 2014/15

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<th>SST (°C)</th>
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<td>146</td>
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All times are GMT
Storm Analysis

<table>
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<tr>
<th>Date/Time</th>
<th>$H_s$ (m)</th>
<th>$T_p$ (s)</th>
<th>$T_z$ (s)</th>
<th>Dir. ($^\circ$)</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>
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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 2.0 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 July 2008, at which time the magnetic declination at the site was 3.0° west, changing by 0.15° east per year.

Acknowledgements

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

* Tidal information used to be obtained from the WaveRadar REX on Teignmouth Pier but this was put out of action on 03 Feb 2014 by damage to the pier. Accordingly, the maximum tidal surge during the storm event is that measured at the next closest tide gauge (the step gauge at West Bay Harbour).
Annual Survey Report

Dawlish Warren to Start Point 2015

Offshore Wave Hs (m)
Torbay WB: 04/07/2008 - 31/03/2015

- >= 0.00 < 0.50 (m)
- >= 0.50 < 1.00 (m)
- >= 1.00 < 1.50 (m)
- >= 1.50 < 2.00 (m)
- >= 2.00 < 2.50 (m)
- >= 2.50 < 3.00 (m)
- >= 3.00 < 3.50 (m)
- >= 3.50 < 4.00 (m)
- >= 4.00 < 4.50 (m)
- >= 4.50 < 5.00 (m)
- >= 5.00 < 5.50 (m)
- >= 5.50 < 6.00 (m)
- >= 6.00 < 998.00 (m)
Start Bay Directional Waverider Buoy

<table>
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| WGS84    | Latitude: 50° 17.542’ N  
Longitdue: 03° 36.948’ W |

Instrument type
Datawell  
Directional Waverider Mk III

<table>
<thead>
<tr>
<th>Water depth</th>
<th>Buoy in situ in Start Bay. Photo courtesy of Fugro EMU Limited</th>
</tr>
</thead>
<tbody>
<tr>
<td>~10m CD</td>
<td>Location of buoy (Google mapping)</td>
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Summary

During this reporting period from April 2014 to March 2015, three storms exceeded the 3.0m storm threshold. The largest measured significant wave height reached 3.62m on 13 November 2014, during which tide a surge of up to 0.78m was measured at the nearest functioning tide gauge at Devonport.

Data Quality

<table>
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<th>Recovery rate (%)</th>
<th>Sample interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>30 minutes</td>
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<th>T_z (s)</th>
<th>Dir. (°)</th>
<th>SST (°C)</th>
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<tbody>
<tr>
<td>April</td>
<td>0.64</td>
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All times are GMT
Storm Analysis

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<tr>
<th>Date/Time</th>
<th>Hₜ (m)</th>
<th>Tₚ (s)</th>
<th>Tₛ (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>
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Distribution plots

The distribution of wave parameters are shown in the accompanying graphs of:
- Wave rose (percentage of occurrence of Direction vs. Hₜ) for all measured data
- Percentage of occurrence of Hₜ, Tₚ, Tₛ, and Direction from April 2014 to March 2015
- Monthly time series of Hₜ (red line is 3.0 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 Hₜ of each storm event is shown

General

The buoy was first deployed on 5 April 2007, at which time the magnetic declination at the site was 3.2° west, changing by 0.15° east per year.

Acknowledgements

TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory. Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.

* Tidal information used to be obtained from the WaveRadar REX on Teignmouth Pier but this was put out of action on 03 Feb 2014 by damage to the pier. Accordingly, the maximum tidal surge during the storm event is that measured at the next closest tide gauge (the National Network gauge at Devonport).
Topographic Survey Record

The table below gives the target and completion dates for topographic surveys between spring 2014 and the repeat baseline surveys of 2015.

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>Spring Interim Profile 2014</th>
<th>Post-Storm</th>
<th>Baseline 2014</th>
<th>Autumn Interim Profile 2014</th>
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Key

- **Completed on time and accepted**
- **Overdue**
- **Surveyed but not submitted / Accepted**
- **Will not be surveyed**

1 Surveyed outside of survey window and delivered late by contractor
2 Not surveyed due to wall collapse at Dawlish covering survey area

For the most recent survey schedules for each survey unit please see [http://www.channelcoast.org/southwest/survey_programme_schedule/](http://www.channelcoast.org/southwest/survey_programme_schedule/)
Topographic Survey Report

Profile Data

Analysis has been conducted for those sites where a minimum of three surveys have been recorded. In general, changes are measured relative to the Mean Low Water Springs (MLWS) level. In cases where none of these levels can be reached the Master Profile is placed at the most appropriate level for the survey unit in question.

A full time series of plotted beach profiles is shown superimposed on and relative to a Master Profile for each profile location. The Master Profile provides the basis for calculation of beach cross-sectional area changes. Where possible, identical depth boundaries have been used for all profiles within a survey unit. However, even where this has not been possible, direct comparisons can be made for the beach cross sectional area at one profile over time, since the Master Profile is constant for each profile (Figure 1). In some instances, raising the lower depth of the Master Profile may reduce the overall cross sectional area of the profile. This may cause small changes in the beach profile to have a large impact on the percentage change. This effect has been taken into account in the analysis of change to beach profiles. The trend in cross-sectional area (CSA) is presented as a graph for each profile (Figure 2).

![Example Master Profile with CSA Calculated from the Surveyed GPS Profile](image.png)

**Figure 1: Example Master Profile with CSA Calculated from the Surveyed GPS Profile**
Baseline Data

As part of the Monitoring Programme specification, each survey unit receives a full topographic baseline survey once every five years. In addition, highly managed sites, or those with a beach management plan, receive an annual baseline survey. Baseline surveys include a full profile survey at 50m intervals and continuous spot height data collected at approximately 1m intervals across the whole beach to the level of MLWS. This continuous data also includes a feature code for each spot height data point recorded, indicating the surface sediment type.

Where there are at least two baseline surveys for a survey unit, a topographic difference model is produced based on the spot height elevations. The raw spot height data is processed into a grid model and successive models are subtracted from one another to produce a difference model for the survey unit. The spot height data from each survey can be used to derive Mean High Water (MHW) and Mean Low Water (MLW) contours along each survey unit. In some cases, where there is no topographic baseline data collected, the information described above may be derived from LiDAR data.

Process Cell

The Beach Change Summary maps contain an at-a-glance condition of the whole area between Dawlish Warren and Start Point, with the lines representing the average accretion, no change or erosion for each survey unit where there is topographic data.
**Survey Unit**

Topographic changes within each survey unit are summarised on six maps where applicable:

- Beach change map (Spring to Spring).
- Beach change map (Baseline to Spring).
- Topographic difference model map (Phase 1 Baseline to 2015 Baseline).
- Topographic difference model map (2014 Baseline to 2015 Baseline).
- Mean High Water line.
- Sediment distribution maps.

Beach change maps show the location of each beach profile, superimposed on an aerial photograph (note that the line may be extended for clarity). Where possible, the annual change in cross-sectional area has been calculated from Spring 2014 to Spring 2015 and from Baseline 2007 to Spring 2015.

**Survey Schedules**

Spring interim surveys are conducted between January and March each year. Baseline and repeat baseline surveys are carried out between April and August. A minimum of 8 weeks must elapse between successive surveys. The dates of individual surveys are given in the topographic survey record and with the analysis for each survey unit.
EXPLANATORY NOTES

Change in Cross-sectional Area (CSA)

The annual change in cross-sectional area is calculated as the difference in CSA between two surveys, expressed as a percentage change compared to the earlier CSA.

\[
\frac{\text{CSA}_1 - \text{CSA}_2}{\text{CSA}_2} \times 100 \quad \text{eqn}(1)
\]

Where \( \text{CSA}_1 \) = most recent spring survey and \( \text{CSA}_2 \) = spring survey previous year. Therefore an annual change of \(-14\%\) represents erosion during the last year of 14\% of the area of last year’s survey.

