

Response from the British Geological Survey and National Oceanography Centre to the Welsh Assembly Government open consultation 'A Living Wales –a new framework for our environment, our countryside and our seas'

Introduction

1. This response is submitted on behalf of the British Geological Survey (BGS) and National Oceanography Centre (NOC).

2. The BGS is a component body of the Natural Environment Research Council (NERC), and is the nation's principal supplier of objective, impartial and up-to-date geological expertise and information for decision making for governmental, commercial and individual users. The BGS maintains and develops the nation's understanding of its geology to improve policy making, enhance national wealth and reduce risk. It also collaborates with the national and international scientific community in carrying out research in strategic areas, including energy and natural resources, our vulnerability to environmental change and hazards, and our general knowledge of the Earth system.

3. The National Oceanography Centre (NOC) is a national research organisation, delivering integrated marine science and technology from the coast to the deep ocean, working in partnership with the UK marine research community. Wholly owned by the Natural Environment Research Council, the NOC was formed by bringing together the NERC-managed activity at Liverpool's Proudman Oceanographic Laboratory and the National Oceanography Centre, Southampton, creating the UK's leading institution for sea-level science, coastal and deep-ocean research and technology development. The centre works in close partnership with institutions across the UK marine science community addressing key science challenges including sea-level change, the oceans' role in climate change, predicting and simulating the behaviour of the oceans through computer modelling, development, the future of the Arctic Ocean and long-term monitoring technologies.

Specific Comments on the consultation document

1. Building the evidence base

Questions for the Evidence Base work stream

- What new forms of information and evidence do we need to help us to focus on ecosystems and their services?
- How might we best align collective scientific and monitoring effort towards an approach focused on ecosystems?
- How do we ensure the full range of expertise is drawn on in accordance with the principles for ecosystem management, including different earth and social sciences?
- How do we provide the information tools that decision makers, land owners and planners can apply locally?
- What might be the approach we adopt to measuring progress and what constitutes success?
- How do we handle risk and uncertainty?
- What can we say about absolute environmental limits?
- What is and isn't working well?
- What are the implications for future goals or targets?

1.1 Earth science data and knowledge is an important part of the fundamental evidence base supporting the 'ecosystem service' approach to sustainable planning and management.

As well as delivering national geological baseline datasets, through its office in Cardiff, the BGS has developed a track record of collaboration with other Public Sector bodies and institutes in Wales. In partnership it has delivered projects that have direct societal benefits and inform planning across diverse areas including mitigation of geological hazards (landslides and flooding), infrastructure development, landscape quality and shallow pollution, groundwater and mineral resource management and geoconservation.

1.2 It is our view that geoscience information forms an integral component of any environmental management framework, for example:

- Understanding Geological soil parent materials play a critical role in understanding both agriculture and management of vulnerable **carbon reservoirs**.
- Knowledge of geological materials and properties comprises a fundamental part of any **sustainable energy** plan, from providing the raw materials for energy generation, through to influencing the siting and development of associated infrastructure.
- Properties of bedrock and superficial geological materials largely control development and transport of fluid in both shallow and deep **aquifers** as well as factors that influence water quality such as migration of anthropogenic pollutants and naturally occurring contaminants.
- Rock type and structural characteristics (e.g. discontinuities and fractures) have a controlling influence of the rate and style of **coastal erosion**. Understanding the nature and distribution of these geological factors is critical to developing robust management plans for our coastlines.
- **Geodiversity, Geoheritage and Geoconservation** are critical in underpinning cultural services and informing the planning process. These are delivered through the network of SSSI's, GCR sites and RIGS as well as initiatives such as UNESCO European Geoparks and international collaborations such as the 'International Appalachian Trail'.
- **Shallow Geo-Hazards** such as shrinking and swelling of the ground (often reported as subsidence) and landslides impact on agriculture, society, industry and infrastructure across the UK. Understanding the distribution and nature of the controlling geological materials is also critical to developing effective mitigation and management strategies.
- Geological maps show where the floodplains and coastal plains are located and therefore the main areas at greatest **risk of flooding**. Scientific studies of how floodplains are formed, and what they are made of, provide important insights into identifying past river and coastal flooding activity and complement other methods for predicting where such flooding may occur in the future.

