Item 9 of the Provisional Agenda

Activities Relating to the Working Group on Toponymic Data Files and Gazetteers

The renewed Geographic Names Register of the National Land Survey of Finland

Submitted by Finland*

The renewed Geographic Names Register of the National Land Survey of Finland

Summary

The Geographic Names Register (GNR) of the National Land Survey of Finland (NLS), initially established in the late 1990s and introduced at the 20th session of UNGEGN (WP 1) was entirely renewed in an NLS development project during 2010–2014. The reform covered the data model and database, the data management, the production application as well as the production lines and organisation of work. The GNR feature classification was also renewed, as were the GNR information services and data products.

General

The Geographic Names Register (GNR) of the National Land Survey of Finland (NLS) is the authoritative geographic names data repository of Finland and one of the elements included in the national and international spatial data infrastructure. The GNR has two integrated parts: (1) the primary, map product independent Place Name Register (PNR), containing information on over 800 000 named places and their standardised names, and (2) the Map Name Register (MNR), an operational dataset holding the cartographic attributes (placement, typography) related to the PNR names selected to be presented in the NLS cartographic product in question.

The GNR was entirely renewed in an NLS development project during 2010–2014. The reform covered the data model and database, the data management, the production application as well as the production lines and organisation of work. The PNR feature classification was also renewed according to needs assessments (*Table 1*), as were the GNR information services and data products.

TERRAIN FEATURES	HYDROGRAPHIC FEATURES	POPULATED PLACES	ADMINISTRATIVE UNITS AND PUBLIC SERVICES
Landforms	*Water areas*	*Population centres and villages*	*Administrative units*
Group of islands or islets	Baltic sea and its main parts	City or town or population centre	(5 feature types)
Island or islet	Part of sea	Village or neighbourhood	*Administrative buildings and offices*
Boulder in water or boulders in water	Group of lakes or ponds	*Parts of population centres*	(5 feature types)
Cape	Lake or pond	Part of town or population centre	*Religious buildings*
Isthmus	Part of lake	Park	(3 feature types)
Shore or waterside	Reservoir	Market place or square	*Burial services*
Group of elevations	Part of reservoir	*Houses*	(2 feature types)
Elevation	Canal	House	*Social and health services*
Depression	*Watercourses*	*Other populated places*	(4 feature types)
Shallows	Watercourse	Other populated place	*Safety and defence units*
Deep	Part of watercourse		(14 feature types)
Terrain areas	Rapids	**TRANSPORT SITES**	*Educational and research units*
Forested area	*Detailed hydrographic features*	(17 feature types)	(6 feature types)
Marsh or paludified area	Spring		*Waste management services*
Field	Water pit	**PRODUCTION AND INDUSTRIAL UNITS**	(3 feature types)
Meadow or pasture	*Other hydrographic features*	(13 feature types)	*Other administrative units and public services*
Blockfield or rocky area	Other hydrographic feature		(1 feature type)
Detailed terrain features		**CULTURAL AND RECREATIONAL SERVICES**	
Boulder	**PROTECTED SITES**	*Cultural services*	
Tree	*Nature reserves*	(5 feature types)	
Other terrain features	(3 feature types)	*Sports and exercise sites*	
Former dwelling place	*Other protected sites*	(10 feature types)	
Other terrain feature	(6 feature types)	*Recreational services*	
		(11 feature types)	

Table 1. Renewed Place Name Register feature classification.

Data model

The basic structure of the GNR data model was retained in the reform. The model is feature oriented and includes the objects Place, Place name and Map name. Places and Place names build up the PNR, and Map names, together with the PNR data, the MNR. All objects are interconnected and provided with external permanent unique identifiers. A named feature (Place) has at least one name (Place name) – in Finland, commonly several names in different

languages – that may have zero, one or multiple occurrences (Map names) in different cartographic products (*Figures 1 and 2*).

