OGC Table Joining Service standard revision and Oskari

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Abstract: National Land Survey of Finland (NLSFI) has worked towards the better integration of spatial and statistical data for a long time. In recent years we have collaborated with Statistics Finland in multiple projects with mutual interests. This year we have again a joint project Spatial Statistics on Web 2, funded partly by a Eurostat grant.
In addition NLSFI has a leading role in the revision work for the OGC Table Joining Service (TJS) standard. While we are making a new version of the standard with the help of other stakeholders we are also working on a reference implementation for the standard. To make use of TJS, one needs a client software and for that we have plans to develop functionalities to Oskari, which is a multi-purpose web mapping platform (www.oskari.org) currently in the OSGeo Incubation Process.
In this presentation we would like to show the principles of combining spatial and statistical data by using TJS and how to visualize and explore the results using OGC WMS / WFS in Oskari. Furthermore we'd like to present the status of the TJS standard revision, what has been done and what is still to come.

1 Introduction

National Land Survey of Finland has a long history of collaboration with Statistics Finland. The collaboration includes meetings of management as well as day to day experts' information exchange and collaborative projects. The INSPIRE secretariat in Finland is at the National Land Survey and we have offered our support services in INSPIRE implementation related matters and in turn we have gotten lots of expert advice from the Statistics Finland side.

In the collaborative projects we have focused on bridging the gap between statistical data and spatial data by bringing those two worlds closer together. In the first project, coined Spatial Statistics on Web, we developed tools to utilise and analyse Statistics Finland's web services offering spatio-statistical data such as population grid data and road accident data. The second, currently ongoing project is unsurprisingly called Spatial Statistics on Web 2 and now we are building tools to create and disseminate dynamic online thematic maps that utilise data from both, spatial and statistical web services combining the information to create applications with maps, charts, tables and animations. Both of the projects have gotten funding from a Eurostat grant and are scheduled for two years, the latter ending in 2019.

The software we develop in both of the projects is called Oskari (www.oskari.org). It is an open source web mapping platform originally developed as the national geoportal in Finland. The development started around 2009 and the project was open sourced in

2011. Today it is a collaboratively developed software and the development is done within a network of 32 member organisations with members from the public and private sectors as well as NGO's. National Land Survey of Finland has coordinated the development work this far and the network has a set of defined roles for each contributing organization. Currently, as we are seeking to be members of the OSGeo foundation (www.osgeo.org), we are going through the roles and processes so that they match with the ones defined by OSGeo.

We have always emphasized the role of open international standards and the Oskari software relies heavily on their use. For web mapping the standards have a long history and we support most of the major Open Geospatial Consortium standards which are also required via the INSPIRE directive, such as Web Map Service, Web Feature Service and Catalogue Service for Web. In Spatial Statistics on Web, we utilised a standard called Web Processing Service to offer analysis tools in the browser based application. For combining statistical (or tabular) data and spatial data there is a standard called Table Joining Service, but we realised it is inadequate for our needs in Spatial Statistics on Web 2 so we decided to see if we could revise the standard. Another driver for the revision work was the Impact Analysis carried out by Statistics Netherlands (CBS). Now we are working on the standard revision in conjunction with developing the tools that utilise it. If we succeed, in the end of the project we will have a very useful and effective tool for disseminating combined spatial and statistical data and maybe even a reference implementation for the revised standard.

