ANNUAL SURVEY REPORT

Lizard Point to Land’s End

2011

AR 18
Cover Photograph: Plymouth Sound, December 2009
Taken by N. Sykes, Plymouth Coastal Observatory.
Southwest Strategic Regional Coastal Monitoring Programme

Annual Report 2011 – Lizard Point to Land’s End

1. Introduction

Analysis presented in this report provides an overview of beach changes and wave and tidal measurements since the commencement of the Southwest Strategic Regional Coastal Monitoring Programme. The first beach surveys took place during the spring of 2007 and changes are reported until spring 2011. This provides a short time base over which beach changes have been monitored. Detailed interpretation and decision-making is not advisable on the basis of these short-term changes, since the changes may not be representative of longer-term trends.

Data are presented at several levels:

- Process cell summary of percentage and actual profile change from 2010 to 2011
- Process cell summary of percentage and actual profile change from 2007 to 2011
- Detailed beach profile change from 2010 to 2011
- Detailed beach profile change from 2007 to 2011
- Change in position of Mean High Water
- Time series of beach profile graphs (on CD)
- Trend analysis of beach cross-sectional area (on CD)

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.

It must be noted that the colour coded lines are based on actual change as opposed to percentage change as is the case with similar reports published by the South East Regional Coastal Monitoring Programme. Percentage change is displayed in brackets following the profile name on each line.

Difference models have been produced where there are at least two baseline surveys to compare. In addition, the most recent LiDAR data has been used to extract the level of Mean High Water (MHW) from each management unit.

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 1m$^2$ 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.

Beach recycling maps have been produced from information provided by the Local Authority for all applicable sites.

It must be emphasised that this is only the third report of a series and that changes identified are indicative only of short-term trends. As the programme progresses, more detailed and meaningful reporting will be possible and this report should be treated accordingly.

2. **Hydrodynamic data**

   a. **Waves**
      
      A Directional WaveRider buoy was deployed at Penzance on the 7th April 2007.
      
      The full wave report is given at Annex A.

   b. **Tides**
      
      There are no Regional Monitoring Programme tide gauges between Lizard Point and Land’s End.

3. **Survey data – topographic**

   Over the past year there has been a mixture of erosion and accretion occurring over the sub-cell. Change appears much stronger in the east, with accretion being the most dominant condition. There are some sporadic pockets of erosion along the coastline stretching from Loe Bar to Porthleven. In the long term significant accretion dominates much of the east; the only exception is the coastline between Gunwalloe Cove and Porthleven which has undergone significant erosion.

   Dates of surveys are shown in Annex E and the detailed topographic survey report is given at Annex F.

4. **Survey data – bathymetric**

   The first baseline bathymetric surveys for Lizard Point to Land’s End were conducted in 2008. No further analysis will be carried out until after the next baseline survey in phase 2.

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<thead>
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<th>Annex</th>
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Explanatory Notes
## South West Regional Coastal Monitoring Programme
### Field Data Collection - CISCAG
#### Topographic and Bathymetric Data

<table>
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<tr>
<th>Sub-cell</th>
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**Key:**
- Green: Completed on time and accepted
- Red: Overdue
- Grey: Will not be surveyed

*Note: The table contains dates for each completion.*
Annex F – Topographic Survey Report for Lizard Point to Lands End

1. Introduction

Analysis has been conducted for those sites where a minimum of four surveys have been recorded. In general, changes are measured relative to the Mean Low Water Springs (MLWS) level.

A full time series of plotted beach profiles are shown superimposed and relative to a Master Profile for each profile location (on the accompanying CD). The Master Profile provides the basis for calculation of beach cross-section area changes. Where possible, identical depth boundaries have been used for all profiles within a Management 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](image-url)
As part of the monitoring programme specification, each management unit receives a full topographic baseline survey once every 5 years, with the exception of BMP sites which receive an annual baseline. 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.