In the GNR reform, a complete version management for Places, Place names and Map names was implemented, based on timestamps for the creation, modification and deletion of the versions, and separate database tables for the modified object versions (*Figure 3*).
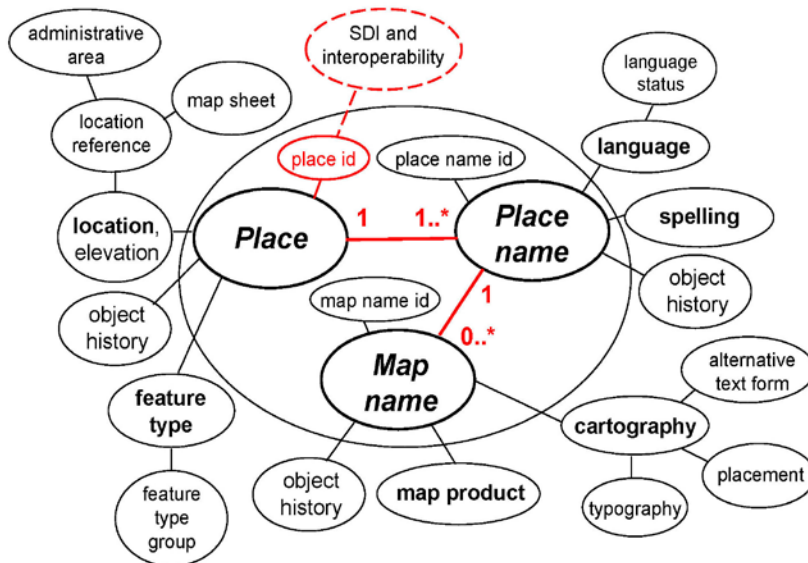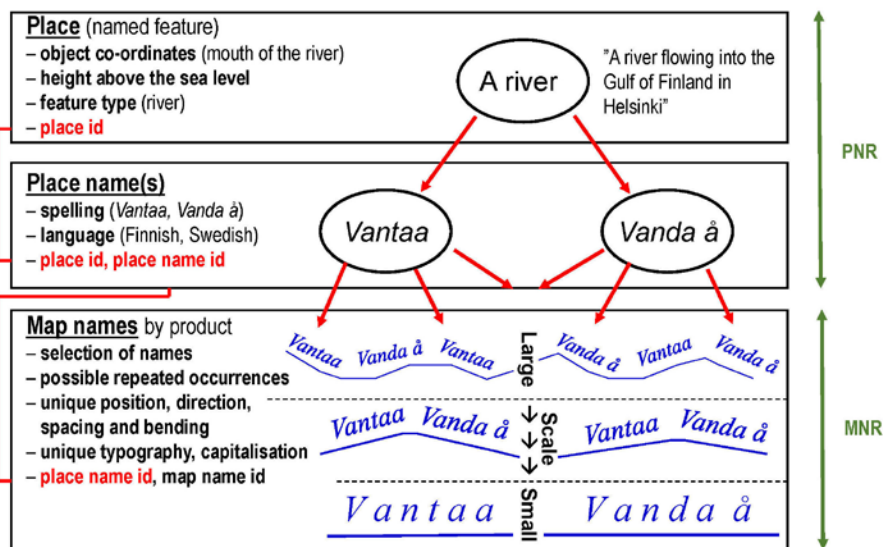

Figure 1. Geographic Names Register data model.

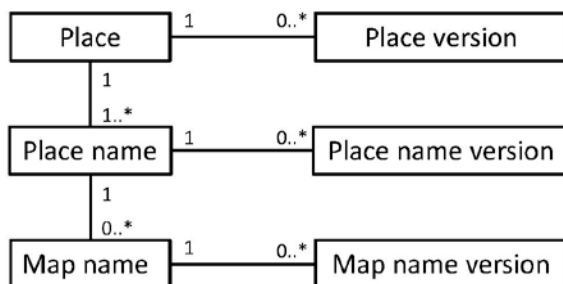**Figure 2**. Realisation of the GNR data model.

Figure 3. GNR object version management.