2   Table Joining Service

Table Joining Service is an open standard by OGC defining a way to combine tabular and spatial data and then access the combined data. The current version of the standard is 1.0 from 2010 and it is not widely used. The reason for its relatively low usage might be the limitations it imposes on the used data format (GDAS). There are other possible reasons and they are described very well in the Impact Analysis done by Statistics Netherlands (see references).
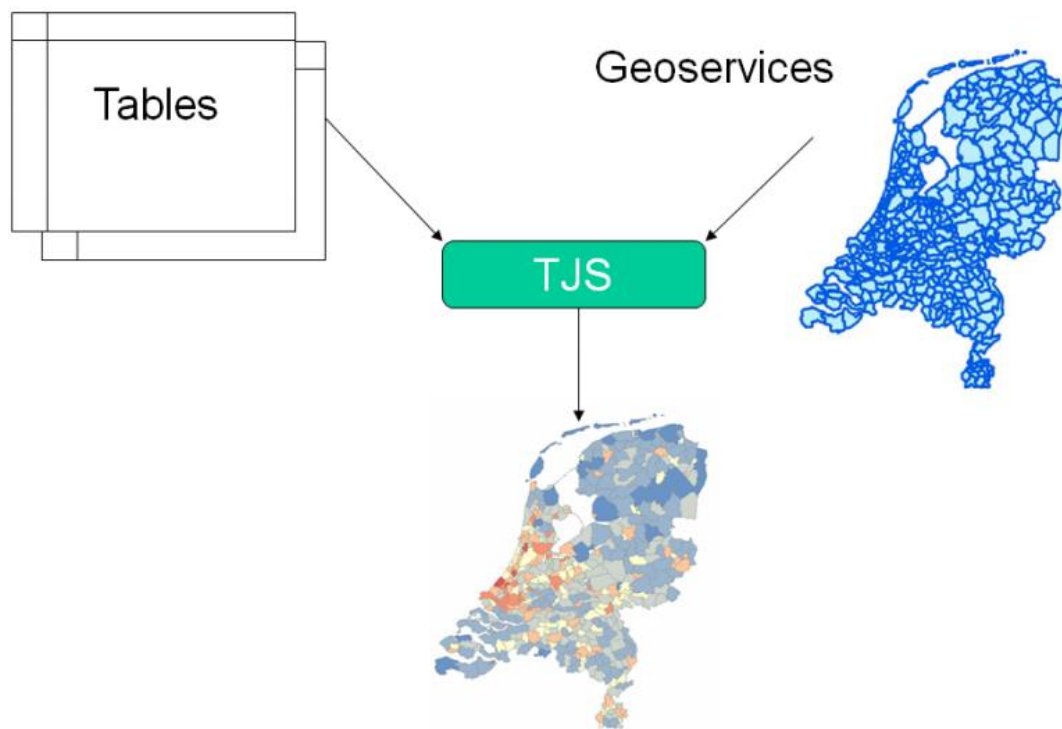
Fig 2.1 Principle of Table Joining Service (Impact analysis Table Joining Service)

We have also identified other possible improvements to the standard, such as offering a way of defining persistent data joins as a web service so that always up-to-date combined data could be accessed in a standardised way by the use of TJS.

In the revision work we try to develop the standard more flexible and usable. The revision is done in a Standards Working Group in OGC and that work should officially take about one year to complete once it has officially started. Together with the revision work we aim to develop a reference implementation to showcase the benefits that the revision makes possible.

3 Oskari

Oskari is an open source web mapping platform licensed with EUPL and MIT licences. It is used by many public sector organisations in Finland: Finnish Transport Agency, Statistics Finland and Finnish Environment Institute to name a few. It's also in use internationally: Iceland and Moldova have taken Oskari into use and power their national geoportals with it. Furthermore the EU-wide project European Location Services (ELS) uses Oskari to showcase data and services made available during the

project. Oskari has a similar role in the Arctic Spatial Data Infrastructure (ASDI) project which considers the 8 countries in the arctic area.

Feature-wise Oskari has a functionality to combine spatial and statistical data on-the-fly creating a dynamic thematic maps that the end user can customise and visually explore. The created maps can also be published and embedded on other websites with an easy to use map publishing tool that does not require any programming skills.

The combined data is shown in a table and a legend is provided for the end user depicting the selected colours and classification for the data. Two types of thematic maps are supported at this point: choropleth maps and gradual point symbol maps. Later on we will add support for time-series and animation and some charts.