Where there are at least two baseline surveys for each management unit a topographic difference model has been produced based on the spot height elevations. The raw spot height data has been processed into a grid model and successive models have been subtracted from one another to produce a difference model for the management unit. The spot height data from each survey has also been used to approximate the level of Mean High Water (MHW) and MLW along each management unit. In some cases, where there is no topographic baseline data collected on foot the information described above may be derived from lidar data.
2. **Condition of process sub-cell**

The Beach Change Summary maps contain an at-a-glance condition of the whole of the Lizard Point to Land’s End, with the lines representing the average accretion, no change or erosion for each Management Unit where there is topographic data.

3. **Condition of individual management units**

Changes within each management unit are summarised on five maps: Beach change map (Spring to Spring), beach change map (Baseline to Spring), topographic difference model map (Baseline to BMP), Mean High Water line and Ecological mapping maps. Beach Change maps show the location of each beach profile, superimposed on an aerial photograph (note that the line has been extended for clarity). Where possible, the annual change in cross-sectional area has been calculated from spring 2009 to spring 2011 and from baseline 2007 to spring 2011.

**6eMU3-2 Mullion**

**Spring 2010 to Spring 2011**
The profile within Mullion Cove has seen no notable changes within the last year.

**Baseline 2007 to Spring 2011**
There has been no overall change in the profile since 2007.

**6eMU3-4 Poldhu Cove**

**Spring 2010 to Spring 2011**
Although both profiles have gained material profile 6e00207 has gained the most over the past year.

**Baseline 2007 to Spring 2011**
Both extended profiles have experienced significant accretion. The MLWS locations of both profiles have extended roughly 100 metres seaward since the baseline survey.

**6eMU3-6 Church Cove**

**Spring 2010 to Spring 2011**
Both profiles have high levels of accretion. Over the past year both profiles have gained material.

**Baseline 2008 to Spring 2011**
Over the three year period there has been significant accretion. The short baseline profile length helps to explain the high percentage change for profile 6e00261.

**6eMU4-2 Gunwalloe Cove**

**Spring 2010 to Spring 2011**
Over the last year the profile has gained 9% of its CSA.
Baseline 2007 to Spring 2011
There has been significant erosion of the profile over the past four years, losing 14% of its CSA.

6eMU4-3 Gunwalloe

Spring 2010 to Spring 2011
The profiles at the edges of the management unit have gained material over the past year. In contrast profile 6e00329 in the middle of the management unit has lost material.

Baseline 2007 to Spring 2011
All profiles in this management unit have lost material over the four year period, with most loss occurring along profile 6e00329 in the middle of the management unit.

6eMU4-4 Loe Bar

Spring 2010 to Spring 2011
Small but significant changes have occurred over the last year, with profile 6e00354 to the South East gaining material and profile 6e00358 to the North West losing material. Profile 6e00356 in the middle of the management unit has remained stable.

Baseline 2007 to Spring 2011
The changes have been small but significant since the baseline 2007 survey with profile 6e00356 showing a gain in material. The remaining two profiles show overall loss.

Topographic difference model changes 2007 - 2010
The back of the barrier beach has remained stable. Regular patches of accretion and erosion can be seen along the crest of the beach. There is a small strip of no change running mid-way along the beach face, which leads onto an increasing loss of material over towards the seaward limit.

Net Sediment Balance above MLWS from 2007 to 2010: -13,868 m³

6eMU4-5 Porthleven Sands

Spring 2010 to Spring 2011
Profile 6e00317 has gained material over the past year. The other profile lines in the management unit have remained stable.

Baseline 2007 to Spring 2011
Accretion has occurred along all of the profiles. Percentages may be exaggerated due to the short length of the profiles here.

6eMU4-6 Porthleven

Spring 2010 to Spring 2011
Over the last year both profiles have gained material.
**Baseline 2007 to Spring 2011**

Over the last four years both profiles have significantly gained material. Percentages may be exaggerated due to the short length of the profile lines.

**6eMU6-2 Praa Sands**

**Spring 2010 to Spring 2011**

Profile 6e00517 has gained a small but significant amount of material over the past year. Profile 6e00527 has remained stable.