Net Sediment Volume Calculation

This is the volume change in m\(^3\) across each individual survey unit over time. The initial volumes are derived from the Digital Terrain Models (DTM) made for consecutive baseline topographic surveys. Both models are clipped to cover the same area, and a volume above the MLWS plane is calculated for each DTM. The net sediment change is calculated as

\[
\text{Vol}_1 - \text{Vol}_2 \quad \text{eqn}(2)
\]

Where \( \text{Vol}_1 \) = most recent DTM model volume and \( \text{Vol}_2 \) = earlier DTM model volume. Therefore a net change of \(-19,730\text{m}^3\) represents erosion since the earlier survey.
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

Survey Unit Boundary

Accretion
Erosion
No Change

< 5 m
5 - 15 m
15 - 30 m
> 30 m

SDADCAG - South Devon
% Change in Cross-sectional Area (Spring 2014 to Spring 2015)

Survey Unit Boundary

- > 30%
- 15 - 30%
- 5 - 15%
- < 5%
- No Change
- < 5%
- 15 - 30%
- > 30%

Beach Change Summary - Spring 2014 to Spring 2015

SDADCAG - South Devon
Survey Unit | 6bSU16-3  
Local Name | Dawlish Warren

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
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<tbody>
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<td>Spring-Spring Beach Change</td>
<td>17/04/2014 - 25/03/2015</td>
<td>Over the last year some erosion has occurred towards the eastern end of the Warren, however the end of the spit has seen little change. Areas of both accretion and erosion have occurred along the length of the Warren.</td>
</tr>
<tr>
<td>Baseline-Spring Beach Change</td>
<td>18/04/2007 - 25/03/2015</td>
<td>Since 2007 high level erosion has occurred throughout the survey unit, with the exception of the profile 6b00007 at the end of the spit which has experienced a 25% increase in cross-sectional area.</td>
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</table>
| Spring-Spring Topographic Difference | 15/08/2014 - 20/08/2015 | Over the past year material has been lost from the eastern seaward extent of the Warren. Material has also been lost from the back beach area between the groynes to the west. Some low level accretion has occurred along the beach front, predominantly on the lower beach areas in the west. Net sediment balance above MLWS: -18,601 m³, Net Sediment Change: -3%.
| Baseline-Spring Topographic Difference | 18/04/2007 - 20/08/2015 | Since 2007 material has been lost from the seaward side of the Warren spit, where a more than 3m change in elevation has occurred. Some accretion has occurred on the landward side of spit. The western extent of the survey unit has experienced low level accretion together with areas of little change. Net sediment balance above MLWS: -204,827 m³, Net Sediment Change: -29%.

<table>
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<tr>
<th>Profile</th>
<th>CSA Diff (m²)</th>
<th>% Change</th>
<th>CSA Diff (m²)</th>
<th>% Change</th>
<th>Master Profile Level (m)</th>
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Survey Unit: 6bSU16-3  
Local Name: Dawlish Warren  
Survey Type: Spring-Spring Beach Change  
Dates Surveyed: 17/04/2014 - 25/03/2015  
Observations: Over the last year some erosion has occurred towards the eastern end of the Warren, however the end of the spit has seen little change. Areas of both accretion and erosion have occurred along the length of the Warren.

Survey Type: Baseline-Spring Beach Change  
Dates Surveyed: 18/04/2007 - 25/03/2015  
Observations: Since 2007 high level erosion has occurred throughout the survey unit, with the exception of the profile 6b00007 at the end of the spit which has experienced a 25% increase in cross-sectional area.

Survey Type: Spring-Spring Topographic Difference  
Dates Surveyed: 15/08/2014 - 20/08/2015  
Observations: Over the past year material has been lost from the eastern seaward extent of the Warren. Material has also been lost from the back beach area between the groynes to the west. Some low level accretion has occurred along the beach front, predominantly on the lower beach areas in the west. Net sediment balance above MLWS: -18,601 m³, Net Sediment Change: -3%.

Survey Type: Baseline-Spring Topographic Difference  
Dates Surveyed: 18/04/2007 - 20/08/2015  
Observations: Since 2007 material has been lost from the seaward side of the Warren spit, where a more than 3m change in elevation has occurred. Some accretion has occurred on the landward side of spit. The western extent of the survey unit has experienced low level accretion together with areas of little change. Net sediment balance above MLWS: -204,827 m³, Net Sediment Change: -29%.

Profile Cross-Sectional Area

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<tr>
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<td>-17</td>
<td>-1.94</td>
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<tr>
<td>6b00046A</td>
<td>2.7</td>
<td>3</td>
<td>This profile has only been surveyed as an interim profile since 2010, therefore there are no long term statistics at present</td>
<td></td>
<td></td>
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<tr>
<td>6b00051</td>
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<td>-1.94</td>
<td></td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

- Survey Unit Boundary

Accretion

- > 30 m
- 15 - 30 m
- 5 - 15 m
- 5 - 15 m
- > 30 m

Erosion

- < 5 m

No Change

- 0 m

Aerial Photography from 2012

0 150 300 m

South West Regional Coastal Monitoring Programme

Annual Survey Report 2015
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

Survey Unit Boundary

Accretion
Erosion
No Change

Aerial Photography from 2012

SDADCAG - South Devon
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Survey Unit Boundary

Accretion

Erosion

No Change

Aerial Photography from 2012

0 150 300 m
Profile 6b00046A has only been surveyed as an interim profile since 2010, therefore there are no long term statistics at present.

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Survey Unit Boundary

- Accretion
- Erosion
- No Change

Aerial Photography from 2012

0 125 250 m
Change in Elevation (m) Between August 2014 and August 2015

Model Extent

Change in Elevation (m)

-3 -2 -1 
-0.5 0 0.5 
1 1.5 2 
2.5 3

EROSION NO CHANGE ACCRETION
Change in Elevation (m) Between April 2007 and August 2015

Model Extent

EROSION
NO CHANGE
ACCRETION

Change in Elevation (m)

Aerial Photography from 2012

0 150 300 m
Change in Elevation (m) Between April 2007 and August 2015

Model Extent

<table>
<thead>
<tr>
<th>Change in Elevation (m)</th>
<th>EROSION</th>
<th>NO CHANGE</th>
<th>ACCRETION</th>
</tr>
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<td>-3 to -2.5</td>
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<td>-2 to -1.5</td>
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<td>-1.5 to -1</td>
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</tr>
<tr>
<td>1.5 to 2</td>
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</tr>
<tr>
<td>2.5 to 3</td>
<td>2.5</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Aerial Photography from 2012
Sediment Type

- Gravel
- Gravel & Sand
- Sand
- Boulder
- Dune
- Dune Vegetated
- Grass
- Gravel & Mud
- Mud
- Mud & Sand
- Rock
- Saltmarsh
- Sea Defence
- Shell
- Water Body
- Mixture
- Obstruction

Aerial Photography from 2012

PLIMOUTH COASTAL OBSERVATORY

0 125 250 m

SDADCG - South Devon
### Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile Level (m)</th>
<th>OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
</tr>
<tr>
<td>6b00066</td>
<td>-10.7</td>
<td>-5</td>
<td>36.3</td>
<td>20</td>
</tr>
<tr>
<td>6b00070</td>
<td>6.9</td>
<td>5</td>
<td>20.9</td>
<td>17</td>
</tr>
<tr>
<td>6b00074</td>
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<td>38</td>
<td>1.7</td>
<td>2</td>
</tr>
<tr>
<td>6b00078</td>
<td>16.0</td>
<td>44</td>
<td>-6.4</td>
<td>-11</td>
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<tr>
<td>6b00082</td>
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<td>-15</td>
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<tr>
<td>6b00086</td>
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<td>4.0</td>
<td>37</td>
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<td>6b00090</td>
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<td>27</td>
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<td>6b00094</td>
<td>2.2</td>
<td>7</td>
<td>-6.9</td>
<td>-17</td>
</tr>
<tr>
<td>6b00098</td>
<td>-32.8</td>
<td>-30</td>
<td>-3.2</td>
<td>-4</td>
</tr>
<tr>
<td>6b00102</td>
<td>15.3</td>
<td>31</td>
<td>-19.3</td>
<td>-23</td>
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<td>6b00107</td>
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<td>-5.1</td>
<td>-5</td>
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<td>6b00111</td>
<td>12.1</td>
<td>35</td>
<td>-13.8</td>
<td>-23</td>
</tr>
<tr>
<td>6b00113</td>
<td>-3.1</td>
<td>-3</td>
<td>-5.8</td>
<td>-6</td>
</tr>
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<td>6b00116</td>
<td>-8.1</td>
<td>-5</td>
<td>16.2</td>
<td>10</td>
</tr>
<tr>
<td>6b00119</td>
<td>3.7</td>
<td>4</td>
<td>-17.9</td>
<td>-16</td>
</tr>
</tbody>
</table>

**Survey Unit**: 6bSU17  
**Local Name**: Dawlish

**Observations**

- **Spring-Spring Beach Change**  
  13/06/2014* - 20/03/2015  
  Little change has occurred over the last year with low level accretion dominating the survey unit. Towards the eastern end of the survey unit profiles 6b00074/78 have gained the most material. Profile 6b00098 is the exception, losing 32.8 m² of material.

