

## A COORDINATED AGENDA FOR MARINE, ENVIRONMENT AND RURAL AFFAIRS SCIENCE (CAMERAS) (2011-2016)

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AGI feels that there is a vital role for geographic information (GI) to play in support of marine, environment and rural affairs policies in Scotland and welcomes this opportunity to submit views on a Coordinated Agenda for Marine, Environment and Rural Affairs Science (CAMERAS) (2011-2016).

### **About the AGI**

Formed twenty years ago, the Association for Geographic Information (AGI) is the United Kingdom's umbrella organisation for all those with an interest in geographic information (GI). The *Association for Geographic Information Scotland (AGIS)* is a regional committee of the AGI. AGI Membership comprises individuals and organisations, including government departments and agencies, local authorities, other national organisations, educational institutions, utilities, software companies and data suppliers. The AGI's mission is to '**maximise the use of geographic information (GI) for the benefit of the citizen, good governance and commerce**'.

In 2003 AGI via AGIS released the report "Towards a Geographic Information Strategy for Scotland: Linking Places & Spaces to connect the Faces of Scotland." This led directly to the development of the Scottish Government's Geographic Information Strategy for Scotland - "*One Scotland - One Geography*"

<http://www.scotland.gov.uk/Publications/2005/08/31114408/44098>) which was published in 2005. This strategy illustrates how Geographic information, if used properly, can support better policy making and service delivery, monitor the effectiveness of performance, identify and analyse specific problems, help make public services more responsive, provide better information on needs and help provide new insights into Scotland and its people.

AGI also sat on the UK GI Panel which developed the UK Location Strategy (UKLS) published by Communities & Local Government (Department of) in November 2008. UKLS is the blueprint for the development of a UK Spatial Data Infrastructure (SDI). AGI now holds a place on the Location User Group of the newly formed UK Location Council which includes representatives from central, local and devolved government.

### **Response to Individual Questions**

#### **Headline Themes**

6. *What facilities, resources and data do you think are important for Scotland to maintain?*

Scotland needs to develop mechanisms that ensure Scotland's key geographies (see Annex 1), as identified in the GI Strategy for Scotland “*One Scotland – One Geography*”, are maintained, managed and made available for scientific research and to other stakeholders . This should be achieved in the most cost-efficient and effective manner practicable, without unnecessary duplication. These key geographies and many other ‘spatial datasets’ which contain information on Scotland’s marine environments, cultural, historical, and rural environments as well as much more information that is linked to location or place, underpin much of the scientific research and commercial activities that takes place in Scotland’s land and sea space. For the marine environment the setting up of the Scottish Marine Management Organisation “Marine Scotland” in Aberdeen has created a body which will lead on all policy matters and be responsible for sourcing GI information necessary to underpin scientific research and to deliver spatial planning, conservation, licensing and fisheries governance. On land the situation is more complex with numerous bodies involved in collecting and maintaining geographic information, including Ordnance Survey, SNH, SEPA, Forestry Commission, BGS, CEH, Macaulay Institute, Registers of Scotland, GRoS, RCAHMS and academia.

*7. Are there other resources that Scotland needs to acquire to support future policy development?*

Scotland needs to ensure that barriers (mainly cultural and institutional) to creating, maintaining and managing a Scottish Spatial Data Infrastructure (SDI) are removed and that resources required to develop these further are acquired. Spatial data can play a vital role in developing policy, measuring and monitoring strategic spatial policies as well as the research that supports these and, as such, an effective and successful SDI needs to be resourced at an appropriate level.

## **Policy Issues**

*10. What do you think will be the most important influences on Scotland’s future in the Marine, Environment, Rural Affairs and related areas?*

The ability to access data and information about areas of interest in the marine, environment and rural affairs and related areas will greatly influence Scotland's development in these areas. An important SDI initiative relevant to environmental data is the INSPIRE (Infrastructure for Spatial Information in Europe) Directive <http://inspire.jrc.it/> This is the legislative basis for the European SDI and requires member states and their sub-state regions to make their GI available in a form which is interoperable in the interest of better environmental policy making.

