

Implementing coastal risk management

The development of sustainable policies for risk reduction in coastal areas necessitates a strategic approach. SMPs (Defra, 20061) provide a large-scale assessment of the risks associated with coastal processes and allows the development of a policy framework to reduce these risks to people and the developed, historic and natural environments in a sustainable manner. In doing so, these 'high level' documents form an important contribution to the national strategy for flood and coastal erosion risk management. SMPs do of course integrate with other types of coastal plans including Estuary Management Plans, Catchment Flood Management Plans and the over-arching Coastal Zone Management Plans and inform key development plans including Regional Spatial Strategies and Local Development Frameworks.

Coastal engineers recognise that the shoreline cannot be entirely free of risk. Because of the varied nature of the geology, coastal landforms and topography, coastal processes obviously give rise to natural hazards such as flooding, coastal erosion and instability. These hazards can affect people and property in susceptible locations. Coastal defence measures may reduce the resulting risks but cannot eliminate them entirely. In their own right coastal processes and landforms can help minimise the impact of extreme storm events by acting as natural coastal defence solutions.

A variety of responses are available to coastal local authorities for managing risks including:

- avoiding inappropriate development in vulnerable areas through land-use planning or realignment of the coastline in a managed way;
- reducing the likelihood of loss of life and property along the coast through effective shoreline management engineering techniques;
- the provision of suitable warning systems;
- protection against damaging storm events through flood and coastal defence schemes or building modifications.

It is clear, therefore, that a key benefit of the SMP process is the 'joined-up thinking' which can be achieved through participation in Regional Coastal Groups, which bring together coastal engineers from adjacent local authorities, with the Environment Agency, County Councils, Natural England and other key stakeholders. Coastal Groups ideally contain a cross-section of flood and coastal erosion engineers, strategic planners and environmental and other interests. The need for close liaison between the coastal defence authorities and the local planning authorities cannot be over-emphasised. Throughout the development of both shoreline management plans and local authority development plans there are strong links and interactions. For example, the development plan can provide information to assist the preparation of the shoreline management plan, and equally the adopted shoreline management plan will provide informal support and contribute to the development plan and its future reviews (Ballinger et al, 20042).

The shoreline management plan will also inform the development control process by providing information on coastal evolution and coastal risks, and the suitability or otherwise for development of land adjacent to particular parts of the coastline. In summary, therefore, shoreline management plans support the planning system, firstly, at a sub-regional level by identifying those issues that need to be considered over a wider area than that of a single local authority, and, second, by informing the local planning

authority of shoreline management issues and identifying areas at risk from flooding and coastal erosion over the next 100 years.

Where the local planning authority is considering allocating coastal sites for development the SMP will provide information on the risks associated with potential development sites as well as providing information on whether, in principle, any coast defence works may be acceptable. In advance of considering planning applications in defined coastal areas the SMP will facilitate consultation between the relevant local authority engineers and the local planning authority on individual planning applications, especially with regard to planning conditions, planning obligations to mitigate risk or modification to proposed design (Ballinger et al. 20042). SMPs take into account an understanding of the anticipated longterm (i.e. over 100 year+ timescale) evolution of the coast and the implications for its future management. In doing so, SMPs can begin to help inform policymakers and the public about the need for longterm management responses.

An assessment of key shoreline management issues provides a framework which allows the selection of the most appropriate coastal defence policy for individual sub-sections (called policy units) within each coastal cell or sub-cell. A process for identifying the most appropriate policy is required in order that the potential constraints to coastal development can be considered at the outset. These may relate to coastal processes and the current state of coastal defences and also to the opportunities for improving the coastal environment in line with the principles of sustainable development. A particular skill in the field of shoreline management is the ability to weigh up the most appropriate long term solution for the section of coast concerned taking account of all factors involved. This is undertaken through a combination of the skills of local authority practitioners, and of the Environment Agency, and the expertise of external consulting engineers together with input from other key organisations such as Natural England and English Heritage. The successful introduction of the SMP initiative in England would not have been possible without the interest and enthusiasm of Defra's Regional engineers who assisted coastal engineers with implementation; this function has now been taken on as part of the Environment Agency Strategic Overview.

It is important at this stage to distinguish between the **Shoreline Management Plan** and other shoreline management initiatives such as Coastal Defence Strategies and individual 'coastal defence schemes'. The prime purpose of the Shoreline Management Plan is to identify policies which are appropriate and this will be delivered through a broad-brush assessment of risks, opportunities, constraints and areas of uncertainty. The Shoreline Management Plan will suggest in broad terms how the coastline should be managed in the future. For example, this may include maintaining or improving existing coastal defences, allowing the coastline to evolve naturally without any human intervention, constructing new defences seaward of the existing coastline or allowing incursion by the sea and retreating the coastal defence line inland.

The preparation of shoreline management plans, taking account of the factors described above, comprise the following main stages:

- Stage 1 – Scope the SMP
- Stage 2 – Assessments to support policy development
- Stage 3 – Policy development
- Stage 4 – Public examination
- Stage 5 – Finalised plan
- Stage 6 – Plan dissemination

The management of the risks through shoreline management policies will be achieved through the implementation of appropriate measures depending on the nature of the problem, together with the technical, environmental and economic constraints. Defra recognises the following generic policies available to shoreline managers in terms of coastal defence:

- **Hold the existing defence line** by maintaining or changing the standard of protection. This policy should cover those situations where works or operations are undertaken in front of the existing defences to improve or maintain the standard of protection provided by the existing defence line.
- **Advance the existing defence line** by constructing new defences seaward of the original defences. This policy is generally limited to those frontages where significant land reclamation is being considered.
- **Managing realignment** by allowing the shoreline to move inland, with management to control or limit movement (such as reducing erosion or building new defences on the landward side of the original defences).
- **No active intervention** where there is no investment in coastal defence assets or operations.

A key output from SMPs will be the associated action plans, which are updated annually. These should link the ongoing and prioritised Strategies along the frontage considered and set a timeframe both for the review and preparation for these strategies, but also for the next review (SMP3) of the plan itself. An SMP review group, led by the Environment Agency, will be responsible for ensuring SMPs are nationally consistent in setting out a long-term course of action for the coast that is sustainable and affordable, and importantly that plans are 'fit for purpose' (Environment Agency Coastal Handbook, 20083).

In contrast to the SMP the key objective of a **Coastal Defence Strategy** is to re-examine the coastal processes in detail, confirm or re-assess the SMP policy and identify appropriate defence schemes that meet Defra's economic criteria. The Coastal Strategy will deliver a preferred approach to coastal defence identifying the best type of civil engineering scheme taking full account of economic and environmental issues, including any compensation measures required for designated habitats.

Essentially, the Coastal Defence Strategy provides an in-depth appreciation of the requirements for coastal defence or otherwise. However, it is the coastal defence scheme itself that actually provides the level of protection required to minimise the risk to an acceptable level. A scheme study will refine the assessment made in the Coastal Defence Strategy and will identify precisely how any necessary civil engineering works, including beach management, may be undertaken. It will, therefore, produce the 'preferred technical solution' that can be submitted to the Environment Agency as part of a Project Appraisal Report and application for coastal defence funding.

References

1. Defra, 2006. 'Shoreline management plans guidance'. Crown copyright. London.
2. Ballinger, R., Potts, J., Taussik, J., McInnes, R. G. & Fairbank, H., 2004. 'Local authority coastal risk management pack'. LGA, London.
3. Department of the Environment, 1991. 'PPG14 – Development on unstable land'. London, HMSO.
4. Environment Agency, 2008. 'Coastal Handbook'.