- **Baseline-Spring Beach Change**  
  19/04/2007 - 20/03/2015  
  Since 2007 the western end of the survey has experienced low level erosion along the profile lying next to the groynes. Accretion has occurred at the eastern extent of the survey unit.

**Comments**

*No spring interim data was available in 2014 due to the collapse of the train line and seawall at Dawlish. Data for comparison was obtained using LiDAR flow in June 2014.*
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

Survey Unit Boundary

Accretion
No Change
Erosion

> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²
15 - 30 m²
> 30 m²

Aerial Photography from 2012
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

- Survey Unit Boundary

- Accretion
- No Change
- Erosion

Aerial Photography from 2012

SDADCAG - South Devon
### Survey Unit
6bSU18-1

### Local Name
Teignmouth

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring</td>
<td>28/04/2014 - 22/01/2015</td>
<td>Over the last year low level accretion has occurred in the majority of the survey unit, with the exception of profiles 6b00165 and 6b00219, both of which have lost material. The greatest change is seen at the western extent of the survey unit around the river mouth. Here 7000 m$^3$ of material has been moved from around 6b00219 (-15% cross-sectional area) to the area between profiles 6b00216 (+25% cross-sectional area) and 6b00212. Material was moved between 22/10/2014 and 29/10/2014 by Teignbridge District Council to protect the exposed seawall and as a precaution against winter storm damage.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>15/05/2007 - 22/01/2015</td>
<td>The central and eastern sections of the survey unit have experienced accretion since 2007, with the exception of profiles 6b00161 and 6b00165 (in the east) which have experienced some erosion. The western section of the survey unit has experienced erosion. Profile 6b00216 has increased by 50% of its cross-sectional area since 2007 due to recycling work done between 22/10/2014 and 29/10/2014.</td>
</tr>
</tbody>
</table>

### Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Apr 2014 to Jan 15</td>
<td>May 2007 to Jan 15</td>
<td>Level (m) OD</td>
</tr>
<tr>
<td></td>
<td>CSA Diff (m$^3$)</td>
<td>% Change</td>
<td>CSA Diff (m$^3$)</td>
</tr>
<tr>
<td>6b00153</td>
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<td>31.8</td>
</tr>
<tr>
<td>6b00157</td>
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<td>16.1</td>
</tr>
<tr>
<td>6b00161</td>
<td>8.5</td>
<td>14</td>
<td>-15.0</td>
</tr>
<tr>
<td>6b00165</td>
<td>-12.6</td>
<td>-33</td>
<td>-11.5</td>
</tr>
<tr>
<td>6b00169</td>
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<td>3.6</td>
</tr>
<tr>
<td>6b00172</td>
<td>-3.6</td>
<td>-8</td>
<td>7.9</td>
</tr>
<tr>
<td>6b00179</td>
<td>18.6</td>
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<td>26.6</td>
</tr>
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<td>6b00183</td>
<td>13.8</td>
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<td>-0.5</td>
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<td>6b00187</td>
<td>-1.9</td>
<td>-5</td>
<td>5.4</td>
</tr>
<tr>
<td>6b00191</td>
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<td>6b00204</td>
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<td>6b00212</td>
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<td>-43.1</td>
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<tr>
<td>6b00216</td>
<td>39.6</td>
<td>25</td>
<td>65.5</td>
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<tr>
<td>6b00219</td>
<td>-83.4</td>
<td>-15</td>
<td>-65.5</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

Survey Unit Boundary

Accretion: > 30 m²
Erosion: < 5 m²
No Change: 5 - 15 m²

Survey Unit Boundary

6b00179: 31%
6b00183: 20%
6b00187: -5%
6b00191: 3%
6b00193: 5%
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

- Survey Unit Boundary
- Accretion
- Erosion
- No Change

Aerial Photography from 2012

6bSU18-1 Teignmouth - Beach Change (3 of 3)
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Survey Unit Boundary

Accretion
No Change
Erosion

> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²
15 - 30 m²
> 30 m²

Aerial Photography from 2012
Little change has occurred within the survey unit over the past year, with low level accretion seen along the majority of profiles. At the rivermouth, profile 6b00263 has experienced some erosion due to the extraction of 5000m$^3$ of material from around this area by Teignbridge District Council between 24/11/2014 and 28/11/2014. The material was deposited in the area around profile 6b00258, causing an increase in the profile’s cross-sectional area of 22%. The aim of this recycling work was to protect the exposed seawall as a precaution against winter storm damage. Erosion along profile 6b00221 can also be attributed to the extraction of material during the other recycling work carried out within survey unit 6bSU18-1.

Since 2007 the dominant trend within the survey unit is for very low level accretion or little change. Profile 6b00221’s cross-sectional area has increased by 34%, despite the material extracted from this area during the recycling work.
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Survey Unit Boundary

Accretion
Erosion
No Change

Aerial Photography from 2012

0 150 300 m
### Survey Unit

**6bSU20-1**  
**Local Name**: Oddicombe Beach

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring</td>
<td>28/02/2014 - 08/01/2015</td>
<td>All profiles in the survey unit have gained material in the past year. Profile 6b00399 has increased in cross-sectional area by 65%, equating to an actual increase of 27 m² of material.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>20/04/2007 - 08/01/2015</td>
<td>Since 2007 the survey unit has remained relatively stable with some low level accretion and erosion seen along the profiles. The greatest change is seen along profile 6b00399; here, although it gained material over the past year, it has actually reduced in cross-sectional area by 18% since 2007.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring</td>
<td>Feb 2014 to Jan 2015</td>
<td>Baseline to Spring Apr 2007 to Jan 2015</td>
</tr>
<tr>
<td>Profile</td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
</tr>
<tr>
<td>6b00396</td>
<td>5.7</td>
<td>5</td>
</tr>
<tr>
<td>6b00397</td>
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<td>41</td>
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<tr>
<td>6b00399</td>
<td>27.0</td>
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<tr>
<td>6b00409</td>
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</tr>
</tbody>
</table>

**Comments**:
Actual Change in Cross-sectional Area (Spring to Spring 2015)

Survey Unit Boundary

Accretion
No Change
Erosion

> 30 m²
15 - 30 m²
5 - 15 m²
5 - 15 m²
15 - 30 m²
> 30 m²
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Survey Unit Boundary

- Accretion
- No Change
- Erosion

Aerial Photography from 2012

6bSU20-1 Oddicombe - Beach Change

SDADCAG - South Devon
## Survey Unit

**6bSU21-2**

## Local Name

**Meadfoot**

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring</td>
<td>17/03/2014 - 09/01/2015</td>
<td>A mixture of accretion and erosion has occurred over the past year. The most westerly profile 6b00529 has increased in cross-sectional area by 47%, while the profile towards the middle of the unit has decreased in cross-sectional area by 34%.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>17/05/2007 - 09/01/2015</td>
<td>Low level erosion has occurred along all the profiles on the main section of beach since 2007. The most easterly profile, positioned on the smaller beach, has increased in cross-sectional area by 23%.</td>
</tr>
</tbody>
</table>

## Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile Level (m) OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mar 2014 to Jan 2015</td>
<td>May 2007 to Jan 2015</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
<tr>
<td>6b00520A</td>
<td>6.3</td>
<td>8</td>
<td>15.3</td>
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<td>6b00524</td>
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<td>6b00527</td>
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<tr>
<td>6b00529</td>
<td>21.0</td>
<td>47</td>
<td>-12.4</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

Survey Unit Boundary

Accretion
Errosion
No Change

6bSU21-2 Meadfoot - Beach Change
SDADCAG - South Devon
South West Regional Coastal Monitoring Programme

Annual Survey Report 2015

Aerial Photography from 2012

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

- Survey Unit Boundary

Accretion
No Change
Erosion

6bSU21-2 Meadfoot - Beach Change

SDADCAG - South Devon
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>6bSU21-4</th>
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</thead>
<tbody>
<tr>
<td>Local Name</td>
<td>Torquay and Livermead</td>
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### Survey Type

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring</td>
<td>Beach Change</td>
<td>The survey unit has remained stable over the past year.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>Beach Change</td>
<td>The survey unit has remained stable since 2007 with little change observed.</td>
</tr>
</tbody>
</table>

### Comments

The high percentage change in cross-sectional area observed along 6b00578 is due to the short length of the profile and does not equate to a large amount of actual material change.

### Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile Level (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
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<td>-4.9</td>
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<td>1.7</td>
</tr>
<tr>
<td>6b00578</td>
<td>-3.1</td>
<td>-21</td>
<td>2.8</td>
</tr>
<tr>
<td>6b00585</td>
<td>0.4</td>
<td>0</td>
<td>2.9</td>
</tr>
<tr>
<td>6b00592</td>
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</tr>
<tr>
<td>6b00595</td>
<td>7.0</td>
<td>14</td>
<td>0.1</td>
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</table>
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>6bSU21-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Name</td>
<td>Paignton</td>
</tr>
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</table>

### Survey Type

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring Beach</td>
<td>15/03/2014 – 19/01/2015</td>
<td>Low level accretion can be observed along the majority of profiles, with the exception of two profiles that show very low level erosion. Actual change and cross-sectional area changes are very low, indicating stability with in the survey unit.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>18/05/2007 – 19/01/2015</td>
<td>Low level erosion has occurred along profile lines at the centre of the survey unit, whereas accretion has occurred at the eastern extent of the survey unit. The three most westerly profiles have experienced very little change since 2007.</td>
</tr>
</tbody>
</table>

### Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring Mar 2014 to Jan 2015</th>
<th>Baseline to Spring May 2007 to Jan 2015</th>
<th>Master Profile Level (m) OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
<tr>
<td>6b00614</td>
<td>10.4</td>
<td>9</td>
<td>18.2</td>
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<td>-6.5</td>
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<td>-1.0</td>
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<td>10.6</td>
<td>8</td>
<td>0.4</td>
</tr>
<tr>
<td>6b00652</td>
<td>-1.0</td>
<td>0</td>
<td>-0.5</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Survey Unit Boundary

Accretion - Erosion

> 30 m 15 - 30 m 5 - 15 m < 5 m

No Change

Aerial Photography from 2012
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring Beach Change</td>
<td>18/03/2014 - 10/01/2015</td>
<td>Very little change has occurred within the survey unit over the past year, with only low level accretion observed along each profile.</td>
</tr>
<tr>
<td>Baseline-Spring Beach Change</td>
<td>19/05/2007 - 10/01/2015</td>
<td>Since 2007 low level erosion has occurred along the two westerly profiles. The central profile has since little change while the two easterly profiles have experienced some accretion.</td>
</tr>
</tbody>
</table>

### Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile Level (m) OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mar 2014 to Jan 2015</td>
<td>May 2007 to Jan 2015</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>CSA Diff (m²)</td>
<td>OD</td>
</tr>
<tr>
<td></td>
<td>% Change</td>
<td>% Change</td>
<td></td>
</tr>
<tr>
<td>6b00673</td>
<td>0.7</td>
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<td>1.2</td>
<td>-2.1</td>
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<td>6b00683</td>
<td>5.9</td>
<td>-6.8</td>
<td>-2.1</td>
</tr>
<tr>
<td>6b00687</td>
<td>14.1</td>
<td>-11.5</td>
<td>-2.1</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

- **Accretion**
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²
- **Erosion**
  - < 5 m²
  - 5 - 15 m²
  - 15 - 30 m²
  - > 30 m²

Survey Unit Boundary

Aerial Photography from 2012

South West Regional Coastal Monitoring Programme

Annual Survey Report 2015

SDADCAG - South Devon
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>6bSU21-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Name</td>
<td>Broadsands</td>
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</table>

### Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
<tr>
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<td>8.8</td>
</tr>
<tr>
<td>6b00721</td>
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<tr>
<td>6b00725</td>
<td>5.4</td>
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<td>6.0</td>
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</table>

**Survey Type**

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring</td>
<td>01/03/2014 - 07/01/2015</td>
<td>Little change has occurred over the past year with only very low level accretion across all profiles.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>02/08/2007 - 07/01/2015</td>
<td>The long term trend is similar to the year on year analysis, with low level accretion or no change across all profiles, indicating stability within the survey unit.</td>
</tr>
</tbody>
</table>

**Comments**

Little change has occurred over the past year with only very low level accretion across all profiles.

The long term trend is similar to the year on year analysis, with low level accretion or no change across all profiles, indicating stability within the survey unit.
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

- **Accretion**
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²

- **Erosion**
  - < 5 m²
  - 5 - 15 m²
  - 15 - 30 m²
  - > 30 m²

Survey Unit Boundary

Aerial Photography from 2012
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

<table>
<thead>
<tr>
<th>Change</th>
<th>&gt; 30 m²</th>
<th>15 - 30 m²</th>
<th>5 - 15 m²</th>
<th>&lt; 5 m²</th>
<th>5 - 15 m²</th>
<th>15 - 30 m²</th>
<th>&gt; 30 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accretion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erosion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Survey Unit Boundary

Aerial Photography from 2012

SDADCAG - South Devon
Survey Unit: 6bSU25-2
Local Name: Blackpool Sands

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring Beach</td>
<td>03/03/2014 – 05/02/2015</td>
<td>Accretion has occurred along all profiles over the past year.</td>
</tr>
<tr>
<td>Baseline-Spring Beach</td>
<td>17/05/2007 – 05/02/2015</td>
<td>Since 2007 significant accretion has occurred throughout the survey unit. 6b01182 has seen the greatest change, increasing in cross-sectional area by 60%.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>Local Name</th>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>6bSU25-2</td>
<td>Blackpool Sands</td>
<td>Spring-Spring Beach</td>
<td>03/03/2014 – 05/02/2015</td>
<td>Accretion has occurred along all profiles over the past year.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baseline-Spring Beach</td>
<td>17/05/2007 – 05/02/2015</td>
<td>Since 2007 significant accretion has occurred throughout the survey unit. 6b01182 has seen the greatest change, increasing in cross-sectional area by 60%.</td>
</tr>
</tbody>
</table>

**Profile Cross-Sectional Area**

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile Level (m) OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
<tr>
<td>6b01175</td>
<td>19.2</td>
<td>3</td>
<td>110.4</td>
</tr>
<tr>
<td>6b01179</td>
<td>58.1</td>
<td>10</td>
<td>174.3</td>
</tr>
<tr>
<td>6b01182</td>
<td>87.6</td>
<td>18</td>
<td>213.4</td>
</tr>
<tr>
<td>6b01186</td>
<td>34.6</td>
<td>10</td>
<td>91.4</td>
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</table>
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

Accretion:
- > 30 m²
- 15 - 30 m²
- 5 - 15 m²
- < 5 m²

Erosion:
- 5 - 15 m²
- 15 - 30 m²
- > 30 m²

No Change:
- < 5 m²

Survey Unit Boundary

Aerial Photography from 2012
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Survey Unit Boundary

- Accretion
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²
- Erosion
  - < 5 m²
  - 5 - 15 m²
  - 15 - 30 m²
  - > 30 m²

