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Date: December 2011
Project Name: Strategic Regional Coastal Monitoring
Management Units: 4cMU01 – 4cMU30

Author: A. Jeffery
Checked By: J. Clarke
Approved By: J. Clarke

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1.0 Introduction

The analysis within this annual report provides an overview of beach performance and wave and tidal measurements for Coastal Cell 4c (Dover to Beachy Head), using data collected over the last year from the strategic regional coastal monitoring programme. Topographic surveys are conducted at all viable sites using land based RTK GPS in the spring, summer and autumn of each year, covering pre-determined designated profiles at intervals along the coast. This report looks specifically at the difference between the latest survey set, Spring 2011, and the comparable data from Spring 2010.

All profile data was imported into SANDS® for analysis. This enables beach cross sectional areas (CSA) to be calculated as an indicator of beach quantity above and seaward of a master profile (Figure 1.1). Where available, seawalls are located spatially using a combination of design schematics and a sea defence survey conducted in 2003. The vertical level of master profiles are set close to the beach toe level or mean low water, whichever is deemed most appropriate. In some areas, clay levels have also been established using the results from trial holes dug into the beach. These have been incorporated to produce a more accurate master profile that calculates the actual beach area.

Data is presented at a number of scales, from an overview of the average change in each management unit, to changes and trends for profiles that have exhibited a significant change. The topographic analysis section of the report highlights notable changes, and areas for concern, for each of the management units. While this provides an accurate portrayal of current beach conditions and changes over the preceding year it should be stressed that these are only short-term trends. In order to view the results in a meaningful light, they should be compared to the full data set for each location. To put these into context, total change is also shown from the baseline survey (2003/2004) to the most recent spring survey (2011).

Those areas that are designated beach management plan sites (Figure 1.2) benefit from a high-resolution beach plan survey every summer. These are utilised to produce a much more comprehensive beach analysis report; as such, this report should be viewed as an interim update for those sites.
Figure 1.2: Management Unit Overview Map (MU01–MU30)
2.0 Condition of Management Units

To provide an overview of the annual change in each management unit, the average change in beach profile CSA is calculated for each unit. These averages are expressed in terms of percentage difference and actual change (m²) and are presented in Table 2.1.

Table 2.1: Management Unit Beach Change Summary (Spring 2010 - Spring 2011)

<table>
<thead>
<tr>
<th>Management Unit</th>
<th>No. of Profiles surveyed</th>
<th>Average CSA Change (%)</th>
<th>Average CSA Change (m²)</th>
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These results are also illustrated as coloured thematic maps in Section 3.

Those units that demonstrate an average change of less than 5% CSA are considered to be within the possible effects of natural processes and survey error. It should be noted that the largest changes often result from units with very few profiles, where a single profile can skew the results. Although these figures can highlight a highly erosive unit, or a recent replenishment, they should be viewed with caution as, for example, it is possible to have a small highly erosive area within a unit that accretes material overall.

Caution should be given to detailed coastal examination based on these results alone as they reflect a short-term trend based on the state of the beach at snapshots in time. These figures show overall trends, but individual profiles should be examined in more detail in those areas of interest. Crucially, the significance of any results should be put in context with previous fluctuations in beach CSA since the start of the monitoring programme in 2003.
3.0 Profile Change Summary

Changes along individual profiles within each management unit are summarised in a series of thematic maps on the following pages. The maps show the location of each beach profile, superimposed on aerial photography (NB the profile lines have been extended for clarity). Where possible, the annual change in Cross-Sectional Area (CSA) has been calculated from spring 2010 to spring 2011.

In order to put these changes in context, thematic maps are also included illustrating the change from the first spring survey in 2003/2004 and the most recent spring survey (2010). These help to establish whether changes in beach morphology have followed a trend, or are an anomaly that has occurred in the past year.
Profile Change Summary for Spring 2010 to Spring 2011 - 6 of 6
Profile Change Summary for Spring 2010 to Spring 2011 - 4 of 5

South East Strategic Regional Coastal Monitoring Programme

Annual Report 2011

Annual Change in Cross-Sectional Area (m²)
(Spring 2010 - Spring 2011)

- **ACCRETION**
  - > 30 %
  - 15 - 30 %
  - 5 - 15 %

- **NO CHANGE**
  - Less Than 5 %

- **EROSION**
  - 5 - 15 %
  - 15 - 30 %
  - > 30 %

CSA Change (m²)

