



# South Downs Coastal Group

## Foreword by John Horne:

DEFRA REGIONAL ENGINEER FOR SOUTH EAST OF ENGLAND



ENVIRONMENT AGENCY/HALGROW

The Government encourages the formation of voluntary coastal defence groups made up of maritime district councils and other bodies with coastal defence responsibilities and interests. South Downs Coastal Group is one of around seventeen national coastal groups which meet regularly to ensure that an integrated strategic approach is achieved in delivering the Government's objectives and coastal defences.

As part of this approach, Defra has issued guidance for maritime local authorities to help in the preparation of Shoreline Management Plans (SMPs). These plans aim to promote a strategic approach to flood and coastal defence works along the coastline based on a detailed understanding of natural processes, planning issues, current and future land use, defence needs and environmental considerations. The South Downs Coastal Group has helped lead the way by testing guidance for the first review of existing SMPs. The Group's realism, awareness and affordability and willingness to help move the industry forward is commended.

In the past, the desire to protect assets has often led to the introduction of well-intentioned structures that have unforeseen and detrimental effects on the coastline or which prove to be unsustainable. Whilst it is impossible to defend the entire coastline, every effort must be made to understand and work with natural processes and to take a holistic and strategic approach to coastline management planning.

Coastal groups, such as the South Downs Coastal Group, are essential for bringing together local stakeholders in a partnership for action. It is necessary to achieve better integration between the disciplines of specialists working in coastal management and I am grateful to those who participate.

May 2005

## Contents



Foreword	2	Brighton Marina
Introduction to the South Downs Coastal Group	4	
The Coastal Group Area	5	
The management of the coastline	6	
Shoreline Management Plans	7	
South East Strategic Coastal Monitoring Programme and Coastal Observatory	8	
Future challenges for coastal defence	10	
Conclusion	12	
Glossary	13	
Useful contacts	15	

## Introduction to the South Downs Coastal Group



Aldwick



Beachy Head

The South Downs Coastal Group (SDCG) has a management overview of the Sussex Coast between Beachy Head and Selsey Bill.

This is a complex stretch of coastline including high chalk cliffs, river estuaries, shingle beaches and low lying rife areas. Some of these features are highly valued for their environmental quality and the rare plants and animals they support. Much of the coastal frontage is developed, with the major settlements of Brighton & Hove, Worthing and Bognor Regis, together with the ports of Newhaven, Shoreham and Littlehampton.

The coastline has always been subject to change. Wind, waves and tides erode material from one place, carry it away and deposit it elsewhere. The Sussex coast is the product of these dynamic processes over many thousands of years. Climate change and pressure for further development add to the challenges facing coastal managers.

The South Downs Coastal Group provides a forum for managing the coastal zone and the associated social, economic and environmental issues. Although the focus of the Group has traditionally been coast defence issues, it is increasingly seeking to develop a wider integrated approach to coastal zone management, working with a range of other partners.

The main objectives of the Group are:-

- To prepare, and keep up to date, a Shoreline Management Plan (SMP) to provide high level strategic policy for the coast between Beachy Head and Selsey Bill.
- To carry forward the SMP into practical management action through Coast Defence Strategies and individual coastal management projects.
- To promote links between the SMP and other plans affecting the coastline, such as Local Development Frameworks.
- To keep up to date with wider issues affecting the coast including national and international policies, and climate change.
- To monitor and analyse data on changes along the coastline, such as erosion rates, wave conditions and beach profiles.
- The Coastal Group encourages public interest in issues affecting the coast, through publication of information on its website and a wide range of documents. This Report is part of our effort to generate interest in the work we do.

## The Coastal Group area

The operating authorities of the South Downs Group area, which have coastal frontages between Selsey to Beachy Head, are shown on the back cover.

The operating authorities which have the statutory powers to undertake flood defence or coast protection activities are represented by:

- Adur District Council**
- Arun District Council**
- Brighton & Hove City Council**
- Chichester District Council**
- Eastbourne Borough Council**
- Environment Agency**
- Lewes District Council**
- Wealden District Council**
- Worthing Borough Council**

In order to provide a sustainable coastal defence, the coastline needs to be considered holistically, hence there are additional members of the Group to those mentioned above. These include:

**West Sussex County Council** – to ensure a consistent approach for the strategic planning of West Sussex

**East Sussex County Council** – similarly, to ensure a consistent approach for the strategic planning of East Sussex coastline

**English Nature** – to provide advice on the natural environment

**English Heritage** – to provide advice on the built environment

**Port Authorities** – Shoreham Port Authority, Littlehampton Harbour Board, Newhaven Port and Brighton Marina Estate

**Fisheries** - Defra and Sussex Sea fisheries

Defra, the Government Department responsible for implementing the Government’s Strategy for flood and coastal erosion risk management and the majority of funding for coastal defence, is represented on the Group as an observer.