Aerial Photography from 2012

South West Regional Coastal Monitoring Programme
Annual Survey Report 2015

SDADCAG - South Devon

6bSU25-2 Blackpool Sands - Beach Change
# Annual Survey Report

## Dawlish Warren to Start Point 2015

### Survey Unit
- **6bSU26-1**

### Local Name
- **Slapton Sands**

## Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile Level (m) OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
<tr>
<td><strong>Mar 2014 to Mar 2015</strong></td>
<td><strong>Sept 2007 to Mar 2015</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6b01220</td>
<td>3.7</td>
<td>-1</td>
<td>132.7</td>
</tr>
<tr>
<td>6b01227</td>
<td>39.3</td>
<td>4</td>
<td>172.8</td>
</tr>
<tr>
<td>6b01233</td>
<td>39.2</td>
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<td>102.5</td>
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<td>6b01237</td>
<td>25.1</td>
<td>3</td>
<td>44.6</td>
</tr>
<tr>
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<td>-20.1</td>
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<td>-86.6</td>
</tr>
<tr>
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<td>13</td>
<td>-70.4</td>
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<tr>
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</tr>
<tr>
<td>6b01277</td>
<td>3.9</td>
<td>1</td>
<td>-74.5</td>
</tr>
</tbody>
</table>

### Observations

**Spring-Spring Beach Change**
- **19/03/2014 - 19/03/2015**
- Accretion has occurred along the majority of profiles in the survey unit. Profiles that have experienced erosion have lost 5% or less of their cross-sectional area. The greatest change in cross-sectional area occurs along profile 6b01319 which has experienced a 52% increase in cross-sectional area*

**Baseline-Spring Beach Change**
- **30/09/2007 - 19/03/2015**
- Since 2007 the majority of profiles have lost material, with the greatest loss occurring from the central area of the survey unit. Accretion has occurred at the eastern extent of the unit.

**Spring-Spring Topographic Difference**
- **15/08/2015 - 18/06/2015**
- Over past year low level accretion has occurred in front of the sea wall at the western end of the survey unit*. Some low level erosion and accretion has occurred in the central area of the beach. At the eastern extent high level erosion has occurred.

**Baseline-Spring Topographic Difference**
- **30/09/2007 - 18/06/2015**
- Significant erosion has occurred throughout the survey unit with the exception of the eastern extent where accretion can be seen. The greatest erosion has occurred in front of the sea defence at the western end of the unit.

### Net sediment balance above MLWS
- **Spring-Spring**: 61,697 m³
- **Baseline-Spring**: -313,813 m³

### Comments

*6000m³ of material from the eastern extent of the survey unit was moved to the area in front on the sea wall in the west of the survey unit, by the local authority. This recycling occurred over January and February 2015. A further 12,000m³ was also taken from the eastern extent to fill bastions situated along the back of the beach.*
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6b01278A</td>
<td>44.7</td>
<td>22</td>
<td>-62.6</td>
<td>-20</td>
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<tr>
<td>6b01283</td>
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<td>2</td>
<td>-68.7</td>
<td>-16</td>
</tr>
<tr>
<td>6b01287</td>
<td>4.3</td>
<td>1</td>
<td>-66.1</td>
<td>-16</td>
</tr>
<tr>
<td>6b01294</td>
<td>5.6</td>
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<td>-56.3</td>
<td>-14</td>
</tr>
<tr>
<td>6b01298</td>
<td>6.2</td>
<td>2</td>
<td>-58.3</td>
<td>-16</td>
</tr>
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<td>-65.6</td>
<td>-20</td>
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<td>-1.0</td>
<td>-1</td>
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</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

- **Accretion**
  - > 30 m$^2$
  - 15 - 30 m$^2$
  - 5 - 15 m$^2$

- **Erosion**
  - < 5 m$^2$
  - 5 - 15 m$^2$
  - 15 - 30 m$^2$
  - > 30 m$^2$

- **No Change**
  - 0 m$^2$

**Survey Unit Boundary**

Aerial Photography from 2012

0 200 400 m
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

<table>
<thead>
<tr>
<th>Change</th>
<th>Survey Unit Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accretion</td>
<td>6b01272A (25%)</td>
</tr>
<tr>
<td></td>
<td>6b01277A (22%)</td>
</tr>
<tr>
<td></td>
<td>6b01277 (12%)</td>
</tr>
<tr>
<td></td>
<td>6b01283 (2%)</td>
</tr>
<tr>
<td></td>
<td>6b01283A (2%)</td>
</tr>
<tr>
<td></td>
<td>6b01287 (1%)</td>
</tr>
<tr>
<td>Erosion</td>
<td>&gt; 30 m²</td>
</tr>
<tr>
<td></td>
<td>15 - 30 m²</td>
</tr>
<tr>
<td></td>
<td>5 - 15 m²</td>
</tr>
<tr>
<td></td>
<td>&lt; 5 m²</td>
</tr>
<tr>
<td></td>
<td>5 - 15 m²</td>
</tr>
<tr>
<td></td>
<td>15 - 30 m²</td>
</tr>
<tr>
<td></td>
<td>&gt; 30 m²</td>
</tr>
</tbody>
</table>

Aerial Photography from 2012

SDADCAG - South Devon
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

- **Accretion**
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²

- **Erosion**
  - < 5 m²
  - 5 - 15 m²
  - 15 - 30 m²
  - > 30 m²

Survey Unit Boundary

Aerial Photography from 2012
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

Aerial Photography from 2012

- **Accretion**
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²
- **Erosion**
  - < 5 m²
  - 5 - 15 m²
  - 15 - 30 m²
  - > 30 m²
- **No Change**

Survey Unit Boundary
Change in Elevation (m) Between August 2014 and June 2015

- ACCRETION
- EROSION
- NO CHANGE

Model Extent

Aerial Photography from 2012

Change in Elevation (m)
Change in Elevation (m) Between August 2014 and June 2015

- EROSION
- NO CHANGE
- ACCRETION

Model Extent

Change in Elevation (m)

Elevation

0 0.25 0.5 1 1.5 2 2.5 3

Aerial Photography from 2012

0 200 400 m
Change in Elevation (m) Between August 2014 and June 2015

- ACCRETION
- EROSION
- NO CHANGE

Aerial Photography from 2012

Model Extent

Change in Elevation (m)
Change in Elevation (m) Between September 2007 and June 2015

- ACCRETION
- NO CHANGE
- EROSION

Model Extent

Aerial Photography from 2012
Change in Elevation (m) Between September 2007 and June 2015

-3  -3.5  -4  -4.5  -5  -5.5  -6  -6.5  -7  -7.5  -8
-3  -3.5  -4  -4.5  -5  -5.5  -6  -6.5  -7  -7.5  -8

EROSION  NO CHANGE  ACCRETION

Aerial Photography from 2012

Change in Elevation (m)

Model Extent
Change in Elevation (m) Between September 2007 and June 2015

<table>
<thead>
<tr>
<th>Change in Elevation (m)</th>
<th>Model Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCRETION</td>
<td>Model Extent</td>
</tr>
<tr>
<td>EROSION</td>
<td>Model Extent</td>
</tr>
<tr>
<td>NO CHANGE</td>
<td>Model Extent</td>
</tr>
</tbody>
</table>

Aerial Photography from 2012

Change in Elevation (m)
Sediment Type

- Gravel & Sand
- Boulder
- Dune Vegetated
- Rock
- Sea Defence
- Obstruction

Aerial Photography from 2012

0 200 400 m
Sediment Type
- Gravel & Sand
- Dune Vegetated
- Grass
- Sea Defence
- Obstruction

Aerial Photography from 2012
Aerial Photography from 2012

Sediment Type

- Gravel & Sand
- Boulder
- Dune Vegetated
- Rock
- Sea Defence
- Obstruction

0 175 350 m
### Profile Cross-Sectional Area

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile Level (m) OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m³)</td>
</tr>
<tr>
<td>6b01330</td>
<td>-18.3</td>
<td>-9</td>
<td>25.3</td>
</tr>
<tr>
<td>6b01334</td>
<td>8.2</td>
<td>3</td>
<td>15.4</td>
</tr>
<tr>
<td>6b01338</td>
<td>9.3</td>
<td>3</td>
<td>-17.1</td>
</tr>
<tr>
<td>6b01342</td>
<td>-19.3</td>
<td>-9</td>
<td>-60.6</td>
</tr>
<tr>
<td>6b01346</td>
<td>14.9</td>
<td>42</td>
<td>-83.0</td>
</tr>
<tr>
<td>6b01350</td>
<td>-8.0</td>
<td>-15</td>
<td>-80.4</td>
</tr>
</tbody>
</table>

A mixture of erosion and accretion has occurred over the past year. Although a greater quantity of profiles have experienced accretion, the profiles that have experienced erosion have lost greater amounts of material.

