South West Regional Coastal Monitoring Programme

Annual Survey Report
Start Point to Lizard Point
2016

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Start Point to Lizard Point

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### Checked By

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Profile Change Graphs* .............................................................................................................. CD
Cross-sectional Area Charts* ..................................................................................................... CD

* 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 have remained in a stable state following a period of recovery after the 2013/14 storm events. The percentage change in cross sectional area across the process cell is relatively small with only a minority of profiles experiencing significant gains or losses. Most profiles have also remained stable in shape experiencing only a minor redistribution of material. In many cases smaller scale features such as berms or platforms have been removed making the profile slope more uniform, although it is worth noting this may be due to localised short term weather and sea conditions and variations in survey date.

Since 2007 there has been a wide variability in both actual change and percentage change across the process cell. Many survey units have remained stable with minimal change occurring across all profiles in the unit. However, where more substantial change has occurred to a profile there is a trend for it to be matched by an opposite, but equal, change to a different profile in the same unit, suggesting a system of closed cells.

The repeat baseline for survey unit 6d6D2-7 (Carlyon Bay) has remained stable over the last year losing only 226m$^3$ of sediment and resulting in no net percentage change. A redistribution of sediment from the eastern to the western end is visible. Since 2007 the beach has gained 6,834m$^3$ of sediment leading to a net increase in beach volume of 2.3%. A trend for redistribution of sediment from either end of the beach to the central section is visible.

Between April 2015 and March 2016 four wave events occurred at the Looe Bay Directional Waverider Buoy that exceeded the 3.75m storm threshold. The predominant wave direction recorded at the buoy is from the southwest with smaller components recorded between 130° and 230°.
South West Regional Coastal Monitoring Programme

Annual Survey Report 2016 – Start Point to Lizard 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 2016.

Data are presented at the following levels:

- **Process Cell**
  - Process cell summary of percentage and actual profile change from Spring 2015 to Spring 2016.
  - Process cell summary of percentage and actual profile change from Baseline 2007 to Spring 2016.

- **Survey Unit**
  - Detailed beach profile change from Spring 2015 to Spring 2016.
  - Detailed beach profile change from Baseline 2007 to Spring 2016.
  - Topographic difference model change from Repeat Baseline 2015 to Repeat Baseline 2016 (where available).
  - Topographic difference model change from Baseline 2007 to Repeat Baseline 2016 (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 eighth report of a series and that changes identified are indicative only of relatively short-term trends.
Looe Bay Directional Waverider Buoy

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<th>Location</th>
<th>OS 228464 E 51550 N</th>
</tr>
</thead>
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</tr>
<tr>
<td></td>
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</tr>
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<td></td>
<td>Longitude: 04° 24.717' W</td>
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<tr>
<td>Water depth</td>
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</tbody>
</table>

Summary

During this reporting period from April 2015 to March 2016, four storms of typical magnitude for the site exceeded the 3.75m storm threshold. The largest storm on 06 February 2016 reached 5.02m $H_s$ at High Water, with a surge of over 0.5m. Whilst the largest individual event did not occur in December, this month had by far the largest average significant wave height of the reporting period. Bimodal seas were persistent throughout December and January.

Data Quality

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<th>Sample interval</th>
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Monthly Averages 2015/16

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<th>$T_p$ (s)</th>
<th>$T_z$ (s)</th>
<th>Dir. (°)</th>
<th>SST (°C)</th>
<th>No. of days</th>
<th>Bimodal seas (%)</th>
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<td>7.4</td>
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All times are GMT
Storm Analysis

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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. (°)</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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<td>0.25</td>
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</table>

Distribution plots

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

- Monthly time series of H$_s$ (red line is 3.75 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
- Percentage of occurrence of H$_s$, T$_p$, T$_z$ and Direction from April 2015 to March 2016
- Wave rose (percentage of occurrence of Direction vs. H$_s$) for all measured data

General

The buoy was deployed on 22 June 2009, at which time the magnetic declination at the site was 3.2° west, changing by 0.15° east per year.

Acknowledgements

The shore station for the Waverider is kindly hosted by the Maritime & Coastguard Agency. 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 is obtained from the nearest recording tide gauge (the National Network gauge at Devonport). 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.
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).

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 Start Point and Lizard 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 (2007 Baseline to 2016 Repeat Baseline).
- Topographic difference model map (2015 Repeat Baseline to 2016 Repeat 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 2015 to Spring 2016 and from Baseline 2007 to Spring 2016.

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.

\[
\frac{CSA_1 - CSA_2}{CSA_2} \times 100 \quad \text{eqn}(1)
\]

Where \( CSA_1 \) = most recent spring survey and \( CSA_2 \) = 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

\[
Vol_1 - Vol_2 \quad \text{eqn}(2)
\]

Where \( Vol_1 \) = most recent DTM model volume and \( Vol_2 \) = earlier DTM model volume. Therefore a net change of \(-19,730 m^3\) represents erosion since the earlier survey.
Topographic Survey Record

The table below gives the target and completion dates for topographic surveys between spring 2015 and the repeat baseline surveys of 2016.

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>Spring Interim Profile 2015</th>
<th>Post-Storm</th>
<th>Repeat Baseline 2015</th>
<th>Autumn Interim Profile 2015</th>
<th>Spring Interim Profile 2016</th>
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<td>17/02/2015</td>
<td>31/12/2015</td>
<td>10/09/2015</td>
<td>31/03/2016</td>
<td>23/01/2016</td>
</tr>
<tr>
<td>6d6D5-4</td>
<td>31/03/2015</td>
<td>17/02/2015</td>
<td>31/12/2015</td>
<td>09/09/2015</td>
<td>31/03/2016</td>
<td>23/01/2016</td>
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<tr>
<td>6d6D5-10</td>
<td>31/03/2015</td>
<td>17/02/2015</td>
<td>31/12/2015</td>
<td>28/10/2015</td>
<td>31/03/2016</td>
<td>08/02/2016</td>
</tr>
<tr>
<td>6d6D5-11</td>
<td>31/03/2015</td>
<td>17/02/2015</td>
<td>31/12/2015</td>
<td>29/10/2015</td>
<td>31/03/2016</td>
<td>08/02/2016</td>
</tr>
<tr>
<td>6d6D5-12</td>
<td>31/03/2015</td>
<td>20/02/2015</td>
<td>31/12/2015</td>
<td>29/10/2015</td>
<td>31/03/2016</td>
<td>09/02/2016</td>
</tr>
</tbody>
</table>
For the most recent survey schedules for each survey unit, please see [http://www.coastalmonitoring.org/southwest/survey_programme_schedule/](http://www.coastalmonitoring.org/southwest/survey_programme_schedule/)
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion

Erosion

No Change

> 30 m²

15 - 30 m²

5 - 15 m²

< 5 m²

15 - 30 m²

> 30 m²

0 10 20 km

Beach Change Summary - Spring 2015 to Spring 2016

SDADCAG & CISCAG
% Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

NDASCAG - Somerset

Beach Change Summary
Actual Change in Cross-sectional Area
(Baseline 2007 to Spring 2016)

- Survey Unit Boundary

---

Beach Change Summary - Baseline 2007 to Spring 2016

South West Regional Coastal Monitoring Programme

Annual Survey Report 2016

SDADCAG & CISCAG
### Survey Unit

<table>
<thead>
<tr>
<th>Local Name</th>
<th>6cSU28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salcombe</td>
<td></td>
</tr>
</tbody>
</table>

### Survey Types

<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 21/01/2015 - 13/01/2016</td>
<td>Over the last year, profile 6c00256 (North Sands) has remained stable. The two profiles on South Sands beach have shown an accumulation of sediment on the upper beach and a reduction seaward, most notably on profile 6c00265A.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Beach Change 19/05/2007 - 13/01/2016</td>
<td>Longer term, profiles 6c00256 (North Sands) and 6c00264 (South Sands) show a net gain in sediment of $39.5m^2$ and $21m^2$ respectively with accumulation occurring on the upper profile. Profile 6c00265A again shows an accumulation on the upper beach however, erosion lower down means there is no net percentage gain.</td>
</tr>
</tbody>
</table>

### Comments

19

### Observations Table

<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>
<td>6c00256</td>
<td>6.99</td>
<td>-8</td>
<td>39.51</td>
</tr>
<tr>
<td>6c00264</td>
<td>9.43</td>
<td>-5</td>
<td>21.13</td>
</tr>
<tr>
<td>6c00265A</td>
<td>11.52</td>
<td>4</td>
<td>-1.49</td>
</tr>
</tbody>
</table>
## Over the Past Year

Profile 6c00472A has lost 1% in cross-sectional area from the bottom of the seawall. Profile 6c00478A has gained 25 m$^2$ in sediment, spread across the whole profile, reducing the prominence of the topographic features and making the beach face more uniform.

