Environment and Sustainability Committee

Meeting Venue:
Committee Room 3 – Senedd

Meeting date:
5 July 2012

Meeting time:
09:00

Cynulliad Cenedlaethol Cymru
National Assembly for Wales

For further information please contact:

Lara Date
Committee Clerk
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Agenda

1. Introductions, apologies and substitutions (09.00)

2. Inquiry into coastal protection – Oral evidence

09:00 – 10:00

E&S(4)-20-12 paper 1: Wales Coastal Monitoring Centre

E&S(4)-20-12 paper 2: Cardiff School of Earth and Ocean Sciences

Louise Pennington, Wales Coastal Monitoring Centre
Emlyn Jones, Wales Coastal Monitoring Centre

10:00 – 11:00

E&S(4)-20-12 paper 3: Countryside Council for Wales

E&S(4)-20-12 paper 4: Environment Agency Wales

Dr Nicola Rimington, Marine & Coastal Physical Scientist, CCW
Dr Susan Gubbay, CCW Council Member
Graham Hillier, Flood and Coastal Risk Manager, Environment Agency Wales
Steve Cook, Strategy Manager, Flood and Coastal Risk Management, Environment Agency Wales

11:00 – 11:10 Break

11.10 – 12:10

E&S(4)-20-12 paper 5: Welsh Local Government Association

Neville Rookes, Flood and Water Officer, WLGA

12:10 – 12:45 Break

12:45 – 13:30
E&S(4)-20-12 paper 6: Atkins
E&S(4)-20-12 paper 7: Halcrow
E&S(4)-20-12 paper 8: Royal Haskoning

Kath Winnard, Atkins
Kevin Owen, Atkins
Marcus Philips, Halcrow
Greg Guthrie, Royal Haskoning

13:30 – 14:30
E&S(4)-20-12 paper 9: The National Trust

Phil Dyke, National Trust Coast & Marine Adviser

3. Motion under Standing Order 17.42(vi) to resolve to exclude the public from the remainder of the meeting

4. Inquiry into coastal protection – Consideration of evidence

ymgynghoriaeth gwynedd consultancy

Huw Williams, B.Sc., C.Eng., C.Env., F.I.C.E.
Pennaeth Gwasanaeth Ymgynghoriaeth Gwynedd
Head of Gwynedd Consultancy Service

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Ms Catherine Hunt
Deputy Clerk
Committee Service
National Assembly for Wales
Catherine.Hunt@wales.gov.uk / ES.comm@wales.gov.uk

22nd June 2012

Dear Ms Hunt,

Written evidence for the National Assembly for Wales Environment and Sustainability Committee's Inquiry into Coastal Protection

Thank you for inviting the Wales Coastal Monitoring Centre (WCMC) as a stakeholder to contribute to the National Assembly for Wales Environment and Sustainability Committee's forthcoming inquiry into Coastal Protection in Wales.

The WCMC is a Welsh Government funded initiative to inform the flood and coastal erosion risk management (FCERM) process in Wales. Hosted by Gwynedd Council, direction for the WCMC is given by a Project Board which reports to the Wales Coastal Group Forum. Five targets the WCMC aims to improve with regards to coastal monitoring activities are:

- *Communication*
  Develop and enhance a collaborative approach between organisations.
- *Efficiency*
  Highlight potential and realise opportunities for time and cost savings.
- *Consistency*
  Optimise monitoring activities through standardising the National approach.
- *Knowledge*
  Use data and analysis to improve understanding of coastal processes and risks.
- *Advice*
  Develop an evidence base to support management decisions at all levels.

The WCMC project is presently funded to the end of the current financial year, with a business case being produced in application to Welsh Government for a five year funding extension.

Our written evidence to address the terms of reference for the inquiry is presented below and we trust the content will be of interest to the Committee.

Swyddfa'r Cyngor
Cae Penarlag,
Dolgellau
Gwynedd LL40 2YB
01341 422341

Assess progress made by the Welsh Government and Welsh flood risk authorities in implementing the objectives of the National Strategy for Flood and Coastal Erosion Risk Management in Wales

The National Strategy for FCERM in Wales was published on 14th November 2011 and a representative from the WCMC attended the launch event in Borth, Ceredigion. The Strategy sets four overarching objectives for FCERM in Wales, being:

(1) Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
(2) Raising awareness of and engaging people in the response to flood and coastal erosion risk;
(3) Providing an effective and sustained response to flood and coastal erosion events;
(4) Prioritising investment in the most at risk communities.

This first National Strategy establishes a framework for the development of a holistic FCERM system fit for Wales. It aims to increase the nation's resilience to the impacts and consequences of flooding and coastal erosion through communicating with, and embracing the delivery actions of, Welsh Government, Risk Management Authorities and also communities and individuals.

Focus is now moving to implementation of the above numbered objectives, for example:

Objective (1):
The coastal erosion map for Wales was completed by the delivery deadline.
Generation of the second edition Shoreline Management Plans (SMP2s) was completed by the delivery deadline.
Local Flood Risk Management Strategy (LFRMS) delivery by 2013 will be achievable as it does not consider coastal erosion in any detail.
My colleagues within Gwynedd Council have established a programme of regular and appropriate maintenance in relation to the Council's own FCERM assets.

Objective (2):
My colleagues within Gwynedd Council are currently undertaking community flood risk awareness raising activities.

Objective (3):
My emergency planning colleagues within Gwynedd Council are leading on addressing this objective.

Objective (4):
The WCMC and Gwynedd Council believe that Welsh Government must lead on the development of a prioritisation system in the near future, with associated guidance for project appraisal and funding allocation.

Further supporting measures and a number of pieces of guidance have also been provided by Welsh Government to demonstrate implementation of Strategy objectives:

Sustainable Development Guidance
Under Section 27 of the Flood and Water Management Act 2010 some Risk Management Authorities must consider sustainable development when exercising their FCERM functions.

Local Flood Risk Management Strategy Guidance
Section 10 of the Flood and Water Management Act 2010 requires Lead Local Flood Authorities (local authorities in Wales) to develop, maintain, apply and monitor a strategy for local flood risk management in its area.

Adapting to Climate Change Guidance
Welsh Government requested the Environment Agency prepare guidance to assist Risk Management Authorities in Wales to adapt to climate change.

Consider how the objectives of the Strategy are being reflected in Shoreline Management Plans and Local Flood Risk Strategies

Welsh Government have asked Environment Agency Wales to report to the Minister (under Section 18 of the Flood and Water Management Act) every two years on all aspects of FCERM undertaken by all Risk Management Authorities. The first report will be produced in approximately summer of 2014 and will cover progress up to and including April 2013 to March 2014. Environment Agency Wales and Welsh Government are planning to scope the proposed method of reporting later this year in order to reach agreement before the 2013/14 year starts when the reporting process will be implemented.

The process of generating second edition SMP2s was in its final stages when the National Strategy was published in November 2011 and therefore there is no clarity in SMP2 content with regards to meeting Strategy objectives. Clearly however, setting out a long term management strategy for the coastline helps everyone to make decisions regarding future investment, sustainability etc because 'hold the line' policies give a commitment to continue to defend into the future.

Although SMP2s are non-statutory documents, there may be scope to also include reporting on progress of SMP2 action plan delivery within the two yearly report noted above. If so, perhaps information could be collated from various coastal group annual reports (including monitoring reports) submitted to Welsh Government when claiming grant in aid funding. Any major changes to SMP2s, such as changes to policies or actions being added or deleted, would of course need to be flagged-up through the reporting process. Practically, any future reporting criteria for SMP2 action plan delivery should be the same in Wales and England for simplicity for those coastal groups spanning the national boundary.

With regards to LFRMS preparation, none have been completed in Wales as yet and when they are complete we anticipate there will be very little reference to coastal erosion because their main aim is to consider flooding from ordinary watercourses, surface water and ground water only.

To gather views on how coastal protection is funded and in what ways this could be improved and to make recommendations to the Welsh Government on how delivery and funding of coastal protection in Wales could be improved.

Welsh Government flood and coastal erosion risk management funding for coast protection works

Funding for FCERM in Wales has more than trebled since 1999 and Welsh Government invested £36 million via the block grant in FCERM in 2009/10. Supplemented by additional funds from the Strategic Capital Investment Fund and European funding, Welsh Government's total FCERM investment across Wales stood at £42million for 2009/10. This was a significant sum, but in the future even more may be required. In recent years access to European funding has enabled the allocation of match funding to facilitate delivery of capital coastal defence projects, such as Tywyn here in Gwynedd and neighbouring schemes at Borth in Ceredigion and Colwyn Bay in Conwy, which may have been unfeasible through Welsh Government funding alone.

The Coast Protection Act (1949) empowers Welsh Government to make grants available to Maritime Local Authorities (MLAs) towards the cost of appropriate capital works carried out under the legislation. The current grant in aid rate ranges from 35% to 75% and above a certain expenditure threshold can be 100%. The aim of the range of grant rates is to acknowledge the financial burden coast protection commitments place on a particular MLA. The rate of grant is calculated specifically for each MLA application and is determined by the MLA's existing burden i.e. its level of expenditure on coast protection schemes in the previous 20 years, and its relative fund raising capacity, which is reflected by the MLA's average Council Tax base Band D properties.

English FCERM funding for coast protection works

From 1 April 2008 responsibility for approving and payment of capital flood defence grant in aid across all authorities in England was transferred to the Environment Agency. The Welsh Government has indicated that they do not foresee this decision being adopted in Wales.

In May 2011, The Secretary of State for the Environment in England introduced a new policy, that of 'Flood and Coastal Erosion Resilience Partnership Funding'. This policy describes a new approach to funding projects starting in 2012/13 in England that will reduce flood and coastal erosion risks. The new policy allows FCERM projects to apply for central grant in aid and encourages funding from other sources to be secured. The proportion of central funding that a project receives will depend on the benefits it will bring.

Instead of meeting the full costs of a limited number of projects, under the new approach a proportion of Government funding would be available to any worthwhile scheme. Funding levels for each scheme will relate directly to the benefits delivered. For schemes that qualify for full funding, cost savings or contributions may mean the scheme is delivered sooner, and could release funding to allow others schemes to go ahead. For schemes not fully funded by Government to proceed, either the costs would need to be reduced or the remainder of the funding provided through local contributions.

Funding for strategic coastal monitoring works

Since 1992, Welsh Government funding modifications have enabled grant in aid to also fund studies including coastal monitoring activities rather than solely for the delivery of capital coastal defence schemes. Of the four MLA-led strategic coastal monitoring initiatives that presently operate in Wales, Swansea and Carmarthen Bay Coastal Engineering Group chaired by Carmarthenshire County Council receive a grant in aid rate of 35%, Gwynedd Council receive a grant in aid rate of 45%, Ceredigion County Council receive a grant in aid rate of 55% and Conwy County Borough Council receive a grant in aid rate of 65% funding. In 2012, the WCMC estimated the average annual expenditure by Welsh MLAs for strategic coastal monitoring activities in the three year period 2009/10 to 2011/12 to be £169,000 of which £97,000 was grant in aid funded direct from Welsh Government.

For comparison in England however, all strategic coastal monitoring programmes receive the full 100% grant in aid funding. Indications from Welsh Government to date suggest a 100% grant rate will not be offered in Wales, partially in view of concerns that if a MLA is not directly contributing financially, the MLA will have less ownership and interest in the programme. The absence of 100% grant in aid funding in Wales is a significant limitation on the success of any future strategic coastal monitoring programme as each MLA partner will have to source the remaining funds from their own (limited) revenue streams.

Welsh Government has alluded that in the future, MLAs will only be eligible for grant aid funding when their strategic coastal monitoring activities conform to the National programme and guidelines to be generated by the WCMC in due course.

We understand that Welsh Government intend to undertake a review of FCERM funding procedures later in 2012.

I look forward to attending the inquiry on Thursday 5th July 2012 with my colleague Emlyn Jones. Please contact me in the interim if you wish to discuss this written evidence further in the interim.

Yours sincerely,

Louise Pennington
Project Co-ordinator, Wales Coastal Monitoring Centre

Environment and Sustainability Committee

E&S(4)-20-12 paper 2

Inquiry into Coastal Protection in Wales – Evidence from Cardiff University School of Earth and Ocean Sciences

The School of Earth and Ocean Sciences

The School of Earth and Ocean Sciences, Cardiff University is a leading research centre in the earth sciences, as confirmed by the results of the 2008 Research Assessment Exercise. With over fifty academics and an extensive postgraduate research programme, the School addresses research themes including global change, environmental science and natural resource exploration. Within its Environmental Science and Policy research group, there is an applied research focus on coastal and offshore environments, including integrated management and policy. This has included research for the Local Government Association's Special Interest Group on Coastal issues, for Defra as part of the 'Making Space for Water' programme and as component of recent European INTERREG projects (notably IMCORE[1] and DELTANET[2]).

Introduction

The School of Earth and Ocean Sciences appreciates this opportunity to provide a response to the Environment and Sustainability Committee's consultation on 'Coastal Protection in Wales.' Given the extensive current overhaul of the Welsh institutional framework for environmental resource management[3] this is most timely, particularly at this early stage of implementation of the Welsh National Flood and Coastal Erosion Risk Management Strategy (Welsh Government 2011).

It should be noted that this response focuses on coast protection, as defined within the Coast Protection Act 1949 and interpreted within the Flood and Water Management Act 2010. This means that the following discussion is largely confined to topics related to coastal erosion risk management. Although coastal erosion risks are generally less well defined and less severe than those associated with flooding, the School considers it important to raise the profile of coastal erosion risk management within Wales. This is particularly relevant given the Welsh coastal assets potentially affected by this and the considerable focus of recent flood and coastal erosion risk management (FCERM) publications on flood rather than erosion risks[4].

1.The National Strategy

The School of Earth and Ocean Sciences welcomes the publication of the Welsh National Flood and Coastal Erosion Risk Management Strategy (the 'Strategy') and within this the transition to a more

[1] INTERREG IVb IMCORE project guidance on coastal climate change adaptation: http://www.coastaladaptation.eu/index.php/en/

[2] INTERREG IV DELTANET project: http://www.deltanet-project.eu/

[3] As indicated through recent Welsh Government consultations, including notably:
Welsh Government (2012a) *Sustaining a Living Wales: a Green Paper on a new approach to natural resource management in Wales*, Welsh Government Consultation Document, 30 January 2012.
Welsh Government (2012b) *Natural Resources Wales: proposed arrangements for establishing and directing a new body for the management of Wales' natural resources*, Welsh Government Consultation Document, 9 February 2012.

[4] Key documents include:
Environment Agency Wales (2010) *Future flooding in Wales: flood defences. Possible long-term investment scenarios*, Environment Agency 2010
Environment Agency Wales (2009) *Flooding in Wales: a national assessment of flood risk*, Environment Agency, 2009.
National Trust (2007) *Shifting shores: living with a changing coastline*
Public Accounts Committee (2010) *Coastal erosion and tidal flooding risk in Wales, National Assembly for Wales*, May 2010
Wales Audit Office (2009) *Report on Coastal Erosion and Tidal Flooding Risks in Wales*. Wales Audit Office, October 2009.

risk-based management approach to both flooding and coastal erosion. This reflects the need to move towards more proactive, adaptive and wider ranging approaches rather than relying solely on traditional engineering solutions. This is also in line with amendments to the Coast Protection Act 1949 brought in through the Flood and Water Management Act 2011. Such a transformation is a necessity in the context of climate change predictions too and is supported by best practice and emerging policies from elsewhere. It also conforms more closely with the Natural Environment Framework (NEF) and associated initiatives promoted by Welsh Government (Welsh Government, 2012a and 2012b), enabling consideration of a broader suite of adaptation options and a wider range of policy instruments for risk management purposes.

The recognition that both coastal flooding and erosion should be dealt with within one overarching national Welsh policy is also a major step forward, given the complexity and inter-relatedness of physical coastal processes. A coastal system approach also is essential, given that the scope of 'works' under the Flood and Water Management Act 2011 can include restoration of natural processes and also in the context of the needs of the recently established National Habitat Creation Programme. This programme ensures compliance with European and national legislation[5] through replacement habitats in the light of coastal squeeze[6].

The implementation of the Strategy alongside the development of the natural resource and ecosystem-based management focus at national levels, as promoted within the *Sustaining a Living Wales* and *Natural Resources Wales* Welsh Government consultations (Welsh Government 2012a & b), marks a considerable opportunity for 'win-win' solutions for coastal areas, as recommended by the Welsh Audit Office (2009).

It is pleasing to note the reference to the Strategy in Welsh Government policy development, particularly in recent consultations (Welsh Government 2012a and 2012b). It is essential that this Strategy remains prominent, particularly given the scale of coastal risks in Wales and their potential impact on key coastal sectors, vital to the Welsh economy.[7] Whilst the School recognises that the Welsh Government intends to promote a joined-up approach at national level (Welsh Government, 2012b), it is recommended that there should be clear and explicit links between this Strategy and other areas of national policy development.

2. Progress with implementing the objectives of the National Strategy

The School of Earth and Ocean Sciences acknowledges that the implementation of the Strategy has only been underway since November 2011 and notes that the Environment Agency is tasked with the responsibility for formal monitoring of the Strategy after a two year period (2013).

In this context and particularly in the light of the formation of the Welsh Single Body (as outlined within the Green Paper *Natural Resources Wales* (Welsh Government, 2012b), it is vital that this reporting timetable is adhered to and that a clear, objective and transparent reporting procedure is utilised. It will also be imperative that sufficient resources are also dedicated to this, particularly in the light of the recently announced reduced cuts to the flood and coastal erosion risk management budget.

It should also be noted that many of the Strategy's objectives are already requirements of existing, legal commitments, notably under the Floods Directive[8] and associated national legislation. Any reporting of Strategy outcomes should clearly acknowledge such commitments as well as the significant 'added value' of additional Strategy sub-objectives.

With respect to progress since November, the School of Earth and Ocean Sciences, without undertaking a major review of its own, has limited information and evidence on which to make specific comments. To facilitate interim monitoring and evaluation, and to make the Strategy implementation 'live' and more engaging, the School recommends reporting of progress through an on-line web-based

[5] Habitats Directive (92/43/EEC) and associated regulations, The Conservation (Natural Habitats, &c.) Regulations 1994.

[6] Coastal squeeze occurs where intertidal habitats are reduced in area and functionality as a result of rising sea levels and their location, seaward of fixed coastal defences.

[7] It has been estimated that the coastal and marine environment in Wales together support (directly and indirectly) about 92, 600 jobs. National Trust (2006) *Valuing our environment. Economic impact of the coastal and marine environment of Wales.*

[8] The Floods Directive (2007/60/EC), the Flood Risk Regulations 2009 and the Flood and Water Management Act 2010

reporting system. Coastal Groups[9] with their knowledge of coastal risks within their respective regions and links to other coastal stakeholders[10] could oversee the development and maintenance of such a reporting system, particularly for regional and local measures delivered by authorities other than Welsh Government. Welsh universities with considerable coastal and ICT capacity should also be involved. However, appropriate financial resources would need to support such activities.

3. Barriers to the development of coast protection within Wales

3.1 Science and evidence base for coast protection

The need for a well grounded Strategy to inform consistent coastal defence and protection decisions based on sound science cannot be underestimated. In this context, the School of Earth and Ocean Sciences welcomes the efforts of the Wales Coastal Monitoring Centre (WCMC) and the recent publication of the Environment Agency's National Coastal Erosion Mapping (NCERM) project on the internet, the first national-scale assessment of the extent of coastal erosion in Wales.

However, there is still a significant gap between the Welsh efforts and those of the English strategic regional coastal monitoring programmes[11] such as that for the south west of England.[12] The latter incorporates an extensive and long-term integrated survey programme and makes large data sets freely available to a wide range of stakeholders, including those undertaking conservation management, academic research and education activities. Indeed the WCMC's annual report (2010/11)[13] recognises the scope for synergies with the more established English strategic coastal monitoring programmes, a point which was recently reflected in local stakeholder meetings on the Severn Estuary as part of the INTERREG IVb IMCORE project[14].

The School is also concerned over the uncertain future of WCMC, given that its initial, three year programme is drawing to a close. We would like to recommend the continued development and investment in a strategic and long-term monitoring and associated research programme. The model provided by the Plymouth Coastal Observatory at the University of Plymouth, which aims to establish strong linkages with researchers and provide opportunities for value added research, may be worth considering.

3.2 Strategy implementation and budget cuts

The School is particularly concerned about the recent announcement of reductions in the Welsh Government's capital budget[15] for flood and coastal erosion projects. A cut of £30 million over a four year period alongside uncertainty about European future funding support post 2015 will impact heavily on coastal flood and erosion risk management in Wales. The Environment Agency Wales (2010)[16] has estimated that even if the current total level of annual investment was maintained over the next 25 years there is likely to be a substantial increase in the number of properties at significant flood risk by 2035 and the Welsh Audit Office (2009) has stated that funding would need to increase threefold just to manage existing assets[17].

There are also further concerns regarding both the capacity and budget of Coastal Protection Services within local authorities which the Welsh Audit Office (2009) consider reflect the low priority given to coast protection in such councils. It is to be hoped that greater awareness and communication of coastal erosion risks, leading to prioritisation of local authority funds, comes about through implementation of the Strategy.

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[9] Coastal Groups include Environment Agency Wales representatives.

[10] The Severn Estuary Coastal Group for example has close links with the wider forum, the Severn Estuary Partnership (see: http://www.severnestuary.net/)

[11] Including the Channel Coast Observatory: http://www.channelcoast.org/

[12] Southwest Strategic Regional Coastal Monitoring Programme - http://www.channelcoast.org/southwest/

[13] Wales Coastal Monitoring Centre (2011) *Annual report 2010/11*, May 2011

[14] Reports of the Severn Estuary Climate Change Research Advisory Group (SECCRAG) hosted under the IMCORE project are available at: http://www.severnestuary.net/sep/imcore/CCSseccrag.html

[15] BBC Wales News (2012) *Welsh Government flood defence budget facing £30 million cut*, Available from: http://www.bbc.co.uk/news/uk-wales-politics-18597520.

[16] Environment Agency Wales (2010) *Future flooding in Wales: flood defences. Possible long-term investment scenarios*, Environment Agency 2010

[17] This was estimated at about £15 million per year, assuming a scheme design life of 50 years and a replacement cost of £2 million per kilometre.

Given the possible future demise of Welsh Government and local government funding, it is essential for the Welsh Government to help promote the development of partnership funding schemes and investigate the effectiveness and efficiency of other funding arrangements more actively. Lessons from the English Coastal Pathfinder project may be useful in this regard.

