8.1.   Workshop in the picture: Web Cartography for National SDIs – EuroSDR workshop held at Agile 2013
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Today, huge amounts of geo-information are being distributed via the Internet. This has many advantages for the users as well as the producers of this data, because it has become easier to deliver up-to-data information, to combine data from different sources, to enable collaborative mapping, to hyperlink between geodata and other information and even to facilitate more personalised maps. But what are the *cartographic issues* related to the *combination* of different web services?

To address these issues, the 14th of May 2013, the first day of the annual AGILE conference on Geographic Information Science (in Leuven, Belgium) a workshop was organized titled "Web Cartography for National SDIs". The aim was obtain a better understanding of the requirements and solutions of handling cartographic aspects in Web services, to identify the needs for further research and developments within this field, and to develop ideas on how to organise and strengthen the necessary research and development activities.

About 30 participants joined the workshop, 14 from National Mapping agencies, 11 from academia and research institutes and 4 from industry. They listened to a couple of invited keynote speakers, and six presentations that had been selected by a review committee from the extended abstracts received.

Figure 18: The "Groot Begijnhof" in Leuven, the scenic venue for the workshop.

The EuroSDR perspective
The workshop was organised under the auspices of EuroSDR (Commission 4 Data Specification), together with the ISPRS (WG II/2 - Multiscale n-dimensional Spatial Data Representations, Data Structures and Algorithms), and the ICA (Commission on Maps and the Internet).
The cartographic issues of displaying geo-information on the Web are of growing interest of NMCAs because nowadays geo-information is much more often used in a web environment than on a traditional map. Displaying the data in a dynamic environment provides new possibilities, such as integration with data from others and serving on-demand maps. This gives other challenges for the cartographic appearance.

The workshop presentations

The opening session started with a keynote by Sebastien Mustière, who introduced the main research issues at IGN France and the COGIT Lab. He presented the work undertaken to automatically derive up-to-date vector maps from vector geographic databases. He argued that the personalization of web maps that users are expecting nowadays, leads to a great need for research into flexible adaptation of legends and symbolization, according to culture, handicap or taste of the map users.

The second keynote was delivered by Lars Harrie, of Lund University (Sweden). He discussed methods to improve the cartography in view services as well as an ongoing project, which looks into standardization of web cartography in Sweden.

In the second session the focus was on web services for visualisation at various scales. Paul Hardy (of ESRI inc., USA) concentrated on the design of multi-scale basemaps in ArcGIS, for use with overlaid operational layers, including the tiered scale data models and consistent cartography for maps that show content from whole nations down to single buildings. He explained how contextual abstraction tools can be used to produce intermediate scale bands, and provided examples of basemap services, their cartography, and their use for vivid communication in story maps.

Mikael Johansson described how Lantmäteriet, the NMA of Sweden, has developed Web Map (Tile) Services to provide a base map, using a workflow including ArcGIS and MapServer. He also mentioned the efforts to provide INSPIRE compliant services and highlighted the problems in providing proper text placement when the annotations in the underlying geographical model are not related to the objects they represent.

The INSPIRE angle was further explored in the session on "Tools for Webmapping", in a talk by Julien Gaffuri (Joint Research Centre, Italy). He provided an overview of how visualisation aspects are already addressed in INSPIRE and what possible next steps could be. One such step he proposed was the creation of a register, listing and describing all INSPIRE styles. This register would act as a cartographic legend for all INSPIRE view services.