Beachy Head

## The management of the coastline



Eastbourne



Ovingdean

The coastline is changing constantly because of the effects of waves and tidal currents. The amount of physical change that results generally depends on the natural processes (movement of beach by wind and waves in a coastal “cell”) and relate to the degree of exposure of each length of the coast and the ground conditions and the geological make up. These change processes have usually taken place over long historical periods and many examples exist where settlements have been lost through erosion eg. Climping (Cudlow), Aldwick and Middleton on Sea, Selsey (Broadreefs ) and Worthing.

Another influence on the development of the coastline has been human intervention, particularly attempts to reduce erosion and flooding. In many cases, this has taken place without any consideration of the effect these works may have on other locations along the coast.

In order to combat the often adverse effects that the ad-hoc coastal management practices were having on neighbouring shorelines, MAFF (now Defra) commissioned research to determine a more appropriate approach to implementing flood and coastal defence. This research suggested

that the coastline could be divided into major “cells”. A “cell” is a length of coastline that is relatively self-contained, as far as the movement of sand and shingle is concerned, and where interruptions to such movements should not have a significant effect on the adjacent sediment cells. The boundaries of the sediment “cells” generally coincide with the mouths of major estuaries/rivers or prominent coastal headlands.

“Regional Coastal Groups” comprising local authorities, the Environment Agency (EA), English Nature and other organisations with a direct role in shoreline management were set up around the coast of England and Wales to provide a more co-ordinated response to coastal erosion and flooding. These groups are arranged around the natural coastal cells rather than administrative boundaries. This encourages a more strategic approach to coastal defence management based on natural coastal processes. The coastal groups help to co-ordinate the preparation of Shoreline Management Plans and Coastal Defence Strategies. A link with Central Government policy-makers, through the national Coast Defence Forum, also helps to commission and disseminate strategic research.

## The shoreline management plans

The purpose of a Shoreline Management Plan (SMP) is to provide a large scale assessment of the risks associated with coastal processes and to present a policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable way. It determines the natural forces that are shaping the shoreline and predicts, so far as it is possible, the way in which it will be shaped into the future.

The plan then goes on to identify the main issues of concern relating to erosion and flooding, the management of these natural processes and identification of coastal assets that may be affected by flood risk or the management practices. These assets in the coastal zone include residential and commercial property and the natural and built heritage. All the issues are then considered together to determine the coast defence policies for the next 100 years. These policies should then be applied to allow society’s objectives to be achieved in full acknowledgement of the potential impact of the coast defence works on the natural environment and the likely environmental, financial and social costs and benefits involved. They take account of and influence Local Development Frameworks which set out planning policies.

The South Downs Coastal Group region is covered by the SMP from Beachy Head to Selsey Bill and the membership of the Group comprises those listed earlier in this document.



Rottingdean/Brighton

## South East Strategic Coastal Monitoring Programme and Coastal Observatory



Pagham

The Strategic Regional Coastal Monitoring Programme is a long term initiative that began in August 2002 and will run initially for a period of five years. As the benefits of the programme are long term it is hoped that support for the programme after the initial period will be maintained and extended to obtain longer term data sets and hence maximum use of the data collected. It is a joint project between the three coastal groups in the south east of England and includes thirty one local authorities and Environment Agency partners. The programme is grant aided by Defra and its primary aim is to

provide a standard, repeatable and cost-effective method of monitoring the coastal environment between the Isle of Grain in the Thames Estuary and Portland in Dorset.

Historically, coastal monitoring and data management has been carried out on an ad-hoc basis throughout the region. The new regional initiative provides a co-ordinated and consistent region-wide approach to data collection that provides economies of scale, higher quality of data and a sound management framework.

## Overview of Programme

Survey work, data analysis and project management is co-ordinated for the South Downs Coastal Group (SDCG) area by a project team based at Worthing Borough Council. Additional specialists are based at Arun DC and the Channel Coastal Observatory (CCO) in Southampton Oceanography Centre (a facility that serves South Downs Coastal Group, S E Coastal Group and Standing Conference on Problems with the Coastline (SCOPAC) and within the Environment Agency.

The programme for the SDCG includes:

- bathymetric (near shore) surveys
- topographic surveys via aerial photogrammetry (partnership working between EA, Arun DC and Survey firms)
- LIDAR (Light Imaging Detection and Radar)
- hydro-dynamic data (waves and tides)

Aerial photogrammetry and bathymetric surveys are conducted by commercial survey firms.