3.3 Welsh Government Planning Policy

Local planning authorities as gatekeepers of development share the responsibility for safeguarding people and property from risk and therefore must work alongside engineers in managing both flood and coastal erosion risk. In so doing, local authority planners should strive to develop more visionary approaches to coastal planning, particularly in the context of future opportunities associated with the renewable energy potential and the regeneration needs of much of our Welsh coasts. In this context, it is recommended that any revised planning policy Technical Advice Note related to coastal areas should consider promoting the futures scenarios approach piloted by the INTERREG IMCORE project[18].

Technical Advice Note (TAN) 14: Coastal Planning (1998)

The School of Earth and Ocean Sciences suggests that appropriate planning policy, notably Technical Advice Note (TAN) 14: Coastal Planning (1998) is in need of urgent updating and revision to reflect the need for cooperative working, the new coastal risk agenda, recent climate change predictions and, in particular the coastal erosion maps from the NCERM project, referred to above. The School considers also that the new TAN should promote the adoption of stronger coastal erosion zones and associated planning policies within local plans, as suggested by Chartered Institute of Water and Environmental Management (CIWEM)[19].

Technical Advice Note (TAN) 15: Development and Flood Risk (2004)

The School also advises that TAN 15 should be revised, particularly in the light of the Strategy and the new responsibilities and opportunities under the National Environmental Framework. There is a need for the revised TAN to consider ways in which planning authorities can work with others to develop innovative cross-cutting approaches which result in 'win-win' solutions. The need for communication of best practice, such as the Conwy regeneration and flood protection scheme (Welsh Audit Office, 2009), to facilitate such approaches is vital.

4. Opportunities for the development of coast protection within Wales

4.1 Integrated Coastal Zone Management

The School is disappointed to have to point out that the issues raised by the Welsh Audit Office (2009) in relation to the lack of integration of flood and erosion risk management with more holistic approaches to coastal management remain. Whilst the Welsh Government developed an Integrated Coastal Zone Management Strategy in accordance with European guidance,[20] this did not encompass more than minimal consideration of coastal erosion and flood risk. The ICZM strategy has also not been updated. The School considers that the Welsh Government's shift towards natural resource management may provide potential in revitalising the ICZM strategy for the Welsh coast. Consequently, it recommends that this possibility should be investigated by Welsh Government, particularly given the land-sea issues which are likely to arise once marine plans are developed.

4.2 Natural resource management planning

The School considers that the natural resource management plans under consideration by the Welsh Government[21] could facilitate more integrated approaches to coastal erosion risk management. Coastal natural resource management plans, traversing the land-sea interface and addressing the needs of coastal systems, could be a critical tool for delivering NEF driven local coastal decision—

[18] IMCORE Scenario guidance: http://www.coastaladaptation.eu/index.php/en/toolbox/scenario-building-techniques-guidelines-and-examples

[19] CIWEM (2008) Flood and Coastal Erosion Risk Management – Position Paper, available from: http://www.ciwem.org/policy-and-international/policy-position-statements/flood-and-coastal-erosion-risk-management.aspx

[20] The Recommendation of the European Parliament and of the Council of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe, (2002/413/EC).

[21] Welsh Government (2012) *Sustaining a Living Wales: a Green Paper on a new approach to natural resource management in Wales*, Welsh Government Consultation Document, 30 January 2012.

making. Whilst the piloting of area plans is supported in principle, the School would recommend that an additional suite of plans could provide further complexity to an already congested local planning and policy arena. Any such plans would therefore, need to have clear linkages with existing local and regional plans and be supported by appropriate planning guidance.

4.3 The Welsh Single Body

The School is keen to support the establishment of the Single Body as proposed by the Welsh Government in its consultation earlier this year (2012b). The broader focus of this institution, if managed carefully, should facilitate more holistic approaches to coastal flood and erosion risk management. This wider vision will be necessary as projected large scale losses of Natura 2000 intertidal Welsh sites[22] lead to potentially costly and contentious compensation and complex trade offs between environmental, social and economic benefits. It is, however, vital that appropriate resources are dedicated to flood and coastal erosion risk within this new body's budget.

4. Shoreline Management Plans and the National Strategy

The School of Earth and Ocean Sciences recognises the significant achievement of Coastal Groups in Wales in supporting the development of the four second generation shoreline management plans (SMP2s) for the entire Welsh coast. These non-statutory plans, with boundaries linked to natural processes,[23] have developed a regional strategic vision for coastal risk management over the next hundred years.

Whilst the initial development of SMPIIs pre-dates that of the Strategy, the plans are largely coherent with the Strategy itself, having been informed by the new risk-based approach. Developed under somewhat prescriptive guidance, the SMPII plan process attempted to engage more fully with stakeholders and the public than that employed for the previous, first generation of SMPs. The School of Earth and Ocean Sciences notes the significant efforts required to involve stakeholders in the Severn Estuary SMPII development and recognises the difficulties associated with engaging with certain key stakeholders in this area, notably with some elected members.

As with all plans, implementation is key. This is particularly true for these non-statutory plans which are designed to inform statutory planning efforts to ensure new development is not located in risk areas and does not exacerbate risk elsewhere. With a variable track record for SMPI policy adoption within local planning documents and a small but significant number of developments gaining approval in Wales which have gone ahead against EAW advice (Environment Agency Wales 2009)[24], it is vital that SMPII policies are understood and translated into appropriate policies within local plans for coastal areas. There will need to be continued effort of Coastal Groups to ensure this takes place. It is recommended that this should include regular discussion and monitoring of local plan development by each Coastal Group as well as the development of tailor-made, specific guidance for local planning authorities. Such guidance is currently under development for the SMPII for the Severn Estuary, partly modelled on the guidance for relevant local planning authorities produced to accompany the North Yorkshire Coast Shoreline Management Plan.

5. Communicating the risk and stakeholder engagement

The School of Earth and Ocean Sciences welcomes the prominence given to stakeholder awareness raising within the Strategy. This is clearly essential given the Welsh Audit Office's (2009) reporting of the little consideration given to long term risks by coastal residents and local authority elected members less than a decade ago.

Environment Agency achievements

The School recognises the significant achievements of the Environment Agency in raising awareness of at-risk communities. The School hopes that such activities will continue and will also include

[22] The Environment Agency Wales reported a potential loss of 7308 Ha of inter-tidal Natura 2000 sites over the next hundred years and an overall average a rate of loss over this period of 73 Ha/year (Environment Agency Wales (2011) *First Progress Report on the National Habitat Creation Programme for Wales.*

[23] Shoreline management plan boundaries are largely defined by the extent of regional sediment cells. The Severn SMPII and that for the North West and North Wales traverse the English-Welsh border.

[24] Environment Agency Wales (2009) *Flooding in Wales: a national assessment of flood risk*, Environment Agency, 2009. This reported 30 developments between 2007 – 2008 including three major ones which went ahead contrary to EAW advice.

awareness of coastal erosion risk as well in relevant locations. With the establishment of a Single Body there are opportunities to develop a specific Welsh resource on coastal risk management supported by appropriate case study examples.

The Toolkit for Flood Risk Management Community Engagement[25]

Whilst the School recognises that this toolkit has been a useful addition to the risk management portfolio, it considers that this would benefit from including some sections on coastal erosion as well as additional supporting information such as examples of best practice, education/ training material that summarises options for mitigation and adaptation, where to get additional advice and support. In this context, it should be noted that Cynnal Cymru and the Climate Change Consortium developed a briefing pack and roadshow for Community Councils in January 2012 that dealt with sustainable development. CoastNet also provided the Countryside Council for Wales with guidance for local authorities regarding a more integrated approach to coastal management, following a series of workshops and focus groups with various Welsh stakeholders including the Welsh Local Government Association, professional bodies and practitioners.

Future toolkit development

The School considers that a pack and/or on-line resource on coastal risks and their management, including coastal erosion, would be beneficial. This should draw on the best practice and lessons identified within the aforementioned Welsh projects and other initiatives[26]. It should be noted that the School of Earth and Ocean Sciences has extensive experience in developing various training materials, having contributed to numerous international training initiatives, including IMCORE's guidance on coastal climate change adaptation[27] and COREPOINT's *North West Europe Schools of Excellence in Integrated Coastal Zone Management*.[28] In this context, the School would be keen to be involved in future discussions related to coastal risk management training and associated resource development.

Local Authority Officer training and support

The limited capacity of local authorities to deal with coastal risk management has been mentioned previously. As there is a quest for more holistic and visionary coastal risk management solutions based on the Natural Environment Framework, so further specific training and support will be vital. Guidance will also be needed for local planning authorities to help them implement the ecosystem approach to maximise ecosystem services and human well-being for complex coastal risk situations.

The School regrets the demise of the Arfordir coastal network, although notes that there remain various opportunities for networking and sharing best practice on coastal matters across Wales. These include the annual Wales Coastal and Maritime Partnership conferences as well as conferences occasionally organised by the Royal Town Planning Institute (RTPI), the Institution of Civil Engineers (ICE) and others. Joint professional conferences which encourage cross-discipline discussions of 'wicked'/complex coastal problems need to be promoted in the context of the NEF.

Public engagement

Further stakeholder groups need to be involved in ensuring that the public continue to be educated and engaged in flooding and coastal erosion risks, mitigation and adaptation options. This should be addressed on a pan-Wales scale to ensure consistency of messages and ongoing response. However, it is noted that recent academic research (Whitmarsh 2011) has shown that, "education alone is not enough, active engagement is required to change behaviour".

Sustaining Living Wales grants and other community-level initiatives

The School recommends that the Environment Agency (and its successor) is involved in over-arching capacity in overseeing the development of community level initiatives including the *Sustainable Living Wales* grant applications. These are being developed via Community and Town Councils. This would help ensure outcomes are directly linked to high level objectives and that common messages are being communicated. In this context it is suggested that Environment Agency staff should be included in the Steering Group of successful Sustainable Living Wales grants.

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[25] Welsh Government (2011) *Flood Risk Management: Community Engagement Toolkit*, Welsh Government, October 2011, (http://wales.gov.uk/docs/desh/policy/111025communityengagementtoolkiten.pdf)

[26] Local factsheets on coastal issues and risks such as those developed by the Suffolk Coast and Heaths Unit and by Cardiff University for the Local Government Association's Coastal Special Interest Group would also be relevant.

[27] As part of the INTERREG IMCORE project: See: http://www.coastaladaptation.eu/index.php/en/

[28] Selected COREPOINT training materials available from: http://corepoint.ucc.ie/Cpages/outputs.htm

Linking with the Climate Change Commission
The School recommends that it would be beneficial for this commission to be more actively involved in implementing the Flooding and Coastal Erosion Risk Management Strategy. This could also help strengthen relations between stakeholders and support widespread communication and engagement.

6. Conclusion

To conclude, the School of Earth and Ocean Sciences welcomes the Strategy and its implementation, particularly given the significant challenges associated with the future management of coastal flood and erosion in Wales.

The School recognises the opportunities that the Welsh Government's proposed institutional changes should bring in helping develop a more holistic, risk-based approach for the Welsh coast. However, it is essential that there is an effective and clear governance system to assist with the Strategy's delivery from day one of the new arrangements. It is also vital that the proposed extensive budget cuts, alongside limited stakeholder capacity, do not undermine the potentially innovative endeavours which otherwise would emanate from the Strategy.

Finally, it should be noted that the School of Earth and Ocean Sciences is, unfortunately, unable to present this response in person to the Committee at the scheduled time. It is, however, willing to respond to any queries that the Committee may have in relation to this paper and its contents.

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29/06/2012

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

NATIONAL ASSEMBLY FOR WALES
ENVIRONMENT AND SUSTAINABILITY COMMITTEE
INQUIRY INTO COASTAL PROTECTION IN WALES

WRITTEN EVIDENCE FROM THE COUNTRYSIDE COUNCIL FOR WALES

KEY MESSAGES

The coastline of Wales is a high quality resource and an economically, socially and environmentally important asset. Coastal protection measures should therefore seek to maintain and enhance this resource for all of the services it provides.

- The coastal environment of Wales is a major attraction to visitors who are drawn by the quality of the landscape, wildlife and sea water. The environmental quality is reflected in the wide range and large number of designations and protected sites that cover the coastline. The high quality coastline is also economically important for Wales and is vital to the tourism industry. Coastal habitats are important for a range of regulating services, with coastal defence being the most important.

- Records show that global sea level has been rising at an increasing rate, and climate change projections indicate that this trend is highly likely to continue. This will lead to an increase in tidal flood risk on the coast and in estuaries.

- The Countryside Council for Wales (CCW) welcomes the publication of the National Strategy for Flood and Coastal Erosion Risk Management in Wales. CCW particularly welcomes the emphasis on the need to adapt to climate change within the National Strategy.

- CCW considers that progress with respect to delivery of the National Strategy is consistent with the timetable set out and is appropriate given the timescales since publication.

- The delivery of the National Strategy provides an opportunity to take forward a more holistic approach to coastal management, and to provide sustainable solutions with multiple benefits. An exemplar of integrated coastal zone management in practice.

- **Integration** between the National Strategy and other key Welsh Government initiatives (e.g. the Sustainable Development Scheme: One Wales One Planet; Sustaining a Living Wales and delivery of the Ecosystem Approach, the Climate Change Strategy, and development of Marine Planning) is a well recognised ICZM principle and will be critical in securing sustainable management of the Welsh coast.

- **Continued strategic leadership from WG** is required to deliver the high level aspirations, and ultimately, sustainable solutions at the coast that meet the objectives set out in the National Strategy. WG must therefore maintain efforts to bring together the relevant government

departments (e.g. FCERM, Planning, Visit Wales, Regeneration, and Transport) with other partners.

- Partnership working is central to the delivery of the National Strategy, and successful delivery will take time and commitment from all partners. We **perceive** that **there may be insufficient staff resource, rather than a lack of drive and enthusiasm** within WG FCERM which may make ongoing delivery of the Strategy a significant challenge. In addition there is considerable expertise in EA HQ and DEFRA that Wales has been able to draw on and learn from in the past. Careful consideration is required to ensure that Wales has access to adequate staff resource and technical expertise going forward.

- CCW believes that the existing **funding** regime (defined in section 3 of the National Strategy) for coast protection works is a significant constraint on the delivery of outcomes which are sustainable and have the potential to deliver multiple benefits. CCW therefore welcomes the measure under Object 4 of the National Strategy to develop a 'National funding policy and prioritisation methodology.'

- CCW recommends that provision of **evidence** remains high on the agenda to ensure that robust decisions can be taken with respect to managing the coast sustainably.

1. INTRODUCTION

1.1 CCW's Role in Relation to Coastal Protection

1.1.1 The Countryside Council for Wales (CCW) welcomes the opportunity to participate in the Environment and Sustainability Committee inquiry into coastal protection in Wales.

1.1.2 CCW champions the environment and landscapes of Wales and its coastal waters as sources of natural and cultural riches, as a foundation for economic and social activity and as a place for leisure and learning opportunities. We aim to make the environment a valued part of everyone's life in Wales.

1.1.3 CCW is the Welsh Government's statutory advisor on sustaining natural beauty, wildlife and the opportunity for outdoor enjoyment in Wales. CCW was created by the Environmental Protection Act 1990 to provide advice on nature conservation, landscape and recreational matters throughout Wales and Welsh waters.

1.1.4 CCW staff engage in a wide range of coastal protection related matters, including

- Advice on designation of sites of National and International nature and geological conservation importance, and advice on their status and management;
- Management of 16 National Nature Reserves on the coast;
- Co-ordination of the delivery of the All Wales Coastal Path on behalf of Welsh Government;
- Advice on coastal landscapes and seascapes;
- Advice on CCWs remit relating to strategic planning processes of relevance to the environment including, Local Development Plans, River Basin Management Plans, and the developing Marine Planning framework;
- Advice on the development and delivery of policy relating to the coastal environment, including the National Strategy; Shoreline Management Plans;

- Input to the Wales Coastal Monitoring Centre;
- Advice on coastal and marine casework
- Research and evidence gathering on coastal environmental status, interactions and pressures relating to our remit;
- And detailed advice on the impact of individual coastal protection schemes.

1.1.5 CCW is represented on the Welsh Coastal Groups responsible for preparation of SMP2s, the Welsh Coastal Groups Forum which oversees the work of the Coastal Groups, and the DEFRA/EA FCERM Stakeholder Forum. CCW is also a member of the Wales Coastal Maritime Partnership and the UK Marine Climate Change Impacts Partnership.

1.2 Importance and Value of the Welsh Coast as a Natural Resource

1.2.1 Wales' coast is considered of international significance as well as a nationally important asset, reflected in the extent of sites designated for conservation purposes. Approximately 75% of the Welsh coast is designated as Sites of Special Scientific Interest to protect nationally important nature conservation and/or geological features. More than 60% of the Welsh coast is also designated under the European Habitats or Birds Directives.

1.2.2 The high quality coastal landscape/seascape is reflected by over 800 km of Heritage Coast, three coastal Areas of Outstanding Natural Beauty, and two National Parks. A recent workshop on coastal protected landscapes and the marine planning system[1] set out some of the special qualities of coastal protected landscapes. These included emotional connections such as 'wildness', and 'untamed'; the visual, ecological and physical transitions from land to sea; the importance of visible geology and geomorphology; and the cultural connections such as 'maritime landmarks', and 'myths and legends'. The economic importance for recreation and tourism, sailing, traditional fishing and local sources of food was also noted.

1.2.3 According to the Coastal Tourism Strategy for Wales[2], the coastal environment is a major attraction to **visitors who are drawn by the quality of its landscape, wildlife and sea water**. The environmental quality of the Welsh coastline is reflected in the wide range and large number of designations and protected sites that cover the coastline. The **high quality coastline** is also economically important for Wales and is vital to the tourism industry in Wales. In 2006, spending associated with an overnight visit to the coast amounted to around £648million, nearly 40% of total tourism spending in Wales. Visits to the coast account for 41% of all overnight trips in Wales - a much higher proportion than in England and Scotland where visits to the seaside only account for 20% and 13% of trips.

1.2.4 The total length of the coastline of Wales is approximately 2740 km, of which about 28% is protected by artificial sea defences[3, 4]. The rest of the coast is afforded

[1] Europarc Federation: Atlantic Isles (2010). Coastal protected landscapes and the marine planning system a report from a workshop held at Losehill Hall, May 2010
[2] Welsh Assembly Government (2008). Coastal Tourism Strategy.
[3] Brazier, P., Birch, K., Brunstrom, A., Bunker, A., Jones, M., Lough, N., Salmon, L. and Wyn, G. (2007). *When the tide goes out. The biodiversity and conservation of the shores of Wales - results from a 10 year intertidal survey of Wales.* The Countryside Council for Wales.

'protection' from natural habitat resources. According to the UK National Ecosystem Assessment[5] **Sand Dunes, Saltmarsh and Sea Cliffs are the most extensive coastal habitats in Wales and are important for a range of regulating services.**

1.2.5 **Coastal defence is the most important regulating service provided by Coastal Margins[6]**. All habitats contribute to coastal defence either directly by dissipating or attenuating wave energy or indirectly through regulating sediment. Sand dunes and shingle provide direct protection as a barrier, while saltmarsh primarily attenuates wave energy.

1.2.6 Up to 50% of wave energy is attenuated in the first 10–20 m of vegetated saltmarsh, reducing the size needed for landward defences[6]. Therefore even the relatively narrow saltmarshes that fringe the exposed Welsh coast of the Severn Estuary perform an important part of the defence function.

1.2.7 In 2007, the sea defence services of sand dunes were calculated to be worth between £53 and £199 million in Wales[5]. For example, the dunes at Crymlyn Burrows near Swansea provide a critical part of the defence function to Fabian Way, and Baglan Dunes provide protection to the Baglan Energy Park.

1.2.8 The CIRIA Beach Management Manual, 2010[7] highlights the importance of beaches as a form of coastal defence, and this role is recognised in SMP2s in areas such as Aberystwyth where management of the beach will be required alongside maintenance of defences in order to achieve the required protection standards.

1.2.9 The coastal margin is also important or highly important for a variety of ecosystem services alongside coastal erosion protection. These include climate, hazard, soil and air quality (regulating services); local places and landscapes/seascapes (cultural services), wild species diversity (cultural/provisioning services) and fish (provisioning services).

1.2.10 The 870 mile long All Wales Coastal Path was opened on 5th May 2012, with a view to encouraging and enabling the public, both locals and visitors, to enjoy the coastline of Wales; to encourage and enable more people to enjoy physical recreation at the coast, thus helping in efforts to become a fitter, healthier nation; and to make coastal access a 'flagship' tourism product, thus bringing economic benefit to coastal communities.

1.2.11 The challenge of managing the dynamic coastal environment where a significant level of human activity occurs is recognised and promoted at the European Level with a focus on ICZM. CCW, through the Wales Coastal and Maritime Partnership, inputted to the development of the ICZM strategy for Wales[8]. Furthermore, the EU OURCOAST programme[9] aims to ensure that lessons learned from the coastal management experiences and practices across EU member states will be shared and made accessible to those who are seeking sustainable solutions to their coastal management practices.

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[4] UK Climate Change Risk Assessment, 2012- A Climate Change Risk Assessment for Wales

[5] Russell, S. *et al* (2011). Chapter 20: Status and Changes in the UK's Ecosystems and their Services to Society: Wales *in* The UK National Ecosystem Assessment Technical Report. UK National Ecosystem Assessment, UNEP-WCMC, Cambridge.

[6] Jones, L. *et al* (2011). Chapter 11: Coastal Margins *in* The UK National Ecosystem Assessment Technical Report. UK National Ecosystem Assessment, UNEP-WCMC, Cambridge.

[7] CIRIA Beach Management Manual (Second Edition), 2010.

[8] Welsh Government, 2007. Making the Most of Wales' Coast -The Integrated Coastal Zone Management Strategy for Wales

[9] http://ec.europa.eu/environment/iczm/ourcoast.htm

1.2.12 The above highlights the strategic importance of the Welsh coastal environment to our society – including the range of sometimes underappreciated 'services'. **It is critical, therefore, that coastal protection activities are delivered with the aim of sustaining and maximising the value of this natural resource**.

1.3 Status of and Pressures on the Natural Resources of the Welsh Coast

1.3.1 60% of population of Wales lives and works in the coastal zone[8]. The coast is also recognised as a popular tourist destination[10].

1.3.2 According to the UK Climate Change Risk Assessment, 2012[11], global sea level has risen at a mean rate of 1.8 mm per year since 1955. From 1992 onwards a higher mean rate of 3 mm per year has been observed. **The climate change projections indicate that the sea level is highly likely to continue to rise and that the rate of rise is projected to increase.** This would lead to an increase in tidal flood risk on the Welsh coast and in estuaries.