Percentage Change

Profile Name

Management Unit Boundaries

MU27 - Pevensey Bay
Profile Change Summary for Spring 2004 to Spring 2011 - 2 of 4

Annual Change in Cross-Sectional Area (m²)
(Spring 2004 - Spring 2011)

- **ACCRETION**
  - > 30%
  - 15 - 30%
  - 5 - 15%
- **NO CHANGE**
  - Less Than 5%
- **EROSION**
  - 5 - 15%
  - 15 - 30%
  - > 30%

MU29 - Eastbourne
4.0 Hydrodynamic Data

Pevensey Bay Directional Waverider Buoy

Location
OS: 570429E 100915N
WGS84: Latitude: 50° 46.966’N Longitude: 000° 24.974’E

Water Depth
Approx. 9.8m CD

Instrument Type
Datawell Directional Waverider Buoy Mk III

Data Quality

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Monthly Means
All times GMT

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Highest events in 2010/11

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<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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* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Newhaven). The surge shown is the residual at the time of the highest Hs. The maximum tidal surge is the largest positive surge during the storm event.
Distribution plots

The distribution of wave parameters is shown in the accompanying graphs of:
- Wave roses (Direction vs. $H_s$) for this reporting year and all data
- Percentage of occurrence of $H_s$, $T_p$, $T_z$ and Direction for this reporting year
- Monthly time series of significant wave height (the red line is the storm threshold)
- Incidence of storms during the reporting period and all previous years. Storms are defined using the Peaks-over-Threshold method. The highest $H_s$ of each storm is shown.

Summary

This reporting year had a similar magnitude and frequency of storms to the previous year, with 3 events exceeding the 3m storm threshold. The largest storm on 08 November was the third highest wave height recorded since deployment of the buoy in July 2003. The peak of this event coincided with HW on spring tides but tidal surge was negligible.

Acknowledgements

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.
Percentage of occurrence of Direction vs. $H_s$ for April 2010 to March 2011 (this reporting year)

Percentage of occurrence of Direction vs. $H_s$ for July 2003 to March 2011 (all measured data)
Pevensey Bay Apr 2010 to Mar 2011

Hs (metres)

Tp (seconds)

Direction (degrees)

Tz (seconds)
Rye Bay Directional Waverider Buoy

Location
OS: 596521E 109474N
WGS84: Latitude: 50° 51.083’ N  Longitude: 00° 47.433’ E

Water Depth
Approx 10m CD

Instrument Type
Datawell Directional Waverider Buoy Mk III

Data Quality

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<th>Sample interval</th>
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Monthly Means

All times GMT

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Tables and plots of these values, together with the minimum and maximum values and the standard deviation are available on the website.

Highest events in 2010/11

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<tr>
<th>Date/Time</th>
<th>Hs</th>
<th>Tp</th>
<th>Tz</th>
<th>Dir.</th>
<th>Water level elevation* (OD)</th>
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<th>Tidal range (m)</th>
<th>Tidal surge* (m)</th>
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* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Dover). The surge shown is the residual at the time of the highest $H_s$. The maximum tidal surge is the largest positive surge during the storm event.
Distribution plots

The distribution of wave parameters is shown in the accompanying graphs of:
- Wave rose (Direction vs. $H_s$) from August 2010 to March 2011
- Percentage of occurrence of $H_s$, $T_p$, $T_z$ and Direction from April 2009 to March 2010
- Monthly time series of significant wave height (the red line is the storm threshold)
- Incidence of storms during the reporting period. Storms are defined using the Peaks-over-Threshold method. The highest $H_s$ of each storm is shown.

Summary

This reporting year had a similar frequency and magnitude of storms as the previous year, with November, December and January being the stormiest months. The largest storm of the year peaked at 4.35m $H_s$. This was the second highest significant wave height recorded since deployment of the buoy in August 2008.

Acknowledgements

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.
Percentage of occurrence of direction vs. Hs for April 2010 to March 2011 (this reporting year)

Percentage of occurrence of direction vs. Hs for August 2008 to March 2011 (all measured data)
Folkestone Directional Waverider Buoy

**Location**
OS: 619265E 133907N  
WGS84: Latitude: 51° 03.7563'N  Longitude: 01° 07.6714'E

**Water Depth**
Approx. 12.7m CD

**Instrument Type**
Datawell Directional Waverider Buoy Mk III

**Data Quality**

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**Monthly Means**

All times GMT

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<th>T_3 (s)</th>
<th>T_p (s)</th>
<th>Tz (°)</th>
<th>Direction</th>
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Tables and plots of these values, together with the minimum and maximum values and the standard deviation are available on the website.