## Over the Longer Term

Over the longer term, both profiles have gained material. The elevation has increased over the whole profile for 6c00472A; apart from in front of the seawall, leading to a net gain of 5%. Profile 6c00478A also shows an increase in material across the whole profile leading to a total gain of 8% and making the beach face more uniformly sloped.

### Survey Results

<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 (m$^2$)</td>
<td>% Change</td>
<td>CSA Diff (m$^2$)</td>
</tr>
<tr>
<td>6c00472A</td>
<td>-2.14</td>
<td>-1</td>
<td>12.39</td>
</tr>
<tr>
<td>6c00478A</td>
<td>25.97</td>
<td>5</td>
<td>37.51</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

- 6cSU30-2 - Hope Cove - Beach Change

SDADCAG - Devon
South West Regional Coastal Monitoring Programme

6cSU30-2 - Hope Cove - Beach Change

Annual Survey Report 2016

SDADCAG - Devon

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

Aerial Photography from 2012

Plymouth Coastal Observatory

Accretion
No Change
Erosion

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

MHW Elevation: 1.65 OD
MLW Elevation: -1.65 OD

- MHW 2016 - 03
- MHW 2014 - 04
- MHW 2012 - 03
- MHW 2009 - 10
- MHW 2008 - 04
- MHW 2007 - 03
- MLW 2016 - 03

Aerial Photography from 2012

0 50 100 m
Over the past year changes in cross-sectional area have been minimal, relative to the longer term trends. The two southernmost profiles, 6c00507 and 6c00509, both show a trend for accretion at the top of the profile and erosion further seaward. This trend is reversed on profile 6c00513 where much of the profile level is raised with two ledges being created. The three northern profiles: 6c00517, 6c00524 and 6c00526 appear very similar in shape and elevation apart from 6c00517 where the elevation has increase by up to 0.5m.

Since 2007 profile 6c00507 has remained stable in terms of overall cross-sectional area, however the profile has changed shape dramatically, as has profile 6c00509. Both have experienced large amounts of dune recession, with material being gained at the seaward extent of the profile to balance the sediment loss. The remaining profiles have all lost significant amounts of material since the original baseline, including 10m of dune recession along profile 6c00524.

Large losses have been observed at the back of the beach across the survey unit, with erosion and dune recession occurring as a result of the storms during the winter of 2013/14. *Profile 6c00526 was added in August 2014, a baseline to spring comparison can be made using data from the 2007 baseline survey.*
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

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

Accretion
No Change
Erosion

Aerial Photography from 2012
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

- Survey Unit Boundary
- Actual Change in Cross-sectional Area
- Survey Unit Boundary
- Actual Change in Cross-sectional Area
- Survey Unit Boundary
- Actual Change in Cross-sectional Area
- Survey Unit Boundary
- Actual Change in Cross-sectional Area

SDADCAG - Devon
Contours

MHW Elevation: 1.65 OD
MLW Elevation: -1.65 OD

- MHW 2016 - 03
- MHW 2014 - 04
- MHW 2012 - 01
- MHW 2009 - 02
- MHW 2008 - 04
- MLW 2016 - 03

Aerial Photography from 2012
Survey Unit | 6cSU31-1
Local Name | Bantham

### Observations

**Spring - Spring**
- **Survey Type:** Beach Change
- **Dates Surveyed:** 19/03/2015 - 12/02/2016
- **Observations:** Over the last year, profile 6c00574 has seen a movement of sediment landward from the seaward region, resulting in a 5% increase in total sediment. This trend also occurs on profile 6c00577, with sediment being eroded from the lower beach but with reduced accretion on the upper beach. This has led to a net loss of 101m² of sediment overall.

**Baseline - Spring**
- **Survey Type:** Beach Change
- **Dates Surveyed:** 29/08/2007 - 12/02/2016
- **Observations:** Since 2007, both profiles have gained material. Profile 6c00574 has seen an increase of 111m² whilst profile 6c00577 has gained 72m². The sediment has been gained in the middle section of the profile, whilst the lower section of the beach has seen a drop in elevation.

### Comments

#### Survey Unit Survey
- **Survey Type:** Spring to Spring
- **Dates Surveyed:** Mar 2015 – Feb 2016
- **Observations:**

<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>
<tr>
<td>6c00574</td>
<td>37.82</td>
<td>5</td>
<td>111.18</td>
</tr>
<tr>
<td>6c00577</td>
<td>-101.42</td>
<td>-10</td>
<td>72.48</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary
South West Regional Coastal Monitoring Programme

Annual Survey Report 2016

Contours

MHW Elevation: 1.65 OD
MLW Elevation: -1.65 OD

- MHW 2016 - 03
- MHW 2014 - 04
- MHW 2012 - 02
- MHW 2009 - 10
- MHW 2008 - 04
- MLW 2016 - 03

Contours map with aerial photography from 2012.
Annual Survey Report  
Start Point to Lizard Point 2016

Survey Unit  
6cSU31-2  
Local Name  
Bigbury-on-Sea

<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>20/03/2015 - 11/02/2016 In the short term, all profiles have seen an increase in cross-sectional area with the exception of 6c00592 which has experienced a significant decrease of 46%. A greater increase in elevation on the seaward regions of the profile relative to a smaller scale loss further landward on the profile has resulted in net increases in cross-sectional area for all other profiles.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Beach Change</td>
<td>01/09/2007 - 11/02/2016 Since 2007 all profiles have shown an increase in cross-sectional area ranging from 8m² for profile 6c00605 to 91m² for profile 6c00596. Along these profiles accretion has occurred on the lower beach, shallowing the slope. The one exception is profile 6c00592 which has lost 141m² of material and has experienced a drop in elevation across the beach profile.</td>
</tr>
</tbody>
</table>

<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>
<tr>
<td>6c00592</td>
<td>-244.02</td>
<td>-46</td>
<td>-141.68</td>
</tr>
<tr>
<td>6c00596</td>
<td>91.27</td>
<td>15</td>
<td>86.97</td>
</tr>
<tr>
<td>6c00603A</td>
<td>76.05</td>
<td>9</td>
<td>80.69</td>
</tr>
<tr>
<td>6c00605</td>
<td>8.45</td>
<td>2</td>
<td>29.76</td>
</tr>
</tbody>
</table>

Comments

In the short term, all profiles have seen an increase in cross-sectional area with the exception of 6c00592 which has experienced a significant decrease of 46%. A greater increase in elevation on the seaward regions of the profile relative to a smaller scale loss further landward on the profile has resulted in net increases in cross-sectional area for all other profiles. Since 2007 all profiles have shown an increase in cross-sectional area ranging from 8m² for profile 6c00605 to 91m² for profile 6c00596. Along these profiles accretion has occurred on the lower beach, shallowing the slope. The one exception is profile 6c00592 which has lost 141m² of material and has experienced a drop in elevation across the beach profile.
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

6cSU31-2 - Bigbury-on-Sea - Beach Change

SDADCAG - Devon

Aerial Photography from 2012

Actual Change in Cross-sectional Area

No Change

Erosion

Accretion

> 30 m²

15 - 30 m²

5 - 15 m²

> 15 m²

< 5 m²

± 50 m²

Annual Survey Report 2016

South West Regional Coastal Monitoring Programme

6c00605A (-1.7%)

6c00595 (4.4%)

6c00592 (-19%)

6c00593 (-19.3%)

6c00603 (-1%)