1.3.3 The 2012 Climate Change Risk Assessment for Wales[12] indicates that the most significant threats for Wales from climate change include increases in flooding both on the coast and inland, and changes in coastal evolution including erosion and coastal squeeze. Estuary models for the Dyfi, Mawddach and Loughor Estuaries[13], developed through collaboration between CCW and Bangor University, have also demonstrated the potential impacts of rising sea-levels.

1.3.4 A CCW report[14] which examined constraints imposed by rail assets at the coast concluded that more than 160 km of railway lies within zones potentially subject to tidal flooding or coastal erosion over the next 100 years, and furthermore that 99 km of coastal railways potentially constrain protected nature conservation sites.

1.3.5 The National Habitat Creation Programme Interim Report (2011)[15] collated predicted coastal habitat losses due to coastal squeeze through the implementation of the Shoreline Management Plans. Excluding the Severn Estuary, this report refers to possible losses of 105 ha in the first epoch (0-20 years), 473 ha in the second epoch (20-50 years), and 993 ha in the third epoch (50-100 years). The figures for the Severn Estuary are not split between England and Wales within this report and are significantly higher (5737 ha over 100 years) than for the rest of Wales combined. This presents significant challenges for the future management of this area, and the need for close cross border working between Agencies and Government in England and Wales.

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[10] Welsh Assembly Government (2008). Coastal Tourism Strategy
[11] UK Climate Change Risk Assessment, 2012- Coastal Report
[12] UK Climate Change Risk Assessment, 2012- A Climate Change Risk Assessment for Wales
[13] Robins, P. 2009 Development of a Morphodynamic model of the Dyfi Estuary to inform future management decisions. CCW Contract Science Reports 898a; Robins, P. 2009 Development of a Morphodynamic model of the Burry inlet to inform future management decisions. CCW Contract Science Reports 898b; Robins, P. 2011 Development of a Morphodynamic model of the Mawddach Estuary to inform future management decisions. CCW Contract Science Reports 898c.
[14] Halcrow, 2006. Assessment of Constraints Imposed on Future Shoreline Management by Rail Assets Adjacent to the Coast. CCW Science Report. Report No. 756.
[15] Environment Agency Wales, 2011. National Habitat Creation Programme Interim Report for Welsh Government

1.3.6 The Welsh coast is a high-quality asset which is under pressure. The available evidence suggests that these pressures are set to increase with time and will need to be addressed in a strategic and integrated way to maintain the value of the coast whilst managing the risks to coastal communities.

1.4 Opportunities for Sustainable Future Coastal Management

1.4.1 CCW welcomes the publication of the National Strategy for Flood and Coastal Erosion Risk Management in Wales which was launched in November 2011. We particularly welcome the references to '*new, sustainable and innovative approaches required to ensure that in future we move beyond defence and drainage alone and find ways to work with natural processes*' and that '*the Welsh Government is committed to ensuring that the actions we take are sustainable, and that we manage the risks to our wider environment*'.

1.4.2 We welcome the emphasis on the need to adapt to climate change within the National Strategy and the reference to '*reducing the consequences ….for the environment*' in the first objective. Whilst the National Strategy is an excellent foundation for future work towards sustainable management of the coast, we advocate closer linkages with other key initiatives, plans and strategies, including those set out below.

1.4.3 The objectives need to embrace the principles of both ICZM[16] and "The Ecosystem Approach"[17] , including conservation of ecosystem structure and function and not just those related to societal choice and local management. Both frameworks highlight the importance of taking a long-term view working with natural processes and sustaining ecosystem structure and function.

1.4.4 As set out in the 'Sustaining a Living Wales' consultation document[18], and CCW's response to it[19], CCW is working to implement the Ecosystem Approach. This includes the need to think and act at the ecosystem or landscape scale to 'ensure that Wales has increasingly resilient and diverse ecosystems that deliver environmental, economic and social benefits now and in the future.' The coastal environment is a particular challenge where an integrated, holistic approach to management as set out in 'Sustaining a Living Wales' could add real value.

1.4.5 Studies on the valuation of Welsh ecosystem services have been identified as a priority by Welsh Government, and are being carried forward in parallel with the spatial mapping of ecosystem services in Wales[20].

1.4.6 The Welsh Government's approach to climate change[21] is set within the context of the Assembly Government's *Sustainable Development Scheme: One Wales One*

[16] Welsh Government, 2007. Making the Most of Wales' Coast -The Integrated Coastal Zone Management Strategy for Wales
[17] Principles of the Ecosystem Approach, Convention on Biological Diversity: http://www.cbd.int/ecosystem/principles.shtml
[18] Welsh Government, 2012. Sustaining a Living Wales- Consultation Document
[19] CCW's response to the 'Sustaining a Living Wales' Consultation, May 2012
[20] Russell, S. *et al* (2011). Chapter 20: Status and Changes in the UK's Ecosystems and their Services to Society: Wales *in* The UK National Ecosystem Assessment Technical Report. UK National Ecosystem Assessment, UNEP-WCMC, Cambridge.
[21] Welsh Government (2010). Climate Change Strategy for Wales

Planet[22]. Within the Climate Change Strategy Adaptation Delivery Plan we specifically welcome the links between Action 11 and the requirements for implementation of the National Strategy. These linkages demonstrate WG commitment to a long term vision and integrated action to address climate change issues.

1.4.7 CCW supports the intention to review funding for Flood and Coastal Erosion Risk Management Activities (identified under Objective 4 of the National Strategy). In our view, this could provide improved flexibility in funding arrangements to enable delivery of the National Strategy. Further details are provided in section 2.3 below.

1.4.8 The consultation on 'Sustaining a Living Wales' and the recent announcement to establish a Single Body (SB) for Wales provide a significant opportunity to bring together and maximise synergies between CCW and EAW, both of whom have a significant role in the coastal environment[23]. Going forward, it is critical that adequate skills are retained or replaced to ensure that the SB can continue to support WG in the delivery of the National Strategy.

1.4.9 Overall the required framework is in place, it is now important to ensure the National Strategy is robustly delivered.

1.4.10 The first key steps in the implementation of the National Strategy described in section 2 below, should provide a strong basis for delivery of other elements of the Strategy, with a view to securing sustainable management of the coast.

2. EVIDENCE AS REQUESTED IN THE TERMS OF REFERENCE FOR THIS INQUIRY

Evidence reflecting the key themes identified in the terms of reference for this Inquiry is provided under the following main headings:

- CCW understanding of progress in implementing the objectives of the National Strategy for Flood and Coastal Erosion Risk Management in Wales, including Shoreline Management Plans and Local Flood Risk Management Strategies;
- CCW views on the National Strategy : it's delivery and how these could be improved;
- CCW views on funding of coastal protection and how this could be improved;
- CCW's views on barriers to the development of coastal protection in Wales and how these could be addressed;

Note: CCW is not providing specific evidence with respect to 'communication of objectives and risks and plans for future communication' as we are not identified as a stakeholder against communication measures under Objective 2 in the National Strategy. However we comment on the importance of communication under section 2.4 below.

[22] Welsh Assembly Government (2009) Sustainable Development Scheme: One Wales One Planet
[23] CCW's response to the 'Sustaining a Living Wales' Consultation, May 2012

2.1 CCW understanding of progress in implementing the objectives of the National Strategy for Flood and Coastal Erosion Risk Management in Wales, including Shoreline Management Plans and Local Flood Risk Management Strategies

2.1.1 The National Strategy was published in November 2011. It sets out four overarching objectives, with 11 sub-objectives and 53 measures, which describe the steps towards delivery of the strategy. CCW is identified as a stakeholder against 19 of the measures, and we have restricted our evidence to those where we have an identified role.

2.1.2 CCW considers that progress with respect to delivery of the National Strategy is consistent with the timetable set out and is appropriate given the timescales since publication.

2.1.3 Shoreline Management Plans (SMP2s)

CCW, along with other bodies, has put considerable effort into the Shoreline Management Planning process because we see the significant value in taking this long term strategic approach to enable Wales to adapt to climate change at the coast. We are pleased to see that implementation of the SMP2s is a requirement of the National Strategy.

As we understand the process, the next step with respect to SMP2s is to secure approval of the plans by WG. The approval process requires WG to ensure compliance with the Habitats Directive. CCW is aware that all of the plans have identified potential for adverse effects on European sites. They therefore require consideration of an 'Imperative Reasons of Over-riding Public Importance' (IROPI) case by WG. As required by the Directive, the plans can only proceed once IROPI is confirmed and if provision for compensatory habitat is secured. CCW understands that the National Habitat Creation Programme (NHCP) has been identified as the primary mechanism for delivery of the required compensatory habitat. Therefore, securing progress on the NHCP, and long term commitment to it, is also critically important to **enable** SMP2s to be implemented. CCW is working in principle and without prejudice with EAW on behalf of WG to take forward the NHCP (see section 2.1.5).

There are also significant challenges in relation to cross-border sites, in particular the Severn Estuary, where the predicted habitat losses are large. CCW welcomes the commitment from DEFRA and WG, EA and EAW, CCW and Natural England to work together to try to resolve these issues.

2.1.4 Links between National Strategy and the SMP2s and Flood Risk Management Strategies (FRMS)

The SMP2s and FRMS (EA- Dee, Clwyd, and Severn) had all been drafted and consulted upon before the National Strategy was published. Therefore it was difficult for these plans/strategies to reflect the National Strategy. However, the objectives in the National Strategy reflect the fundamental requirements of the SMP2s. For example, the SMP policies are intended to 'reduce the consequences' and the process of developing the SMP2s has helped to 'raise awareness'. Nevertheless it would seem appropriate for WG to check the SMP2s for compliance with the National Strategy, as part of its approval procedure.

For Local Flood risk Strategies, these are at too early a stage for CCW to comment.

2.1.5 The National Habitat Creation Programme (NHCP)

CCW understands that the National Habitat Creation Programme (NHCP) has been identified by WG as the primary delivery mechanism for compensatory habitat for SMP2s. Provision of compensatory habitat is required to **enable** the coastal management/protection requirements set out in the SMP2s to be delivered, whilst remaining compliant with the requirements of the Habitats Directive. This means that the NHCP is a critical element in the delivery of coastal protection in Wales, and will ensure that our natural coastal resources are maintained, protected and hopefully enhanced.

We recommend that the NHCP moves forward as an integral part of the Flood and Coastal Erosion Risk Management Programme. The NHCP should be viewed as part of the solution wherever possible. For example, this can be achieved by identifying habitat creation sites in estuaries that not only create compensatory habitat but also reduce water levels across the estuary (by increasing the estuary capacity). This would then reduce the pressure on defended sections. This approach has been attempted in several schemes e.g. Alkborough in the Humber Estuary[24]. Alternatively, it may be possible to establish a set back defence line which enables habitat creation to seaward. The new saltmarsh can then contribute to improved defence function through increased wave energy dissipation.

To date the NHCP has focussed on creation of saltmarsh and intertidal mudflat and sandflat habitats only. However, CCW is concerned that this does not include the full range of habitats and species which may be affected by coastal squeeze. Other examples are likely to include cave, shingle and reef habitats.

CCW is currently engaged in research to develop our understanding of coastal habitats and species at risk due to climate change and implementation of SMP2s. The research also aims to explore what mitigation or compensation measures may be possible to address these risks/potential losses. We intend to continue to work closely with EAW and WG to feed this information into the NHCP as it becomes available.

We welcome the appointment of a full time officer within EAW to progress this work. This is a significant area of work where we consider adequate capacity will need to be retained.

2.1.6 Research into the Use of Softer Engineering Approaches

There are two measures related to this topic under Objective 4 (prioritising investment in the most at risk communities): ‘research into the costs and benefits of softer engineering approaches’ and ‘guidance on the comparative use of hard and soft engineering approaches’. The delivery deadline for these measures is 2013.

CCW is pleased to have secured early WG engagement in a recent project which we hope will contribute significantly to the delivery of these measures. The ‘Re-building Welsh Beaches to Deliver Multiple Benefits’[25] project received significant funding from the Aggregates Levy Fund for Wales. This project, commissioned by CCW, was

[24] http://www.abpmer.net/omreg/search_database.aspx
[25] http://www.ccw.gov.uk/environmental-change/climate-change/safeguarding-welsh-beaches.aspx

delivered in partnership with representatives from WG Flood and Coastal Erosion Risk Management Team, WG Planning, Visit Wales, Environment Agency Wales, The Crown Estate and the British Marine Aggregates Producers Association.

Further details on this project and the opportunity it provides to contribute towards delivery of the National Strategy is set out in Box 2 (section 2.2) below.

2.1.7 Evidence

CCW welcomes the WG commitment to fund the Wales Coastal Monitoring Centre (WCMC), as set out in paragraph 99 of the National Strategy.

The WCMC was launched in January 2010. CCW supports the aim of the WCMC to: '*establish a framework necessary to provide good quality information on coastal change that will help inform flood and coastal risk management decisions*'. More specifically, the WCMC intends to co-ordinate the collation, storage and analysis of coastal process data to fulfil this aim[26].

CCW is of the view that the WCMC will, when further developed, be an essential mechanism to help deliver a robust evidence base to inform management of the Welsh coastline. Such evidence would have a range of valuable outputs and could help to deliver monitoring requirements associated with Shoreline Management Plans, Flood Risk Management Strategies and the National Strategy. Currently the WCMC is developing a business case for it's continuation beyond the initial three year commitment. It is hoped that the future of the Centre is secured with adequate resources to allow fulfilment of its aims. Other mechanisms to deliver coastal monitoring requirements on a national basis remain limited/ unknown at present.

CCW (and presumably the Single Body (SB)) embraces the UK and WG vision of "clean, safe, healthy, productive and biologically diverse oceans and seas". This vision comes with a high level objective to use sound science responsibly[27]. In particular, it is recognised that our understanding of the marine and coastal environment continues to develop through new scientific research and data collection. Also sound evidence and monitoring underpins effective marine management and policy development.

CCW is taking part in SB implementation projects focused on the evidence required to underpin the work of the SB and is seeking the adoption of the science objective described above. We recognise that EAW benefited from considerable support and expertise provided by evidence specialists based in England working on areas such as flood and coastal risk management. Careful consideration is required to ensure that Wales has access to adequate technical expertise going forward, and CCW considers it critically important that this issue is resolved.

The creation of the SB provides an ideal opportunity to develop a shared research agenda with WG and others to support the delivery of s government policy objectives. We also consider it equally important to make sure that Wales engages with and benefits from the findings of larger scale research programmes, such as those funded by the Natural Environment Research Council, DEFRA and the European Commission.

[26] Wales Coastal Monitoring Centre, Wales Coastal Monitoring Centre First Annual Report 2010/11, May 2011.
[27] http://archive.defra.gov.uk/environment/marine/documents/ourseas-2009update.pdf

Given the potentially sensitive nature of technical advice on coastal protection, we also think that the SB and WG need to have clear rules on how they work together from the outset. We think the "Principles of Scientific Advice to Government" [28] should be adopted as the basis for operations and interactions.

The Wales Biodiversity Partnership is also undertaking an exercise to identify research priorities in Wales, including coastal environments. Although they have not reported yet we anticipate that the partnership will highlight research focused on ecosystem functioning and services, climate change, dune stabilisation and saltmarsh.

There is potential to make links with the WG's recently published "Science for Wales: A strategic agenda for science and innovation in Wales"[29]. This document sets out three "Grand Challenge" priority areas. In particular, a challenge is developed around low carbon, energy and environment which includes climate change science and adaptation, environmental monitoring, water and ecology.

We recognise that Welsh academic community has some important skills and specialist knowledge required to make a significant contribution to the research required to support sustainable coastal protection in Wales. This knowledge and expertise will need to be supported and harnessed.

2.2 CCW views on the National Strategy: its delivery and how this could be improved

2.2.1 The move towards delivery of the National Strategy requires an **ongoing commitment to communication and close working,** both within Government (between relevant departments) and between Government and other key partners. The example at Borth, provided in Box 1 illustrates the challenges we face, as well as the importance of working towards an integrated approach and a sustainable solution.

Box 1 – Example - Borth

Significant investment has already been made in the improved sea defences at Borth, and further investment has been announced as part of the Wales Infrastructure Investment Plan. However, coastal defence works at Borth can only be seen as a partial 'sticking plaster'. The recent flood events (June 2012) in the Leri were contributed to by high tide conditions in the lower reaches, and had the potential to put Borth village at risk due to flooding from the rear. Therefore an integrated approach to investment and future management in the area is required. Any detailed strategy also needs to take account of the interests of the Internationally important Borth Bog, Ynyslas Dunes and the Dyfi Estuary, as well as the railway line that runs through this area. This is recognised in the SMP2, and in the work underway in EAW in terms of developing a Flood Risk Management Strategy. However, the decision to approve further funding for works on the coastal frontage at Borth comes with the usual pressures of timescale for delivery due to financial restrictions. It does not allow time for an integrated approach to be developed and agreed upon. There is therefore a risk that the current investment will not be consistent with delivery of the detailed longer term strategy for this area.

[28] http://www.bis.gov.uk/go-science/principles-of-scientific-advice-to-government
[29] http://wales.gov.uk/topics/businessandeconomy/csaw/publications/120312sfw/?lang=en

2.2.2 We therefore emphasise the **need for continued strategic leadership from WG**, to bring together the relevant departments (FCERM, Planning, Visit Wales, Regeneration, and Transport for example) and other partners to deliver the high level aspirations, and ultimately, sustainable solutions at the coast that meet the objectives set out in the Strategy. The lack of strategic leadership was highlighted by the Wales Audit Office in 2009 in their report on Coastal Erosion and Tidal Flooding Risks in Wales[30] and CCW welcomes the commitment from WG to addressing this issue.

2.2.3 **Partnership working** is central to the delivery of the National Strategy, and successful delivery will therefore take time and commitment from all partners. We **perceive** that **there may be insufficient staff resource, rather than a lack of drive and enthusiasm** within WG FCERM which may make ongoing delivery of the Strategy a significant challenge. This issue was also noted in the Wales Audit Office report in 2009[21]. In addition there is considerable expertise in EA HQ and DEFRA that Wales has been able to draw on and learn from in the past. Careful consideration is required to **ensure that Wales has access to adequate technical expertise going forward**.

2.2.4 It important to ensure that **delivery of the National Strategy complements other key Welsh Government initiatives** e.g. the Sustainable Development Scheme: One Wales One Planet agenda; Sustaining a Living Wales and delivery of the Ecosystem Approach, delivery of the Climate Change Strategy, Wales ICZM Strategy, development of Marine Planning, and also plans for transport, tourism and regeneration in the coastal zone. Furthermore, Glastir could also be a key opportunity for influencing the management of coastal land to deliver the objectives of the National Strategy. Such co-ordination and integration will help to secure coastal management which looks for win-win outcomes and is sustainable.

2.2.5 Securing successful and sustainable outcomes at the coast will also require an element of 'grasping opportunities' as they arise. To do this requires both sufficient staff resource within WG to provide the strategic leadership referenced in section 2.2.2. A key example of a potential opportunity is provided in Box 2.

[30] Wales Audit Office, 2009. Coastal Erosion and tidal Flooding Risks in Wales. A report to the National Assembly.

Box 2 – Example - Safeguarding Welsh Beaches- a key opportunity?

CCW, WG (FCERM, Planning and Visit Wales), EAW, The Crown Estate and the British Marine Aggregate producers Association were all members of the Steering Group for a recent Aggregate Levy Fund for Wales funded project called 'Safeguarding Welsh Beaches' which examined the feasibility of beach nourishment (adding sediment to beaches) in Wales.

The project improves our understanding of the technique and its possible application in Wales. It included stakeholder engagement through workshops; a review of SMP2s to see how beaches had been valued in terms of their importance for nature conservation, tourism and recreation, and flood and coastal erosion risk management function; and a resource and economic analysis.

Following completion of the project we are aware that The Crown Estate has approached WG to propose a potential large scale sustainable beach nourishment proposal for the North Wales coast. The scheme, as we understand it would involve significant investment from the Crown Estate, with a view to increasing the value of their asset. It would potentially provide a coastal defence role, a tourism amenity in terms of improved beach facility, and a source of sediment for the designated dune system at Gronant- Talacre, as well as possibly a much need solution to the erosion issues at Traeth Pensarn SSSI.

It is worth noting that beach nourishment is already identified as a mitigation measure within the SMP2 for this section of coast - to allow a Hold the Line policy to be maintained whilst avoiding sediment starvation, and therefore adverse effects, on the dune features (including a priority habitat) at the mouth of the Dee Estuary SAC and Ramsar site.

This is a possible exemplar project to develop a strategic level sustainable approach which is well aligned with the policy drivers. How can Wales take this forward, and who should drive it?

2.3 CCW views on funding of coastal protection and how this could be improved

2.3.1 CCW believes that the existing funding regime (defined in section 3 of the National Strategy) for coast protection works is a significant constraint on the delivery of outcomes which are sustainable and have the potential to deliver multiple benefits. We therefore welcome the measure under Object 4 of the National Strategy to develop a 'National funding policy and prioritisation methodology.'

2.3.2 A recent study by CCW (2005)[31] looked at four examples of coastal protection works in Wales in or adjacent to National Parks. The case study sites were the coastline south of Morfa Dyffryn (home to a number of private caravan parks), Pen yr Ergydd Spit and Poppit Sands at the mouth of the Teifi Estuary, and Wiseman's Bridge and Amroth in Carmarthen Bay.

2.3.3 The main conclusions were:

'*In principle, the **optimal sustainable solutions** for each of the sites would have been to **allow natural processes to resume** (with managed retreat), instead of the artificial hard defences that have been constructed.'*

[31] Jacobs Babtie Ltd, 2005. Identification of Constraints on the delivery of sustainable flood and coastal defences. CCW Science Report Number 669.

'It is high time that coastal defence decision-making processes ***move away from focusing on single-issue solutions*** *to seek ways of generating win-win solutions. Nowhere is the need for integrated solutions greater than along the coast with so many different interests involved.*

The most important issue is how to ensure an optimum sustainable solution is found that is agreed amongst the different interested parties. The ***solution should*** *be an holistic and integrated one, which* ***balances economics, environment and social issues****.*

The ***most influential people in this process are the engineers and other design professionals*** *involved with considering the coastal defence project in all its detail, from initial concepts and designs, through to the details of works to be implemented in response to site characteristics and coastal processes.*

The funding process for securing central government financing encourages capital schemes supported by cost:benefit analysis that focuses on readily quantifiable costs and benefits such as preventing or delaying the loss of houses and roads. ***More attention needs to be paid to the economic value of less tangible assets*** *such as landscape and biodiversity, while costs and benefits also need to be considered over the longer term in order to identify real sustainable solutions.*

A partnership approach from different agencies is the most likely way to achieve the ideal solutions*. Recommending wholesale changes in funding mechanisms is likely to cause confusion and detract from the overall process. However there is currently no mechanism to make relocation of caravan sites an economically or politically desirable option.* ***Changes in policy and appropriate legislation need to be introduced to make relocation a feasible alternative to expensive sea-defences that are not sustainable in the longer term****.'*

2.3.4 The National Strategy embraces many of the conclusions and recommendations referred to in the CCW (2005) report. However, the recent and planned works at Borth (Box 1) show that in practice, many of the challenges and constraints remain.