Another important fact is the paucity of good quality data that exists in many areas offshore around the coasts of Scotland. For a maritime nation drawing much economic benefit from the seas, spending on new survey programmes is considered to be poor leading to a dearth of knowledge about the natural environment.

*11. Why do you think these are important?*

Exploiting Scotland’s sea space to provide new commercial activities as well as scientific research in these areas has a spatial dimension and involves

geographic information (GI). How this is managed in Scotland is vitally important. Not only should GI be accessible but it must also be possible to determine fitness for purpose for a number of uses, under the 'collect once-use many times' principle. For this to be possible, Scotland needs to be managing spatial data to national and international data standards where appropriate, ensuring data is catalogued and made searchable and then easily available for scientific research across the disciplines. In short, the development and management of Scotland's Spatial Data Infrastructure will have an important influence on Scotland's future in these areas. The GI Strategy for Scotland "*One Scotland-One Geography*" highlights many of the important aspects of Scotland's SDI.

## **The Science**

*13. What existing areas of Scottish based scientific expertise should be maintained to contribute evidence to key policy issues?*

Scotland needs to understand environmental change over air, land and sea and to do so requires research that relies on data gathered by the scientific communities and the GI industry. Some examples where more or better quality data, which relate to the relevant scientific expertise, include:

- Bathymetry and Elevation (natural and physical entities) such as topography of the seabed, sediments and sub surface geology – the base data required for all marine scientific research, better marine planning and risk mitigation purposes.
- Subsurface geoscience including 3D geology and aquifer characterisation for carbon capture and storage programmes.
- Hydrogeological data including recharge and permeability to better understand the interaction between groundwater and surface water in flood scenarios and to help predict the mobilisation of contaminants in a changing climate.
- The amount of carbon in Scottish soils and their susceptibility to erosion and oxidation in a changing climate.
- Seabed habitat maps for management and sustainability.
- Seabed surveys undertaken through cross sector co-operation (capture once use many times).
- Scotland must also be at the forefront of renewable energy development and can be a global leader in this field. Research and development relies heavily on the most suitable data being available in a timely fashion. Gaps include knowledge of Scotland's potential for shallow, intermediate and deep geothermal energy generation.

*15. In which areas of science can we continue to make use of expertise supported elsewhere e.g. at the UK, EU and international levels?*

At the EU level there is the expertise of the Joint Research Centre (JRC) to consider. In the UK, the services provided by NERC, the Engineering and Physical Sciences Research Council and the Economic and Social Research

Council (ESRC) are relevant. Additionally it is important to consider the scientific expertise of UK public agencies pertinent to the examples listed above in 13., for example in hydrography, topography, hydrology, geology and meteorology.

## **Delivery**

*19. Knowledge Exchange is essential for scientific activity to achieve impact. Do you agree that KE should be an explicit and integral aspect of the delivery of this Coordinated Agenda?*

Yes.

*20. How can we continue to improve the integration of evidence from a diverse range of sources into forms that are accessible to end users?*

Globally, the GI community has expended a large amount of effort in facilitating the sharing of data through the creation of Spatial Data Infrastructures (SDI's) such as Digital Norway and GeoConnections - Canada and the development of open international geospatial interoperability standards (such as ISO and OGC). Work is continuing at the United Kingdom level with the recent publication of the UK Location Strategy (UKLS), the establishment of a UK SDI Programme Team and a UK Location Council. The fundamental idea behind SDI is to remove the barriers restricting the free flow of GI between users and, as such, this could play a vital role in improving the integration of evidence in Scotland collected from a diverse range of sources. Scotland should be able to ensure the processes required sharing relevant, timely, harmonised geospatial information in accordance with best UK and international practices are as streamlined and robust as possible. The key stakeholders and organisations in Scotland using and maintaining geographic information are described in the GI Strategy for Scotland "*One Scotland - One Geography*". Policies should be in place which allow easy of access to GI across these organisations.