Database and transaction management

The GNR is an Oracle Spatial database enabling efficient spatial operations. The management of absolutely necessary transactions of long duration (isolation of data changes during the production and automatic and semi-automatic resolution of possible conflicts during the merge) is based on Oracle Workspace technology. The hierarchical workspace structure may have one to three temporary working levels for different kinds of national, regional, local and object-wise production tasks (*Figure 4*).
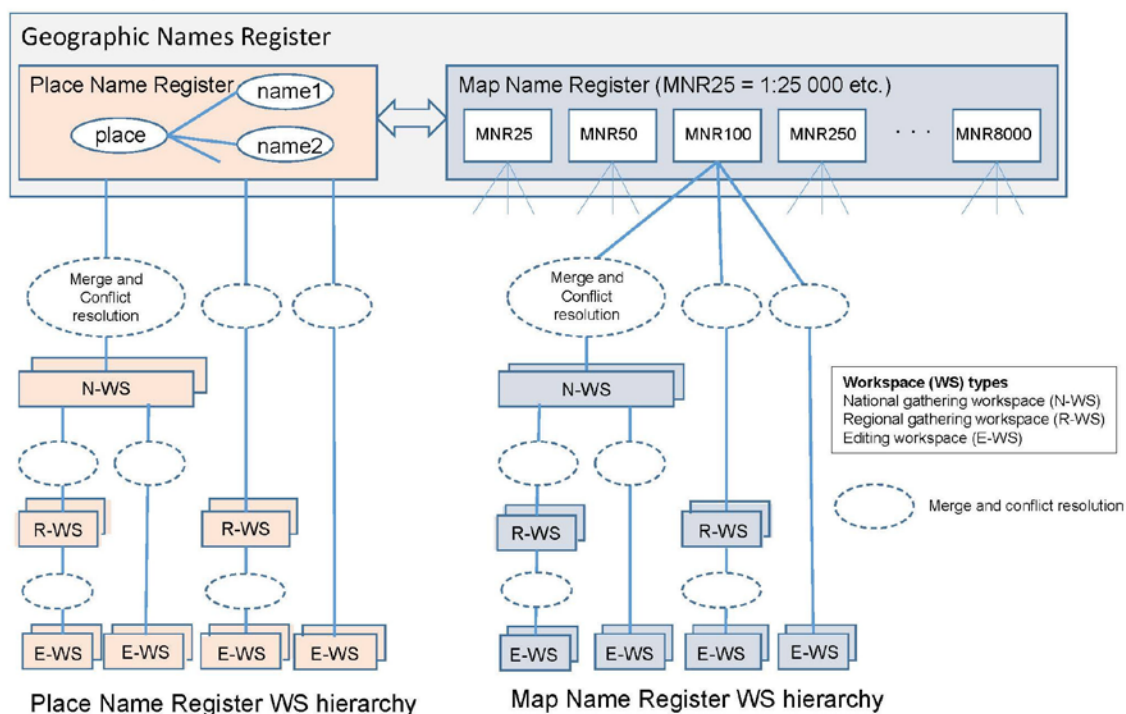

Figure 4. GNR workspace structure.

Data maintenance

The GNR production functionality is integrated into the NLS Topographic Database (TDB) production application based on Smallworld technology. Thanks to the integration, all the TDB production functionality developed in the NLS for decades is available for the GNR production too.

The GNR production functionality covers the workspace management, the Place Name Register data maintenance and the Map Name Register data maintenance. The user interface consists of forms, lists and the map interface (*Figure 5*) for displaying and altering the data.