2.3.5 We recommend that the proposed National Funding Policy and Prioritisation Methodology is sufficiently **flexible** to enable a wide range of solutions to be considered, for example the relocation of assets. CCW notes and welcomes the reference to this in paragraph 112 of the National Strategy. CCW also welcomes the work carried out under the DEFRA Coastal Change Pathfinder programme[32]. £11 million has been invested since 2009 to enable Pathfinder Authorities to work in partnership with their communities, to road-test new and innovative approaches to planning for and managing change. The key aims were to improve understanding of how coastal communities can adapt to coastal change and what the costs and benefits of different approaches are; and to provide practical lessons and examples to be shared with other practitioners. We recommend that WG reviews the lessons learnt from the Pathfinder Programme, and ensures that any revised funding methodology has the ability to **deliver innovative solutions**.

2.3.6 The National Funding Policy and Prioritisation Methodology should **facilitate partnership working and partnership funding** with the aim of securing **multiple benefits**. CCW notes and welcome the reference to this is paragraph 149 of the National Strategy, but we recommend that the emphasis on sustainability is strengthened.

[32] http://www.defra.gov.uk/environment/flooding/coastal-change-pathfinders/

2.3.7 Paragraph 178 of the National Strategy refers to the need to prioritise 'preservation of our landscape and our designated habitats'. Whilst this is welcomed, where possible, CCW advocates an approach which **embraces working with natural processes** and looks to use natural resources **as part of the solution**. See section 2.1.7 for examples.

2.3.8 CCW looks forward to working with WG on the development of the National Funding Policy and Prioritisation Methodology in due course.

2.4 CCW's views on barriers to the development of coastal protection in Wales and how these could be addressed

2.4.1 Climate change presents serious challenges for the management of the coast and protection of coastal assets.

2.4.2 The publication of the National Strategy has demonstrated WG's commitment to addressing the barriers to the delivery of **sustainable** coastal protection.

2.4.3 It also demonstrates WG's recognition of the importance of **integrated** planning as referenced in the Wales ICZM Strategy[33] and the EU OURCOAST programme[34].

2.4.4 The OURCOAST programme provides a wealth of information and analysis of case studies which has been collated to provide guidance on six key 'Approaches' which as well as 'integration' include the '**Ecosystem-based**' approach, the '**Technical**' approach', the '**Knowledge-based**' approach, and the '**Socio-Economic**' approach.

2.4.5 The references to the 'Ecosystem-based' approach link well with the recommendations within the 'Sustaining a Living Wales' consultation, and the findings of the UK National Ecosystem Assessment.

2.4.6 The 'knowledge-based' approach and the 'Technical' approach reflect the comments and recommendations made within this paper with respect to the importance of evidence in decision making (see section 2.1.7). CCW recommends that provision of **evidence** remains high on the agenda to ensure that robust decisions can be taken with respect to managing the coast sustainably.

2.4.7 The OURCOAST programme stresses the importance of **'participation**' in the coastal planning process. 'Raising awareness' is a key objective of the National Strategy and is reflected in a number of measures which recognise the importance of communication. However, this objective is focussed on communicating risk rather than involving stakeholders in the solutions. We therefore recommend that further consideration is given to the role of 'participation' in delivery of the National Strategy.

2.4.8 CCW welcomes the intention within the National Strategy to develop a 'National funding policy and prioritisation methodology.' Any such policy and methodology **needs to be sufficiently flexible to enable** delivery of the National Strategy by building in the ability to work with others to find win-win solutions and to secure other sources of funding.

[33] Welsh Government, 2007. Making the Most of Wales' Coast -The Integrated Coastal Zone Management Strategy for Wales

[34] http://ec.europa.eu/ourcoast/index.cfm?menuID=18

2.4.9 CCW also welcomes clarification of WG's expectations with respect to delivery of flood and coastal erosion risk management functions by Risk Management Authorities (as set out in paragraph 132 of the National Strategy). CCW particularly welcomes the references to: delivery based upon a holistic understanding of the risks and consequences*;* consideration of the full range of risk management responses; holistic management of our water, land and marine resources reflecting the ecosystem approach set out in the Natural Environment Framework; maximising opportunities to adapt to climate change; and taking account of relevant legislation such as the Habitats Directive.

2.4.10 Overall, the delivery of the Strategy is still in its infancy. An ongoing commitment to: integration, leadership from WG, and provision of the required staff resource should ensure that good progress will continue to be made against the measures and timetable set out.

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales
June 2012

Environment and Sustainability Committee

E&S(4)-20-12 paper 4

Inquiry into Coastal Protection in Wales – Evidence from Environment Agency Wales

Summary

- The scale of flood and erosion risk along Wales' coast is significant, with potential impacts upon both the social and economic fabric of many communities. We believe a more integrated approach to decision making would deliver more efficient use of Wales' natural and financial resources and achieve outcomes for our coast that are sustainable into the long term.
- The National Strategy provides the appropriate high level framework to inform coastal risk management by the relevant authorities and other partners. Environment Agency Wales continues to implement the Strategy's principles, our specific actions and to support our partners.
- We believe there needs to be greater recognition that the current way in which the coast is managed is unsustainable in the long term, and that all options for a more sustainable approach will require new financial investment.

The current extent of coastal flood and erosion risk in Wales`

Environment Agency Wales (EAW) considers there are two key elements to 'coastal protection' – the flooding of land from the sea and the loss of land from coastal erosion.

Coastal flooding

There are approximately 105,000 properties (homes and businesses) currently at risk from coastal flooding in Wales. This represents 29% of the total number of properties at risk from all sources of flooding in Wales. The other main sources of flooding in Wales are from rivers, surface water and sewers. There are locations, including coastal ones, where properties are at risk from multiple sources of flooding.

Flood risk is a combination of the likelihood of a flood happening and the consequences when it does. Whilst there is a relatively low likelihood of coastal flooding happening in Wales, the consequences for people and properties when it does occur are high.

This is because of a range of factors including: the wide geographical area over which a coastal flood could occur; the rate of onset particularly if the sea overwhelms a flood defence; the potential depth of flood water; the number of homes and businesses that would be flooded, and; the amount of infrastructure that would also be flooded, e.g. roads, railways, power and water supply.

The normally benign coastal conditions and the presence of coastal flood defences mean that overall there is a low likelihood of a coastal flood event happening. However that can lead to a lack of awareness that flooding can still happen and an over-reliance upon the existing defences, which could be overwhelmed if very severe sea and weather conditions occur.

Coastal flooding can be particularly damaging because it can happen multiple times on successive high tides. This was the case in Towyn in 1990 and led to substantial property damage and disruption as well as being a significant risk to people's lives.

The combined effect of high tides, low pressure and on-shore winds is often referred to as a 'coastal surge', which can raise sea levels by over a metre above normal high tide level. Coastal surges could occur around the coast of Wales. In the most extreme case, potentially a third of the Welsh coastline could be affected almost simultaneously, along with parts of the neighbouring English coast.

The economy and social well being of coastal communities are protected by approximately 415 km of man-made sea defences with a replacement cost of about £750 million, protecting assets worth over £8 billion[1]. Coastal defences are owned or managed by the Environment Agency, Local Authorities and other third parties. Railway lines run along a large parts of Wales' coastline and a substantial amount of these are at risk from coastal flooding. In some locations railway embankments provide a flood risk management function which reduces the flood risk for the communities behind them.

The people occupying coastal communities can be particularly vulnerable to coastal flooding. Many caravan and campsites are located along the coast, as are a substantial number of bungalows. Were a flood to occur, the occupants are more at risk than people living in two storey houses. Many elderly people have retired to live by the coast, whilst people in caravan and campsites and rented holiday accommodation are often visitors and thus are less aware of the flood risk or what to do in a flood event.

The current level of risk from coastal flooding is expected to rise. From the UK Climate Projections[2], sea level is expected to rise by about 20cm around the coast of Wales over the next century. The waves that attack our coast will be bigger and storms will be more intense and happen more often, both in summer and winter[3].

Coastal Erosion

The Environment Agency is leading a project to better understand the level of risk from coastal erosion in Wales and England. As part of that project, we are currently analysing the projected number of properties (homes and businesses) at risk from coastal erosion in Wales currently and by 2050 and 2100. Unlike flooding, coastal erosion involves the permanent loss of an area of land and thus the consequences can be very high. A community would take much longer to recover from an erosion event, since complete replacement of properties or infrastructure may be needed.

The role of EAW and others in managing coastal flood and erosion risks

Environment Agency Wales delivers three coastal risk management roles - as an operator, regulator and advisor. We build and maintain coastal flood defences,

[1] Wales Audit Office (2009). Coastal Erosion and Tidal Flooding Risks in Wales.
[2] UKCP09
[3] Adapting to Climate Change: Guidance for FCERM Authorities in Wales. Welsh Government, December 2011

provide a flood warning service wherever practicable and respond to coastal flood incidents. We consent applications from coastal Local Authorities to undertake coastal works, as well as applications by any party for works on or near a main river. We also now have the power to undertake works in relation to any source of flooding or coastal erosion, as directed by Welsh Ministers.

Coastal Local Authorities lead on the management of coastal erosion and on the production of Shoreline Management Plans (SMPs).

In our advisory role, we support coastal Local Authorities by providing technical advice, data, maps and other tools to inform the planning and delivery of their coastal risk management role. We also advise Local Authorities on the coastal flood and erosion risk posed by new development seeking planning approval.

The Welsh Government sets the strategic direction for how we and coastal Local Authorities should manage coastal flood and erosion risk:

- through its national strategy for flood and coastal erosion risk management in Wales (hereafter referred to as 'the national strategy');
- by approving Shoreline Management Plans
- by allocating capital grant for coastal protection works to Local Authorities;

In England these roles are undertaken by the Environment Agency.

Welsh Government has also given EAW a strategic oversight role – to understand the extent of risk from all sources of flooding and coastal erosion in Wales and to report to Minsters on progress being made to manage these risks.

Our contribution to the delivery of Welsh Government's National Strategy

Through our roles as operator and regulator, we continue to deliver our objectives to reduce the level of coastal and main river flood risk posed to people and property. We also undertake an advisory role, supporting Local Authorities in their management of local sources of flood risk and also offering advice to water and sewerage companies and Internal Drainage Boards. Fulfilling these three roles is a key component in the delivery of the four overarching objectives of the Welsh Government's National Strategy, published last November. We summarise in Annex 1 the progress we have made in our contributions to delivering these four objectives.

Future areas of focus for the management of coastal risk

Management of coastal flooding and erosion risk in Wales remains a challenge for all Risk Management Authorities. The scale of risk to which the country's social and economic infrastructure is exposed is significant, and the consequences of a large scale coastal flood event are profound. We believe there are several key areas of focus to ensure Wales' coastal risks continue to be properly managed in the future.

<u>A. The importance of coastal risk management to economic and infrastructure decision making</u>

There are strong interdependencies along all of Wales' coast between social well being, economic growth and a clean and attractive environment. We clearly recognise the constraints of the current financial climate. However in our view, a more integrated approach to decision making would deliver more efficient use of

Wales' natural and financial resources and achieve outcomes for our coast that are sustainable into the long term.

We believe therefore that a sustainable approach to coastal management requires policy and funding frameworks to be created and applied across Government, and not restricted to solely environmental issues. It is equally important that consideration of coastal flood and erosion risk happens at the start of discussions, not at the end, in order for issues to be addressed in the most effective manner with least cost.

We recognise the need for economic renewal and growth in Wales, including on the coast, and will play our part in helping that goal be achieved in a truly sustainable way. We continue to offer our expertise on managing flood and coastal erosion risk to local planning authorities, developers and the Welsh Government through advice on the most appropriate locations at a national and local scale, and on safe building design where there is no alternative to development in areas at risk. Minimising the level of risk (through appropriate location and design of new development) is essential to minimising the amount of funding needed to manage it.

B. Levels of investment in coastal risk management

In our 2010 report[4] into long term investment for flood risk management we highlighted the extent to which Wales' infrastructure (transport, communications, power, emergency services, etc) is at risk from river and sea flooding. Businesses are at risk as well as residential properties, for example five of the six recently identified Welsh Enterprise Zones are at risk of flooding, particularly Cardiff and Deeside.

We believe therefore that investment in flood and coastal risk management helps protect jobs and promote growth by creating sustainable locations that attracts business to invest in them for the long term.

To deliver that sustainable economic and social situation requires appropriate levels of investment in flood and coastal risk management. To avoid increasing the number of properties at flood risk in 2035 above present-day levels may require around three times the current level of investment and four times the current level to reduce the number. However given the estimated average damages from river and sea flooding alone (excluding surface water flooding) totals £200m annually[5], we believe it offers value for money and helps safeguard the Welsh economy and society's needs.

Therefore investment in flood and coastal risk management should not be seen by decision makers as solely an environmental issue. We would support a move for greater financial recognition that it is an issue of equal importance for both economic and social infrastructure.

Over recent years the Environment Agency has implemented a range of measures to make our flood defence capital and maintenance programmes as efficient as possible. We believe we could deliver even greater levels of efficiency

[4] Future flooding in Wales: flood defences, EAW 2010
[5] Flooding in Wales, EAW, 2009

and reduce the risk for more people and properties if we were able to plan with a greater level of certainty over the amount of funding we would receive. Currently we operate on a 12 month funding horizon and yet have a 15 year programme of flood defence projects. In England the Environment Agency is able to plan its work over a three year funding horizon, mirroring the Comprehensive Spending Review.

C. All options for the sustainable management of the coast will require new investment

We believe there needs to be greater recognition that the current way in which the coast is managed is unsustainable, and that all options for a more sustainable approach will require new financial investment.

Until that recognition is reflected across Government's policy framework, the relevant bodies may be constrained from using their resources in the most cost effective way for the long term.

Whether we continue to build more defences and maintain the existing ones, adapt a more flexible approach to how we use and live along coastal land or do nothing, all options incur significant costs.

In light of climate change it will be economically and socially unsustainable to simply build coastal defences higher and higher. The cost of doing so would exceed financial resources, create barriers between communities and their coast (e.g. with impacts on tourism and landscape value) and put people at more flood risk from the higher and faster flood waters should a defence be overwhelmed.

Implementing the Shoreline Management Plans' proposed approach is a much more sustainable approach. Implementation would typically involve two elements: in some locations maintaining existing defences and improving them to keep pace with climate change, and; in other locations adapting, from the medium to longer term onwards, how we use coastal land to fit in with the coast will change.

Implementing that approach would reduce the future projected numbers of properties at flood or coastal erosion risk. It would use Wales' natural ecosystems to provide as an explicit mechanism to manage flood and/or coastal erosion risk. We believe using natural coastal habitats in this way would involve much lower maintenance costs than traditional concrete or rock defences. It would also offer multiple benefits for communities through enhanced recreation, biodiversity and tourism opportunities.

Both the traditional and managed adaptation approaches would require significant investment, at a level that exceeds current flood and coastal risk management budgets. However we must remember that the alternative is to do nothing, and the cost of that option would the loss of properties to the sea, businesses left unviable, and lives put at risk.
Therefore, coastal flood and erosion risk management requires investment in the short to medium term for it to deliver more effective solutions in the longer term with the benefits for communities significantly outweighing the costs.

D. Government policy direction

Overall, we believe the Welsh Government's National Strategy does provide the appropriate framework for the management of coastal flooding and erosion. It is only eight months since it was published and its influence has yet to be fully demonstrated at either the national or local level.

Key to the effective management of coastal risk will be strategic direction from the Welsh Government to ourselves and others, particularly on these aspects:

- the publication of a policy on coastal risk management, including revision of TAN14
- the publication of a new policy for the funding of flood (all sources) and coastal erosion risk management
- the desired level of service for delivering our new statutory role to consent applications for any coastal works (flood and erosion)
- a centralised 'One Wales' programme for overseeing and delivering all flood and coastal erosion risk management works

We recognise the importance of each of these and have been providing data and advice to support the Welsh Government in its development of each of these and we will continue to do so. As a body that operates across all of Wales we believe that EAW (and subsequently as the Natural Resources Body for Wales) is best placed to oversee that programme, doing so in a transparent and accountable manner.

We are committed to maintaining the existing standards of service for flood warning and incident response both before, during and after EAW's transition to become part of the Natural Resources Body for Wales.

ANNEX 1 – EAW's implementation of the National Strategy's four objectives

1. Raising awareness of and engaging people in the response to flood and coastal erosion risk

Close engagement with communities at flood risk has been a priority for EAW through its Flood Awareness Wales campaign. This initiative has been running since 2010 and aims to raise awareness and highlight the practical steps individuals can take to prepare for flooding. To date we have engaged with over 50 coastal communities across Wales, visiting individual houses and community groups. As a result of our engagement over 30 flood plans have been produced, ranging from those for whole coastal communities down to individual businesses.

In April 2012 we produced, in liaison with coastal Local Authorities, information on the extent of coastal erosion in Wales. This included publicly available maps and background data for coastal Local Authorities, Countryside Council for Wales and the Welsh Coastal Monitoring Centre. We are also raising awareness of the erosion data with Network Rail and Dwr Cymru Welsh Water.

In 2010 we delivered an enhanced surface water flood risk map to Local Authorities. We then helped establish three regional groups to support the 22 Local Authorities in their task to undertake preliminary assessments of surface and groundwater flood risk. In partnership with them, we are now producing risk and hazard maps for surface water and all other sources of flooding for publication by December 2013.

We have been closely involved in supporting Local Authorities' production of the second generation of Shoreline Management Plans, providing them with data and advice and participating in community engagement workshops. We are a member of all the Coastal Groups in Wales and the Wales Coastal Forum, working alongside our partners and the Welsh Government to plan and deliver coastal risk management as effectively and efficiently as possible.

The EA, supported by the Welsh Government and Defra, has led the skills capacity programme across Wales and England, providing a series of workshops and e-learning materials for Local Authorities on their new duties.

We have implemented our statutory responsibilities set out within the Flood and Water Management Act 2010 and the Flood Risk Regulations 2009. For example, we have re-established our Flood Risk Management Wales committee as a flood and coastal committee and are recruiting a specific coastal representative.

We have continued to implement the Catchment Flood Management Plans and their risk based approach to managing main river flood risk. Of the CFMPs' actions due for delivery by 2015 (over 700 of them) currently 90% are either complete, underway or have a commencement plan.

We continue to run a pilot national Single Point of Contact approach using the EA Floodline Service with four Local Authorities and Dwr Cymru Welsh Water to answer queries from the public relating to flood risk. The pilot period ended at the end of May 2012 and a report will be provided to Welsh Government to decide on whether to encourage other Local Authorities in Wales to participate in the

service. A similar approach has been taken regarding queries on coastal erosion and we would look to combining the flood and erosion Single Point of Contact systems should the Welsh Government decide to implement this approach across all of Wales.

2. Providing an effective & sustained response to flood and coastal erosion events

In 2011 the EA led the Watermark flood exercise which was the largest peacetime emergency exercise in Britain. We continue to support civil contingency arrangements under the guidance of the Local Resilience Fora, to deliver emergency response planning and action to deal with the consequences of flooding. We are working with the Local Resilience Fora to review existing flood emergency arrangements, in particular mass-evacuation, mass-accommodation and recovery. In addition to exercise Watermark we helped organise and deliver a reservoir emergency exercise in the South Wales area.

EAW recognised the need for Wales to be prepared for a possible coastal surge. We therefore arranged a visit by Lincolnshire County Council's Emergency Planning Manager and the local EA manager to share their experiences with organisations in Wales that would be involved in responding to a coastal flood emergency.

3. Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion; and
4. Prioritising investment in the most at risk communities.

Over the last two years we have reduced the risk of flooding to over 2,600 properties across Wales by delivering our programme of building new, and maintaining existing, flood defences through capital investment of £29m. On the coast, we have built flood alleviation schemes including on the river Clwyd and at Glynea and we are developing a scheme at Fairbourne to reduce the risk of flooding to 420 properties.

We continue to invest in modelling coastal flood risk so we better understand the risk (extent of flooding, potential depth and velocities) and can make predictions of flooding to help us manage incidents, issue warnings and provide advice to our professional partners and the public.

Through our partnership work with the Met Office and as part of the UK Coast Monitoring & Forecasting Service, we have improved our wave and storm surge forecasts, refurbished the UK tide gauge network and now provide customer focussed Flood Guidance Statements, supported by Flood Advisory Service teleconferences when there is a significant flood risk.

We continue to improve and expand our flood warning services - we have increased the numbers of properties (inland and coastal) signed up to our flood warning service through pre-registering customers via an "opt-out" approach rather than the traditional "opt-in" approach. We have a programme in place to expand the coverage of the service along the coast.

EAW has continued to deliver its statutory duty to undertake a National Habitats Creation Programme to remediate for loss of intertidal habitats on sections of the coast where movement of the shoreline is constrained (coastal squeeze) and

through water level management issues on rivers and wetlands. With a duty to compensate “like for like” for habitat loss and ensure no net loss of protected areas, we are developing a progressive programme of habitat creation across Wales. This will maintain the coherence of the network of designated sites along Wales’ coast for birds and habitats of international importance.

EAW is already involved in a range of initiatives aimed at delivering more sustainable and ecosystems based approaches to environmental improvement. The creation of the Natural Resources body for Wales presents a significant opportunity for it to manage the coast in a more integrated, ecosystems based approach. This would enable EAW’s community needs-led approach to identifying appropriate coastal risk management options to be overlain with those for recreation, tourism, biodiversity, etc. The ability to take a holistic approach to all the environmental needs of a community creates the potential for much more effective delivery of its social and economic requirements as well.

Environment and Sustainability Committee

5th July 2012

Coastal Protection

WLGA • CLlLC

INTRODUCTION

1. The Welsh Local Government Association (WLGA) represents the 22 local authorities in Wales, and the three national park authorities, the three fire and rescue authorities, and four police authorities are associate members.

2. It seeks to provide representation to local authorities within an emerging policy framework that satisfies the key priorities of our members and delivers a broad range of services that add value to Welsh Local Government and the communities they serve.

3. This document contains evidence for the Environment and Sustainability Committee for their inquiry into coastal protection in Wales. It considers the progress being made by the Welsh Government and Welsh flood risk management authorities in implementing the objectives of the National Strategy for Flood and Coastal Erosion Risk Management in Wales.