### Benefits of programme:

#### Technical Benefits

The project plan presents a long-term vision for the coast and provides essential information for improved policy decision making within shoreline management. Issues such as climate change and the provision of coastal defences that are sustainable in the long term are particularly reliant on good quality data. Long term (several decades) data sets are needed to deliver these benefits. There are many short term gains already arising from the programme; these include provision of high quality data for scheme design and efficiency savings arising from collaborative working.

Many coastal defence schemes within the SDCG region now involve improved management solutions such as beach recharge and beach recycling. Whilst these techniques are sustainable over the longer term; they require considerable management effort, including on the ground monitoring, to ensure they function efficiently. Good examples of well established schemes within the SDCG area can be found at Felpham, Elmer, Goring, Worthing, Shoreham and Brighton.

The monitoring programme will continue to provide data for these schemes as well as new sites.

#### Improved Coastal Defence Design

The availability of beach material at any given site for recycling is often a problem. Long term monitoring data has helped to improve the understanding of long and short term beach behaviour and this information is allowing beach recycling operations to be optimised. The long term data sets of beach volume and profile changes provided through aerial surveys of the beach have enabled beach management practice to be optimised (e.g. Seaford, Worthing, Elmer and Pagham Harbour and Pagham)

Wave recorders have been deployed off the coast, eg. Rustington. The programme will use the data to improve modelling methods, fine tune scheme designs and for analysis of storms.

#### Assessing Storm Damage

Our coastal defences are designed to withstand major storm events. Understanding the performance of these systems is essential for future planning of maintenance and longer term management. Storm damage is often assessed visually by high quality post-storm beach surveys, these together with wave data and predictive models enable risks of breaching to be quantified more accurately.

#### Long Term Cost Savings

Many of the benefits of the programme will not be realised for some years but it is anticipated that these benefits will exceed the programme cost by a substantial amount.

#### Data Dissemination and Website

Project partners are kept up to date with progress via reports to the SDCG website [www.sdgcg.org.uk](http://www.sdgcg.org.uk) annual one to one meetings, formal meetings every six months and by the regular e-newsletter together with any other specialist training or seminars which are periodically arranged. Real time wave and tidal data, along with a host of other information, including aerial photographs and newsletters, are displayed on the project website [www.channelcoast.org](http://www.channelcoast.org).

## Future challenges for coastal defence

### Climate Change

Over recent years, there has been growing evidence that our climate is changing. Most scientists believe that the world's climate is becoming warmer as a result of human activity. As a result, the summers will get drier and hotter, the winters will get milder and wetter, and there will be more extreme weather events such as storms, droughts and floods. All of this will have profound effects on the coast through the 21st Century.

In Sussex, this is likely to mean higher sea levels, narrowing of beaches and pressure on other coastal habitats such as salt marshes. Changing climate patterns are likely to result in increased weathering of coastal cliffs and more extreme weather events, which will test coastal defences.

Therefore, the way we manage the coast will need to respond to climate change. In some places, hard defences such as sea walls and groynes may have to be raised and strengthened. In other places, the coastline may have to retreat to allow natural processes of coastal change to resume. This will raise big environmental social and economic issues. For example, should we meet the increasing costs of defending the coast in an era of climate change, or should we accept that change is inevitable and work with nature?

The challenge will be for Engineers and Planners to provide an innovated response to these important issues.

### Sustainable Coastal Management

As outlined above, climate change may result in the need to raise defences. Securing funding for coastal defence schemes is already a challenge for the responsible authorities. This is likely to become more of a significant issue, as structures require increased maintenance, upgrading or even total replacement as a result of sea level rise. Increased works would also place demands on raw materials, such as aggregates, rock and timber, whose provision can have environmental consequences.

As a result of higher water levels “coastal squeeze” will occur. This will lead to beaches, inter-tidal areas and amenity value being reduced or lost and the public having to accept the effects of hard engineering solutions along the coast if there is a need to defend the frontage. Continuing the protection of important coastal habitats and reducing the rate of coastal squeeze is a real challenge. In response to these issues, coastal engineers are increasingly likely to be asked for innovative ideas to support sustainable defence solutions. The use of recycled and re-used material and increased application of management realignment will be key to effective future management of the coast.

### Development pressures

Although much of the Sussex coast is already developed, there is strong pressure for more housing and commercial development to meet social and economic needs. Several towns are important seaside resorts or ports, where the coastline is a great asset to the local economy. However, many of the coastal towns have experienced considerable change over recent decades and have become a regional priority area for economic regeneration. This all puts further pressure on the coastal environment.