Next, Edward Mac Gillavry (WebMapper, The Netherlands) reported about the tools that have been developed in order to facilitate the adoption and wide-spread use of the Dutch National Spatial Data Infrastructure. Besides simply providing geographic data sets through web services that comply with the OGC recommendations, an all-purpose online base map has been developed together with a full-fledged geographic application, the "GEOZET" viewer. To reach out to casual users, a wizard was developed to add simple, yet interactive, maps to web pages, as well as a plugin for the Open Source GIS software QGIS. Edward also presented the Dutch "Guidelines for Web Cartography", aiming at web developers without cartographic background, and meant to be a template for an implementation-independent formulation of cartographic visualisation rules.
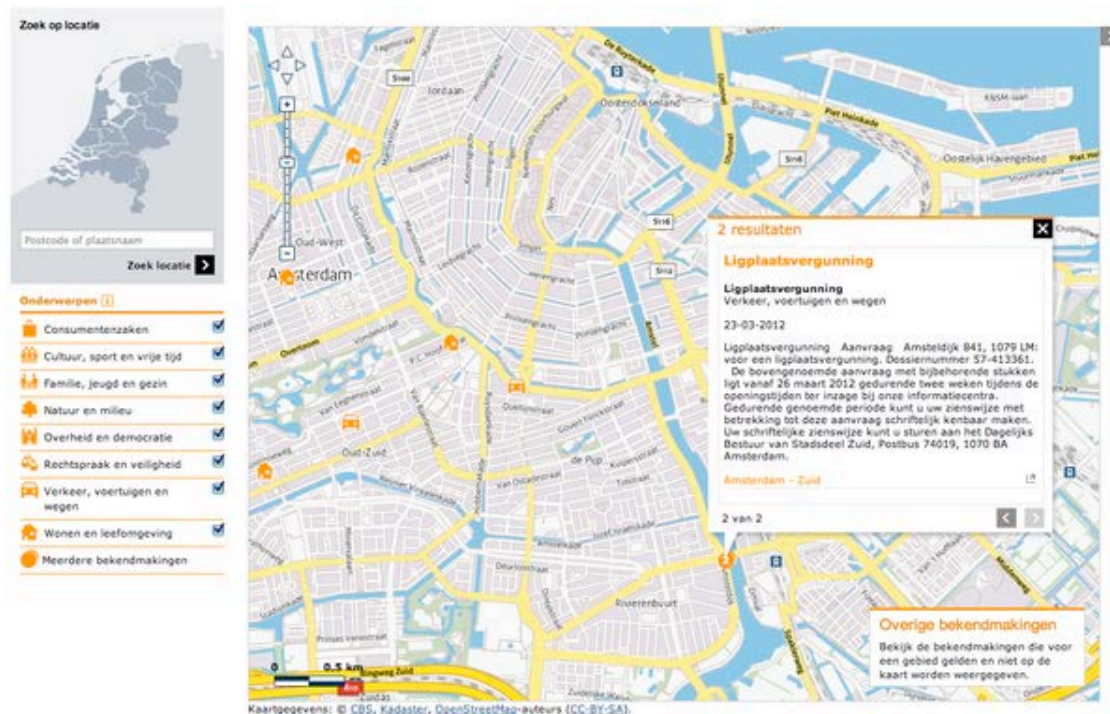
Figure 19: Geozet viewer

The final presentation session on "Visualisation of NMA maps on the web" featured two talks by national mapping agencies. First, Jean-Christophe Guélat showed how swisstopo (Switzerland) is publishing swissTLM-Map, a raster version of its large-scale 3D topographical landscape model. The publication workflow consists of symbolizing vector data in ArcMap and exporting raster data as geoTIFF using a custom command tool, and finally publishing the service using MapServer. One sixth of Switzerland is updated each year, thus allowing swisstopo to reach its up-to-dateness requirements (i.e. once every six years).

Lastly, Frédérique Spitaels of NGI Belgium described the CartoWeb project, which dealt with the design and implementation of the production and publishing process of the CartoWeb product. This is a cartographic representation of the Belgium geographical base data, adapted for onscreen display. As such it is a new, attractive and less expensive, alternative for the traditional cartographic products. It is offered in 11 scale levels, ranging from 1:4 million to 1:2,500. One new feature is the possibility of using ortho-photos as a backdrop to the larger scale maps.

Group Discussions and Results
The last hours of the workshop were reserved for a series of group discussions. The first discussion subject was "visualisation of overlaying map layers from disparate web map services", and focused on the actual cartographic challenges, the use of cartographic rules and the need for and possibilities of implementation of guidelines for Web Cartography. The main findings were that there are still considerable problems when overlaying a varying set of map layers from disparate data sources. The unpredictability of the combinations chosen by the users, combined with the inflexibilty of the symbolisation of the layers, leads often to inconsistencies, confusing symbolisation and legends and other problems. Especially the balance between background layers and thematic foreground is difficult to optimise. The participants saw several approaches to solve these problems: Limitation of themes and content was mentioned, and also the use of more versatile (background) layer symbology. For the latter, multi-resolution and especially vector technology was often suggested.
The second discussion focused on the subject "towards intelligent automated web mapping from NMA/SDI data: what tools do we have, what are we missing...?" and its main topic was the availability and usability of modeling and software *tools* to create high quality web map services. The

general consensus seemed to be that the current tools offer solutions for many of our challenges, with the possible exception of good support for Styled Layer Descriptors. Especially the lack of easy to use SLD editors was mentioned. Developments in the near future, especially the growing use of web maps on mobile devices, is expected to lead to the need for support of vector tiles.

With a focus more on research subjects such as knowledge, models and metadata, the topic of the third discussion was "towards intelligent automated web mapping from NMA/SDI data: challenges for research". Here the main findings were that there is a need for uniform solutions to portray meta data, and that there is a clear shift from raster to vector technology. Furthermore, general discussions of the right balance between client-and server-tasks were raised, and it was agreed that on several terrains we lack proper mechanisms to evaluate quality. Examples given were the quality of dynamic generalisation, of automatic labeling, of usability of end-user applications, and more general of web mapping standards: How can we measure if a map is "good enough" for our users?

In the final plenary discussion there was agreement that overall, an emerging key subject seems to be the use of vector technologies replacing the more traditional raster (tile) mapping paradigm.

The presentations and extended abstracts can be found on the workshop website at http://kartoweb.itc.nl/WebCarto13/

Figure 20: Picture of workshop