The dominant trend since 2007 is for erosion. The five profiles stretching from west to east have all lost significant amount of material. The two most easterly profiles have experienced accretion, fitting a pattern of erosion at the western end of the beach and accretion at the eastern end.

Accretion has occurred at the western end of the beach and towards the back of the beach above the MHW level at the centre and eastern end. Erosion has occurred below the MHW level at the eastern end of the beach. A section of erosion has also occurred at the back of the beach just west of the centre of the survey unit.

Erosion can be seen at the western end of the beach stretching towards the centre of the survey unit. Beach wide erosion turns into a discrete line of erosion than continues throughout the entire survey unit along the MHW level. Accretion has occurred at the eastern extent of the survey unit, with areas also seen along ether side of the MHW level towards the centre of the survey unit.

Remedial work has been carried out to the sea defence in front of the main village, with additional boulders placed in front of the first section of road that services the houses at the eastern end of the beach.
| 6b01354 | 2.5 | 4 | -54.6 | -47 | -2.02 |
Actual Change in Cross-sectional Area (Spring 2014 to Spring 2015)

<table>
<thead>
<tr>
<th>Survey Unit Boundary</th>
<th>Accretion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 30 m²</td>
</tr>
<tr>
<td></td>
<td>15 - 30 m²</td>
</tr>
<tr>
<td></td>
<td>5 - 15 m²</td>
</tr>
<tr>
<td></td>
<td>&lt; 5 m²</td>
</tr>
<tr>
<td>Erosion</td>
<td>5 - 15 m²</td>
</tr>
<tr>
<td></td>
<td>15 - 30 m²</td>
</tr>
<tr>
<td></td>
<td>&gt; 30 m²</td>
</tr>
</tbody>
</table>

Aerial Photography from 2012

Survey Unit Boundary
South West Regional Coastal Monitoring Programme
Annual Survey Report 2015

Aerial Photography from 2012

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

- > 30 m²
- 15 - 30 m²
- 5 - 15 m²
- < 5 m²
- Erosion
- 15 - 30 m²
- > 30 m²
- No Change

Survey Unit Boundary
Change in Elevation (m) Between September 2007 and May 2015

- ACCRETION
- EROSION
- NO CHANGE

Aerial Photography from 2012

Model Extent

0 200 400 m
Sediment Type
- Gravel
- Gravel & Sand
- Boulder
- Dune Vegetated
- Rock
- Sea Defence

Aerial Photography from 2012

0 200 400 m
## Survey Unit

**Local Name**

Hallsands

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring-Spring</td>
<td>04/03/2014 - 07/03/2015</td>
<td>Accretion has occurred along the three westerly profiles over the last year. The most easterly profile has experienced some erosion losing 29.8 m$^2$ of material, equating to 15% of its cross-sectional area.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>26/09/2007 - 07/03/2015</td>
<td>Since 2007 all profiles have lost a significant amount of material. All have decreased in cross-sectional area by more than 25%. The greatest change is seen in the western section of the survey unit, although the greatest amount of material has been lost along the profile in the centre of the beach.</td>
</tr>
<tr>
<td>Spring-Spring</td>
<td>10/08/2014 - 08/07/2015</td>
<td>Accretion has occurred from the centre of the beach stretching westwards. Areas of accretion can also be seen along the back beach above MHW. The eastern area of beach has experienced erosion below MHW.</td>
</tr>
<tr>
<td>Baseline-Spring</td>
<td>28/09/2007 - 08/07/2015</td>
<td>Since 2007 erosion has dominated the survey unit. Material has been lost from all areas across the main beach, however, in the eastern extent some very low level accretion has occurred. The greatest erosion has occurred along MHW.</td>
</tr>
</tbody>
</table>

### Comments

Some remedial work has been carried out at the western extent of the survey unit after the winter storms in 2013/14, with extra boulder defence added to protect the access road.

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA Diff (m$^2$)</td>
<td>% Change</td>
</tr>
<tr>
<td>6b01382</td>
<td>-29.8</td>
<td>-15</td>
</tr>
<tr>
<td>6b01383</td>
<td>20.0</td>
<td>11</td>
</tr>
<tr>
<td>6b01384</td>
<td>28.1</td>
<td>46</td>
</tr>
<tr>
<td>6b01385</td>
<td>22.2</td>
<td>35</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area
(Spring 2014 to Spring 2015)

6bSU26-3: Hallsands - Beach Change

South West Regional Coastal Monitoring Programme
Annual Survey Report 2015

SDADCAG - South Devon

Aerial Photography from 2012

Survey Unit Boundary

PLUMOUTH
COASTAL
OBSERVATORY

Accretion

> 30 m²
15 - 30 m²
5 - 15 m²
No Change
< 5 m²
5 - 15 m²
15 - 30 m²
> 30 m²

Erosion

0 50 100 m

No Change

Survey Unit Boundary

> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²
5 - 15 m²
15 - 30 m²
> 30 m²
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2015)

6bSU26-3: Hallsands - Beach Change

Aerial Photography from 2012

<table>
<thead>
<tr>
<th>Survey Unit Boundary</th>
<th>Accretion</th>
<th>Erosion</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td></td>
<td>&lt; 5 m²</td>
<td>&lt; 5 m²</td>
</tr>
<tr>
<td>No Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Change in Elevation (m) Between August 2014 and July 2015

- ACCRETION
- EROSION
- NO CHANGE

Model Extent

Aerial Photography from 2012

Change in Elevation (m)
- ≥ 32.5
- 32 - 2.5
- 21 - 1.5
- 10 - 0.5
- ≤ -3
- -0.25 - 0.25
- -0.5 - -0.25
- -1 - -0.5
- -1.5 - -1
- -2 - -1.5
- -2.5 - -2
- -3 - -2.5

Western Trimline: 32 - 35 ± 2

SDADCAG - South Devon
Change in Elevation (m) Between September 2007 and July 2015

- EROSION
- NO CHANGE
- ACCRETION

Aerial Photography from 2012

Model Extent
South West Regional Coastal Monitoring Programme

Annual Survey Report 2015

SDADCAG - South Devon

Aerial Photography from 2012

Sediment Distribution
- Gravel
- Gravel & Sand
- Boulder
- Dune Vegetated
- Rock
- Sea Defence
- Obstruction

6bSU26-3: Hallsands - Sediment Distribution
Profile Charts for Survey Unit 6bSU16-3
Cross Sectional Area above MP Trend for Location: 6b00005 and Reference Profile Set

Area Above MP Trend Eroding at -2.413 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00007 and Reference Profile Set

Area Above MP Trend: Accreting at 19.238 m²/Year

Survey Date

Recycling Event
Area Above MP
Area Trend
Area Between MP & DP
Cross Sectional Area above MP Trend for Location: 6b00009 and Reference Profile Set

Area Above MP Trend Eroding at -9.98 m²/Year

Survey Date

04/12/2005 04/12/2006 04/12/2007 03/12/2008 03/12/2009 03/12/2010 03/12/2011 02/12/2012 02/12/2013 02/12/2014

Area Above MP
Area Trend
Area Between MP & DP
Recycling Event
Cross-Sectional Area above MP Trend for Location: 6b00011 and Reference Profile Set

Area Above MP Trend: Eroding at -33.625 m²/Year

Survey Date

04/12/2005 04/12/2006 04/12/2007 03/12/2008 03/12/2009 03/12/2010 03/12/2011 02/12/2012 02/12/2013 02/12/2014