Scotland needs to be able to manage data to national and international standards particularly those datasets which fall under the INSPIRE Directive for example (BS, ISO<sup>1</sup> and OGC<sup>2</sup>). Other directives and legislation such as the Water Framework Directive, the Floods Directive, Marine Spatial Planning and Strategic Environmental Assessments require a large amount of spatial data creation and management and the GI community and data created plays a vital role in delivering these mechanisms.

*21. How can we reconcile the requirement for science to be responsive and flexible to short term demands while at the same time ensuring that longer term strategic research continues to progress our knowledge and understanding?*

Well managed spatial data from a variety of sources can progress Scotland's knowledge and understanding in both the short term and long term. The

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(1) <sup>1</sup> [www.iso.org/](http://www.iso.org/) International Organization for Standardization ISO 19115, ISO 19136, ISO 19118 and ISO 19115 are examples of standards which relate to geographical data.

(2) <sup>2</sup> [www.opengeospatial.org/](http://www.opengeospatial.org/) . The Open Geospatial Consortium, Inc.® (OGC) is a non-profit, international, voluntary consensus standards organization that is leading the development of standards for geospatial and location based services.

success of this can largely depend on knowledge of and, ease of access to data, the ability to find data that is fit for purpose, the availability of data, organisational policies, hardware and software, the financial and human resources necessary and ultimately the policies that enable these processes. In the marine environment, this process will be made less traumatic through the development of the Marine Environmental Data and Information Partnership (MEDIN) to which the Scottish Government and other key GI players are sponsor members. MEDIN is widely viewed as the marine element of a Scottish and UK Spatial Data Infrastructure (SDI). By ensuring that international standards of cataloguing metadata are commonplace for geographic data collected in Scotland and with support for Scotland's SDI that is mainstream and with a long term vision, data can be easily accessed and reused and contribute to strategic long term research programmes.

*22. How can we ensure that the 2 way flow of knowledge from science to policy and from policy to the academic community is optimised?*

AGI believes that open dialogue between stakeholders and the GI community needs to be encouraged and supported to ensure that spatial data contributes effectively to the evidence base in policy making and Scotland's longer term strategic based scientific research.

### **General Comments**

*25. We would also welcome any other general comments you may have on any of the issues raised in this document.*

Geographic Information has a key role to play in scientific research as well as in contribution to the development, management and monitoring of evidence-based policies. Much of the work done in Scotland now and in the future has a spatial component and as such can contribute to Scotland's Spatial Data Infrastructure. GI data and Geographic Information Systems should be part of mainstream IS/ICT programmes and procurement processes and the technical and professional standards required for the efficient and effective use of geographic information in Scotland should be encouraged and resourced.

AGI also believes that support for Scotland's academic centres of geographic expertise should be ensured and that resources for the effective management and application of an SDI should be secured. GI and SDIs enable users to integrate information from multiple sources, assess suitability for multiple uses and provide a framework for a 'collect once – use many times' culture and the rationalisation of data collection, management and analysis. All of this will have a significant impact on the development of scientific research in Scotland in the areas of marine, environment, rural affairs and related policies.

### **Annex 1**

Examples of key reference geographies essential to scientific research, decision making and asset management

1. Topography and land height data.

2. Aerial photography and satellite imagery.
3. Bathymetry and Elevation (natural and physical entities) such as topography of the seabed, inland lochs, sediments and sub surface geology.
4. Marine Structures and Obstructions such as shore line constructions, wells, pipelines, cables, wrecks and obstructions.
5. Socio- economic (human activities) such as Maritime limits, administrative areas (sea regions), shipping zones and disposal sites.
6. Conservation and Environment such as Protected Areas, Heritage and Archaeology.
7. Climate such as tides, meteorological information, currents and waves.
8. Definitive rivers network and river quality data.
9. Bedrock and surface geology.
10. Hydrogeological data including aquifer vulnerability, recharge, and permeability.
11. Soil type and carbon content.