South West Regional Coastal Monitoring Programme
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

Accretion > 30 m²
Erosion > 30 m²
No Change

± 15 - 30 m²
± 5 - 15 m²
± < 5 m²
### Survey Unit
**6cSU31-3**  
**Local Name**  
**Challaborough**

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>20/03/2015 - 11/02/2016</td>
<td>Over the short-term, profile 6c00619 has lost 18.4m(^2) of material, equating to a 5% loss. This sediment has been lost from the very lowest seaward extent and upper section. The majority of the beach face has become more uniform but with a ledge being created at the top of the profile.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>01/09/2007 - 11/02/2016</td>
<td>Since the original baseline survey profile 6c00619 has increased in cross-sectional area by 13%. Material has accumulated in the middle section of the profile and been lost from the lower seaward extent, resulting in a net gain of 23.41m(^2).</td>
</tr>
</tbody>
</table>

### CSA Diff (m\(^2\)) and % Change

<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>6c00619</td>
<td>-18.41</td>
<td>23.41</td>
<td>-2.35</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

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

Accretion
No Change
Erosion

Aerial Photography from 2012

SDADCAG - Devon
### Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

<table>
<thead>
<tr>
<th>Change in Cross-sectional Area</th>
<th>Survey Unit Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 20 m²</td>
<td>No Change</td>
</tr>
<tr>
<td>15 - 30 m²</td>
<td>No Change</td>
</tr>
<tr>
<td>5 - 15 m²</td>
<td>No Change</td>
</tr>
<tr>
<td>&lt; 5 m²</td>
<td>No Change</td>
</tr>
<tr>
<td>&gt; 15 m²</td>
<td>Erosion</td>
</tr>
<tr>
<td>&lt; 15 m²</td>
<td>Erosion</td>
</tr>
<tr>
<td>&lt; 5 m²</td>
<td>Erosion</td>
</tr>
</tbody>
</table>

Schematic Diagram:

- **Survey Unit Boundary**: Indicates the area surveyed.
- **Accretion**: Increase in cross-sectional area.
- **Erosion**: Decrease in cross-sectional area.

Aerial Photography from 2012
Contours

MHW Elevation: 1.65 OD
MLW Elevation: -1.65 OD

- MHW 2016 - 03
- MHW 2014 - 04
- MHW 2012 - 03
- MHW 2009 - 10
- MHW 2008 - 04
- MLW 2016 - 03
### Survey Unit
- **Survey Unit:** 6cSU33
- **Local Name:** Wembury

### Observations Summary

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>22/01/2015 - 25/01/2016</td>
<td>Over the last year, profile 6c00992 has lost 7% of its total cross-sectional area. Whilst the upper beach has remained stable, or experienced accretion, in parts of the lower extent sediment has been lost, resulting in a net erosion of 24.44 m² in total.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>14/06/2007 - 25/01/2016</td>
<td>Since 2007 the profile has experienced a 4% decrease in cross-sectional area; the majority of which has occurred at the lower seaward extent. A small amount of accretion has occurred at the very top of the profile creating a small ledge and also in the middle section of the profile.</td>
</tr>
</tbody>
</table>

#### Comments

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### Cross-Sectional Area (CSA) Changes

<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>
<tr>
<td>6c00992</td>
<td>-24.44</td>
<td>-7</td>
<td>-12.29</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

- Survey Unit Boundary

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

- Accretion
- No Change
- Erosion

Aerial Photography from 2012

0 50 100 m
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>6cSU38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Name</td>
<td>Kingsand Cawsand</td>
</tr>
</tbody>
</table>

### Survey Type | Dates Surveyed | Observations
--- | --- | ---
Spring - Spring | Beach Change 22/01/2015 - 26/01/2016 | In the last year profiles 6c01297 and 6c01299 at Kingsand have lost 6% and 12% of their total cross-sectional area respectively, with the sediment specifically being lost from the bottom seaward extent, steepening the profile. Profiles 6c01304 and 6c01304A, at Cawsand, have remained stable in area and shape.

Baseline - Spring | Beach Change 15/06/2007 - 26/01/2016 | In the longer term, the same trend of erosion at Kingsand and accretion at Cawsand is visible albeit to at minimal levels. The shape of all profiles has remained stable with minimal loss or gain of sediment.

### Comments

### Table: CSA Diff (m²) % Change

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring Jan 2015 – Jan 2016</th>
<th>Baseline to Spring Mar 2007 – Jan 2016</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>
<tr>
<td>6c01297</td>
<td>-6.53</td>
<td>-6</td>
<td>-3.65</td>
</tr>
<tr>
<td>6c01299</td>
<td>-9.38</td>
<td>-12</td>
<td>-2.89</td>
</tr>
<tr>
<td>6c01304</td>
<td>2.44</td>
<td>1</td>
<td>5.43</td>
</tr>
<tr>
<td>6c01304A</td>
<td>-0.93</td>
<td>0</td>
<td>10.41</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

Accretion
Erosion
No Change

> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²

6c01304 (33%)
6c01304A (33%)
6c01293 (43%)
6c01297 (43%)
6c01302 (53%)
6c01302A (53%)
6c01301 (63%)
6c01301A (63%)
6c01300 (73%)
6c01300A (73%)
6c01299 (83%)
6c01295 (83%)
6c01306 (93%)
6c01306A (93%)
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>22/01/2015 - 21/03/2016</td>
<td>Since last year, the majority of profiles have shown very little change in percentage cross-sectional area. All profiles have shown less than 5% change overall. The shape of the beach in the eastern section (6d00278 – 6d00314) has remained stable with the exception of profile 6d00286 where the upper section has steepened and a berm has been created. Although the profiles in front of Seaton have remained stable in cross-sectional area, a redistribution of sediment has occurred. The 20m wide ledge at the top of the beach in profile 6d0318 has been raised with a steepening of the beach face. Along profile 6d00323 sediment has been redistributed from the top of the profile to the middle section, lowering the beach level by approximately 1m and moving the river 7m seaward.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>15/06/2007 - 21/03/2016</td>
<td>Again, over the longer term there has been little change in the cross-sectional area of the majority of profiles. All profiles have experienced a percentage change of 5% or less with 6d00301 the only exception experiencing a loss of 12%. Where sediment has been lost it has mainly occurred at the lower end of the profile sometimes exposing the underlying rock, such as in profile 6d00301. Where sediment has been gained there is a trend for it to be from the top of the profile overcoming a loss lower down and steepening the beach face.</td>
</tr>
</tbody>
</table>

### Comments

*Profiles 6d00278 to 6d00290 were added to the programme at the beginning of phase two. LiDAR data from February 2008 was used to provide profile data for longer term baseline comparison.*

### Cross-sectional Area Changes

<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>
<tr>
<td>6d00278</td>
<td>6.19</td>
<td>3</td>
<td>8.08</td>
</tr>
<tr>
<td>6d00282</td>
<td>4.43</td>
<td>1</td>
<td>-2.61</td>
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<tr>
<td>6d00286</td>
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<td>4.88</td>
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<tr>
<td>6d00290</td>
<td>0.22</td>
<td>0</td>
<td>16.04</td>
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<td>6d00296</td>
<td>3.91</td>
<td>2</td>
<td>-3.55</td>
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<tr>
<td>6d00298</td>
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<td>-37.76</td>
</tr>
<tr>
<td>6d00306</td>
<td>-1.54</td>
<td>-1</td>
<td>6.69</td>
</tr>
<tr>
<td>6d00310</td>
<td>-4.55</td>
<td>-3</td>
<td>-0.63</td>
</tr>
<tr>
<td>6d00314</td>
<td>6.05</td>
<td>3</td>
<td>-7.58</td>
</tr>
<tr>
<td>6d00318</td>
<td>5.53</td>
<td>1</td>
<td>-4.52</td>
</tr>
<tr>
<td>6d00323</td>
<td>-6.35</td>
<td>-2</td>
<td>5.86</td>
</tr>
</tbody>
</table>
South West Regional Coastal Monitoring Programme

Annual Survey Report 2016

Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion Erosion

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

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

Aerial Photography from 2012

CISCAG - Cornwall
Contours

MHW Elevation: 1.75 OD
MLW Elevation: -1.75 OD

- MHW 2016 - 02
- MHW 2014 - 05
- MHW 2012 - 03
- MHW 2011 - 01
- MHW 2010 - 01
- MHW 2009 - 01
- MHW 2008 - 02
- MLW 2016 - 02

Aerial Photography from 2012
Over the past year the cross-sectional area of all the profiles has varied by less than +/- 5%. The shape of the profiles has generally remained constant over this time; however, where sediment has been redistributed there is a trend for a very small offshore movement of material, lowering the top of the profile and elevating the bottom, such as in profiles 6d00429, 6d00427 and 6d00425.

