

Removing spatial silos: delivering spatial statistics in the UK through standards

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Abstract: The need to produce indicators to measure its progress to Sustainable Development Goals and to deliver its 2021 population censuses is challenging the UK to better integrate statistical and geospatial data in its production of statistics. The current lack of interoperability between standards from the statistical and geospatial domains has led to a number of interim solutions where the geospatial data sits outside the statistical production process.

This presentation will look at the challenges of delivering a more integrated approach to producing spatial statistics and the approaches the UK has developed for using geospatial data within the statistical process model. It will focus on where geospatial standards have been used to develop these approaches and how greater interoperability between statistical and geospatial standards would allow geospatial data to support greater understanding, communication, visualisation and dissemination of statistics. Ordnance Survey, with the UK technical committee on geospatial standards, will contribute how the lessons learned from this work can be carried forward in the geospatial standards community.

Finally the presentation will consider the wider UK digital marketplace to consider how geospatial standards could help to deliver the UK's digital agenda. The current digital standards used to support interoperability and accessibility across government have never considered geospatial data and this remains a challenge for the geospatial standards community to address.

Background:

The Office for National Statistics (ONS) is the UK's largest independent producer of official statistics and its recognised national statistical institute. We are responsible for collecting and publishing statistics related to the economy, population and society at national, regional and local levels. We also conduct the census in England and Wales every 10 years.

The ONS Geography branch within ONS provides the geographic framework for producers of statistics. This includes the geographic data, tools, services and best practices that drives every stage of statistical production, from sampling and collection, through to analysis and presentation. ONS's geographic data products and services (available from the [Open Geography portal](#) and [Linked Data portal](#)) are used across national and local government, the NHS, public agencies and charities, academia and the commercial sector. We also collaborate with experts in academia and with other national statistics and geospatial institutes and forums worldwide.

Delivering Spatial Statistics in the UK

Modernising ONS – Data Transformation

The statistical process is changing. Driven by digital disruption it is now possible to use new data, new technologies and new methodologies to support higher quality and more efficient official statistics. All National Statistical Institutes (NSIs) are now faced with the challenges of how to incorporate these data, technologies and methods into their statistical processes to modernise their organisation. At the global level this is being driven through programmes such as the UNECE High Level Forum for the Modernisation of Official Statistics but at the national level there are an increasing number of transformation programmes that are being used to change the way that data is collected, processed, analysed and disseminated.

As ONS moves forward into using non survey data to enhance, and in time replace survey data, it needs to transform the way it accesses and uses the much wider and more varied data now available.

Implementing this transformation requires a geographic framework that can be used to manage these changes and link them to the principal current drivers for change: Sustainable Development Goals, the 2021 Census and subsequent statistical production using non survey data. The challenge for ONS is to integrate these geospatial frameworks into its single mainstream data governance and management. Standards exist, but not for every level of the existing geospatial framework, and are often not sufficient for the requirements of official statistics. The ONS data revolution has momentum, but lacks engagement with data standards at an organisational level, and certainly around the, lack of interoperability between statistical and geospatial standards.

The role of Geospatial

Every object on the earth's surface has a specific location, a geographical location, whether static or dynamic, and is therefore geospatial information. Everything happens somewhere, and knowing 'where' something happens is critically important to our lives. "Where do you live?", or "Where are the most economically disadvantaged?" Knowing where people and things are, their location, and their relationship to each other, is essential to informed decision making.

ONS now has access to comprehensive and accurate, location-based information to support its strategic priorities of [Better Statistics, Better Decisions](#). Geospatial information technologies have therefore become critical tools to support improved decision making and policy formulation for national development and economic growth..

At the international level this is being driven through the 2030 Sustainable Development Agenda. The UK/ONS is heavily involved with this in identifying the role of geospatial data and methods to fill data gaps and also to validate, augment, disaggregate and disseminate existing data and statistics.

Frameworks

At both the global and national level there is an increased recognition of the need to better integrate statistical and geospatial information.

The Global Statistical Geospatial Framework (GSGF) is a high-level framework which facilitates consistent production and integration approaches for geo-statistical information. It is generic and permits application of the framework principles to the local circumstance of individual countries.

The UK's Government Statistical Service Geography Policy provides best practice guidance on the geographic reference data to use, and how to use it so that official statistics are geographically comparable, consistent and fit for purpose. Both are integral to the Strategy for UK statistics – [Better Statistics, Better decisions](#). Within ONS there are now a number of projects that are seeking to change the way that statistics are presented and disseminated and these projects represent an opportunity to utilise geospatial standards in delivering improved services to UK statistical users.

The GSS Data Discovery project

The GSS Data Discovery project aims to research and identify the feasibility, implications, risks and benefits of developing a standard approach to data publishing across the GSS, making it easier for users to find access and interrogate our data. As part of this project ONS has been testing bringing together data from a range of agencies and linking it together through location. By linking the data and attributes this approach reduces the burden on the user of statistics to identify and link datasets based on their perceived relationships. Instead, producers of data are able to explicitly define the relationships between data so that disparate datasets across a wide range of organisations can now be analysed as a single “datacube”.

The Customise My Data project

The Customise My Data project is now in Beta phase looking at how ONS can allow our users to consume data in flexible ways. Users have expressed their preference to access the geographic data from the same place as they access statistics for those geographies, and the aim is to move towards a seamless integration of statistical and geospatial data. Customise My Data will allow ONS website users to navigate through ONS data and metadata to enable users to find data and metadata easily, to customise datasets, and to browse datasets by location. Users will be able to select, preview and download their data and metadata. The data and metadata will also be available through the API.

The Open Geospatial Consortium

A major challenge for ONS is the availability of common output geographies and the accessibility/usability of those outputs. ONS have joined the Open Geospatial Consortium (OGC) to support this work. The OGC is an international not for profit organization committed to making quality open standards for the global geospatial community. In particular, ONS are involved with the Spatial Data on the Web working group and are prioritising discrete global

grids and GeoPackage, an open format for transferring geospatial information, for evaluation. Consideration is also being discussed to form an OGC Statistics Domain Working Group.

Challenges

Although there is a large amount of work within the UK to transform the statistical process and support modernisation of official statistics there is still a lack of engagement with standards at the organisational level. This is not limited to geospatial standards but is representative of a wider apathy towards the role that standards to support the data architecture of official statistics. This apathy needs to be challenged if we intend to maximise the impact of standards on the statistical process. This cultural barrier has also meant that we have not fully explored all of the available standards to support statistics and a more comprehensive analysis of the standards (and wider tools) available to support statistical modernisation will need to be implemented if we intend to deliver better statistics.

Summary

ONS transformation has momentum, but there is still a need to get standards and particularly geospatial standards considered by the wider statistical community. The misconception that geographic data can be handled in the same way as other data formats, or can be treated as simply another variable to be added to a statistical dataset needs to change. The UK digital community need to establish how geospatial methodology and analysis can impact on statistical data and produce standards to support this. We are improving, but we are not quite there yet.....