1.3 With the passing of the Marine and Coastal Access Act 2009 and subsequent Welsh Zones (Boundaries and Transfer of Functions) Order 2010, Welsh Ministers are responsible for a greatly increased marine territory compared with the old 12 mile Territorial Sea, now extended to 200 miles or the median line with neighbouring states. This marine estate is larger than the total land area of Wales, and mapped to a very low resolution in most instances. Fortunately the UK has world-class expertise in evidence acquisition, monitoring and assessment of the marine environment, with NERC Marine Centres at Southampton,

Liverpool, Dunstaffnage and Plymouth as well as BGS; Government laboratories in Lowestoft, Aberdeen and Weymouth; and major marine capabilities at universities in Bangor, Southampton, Plymouth, East Anglia and London. The private sector is well developed and includes a number of established companies with open-ocean seagoing mapping and monitoring capability. Large ports such as Milford Haven and to some extent Port Talbot have the capability to map their harbour approaches and anchorages. However within the public sector in Wales only the Ministry of Defence and the School of Ocean Sciences at Bangor have a well developed capability to undertake work beyond 12 nautical miles offshore without having to call in external expertise. In the case of Bangor the major infrastructure asset is the Research Vessel 'Prince Madog' (<http://www.pomaritime.com/PrinceMadogSpecs.asp>) which is well equipped and capable of a wide range of education, survey and monitoring tasks. She is operated by P&O Maritime Services on behalf of the School of Ocean Sciences.

The Welsh Assembly Government is not at present resourced to carry out functions equivalent to the Marine Management Organisation in England or Marine Scotland.

1.4 Building the evidence base for integrated marine and coastal zone management as required under the Marine and Coastal Access Act 2009, and the European Marine Strategy Framework Directive will require cross-border working within the UK and EU partner states to pool resources and obtain best value for money. It requires access to ships, multi-beam bathymetry systems, seabed sampling and follow up interpretation, ideally on a scale similar to that carried out by the Irish Government for their waters (see www.infomar.ie) at a cost of many millions of Euros.

1.5 Given the present limitations on new resources, use will need to be made of techniques such as those developed by the Joint Nature Conservation Committee's EUSeaMap project (www.jncc.gov.uk/EUSeaMap) which uses predictive techniques to 'guess' seabed type in the absence of hard data. The joint BGS/NOC MAREMAP project also brings together the expertise and resources of NERC to deliver a National research programme with annual funding of around £1M, focusing on coastal and shelf geological and habitat models; deep water geological and habitat models; submarine geohazards; sediment mobility and 4D monitoring / modeling; technology and techniques; heritage and archaeology and data products

2. Valuing Ecosystems : The evidence base for ecosystems valuation

Questions for the Valuing Ecosystems work stream

- What is the societal value of ecosystem services in Wales?
- Which services could be captured financially and how?
- How do we best factor costs and benefits into decision making?
- Are there further opportunities within current or future EU policy, such as CAP?
- Which economic tools could be most effective in securing long term sustainable decision making?
- Would there be value in developing formal accounting for natural capital in Wales?

2.1 Geological baseline data make up a critical part of the evidence base that supports sustainable environmental planning and management and thus land valuation. BGS is committed to developing integrated models and datasets to deliver geo-environmental data

and advocate a catchment-based, whole systems approach as an appropriate means to provide a comprehensive environmental audit and research platform for Wales.