Since 2007 all profiles have increased in percentage cross-sectional area, with the exception of 6d00410, which has remained constant. The majority of profiles have also maintained constant shape with only 6d00396 showing significant change and steepening.
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion
Erosion
No Change

> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)
Contours

MHW Elevation: 1.75 OD
MLW Elevation: -1.75 OD

- MHW 2016 - 02
- MHW 2014 - 05
- MHW 2012 - 02
- MHW 2011 - 01
- MHW 2010 - 01
- MHW 2009 - 01
- MHW 2008 - 02
- MLW 2016 - 02
Over the past year both profiles show the same trend for a loss of material from the upper profile and redistribution to the lower seaward section. For profile 6d00527 this results in a net gain of 3.4 m² whilst profile 6d00528 has experienced a net loss of 15 m².

Longer term, both profiles have lost 5% of their cross sectional area. This has predominantly been from the lower sections of both profiles.
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion
No Change
Erosion

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

Aerial Photography from 2012

0 50 100 m

CISCAG - Cornwall
Actual Change in Cross-sectional Area
(Baseline 2007 to Spring 2016)

Survey Unit Boundary

- Accretion
- No Change
- Erosion

Aerial Photography from 2012

0 50 100 m
## Survey Unit

| Local Name | 6d6D2-4 | Par Sands |

## Observations

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>01/02/2015 - 11/02/2016</td>
<td>Over the past year there has been minimal change in the percentage cross-sectional area with all profiles experiencing less than +/-5% change. The main morphodynamic changes have occurred at the lower seaward end of the profiles, most notably on profiles 6d00956 and 6d00965.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>20/03/2007 - 11/02/2015</td>
<td>In the long term, all profiles have gained material with a maximum of 7% increase in cross-sectional area occurring on profile 6d00960. As well as fluctuations on the lower beach, sediment accumulation has also occurred at the landward end of each of the profiles.</td>
</tr>
</tbody>
</table>

## Survey Details

<table>
<thead>
<tr>
<th>Survey</th>
<th>Dates</th>
<th>Change</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>Feb 2015 - Feb 2016</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Mar 2007 - Feb 2016</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
</tr>
<tr>
<td>Master Profile</td>
<td>Level (m)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<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>Feb 2015 - Feb 2016</td>
<td>Mar 2007 - Feb 2016</td>
<td>Level (m)</td>
</tr>
<tr>
<td>6d00952</td>
<td>-35.96</td>
<td>8.02</td>
<td>1</td>
</tr>
<tr>
<td>6d00956</td>
<td>18.46</td>
<td>18.19</td>
<td>1</td>
</tr>
<tr>
<td>6d00960</td>
<td>-6.38</td>
<td>70.23</td>
<td>7</td>
</tr>
<tr>
<td>6d00965</td>
<td>-30.14</td>
<td>62.15</td>
<td>6</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

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

Aerial Photography from 2012

CISCAG - Cornwall
South West Regional Coastal Monitoring Programme

Annual Survey Report 2016

CISCAG - Cornwall

Aerial Photography from 2012

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

No Change

Erosion

Accretion

< 5 m²

5 - 15 m²

15 - 30 m²

> 30 m²

200 m

400 m

0
Contours

MHW Elevation: 1.50 OD
MLW Elevation: -1.85 OD

- MHW 2016 - 02
- MHW 2014 - 05
- MHW 2013 - 04
- MHW 2011 - 01
- MHW 2009 - 10
- MHW 2008 - 01
- MLW 2016 - 02

Aerial Photography from 2012

0 100 200 m
### Observation Details

**Survey Unit:** 6d6D2-7  
**Local Name:** Carlyon Bay

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>02/02/2015 - 29/02/2016</td>
<td>Over the last year the most significant changes have occurred at the western end of the beach. In particular, profile 6d01018 has lost 56.83m³ of material, predominantly from the seaward extent of the profile. This pattern is replicated in profile 6d01022 to a lesser extent. The eastern half of the beach has generally seen an increase in elevation however the movement of the river feature can be misleading in statistics.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>18/03/2007 - 29/02/2016</td>
<td>Since 2007 four of the five profiles have decreased in cross-sectional area. To the west of the beach both the percentage and actual change increase westwards with a maximum of 50% decrease in cross-sectional area on profile 6d01026. This is, however, the area in closest proximity to the building developments. A large increase in cross-sectional area occurs at the eastern end of the beach, however, changes to profiles 6d01010 and 6d01014 are most likely due to the changing course of the river outflow.</td>
</tr>
<tr>
<td>Spring - Spring</td>
<td>09/04/2015 - 22/06/2016</td>
<td>Over the last year changes to the beach have been spatially patchy but numerically stable with the beach losing 226m³ of sediment with no percentage change. It appears there has been a movement of sediment westwards along the beach with opposing areas of erosion and accretion at either end of the lower beach. The most dynamic area is around the river outflow, however, this can be expected as it shifts position over time.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>18/03/2007 - 22/06/2016</td>
<td>Since 2007 the beach has remained stable losing only 2.3% of its volume. The beach can be split into three distinct sections. At the eastern end there is an area of erosion on the lower extent. In the middle section there is an area of accretion around the river outflow. At the western end there is a clear split around the stack, with accretion to the east and erosion to the west.</td>
</tr>
</tbody>
</table>

**Net sediment balance above MLWS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>-226m³</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>6,834m³</td>
</tr>
</tbody>
</table>

**Net sediment change**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>0%</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>+2.3%</td>
</tr>
</tbody>
</table>

**Comments**

Significant works have been carried out at this location over the last few years and as such profiles have changed in shape and length significantly. It is advised that the profile charts are consulted before making any further decisions based on these analyses.
<table>
<thead>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>6d01006</td>
<td>29.72</td>
<td>7</td>
<td>50.95</td>
<td>13</td>
<td>-2.45</td>
</tr>
<tr>
<td>6d01010</td>
<td>-29.08</td>
<td>-9</td>
<td>-12.46</td>
<td>-4</td>
<td>-2.45</td>
</tr>
<tr>
<td>6d01014</td>
<td>2.24</td>
<td>2</td>
<td>19.74</td>
<td>17</td>
<td>-2.45</td>
</tr>
<tr>
<td>6d01022</td>
<td>-13.68</td>
<td>-18</td>
<td>-15.41</td>
<td>-20</td>
<td>-2.45</td>
</tr>
<tr>
<td>6d01026</td>
<td>-17.27</td>
<td>-15</td>
<td>-95.48</td>
<td>-50</td>
<td>-2.45</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion
Erosion
No Change

Aerial Photography from 2012

0 110 220 m
Change in Elevation (m) Between April 2015 and June 2016

Model Extent

Erosion
No Change
Accretion

Change in Elevation (m)

-3 -2.5 -2 -1.5 -1 -0.5 -0.25 0.25 0.5 1 1.5 2 2.5 3

0 100 200 m

Aerial Photography from 2012

CISCAG - Cornwall
Change in Elevation (m) Between March 2007 and June 2016

Model Extent

Change in Elevation (m)

-3 -2.5 -2 -1.5 -1 -0.5 -0.25 0 0.25 0.5 0.75 1 1.5 2 2.5 3

EROSION NO CHANGE ACCRETION
Sediment Types

**7d7D2_7_seddist**

**FEATURE_CO**

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

Aerial Photography from 2012
Contours

MHW Elevation: 1.50 OD
MLW Elevation: -1.85 OD

- MHW 2016 - 02
- MHW 2014 - 05
- MHW 2012 - 09
- MHW 2011 - 01
- MHW 2009 - 10
- MHW 2008 - 01
- MLW 2016 - 02

Aerial Photography from 2012

0 75 150 m

N

6d6D2-7 - Carlyon Bay - MHW and MLW Contours

CISCAG - Cornwall
Over the past year all profiles have experienced a reduction in cross-sectional area. Profiles 6d0129 and 6d01233, at the northern and southern extremes of the beach, have lost greater than 10% of their total areas. The general trend across all profiles is that erosion has occurred in the upper sections and sediment has accumulated in the middle or lower sections.