Peach Area (m²)

140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520

✓ Yellow Recycling Event ✓ Green Area Above MP ✓ Green Area Trend ✓ Blue Area Between MP & DP

SAIIDS
Cross-Sectional Area above MP Trend for Location: 6b00014 and Reference Profile Set

Area Above MP Trend: Eroding at -31.688 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00027 and Reference Profile Set

Area Above MP Trend Eroding at -6.602 m²/Year

Survey Date

04/12/2005 04/12/2006 04/12/2007 04/12/2008 03/12/2009 03/12/2010 03/12/2011 02/12/2012 02/12/2013 02/12/2014

Survey Unit 6bSU16-3
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00029 and Reference Profile Set

Area Above MP Trend: Eroding at -11.367 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00030 and Reference Profile Set

Area Above MP Trend: Eroding at -13.745 m²/Year

Survey Date:
- 04/12/2005
- 04/12/2006
- 04/12/2007
- 03/12/2008
- 03/12/2009
- 03/12/2010
- 03/12/2011
- 02/12/2012
- 02/12/2013
- 02/12/2014

Survey Unit 6bSU16-3
Cross-Sectional Area Charts
Cross Sectional Area above MF Trend for Location: 6b00042 and Reference Profile Set

Area Above MF Trend: Eroding at -4.759 m²/Year

Survey Date:

- 04/12/2005
- 04/12/2006
- 04/12/2007
- 03/12/2008
- 03/12/2009
- 03/12/2010
- 03/12/2011
- 02/12/2012
- 02/12/2013
- 02/12/2014

Survey Unit 6bSU16-3
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00051 and Reference Profile Set

Area Above MP Trend Eroding at -0.170 m²/Year

Survey Date

04/12/2005 04/12/2006 04/12/2007 03/12/2008 03/12/2009 03/12/2010 03/12/2011 02/12/2012 02/12/2013 02/12/2014

Peach Area (m²)

25 27 30 32 33 34 35 36 37 38 39 40 41 42 43 44 45

Survey Unit 6bSU16-3
Cross-Sectional Area Charts
Cross-Sectional Area above MP Trend for Location: 6b00074 and Reference Profile Set.

Area Above MP Trend: Eroding at -1.461 m²/Year.
Survey Unit 6bSU17
Cross-Sectional Area Charts

Cross Sectional Area above MP Trend for Location: 6b00078 and Reference Profile Set

Area Above MP Trend: Eroding at -0.924 m²/Year

Survey Date:
- 13/08/2007
- 16/02/2008
- 19/06/2008
- 14/02/2009
- 15/06/2009
- 13/02/2010
- 14/08/2010
- 12/02/2011
- 13/09/2011
- 11/02/2012
- 11/08/2012
- 09/02/2013
- 10/06/2013
- 08/02/2014
- 09/08/2014
- 07/02/2015

Graph shows changes in cross-sectional area over time, indicating erosion at a rate of -0.924 m²/year.

Legend:
- Yellow: Recycling Event
- Green: Area Above MP
- Gray: Area Trend
- Blue: Area Between MP & DP

SAIDS
Cross Sectional Area above MP Trend for Location: 6b00082 and Reference Profile Set

Area Above MP Trend: Eroding at -0.056 m²/Year

Survey Date:

Graph: Cross-Sectional Area Charts

Legend:
- Yellow: Recycling Event
- Green: Area Above MP
- Blue: Area Between MP & DP
- Light Green: Area Trend

Survey Unit 6bSU17

SAIDS
Survey Unit 6bSU17
Cross-Sectional Area Charts

Cross Sectional Area above MP Trend for Location: 6b00111 and Reference Profile Set

Area Above MP Trend Eroding at -1.909 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00113 and Reference Profile Set

Area Above MP Trend: Accreting at 0.197 m2/Year

Survey Date


Survey Unit 6bSU17
Cross-Sectional Area Charts
Cross Sectional Area above MF Trend for Location: 6b00116 and Reference Profile Set

Area Above MF Trend: Eroding at 1.051 m²/Year

Survey Date


Survey Unit 6bSU17
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00157 and Reference Profile Set

Area Above MP Trend: Accreting at 1.218 m²/Year

Survey Unit 6bSU18-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00172 and Reference Profile Set

Area Above MP Trend: Accreting at 2.042 m²/Year

Survey Date

Peach Area (m²)
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

Survey Unit 6bSU18-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00179 and Reference Profile Set

Area Above MP Trend: Accreting at 0.899 m²/Year

Survey Date


Pitch Area (m²)
Cross Sectional Area above MF Trend for Location: 6b00187 and Reference Profile Set

Area Above MF Trend: Accreting at 1.152 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00191 and Reference Profile Set

Area Above MP Trend Eroding at -0.346 m²/Year

Survey Date


- Recycling Event
- Area Above MP
- Area Trend
- Area Between MP & DP

SAIDS
Cross Sectional Area above MF Trend for Location: 6b00198 and Reference Profile Set

Area Above MF Trend: Eroding at -1.780 m²/Year

Survey Date


Peach Area (m²)
Cross Sectional Area above MF Trend for Location: 6b00209 and Reference Profile Set

Area Above MF Trend Eroding at -8.38 m²/Year

Survey Date

90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200


Yellow: Recycling Event  Orange: Area Above MF  Green: Area Trend  Blue: Area Between MF & DP

SAIDS
Area Above MP Trend: Eroding at -2.834 m²/Year

Survey Unit 6bSU18-1
Cross-Sectional Area Charts
Cross-Sectional Area above MP Trend for Location: 6b0C2'19 and Reference Profile Set

Area Above MP Trend: Eroding at -10.633 m²/Year

Survey Date

Survey Unit 6bSU18-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00221 and Reference Profile Set

Area Above MP Trend: Accreting at 4.863 m²/Year

Survey Unit 6bSU18-2
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00224 and Reference Profile Set

Area Above MP Trend Eroding at \(-0.540 \text{ m}^2/\text{Year}\)

Survey Date:


Areas:
- Yellow: Recycling Event
- Black: Area Above MP
- Green: Area Trend
- Blue: Area Between MP & DP
Cross Sectional Area above MP Trend for Location: 6b00228 and Reference Profile Set

Area Above MP Trend: Accreting at 0.526 m²/Year

Survey Date


Pebble Area (m²)
Cross Sectional Area above MP Trend for Location: 6b0c249 and Reference Profile Set

Area Above MP Trend Eroding at -2.520 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00252 and Reference Profile Set.

Area Above MP Trend: Eroding at -0.657 m²/Year.
Cross Sectional Area above MP Trend for Location: 6b00396 and Reference Profile Set

Area Above MP Trend: Accreting at 1.411 m²/Year

Survey Date
04/12/2007  03/12/2008  03/12/2009  03/1/2010  03/12/2011  02/12/2012  02/12/2013  02/12/2014

Survey Unit 6bSU20-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00397 and Reference Profile Set

Area Above MP Trend Eroding at -0.364 m²/Year

Survey Date:

- 04/12/2007
- 03/12/2008
- 03/12/2009
- 03/12/2010
- 03/12/2011
- 02/12/2012
- 02/12/2013
- 02/12/2014

Legend:
- Yellow: Recycling Event
- Green: Area Above MP
- Green Dash: Area Trend
- Blue Dash: Area Between MP & DP

Survey Unit 6bSU20-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00409 and Reference Profile Set

Area Above MP Trend: Accreting at 0.509 m²/Year

Survey Date

Area Trend

Area Between MP & DP

Recycling Event

04/12/2007  03/12/2008  03/12/2009  03/12/2010  03/12/2011  02/12/2012  02/12/2013  02/12/2014

Survey Unit 6bSU20-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00629 and Reference Profile Set

Area Above MP Trend: Eroding at -2.787 m²/Year

Survey Date:
- 18/06/2007
- 16/02/2008
- 15/08/2008
- 15/08/2009
- 14/02/2010
- 15/08/2010
- 13/02/2011
- 14/08/2011
- 12/02/2012
- 11/02/2013
- 11/08/2012
- 09/02/2013
- 10/08/2013
- 08/02/2014
- 09/08/2014