4. The Welsh Government should be commended on the production and publication of the National Strategy and publication of the guidance document for the preparation and production of the Local Strategy for Flood Risk Management, in November 2011. This has helped to give structure to the agencies involved in flood and coastal erosion work.

Links between National Strategy objectives, SMPs and Local Strategies

5. The National Strategy set out four overarching objectives as follows:

   - reducing the impact on individuals, communities, businesses and the environment from flooding and coastal erosion;
   - raising awareness of and engaging people in the response to flood and coastal erosion risks;
   - providing an effective and sustained response to flood and coastal erosion events;
   - prioritising investment in the most at risk communities

6. **Shoreline Management Plans** predate the National Strategy. The preparation of SMPs started in 2009 and consultation took place in 2010/2011. The approach taken

was to consider 3 'epochs', of 0-20 years; 20-50 years; and 50-100 years There are then four options to choose from, which inform the objectives and actions in these plans. These are as follows:

- **Hold the Line** – to provide some level of coastal defence and keep the position of the defence approximately where it is now;
- **No Active Intervention (NAI)** – assumes that no maintenance, repair or replacement of existing defence structures takes place;
- **Managed Realignment (MR)** – is the landward movement of defences, giving up some land to the sea to form a more sustainable defence line in the future
- **Advance the Line (ATL)** – means reclaiming land from the sea by building new defences further seaward.

7. All of the Welsh SMPs are complete, subject to final sign-off by a Quality Review panel. Their actions plans will form part of that review. The four overarching objectives of the National Strategy are clearly relevant to the SMPs but, because of the order of their production, the National Strategy could not be said to have directly influenced their development.

8. The SMP Action Plans will need to be revisited, however, as the work on the Local Strategies progresses. Catchment Flood Management Plans (prepared in 2009/2010) will also need to be revisited.

9. It should be noted that two areas of Wales' coastline are in Coastal Groups which include areas of England. The Severn Estuary Coastal Group covers the coastline from Lavernock Point to Gloucester and from Gloucester to Hinkley Point, Somerset. This therefore includes the South East coast of Wales (from Chepstow to Lavernock Point). In North Wales, the North West and North Wales Coastal Group of Wales includes the welsh coastline from Great Orme's Head to the Dee Estuary, and the North West of England coastline from the Dee Estuary to the border with Scotland

10. In responding to the requirements of Flood and Water Management Act 2010 these two Coastal Groups have to consider the objectives of the respective (English and Welsh) National Strategy documents. The two areas have been following the timetable for England and, as a result, the implementation of their SMP Action Plans is already underway. For the Severn, the Severn Estuary Flood Risk Management Strategy

(SEFRMS) is progressing in parallel. (It should be noted that although 'plans' usually follow 'strategies', in this instance the SMP is effectively the high level policy document for the coast and the SEFRMS is actually the plan of how it is implemented).

11. In relation to the preparation of **Local Strategies,** the Flood and Water Management Act 2010 s10(1) and (2) requires that:

(1) A lead local flood authority for an area in Wales must develop, maintain, apply and monitor a strategy for local flood risk management in its area (a local flood risk management strategy)
(2) In subsection (1) "local flood risk" means flood risk from –
a. Surface runoff,
b. Groundwater, and
c. Ordinary watercourses

12. The local authorities are the lead local flood authorities (LLFAs) in Wales and a deadline of March 31st 2013 has been set by Welsh Government for each local authority to complete its Local Strategy. The Local Strategies are being developed currently and therefore it is difficult at this stage to show how links with the National Strategy are being made. However, local authorities are certainly undertaking the work in light of the four overarching objectives of the National Strategy. They are also, as appropriate, taking account of and acknowledging Preliminary Flood Risk Assessments (PFRAs) already undertaken by local authorities, the Shoreline Management Plans and Catchment Flood Management Plans in determining 'at risk' communities.

13. The Local Strategies will be high-level documents indicating the principles which will be applied when considering flood risk information. Specific plans for those areas identified at risk will be drawn up based on these principles, in accordance with the Flood and Water Management Act 2010, taking account of other relevant local and national policies.

14. Prior to the March 31st 2013 deadline the Minister for Environment and Sustainable Development requires each LLFA to submit a *draft* Local Strategy in December 2012, for 'sign-off'. This timescale for production of these drafts is very tight. To conform to the National Strategy, the Local Strategy must be subject to a Strategic Environmental Assessment (SEA) (and there is a statutory requirement for a 5 week consultation period with Environment Agency, CADW and CCW on the scope for the SEA). When

the SEA has been completed and an Environmental Report produced there is then a statutory requirement for a 6 week consultation on the Environmental Report and the Local Strategy with the Environment Agency, CADW, CCW and the public (run concurrently).

15. **Flood Hazard Maps** (which indicate the depth and velocity of surfacewater flooding) are being prepared by the Environment Agency. However, these will not be completed and available until *after* the March 31st deadline. The information contained within these hazard maps will supplement the detail already available from the PFRAs and other local knowledge in identifying areas that are at high risk of surface water flooding. There will therefore be an iterative process as more information becomes available, allowing the level of detail and understanding to be enhanced over time.

Are there any barriers to the development of coastal protection in Wales and how these could be addressed?

16. The main barriers relate to skills/personnel and funding/resources. Capacity building workshops are seeking to address the former, but identification of funding for implementation will be an on-going issue. The current European programmes have provided substantial resources for flood and coastal erosion works and it will be important that such projects continue to be eligible under the new Programmes. There will need to be increased emphasis on community resilience, raising awareness and identifying measures communities can take themselves to reduce risks.

17. There may also be barriers in relation to planning and conservation which may limit the scope for communities to 'migrate' away from the coast over time. Some coastal villages have their economic heart on the foreshore and may be constrained by tightly drawn development boundaries.

How effective are current funding mechanisms for coastal protection?

18. Local Authorities have not always been clear as to how the Welsh Government funding allocation process works. Amongst other considerations there is the issue of balance between inland flood protection schemes and coastal schemes and between funding for local authorities and the EA.

19. Encouragingly, there is currently work underway to develop a 'risk-based' approach with set criteria /procedures to determine how funding is allocated. The WLGA and

local authorities are involved in this work with EA and Welsh Government. As part of this work there may be an opportunity to develop a consistent approach to both coastal and inland flooding. The SMPs consider all sections of the coast on a 3 epoch basis and this encourages long term planning, with consideration of options such as managed realignment or retreat in some areas. The work being undertaken as a result of the Flood and Water Management Act 2010 and the Flood Risk Regulations 2009 may help in this respect, providing the necessary information in relation to inland flood risk.

20. Finally, on this point, Wales' coast is vulnerable because of aged defences and climate change. In addition to properties there is also some major infrastructure at risk. This raises the potential for there to be collaborative and partnership approaches, seeking financial contributions– e.g. from Welsh Government's Regeneration section where appropriate, and other affected stakeholders such as Network Rail, Dwr Cymru/Welsh Water and the Trunk Road Agencies to support coastal protection schemes.

What is being done to communicate objectives and risks associated with Coastal protection and plans for future communication?

21. The West of Wales SMP considered the effects of tidal flooding including a worst case scenario, the H++ case of 2m sea level rise over the next century from the UKCIP09 report. This provided a useful benchmark for discussion and public presentation and consultation of the limited options for new defences. For the Severn estuary a substantial consultation took place for the SMP and there was an additional round of consultation for the SEFRMS. Leaflets are planned for each of the Local Authorities regarding the SMP issues and policies for their own areas. Local Authorities will give a commitment within their Local Strategies to engage and consult with those communities at most risk, to identify the most appropriate resolution. There will need to be close liaison with the Environment Agency over communication to ensure a 'joined up' approach.

What are the views of stakeholders on these different aspects?

22. Consultation on the SMPs generated a good response, with useful feedback. Consultation on Local Strategies is not scheduled until later in 2012. There has not been an opportunity since the May elections to discuss flood and water issues at WLGA political meetings. However, there is a WLGA event for Environment, Waste and

Transport Cabinet members taking place on 5/6th July and flood and water issues are on the agenda.

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Environment and Sustainability Committee

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Inquiry into Coastal Protection in Wales – Evidence from Atkins Limited

Are there barriers to the development of coastal protection in Wales?

Welsh (and UK) Government policy towards Flood and Coastal Erosion Risk Management (FCERM) is more than coastal protection. Protection may not be appropriate, affordable, environmentally sustainable or required on all areas of the coast. It is not possible to prevent or stop all flooding or erosion and building higher and/or more defences in all areas where there is a risk of erosion or flooding is not sustainable.

There has been a general shift from "defence" to "risk management" in the approach and terminology to all flood risk management policy, planning and actions including at the coast.

FCERM is not just about engineering. Responsible management of flooding and coastal erosion risk includes planners, development control officers, politicians, transport and infrastructure managers, residents, farmers, landowners, etc… Some of these groups have a more active role than others.

Language - Policy and strategy documents tend to be aimed at and/or written by flood and erosion risk managers. They contain technical language and information. They are not aimed at planners or a wider audience. They don't help to overcome barriers to integration between coastal engineers and others that may have a role in FCERM either strategically or at a specific location.

Shoreline Management Plans, for example, cover large geographic areas and long time periods (100 years). The complexity of the SMP2 development process, their high level, strategic nature and the technical issues involved (the different types of flooding, the terminology, statutory environmental assessments) make it difficult for non-technical and general members of the public to pick out which elements they need to / should be involved with and comment on.

Link between planning and FCERM – appropriate land use planning and granting of development in locations that do not place an unnecessary management burden on future generations is integral to FCERM. But the link between planning and FCERM is not clearly made and often driven by the personalities of individual coastal engineers and planners.

Coastal engineers and planners use different language. There is a need for FCERM plans and strategies to be "translated" into format and language that is appropriate and accessible for local authority planners so that there is a better understanding of the impact of policies that are being put in place.

Natural defences – the role that natural features play in FCERM is not well understood outside coastal engineers / technical advisors and is not clearly stated in SMPs, potentially leading to decision makers not fully appreciating the need to manage and/or re-build beaches, dunes, salt marsh, etc. or invest in these actions. It is easy to see the investment made in a new coastal defence structure and appreciate its value to protecting the land behind the coast. It is less easy to see and

appreciate the value of investing in adding more sand to a beach or protecting dunes. These natural features also have additional value in terms of tourism, recreation, the environment, landscape and science / culture / history.

Timescales – FCERM plans and acts on long time horizons that do not match well with the timescales of local development plans, politicians, funding streams or individuals.

It is difficult to integrate the 100 year timescales of SMPs and climate change predictions into the 15 year local development plan framework, to grasp what long term changes at the coast might look like or how to incorporate these issues into land use plans without creating an LDP for 100 years.

There is a need for developers and planning development control officers to think about long term issues when considering development – a new school will most likely still be around in 50 or 100 years but the decisions about whether to build it, where to build it and how to build it need to be made now. Planners and developers need practical advice to help them understand the issues and make the necessary decisions on planning consents and applications.

Similarly, infrastructure that is currently located at the coast (substations, railway lines, roads) will, at some point need to be repaired / replaced / upgraded. Some of these structures do not have to be located at the coast, while others may actually function as part of the coastal defences (e.g. a road or rail embankment).

<u>Funding FCERM</u>

There appears to be a disconnect between strategies for FCERM and the funding for specific actions for FCERM. As noted above, strategies, particularly large scale and long term strategies discuss and promote risk management, adaptation and resilience, rather than “defence”.

Funding mechanisms seem to remain linked to the national economic cost-benefit assessment of the investment in terms of reduction to the risk of flooding or coastal erosion (in accordance with HM Treasury Green Book guidance). These assessments consider the capital costs of a project, discounted over time against the economic costs of repairing / replacing damages / losses from flooding and erosion. They continue to be used for more ‘traditional’ large scale approaches. There is more funding to be used for more local scale and / or individual property type schemes as well as resilience and adaptation actions, which can be assessed in the same way as large schemes. Ecosystem services can also be included in the cost-benefit assessments, although the valuation of such items is much more subjective. Individual property owners can also apply for funding for their own flood risk reduction actions, such as individual demountable flood barriers, however, public awareness of this is low.

It appears that money is allocated separately to capital and non-capital (incl. maintenance) activities an apparent inability to transfer funds between these two separate pots. The budget allocated for non capital activities is included in general local authority budget allocations with no specific directions as to what this is spent on. Additional benefits could be realised if non-capital activities such as increasing awareness of flooding, actions individuals can take, improving resilience, were carried out ‘hand in hand’ with capital schemes. This is the case with river schemes undertaken by the Environment Agency through Flood Awareness Wales, but it less consistent between coastal schemes, happening in association with some projects but not with others.

Sources of funding may also be a barrier to undertaking a capital project when the potential cost of works is greater than a single funding source. Coastal risk management schemes can have wider benefits than just flood and erosion protection – tourism, environmental, recreation, economic development. However, funding for schemes is usually from the coastal defence capital pot. If funding is available from a number of sources, which are treated as a basket of funding, the works may become affordable. UK Government / Defra have recently changed their policy on this such that contributions from other funding sources are excluded from the overall assessment to determine if FCERM funding should be invested in a scheme. However, quantifying the additional benefits of a coastal risk management scheme beyond flood and erosion protection is problematic and can be subjective, and the mechanisms for arranging funding across a basket of sources remain difficult.

Following flood events, funds are made available on an ad-hoc basis from Welsh Government and via insurance claims to clean up and make repairs. Insurance claims only replace what was lost, without reducing the impact of potential future events. Additional funding could be made available to help householders not just recover but improve their resilience to reduce the cost and impacts of future events.

It is not clear if / how strategic planning of spending is managed and the timing of spend may be artificially constrained by financial deadlines. Recent coastal defence projects in Wales have been allocated significant EU funds, which boosts Welsh Government funding. However, EU spending rules place strict deadlines on how and when funds need to be spent. This can lead to artificially compressed timescales for projects.

Design and environmental assessment of projects should progress in parallel with each informing the other. This does occur, to a certain extent, but is usually at the point when a general approach to a scheme has been agreed. . Construction should be timed to occur when it causes least disruption to habitats, species, people, etc. Condensing project timelines means that often a contractor is not procured until after an EIA is complete. Yet projects do not apply for development consents until funds are allocated in case they are unsuccessful in their funding application. Involving designers and contractors in the EIA process gives greater certainty of the methods that will be used and the possible environmental impacts. Greater uncertainty in an EIA can lead to more conditions applied to licences, the need to apply for amendments to licences and potentially greater risk to the environment. Having to work around artificial deadlines can increase risk to everyone – the environment, the client, the contractor, suppliers. This can lead to increased costs and less overall value for money.

Resources

The level of resource available to manage FCERM is limited. The WCMC 1st annual report (2011) highlights the level of staff resource available for each LA with a coastline. Only three of the 15 Maritime Local Authorities (MLAs) (20%) have more than one full time equivalent (FTE) member of staff dealing with coastal flood and erosion risk management, despite the MLAs jointly being responsible for 119 km of defended coastline (29% of the total defended coastline length).

Capacity building and awareness raising is a priority and not just for coastal / flood engineers to manage the coastline. Raising awareness of the risks of flooding and erosion among planners and

development control officers is also key to ensure that development does not take place in inappropriate areas.

Communicating FCERM

The language of FCERM is technical, the timescales long and the areas covered large. These all increase the difficulty in communicating FCERM to non-technical experts, which included planners, developers, politicians and the wider public.

As a member of the public, I don't see a lot of evidence of such communication. That could be a function of not living in an area at risk of flooding. As part of a business that works in the FCERM industry, Atkins is aware of consultations, strategies and individual projects, but often this is as a result of working on a specific project or actively seeking out that information – through email alerts, conferences, networking, etc. Recent innovations such as the Environment Agency's Flood Warning Facebook application are good examples of how communication tools are being developed to engage the wider public and raise awareness. Others include more awareness raised during weather forecasts. However, these deal with current storm / flood warning and not the wider ongoing need to raise awareness prior to an event.

There is a fear that communicating risk of flooding or erosion or putting planning policies in place that limit the type of development or highlight areas for managed realignment could lead to blight, reducing property prices, discouraging investment and leading to people moving away. But without making people aware of risk, it may increase the need to invest in economically unsustainable flood risk schemes, placing a burden on the public purse now and in the future. There is little information relating to whole life costs of "traditional" FCERM versus managed realignment / other approaches, particularly as many of the benefits of other approaches are either non-monetised (e.g. habitat creation, soft defences) or relate to the avoidance of continued maintenance and construction costs for defences.

Communicating FCERM is more than just asking people to comment on a printed document, inviting people to a workshop or holding a public meeting – stakeholders need to know why they should be interested / engaged.

Environment and Sustainability Committee

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Inquiry into Coastal Protection in Wales – Evidence from Halcrow Group Limited

Introduction

The National Flood and Coastal Erosion Risk Management Strategy (Welsh Government, November 2011) sets out four overarching objectives for flood and erosion risk management in Wales:

- **reducing the consequences** for individuals, communities, businesses and the environment from flooding and coastal erosion;
- **raising awareness of and engaging people in the response** to flood and coastal erosion risk;
- **providing an effective and sustained response** to flood and coastal erosion events;
- **prioritising investment** in the most at risk communities.

A summary of how the objectives of the Strategy have been reflected in the Lavernock Point to St Ann's Head second generation Shoreline Management Plan is provided below.

Lavernock Point to St Ann's Head second generation Shoreline Management Plan (SMP2)

Halcrow Group Limited (Halcrow) was commissioned by the Swansea and Camarthen Bay Coastal Engineering Group in January 2009 to develop the second generation Lavernock Point to St Ann's Head Shoreline Management Plan (SMP2).

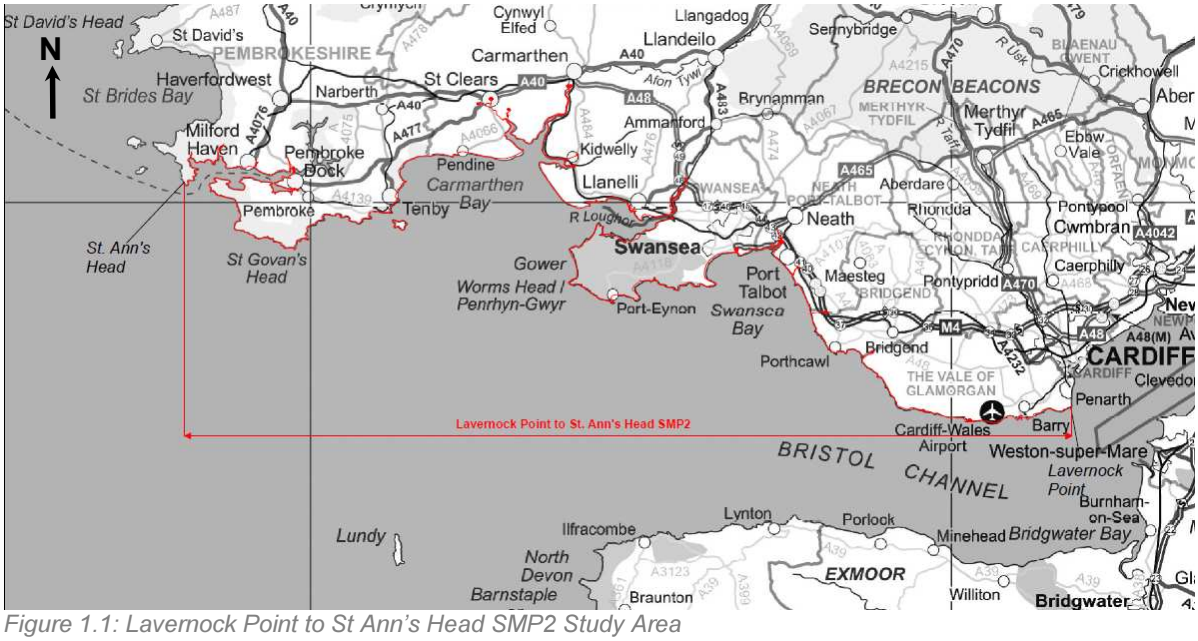

Figure 1.1: Lavernock Point to St Ann's Head SMP2 Study Area

The National Strategy had not been developed at the start of the SMP2 study, but the former "New Approaches" programme was in place. SMP2 policy appraisal was based on an examination of all benefits with a focus on reducing the risk of coastal erosion and flooding to people and maintaining the tourist/ recreation value of existing coastal amenities which have socio-economic benefits to the wider community.

From the outset of the development of the SMP2 it was recognised by Halcrow and the Client Steering Group (CSG) that there is a risk with respect to the future availability of public funding for coastal erosion and flood risk management and that alternatives to continuing

present management practices such as “hold the line” policies needed to be considered seriously.

On 19 February 2009 Halcrow (Marcus Phillips) attended an initial meeting with officials representing the Welsh Government (Kerry Keirle) and Environment Agency Wales (Natalie Newton) to seek guidance on Welsh Government scheme priority and future funding availability to inform the development of the SMP2. It was confirmed that the Welsh Government were in the process of considering options with respect to scheme prioritisation.

SMP2 Guidance developed collaboratively by Defra and WAG recommends that preferred policies are as sustainable as possible into the long term, defining sustainable policies as “those which take account of the relationships with other defences, developments and processes, and which avoid, as far as possible, committing future generations to inflexible and expensive options for defence” (Defra, 2006). From this statement, it is apparent that the best theoretical policy would be to work with natural processes and seek to maximise the extent of coastline that can change naturally. However since it is also necessary to consider the balanced needs of the human, natural and historic environments, this is not always acceptable or appropriate.

One of the main objectives of the Lavernock to St Anns Head SMP2 was to achieve ‘balanced sustainability’ by considering together the needs and objectives of people, nature, cultural heritage and economic development. It is however often impossible to fully achieve all of the often conflicting objectives of these sectors together. For example, building large-scale defences to reduce the risk of coastal erosion and flooding to a coastal town would conflict with objectives to allow the coastline to develop naturally. Careful planning, management and close liaison with the Client Steering Group (CSG – including representatives from the maritime local authorities (engineers and planners), Environment Agency Wales and Countryside Council for Wales) throughout the development of the SMP2 has resulted in a balanced plan which considers these issues both now and into the future.

All SMP2s have been developed consistently around the coast to consider policy development over 100 years split into three epochs, the short term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years). Welsh Government requested that a transition period was adopted in the short term (0 to 20 years) prior to adopting a change to the existing coastal erosion and flood risk management approach. This ties in with the typical residual life of existing coastal defences for the Lavernock to St Anns Head SMP2 study area, although the risk of flooding is likely to increase over this period. Since a risk management approach to coastal erosion and flood risk management has only recently been adopted in Wales some period of transition is necessary.

