# 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

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[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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