2.2 Examples of these across the UK include the DEFRA-funded, EA led 'Demonstration Test Catchments' project which will provide a platform to test measures for reducing diffuse pollution from agriculture by considering the impacts and effects on both ecosystems and sustainable production. BGS is involved through the provision of sub-surface models, groundwater assessment and the study of movement of diffuse pollutants in the sub-surface. Another example is the ongoing BGS 'cross-cutting' project in the Clyde catchment aimed at supporting sustainable urban living through providing local authority planners, regulators and others with attributed 3D geological models and environmental and engineering geoscience data and knowledge to assist in decision making. The data are particularly relevant to major regeneration and infrastructure projects in and around Glasgow. They will, for example, enable a better understanding of the impacts of urban land use on ecosystem services; and of environmental change, at local to regional scales.

3. Refreshing regulatory and management approaches

Questions for the Regulatory Approaches work stream

- How do we best link the various regulatory and management mechanisms to achieve an integrated approach? How do we do this in the most efficient, effective way given the financial constraints?
- How far can our evidence base or monitoring proposals sustain a risk-based approach to regulation?
- How do we maximise benefits from current land and marine designations? Do we need to look again at the purpose of some of them?
- Are there any genuine constraints to using a sustainable ecosystems approach within the current EU framework?
- How far would the current framework of regulation and management need to adapt to meet these new goals?
- Are there activities which are currently unmanaged which in future should be because of their critical importance?
- Do we need fresh Welsh legislation to address any of these issues?

Specific evidence for the Regulatory Approaches work stream

3.1 The European Marine Strategy Framework Directive (see http://ec.europa.eu/environment/water/marine/index_en.htm) applies to Welsh Zone waters so Welsh Ministers will be obliged to work with English, Scottish and Northern Irish colleagues as well as neighbouring states to demonstrate that they are working to achieve 'Good Environmental Status' by 2020. The achievement of GES is defined by a series of 11 indicators. The UK as a whole is currently drafting a National Marine Policy Statement as a consequence of the Marine and Coastal Access Act 2009 and Marine (Scotland) Act 2010. All of these new pieces of legislation rely on the adoption of ecosystem based management techniques and a holistic approach to marine spatial planning – the new EU framework should not pose constraints to a sustainable ecosystems approach unless the 2013 reformed Common Fisheries Policy is allowed to somehow bypass the ecosystem management approach specified by Europe's integrated maritime policy.

There is overlap between the Marine Strategy Framework Directive and Water Framework Directive and it makes sense to manage the interface between the terrestrial and marine environments in a joined-up manner.

4. Refreshing Partnership mechanisms and regulatory approaches

Questions for the Delivery Mechanisms work stream

- How do we ensure all the various stakeholders and sectors can shape the implementation of the framework positively?
- How do we build a common view of the true significance of 'green and blue' infrastructure of Wales and a language to describe it that communicates well with the wider public?
- How might we improve current stakeholder delivery arrangements to meet the new challenges?
- How can we do this in the most efficient, effective way given the financial constraints?
- What are the appropriate partnership vehicles to take forward the ecosystems approach?
- Which are the key sectors and policy areas that would need to reflect the new approach?

Are planning frameworks such as the Rural Development Plan, the proposed National Infrastructure Plan and the Wales Spatial Plan (including the Networked Environment Region project) together with local development plans and community strategies capable of forming the basis for a future approach to local delivery?

4.1 Partnership working is critical to delivering a 'whole systems approach' to managing ecosystems. This is probably the most effective way to optimise synergies and minimise duplication of effort, but also presents considerable challenges to organisational cultures and funding models that need to be considered in any implementation strategy.

4.2 The UK National Marine Policy Statement, coupled with the 2010 UK Marine Science Strategy will encourage cross-agency working and cross-devolved administration co-operation to optimise resources and obtain best value for money. To obtain the benefits of access to ships, infrastructure, data centres and research expertise it is important that Wales plays a full role in UK-wide bodies such as the cross-government Marine Science Co-ordination Committee, OSPAR working groups etc. As far as marine aspects go, there is a huge body of expertise within the UK and EU willing and able to help Welsh agencies succeed in achieving their vision – the sea and marine creatures do not recognise human boundaries and given the expense and technical complexity of marine work, a high level of cross-border cooperation is to be encouraged.