**Baseline 2007 to Spring 2011**

Both profiles have experienced a significant gain in material over the four year period.

**Topographic difference model 2007 - 2010**

Accretion is generally seen throughout the low toe terrace, with a strip of no change mainly along the beach toe. Material has been lost from the back of the beach around the mid part of the management unit. To the east there is a clear pattern of erosion/accretion/erosion/accretion moving towards the back of the beach. Material has been gained further towards the back of the beach at the far west end of the management unit.

*Net Sediment Balance above MLWS from 2007 to 2010: +15,451 m³*

**6eMU6-3 Praa Sands**

**Spring 2010 to Spring 2011**

Material has been gained on both profiles, with the western most profile gaining more.

**Baseline 2007 to Spring 2011**

Significant accretion is observed along both profiles.

**Topographic difference model 2007 - 2010**

Accretion is dominant in the east of the management unit, with some patches of accretion further along the seaward edge. Some erosion can be seen in the north western corner of the model extent, with the remainder of the management unit appearing to be stable.

*Net Sediment Balance above MLWS from 2007 to 2010: +7,630 m³*

**6eMU8-2 Perran Sands**

**Spring 2010 to Spring 2011**

Over the past year, profile 6e00648 towards the west of the management unit has gained material. Profile 6e00645 in the east has remained stable.

**Baseline 2007 to Spring 2011**

Since the initial baseline survey both profiles have seen a significant increase in material.
6eMU9-2 Little London

**Spring 2010 to Spring 2011**
The profiles located on Little London beach have experienced both erosion and accretion, with accretion in the east and erosion in the west. Erosion can also be observed along profile 6e00708 parallel to the causeway in the east.

**Baseline 2007 to Spring 2011**
The same pattern as seen over the last year is apparent over the longer term period, but with increased levels of erosion. The amount of material gained and lost on Little London was 18m² for each profile.

6eMU10-1 Marazion

**Spring 2010 to Spring 2011**
All of the profiles with the exception of profile 6e00743 have lost material over the past year. Profile 6e00743 has gained material.

**Baseline 2007 to Spring 2011**
Over the longer term period, profiles 6e00743 and 6e00747 have gained and lost material, respectively. Profile 6e00739 has lost a small but significant amount. Profile 6e00734 has remained stable.

6eMU10-2 Mounts Bay

**Spring 2010 to Spring 2011**
Most profiles in this management unit have remained stable over the past year. Profile 6e00757 at the far end of the management unit has gained material and 6e00810 towards the west has lost material.

**Baseline 2007 to Spring 2011**
The majority of profiles have undergone accretion or no change; two profiles have lost material.

6eMU11 Newlyn

**Spring 2010 to Spring 2011**
There have been no major changes over the last year.

**Baseline 2007 to Spring 2011**
The management unit has changed little over the past four years, with the exception of profile 6e00861 in the middle of the management unit which has gained material.
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 springtime 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 Calculation

The value derived from this calculation represents the volume change in m³ across each individual management unit over time. The initial volumes are derived from the Digital Terrain Models 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 \(-19730\text{m}^3\) represents erosion since the earlier survey.
% Change in Cross-Sectional Area

Annual % Change in Cross-sectional Area (Spring 2010 to Spring 2011)

- **Accretion**:
  - > 30%
  - 15 - 30%
  - 5 - 15%
  - Less than 5%

- **Erosion**:
  - 15 - 30%
  - > 30%

No Change:
- 5 - 15%
- Less than 5%

MU boundary:

Actual Annual Change in Cross-sectional Area ($m^2$)
Actual Change in Cross-Sectional Area

**Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)**

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

**MU boundary**

**Actual Annual Change in Cross-sectional Area (m²)**

- 7d01323 (3)
% Change in Cross-Sectional Area

Annual % Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

- **Accretion**
  - > 30 %
  - 15 - 30 %
  - 5 - 15 %
  - Less than 5 %

- **Erosion**
  - 5 - 15 %
  - 15 - 30 %
  - > 30 %

No Change

MU boundary

Actual Annual Change in Cross-sectional Area (m²)