For example at Amroth, Pembrokeshire County Council, the preferred SMP2 policy between year 0 and year 50 was defined as Hold the line for as long as possible through maintaining the existing defences to ensure that the risk of erosion is managed, but do not improve the standard of flood protection. Adopt adaptive measures to manage increased risk of overtopping and flooding over time. Thereafter, between years 50 and 100 the policy is no active intervention, once the defences fail, allow the shoreline to naturally evolve and retreat along this frontage. Sensitivity of preferred policy: Amroth is a small holiday resort comprising a limited number of residential, amenity and tourist facilities. Coastal erosion and flood risk management is likely to become increasingly difficult and expensive in the long term as a result of sea level rise, in relation to the number of residents and assets at risk. A key influence on long term policy is therefore the technical and economic sustainability of defences. This policy is sensitive to high level future public funding and investment decisions.

The economic appraisal undertaken during the SMP2 identified the number of residential properties, residents, non-residential properties, areas of agricultural land and key/ strategic infrastructure assets which are at risk from coastal erosion and flooding in the long term (100 years). The economic review also included an initial appraisal of undiscounted benefits and costs associated with the preferred SMP2 policies.

As part of the SMP2 economic appraisal a high level sensitivity analysis was undertaken to define the additional number of residential and non-residential properties would be at risk from future sea level rise. Along the SMP2 coastline the additional number of properties at risk was typically small (less than 4% assuming 1m future sea level rise), compared to the number of properties which are currently at risk, since the topography rises steeply from the existing flood plain, see Table 1.1.

Table 1.1: Number of residential and non-residential properties at risk from future sea level rise (1 in 1,000 year return period extreme tide event, excluding existing defences)

Residential properties in coastal flood risk area		
Excluding sea level rise	1m future sea level rise	2m future sea level rise
12,927	13,416 (489 or 3.8%)	14,024 (1,097 or 8.5%)
Non-residential properties in coastal flood risk area		
Excluding sea level rise	1m future sea level rise	2m future sea level rise
2,592	2,686 (94 or 3.6%)	2,767 (175 or 6.8%)
(Figures in brackets indicate the additional number of properties which are at risk from flooding as a result of future sea level rise)		

The CSG is aware of the need to review the affordability of the SMP2 once Welsh Government funding policies and priorities have been confirmed. High level decisions will need to be made on the appropriate distribution of public funds across the whole of Wales. In liaison with Welsh Government, the CSG will review what needs to be delivered against available funding and develop a medium-term delivery plan for the SMP2 area. It will be necessary to investigate alternative funding options where it is not possible to justify or affordable for public investment in coastal erosion and flood risk management.

In addition to funding uncertainties, the justification for a particular preferred SMP2 policy may also change in the future due to other uncertainties such as future climate change (sea level rise, increased storminess, changes of river flows in estuaries), rates of cliff retreat, estuary response, future development of key industrial assets, critical infrastructure, ports and dock operations, future offshore dredging operations and marine renewable energy schemes.

The SMP2 development placed considerable emphasis on raising awareness of the risks. Public consultation on the draft SMP2 (which included policy maps which illustrated the risk of coastal erosion and coastal flooding in the short, medium and long term) was undertaken over a three month period (between 6 September 2010 and 6 December 2010). On 2 September 2010, in advance of the start of the public consultation period, the CSG placed a public notice in the Western Mail and the Evening Post and issued the press release to local newspapers. Announcements were made on Bridge FM and Radio Pembrokeshire. Throughout the period of public consultation (6 September 2010 and 6 December 2010) the draft SMP2 document was available to review at local council offices, libraries and on-line at the SMP2 web-site www.southwalescoast.org.

Conclusion

There has not been clarity on availability of public funding for coastal defences in Wales for many years and this has hindered the development of policy for managing the coast. In England there has been a formal prioritisation system for schemes seeking funding for more than ten years, with iterative changes to the system to reflect government priorities and specific targets or outcomes.

Environment & Sustainability Committee

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Inquiry into Coastal Protection in Wales – Evidence from Royal Haskoning

HASKONING UK LTD.
WATER

To	:	National Assembly for Wales -Environment & Sustainability Committee
From	:	Royal Haskoning
Date	:	18 June 2012
Copy	:	
Our reference	:	/NResponse 1/301164/PBor
Subject	**:**	**Inquiry into Coastal Protection**

Introduction
Royal Haskoning are pleased to provide this paper of written evidence based on our experience in providing advice to various operating and regulatory bodies with respect to the management and engineering around the coast of Wales.

In providing this paper we have structured our evidence in the following manner:

- *Context*– a brief description of Royal Haskoning's involvement and experience of coast protection and coastal management.
- *Coast Protection and Coastal Management* – examining coastal risk, drawing specifically on the findings of the West of Wales SMP but using examples from other areas.
- *Coastal Risk* – providing a discussion and explanation of coastal erosion and the interaction between sections of coastline, highlighting the thinking and use of SMPs and the impact of climate change and highlighting examples for the long term need for change management and the responsibilities in taking this forward..
- *Funding and Prioritisation* - discussion of influences of and barriers to funding.

Context
Royal Haskoning has been involved with the Welsh coastline for some 60 years, providing advice (now as Royal Haskoning and previously as Lewis and Duvivier and then Posford Duvivier) variously, to Urban, Rural and District Authorities and more recently to the Unitary Authorities, the Environment Agency Wales and the Welsh Assembly. We have also undertaken studies on behalf of Highway Authorities, Countryside Council for Wales (CCW) and the National Trust.

Over the last ten or so years we have provided services in relation to Coast Protection and Flood Risk Management works, coastal monitoring, Port and Harbour development, the Dredging Industry and the assessment of impacts on the natural environment. Currently we are in the process of completing the West of Wales Shoreline Management Plan (covering some 1,200km of the Welsh coastline between Milford Haven and The Great Orme), we have been involved in the development, design and construction of the major scheme at Borth on behalf of Cyngor Sir Ceredigion, we have recently been acting as specialist advisors to the Pwllheli Pilot Study and we are at present advising CCW on the potential for habitat recreation in the intertidal and shallow coastal zone.

At a more local scale we have been working with Pembrokeshire County Council and the National Trust in development of a managed realignment approach at Abereiddy. We also continue to provide ad hoc advice on local management and maintenance issues at a number of locations within Pembrokeshire and Ceredigion.

Staff within Royal Haskoning, such as Gregor Guthrie and Mick Newman, currently involved with the above work, have up to 30 years involvement with the development of management of the coast of Wales and the firm and individuals have had involvement with works and studies in the Dee, North Wales, Anglesey, the Llŷn Peninsula, Cardigan Bay, Milford Haven and Pembrokeshire, Carmarthen Bay and the Burry Inlet, Swansea Bay and the Severn Estuary.

In addition to work directly associated with the Welsh Coastline, individuals involved with work within Wales are also involved more generally with providing advice and undertaking research on behalf of Defra and the Environment Agency. We have been involved with the recent update to Project Appraisal Guidance in England, the development of Planning Policy Statement (PPS)25 and its coastal supplement, Coastal Habitat Management Plans (CHaMPs) and the development of the FaCET analysis tool for developing national funding strategies. Key staff also have experience of developing approaches to coastal management throughout the UK and internationally.

We believe that we can contribute, through our experience and the evidence provided to the committee, a wide ranging knowledge in both; the current situation and thinking, but also, related to this, on the important perspective of issues that have driven change in attitudes towards coastal management and coast protection.

Coastal Protection and Coastal Management
We generally welcome the changes made to the National Strategy for Flood and Coastal Erosion Risk Management in Wales (the Strategy), following the consultation on the initial draft. We feel that the revised Strategy document does go a significant way to redressing the balance in considering specific coastal erosion risks as distinct from more typical flood risk issues. We do, however, believe that these distinctions could be brought out even more clearly and that this will be important in considering how the Strategy is taken forward. We therefore welcome the opportunity provided by the Inquiry into Coast Protection to ensure that coastal issues are fully understood and discussed.

In considering coast protection there is now a far greater appreciation that the well-being of many coastal towns and villages depends upon their interaction with the coast. The majority of the major towns and cities within Wales are at the coast and there are numerous smaller towns and villages along the coastal fringe, whose character and cultural heritage are inextricably linked to their association with the sea. These towns and villages are an essential part of the character of Wales as well as being important residential areas and providing vital services and cultural centres to the large rural hinterland. The various harbours are also important and add both direct value to these settlements and, in the case of the major ports, are identified as important commercial and transport hubs for Wales. Other harbours are important sailing centres, forming a necklace of harbours around the coast, supporting investment in the area. Many of these harbours also provide important services to the local fishing effort as well as supporting the watersports industry.

There are important transport routes which run within the coastal area; several of the main roads or local roads linking communities run close to or at the shoreline or run through areas at risk from coastal flooding. The main railway lines along the north coast and along the coast of north Cardigan Bay and the eastern shoreline of Carmarthen Bay run at the shoreline over much of their length, with critical locations at risk.

The outstanding natural beauty of the coast is important in terms of landscape, its ecological value and in understanding of the geological and geomorphological changes that have occurred. This, together with the historic landscape, has an intrinsic value but also underpins the attraction of the coast for tourism and as a place to live and work. In many areas the beaches provide both an important aspect of coast protection but also a significant value in terms of landscape, recreational use and ecological function.

Coastal change and the management of change cannot be considered purely in terms of a traditional attitude to coast protection or risk management. We welcome and fully support, therefore, the overall attitude taken within the Strategy as set out in the statement:

"Underpinning all of the work on flood and coastal erosion risk management is the Welsh Government's commitment to sustainable development, in terms of well-being, as our core organising principle. The key aspects of well-being include taking action on social justice, poverty and equality and living within environmental limits, and these are all integral to delivering an effective flood and coastal erosion risk management system for all."

We also welcome and support the overall approach to funding set out in the Strategy, recognising the increasing pressure on the coast and the need for change and, therefore, the need to prioritise and plan expenditure on coast protection. In particular we support the need for alternative funding arrangements to be developed. Through our involvement with the scheme at Borth, we have seen a good example of how different funding streams have been used in developing an approach providing security to the village in a manner that contributes to the wider values within the area. It has, by no means, been a simple process,

Notwithstanding the above support for the Strategy, however, we do have concerns that the Strategy, with its focus on risk management objectives, (reflecting the similar focus on risk management set out in the Flood and Water Management Act 2010 (FWMA)), potentially constrains and may miss the opportunities for a more integrated approach to coastal management. Risk management forms an essential aspect of management but cannot provide the vision for the coast.

In this, we would make reference to one of the core findings of the House of Commons Environment Committee report on Coastal Zone Protection and Planning (1992) that:

"Coastal zone protection and planning cannot be reviewed in isolation; they are inextricably linked to the administration and management of the many activities and uses of the coastal zone….."

The report went on to highlight the need for a broad and integrated view of coastal issues.

Our evidence, presented in this paper, attempts to draw out some of these issues more comprehensively, highlighting the key distinctions between the coastal behaviour, coastal risk and coastal erosion and the risks associated with other sources of flooding and flood risk management. We have taken the topic of coast protection to include some aspects of coastal

flooding in addition to coastal erosion, taking the broader definition of the Coast Protection Act 1949 as “encroachment by the sea”, considering within this wave overtopping and inundation flood risk, where land would normally be covered by tidal waters if it were not defended. In this way we attempt to cover the principle aspects of coast protection that are different from other forms of flooding. We recognise that not every situation is the same and that some aspects of coastal risk may also apply to other forms of flooding. However, in general terms the key distinctions are made:

- Loss is permanent rather than being recoverable.
- Coastal change tends to be progressive and, while there may be the need for emergency response to individual events, this tends to be in the context of longer term changes resulting in increasing vulnerability. As such, the response to erosion or tidal inundation can be very different to flooding; it may not be a case of temporary accommodation, repair to infrastructure or clearing up, it is likely to require preplanning of fundamental change to land use.
- In many areas coast protection is as much about the management of the form of the coast rather than management of probability based extreme events. This is reflected in the different approach taken to Shoreline Management Plans (SMP) and Catchment Flood Management Plans (CFMP). This is discussed later.
- Coast Protection is far more about management of energy (making space for energy) rather than purely water (making space for water).
- Even where we are discussing flooding issues and in particular in areas of tidal inundation, it is considering how this may impact on the hydrodynamic and sediment system over a wide scale that is as significant as the direct impact of flooding.
- As a result of working within a system changing over time, there are situations where there is an element of inevitability. As such, while property may not actually be lost for some time in the future, the decisions made now; the actions taken now, result in putting in motion a condition where future change becomes inevitable.
- The corollary of this is that it is possible to influence and change the coastal system. In some areas, we can create conditions where management of core values becomes more sustainable. This runs counter to the general perception that, in all areas, with climate change, erosion will become worse and that pressure and cost of management will inevitably increase. This may be true in a large number of areas, particularly where there is already significant pressure on the existing defence. It is however possible to modify the way in which energy is directed against the shoreline such that beaches build or that the physical environment is created where accretion of, for example salt marsh, is possible. This all gives a very different perspective to realignment, defined by SMPs as adjusting the form of the coast to achieve a more sustainable system; this is in contrast to the typical flood based definition, implying a necessary retreat from an existing defence line. This comes back to the concept that we are very largely managing energy, rather than water, at the coast.
- Finally, we know that the very character and fundamental function of many coastal communities are so closely aligned with, and dependant on, the behaviour of the shoreline. We also know that coastal communities and transport systems linking communities underpin the social structure of much larger areas of Wales. Therefore, coast protection and coastal management has to consider impacts, interactions and interdependencies over large areas reflecting both physical processes and socio-economic systems functioning at a broad scale and over a long time scale.

If the National Strategy wishes to establish,

"the overarching framework for the development of a holistic flood and coastal erosion risk management system fit for Wales",

In terms of coastal risk management, we believe it has to be embedded within a holistic and integrated approach to planning and spatial vision for Wales.

Coastal Risk
We welcome the discussion within the Strategy highlighting that the impact of erosion can be as significant as that of flooding. However, we do feel that this is somewhat diluted by the way in which some of the other statements might be interpreted.

Whilst we fully recognise that loss due to erosion directly affects less property and land than flooding, we are surprised at the numbers quoted for erosion loss over the last 100 years. We are aware of some six properties being lost at Amroth during the 1930s. There was a major sea wall failure at Aberystwyth around the same time that resulted in loss of the promenade and loss of use of property behind. There has been a continuous loss of land and, we understand, property at Hells Mouth due to land instability caused by erosion, and similar losses along the North Llyn shoreline and at New Quay.

It may be of interest to the committee that at New Quay, the existing church at Llanina Point is possibly the sixth church in this general location since the 7th century, as the Point has eroded back. This does suggest that in the past there has been a greater acceptance and capacity for change but possibly fewer records of loss than identified by the Strategy.

With respect to the future, the West of Wales SMP (WoW) has provided the following assessment of loss over the next 100 years under a No Active Intervention scenario.

No Active Intervention Box 1. Communities - potential economic damage to property:
Without defence there would be significant loss to all the major towns on the coast. Overall it has been assessed that:
Some 1600 properties would be lost due to erosion, with a discounted present value in the order of £30million (£200 million current value). This does not take account of services and loss of amenity. The main areas at risk from erosion are:

- Little Haven and Broadhaven (50 properties)	- Aberporth and the villages of South Ceredigion (20 properties)
- Fishguard and Newport (20 properties)	
- New Quay and Aberaeron (130 properties)	- Aberystwyth (180 properties)
- Borth (320 properties)	- Aberdyfi and Tywyn (95 properties
- Barmouth (40 properties)	- Porthmadog area (110 properties)
- Criccieth (100 properties)	- Pwllheli and Abersoch (12 properties)
- Aberdaron (30 properties)	- North Llyn (45 properties)
- Western Menai Strait (110 properties)	- Eastern Menai Strait (85 properties)
- Western Anglesey (40 properties)	- North and East Anglesey (61 properties)
- Conwy and Llandudno (100 properties)	

There are at present some 14,000 properties at risk from flooding within the SMP area. Despite the economic value of damages being discounted back to a present value, the economic losses would increase over the three time periods of the SMP (over the next 20 years, between years 20 and 50 and between year 50 and 100). This reflects both the gradual failure of defences and the impact of sea level rise making flooding more frequent. Over the 100 years, the economic loss would be in the order of £1,350 million. Over the short term, medium term and long term, the economic damages, purely in terms of direct flood damage to properties and businesses, would be of the order of £220 million, £330 million and £800 million, respectively. This does not take account of potential risk due to inland flooding and the risk from wave overtopping. The most severely affected populations centres, due to direct tidal flooding, would be:

- Newgale and Solva (40 properties)
- Cardigan (100 properties)
- Aberaeron (350 properties)
- Borth and the Dyfi Estuary (500 properties)
- Fairbourne (400 properties)
- Harlech Area (450 properties)
- Pwllheli (1200 properties)
- The Cefni and Malltraeth area (140 properties)
- Holy Island (350 properties)
- Beaumaris and Porthaethwy (270 properties)
- Llanfairfechan (78 properties)
- Llandudno (4800 properties)
- Lower town Fishguard and Newport Parrog (50 properties)
- Aberystwyth (950 properties)
- Aberdyfi to the Dysynni (350 properties)
- Barmouth (250 properties)
- Porthmadog (1650 properties)
- The Western Menai Strait (176 properties)
- Rhosneigr and Valley (250 properties)
- Traeth Coch area (35 properties)
- Bangor (330 properties)
- Conwy and the inner Conwy Estuary (1000 properties)

Clearly, this assessment does highlight significantly greater economic damage resulting from flooding, however, it may be argued that because we are identifying permanent loss due to erosion, erosion may have substantially greater social consequence. In relation to coastal erosion, the statement in the Strategy that,

"….Shoreline Management Plans suggest that the numbers are significantly less. The majority of these would be affected in the medium to long term when the effects of sea levels result in increasing erosion."

tends to underplay the significance of erosion and certainly underplays the need for present day management and possible investment and as importantly planning for change now.

In considering those locations identified in the table above, it is important to consider the specific circumstances, rather than the implication that this is a future problem that may be put off to the future.

- In many of these areas, in fact in relation to nearly all properties identified, are areas that are currently defended and areas that have had some form of defence over anywhere between 30 to 50 years or for well over 100 years. In this respect, identifying the property as being at risk purely in the future is not strictly true. They are at risk now but that risk is being managed with existing defences.
- In several cases, therefore, the timing of loss is related directly to the residual life of the defence, not as suggested by the Strategy a consequence of sea level rise or the slow process of erosion. In several areas the loss of defence would result in almost immediate loss of property, irrespective of sea level rise or further need for long term erosion; basically properties are sat immediately behind the defence.

- Without continued investment and improvement to the defences, should defences be allowed to fail, while some properties might not be lost for twenty or even 50 years, their loss may then be inevitable. In many areas (but not all) the concept of setting back the defence to a more sustainable position is not a technically viable alternative.
- For many of the communities the sea front and property associated with the sea front form the core of the community. Loss of individual properties cannot in reality be viewed in isolation but should be seen as loss of the integrity of community.
- The amenity and often tourism and economic value of the sea front in several cases provide a core element of the community. In project appraisal terms, in defining erosion damages, this can distort the economic loss. Taking locations such as Broadhaven, Barmouth, Criccieth or Llandudno, the width of promenade, even while being essential to the function of the town, contributing also to the essential landscape of the community also, in terms of traditional attitudes to risk management, acts as a buffer zone before the loss of actual property.

These issues are, from our experience in other areas of the UK, only coming to the fore now, particularly in England in developing the new Defra approach to funding and prioritisation of funding.

For completeness, we also include the equivalent table identifying potential loss for the West of Wales area under the preferred SMP plan approach to management.

Preferred Plan
Box 3. Communities -:
The plan aims to reduce risk from erosion and flooding:
Of the 1600 properties at risk due to erosion under the No Active Intervention (NAI) over 1000 properties would be protected under the policies set out in the plan. Many of the properties still at risk would gain some protection over a longer period of time. The economic loss under the plan would be reduced from approximately £30 million to £8 million. The main areas where potential loss is anticipated over the next 100 years are set out below. NAI losses are shown in *italics* for comparison.

- Little Haven and Broadhaven (11properties, *50*)	- Aberporth and the villages of South Ceredigion (4 properties, *20*)
- Fishguard and Newport (1 property, *20*)	
- New Quay and Aberaeron (43 properties, *130*)	- Aberystwyth (6 properties, *180*)
- Borth (290 properties, *320*)	- Aberdyfi and Tywyn (0 properties, *95)*
- Barmouth (10 properties, *40*)	- Porthmadog area (4 properties, *110*)
- Criccieth (2 properties, *100*)	- Pwllheli and Abersoch (6 properties, *12*)
- Aberdaron (5 properties, *30*)	- North Llyn (32 properties, *45*)
- Western Menai Strait (11 properties, *110*)	- Eastern Menai Strait (21 properties, *85*)
- Western Anglesey (15 properties, *40*)	- North and East Anglesey (30 properties, *61*)
- Conwy and Llandudno (*20* properties, 100)	

Note: Losses are estimated based on projected erosion over the next 100 years.

There are at present some 14,000 properties at risk from flooding within the SMP area. These properties would continue to be at risk; however the SMP would aim to reduce the impact of flooding. The economic damages would be reduced from £1,350 million under a NAI scenario to £223 million over the period considered under the plan. The risk to property would still increase over the three epochs. Over the short, medium and long term, the economic damages, purely in terms of direct flood damage to properties and businesses, would be of the order of £40 million, *(£220 million NAI)*, £50 million *(£330 million NAI)* and £140 million *(£800 million NAI)*, respectively. This reflects the increased risk associated with sea level rise, but also the intent within the plan to defend areas where it is sensible to do so without leaving people in a more vulnerable position. The most significant areas where properties may be lost due to increased risk or where there is greatest need for adaption are shown below.

- Newgale (epoch 1) and Solva (epoch 3)
- Borth and the Dyfi Estuary (epoch 3)
- Clarach (epoch 1)
- Artro Estuary (epoch 2)
- Pwllheli (epoch 2)
- Dinas Dinlle and Morfa Dinlle (from epoch 2)
- Beaumaris and Porthaethwy (epoch 3)
- Llanfairfechan (epoch 3)
- Lower Town Fishguard and Newport Parrog (both in epoch 3)
- Fairbourne (epoch 2)
- Dysynni Estuary (epoch 2)
- Porth Dinllaen and Morfa Nefyn (epoch 2)
- Porth Llechog, Moelfre and Traeth Coch (epoch 3)
- Bangor (epoch 3)
- Conwy valley (epoch 2)

There would continue to be significant flood risk to:

- Cardigan
- Aberaeron
- Aberystwyth
- Aberdyfi
- Harlech and Talsarnau
- Porthmadog
- Caernarfon and Y Felinheli
- Valley and areas of Holy island
- Llandudno
- Conwy and the inner Conwy Estuary

This highlights the need identified by WoW for adaption and the recognition that not all communities or defences will be sustainable.