Over the longer term, profiles 6d01219 and 6d01233 have again experienced the highest levels of erosion, losing 13% and 15% of their cross-sectional area’s respectively. Profiles 6d01220A and 6d01221 have both experienced long term accretion, increasing in cross-sectional area by 2% and 5% overall.

Profile 6d01220A was added after the 2014 storms. Data for this profile from 2007 has been added from LiDAR.
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

6d01220A (-3%)
6d01219 (-11%)
6d01221 (-8%)
6d01225 (-9%)
6d01229 (-2%)
6d01233 (-10%)

CISCAG - Cornwall

Aerial Photography from 2012

Accretion
No Change
Erosion

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

0 150 300 m
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

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

- 6d01220A (2%)
- 6d01221 (5%)
- 6d01225 (-9%)
- 6d01229 (-8%)
- 6d01233 (-15%)
- 6d01229 (-6%)
- 6d01233 (-15%)
- 6d01229 (-6%)
- 6d01225 (-9%)
- 6d01220A (2%)
## Survey Unit

### 6d6D2-15

### Local Name

**Portmellon Beach**

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>03/02/2015 - 15/03/2016</td>
<td>In the last year the profile has gained a very minimal amount of material along the upper section, resulting in a 1% increase in cross-sectional area.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>21/03/2007 - 15/03/2016</td>
<td>Since the baseline survey in 2007, the profile has gained material along the upper section and at the very seaward extent resulting in a 5% increase in cross-sectional area.</td>
</tr>
</tbody>
</table>

<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>
<tr>
<td>6d01291</td>
<td>0.79</td>
<td>1</td>
<td>7.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-2.35</td>
</tr>
</tbody>
</table>

### Comments

In the last year the profile has gained a very minimal amount of material along the upper section, resulting in a 1% increase in cross-sectional area. Since the baseline survey in 2007, the profile has gained material along the upper section and at the very seaward extent resulting in a 5% increase in cross-sectional area.
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

- Survey Unit Boundary

- No Change

- Erosion: > 30 m
  - 15 - 30 m
  - 5 - 15 m
  - < 5 m

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

Aerial Photography from 2013

0 30 60 m
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

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

Aerial Photography from 2012

0 30 60 m

CISCAG - Cornwall
Contours

MHW Elevation: 1.80 OD
MLW Elevation: -1.70 OD

- MHW 2016 - 02
- MHW 2014 - 04
- MHW 2012 - 03
- MHW 2011 - 01
- MHW 2009 - 10
- MHW 2009 - 02
- MHW 2008 - 02
- MLW 2016 - 02
Over the past year both profiles have experienced a net loss of sediment predominantly from the upper, landward, half of the profile. Specifically, the beach face has retreated by more than 10m on profile 6d01374, resulting in a total loss of 20.4m$^2$ of sediment and a more uniform slope.

Over the longer time period, both profiles have gained material over the entire profile lengths, resulting in increases in cross-sectional area of 7% and 5%.

LiDAR data from January 2008 was used to provide a baseline comparison for profile 6d01374.

<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 (m$^2$)</td>
<td>% Change</td>
<td>CSA Diff (m$^2$)</td>
</tr>
<tr>
<td>6d01374</td>
<td>-16.68</td>
<td>-5</td>
<td>20.36</td>
</tr>
<tr>
<td>6d01377</td>
<td>-4.31</td>
<td>-2</td>
<td>9.78</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

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

Aerial Photography from 2012

CISCAG - Cornwall
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

Accretion Erosion

No Change

< 5 m

5 - 15 m

15 - 30 m

> 30 m

6D01374 (7%)

6D01377 (5%)

LiDAR data used from Jan 2008 for baseline comparison with profile 6D01374.
### Survey Unit: 6d6D3-2
**Local Name:** Hemmick Beach

<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 06/02/2015 - 26/01/2016</td>
<td>Over the past year the profile's cross-sectional area has decreased by 2%, with losses occurring on the flat plateau at the top of the beach. The rest of the beach shape is unchanged.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Beach Change 23/03/2007 - 26/01/2016</td>
<td>Longer term the profile has gained 10.24 m² of material, leading to an increase of 3% in the cross-sectional area. This gain has again occurred on the upper flat section of the beach with the sloping face remaining stable.</td>
</tr>
</tbody>
</table>

### Profile

<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>
<tr>
<td>6d01477</td>
<td>-6.63</td>
<td>-2</td>
<td>10.24</td>
</tr>
</tbody>
</table>

---

82
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

- 6d01477 (5%)
- > 30 m²
- 15 - 30 m²
- 5 - 15 m²
- < 5 m²

No Change

Accretion

Erosion

Aerial Photography from 2012

0 50 100 m

South West Regional Coastal Monitoring Programme

CISCAG - Cornwall

Annual Survey Report 2016

6d6D3-2 - Hemmick Beach - Beach Change
Survey Unit: 6d6D3-4  
Local Name: Porthluney Cove

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td></td>
<td>Over the past year profile 6d01526 has lost 36.4 m$^2$ of material equating to a 7% decrease in cross-sectional area. The loss has occurred across the majority of the profile with the exception of the most seaward section. Profile 6d01528 has increased in cross-sectional area by 8% with gains occurring in concentrated sections across the entire length of the profile.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>23/03/2007 - 26/01/2016</td>
<td>Since 2007 both profiles have undergone a slight increase in cross-sectional area. This has occurred in concentrated areas across the entire length of the profile.</td>
</tr>
</tbody>
</table>

<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 (m$^2$)</td>
<td>% Change</td>
<td>CSA Diff (m$^2$)</td>
</tr>
<tr>
<td>6d01526</td>
<td>-36.37</td>
<td>-7</td>
<td>14.03</td>
</tr>
<tr>
<td>6d01528</td>
<td>29.74</td>
<td>8</td>
<td>17.72</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion

No Change

Erosion

> 30 m²

15 - 30 m²

< 5 m²

> 5 m²

5 - 15 m²

15 - 30 m²

> 30 m²

CISCAG - Cornwall
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

Accretion
No Change
Erosion

Aerial Photography from 2012

No Change

Accretion

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

0 75 150 m
In the last year, profile 6d01556 has increased in cross-sectional area by 15%. This accumulation of material has occurred in the middle section of the beach with the landward section in front of the seawall experiencing a decrease in elevation. Profile 6d01561 has lost only 1.8 m$^2$ of sediment maintaining a stable shape across the whole profile.

Since 2007, profile 6d01556 has lost 13% of its cross-sectional area. Material has been lost from the very seaward extent of the profile and the top of the profile in front of the seawall. Profile 6d01561 has lost 6% of its cross-sectional area with material predominantly being lost from the very seaward extent.