**Highest events in 2010/11**

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<tr>
<th>Date/Time</th>
<th>H_s</th>
<th>T_p</th>
<th>T_z</th>
<th>Dir.</th>
<th>Water level elevation (OD)</th>
<th>Tidal stage (hrs re: HW)</th>
<th>Tidal range (m)</th>
<th>Tidal surge* (m)</th>
<th>Max. surge* (m)</th>
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<td>0.01</td>
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</table>

* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Dover). The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest positive surge during the storm event.
Distribution plots

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

- Wave roses (Direction vs. $H_s$) from April 2010 to March 2011 and all data
- Percentage of occurrence of $H_s$, $T_p$, $T_z$ and Direction from April 2010 to March 2011
- Monthly time series of significant wave height (the red line is the storm threshold)
- Incidence of storms during the reporting period and all previous years. Storms are defined using the Peaks-over-Threshold method. The highest $H_s$ of each storm is shown.

Summary

This reporting year was relatively uneventful, with only 3 events exceeding the 2.5m storm threshold. Dominant storm wave direction is from the south, although the highest percentage of smaller waves approach from the east.

Acknowledgements

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.
Percentage of occurrence of direction vs. $H_s$ for April 2010 to March 2011 (this reporting year)

Percentage of occurrence of direction vs. $H_s$ for July 2003 to March 2011 (all data)
Storms at Folkestone from Apr 2010 to Mar 2011

Storm threshold is \( H_s = 2.5 \text{m} \)

Storms at Folkestone - all years
5.0 Topographic Analysis

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

5.1 Folkestone and Dover

5.1.1 MU01 – South Foreland
Topographic surveys are not carried out in this management unit.

5.1.2 MU02 – Dover Harbour (4c00001 – 4c00060)
There are two 1.2km long beaches in this management unit, one inside the harbour and one to the west. As in previous years, the latter beach has gained material in 2010-11. The greatest change in profile cross-section area (CSA) occurred on Profile 4c00052 which gained 21% of its previous CSA (34m²). Although MU02 was characterised by little significant change, most profiles gained material, with only four experiencing losses.

However, since 2004 the majority of profiles have experienced significant change. The greatest percentage loss was experienced on profile 4c00011 (-33%, -31m²), although the greatest actual loss was on profile 4c00056 (-15%, -38m²) which is part of the larger western beach. Accretion predominates at the eastern end of the western beach, as well as on the harbour beach. This suggests that the harbour beach and eastern end of the west beach are more sheltered from storms, such as the 2006/07 winter storms that caused significant erosion in this management unit. Additionally, based on drift directions, it is likely that the eastern end of the western beach is a sediment sink, with material trapped by the harbour arm.

5.1.3 MU03 – Shakespeare Cliffs
Topographic surveys are not carried out in this management unit.

5.1.4 MU04 – Samphire Hoe
Topographic surveys are not carried out in this management unit.

5.1.5 MU05 – Abbot’s Cliffe
Topographic surveys are not carried out in this management unit.

5.1.6 MU06 – The Warren (4c00097 – 4c00130)
Some areas of the 3km Warren frontage are characterised by very low beach levels. This means relatively small changes in beach topography can lead to large CSA percentage changes. In the past year, MU06 has been characterised by significant accretion in the east, and low levels of erosion on the wider beaches in the west. Profile 4c00103 experienced an increase in CSA of 184% over the past year, equal to a gain of 3m²; however profile 4c00113 gained 5m², but with a percentage gain of only 81% as the beach is larger at this location.

Looking at the longer-term trends since 2004, there appears to be no clear pattern of change, other than erosion is more dominant than accretion. The most erosive profile
was 4c00099 (-58%, -3m^2), although the greatest percentage change occurred on Profile 4c00103, which gained 914%, although this only equates to a change of 4m^2.

5.1.7 MU07 – Copt Point
Topographic surveys are not carried out in this management unit.

5.1.8 MU08 – Folkestone (4c00150 – 4c00264)
Due to the completion of a major coastal protection scheme in 2004, the baseline has been re-set to 2005. The frontage is now entirely dependent on the successful implementation of beach management through a sediment recycling programme, which takes place twice each year in spring and autumn. The ongoing recycling operations counter the natural transport of sediment along the Hythe to Folkestone Harbour frontage; as a result the beach levels appear to fluctuate along this section of coastline.