Beach Change Summary - Baseline 2007 to Spring 2011

CISCAG - Cornwall
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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

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

**No Change**

**Annual Change in Cross-sectional Area (%)**

- 7d01323 (3 %)

Aerial Photography from 2009

6eMU3-2 - Mullion - Beach Change

CISCAG - Cornwall
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

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

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

**Annual Change in Cross-sectional Area (%)**

- 7d01323 (3 %)

- 6e00202 (3%)

**MU boundary**

Aerial Photography from 2009
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

CISCAG - Cornwall

Contours

MHW Elevation: 1.85 OD
MLW Elevation: -1.65 OD

- MHW 2010 - 10
- MHW 2007 - 09
- MLW 2010 - 10

Contour Maps

Aerial Photography from 2009
Ecological Mapping

See Separate Map for Legend
Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

- **Accretion**:
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²
- **No Change**:
  - Less than 5 m²
  - 5 - 15 m²
  - 15 - 30 m²
- **Erosion**:
  - > 30 m²

Annual Change in Cross-sectional Area (%): 7d01323 (3 %)

 MU boundary

Aerial Photography from 2009

Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011):
- 6e00251 (6 %)
- 6e00248 (17 %)

6eMU3-4 - Poldhu Cove - Beach Change

CISCAG - Cornwall
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

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

- **Erosion**
  - Less than 5 m²
  - 5 - 15 m²
  - 15 - 30 m²
  - > 30 m²

<table>
<thead>
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<th>MU boundary</th>
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<tbody>
<tr>
<td>7d01323 (3 %)</td>
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</table>

Annual Change in Cross-sectional Area (%)

- 6e00251 (13%)
- 6e00248 (97%)
- 6e00251 (13%)

Aerial Photography from 2009
Contours

MHW Elevation: 1.85 OD
MLW Elevation: -1.65 OD

- MHW 2010 - 10
- MHW 2007 - 09
- MLW 2010 - 10

Aerial Photography from 2009
### Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

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<td>Less than 5 m²</td>
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**MU boundary**

- **7d01323 (3%)**

**Annual Change in Cross-sectional Area (%)**

- **Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)**

- **6eMU3-6 - Church Cove - Beach Change**

**CISCAG - Cornwall**

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**Aerial Photography from 2009**

- **05 0 1 0 0 m**

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Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

Contours

MHW Elevation: 1.85 OD
MLW Elevation: -1.65 OD

- MHW 2010 - 10
- MHW 2007 - 09
- MLW 2010 - 10

Aerial Photography from 2009

± 50 100 m
Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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

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

- **No Change**

**Annual Change in Cross-sectional Area (%)**

- 7d01323 (3 %)

**Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)**

- 6e00313 (5.4)

**MU boundary**

**Aerial Photography from 2009**
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

Contours

MHW Elevation: 1.91 OD
MLW Elevation: -1.59 OD

- MHW 2010 - 10
- MHW 2008 - 12
- MHW 2007 - 09
- MHW 2007 - 04
- MLW 2010 - 10

Aerial Photography from 2009
Southwest Strategic Regional Coastal Monitoring Programme
Annual Survey Report 2011

Aerial Photography from 2009

MU boundary

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

- **Accretion**
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²
- **No Change**
  - Less than 5 m²
  - 5 - 15 m²
- **Erosion**
  - 15 - 30 m²
  - > 30 m²

- **Annual Change in Cross-sectional Area (%)**
  - 7d01323 (3 %)
  - 6e00341 (17 %)
  - 6e00329 (23 %)
  - 6e00319 (41 %)

6eMU4-3 - Gunwalloe - Beach Change
CISCAG - Cornwall
Contour Map of Gunwalloe

- MHW Elevation: 1.91 OD
- MLW Elevation: -1.59 OD

- MHW 2010 - 10
- MHW 2008 - 12
- MHW 2007 - 09
- MHW 2007 - 04
- MLW 2010 - 10

Aerial Photography from 2009
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