WoW also identifies other aspects of the coast at risk. This includes both risk in terms of erosion and inundation. The two tables show respectively the No Active Intervention scenario and the situation for the West of Wales area under the preferred SMP plan approach to management.

No Active Intervention

Box 2 Transport and Critical Infrastructure:

Without defence or managed adaption there would be significant loss and disruption to transport routes. The main areas at risks are identified below.

- the coastal road around St Brides Bay and St David's (including Little Haven, Broad Haven Newgale and Solva).
- the coastal road and access to Fishguard Harbour and through Lower Town.
- road access to New Quay and between Aberaeron and Aberystwyth.
- the road and rail network within the Dyfi Estuary, including the rail link to Aberystwyth.
- the railway line between Dyfi Junction and Pwllheli: at the Dyfi, across the Dysynni, at Friog and across the Mawddach Estuary, at Harlech, and across both the Dwyryd and Glaslyn Estuaries, along the Criccieth frontage and at Abererch.
- the airfield at Morfa Dinlle.
- the coastal roads at Menai Straits.

- the road system to and through Beaumaris.
- the road and rail links along the north Wales coast and across Anglesey to Holyhead.
- the road and rail links along the Conwy valley and through to Llandudno.

There are some 34 harbours, landing stages or mooring areas identified within the area, providing over 2500 moorings. By their nature such facilities are inevitably at risk from flooding or potentially impacted by erosion and coastal change. The main harbours are identified below:

- Solva, Porthclais and Porthgain	- Fishguard	- Newport
- Teifi and Cardigan	- New Quay	- Aberaeron
- Aberystwyth	- Aberdyfi	- Barmouth
- Shell Island	- Porthmadog	- Pwllheli
- Morfa Nefyn	- Caernarfon and Y Felinheli	- Holyhead
- Bangor and the Eastern Menai Strait		- Amlwch
- Conwy	- Deganwy	

There are approximately 64 waste water and sewage treatment works within the SMP2 study area. Power distribution and electricity sub stations tend to be clustered around the main urban coastal centres. There are 27 waste treatment and recycling sites occurring within the coastal SMP2.

Preferred Plan
Box 4 Transport:
The key areas where decisions need to be taken with respect to the future of the transport network are highlighted below.

- the coastal road around St Brides Bay and St David's.	There are several areas where defence of the road would no longer be sensible or would constrain appropriate management of the adjacent shoreline. The whole transport network within the area will need to be reviewed over epochs 1 and 2
- the coastal road and access to Fishguard Harbour and through Lower Town.	Consideration need to be given to realignment of the road.
- the road and rail network within the Dyfi Estuary, including the rail link to Aberystwyth.	The potential for realigning the railway and road needs to be considered during epoch 1, in preparation for increased pressure on defences in the long term
- the railway line between Dyfi Junction and Pwllheli:	There are several sections of the line that may not in the future be sustainable, particularly where the railway runs across the flood plain or behind or across soft natural defences. The need for realignment is highlighted in several of these areas potentially affecting the entirety of the route. (epoch 1)
- the road system to and through Beaumaris	The potential need for long term change is highlighted
- the road and rail links along the north Wales coast and across Anglesey to Holyhead.	This route would be maintained but there are areas where there would be joint benefit in management of other assets.
- the road and rail links along the Conwy valley and through to Llandudno.	Realignment of the route along the Conwy Valley would be necessary to sustain the service provided.

We have provided a map as Figure 1 showing the key areas of concern with relation to the Cambrian railway, to provide better context of the larger scale and interconnected issues relating to Coast Protection and coastal management. This is discussed more broadly in the section of our evidence below.

Context of Coastal Change
The above reference to the broader scale geographic implications of coast protection is highlighted in considering the potential risk to the Cambrian Railway and the need for long term planning in decision making with respect to individual sections of the coast. In this section of our evidence we highlight how this equally applies, but at a slightly more local scale, to other areas of the coast. This is presented with reference to two areas of New Quay and Aberystwyth but hopefully provides a discussion of broader issues that are applicable to understanding and in considering issues of coast a protection more generally.

The Strategy refers to erosion as happening not at a constant rate (which is true) but then suggests that it is purely event driven (which it is not). It is also suggested that the first visible signs of erosion is the loss of sand or shingle exposing the underlying rock. This tends to suggest a very simplistic message, ignoring the very visual influence of geomorphology at a larger scale than that of a beach.

There is also the implication within the Strategy that there is a real distinction between hard and soft approaches to management at a strategic level, such that within section 4 of the Strategy (Implementation) reference is made to working with natural processes alongside reference to beach nourishment, with the strong implication that beach nourishment at a Wales strategic level is necessarily a desired form of engineering.

The principles of “working with nature” are, we feel, very important but this term tends to be with reference to understanding and incorporating the needs of the natural ecological system as an integral part of coastal management.

This is quite distinct from the “engineering with nature” which is a term used for example in describing the recent scheme for large scale import of sediment to the coast of the Netherlands (an approach which could have application to certain sections of the Welsh coastline) or at a more modest scale in using and influencing the behaviour of the coast to create more sustainable outcomes.

Approaches such as beach nourishment could be very valuable in certain locations of the Welsh coast but, as with any other form of engineering, may not be technically viable in others and could equally have major negative impacts on the way in which the coast behaves, the use of the coast or the ecological value and diversity of the shoreline. We believe it is important that a clear distinction is made in the Strategy (and in taking it forward) between strategic intent and the technical tools or techniques for delivering the strategy.

Finally as an introduction to this section, the Strategy makes reference to SMPs, thus:

“In terms of coastal erosion, our Shoreline Management Plans are based on an understanding of coastal processes, planning issues, current and future land use, defence needs and environmental considerations. Each Shoreline Management Plan defines specific lengths of coast which each have a proposed shoreline management policy.”

The focus on the SMP policy in this is incorrect, in that the SMPs attempt to define a preferred management plan for the shoreline, not specific policies. Individual policies for specific sections of the coast are to deliver the plan and cannot be taken out of context of the broader scale intent of management which is the main output of the SMP.

These points are developed in relation to New Quay and Aberystwyth to help understand the context within which we see the Strategy being taken forward.

New Quay (Figure 2).
From the figure the very distinct shape of the coast may be appreciated. This bay shape is formed by the erosion of the soft central section of the bay, eroding the toe of the coastal slope and preventing the coastal slope from developing a naturally stable slope. The shape is controlled by the hard rock of New Quay Head, enhanced by the influence of the Stone Pier, providing shelter from the dominant wave energy, and by the harder outcrop of glacially deposited material at Llanina Point.

From this it may be seen that the way in which we intend to manage coast protection to the town and at Llanina Point has a major influence on the way in which the central section of the coast then develops. The overall management intent for the area is to continue to manage the whole frontage. The economic value underpinning this is focussed on sustaining the essential core use of the town, the road running through the town down to the harbour, the harbour itself and the overall importance of the town in relation to the rural hinterland, Ceredigion and indeed Wales; New Quay being one of the iconic towns supporting tourism to Wales. The specific policy from the SMP for the town is Hold the Line. The number of properties actually affected by erosion provides relatively limited direct economic benefit. Indeed, over the first 20 years should defences be allowed to fail there would be no direct loss of properties within the town.

Clearly if defences were allowed to deteriorate and fail, the harbour and any investment opportunity would be severely constrained. There would be little benefit in re-establishing defences further back, as one would have lost access through the town. New Quay as a community would be lost..

At Llanina Point the policy is also to Hold the Line. This policy is set in the context of the overall management approach to the bay. The intent is not specifically to defend the Point from any or all erosion but to maintain the influence of the point as a control feature of the shoreline. This is set out in explaining the specific policy associated with this section of the coast.

Between these two Hold the Line policy sections, there is no strong economic argument for defence of the coastal slope, and quite strong environmental and sustainability issues with attempting to defend this frontage. However, holding the two adjacent frontages effectively means that the policy of Managed Realignment is imposed on the central section of the bay. This does also provide the opportunity for adaptation of the use of the coastal slope and adaptation of the important caravan park located at the crest of the slope.

It may be seen from this that there is a need for a co-ordinated approach to coast protection over the whole frontage. The traditional risk values in relation solely to loss of properties provides only one aspect in terms of the management of broader scale risk and values. There is the need to

consider the longer term impact of coast protection, or the lack of coast protection, in looking at sustainable communities and the ability to adapt.

It is the combination of nominally hard engineering, coupled to the ideas of influencing and working with and understanding natural processes that provides this sustainable approach to coastal management.

In terms of funding, various schemes have been mooted in the past for improvement to the harbour. This might open opportunities for alternative funding arrangements but equally has to be set in the context of how the coast functions, the impact on the landscape and the potential impact on the ecology. This then ties in to the need to have a clear overall vision for the area, identifying the essential values that characterise this section of the coast.

Aberystwyth. (Figure 3)
We have selected Aberystwyth as being representative of several other towns, cities or indeed villages. Typically, such places as Swansea, Llanelli, Saundersfoot, Lower Town Fishguard, Aberaeron, Barmouth, Pwllheli Beaumaris or Llandudno, all of have significant areas of flood and erosion risk, either in combination or as discrete issues affecting different areas of the community. In the case of Aberystwyth, the town has an important sea front and promenade, extending from the harbour through to Marine and Victoria Terrace. Much of the new development of the town has taken place within the Rheidol valley extending up along the defended valley floor through to the town centre. The potential flood risk area from tidal influence is shown in Figure 3. The defence is manageable, in that it is not under significant pressure apart from increasing water levels as sea level rises (i.e there is no significant flow pressures causing erosion). Defences may be raised to improve or maintain the standard of defence in the future. The main consideration for the future is the height to which the defence will need to be raised to provide an adequate standard of protection, coupled to the increasing vulnerability in the longer term under conditions when the defence standard might be exceeded.

This risk is seen as being manageable, at least under standard predictions of sea level rise, and, with the development that has taken place within the valley, is certainly economically justified. There are potential issues should sea level rise be greater than the typical 1m values recommended by Defra for strategic planning over the next 100 years. Given the possibility of more rapid sea level rise or looking beyond the 100 years, there have to be questions as to the sustainability of defence to the area. This becomes a long term planning issue for the future economic development of Aberystwyth.

The other key area of risk to the town is along its sea front, particularly along Victoria and Marine terraces. This area is as critical to the sustainability of core values to the overall town as a centre of tourism within West of Wales. The main retail centre, the services and catering sections of the town rely on the sea front attracting visitors and defining one of the principle characteristic values of Aberystwyth. Significant effort has gone into regeneration of this sea front asset, reflecting its important value.

In terms of defence, the frontage is protected against both wave overtopping and erosion by sea walls. As mentioned earlier in our evidence, failure of the sea wall to the north of the sea front did result in local damage both to the promenade and property. However, over much of the length, actual loss of property may not occur for 20 to 50 years following failure of the sea walls. The economic case for defence, however, is strong enough based on normal risk analysis to justify

the Hold the Line policy, with the intent of management being to sustain the overall value and function of the sea front.

With sea level rise, the pressure for erosion, risk of overtopping and direct water level flooding increases. In addition to the increased economic risk, is the risk of loss of the beach. In the longer term defences could be raised but at the expense of creating a barrier between land and sea that would itself detract from the function of the promenade. Beach nourishment might go some way to addressing deterioration in levels and improving the amenity of the frontage but this would require regular re-nourishment and might not be considered sustainable in the future. There are, therefore, very difficult challenges in terms of coast protection and sustaining the important sea front asset of the town. This is discussed within the SMP and the conclusion drawn is that there may be a need to radically rethink the sea front, potentially building forward and encouraging opportunity for creating new development seaward of the existing defences. This requires a new way of thinking beyond that purely of risk management. Risk management becomes an essential part (and possibly the driver for change) but does not become the driver for what is actually done.

The function of the SMP is, in an area such as this and in many other areas of the coast at different scales and in different detail, to raise such issues and open discussion of how coast protection and flood risk management may be adapted to add to future sustainability of communities. This goes beyond the traditional role of flood and coastal erosion risk management in regulating and controlling development. We believe this example demonstrates that need in taking forward the Strategy to allow risk management at the coast to provide an important new role within spatial planning of the coastal zone. This has important implications with respect to responsibilities defined by the Flood and Water Management Act 2010.

Over the last few years, certainly with respect to councils responsible for coast protection in the WoW area, there has been progress in discussing these issues at the local level with communities at risk. The works at Borth have been developed in partnership with the community. The Pwllheli Pilot has been involving local people in developing an approach to management of the coast as well as raising awareness of the risks being faced.

There are, however, barriers to this. While significant effort is going into raising awareness of risk, the mechanism for developing actions to address such risks in a positive way, looking at how change management can form a catalyst for rethinking how communities develop into the future, is not always being followed through. Without established mechanisms for taking this forward the awareness of and discussion of how future risk could be managed tends to fade into the background. There is almost an acceptance among communities that they are at risk but then a rapid return to “business as usual” with the expectation that others will address or initiate actions.

At a very local level, this can be seen in the planning applications that are emerging Despite an apparent awareness of the risk, individual applications are made which quite clearly offer no longer term thought for a need to adapt. This often places the Planning Authorities and the Environment Agency either in a position of conflict with individuals and communities, or, in accepting applications with necessary conditions, acting to kill long term strategic thinking by a process of “death by a thousand cuts”.

We do see, almost perversely, that a result of providing a stronger responsibility structure and hierarchy through the Flood and Water Management Act 2010, with respect to risk management, is possibly weakening the links directly between risk management, planning and communities. With the problems predicted for the future, there is a growing need to be thinking one step ahead, rather than waiting for issues to become critical, when it becomes easier to draw people together to deal with a common concern, when options for addressing such problems may be far more limited.

Not least of the barriers to the development and implementation of longer term aspirations for sustainable management of the coast is funding, and this is discussed below.

Funding and Prioritisation.
What becomes very clear from the SMPs and from research undertaken, both with respect to Wales and more broadly with respect to other areas of the UK, is that to maintain coast protection defences, in the same way as in the past, is going to require significant increase in costs. Notwithstanding the present economic situation, highlighted within the Strategy, it is the longer term climate change and sea level rise that will impose significant additional costs just to stand still in terms of the standard of defence provided at present.

How and where national funding is spent will need to be prioritised and planned. In terms of the overall pot and the role Government in funding coast protection, we feel this lies outside our remit of providing evidence and we focus on the discussion of the influence of how funding is delivered and the potential barriers to alternative funding.

It is, however, noted that the level of national funding has been an issue long discussed. The Royal Commission on Coastal Erosion, in 1906, discussed this very matter; alongside attempting to define erosion lines and rates of erosion. In addition, it is worth noting that one of the core principles behind the Coast Protection Act 1949 was that funding arrangements should reflect the value of the coast to the nation. This is also alongside the responsibility of government to support the wellbeing of people living on the coast, the value of coast protection to the local community and the direct benefits that individuals gain from coast protection. The concept of partnership funding is, therefore, far from new.

Furthermore, prior to the Coast Protection Act, funding in many areas did tend to come primarily from individuals, local funding or even public subscription. We see evidence that, as increasingly more development occurred on the coast, so this local, piecemeal approach to coast protection did result, in some areas, construction of inappropriate defences creating problems that we have now inherited. It is equally true, however, that some of the nationally funded works undertaken, particularly on the east coast of England, following from and in immediate response to the storm of 1953, gave rise to an expectation of defence that we are now having to address through different approaches, including adaptation of land use rather than reinforcing existing defences.

The tensions we now see emerging from the present move towards localism and joint funding are:

- the need for good strategic guidance to ensure local defence does not create broad scale problems
- and the need to ensure that national funding is not purely driven by the local ability to pay or match fund.

We have seen that, as schemes have been developed over the last few decades, there does seem to have been greater emphasis on broadening of objectives, which might not in the past have been strictly considered a function of coast protection. In many ways this has led to far better schemes, providing a far more integrated approach, incorporating broader vision within the need for coast protection.

Schemes such as those constructed at Blackpool or Weston-super-Mare are excellent examples of this. It is interesting, however, that these schemes have been triggered by the need to improve defences and, only on the back of this, have the ideas for regeneration and amenity improvement really been developed. The opportunity was taken, at Weston-super-Mare, to step back from the initial concepts for defence and to consider the broader scale, longer term regeneration of the sea front.

In some ways, and this was a point made in recent Defra research on adaptation, this highlights that it has only been where there is strong traditional justification for coast protection, that opportunity has emerged for improving the quality of the scheme to deliver wider benefits. Where the economic justification, from a risk perspective, is weaker, there is a tendency for schemes to be developed within very limited budgets with little opportunity to address or attract funding to address broader issues associated with the coast.

This issue has been addressed in part by the new English approach to prioritisation of grant in aid, with the move from 100% funding to an approach which attempts to spread funding over a broader range of schemes. However, we still see issues arising from this:

- The present policy approach based on number of properties lost, with a bias on properties lost within the first epoch (first 20 years), this does not fully recognise some of the peculiarities of coastal communities identified earlier in our evidence (e.g. a promenade may act as a buffer zone extending the nominal life of property but in reality not capturing the inevitability of loss to a community).
- With the focus starting from the need to address a coastal risk problem, it is more difficult to attach joint funding, as such funding tends to come from those most at risk rather than from those who benefit in other way from sustaining or improving the interaction between the community and its sea front.
- Starting from a scheme designed to address coastal risk issues, the approval process tends to take over, such that approval is given to a specific, closely defined approach. This can immediately constrain thinking about the opportunity in developing and designing an approach with a more opportunity (land use led) built in from the inception stage.
- The alignment of funding sources remains a key issue; with pressures to spend funds within tight deadlines, the legal difficulties associated with commitment of funding from different partners and also the arrangements, particularly where funds are obtained from individual property owners in relation to construction risk and contingency.

We provide a brief discussion of some of these issues in relation to our experience from the Borth Scheme as we do see this as a very positive example of bring together funding opportunities, while highlighting some of the challenges.

The initial identification of developing issues in relation to the frontage were in 1994, following inspection and monitoring of the groynes and beach levels over the previous 10 years. It was

seen that the groynes (typically constructed in the 1970s) were showing signs of increasing deterioration and need for repairs. An initial assessment was made as to the long term commitment likely to be needed to sustain the defence into the future. It was felt that much more major investment would be required over the next 10 to 15 years and that there was opportunity for adopting a different approach to defence.

This commitment to monitoring and continual re-assessment of the situation by the Cyngor Sir Ceredigion was vital in allowing time within which to respond to the developing situation.

Two actions were subsequently taken. The first was to examine, from a perspective of coast protection risk management, potential options for future defence. This involved development of a strategic framework for management based on modelling and appraisal of the problem.

The second action was in involving the community in a visioning exercise, developing alongside the risk management approach an awareness and understanding of the issues coupled to an exploration of how the community felt Borth could or should develop in the future.

In combining these two aspects, a coast protection strategy was developed. An essential feature of this strategy was that while setting out clear guidance on the technical, environmental and economic parameters, the approach needed to retain a strong element of adaptability so as not at this stage to constrain ideas and the future thinking about opportunities.

The final phase 1 of the scheme has developed through a series of interactions, developing the approach through outline and detailed design, allowing local input in arriving at the solution.

The attitude towards funding and building in EU and national funding, alongside additional funding from the council has been a major benefit in delivering the scheme. Associated with this has been the council's ability to demonstrate that the scheme is part of their overall forward planning for the wider area, addressing issues that contribute to EU fund objectives, alongside development of a local vision for Borth. The scheme design recognises the longer term sustainability issues of defence to the village as identified through the SMP and is designed to provide flexibility in how management may be undertaken towards the latter part of the this century. It therefore provides present day security, while allowing for future adaptation.

The overall approach has necessarily worked within established procedures for appraisal of coast protection but has been constrained by this process. This has benefited from a case by case approach to scheme approval rather than a strictly formulaic approach, particularly in terms of funding allocations.

There have been significant challenges that have had to be overcome, not least in terms of timing associated with different funding streams. This had led to extremely tight deadlines, with increased design and construction risks.

Further phases of work to deliver the full strategic approach to the frontage are currently being progressed and will rely upon continuity of funding arrangements. Whilst it seems likely that these future phases will need to be re-examined in detail, not least in light of lessons learnt from phase 1, the overall strategic approach provides a strong framework from which this can be undertaken.

In terms of coast protection management and delivery and implementation of the Wales Strategy, we feel that the important issues highlighted by the Borth scheme are:

- The need for monitoring of the coast and the way in which defences perform and are managed. The value of such monitoring needs to focus on the specific issues of individual areas as much as providing national information in compliance with the Flood and Water Management Act 2010.
- That information needs to be used locally and nationally to allow planning of future management activities and the results of monitoring needs to be disseminated to communities such that they gain an understanding of issues.
- That flood and coast protection risk management cannot be viewed separately from other issues at the coast and that there needs to be a long term commitment and involvement from both operating authorities and communities in developing risk management within future planning to meet the broader issues of the communities.
- While there needs to be planning and prioritisation of funding for coast protection, this needs to maintain the flexibility to adapt to actual needs and timing in development of schemes on a case by case basis.
- Planning more adaptive and sustainable approaches to coast protection needs time and should be driven by the specific needs of individual areas not by fixed processes and procedures.
- The timing of funding streams is a major issue that requires careful consideration. This will become more critical as greater emphasis is placed on private or local funding arrangements.

As a final note on future funding and prioritisation of funding, it is recognised from our experience even now, that the level of support is not adequate to meet the needs of all works necessary to maintain and improve defences around the UK and in Wales. There will be a need for change. As part of making decisions, we envisage, as stated in the WoW SMP and other SMPs that there may well be the need to move existing communities due to increased vulnerability or due to lack of funding. Whilst creating a more sustainable approach in the long term to coastal management, the cost and thought associated with managing such major relocation will not be insignificant. At present there appears to be little recognition of this and no clear responsibilities in terms of initiating or implementing such change. At present the approach appears to fall between authorities such that should the decision be made to withdraw maintenance of defences, there is little guidance or preparation for what happens then.

The focus within the Strategy is on preparing for emergency response to flooding. This quite correctly does need a high priority. However, at the coast where it is possible to predict the need for longer term permanent loss, the Strategy does not address this issue.

Conclusion

This note has been prepared by Royal Haskoning in response to an invitation to do so by the Environment and Sustainability Committee. We are conscious that the subject of coast protection is wide ranging and we have attempted to provide evidence and comment based on our experience in this field relevant to the Committee's terms of reference. Should there be further aspects of the subject where the Committee feel that we could provide further more specific evidence we would be pleased to do so.