Coastal management has not so far engaged fully with the planning system in managing these development pressures. There needs to be closer engagement between planners and coastal managers on the development of SMPs; incorporating SMPs, and coastal issues generally, into the new generation of development plans called Local Development Frameworks; and a shared commitment to reducing flood and coastal erosion risk by avoiding new development in vulnerable locations.

### Promoting environmental quality

Many of the flood defences improved or maintained by operating authorities are located in areas that have national and international nature



Pagham/Aldwick Bay

conservation interest. (e.g. Pagham Harbour Special Protection Areas (SPA), Ramsar Site candidate for Special Areas of Conservation (cSAC) and Site of Special Scientific Interest (SSSI)). There is a great deal of uncertainty about how climate change will affect the biodiversity of these sensitive ecosystems. With the acceptance of climate change, sea levels rise and changing rainfall patterns, we can expect to see changes in the ranges and behaviour of plants and animals.

For example, the rise in temperature (increase of 1°C) has already brought forward the egg-laying dates of at least 20 species of birds – they are between 4 and 17 days earlier than 25 years ago. Coastal habitats and species are very vulnerable to the effects of climate change. Tidal wetlands, like saltmarshes are threatened by sea level rise, change in salinity and storm erosion.

It is important to understand the impacts of climate change both to the built and natural environment and to ensure that new infrastructure is appropriately designed and can adapt to the change that will inevitably occur.

A key impact of climate change is likely to be loss of beaches and land, much of which provides a rare coastal habitat.

As sea levels rise, coastal habitats such as saltmarsh, will respond by migrating landward or “rolling back” to adjust their position in accordance with the new sea level. The coastal habitats are “squeezed out” between rising sea levels and fixed defence lines. This process is called “coastal squeeze”.

## Concluding remarks

This is the first report that the South Downs Coastal Group has produced. It is intended to inform members of the public and interested bodies including students, of the work supported and undertaken by the Group.

Along with other similar groups, the South Downs Coastal Group have overseen the preparation of a number of coast defence strategies and more recently, the first review of the Shoreline Management Plan which addresses the issues and impact resulting from climate change on our environment. The Group will continue to manage, through its Members, the coastline with its diverse natural habitats and acknowledge, through the SMP, that to continue defending our coastline as we have always done is not necessarily sustainable. Climate change will be a driving force and a challenge to not only the Group Members but all those who use the coast.

The Group has also responded to a number of key external issues including the "Making Space for Water" Strategy for Flood Management and Coastal Protection and Marine Aggregate extraction Licences.

The Group has met quarterly, received presentations from both its own members and consultants, made site visits and has undertaken an in depth review of its Terms of Reference and Business Plan in the past 12 months.

One of the major challenges for the Group over the coming years will be to consider and take forward the issues coming from the Government's first response to "Making Space for Water". Examples of the future activities already identified to be pursued by the group over 2005/06:

- The SMP will be adopted by all operating authorities and this will inform the development policies of local authorities within the Group's area.
- The completion of the Shoreline Management Plan (one of only three national pilots).
- The sharing of the professional skills that are available within the local authority and other agencies.
- Continued partnership working between the Local Authorities and the Environment Agency on the Regional Monitoring Programme.
- The Strategic Regional Monitoring Programme including monitoring of Beach Management Plans.
- The Group's Action Plan will be regularly reviewed and moved forward to provide improved working arrangements.

The South Downs Coastal Group very much relies on the limited time made available by its respective authorities (see schedule on Page 5). Here, I must give thanks to those authorities for supporting the Group's activities.

If you have enjoyed reading this annual report, please visit our website [www.sdgc.org.uk](http://www.sdgc.org.uk) or any of the member authorities/agencies of the Group which can be accessed through the links on the Members page of the SDCG website.

In conclusion, therefore, I would like to thank you for taking the trouble to read this report and add my personal thanks to:

Brian Curtis, Secretary to the South Downs Coastal Group and Roger Spencer, Treasurer and Web Master.

**David Green**  
**Chairman**  
**South Downs Coastal Group**  
**May 2005**

## Glossary of Terms and Abbreviations

**Breakwater:** A rock or concrete armour faced structure usually positioned parallel to the coastline, to dissipate wave energy before reaching the shore.

**Coastal Defence:** A term used to encompass both coastal protection and sea defence respectively to resist erosion or inundation of the land.

**Coast Protection:** Reducing the rate at which the land is worn away by the sea. Usually carried out by Local Maritime Authorities.

**Coastal Defence Strategy:** A detailed assessment of the strategic coastal defence options for a management unit (a length of shoreline with coherent characteristics in terms of coastal processes and assets at risk that can be managed efficiently).