The continuation of the shingle recycling programme has meant that in the short-term at least, there is little significant change in MU10. The most significant loss of material occurred on Profile 4c00175A, located in the new rock groyne filed, which lost 30m^2 (10%). In contrast, the profiles on the open beach in the western half of the management unit are characterised by small gains in CSA, with the exception of Profile 4c00264 (one of only three profiles experiencing significant erosion in 2010-11).

The long-term trend is one of accretion in the central section, especially adjacent to the rock groyne bays, and erosion at either end of the management unit. The greatest percentage increase in CSA occurred on Profile 4c00198 (up 40%), although the greatest actual change was on 4c00220 (52m^2). The most erosive profile was 4c00256 in the west of MU08, which lost 17% (43m^2) of its CSA between 2005 & 2011. The areas of accretion appear to be generally consistent with the recycling areas.

5.1.9 MU09 – Sandgate (4c00266 – 4c00346)
This frontage has undergone several recycling schemes since monitoring began, which has influenced the natural distribution of beach material by littoral transport. MU09 is split into three sections by rock groynes, with material recycled from the eastern end of each groyne bay and deposited at the western end. This notwithstanding, over the past year the eastern end of MU09 has gained material, whereas erosion is more common at the western end. This suggests that the recycling activities are not balancing the natural longshore movement of sediment.

Profile 4c00346 (Figure 5.1) has consistently lost material since monitoring began. In the past year it shed 29% of its CSA (87m^2), and since 2004 has lost 39% (136m2). The overall pattern of longer-term change is of erosion, with the only consistent area of erosion in the east. The remainder of the management unit has experienced (mostly) significant erosion.
This section of coastline is managed by the Ministry of Defence. As in previous years, little significant morphological change has occurred in 2010-11. Only three profiles gained material, the rest losing sediment, especially Profile 4c00370, which lost 19m² of beach material (9%). This trend continues in the longer-term (2003-2011), although there are a greater proportion of accretive profiles. However, there is little significant change.

5.2.2 MU11 – Dymchurch (4c00459 – 4c00625)
Since 2007, the defences in Mu11 have been upgraded as part of a capital coastal protection scheme, which is scheduled for completion in 2018/19. The scheme includes the construction of a large rock revetment at the eastern end of the management unit, and upgrading the standard of protection offered by the seawall. At present, the northern half of MU11 (Profiles 4c00409- 4c00503) is not accessible for surveying, which is why these profiles appear to show no actual or percentage change.

As in previous years, MU11 has experienced modest changes in beach morphology. In general, most profiles have gained material, the most accretive being 4c00534, which gained an extra 25% of beach material (13m²). Profile 4c00544 lost the most material; (13m², 6%), but overall there appears to be no pattern to the morphological change.

However, the longer-term pattern is one of more significant change, although accretion is still dominant. The most accretive profile is 4c00503 (Figure 5.2), which gained 103% of its previous CSA (now 20m²), one of six profiles that increased in volume by more
than 30%. The profile that has lost the most beach material since 2003 is 4c00496, where the profile CSA shrank by 33%, 21m².

Figure 5.2: Profile 4c00544

5.2.3 MU12 – Romney Sands (4c00628 – 4c00770)
Romney Sands is one of the highest naturally accreting sections of the Kent coastline; the section around the peninsula is particularly accretive and is subject to regular extraction of material. A number of recycling schemes have influenced the 8.5km frontage since monitoring began. The first scheme removed 21,560m³ of shingle from Dungeness between 2003 and 2004, which was placed along the Jury’s Gap frontage (MU15). Further recycling in 2006 and in 2007 saw 38,000m³ and 21,560m³, respectively, of beach material extracted between Profiles 4c00730 and 4c00763, which was used for the Lydd Ranges recharge (MU14).

The pattern of change in MU12 in 2010-11 is similar to that in MU11, in that accretion dominates. However, there is also a trend for accretion to increase (in actual, if not percentage, volumes) towards the peninsula. Due to the width of the beaches in this management unit, there are a number of profiles classed as no significant change despite large changes in actual CSA, as these don’t translate into high percentage changes. The profile that has gained the most is Profile 4c00734 (Figure 5.3), which gained 101m² (22%) in CSA over the past year. There are also intermittent profiles with moderately significant levels of erosion. However, it is unclear as to why these are occurring – possibly localised scour or areas that have gained less material than has been moved away from the profile by longshore drift.