Graphical representation showing trends in cross-sectional area above the MP over time.
Cross Sectional Area above MF Trend for Location: 6b00574 and Reference Profile Set

Area Above MF Trend: Accreting at 0.775 m²/Year

Survey Date

Area Trend
Area Between MF & DP
Area Above MF
Recycling Event
Cross Sectional Area above MP Trend for Location: 6b00585 and Reference Profile Set

Area Above MP Trend: Accreting at 0.679 m²/Year

Survey Date:

Survey Unit 6bSU21-4
Cross-Sectional Area Charts
Cross-Sectional Area above MP Trend for Location: 6b00595 and Reference Profile Set

Area Above MP Trend: Accreting at 0.545 m²/Year

Survey Date


Survey Unit 6bSU21-4
Cross-Sectional Area Charts
Cross-sectional Area above MP Trend for Location: 6b00624 and Reference Profile Set

Area Above MP Trend: Accreting at 1.879 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00632 and Reference Profile Set

Area Above MP Trend Eroding at -0.223 m²/Year

Survey Dates:
- 18/06/2007
- 16/02/2008
- 16/08/2008
- 14/02/2009
- 15/08/2009
- 13/02/2010
- 14/08/2010
- 12/02/2011
- 13/08/2011
- 11/06/2012
- 11/06/2013
- 09/02/2014
- 09/06/2014

Legend:
- Yellow: Recycling Event
- Green: Area Above MP
- Light Green: Area Trend
- Blue: Area Between MP & DP
Cross Sectional Area above MF Trend for Location: 6b00648 and Reference Profile Set

Area Above MF Trend Eroding at -0.128 m²/Year

Survey Date


Survey Unit 6bSU21-5
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b00673 and Reference Profile Set

Area Above MP Trend: Accreting at 2.585 m²/Year
Cross Sectional Area above MP Trend for Location: 6b00676 and Reference Profile Set

Area Above MP Trend: Accriring at 2.636 m²/Year

Survey Date:

Survey Unit 6bSU21-6
Cross-Sectional Area Charts
Cross Sectional Area above MF Trend for Location: 6b00687 and Reference Profile Set

Area Above MF Trend Eroding at -2.953 m²/Year
Cross Sectional Area above MF Trend for Location: 6b00721 and Reference Profile Set

Area Above MF Trend: Accreting at 0.067 m²/Year

Survey Date

Area Above MF
Area Trend
Area Between MF & DP
Recycling Event

Survey Unit 6bSU21-8
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location 6b00725 and Reference Profile Set

Area Above MP Trend: Accreting at 0.015 m²/Year

Survey Date

16/06/2007 16/06/2008 14/06/2009 13/06/2010 14/06/2011 12/02/2012 12/06/2012 09/02/2013 10/02/2013 09/08/2014

Recycling Event Area Above MP Area Trend Area Between MP & DP

SAIDS
Survey Unit 6bSU25-2
Cross-Sectional Area Charts

Cross Sectional Area above MP Trend for Location: 6b01186 and Reference Profile Set

Area Above MP Trend: Accreting at 6.421 m²/Year

Survey Date

04/12/2007 03/12/2008 03/12/2009 03/12/2010 03/12/2011 02/12/2012 03/12/2013 02/12/2014

Survey Date


Peach Area (m²)

Recycling Event  Area Above MP  Area Trend  Area Between MP & DP
Profile Charts for Survey Unit 6bSU26-1
Cross Sectional Area above MP Trend for Location: 6b01220 and Reference Profile Set

Area Above MP Trend: Accreting at 27.480 m²/Year
Cross Sectional Area above MP Trend for Location 6b01227 and Reference Profile Set

Area Above MP Trend: Accreting at 19.278 m²/Year
Cross Sectional Area above MP Trend for Location: 6b01233 and Reference Profile Set

Area Above MP Trend: Accreting at 0.037 m²/Year
Survey Unit 6bSU26-1
Cross-Sectional Area Charts

Cross Sectional Area above MP Trend for Location: 6b01237 and Reference Profile Set

Area Above MP Trend: Accreting at 3.782 m²/Year
Cross Sectional Area above MP Trend for Location: 6b01243 and Reference Profile Set

Area Above MP Trend: Eroding at -6.035 m²/Year

Survey Date:
- 16/02/2008
- 16/08/2008
- 14/02/2009
- 15/09/2009
- 13/02/2010
- 14/08/2010
- 12/02/2011
- 11/08/2011
- 11/09/2012
- 10/02/2013
- 09/02/2014
- 09/06/2014
- 07/02/2015
Cross Sectional Area above MP Trend for Location: 6b01247 and Reference Profile Set

Area Above MP Trend: Eroding at -5.688 m²/year

Survey Date:
- 16/02/2008
- 16/08/2008
- 14/02/2009
- 15/09/2009
- 13/02/2010
- 14/05/2010
- 12/02/2011
- 11/09/2011
- 11/08/2012
- 09/02/2013
- 10/06/2013
- 09/06/2014
- 07/02/2015

Survey Unit 6bSU26-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b01253 and Reference Profile Set

Area Above MP Trend: Eroding at -8.387 m²/Year

Survey Date

Survey Unit 6bSU26-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b01257 and Reference Profile Set

Area Above MP Trend: Eroding at -0.620 m²/Year
Cross Sectional Area above MP Trend for Location: 6b01259A and Reference Profile Set

Area Above MP Trend: Eroding at -17.474 m²/Year
Cross Sectional Area above MP Trend for Location: 6b01267 and Reference Profile Set

Area Above MP Trend: Eroding at -1.2130 m²/Year
Cross Sectional Area above MP Trend for Location: 6b01268A and Reference Profile Set

Area Above MP Trend: Eroding at -15.636 m²/Year
Survey Unit 6bSU26-1
Cross-Sectional Area Charts

Cross Sectional Area above MF Trend for Location: 6b01277 and Reference Profile Set

Area Above MF Trend: Eroding at -11.803 m²/Year

Survey Date

Depth Area (m²)
355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525

Legend:
- Recycling Event
- Area Above MF
- Area Trend
- Area Between MF & DP

SAINDS
Cross Sectional Area above MF Trend for Location: 6b01283 and Reference Profile Set

Area Above MF Trend Eroding at -8.553 m²/Year

Survey Unit 6bSU26-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6b01298 and Reference Profile Set

Area Above MP Trend: Eroding at -7.944 m²/Year

Survey Date:

Survey Unit 6bSU26-1
Cross-Sectional Area Charts
Survey Unit 6bSU26-1
Cross-Sectional Area Charts

Cross Sectional Area above MP Trend for Location: 6b01315 and Reference Profile Set

Area Above MP Trend: Eroding at -15.058 m²/Year

Survey Date


Area Above MP
Area Trend
Area Between MP & DP
Recycling Event
Cross Sectional Area above MF Trend for Location: 6b0133B and Reference Profile Set

Area Above MF Trend Eroding at -2.185 m²/Year

Survey Unit 6bSU26-2
Cross-Sectional Area Charts
Cross Sectional Area above MF Trend for Location: 6b01342 and Reference Profile Set

Area Above MF Trend: Eroding at -6.866 m²/Year
Cross Sectional Area above MP Trend for Location: 6b01350 and Reference Profile Set

Area Above MP Trend: Eroding at -10.533 m²/Year
Cross Sectional Area above MF Trend for Location: 6b01354 and Reference Profile Set

Area Above MF Trend Eroding at -8.611 m^2/Year
Profiles: 6b01382

Level (m) vs Chainage (m)

- 2015-03-07
- 2014-03-04
- 2007-09-26
- Design Profile
- Master Profile
- Profile Envelope
Cross Sectional Area above MP Trend for Location: 6b01384 and Reference Profile Set

Area Above MP Trend: Eroding at -6.104 m²/Year
Cross Sectional Area above MP Trend for Location: 6601385 and Reference Profile Set

Area Above MP Trend: Eroding at -5140 m²/Year