CISCAG - Cornwall

Ecological Mapping
See Separate Map for Legend

Aerial Photography from 2009

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Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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Annual Change in Cross-sectional Area (%)

MU boundary

7d01323 (3 %)

Aerial Photography from 2009
Change in Elevation (m) between April 2007 and August 2010

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Aerial Photography from 2009

Model Extent
Contours

MHW Elevation: 1.91 OD
MLW Elevation: -1.59 OD

- MHW 2010 - 10
- MHW 2008 - 12
- MHW 2007 - 04
- MLW 2010 - 10

Aerial Photography from 2009

0 100 200 m
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

Contours

MHW Elevation: 1.91 OD
MLW Elevation: -1.59 OD

- MHW 2010 - 10
- MHW 2008 - 12
- MHW 2007 - 04
- MLW 2010 - 10

Aerial Photography from 2009
Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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

- **No Change**
  - 5 - 15 m²

- **Erosion**
  - 15 - 30 m²
  - > 30 m²

MU boundary

- 7d01323 (3 %)

Annual Change in Cross-sectional Area (%)
Contours

MHW Elevation: 1.91 OD
MLW Elevation: -1.59 OD

- MHW 2010 - 10
- MHW 2008 - 12
- MHW 2007 - 04
- MLW 2010 - 10

Aerial Photography from 2009
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

Ecological Mapping

See Separate Map for Legend

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Aerial Photography from 2009

0 50 100 m
Southwest Strategic Regional Coastal Monitoring Programme  
Annual Survey Report 2011

6eMU6-2 - Praa Sands - Beach Change

Aerial Photography from 2009

0 100 200 m

Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

- Accleration
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²
  - Less than 5 m²
- No Change
  - 5 - 15 m²
- Erosion
  - 15 - 30 m²
  - > 30 m²

MU boundary

7d01323 (3 %)

Annual Change in Cross-sectional Area (%)

CISCAG - Cornwall
Change in Elevation (m) between April 2007 and August 2010

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Model Extent

Aerial Photography from 2009
Ecological Mapping

See Separate Map for Legend
Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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

- **No Change**
  - Less than 5 m²
  - 5 - 15 m²

- **Erosion**
  - 15 - 30 m²
  - > 30 m²

**Annual Change in Cross-sectional Area (%)**

- 7d01323 (3 %)
- 6e00530 (26%)
- 6e00532 (2%)
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

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

No Change
- Less than 5 m²
- 5 - 15 m²

Erosion
- 15 - 30 m²
- > 30 m²

Annual Change in Cross-sectional Area (%)

MU boundary

7d01323 (3 %)

Aerial Photography from 2009

± 0 0 1 0 0 m
Change in Elevation (m) between April 2007 and August 2010

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Model Extent
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

CISCAG - Cornwall

Contours

MHW Elevation: 1.91 OD
MLW Elevation: -1.59 OD

- MLW 2010 - 10
- MHW 2009 - 09
- MHW 2008 - 12
- MHW 2007 - 09
- MHW 2007 - 04
- MLW 2010 -10

Aerial Photography from 2009
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

CISCAG - Cornwall

Aerial Photography from 2009

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

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

No Change
- Less than 5 m²
- 5 - 15 m²

Erosion
- 15 - 30 m²
- > 30 m²

Annual Change in Cross-sectional Area (%)

MU boundary

6eMU8-2 - Perran Sands - Beach Change

CISCAG - Cornwall
Contours

MHW Elevation: 1.95 OD
MLW Elevation: -1.65 OD

- MHW 2011 - 01
- MHW 2008 - 12
- MHW 2007 - 04
- MLW 2011 - 01

Annual Survey Report 2011
CISCAG - Cornwall

Contours
MHW Elevation: 1.95 OD
MLW Elevation: -1.65 OD

- MHW 2011 - 01
- MHW 2008 - 12
- MHW 2007 - 04
- MLW 2011 - 01

Aerial Photography from 2009
Ecological Mapping

See Separate Map for Legend

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Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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