<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 (m$^2$)</td>
<td>% Change</td>
<td>CSA Diff (m$^2$)</td>
</tr>
<tr>
<td>6d01556</td>
<td>27.03</td>
<td>15</td>
<td>-29.93</td>
</tr>
<tr>
<td>6d01561</td>
<td>-1.83</td>
<td>-1</td>
<td>-11.99</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion
No Change
Erosion

Aerial Photography from 2012
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

<table>
<thead>
<tr>
<th>Change Category</th>
<th>Change Range</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accretion</td>
<td>&gt; 30 m²</td>
<td>Red</td>
</tr>
<tr>
<td>Erosion</td>
<td>&gt; 30 m²</td>
<td>Red</td>
</tr>
<tr>
<td>No Change</td>
<td>5 - 15 m²</td>
<td>Blue</td>
</tr>
<tr>
<td>Erosion</td>
<td>15 - 30 m²</td>
<td>Blue</td>
</tr>
<tr>
<td>Accretion</td>
<td>15 - 30 m²</td>
<td>Blue</td>
</tr>
<tr>
<td>No Change</td>
<td>&lt; 5 m²</td>
<td>Green</td>
</tr>
<tr>
<td>Erosion</td>
<td>&lt; 5 m²</td>
<td>Green</td>
</tr>
<tr>
<td>Accretion</td>
<td>&lt; 5 m²</td>
<td>Green</td>
</tr>
</tbody>
</table>

Aerial Photography from 2012

CISCAG - Cornwall
Over the past year all profiles, with the exception of 6d01750, have shown a reduction in cross-sectional area. The largest decrease occurs on the most western profile, 6d01754, where 35m² of material has been lost from the upper section, decreasing the berm height and shallowing the beach slope. At the eastern end of the beach sediment has been lost from the top of profile 6d01734 uncovering some of the underlying rock. Profiles in the middle section of the beach have remained stable in shape, showing a small but uniform decrease in elevation across the whole profile.

Since 2007 the eastern profiles (6d01734, 6d01738 and 6d01742) have all increased in cross-sectional area, with material being accumulated uniformly over the entirety of the profiles. Further west, profiles 6d01746 and 6d01750 have both reduced in cross-sectional area with losses occurring on the upper and lower sections of the profiles. The most western profile, 6d01754, has seen a loss of sediment at the very landward end of the profile and an increase in the middle section leading to a net gain of 9.9m² of material in total.

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>04/03/2015 - 10/02/2016</td>
<td>Over the past year all profiles, with the exception of 6d01750, have shown a reduction in cross-sectional area. The largest decrease occurs on the most western profile, 6d01754, where 35m² of material has been lost from the upper section, decreasing the berm height and shallowing the beach slope. At the eastern end of the beach sediment has been lost from the top of profile 6d01734 uncovering some of the underlying rock. Profiles in the middle section of the beach have remained stable in shape, showing a small but uniform decrease in elevation across the whole profile.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>18/03/2007 - 10/02/2016</td>
<td>Since 2007 the eastern profiles (6d01734, 6d01738 and 6d01742) have all increased in cross-sectional area, with material being accumulated uniformly over the entirety of the profiles. Further west, profiles 6d01746 and 6d01750 have both reduced in cross-sectional area with losses occurring on the upper and lower sections of the profiles. The most western profile, 6d01754, has seen a loss of sediment at the very landward end of the profile and an increase in the middle section leading to a net gain of 9.9m² of material in total.</td>
</tr>
</tbody>
</table>

<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>
<tr>
<td>6d01734</td>
<td>-5.37</td>
<td>-2</td>
<td>28.79</td>
</tr>
<tr>
<td>6d01738</td>
<td>-2.42</td>
<td>-1</td>
<td>59.95</td>
</tr>
<tr>
<td>6d01742</td>
<td>-14.13</td>
<td>-5</td>
<td>1.25</td>
</tr>
<tr>
<td>6d01746</td>
<td>-14.38</td>
<td>-5</td>
<td>-25.94</td>
</tr>
<tr>
<td>6d01750</td>
<td>2.65</td>
<td>1</td>
<td>-20.86</td>
</tr>
<tr>
<td>6d01754</td>
<td>-35.57</td>
<td>-10</td>
<td>9.96</td>
</tr>
</tbody>
</table>
Over the last year both profiles have shown minor changes in cross-sectional area. 6d01821 has remained stable over the majority of the profile, only losing a small amount of material from in front of the seawall. Profile 6d01835 has also remained stable with a small increase in material in front of the seawall.

Long term, profile 6d01821 has increased in cross-sectional area by 3% with material accumulating on the bottom half of the profile. Profile 6d01835 has increased its cross-sectional area by 37% with most sediment accumulating in the middle and lower sections, extending and raising the beach face.
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Aerial Photography from 2012

<table>
<thead>
<tr>
<th>Change</th>
<th>0 - 5 m²</th>
<th>&gt; 5 m² and ≤15 m²</th>
<th>&gt; 15 m² and ≤30 m²</th>
<th>&gt; 30 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accretion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Survey Unit Boundary

6d01821 (2.25%)
6d01835 (2.25%)
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

- 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

Aerial Photography from 2012
Over the last year both profiles have decreased in cross-sectional area. The upper and middle sections of the beach have remained stable, with material being lost from the lowest seaward sections, causing a steepening of the profile.

Over the longer term, both profiles have remained stable. Profile 6d02097 has lost a small amount of material from the bottom of the profile whilst Profile 6d02083 has seen a small movement of material landward resulting in no net percentage change.
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

- Accretion
- Erosion
- No Change

Aerial Photography from 2012

CISCAG - Cornwall
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>6d6D5-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Name</td>
<td>Maenporth</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>Beach Change: 12/02/2015 - 23/01/2016</td>
<td>In the last year the profile has remained stable only increasing in cross-sectional area by 1%</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Beach Change: 15/03/2007 - 23/01/2016</td>
<td>Since 2007 sediment has been redistributed from the middle section of the profile to the lower seaward section resulting in a net increase of 6%.</td>
</tr>
</tbody>
</table>

<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>CSA Diff (m²)</td>
<td>% Change</td>
<td>CSA Diff (m²)</td>
<td>% Change</td>
</tr>
<tr>
<td>6d02148</td>
<td>4.09</td>
<td>27.88</td>
<td>-2.11</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Aerial Photography from 2012

Accretion
No Change
Erosion

0 100 200 m

6d6D5-4 - Maenporth - Beach Change

CISCAG - Cornwall
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

6d02148 (6%)

Aerial Photography from 2012

Accretion
No Change
Erosion

0 100 200 m
> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²
15 - 30 m²
> 30 m²
Over the last year, both profiles have remained stable, varying in cross-sectional area by +/-1%. In general the movement of material has meant that the profiles have become more uniform across the beach face.

Since 2007 both profiles have again remained stable, gaining a small amount of material, predominantly at the very seaward extent of the beach, shallowing the beach face.

<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>17/02/2015 - 08/02/2016</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Beach Change</td>
<td>28/09/2007 - 08/02/2016</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>Beach Change</td>
<td>17/02/2015 - 08/02/2016</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Beach Change</td>
<td>28/09/2007 - 08/02/2016</td>
</tr>
</tbody>
</table>

<table>
<thead>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>6d02327</td>
<td>2.58</td>
<td>1</td>
<td>4.85</td>
<td>1</td>
<td>-2.3</td>
</tr>
<tr>
<td>6d02326</td>
<td>-3.26</td>
<td>-1</td>
<td>6.32</td>
<td>2</td>
<td>-2.3</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

<table>
<thead>
<tr>
<th>Change in Cross-sectional Area</th>
<th>No Change</th>
<th>Erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 30 m²</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>15 - 30 m²</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>&lt; 5 m²</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5 - 15 m²</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 15 - 30 m²</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Aerial Photography from 2012

CISCAG - Cornwall
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

- Survey Unit Boundary
- Accretion
- No Change
- Erosion

Aerial Photography from 2012

CISCAG - Cornwall
### Survey Unit

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>6d6D5-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Name</td>
<td>Porthoustock</td>
</tr>
</tbody>
</table>

### Survey Details

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>17/02/2015 – 08/02/2016</td>
<td>Over the last year there has been little change to the overall profile area. A large berm feature on the beach face has been eroded with a smaller one being created further landward.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>27/09/2007 – 08/02/2016</td>
<td>Since 2007 there has been minimal change to the total profile area, losing only 7.5m² of material. As in the spring-spring analysis the berm feature has been eroded with material being deposited at the seaward extent of the profile and forming a smaller berm feature further landward.</td>
</tr>
</tbody>
</table>

### Comments

106

### CSA Changes

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring (Feb 2015 – Feb 2016)</th>
<th>Baseline to Spring (Sept 2007 – Feb 2016)</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>
<tr>
<td>6d02372</td>
<td>-6.75</td>
<td>-1</td>
<td>-7.53</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