**Defra (Department of Environment, Food and Rural Affairs):** Defra has overall policy responsibility for flood and coastal erosion risk management in England. The Department funds most of the Environment Agency's activities in this area through a fixed budget for each year and provides grant aid on a project by project basis to the other flood and coastal defence operating authorities (local authorities and internal drainage boards) for capital improvement works. From April 2005, the new Regional Flood Defence Committees will be responsible for setting and running budgets for the Environment Agency. Defra does not build defences or direct authorities

on what specific projects to do. The works programme to manage the risk is driven by the operating authorities. Defra regards this arrangement as a partnership, try to ensure that risk is managed effectively by the authorities and provide guidance to help ensure this. Flooding in this context is from watercourses or the sea rather than from surface water run-off, groundwater, inadequate drainage or sewers.

**Environment Agency:** Multi-operational Authority but in response to Coastal Defence. The Environment Agency has permissive powers to maintain and operate defences to reduce the risk of flooding from designated "main rivers" and the sea (Section 165: Water Resources Act) and to carry out improvement works to flood defence assets. The Agency also has a duty to exercise supervision of all matters relating to flood defence.

**Groyne:** Structures in rock or timber, typically perpendicular to the shoreline, used to control beach material movement.

**Hold the Line:** Sustaining the existing line of defence by maintaining or changing the standard of protection.

**Managed Realignment:** The management of a process of establishing a new coastal defence line often set back from the existing position, with the aim of improving the long term sustainability of the coast defence and/or contributing to other aims such as habitat creation.

## Glossary continued

**Maintenance:** Refers to the activities involved in keeping coastal defence structures in a defined operational state.

**Operating Authority:** A body with statutory powers to undertake flood defence or coast protection activities. In the SDCG region the Environment Agency takes responsibility for activities in managing risk of flooding to low lying land and local authorities take responsibility for areas at risk from coastal erosion and take some responsibility for inundation of land from the sea.

**Permissive Powers:** These come from different Acts of Parliament and allow operating authorities to carry out works but do not impose a duty to act.

**Physical Processes:** The actions, such as sediment transport and erosion, responsible for shaping the coast and underpinning its dynamic qualities.

**Renourishment/Recharge:** The placement of beach material (shingle and/or sand) to raise/widen the beach and/or increase the stability of the beach where natural material has previously been lost as a result of coastal processes.

**Sea Defence:** The control of flooding from the sea, usually of low lying land and carried out by the Environment Agency.

**SMP (Shoreline Management Plan):** A large scale assessment of the risks associated with coastal processes. The SMP presents a long term policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner. In doing so, the SMP is a high level document that forms an important element of the strategy for flood and coastal defence. It also provides relevant information to local authorities to consider when preparing Local Development Frameworks for development.

**SDCG:** South Downs Coastal Group

**SCOPAC** The Standing Conference on Problems associated with the Coastline. A significant coastal group formed in 1986 to give a forum for promoting best practice and resolving issues of concern to bodies involved in the management of the coast in central southern England

## Useful links and sources of information

If you wish to find out more about the South Downs Coastal Group or the work of our individual member organisations, have a browse through the website links below. Alternatively, contact any of the SDCG officers listed below who will be happy to help.

South Downs Coastal Group Website  
[www.sdcg.org.uk](http://www.sdcg.org.uk)

Chairman/ Secretary: To be appointed

Treasurer and Webmaster: Roger Spencer (Arun District Council)  
[roger.spencer@arun.gov.uk](mailto:roger.spencer@arun.gov.uk)

### Other related websites:

Defra  
[www.defra.gov.uk](http://www.defra.gov.uk)

or flood and coastal defence focus  
[www.defra.gov.uk/enviro/fcd/default.htm](http://www.defra.gov.uk/enviro/fcd/default.htm)

Coastal Observatory  
[www.channelcoast.org](http://www.channelcoast.org).

Environment Agency  
[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

English Nature  
[www.englishnature.gov.uk](http://www.englishnature.gov.uk)

### Links to websites:

SCOPAC  
[www.scopac.org.uk](http://www.scopac.org.uk)

SE Coastal Group  
[www.se-coastalgroup.org.uk](http://www.se-coastalgroup.org.uk)

### Acknowledgments.

**Defra: 2001**

*Shoreline Management Plans : A Guide for Coast Defence Authorities*

**SCOPAC : 2003**

*Coast Defence: Non-Technical Guide*

**Defra: 2004**

Consultation paper on *Making Space for Water Strategy for Flood and Coastal Defence*

**Defra: 2005**

*Making Space for Water – Taking forward a new Government strategy for flood and coastal erosion risk management for England*