MU boundary

Aerial Photography from 2009

Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

- 7d01323 (3 %)
- Annual Change in Cross-sectional Area (%)
Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

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

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

- **No Change**

Annual Change in Cross-sectional Area (%)

- 7d01323 (3 %)

Aerial Photography from 2009
Contours

MHW Elevation: 1.91 OD
MLW Elevation: -1.65 OD

- MHW 2011 - 01
- MHW 2008 - 12
- MHW 2007 - 04
- MLW 2011 - 01
Ecological Mapping

See Separate Map for Legend

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Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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Contour

MHW Elevation: 1.91 OD
MLW Elevation: -1.65 OD

- MHW 2011 - 01
- MHW 2008 - 12
- MHW 2007 - 04
- MLW 2011 - 01
Ecological Mapping

See Separate Map for Legend

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Annual Survey Report 2011

Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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

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

- **Erosion**
  - Less than 5 m²
  - 5 - 15 m²

MU boundary

Annual Change in Cross-sectional Area (%)

Aerial Photography from 2009
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)

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

Annual Change in Cross-sectional Area (%)

7d01323 (3 %)

Aerial Photography from 2009
### Contours

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Aerial Photography from 2009
Actual Change in Cross-sectional Area (Spring 2010 to Spring 2011)

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<td>15 - 30 m²</td>
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<td>&gt; 30 m²</td>
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MU boundary

Annual Change in Cross-sectional Area (%)

Aerial Photography from 2009

Accretion

Erosion

No Change

Less than 5 m²

5 - 15 m²

15 - 30 m²

> 30 m²

± 0 150 300 m
Southwest Strategic Regional Coastal Monitoring Programme

Annual Survey Report 2011

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**6eMU11 - Newlyn - Beach Change**

**CISCAG - Cornwall**

Aerial Photography from 2009

---

**Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)**

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</tr>
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</table>

**Annual Change in Cross-sectional Area (%)**

7d01323 (3 %)

---

**Actual Change in Cross-sectional Area (Baseline 2007 to Spring 2011)**

- **Accretion**
  - > 30 m²
  - 15 - 30 m²
  - 5 - 15 m²
  - Less than 5 m²
- **Erosion**
  - 5 - 15 m²
  - > 30 m²

---

**Annual Change in Cross-sectional Area (%)**

± 0.15 0.3 0.0
Contours

MHW Elevation: 1.95 OD
MLW Elevation: -1.65 OD

- MHW 2011 - 03
- MHW 2009 - 02
- MHW 2007 - 04
- MLW 2011 - 03

Aerial Photography from 2009
Ecological Mapping
See Separate Map for Legend
**Ecological Mapping Legend**

**CALCAREOUS GRASSLAND**
- GC24 Upland calcareous grassland Sesleria caerulea - Galium album sub-community
- GC12 Semi-natural dry grasslands and scrubland facies on calcareous substrates [important orchid sites]

**GI0 W**
- GN13 Lowland water meadows
- GN12 Lowland meadows and pastures

**GC1**
- LT3 Railway verge [calcareous grassland]
- LT3 Railway verge [broadleaved woodland]
- LT3 Railway verge [scrub woodland]