- Survey Unit Boundary

- Accretion
- No Change
- Erosion

Aerial Photography from 2012
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

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

Accretion
No Change
Erosion

Aerial Photography from 2012

0 50 100 m
<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>6d6D5-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Name</td>
<td>Coverack</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>23/02/2015 - 09/02/2016</td>
<td>Over the past year both profiles have undergone minimal change in cross-sectional area, with neither displaying any significant change in profile shape.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>20/03/2007 - 09/02/2016</td>
<td>Since 2007, both profiles have gained a substantial amount of material, increasing their cross-sectional areas by up to 36%. The addition of material is primarily seen on the seaward half of both profiles.</td>
</tr>
</tbody>
</table>

| Comments | |

<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>CSA Diff (m²)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% Change</td>
<td>% Change</td>
<td></td>
</tr>
<tr>
<td>6d02481</td>
<td>-6.03</td>
<td>43.45</td>
<td>-2.3</td>
</tr>
<tr>
<td>6d02485</td>
<td>4.24</td>
<td>54.31</td>
<td>36</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

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

No Change
- < 5 m²
- 5 - 15 m²

Erosion
- 15 - 30 m²
- > 30 m²

Aerial Photography from 2012

Survey Unit Boundary
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

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

Survey Unit Boundary

Aerial Photography from 2012

0 50 100 m
**Survey Unit** 6d6D5-14  
**Local Name** Kennack Sands

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Dates Surveyed</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring - Spring</td>
<td>08/03/2015 - 09/02/2016</td>
<td>Significant losses have occurred on the profile over the past year with a loss of 48m$^3$ of material; equating to a decrease in cross-sectional area of 17%. The material has been lost from the seaward half of the profile, with a drop in elevation of up to 1.5m.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>02/08/2007 - 09/02/2016</td>
<td>Since 2007 the profile has decreased in cross-sectional area by 15%, again this loss of material has primarily been from the seaward half of the profile.</td>
</tr>
</tbody>
</table>

**Profile**

<table>
<thead>
<tr>
<th></th>
<th>Spring to Spring Mar 2015 – Feb 2016</th>
<th>Baseline to Spring Aug 2007 – Feb 2016</th>
<th>Master Profile Level (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA Diff (m$^3$)</td>
<td>% Change</td>
<td>CSA Diff (m$^3$)</td>
<td>% Change</td>
</tr>
<tr>
<td>6d02639</td>
<td>-48.6 -17</td>
<td>-41.65 -15</td>
<td>-2.3</td>
</tr>
</tbody>
</table>
South West Regional Coastal Monitoring Programme

Annual Survey Report 2016

CISCAG - Cornwall

Aerial Photography from 2012

Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion
Erosion
No Change

> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²

6d6D5-14 - Kennack Sands - Beach Change

6d02639 (-17%)
Actual Change in Cross-sectional Area
(Baseline 2007 to Spring 2016)

Survey Unit Boundary

Accretion
No Change
Erosion

> 30 m²
15 - 30 m²
5 - 15 m²
< 5 m²

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

Aerial Photography from 2012

PLUMOUTH COASTAL OBSERVATORY

CISCAG - Cornwall
### Survey Unit

<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>Over the past year all three profiles have decreased in cross-sectional area with the percentage change reducing from east to west. The majority of the material on profile 6d02646 has been lost from the seaward end of the profile. Profile 6d02651 has gained material on the upper beach, however due to a loss of material at the seaward extent MLWS is reached ~40m further landward than previous surveys. Overall the profile has lost 24m² of material. Profile 6d02655 has lost a total of 14m² of material from the upper half of the beach.</td>
</tr>
<tr>
<td>Baseline - Spring</td>
<td>Beach Change</td>
<td>The longer term trends are the same as those observed over the past year.</td>
</tr>
</tbody>
</table>

### Profile Data

<table>
<thead>
<tr>
<th>Profile</th>
<th>Spring to Spring</th>
<th>Baseline to Spring</th>
<th>Master Profile</th>
<th>Level (m)</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>6d02646</td>
<td>-52.21</td>
<td>-13</td>
<td>-57.46</td>
<td>-13</td>
</tr>
<tr>
<td>6d02651</td>
<td>-24.02</td>
<td>-12</td>
<td>-24.17</td>
<td>-12</td>
</tr>
<tr>
<td>6d02655</td>
<td>-4.22</td>
<td>-2</td>
<td>-14.66</td>
<td>-5</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

Survey Unit Boundary

Accretion
Erosion
No Change

Aerial Photography from 2012

0 50 100 m
Survey Unit: 6d6D5-17
Local Name: Cadgwith

Survey Type | Dates Surveyed | Observations
---|---|---
Spring - Spring | Beach Change 11/03/2015 - 09/02/2016 | Over the last year the total cross-sectional area of both profiles has remained stable. Profile 6d02700A has seen an offshore migration of the previously present berm to the bottom of the profile.
Baseline - Spring | Beach Change 27/09/2007 - 09/02/2016 | Since 2007, the trends are similar to the year on year analysis. Profile 6d02700A has gained material at the seaward extent of the profile whilst 6d02701A has lost a small amount of material from the very landward extent.

Comments: Baseline data has been acquired from LiDAR flown in September 2007.

<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>
<tr>
<td>6d02700A</td>
<td>1.32</td>
<td>0</td>
<td>10.15</td>
</tr>
<tr>
<td>6d02701A</td>
<td>1.31</td>
<td>1</td>
<td>-1.68</td>
</tr>
</tbody>
</table>
Actual Change in Cross-sectional Area (Spring 2015 to Spring 2016)

Survey Unit Boundary

Accretion
No Change
Erosion

Aerial Photography from 2012

0 30 60 m
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2016)

- Survey Unit Boundary
- Accretion
- No Change
- Erosion

Aerial Photography from 2012

CISCAG - Cornwall
Cross Sectional Area above MP Trend for Location: 6c00256 and Reference Profile Set

Area Above MP Trend: Accreting at 3.511 m²/Year
Cross Sectional Area above MP Trend for Location: 6c00284 and Reference Profile Set

Area Above MP Trend: Accreting at 1.114 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 02/12/2015

Area (m²)
Cross Sectional Area above MP Trend for Location: 6c00265A and Reference Profile Set

Area Above MP Trend: Eroding at -0.281 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 02/12/2015

Area (m²)

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400

Recycling Event  Area Above MP  Area Trend
Cross Sectional Area above MP Trend for Location: 6c00478A and Reference Profile Set

Area Above MP Trend: Accreting at 2.653 m²/Year

Survey Unit 6cSU30-2
Cross-Sectional Area Charts

Survey Date

Area (m²)

04/12/2007 03/12/2008 03/12/2009 03/12/2010 03/12/2011 02/12/2012 02/12/2013 02/12/2014 02/12/2015

Recycling Event  Area Above MP  Area Trend

SANDS
Cross Sectional Area above MP Trend for Location: 6c00507 and Reference Profile Set

Area Above MP Trend: Accreting at 6.011 m²/Year
Cross Sectional Area above MP Trend for Location: 6c00517 and Reference Profile Set

Area Above MP Trend: Accreting at 5.201 m²/Year
Cross Sectional Area above MP Trend for Location: 6c00524 and Reference Profile Set

Area Above MP Trend: Accreting at 3.066 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  02/12/2015

Area (m²)
Cross Sectional Area above MP Trend for Location: 6c00526 and Reference Profile Set

Area Above MP Trend: Eroding at -0.723 m²/Year
Cross Sectional Area above MP Trend for Location: 6c00577 and Reference Profile Set

Area Above MP Trend: Accreting at 10.752 m²/Year

Survey Date

Area (m²)

04/12/2007 03/12/2008 03/12/2009 03/12/2010 03/12/2011 02/12/2012 02/12/2013 02/12/2014 02/12/2015

Survey Unit 6cSU31-1
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6c00603A and Reference Profile Set

Area Above MP Trend: Accreting at 5.569 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 02/12/2015

Area (m²)

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850

Survey Unit 6cSU31-2
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6c00619 and Reference Profile Set