All of the developed functionalities will be available in the map publishing tool as well, meaning that the end user can create an embedded map application on his or her own website and include the abovementioned tools. We believe that this will be a great tool to disseminate statistical data with a spatial aspect for many kinds of users.
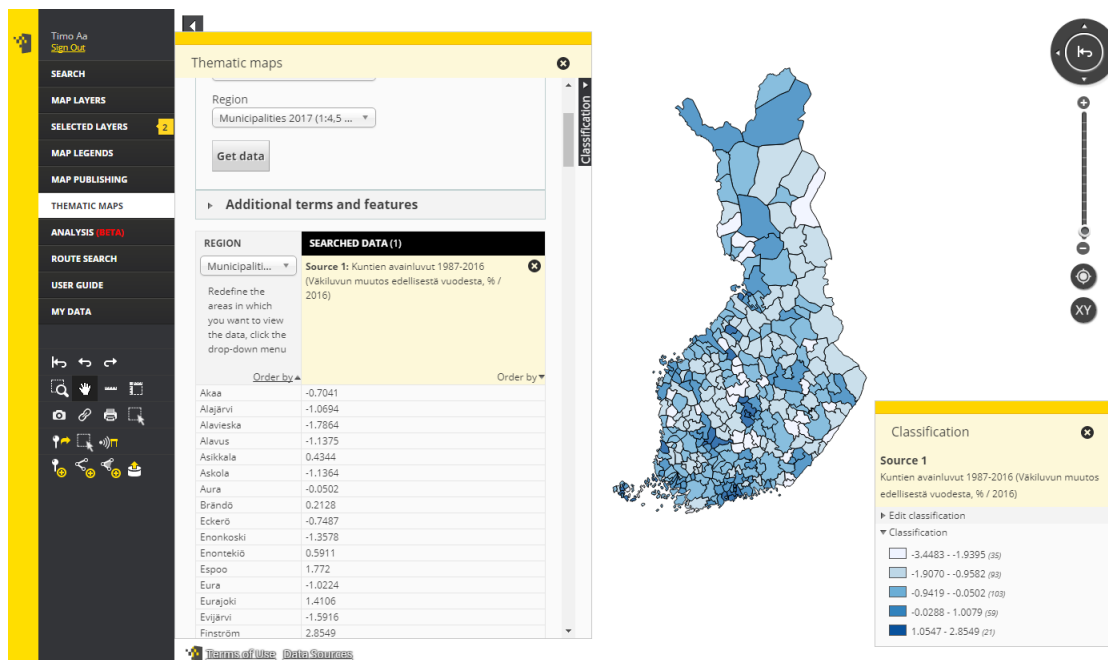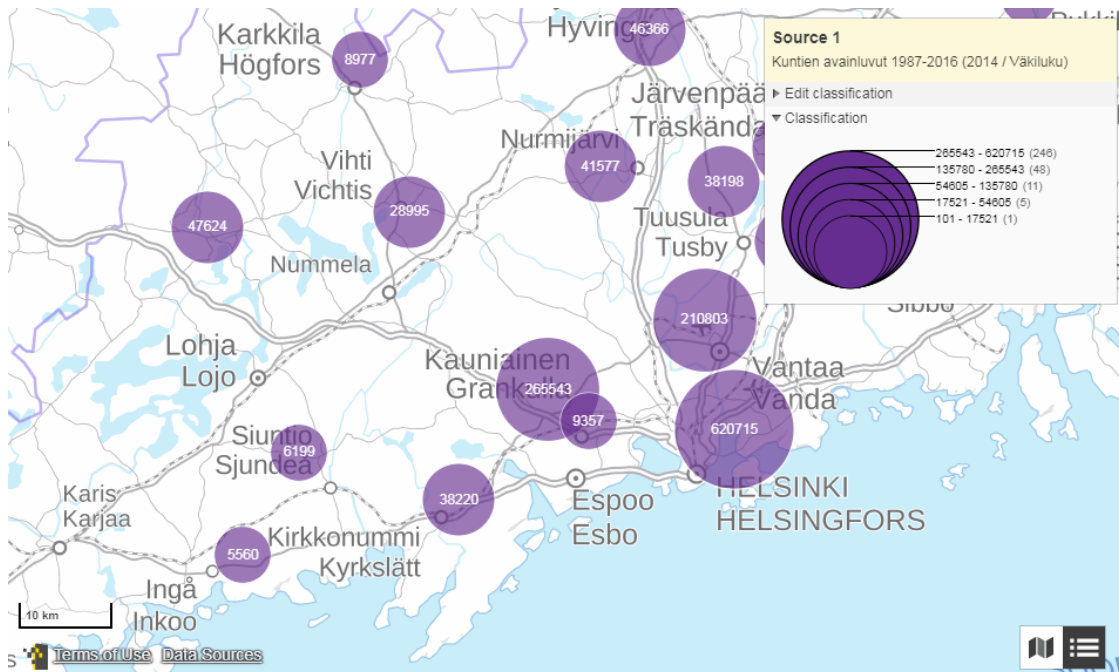

Fig 3.1 Screenshot of the thematic maps functionality

Fig 3.2 Screenshot of a published map application with gradual dot symbols

References

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