**GC2**
- EM22 Inundation vegetation
- EM21 Marginal vegetation
- EM2 Marginal land inundation vegetation
- EM1Z Other swamp vegetation
- EM1862 Schoenoplectus tabernaemontani swamp
- EM176 Carex ve Sacharia swamp
- EM13 Bolboschoenus maritimus dominant community
- HE223 Ulex minor-Agrostis curtisii wet heath
- HE222 Erica-Sphagnion mire
- HE21Z Other Northern Atlantic wet heaths with Erica tetralix
- HE214 Erica vagans-Schoenus nigricans heath [Lizard wet heath]
- HE211 Vaccinium myrtillus-Deschampsia flexuosa heath
- HE21 Calluna vulgaris-Carex arenaria heath
- HE1 Vaccinium myrtillus-Festuca ovina heath
- HE1V European dry heaths
- HE0 Dwarf shrub heath
- WCZ Other coniferous woodlands
- WB363 Tilio-Acerion woodlands
- WB34 Wet woodland
- WB3312 Asperulo-Fagetum beech forests
- WB326 Scrub woodland [Rhododendron ponticum]
- WB3 Broodleaved woodland
- WB26 Scrub woodland [Rhododendron ponticum]
- WB25 Forest
- WB24 Forest edge
- WB23 Hardwood woodland
- WB22 Deciduous woodland
- WB21 Woodland
- WE24 Arable land
- WE23 Arable land
- WE21 Arable land
- WE1 Zonation unit
- WE0 Land cover

**SALTMARSH**
- SR23 Communities on artificial boulder formations above the high tide mark
- SR22 Communities on natural boulder formations above the high tide mark
- SR21 Rock above the high tide mark
- SR12Z Other maritime hard cliffs and slopes
- SR123 Maritime hard cliff and slope grassy ruderal communities
- SR121 Maritime hard cliff and slope grassland and lichen communities
- SR12 Maritime hard cliffs and slopes
- SR115 Unvegetated maritime soft cliffs and slopes
- SR114 Maritime soft cliff and slope scrub communities
- SR11 Maritime soft cliffs and slopes
- RE11 Natural rock and scree habitats
- SS4 Strandline vegetation
- SS3Z Unvegetated shingle above the high water mark
- SS31 15 Shingle acid grassland
- SS19 Unvegetated sand and dunes above high water
- SS175 Rush pasture dune slacks
- SS173 Wet base poor dune slack communities
- SS172 Wet dune slack communities
- SS171 Pioneer dune slack communities
- SS1 1 Embryonic shifting dunes
- LS342 Juncus maritimus upper saltmarsh
- LS341 Festuca rubra upper saltmarsh
- LS33Z Other Atlantic saltmeadows
- LS3341 Rayed Aster low marsh
- LS334 Aster tripolium low marsh
- LS332 Puccinellia maritima mid-marsh
- LS331 Sporaminum marsh
- LS322 Other Spartina swards
- LS321 Spartinion maritimae swards
- LS31Z Other pioneer saltmarsh
- LS3 Coastal saltmarsh
- LSZ Other littoral sediment
- LS6 Intertidal shingle
- LS41 Mudflats and sandflats
- AR0 Rivers and streams
- AR07 Very brackish ditches
- AR42 Tidal rivers upstream of estuary, fresh
- AR32 Saltmarsh
- AR23 Saline dune
- AR22 Saline marsh
- AR1Z Other salt marshes
- AS63 Very brackish ditches
- AS61 Saline lagoon
- AS65 Brackish mudflats
- AM6 Zostera spp.

**STONES AND ROCKS**
- LR0 Surficial rock
- LR1 Surficial bedrock
- LR0C Rock in landform
- LR2 Coastal rock
- LR21 Unvegetated coastal rock
- LR22 Vegetated coastal rock
- LR20 Coastal rock
- RE1 Natural rock and scree habitats
- SS31 15 Shingle acid grassland
- SS19 Unvegetated sand and dunes above high water
- SS175 Rush pasture dune slacks
- SS173 Wet base poor dune slack communities
- SS172 Wet dune slack communities
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- AR42 Tidal rivers upstream of estuary, fresh
- AR32 Saltmarsh
- AR23 Saline dune
- AR22 Saline marsh
- AR1Z Other salt marshes
- AS63 Very brackish ditches
- AS61 Saline lagoon
- AS65 Brackish mudflats
- AM6 Zostera spp.
Cross Sectional Area above MF Trend for Location: 6e00248 and Reference Profile Set

Area Above MP Trend: Accreting at 23.786 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00251 and Reference Profile Set