Area Above MP Trend: Accreting at 3.748 m²/Year
Cross Sectional Area above MP Trend for Location: 6c00992 and Reference Profile Set

Area Above MP Trend: Accreting at 0.377 m²/Year
Cross Sectional Area above MP Trend for Location: 6c01297 and Reference Profile Set

Area Above MP Trend: Accreting at 0.295 m²/Year
Cross Sectional Area above MP Trend for Location: 8c01299 and Reference Profile Set

Area Above MP Trend: Accreting at 0.140 m²/Year
Cross Sectional Area above MP Trend for Location: 8c01304 and Reference Profile Set

Area Above MP Trend: Accreting at 0.500 m²/Year
Cross Sectional Area above MP Trend for Location: 6c01304A and Reference Profile Set

Area Above MP Trend: Accreting at 1.393 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  02/12/2015

Area (m²)
Cross Sectional Area above MP Trend for Location: 6d00298 and Reference Profile Set

Area Above MP Trend: Eroding at -0.444 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 02/12/2015

Area (m²)
Cross Sectional Area above MP Trend for Location: 6d00310 and Reference Profile Set

Area Above MP Trend: Accreting at 0.294 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00314 and Reference Profile Set

Area Above MP Trend: Eroding at -5.331 m²/Year

Survey Dates:
- 04/12/2007
- 03/12/2008
- 03/12/2009
- 03/12/2010
- 03/12/2011
- 02/12/2012
- 02/12/2013
- 02/12/2014
- 02/12/2015

Area (m²):
- 580
- 520
- 480
- 440
- 400
- 360
- 320
- 280
- 240
- 200
- 160
- 120
- 80
- 40
- 0

Legend:
- Yellow: Recycling Event
- Black: Area Above MP
- Gray: Area Trend
Cross Sectional Area above MP Trend for Location: 6d00318 and Reference Profile Set

Area Above MP Trend: Accreting at 0.455 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00323 and Reference Profile Set

Area Above MP Trend: Accreting at 5.702 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00402 and Reference Profile Set

Area Above MP Trend: Accreting at 1.549 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00410 and Reference Profile Set

Area Above MP Trend: Accreting at 0.115 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00414 and Reference Profile Set

Area Above MP Trend: Accreting at 1.359 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
- 02/12/2015

Area (m²):
- 0
- 20
- 40
- 60
- 80
- 100
- 120
- 140
- 160
- 180
- 200
- 220
- 240
- 260
- 280
- 300
- 320
- 340
- 360
- 380
- 400
- 420
- 440
- 460
Cross Sectional Area above MP Trend for Location: 6d00425 and Reference Profile Set

Area Above MP Trend: Accreting at 2.995 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00427 and Reference Profile Set

Area Above MP Trend: Accreting at 2.686 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00429 and Reference Profile Set

Area Above MP Trend: Accreting at 3.177 m²/Year
Cross Sectional Area above MP Trend for Location: 6d00528 and Reference Profile Set

Area Above MP Trend: Eroding at -1.977 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 02/12/2015

Survey Unit 6d6D1-8
Cross-Sectional Area Charts

SANDS
Cross Sectional Area above MP Trend for Location: 6d00060 and Reference Profile Set

Area Above MP Trend: Accreting at 8.758 m²/Year

Survey Unit 6d6D2-4
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6d01006 and Reference Profile Set

Area Above MP Trend: Accreting at 4.674 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01010 and Reference Profile Set

Area Above MP Trend: Eroding at -0.369 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01014 and Reference Profile Set

Area Above MP Trend: Accreting at 0.893 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01018 and Reference Profile Set

Area Above MP Trend: Accreting at 1.083 m²/Year

Survey Date

- Recycling Event
- Area Above MP
- Area Trend

SANDS
Cross Sectional Area above MP Trend for Location: 6d01022 and Reference Profile Set

Area Above MP Trend: Eroding at -1.601 m²/Year

Survey Unit 6d6D2-7
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6d01026 and Reference Profile Set

Area Above MP Trend: Eroding at -7.595 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 02/12/2015

Area (m²)
Cross Sectional Area above MP Trend for Location: 6d01219 and Reference Profile Set

Area Above MP Trend: Eroding at -1.248 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 02/12/2015

Area (m²)
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1,000 1,050 1,100 1,150 1,200 1,250 1,300 1,350 1,400
Cross Sectional Area above MP Trend for Location: 6d01221 and Reference Profile Set

Area Above MP Trend: Accretion at 4.570 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01229 and Reference Profile Set

Area Above MP Trend: Eroding at -3.319 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 02/12/2015

Area (m2)
1,400
1,350
1,300
1,250
1,200
1,150
1,100
1,050
1,000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
Cross Sectional Area above MP Trend for Location: 6d01233 and Reference Profile Set

Area Above MP Trend: Eroding at -8.840 m²/Year

Survey Unit 6d6D2-13
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6d01291 and Reference Profile Set

Area Above MP Trend: Accreting at 1.137 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01374 and Reference Profile Set

Area Above MP Trend: Accreting at 2.906 m²/year
Cross Sectional Area above MP Trend for Location: 6d01377 and Reference Profile Set

Area Above MP Trend: Accreting at 0.440 m²/Year
Cross sectional area above MP trend for location: 6d01477 and reference profile set.

Area above MP trend: Eroding at -1.966 m²/year.
Cross Sectional Area above MP Trend for Location: 6d01526 and Reference Profile Set

Area Above MP Trend: Eroding at -0.894 m²/Year

Survey Date

Survey Unit 6d6D3-4
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6d01528 and Reference Profile Set

Area Above MP Trend: Eroding at -1.063 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01556 and Reference Profile Set

Area Above MP Trend: Eroding at -4.015 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01561 and Reference Profile Set

Area Above MP Trend: Eroding at -0.859 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01734 and Reference Profile Set

Area Above MP Trend: Accreting at 1.057 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01738 and Reference Profile Set

Area Above MP Trend: Accreting at 3.226 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01746 and Reference Profile Set

Area Above MP Trend: Eroding at -2.663 m²/Year
Cross Sectional Area above MP Trend for Location: 6d01750 and Reference Profile Set

Area Above MP Trend: Eroding at -0.840 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 02/12/2015

Area (m²)

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

Survey Unit 6d6D3-10
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6d01754 and Reference Profile Set

Area Above MP Trend: Eroding at -4.837 m²/Year

Survey Unit 6d6D3-10
Cross-Sectional Area Charts
Cross Sectional Area above MP Trend for Location: 6d01835 and Reference Profile Set

Area Above MP Trend: Accreting at 4.788 m²/Year
Cross Sectional Area above MP Trend for Location: 6d02083 and Reference Profile Set

Area Above MP Trend: Accreting at 0.884 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
- 02/12/2015

Area (m²):
- 520
- 500
- 480
- 460
- 440
- 420
- 400
- 380
- 360
- 340
- 320
- 300
- 280
- 260
- 240
- 220
- 200
- 180
- 160
- 140
- 120
- 100
- 80
- 60
- 40
- 20
- 0
Cross Sectional Area above MP Trend for Location: 6d02148 and Reference Profile Set

Area Above MP Trend: Accreting at 0.602 m²/Year

- Survey Date
- Area (m²)

[Graph showing data points and trend]
Cross Sectional Area above MP Trend for Location: 6d02326 and Reference Profile Set

Area Above MP Trend: Accreting at 0.899 m²/Year
Cross Sectional Area above MP Trend for Location: 6d02372 and Reference Profile Set

Area Above MP Trend: Eroding at -0.567 m²/Year
Cross Sectional Area above MP Trend for Location: 6d02485 and Reference Profile Set

Area Above MP Trend: Accreting at 5.586 m²/Year
Cross Sectional Area above MP Trend for Location: 6d02S46 and Reference Profile Set

Area Above MP Trend: Eroding at 6.231 m²/year
Cross Sectional Area above MP Trend for Location: 6d02651 and Reference Profile Set

Area Above MP Trend: Eroding at -1.984 m²/Year
Cross Sectional Area above MP Trend for Location: 6d02655 and Reference Profile Set

Area Above MP Trend: Eroding at -0.910 m²/Year