The long-term pattern of change is one of strongly defined accretion. There is only one profile (4c00638) that has experienced net losses between 2003 & 2011 (-10%, -13m²), which is probably unique for a management unit of this size in this coastal cell. Although not experiencing the largest gains in profile CSA in MU12 (i.e. Profile 4c00740, 124% & 349m²), the CSA of Profile 4c00734 still increased by 99% or 276m². These significant increases continue around to the southern side of the peninsula.
5.2.4 MU13 – Dungeness Power Station (4c00773 – 4c00797)

In previous years, MU13 used to be subject to an annual recycling scheme carried out by Halcrow and the Environment Agency, moving shingle from the Dungeness peninsula around to the power station and beyond. Net longshore sediment transport moves material from west to east along this frontage, part of the larger drift of material from Beachy Head to Dungeness. The recharge works were also used to build up the crest in front of the power station, which continues to be carried out as necessary, using material either from Dungeness or brought from quarries.

The general trend for MU13 over the past year has been an erosive one, although only one profile (4c00773) experienced significant levels of erosion (-34m², -6%). Two profiles gained material, although again only one (4c00797) significantly (6%, 24m²). In the longer term, the pattern of profile change switches from accretion in the east (none of which reaches significant levels) to erosion in the west. This is where the crest is more vulnerable in MU13, possibly explaining these longer-term losses.

5.3 Camber Sands

5.3.1 MU14 – Lydd Ranges (4c00801 – 4c00948)

Although beach management surveys were carried out in MU14 in the summers of 2004 and 2009, regular spring profile surveys are not conducted along this section of coastline. Hence, short-term (2010-2011) and long-term (2003/4-2011) CSA changes cannot be assessed at this time.

5.3.2 MU15 – Jury’s Gap (4c00949 – 4c00998)

As mentioned previously, material used to be extracted from the Dungeness peninsula and moved back to Jury’s Gap. This may be due to the lack of updrift feed, the result of the harbour arm at the mouth of the River Rother. Losses usually manifest as cliffing at
the beach crest, although no recharge has been carried out in 2010-2011. This may explain why MU15 was dominated by profile CSA losses over the past year. The most significant of these was on Profile 4c00994, which lost 115 m², or 54% of CSA. As can be seen, it has only experienced a net loss of 116 m² (55%) over the past seven years, suggesting that recharge is maintaining the shingle ridge. This would suggest that further recharging will be required in MU15, as this pattern of proportional losses over the past year is repeated through the rest of the management unit.

5.3.3 MU16 – Camber Sands (4c01005 – 4c01057)
Camber Sands has, to date, not required the same level of anthropogenic management as MU15. Although similarly downdrift of Rye harbour arm, MU16 has not experienced the same level of erosion. This is possibly due to its more sheltered location in Rye Bay, and possibly due to fines being able to bypass the harbour arm. In addition, this management unit benefits from occasional recharge from MU18, especially if it is fine grade material. However in 2010-11 no recharge (from MU18 or MU12) has taken place.

In the past year the general trend is that of sediment loss, although not the same extent as in MU15. This occurs over the whole management unit, with only intermittent accretive profiles. The most significant losses in both 2010-11 & 2004-11 occurs on Profile 4c01032 (-19%, -191 m² & -7%, 58 m² respectively). Although the actual volumes are high, the percentage of total CSA isn’t, as the beaches in MU16 are generally quite wide. However, in the longer-term, the trend is reversed, with accretion dominating.

5.4 Pett Levels

5.4.1 MU17 – River Rother mouth
Topographic surveys are not carried out in this management unit.

5.4.2 MU18 – Winchelsea Beach (4c01061 – 4c01263)
MU18 covers the low lying grazing land from Cliff End to Rye harbour arm. Since 2006, a capital coast protection scheme and annual recycling commenced. The scheme consisted of installing and upgrading the groyne field along the frontage, especially the stretches of beach in front of Cliff End and Winchelsea Beach. The recycling scheme moves beach material from the sediment sink at Rye harbour arm, and returns it to Cliff End and other locations in MU18 as required.