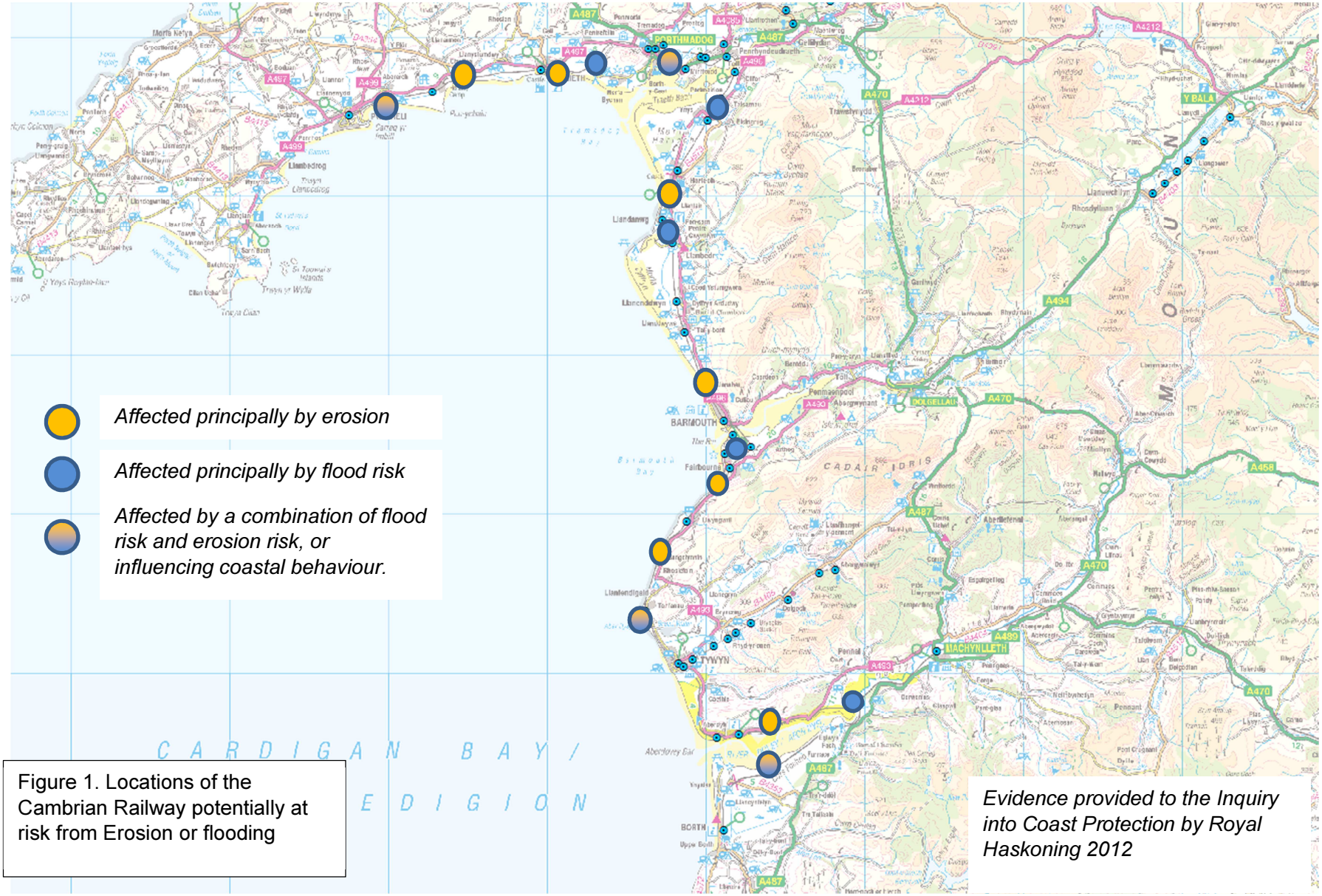

Figure 1. Locations of the Cambrian Railway potentially at risk from Erosion or flooding

Evidence provided to the Inquiry into Coast Protection by Royal Haskoning 2012

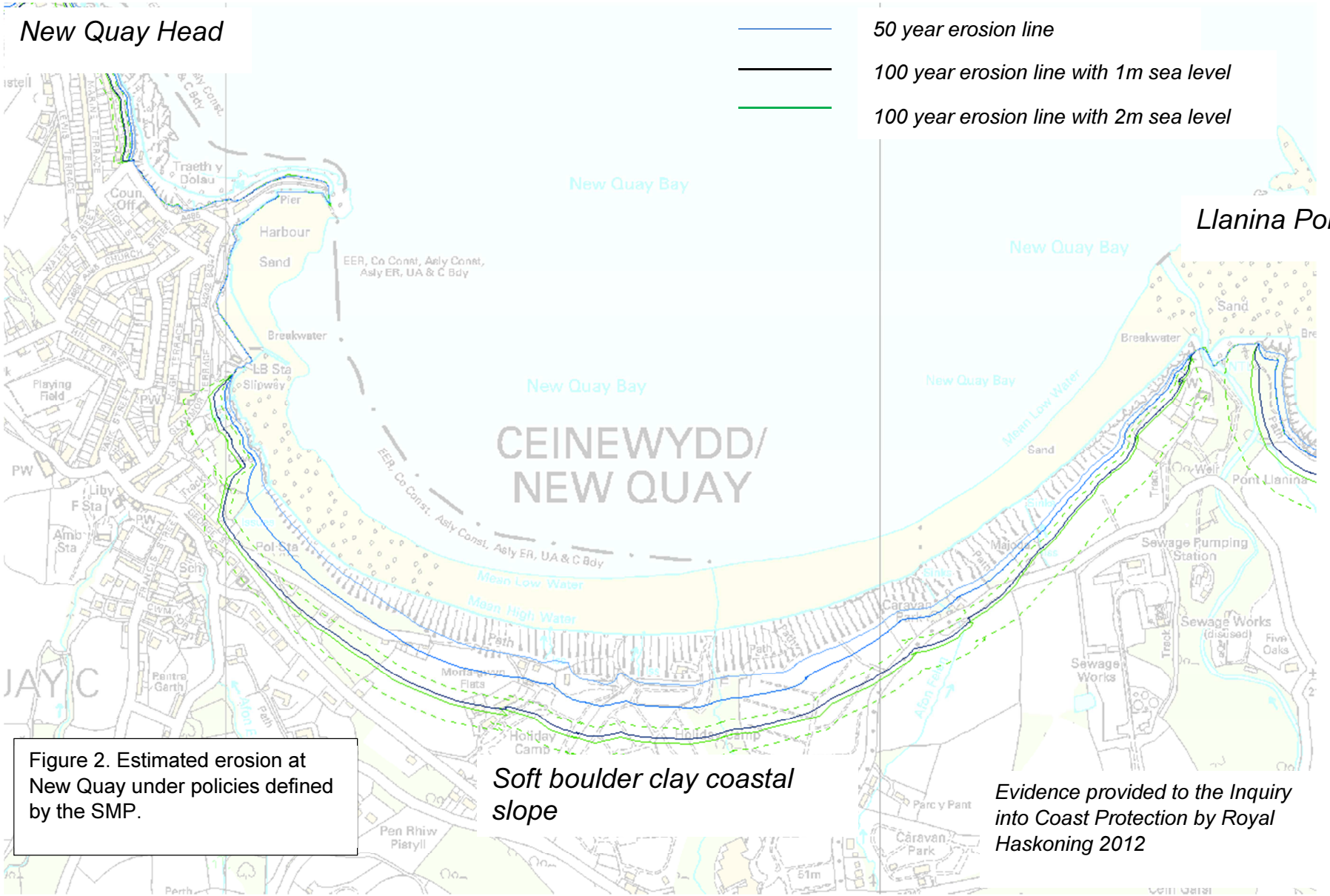

Figure 2. Estimated erosion at New Quay under policies defined by the SMP.

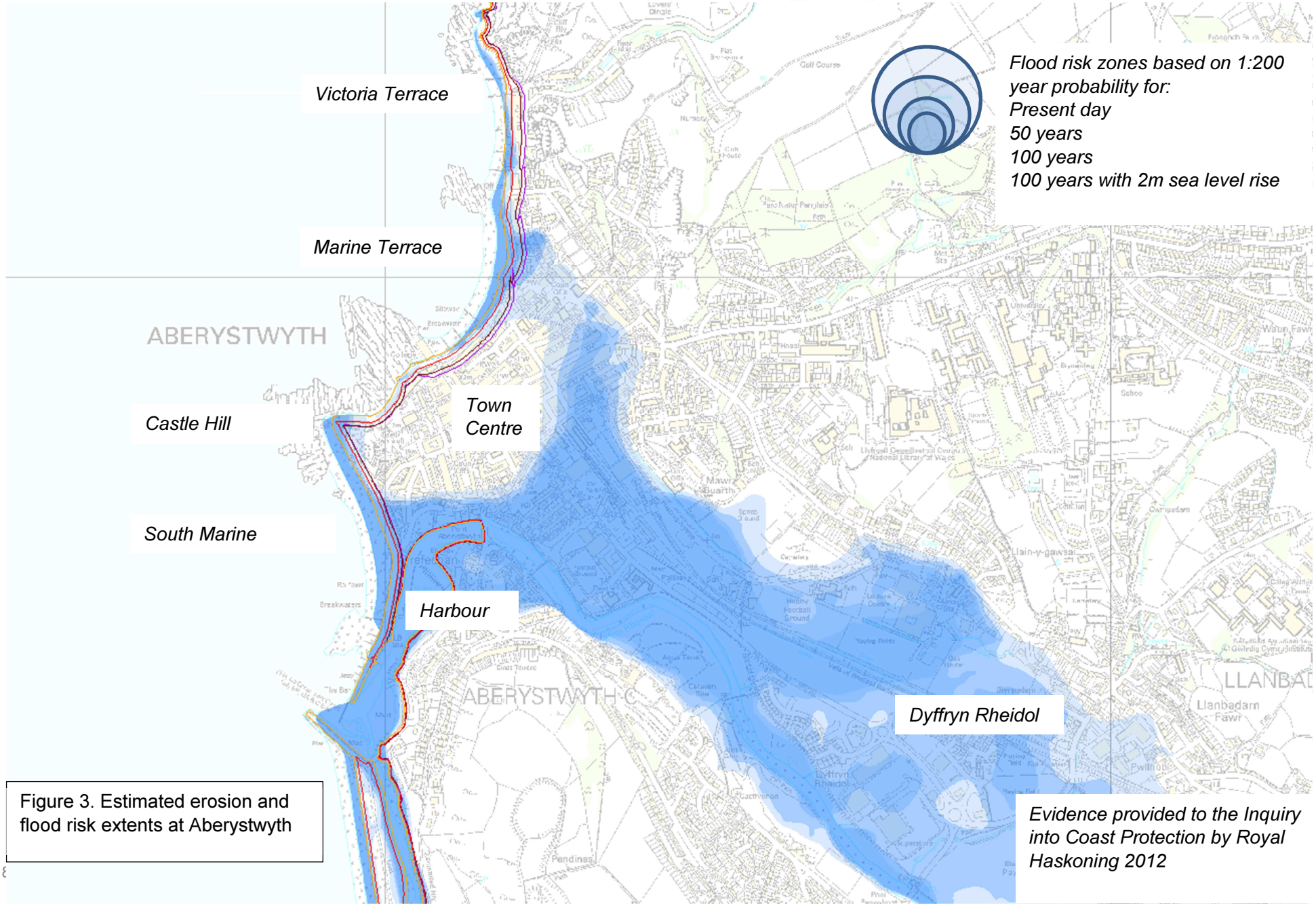

Figure 3. Estimated erosion and flood risk extents at Aberystwyth

Ymddiriedolaeth
Genedlaethol
National Trust

Environment and Sustainability Committee

E&S(4)-20-12 paper 9

Inquiry into Coastal Protection – Evidence from National Trust

1. Executive Summary

1.1. The character of the coast of Wales is defined by continuous change, erosion and accretion, a dynamism that will increase in the future with climate change driven sea level rise and the possibility of increased storminess. These pressures will lead to the continuing breakdown of existing engineering works, resulting in an increase to the footprint of the coastal risk zone, in turn posing greater risk to coastal communities, squeezing coastal habitats and species and challenging our current approach to coastal protection

1.2. Investment in coastal defence schemes will remain important in the right location but as the Welsh Government's Strategy acknowledges: engineering solutions are time limited, costly and in some instances counter productive. Public policy is tends to be framed by an approach often described as 'defend or do nothing'. If the cost benefits do not stack up in favour of defence then public policy has little else to offer, leaving communities feeling abandoned.

1.3. To move beyond 'defend or do nothing' it will become increasingly essential to invest in and develop adaptive responses to coastal change, working with, not against, nature and raising public awareness of the validity of this approach. Policies such as roll-back, managed re-alignment and removal of failed sea defences (to reinstate natural coastal processes) need to come to the fore and be embedded in both land-use planning and marine planning. In the context of land use planning TAN14 should be reviewed.

1.4. The Government has an important role to play in providing leadership and coordination of coastal change management in Wales, helping us move beyond the defend or do nothing stalemate. To this end the National Trust welcomed the publication in 2011 of the National Strategy for Flood and Coastal Erosion Risk Management in Wales.

1.5. The Strategy sets out some important principles about developing a more adaptive approach to coastal change management but we are concerned that there is a lag effect between establishing a strategy and seeing an adaptive approach to practice emerge on the ground. Coastal protection remains the preserve of engineers when in fact an adaptive response would see the land-use planning system and forward planning in particular become the focal point for coastal change management.

1.6. The current review of Shoreline Management Plans in Wales is welcomed, particularly as the plans help us take a long term view and work at an appropriate geographic scale linked to the functioning of coastal cells. However there is a sense emerging that the SMP process can lead to difficult and

uncomfortable decisions being put off for the future, raising questions of intergenerational equity.

2. Introduction

2.1 The National Trust welcomes the opportunity to contribute evidence to the Inquiry into Coastal Protection. The National Trust owns some 230kms or one fifth of the coast of Wales, representing all the different coastal typologies and including key access points, natural habitats, heritage sites, popular beaches, visitor centres and coastal settlements.

2.2 In 2007 we published '*Shifting Shores'* explaining how much of this coastline may be affected by climate change. In 2009 we published a companion document *'Coastal Risk Assessment Phase 2'*, copies of which have been provided to the Inquiry.

2.3 Our Coastal Risk Assessment document details how we have been working to better understand how the coast will change and what is at risk. Our Risk Assessment tells us that when managing the coast:

- **long-term planning is essential**
- **we need to think and act in a wider context**
- **we have to work with nature not against it**
- **solutions need partnership**
- **involving the public is critical**

2.4 Having assessed risk we can now work to address it. This means changing the way we manage the coast and plan for the future. Our approach to managing coastal change is based on these key principles:

- **understand what change will mean**
- **prepare for change through adaptation and remain adaptive**
- **embrace sustainable development**
- **create the best possible future for our coast and coastal communities.**

3. Progressing implementation of The National Strategy for Flood and Coastal Erosion Risk Management in Wales

3.1 The National Trust was pleased to be able to contribute over the past few years to the development of The National Strategy for Flood and Coastal Erosion Risk Management in Wales

3.2 The Strategy has a strong resonance with our approach set out in section 2 above and we believe the Strategy sets out some important principles about developing a more adaptive approach to coastal change management

3.3 We are concerned however that there is a lag effect between establishing a sound Strategy and seeing an adaptive approach being applied to practice on the ground.

3.4 One barrier we perceive to progress in delivering the Strategy is that in practice, and at a local leve,l coastal protection remains the preserve of engineers working in

reactive responses to coastal erosion. In contrast an adaptive response to coastal change management, part of the ambition of the Strategy, would see the land-use planning system and forward planning in particular become the focal point for coastal change management. Therefore we would recommend that TAN14, which was published in 1998, should be reviewed, along with relevant parts of Planning Policy Wales, as part of the integration of the Strategy with the land use planning system.

3.5 Review of the planning system should seek to embed within it policies and guidance that encourage and support adaptive responses to coastal change management. Such an approach would help to guard against communities becoming blighted if they are no longer deemed as economically viable to defend. Coastal erosion threatening settlements can take decades to unfold before the housing and infrastructure is lost to the sea. Coastal communities will be blighted by the threat of loss and will decline through this blight and through the loss as it occurs. The blight on communities takes the form of unsaleable houses, threats to livelihoods, loss of community facilities and infrastructure. In combination these can lead to marginalised communities with accompanying deprivation and social exclusion. Embedding adaptive approaches in land use planning is a means of tackling this blight.

3.6 Policies need to be put in place to mitigate these consequences, but not policies that seek merely to prop up failing sea defences. SMP and local FCEMS have a significant role to play in this respect – see 4.0 below

3.7 To move beyond 'defend or do nothing' it will become increasingly essential to invest in and develop adaptive responses to coastal change management – working with not against nature. Policies such as roll-back, managed re-alignment and removal of failed sea defences to reinstate natural coastal processes need to come to the fore and be embedded in both land-use planning and marine planning

4. Improving delivery of the objectives of the Strategy through SMP and local Flood and Coastal erosion Risk Management Strategies

4.1The review of Shoreline Management Plans in Wales is welcomed, particularly as the plans help us take a long term view and work at an appropriate geographic scale linked to the functioning of coastal cells. However there is a sense emerging that the SMP process can lead to difficult and uncomfortable decisions being put off into the future

4.2 The Strategy may be contributing to this problem as it talks rather loosely about the effects of climate change not being felt for many years, suggesting variously this might not be for 20, 30 or even 100 years. This in turn fuels the temptation to fail to grapple with tricky decisions that would be better made now. This can lead to a 'not on my watch' mind set that may be palatable at present but one that does raise questions of intergenerational equity.

4.3 Shoreline Management Plans provide a factual baseline of geomorphological information that in turn helps set the high level policy of: Hold the Line, Managed Realignment etc. But this is indeed high level policy not designed to deal with the nuances associated with coastal change management that occur at a local level or connections with other plans such as catchment management plans. This is where local flood and coastal erosion management strategies have a major part to play. Providing a mechanism for engagement with local communities at a scale that makes sense to the people that live there and offering the possibility for individuals to contribute their

knowledge and experience. In theory at least, enabling communities to become part of the solution rather than part of the problem.

4.4 To date however there seems to have been a reluctance to deploy local flood and coastal erosion management strategies. The case study below for Llandanwg highlights the value of developing more local strategies in the future as a means to reflect the objectives and principles of the Wales Strategy at a local level

Case Study - Llandanwg

The National Trust owns 30 acres of maritime grassland and sand dunes at Llandanwg near Harlech. The dune system is a designated SSSI important for species such as the sea holly and rare sharp rush. It is a popular place for visitors, with parking and facilities nearby. The dunes are subject to erosion which is likely to continue and increase, resulting in the river breaking through the dunes and creating an island.

At present, sea defences protect adjacent land, including houses and the site of the medieval church of Llandanwg.. Some of the important conservation features of the site depend on the coast being dynamic. These will require space to move inland as the shoreline changes. It is possible that there are historic structures associated with the church buried under the sand. These will need to be recorded.

We are currently working to maintain a healthy dune system by planting marram grass and defining footpaths. In the longer term, we and other local stakeholders will need to agree an approach to managing this section of coast which creates the best possible future for people and the environment.

The Shoreline management Plan is the starting point for consideration of future management but a local flood and coastal erosion strategy would be a valuable next step.

5. Coastal Protection funding

5.1 As an NGO the National Trust would not seek to express any particular views on the detail of how coastal change management funding is managed.

5.2 Our interest would be to ensure that funding was not just restricted to being made available for construction of sea defence works but that coastal protection funding should be equally available for encouraging and supporting adaptive responses to coastal change management including stakeholder engagement.

5.3 To move beyond 'defend or do nothing' it will become increasingly essential to invest in and develop adaptive responses to coastal change management through approaches such as roll-back, managed re-alignment and removal of failed sea defences (to reinstate natural coastal processes)

5.4 The National Trust was involved in a number of the recent Coastal Change Pathfinder projects initiated by Defra in England. Whilst Defra is still evaluating the lessons learnt from Pathfinder it is clear to us as participants that the focus on enhancing community understanding of coastal change is an important step to take towards delivering more adaptive responses to coastal change management.

5.5 The National Trust would welcome a programme of pilot projects in Wales along the lines of Pathfinder. A recent positive collaborative experience of a novel approach to managing coastal change at Abereiddi is a case in point:

Case Study – Abereiddi, Pembrokeshire

The beach at Abereiddi near St David's is a rolling shingle barrier beach. It is an important geological site, famous for its graptolite fossils.

There is a car park behind the beach, serving both the beach and the Blue Lagoon, a flooded former slate quarry and one of Pembrokeshire's best-known beauty spots. The National Trust owns the Blue Lagoon, the adjacent coastal land and a small section of the car park.

In the 1960s a sea defence was built by Preseli RDC to protect the car park, using the rails and sleepers from the disused railway track that connected the quarry to the slate works at Porthgain. This prevented the natural evolution of the beach, and as it was incorrectly aligned caused longshore drift from north to south. By the late 1990s the sea defence was being undermined at the north end, fine material was being washed out from behind it and Pembrokeshire County Council who had inherited the liability backfilled it with imported boulders. In time the iron and wood uprights deteriorated to the point where the entire structure was in danger of collapse.

Shoreline Management Plan 2 provided an opportunity to identify a solution. Issues included multiple ownership, the greatly increased use of the car park, and the perceived consequences of the removal of the sea defence for the 3-4 cottages behind the car park.

Standard SMP2 process did not allow for sufficient detail, so the National Trust and PCC jointly funded an additional study by the SMP2 consultants Royal Haskoning to review all the historical, geomorphological, mapping and anthropogenic data, and to produce a plan. The result of this was a study which was used in stakeholder consultations.

PCC removed the sea defence in April 2012 because it was becoming dangerous (see Annex 1 before and after photos). The remainder of the plan, to be implemented later in the year, is for natural processes to be restored to most of the beach but for the introduced boulders to be used to defend a smaller, shaped car park area at the south end. LiDAR confirms that the cottages would be safe from a sea level rise of 2 metres, even without the sea defence.

The agreed plan is a compromise reached through consultation among the stakeholders. The ideal solution, which may become unavoidable in the future, would be for the car park to be removed altogether from the beach area.

6.0 Suggestions on how delivery and funding of coastal protection in Wales could be improved.

6.1 The Executive Summary at the beginning of this paper sets out a number of suggestions about how the delivery of coastal change management in Wales could be improved and it is hoped that the Committees Inquiry will find these suggestions of value.

Annex 1 – **Abereiddi before and after photos**

Before – Showing the failed sea wall and unsightly imported boulder back fill

After – Phase 1 of the beach restoration complete restoring the natural function of the barrier beach and enhancing access and amenity of the beach for beach users.