Area Above MP Trend: Accreting at 21.725 m²/Year
Area Above MP Trend: Accreting at 11.938 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00329 and Reference Profile Set

Area Above MP Trend: Eroding at -12.370 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00341 and Reference Profile Set

Area Above MP Trend: Eroding at -5.417 m²/Year

Survey Date

Recycling Event
Area Above MP
Area Trend
Area Between MP & DP
Cross Sectional Area above MF Trend for Location: 6e00354 and Reference Profile Set

Area Above MP Trend: Accreting at 1.018 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00377 and Reference Profile Set

Area Above MP Trend: Accreting at 6.137 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00381 and Reference Profile Set

Area Above MP Trend: Accreting at 1.439 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00391 and Reference Profile Set

Area Above MP Trend: Accreting at 10.345 m²/Year
Management Unit 6eMU-2

Cross-Sectional Area Charts

Area Above MP Trend: Accretion at 21.947 m²/year

Survey Date:

Beach Area (m²):
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410
Cross Sectional Area above MF Trend for Location: 6e00532 and Reference Profile Set

Area Above MP Trend: Accreting at 25.017 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00734 and Reference Profile Set

Area Above MP Trend: Eroding at -9.723 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00756 and Reference Profile Set

Area Above MP Trend: Accreting at 3.046 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00760 and Reference Profile Set

Area above MP Trend: Accreting at 3.644 m²/Year

Survey Date:
- 07/06/2007
- 05/09/2007
- 04/12/2007
- 03/03/2008
- 01/06/2008
- 30/06/2008
- 26/11/2006
- 25/02/2009
- 27/05/2009
- 25/06/2009
- 23/11/2009
- 21/02/2010
- 22/05/2010
- 20/08/2010
- 18/11/2010
- 16/02/2011

Beach 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
- 480
- 500
- 520

Surveying Event Indicators:
- Yellow: Recycling Event
- Green: Area Above MP
- Green with checkmark: Area Trend
- Blue: Area Between MP & DP

Diagram Title:
Management Unit 6eMU10-2
Cross-Sectional Area Charts
Cross Sectional Area above MF Trend for Location: 6e00764 and Reference Profile Set

Area Above MP Trend: Accreting at 2.333 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00768 and Reference Profile Set

Area Above MF Trend: Accreting at 21.054 m²/Year

Survey Date:


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

Legend:
- Yellow: Recycling Event
- Green: Area Above MP
- Green Dash: Area Trend
- Blue: Area Between MP & DP
Cross Sectional Area above MF Trend for Location: 6e00760 and Reference Profile Set

Area Above MP Trend: Accreting at 0.943 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00784 and Reference Profile Set

Area Above MP Trend: Eroding at -0.165 m²/Year

Survey Date

Beach Area (m²)
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520

Filter: Recycling Event Area Above MP Area Trend Area Between MP & DP
Cross Sectional Area above MF Trend for Location: 6e00768 and Reference Profile Set

Area Above MP Trend: Accreting at 2.557 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00797 and Reference Profile Set

Area Above MP Trend: Accreting at 3.781 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00814 and Reference Profile Set

Area Above MP Trend: Accretion at 0.348 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00822 and Reference Profile Set

Area Above MP Trend: Accreting at 0.940 m²/Year

Survey Date

Cross Sectional Area above MF Trend for Location: 6e00852 and Reference Profile Set

Area Above MF Trend: Eroding at -0.123 m²/Year
Cross Sectional Area above MF Trend for Location: 6e00861 and Reference Profile Set

Area Above MP Trend: Accreting at 3.598 m²/Year
Cross Sectional Area above MF Trend for Location : 6e00865 and Reference Profile Set

Area Above MP Trend: Eroding at -2.642 m^2/Year
Cross Sectional Area above MF Trend for Location: 6e00874 and Reference Profile Set

Area Above MP Trend: Eroding at -0.649 m²/Year
Profile Charts for Management Unit 6eMU8-2

Beach Profiles: 6e00645