The low level of significant change over the past year suggests that the recycling is having the desired effect of stabilising the frontage. There are no strong trends in the distribution of profile CSA change, although the section between Cliff End and Winchelsea Beach appears more accretive than elsewhere in the unit. Losses seem to be marginally more prevalent east of here, even in the sediment sink immediately adjacent to the harbour arm. In the latter case this is likely the result of extracting material to a depth lower than the 2010 level.

The longer term morphological trends are broadly similar to the short-term trends, only with more significant change. The central area of accretion observed in 2010-11 is expanded to include the Winchelsea Beach frontage, and a short section c.1km east of the village. The profile that gained the most in percentage terms was Profile 4c01162, which increased its CSA by 57% (113 m²). However, Profile 4c01107 gained more material (122 m²), but due to the wider beach at this location this equates to a lower percentage gain (23%). The profile that lost the most material was 4c01239 at Cliff End, which lost 57 m² (20%), suggesting that the recycling programme is still necessary to maintain beach levels.
5.5 Fairlight

5.5.1 MU19 - 21 – Fairlight Cove East / Central / West (4c01275 – 4c01288)
These management units fronting Fairlight Cove (MU19-21) include the most active cliff section in the area covered by this report. In general, the cliff falls create cyclical patterns of erosion and accretion, as material falls onto the beach and is then removed by wave action.

Over the past year, it would appear that the latter process has been dominated, with all profiles losing significant amounts of beach material. Most erosive was Profile 4c01279, which lost 87% (175m²) of its CSA, although Profile 4c01275 lost a similar amount. The long-term pattern is similar, with the past years losses making up the majority of beach.

5.5.2 MU22 – Fairlight
Topographic surveys are not carried out in this management unit.

5.5.3 MU23 – Fairlight Glen (4c01302 – 4c01324)
As with the previous management units, MU23 experiences input from the actively retreating cliff line. Over the past year, all three designated profiles in the management unit gained significant amounts of material, a reversal of the previous year trend. However, the long-term trend remains one of erosion.

5.6 Hastings

5.6.1 MU24 – Hastings (4c01349 – 4c01455)
Over the past couple of years, the section of MU24 immediately east of the pier has undergone defence improvements and recycling over the past few years, mainly around Profile 4c01376. However, no recycling has been carried out in the past year, and as a result the profile has experienced a significant loss of material as the beach returns to a naturally stable profile (Figure 5.4). However, the long-term trend for this profile is still one of accretion, although thus has been skewed by the recycling events. Elsewhere in MU24, there has been little significant change apart from at the western end of the management unit, where Profile 4c01415 gained material.

The long-term trend is one of modest accretion, although there is a short section of significant erosion (Profiles 4c03293 – 4c01401) and many profiles do not experience significant change. The area of deposition east of the pier has experienced significant gains as is to be expected, apart from on Profile 4c01353, which cuts through the borrow area.

5.6.2 MU25 – Bulverhythe (4c01459 – 4c01522)
In the spring of 2006, a new rock revetment and beach replenishment scheme at Bulverhythe was completed. As part of the scheme, profile positions and names have changed due to the repositioning of groynes and revetment construction. Because of this the baseline has been re-set to 2006 for long-term profile analysis.

During the past year the majority of profiles in MU25 have experienced significant changes in CSA, with the eastern half generally gaining material, and the western half experiencing losses. The construction of the rock revetment has foreshortened the profiles in front of it, leading to large percentage changes from small actual changes. As a result, all but one of the profiles in front of the revetment has experienced significant percentage changes, the largest in the management unit. Profile 4c01483 gained 70% compared to the previous year’s profile, although this only equates to 12m² – Profile 4c01466 gained more (50m²), but this is a lower percentage of the total CSA (13%).
Similarly, Profile 4c01495 lost 10m² (32%), but this is more significant than the loss of 22m² (9%) on Profile 4c01512 due to the relative cross section of the beach.

Due to the nature of the capital works, it is not yet possible to make any valid comment on longer-term trends, as the baseline is only taken from Spring 2007. The most significant changes, in percentage terms at least, are found on profiles located in front of the rock revetment, as with the short-term changes experienced over the past year. The greatest positive and negative change (+ and – 31%) occurred on Profiles 4c01478A & 4c01495 respectively, though these are only small actual changes. However, there appear to be no other spatial patterns of long-term change.