4.3 In the marine sector, stakeholder engagement is relatively well developed due to the limited number of users compared with the land. There is good liaison between government departments and the individuals/companies taking part in fisheries, aggregates extraction, recreation, heritage, renewable energy and transportation sectors. However interaction is still often on a sector-by-sector basis rather than a joined-up cross-marine basis.

5. Refreshing Institutional Arrangements

Questions for the Environmental Delivery Bodies review

- What are the organisational implications of pursuing an integrated approach based on ecosystems?
- How would delivery best be organised at the localised level to ensure coherent delivery?
- What can be learnt from the approaches of the different bodies to improve delivery, regulation and enforcement?
- How do we ensure we can draw on wider expertise to inform future work?
- What are the detailed costs and benefits of change?

Specific evidence for the Environmental Delivery Bodies review

5.1 If possible an integrated marine/terrestrial/freshwater management organisation would be well suited to Welsh needs, minimising bureaucracy and 'turf wars', for example in the complex zone where land managers interface with the marine environment. In the marine context, the body will need to interface closely with the Marine Management Organisation, Marine Scotland and Northern Irish agencies responsible for delivering 'Good Environmental Status' under the Marine Strategy Framework Directive, and to deliver executive functions devolved to Wales since the Marine and Coastal Access Act 2009. It will be necessary to work closely with neighbours on marine spatial planning and fisheries management.

5.2 Enforcement in the marine sector is expensive and resource intensive, requiring access to vessels capable of operating in winter conditions in the Celtic Sea and Western Approaches. The Royal Navy, HM Revenue and Customs, and Marine and Coastguard Agency will all need to work with Welsh Ministers to provide marine enforcement but additional resources, in particular for coastal zone work, are bound to be required otherwise regulations will not be enforceable.

5.3 For the marine sector resources and expertise are available from the UK Marine Science Coordination Committee, the NERC marine laboratories, The Crown Estate, CEFAS, Marine Scotland, the Marine Management Organisation, Defra, Irish Marine Institute, CCW, the well-developed Severn estuary stakeholder community and the Professional Bodies and Learned Societies such as the Institute for Marine Engineering, Science and Technology (IMarEST), and Marine Biological Association (MBA).

5.4 Private organisations, contractors and consultancies have a wide expertise in many aspects of coastal zone management and marine environmental assessment. Forums such as the CMS 'Coastal Futures' series of annual meetings, and the COASTNET network provide helpful resources for coastal zone managers.

6. Other comments/issues

6.1 As highlighted above, the seas and oceans do not recognise human borders, and animals, physical and chemical features move freely where they like. It is therefore difficult to manage the marine sector without close cooperation with neighbouring authorities, and certain legal constraints such as the rights to Freedom of Navigation under the UN Convention on the Law of the Sea (UNCLOS), and international treaty obligations can limit full freedom of action for the local manager.

6.2 As a component of the UK, Wales is subject to the Marine and Coastal Access Act 2009 as implemented by the Welsh Zones (Boundaries and Transfer of Functions) Order 2010 and is also subject to the EU Marine Strategy Framework Directive, which places an obligation for Members States to demonstrate that they are working to achieve 'Good Environmental Status' by 2020, with an initial assessment of the state of the marine sub-region by July 2012. Fortunately the work done by the UK Marine Monitoring and Assessment Strategy in publishing 'Charting Progress 2' in July 2010 has already gathered much of the required baseline information. This required extensive cross-border working across the UK and it is fair to say that such is the required infrastructure (ships, data centres, equipment, etc.) that there is a strong case for Scotland, England, Wales and Northern Ireland to avoid duplication of assets, and share resources where possible and appropriate. UK resources are concentrated in a handful of Centres of Excellence/marine clusters, and we very much hope that Wales is able to develop close working relationships with the wide marine community to meet the requirement for underpinning scientific advice and data provision. Currently Wales is not strongly represented at UK-wide marine scientific meetings and there is a risk of falling behind the 'state of the art' without more intensive engagement with the wider marine community.

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