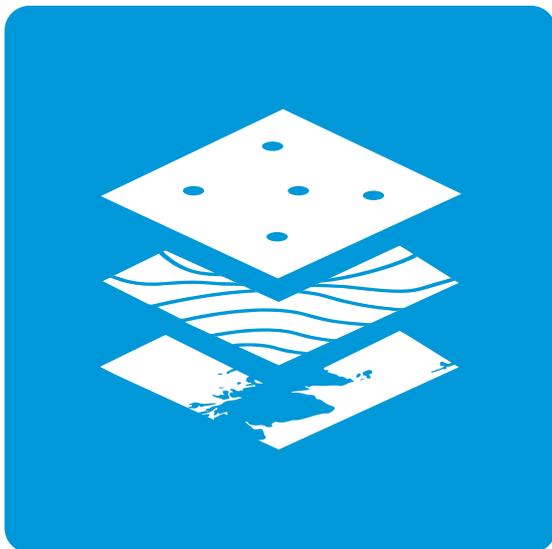**Scottish Science Advisory Council**

Future Landscapes: Report on Geospatial Knowledge
(Summary)

Geospatial data - information referenced by space and time - guides and informs human activity, from meeting friends to planning a spaceport. Though vast stores of geospatial data are added to daily, key to their optimal usage is that they are: Findable, Accessible, Interoperable, and Reusable - the so-called FAIR principles. This report: i) examines to what extent geospatial data available to the Scottish Government comply with these principles and ii) makes recommendations on how identified deficiencies can be remedied.

Introduction

The climate emergency and global Covid-19 pandemic have brought centre-stage the need for spatially-referenced geo-environmental data (geospatial data). Our daily exposure to satellite earth imagery can give a false impression of geospatial data ubiquity. There remains, however, a considerable job to be done in the digital structuring of our geospatial knowledge base, ensuring wide dissemination and correct usage, and up-skilling of people to do this. This job is not an inevitability, but requires sustained and supported effort.

An SSAC approach to Scottish Government in 2019 revealed concerns that the aims of the UK-wide Geospatial Commission may not address some Scottish geospatial data requirements. In particular those with relevance to Scotland's predominantly agri-rural landscape in the contexts of the Scottish Government's 3rd Land Use Strategy (2021) and Climate Change Action Plan (update, 2020).

Evidence

SSAC commissioned a post-graduate researcher to gather evidence, interviewing 44 Scotland-based geospatial data stakeholders across public, academic and private sectors. The full report, sponsored jointly by SSAC, Scottish Government and SAGES (Scottish Alliance for Geoscience Environment and Society), is published alongside this summary report. Drawing from the main report, and with additional expert input from SSAC members, we identify generic geospatial data limitations (p10), provide specific recommendations (p16) and include timescales and lead responsibilities for implementation (p25, Appendix 1).

The aim is to improve the evidence-based geospatial data foundations in the implementation of key areas of Scottish Government policy: the 3rd Land Use Strategy (2021), the Climate Change Action Plan (2020), the Digital Strategy (2021), and the Digital Strategy for Planning (2020).

Case Studies, generic geospatial data issues

Four exemplar case studies of particular relevance to Scotland (p9) were selected to test for both general and specific geospatial data utility: Wildfires, Urban Green Spaces and Public Health, Coastal Erosion, Plant Disease. With some limited exceptions (e.g. the growing automated use of satellite-derived data), it was found that even when data quality is good, geospatial data reside in a fragmented landscape, severely limiting its potential application. Action is needed to build trustworthy, cross-sectoral, publicly available data infrastructures.

Key Recommendations

1. Scotland needs a central data directory for all spatially-referenced data with links to existing cross-sector data portals: this is seen as government responsibility;

2. All government-funded projects which generate new geospatial data should be required to provide free public access to the new data;

3. Health professions (NHS) should improve the geospatial context and Geographic Information Systems (GIS) compatibility of their data, and a skills-gaps analysis undertaken to identify the cause(s) of gaps in their data;

4. Government-held or funded data catalogues should provide clearer user guidance, and follow GEMINI/ INSPIRE standards;

5. A Scotland-wide (public, private, academic) mapping exercise of skilled data analysts, data gaps, skill gaps, and data science training opportunities would help to identify gaps in priority training which should be commissioned via a Scottish Government agency. There is a need both to up-skill non-specialist data generators to improve their data offering, and for specialist data scientists to make data repositories more user-friendly;

6. A Scotland-wide geospatial framework should be established to combine expertise and datasets across policy areas, starting with the Environment, involving a consortium of cross-sectoral partners, allowing for expert input to policy decisions of a geospatial nature. ERAMMP, co-funded by the Welsh Government, is a prime illustrative example which could provide the basis for a similar group in Scotland [https://erammp.wales/en];

7. Long-term data collection projects should be given adequate priority by public funders, with in-built flexibility in the collection process, to sustain continued dynamic data collection.

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