**5.7 Bexhill**

**5.7.1 MU26 – Bexhill (4c01524 – 4c01667)**

There appear to be no significant spatial patterns to profile cross-section area (CSA change in MU26, although the western end appears more likely to experience little or no significant change. The profile with the greatest positive change is 4c01599, which experienced an increase in CSA of 22%, equal to 58m², and is located in the centre of the management unit. The profile that experienced the greatest loss is Profile 4c01524, at the easternmost end of MU26, losing 23% of its CSA, or 40m².

The long term trend exhibits stronger patterns of spatial change. The entire frontage has gained material, apart from five profiles at the eastern end of MU26. The area of most significant accretion is on Profiles 4c01586 – 4c01602, all of which experienced an increase in profile CSA greater than 30%. The most accretive in percentage terms was 4c01586 (37%), but the greatest actual change occurred on 4c01602 (84m²) (Figure 5.5).
5.8 Pevensey Bay

5.8.1 MU27 – Pevensey (4c01672 – 4c01722)

The Environment Agency’s appointed PFI Contractor, Pevensey Coastal Defence Ltd, actively manages this section of beach as part of a 25-year contract. During 2010-2011, the eastern half of the management unit has experienced more significant change, whereas the western half (which fronts the village of Pevensey Bay) appears to be more stable. The profile that has experienced the greatest contraction in CSA is 4c01669, which lost 89m² (28%) of beach material. The adjacent profile (4c01688) was the most accretive, although not at the same magnitude (10%, 28m²).

Profile 4c01669 experienced the second greatest loss of any profile in MU27 (-34%, 120m²) from 2004-2011, slightly less than Profile 4c01710 (-43%, 160m²), illustrated in Figure 5.6). The location of this profile is unusual in that it is located in the accretive western half of the management unit. Overall, the magnitude of change has increased in the longer term, although the highest magnitude is associated with CSA losses; the greatest gain was only 35m² (27%) on Profile 4c01715.

5.9 Eastbourne

5.9.1 MU28 – Sovereign Harbour (4c01723 – 4c01735)

MU28 is dominated by the entrance to Sovereign Harbour, which divides the management unit in half. The beach to the southwest, between Langney Point and the Sovereign Harbour arm, has previously been the extraction site for a recycling scheme carried out by Pevensey Coastal Defence Ltd.. Beach material was transferred by road from Langney Point to the eastern side of the entrance of the harbour to Pevensey Bay.
Unlike the previous year, 2010-2011 was characterised by more significant levels of profile CSA change, especially on the southern beach. Apart from one profile, this area is an erosive one, especially profile 4c01733, which lost 32m² (16%) of its CSA, the most for the whole management unit in 2010/11. The northern half of MU28 exhibited no significant change, apart from the two profiles immediately north of the harbour arm, which north gained material.
However, in the longer term, the characteristics of the beaches are reversed. The southern beach is highly accretive, apart from Profile 4c01733 which experienced the greatest percentage loss (21%). Profile 4c01723 experienced the greatest actual gain (324m², equal to 119%) (Figure 5.7), although Profile 4c01735 experienced the greatest percentage gain (185%), as the beach is smaller at that location. Thus, small actual changes create larger percentage changes. Conversely, the northern half of MU28 has exclusively lost material, the greatest actual loss occurring on Profile 4c01723 (48m²).

5.9.2 MU29 – Eastbourne (4c01737 – 4c01857)
Management Unit 29 has experienced several capital recharge schemes since 1999. Beach recycling and groyne replacement took place in that year, improving the protection to a 1:200 year design standard and extending the residual life of the defences to 30 years. Beach recycling also occurred in February 2009, using material from Langney Point and an area east of Eastbourne town centre to enlarge the beach around the pier. The latest scheme was carried out in spring 2011, again involving recycling & recharge.

This latest scheme is reflected in the profile CSA change, especially over the last year. Overall the pattern is an accretive one, the only significant erosion occurring at the northern end, near Langney Point. The majority of profile CSAs increased by 5-15%, the most significant gain occurring on profile 4c01797, which gained 77m² (32%).

The longer-term picture (2004-2011) is not as accretive, although it still dominates the management unit, especially south of the pier. Profile 4c01797 also gained the most material in the long-term, up 35% (82m²) since 2004. However, the area of erosion extends further south from Langney Point, perhaps the result of this section of coastline being used as a borrow area to feed the rest of the management unit. The recharge/recycling probably explains much of the accretion to the south.

5.9.3 MU30 – Beachy Head
Topographic surveys are not carried out in this management unit.