To ensure the consistency between the PNR and MNR and between the MNR map name layers of different cartographic products there are 13 pre-programmed parameterised SQL tools for making sure, for example, that recent changes in the PNR (additions, deletions, certain modifications) are taken into consideration in map compilation, that all parallel names in different languages are presented as map names according to the rules and that names of all PNR features of a given feature type are presented as map names.
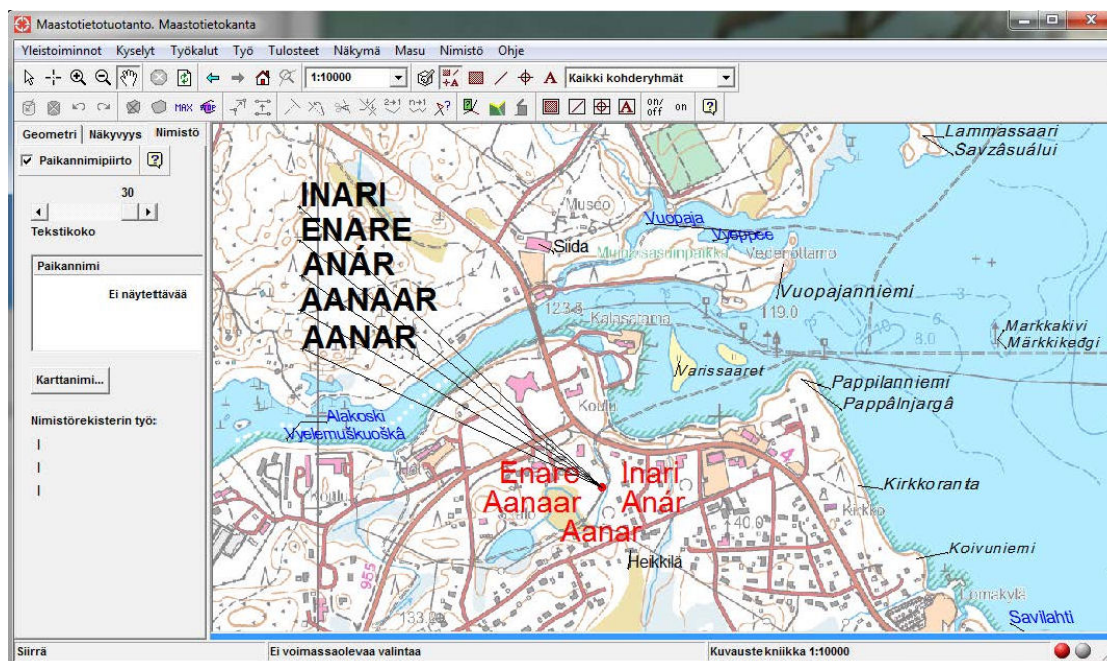
Figure 5. GNR production application map interface. A Place and related Place names are displayed in red, and Map names in 1:25 000 (Basic Map) in black and blue.

Production lines

PNR production is carried out by an NLS team devoted to the task. The linguistic office treatment and standardisation of the names is carried out by the Institute for the Languages of Finland (Finnish and Swedish names) and University of Oulu experts (Saami names). These experts can access the PNR directly online by using the NLS GNR production application.

The MNR is maintained as a part of normal map data production of the Basic Map 1:25 000, Topographic Map 1:50 000 and small scale maps 1:100 000–1:8 million. In total there are over 200 daily users performing GNR transactions.

Services and products

The NLS names datasets are available – globally free of charge – through WFS interfaces, as GML data products, and soon as linked data. In addition to the national XML schemas for PNR and MNR, the geographic names XML schema profile sanctioned by the EU INSPIRE directive (Infrastructure for Spatial Information in the European Community) has been implemented for international use.

Fields of application

Examples of fields of application for applications based on GNR services and data products are:

− National and international standardisation of geographic names; clear and consistent use of nationally standardised and accurate geographic names in any type of communication;
− Search; finding named places and geographic names by using their attributes (e.g. spelling); map browsing applications; gazetteer services;
− Geocoding; automatic positioning and navigation;
− Interoperability within the national and international spatial data infrastructure, based on unique and permanent Place and Place name identifiers; linked data; geoparsing; ontology;

- Visualisation; map production; geographic names as an information layer in viewing services;
- Research, e.g. onomastics, historical research, natural science, archaeology, genealogy;
- Cultural heritage promotion; safeguarding of the cultural heritage related to inherited geographic names and respective places.

More information:

Leskinen T. A Data Repository for Named Places and Their Standardised Names Integrated With the Production of National Map Series, Proceedings of the 27th International Cartographic Conference, Rio de Janeiro, Brazil, 23–28 August 2015, http://icaci.org/files/documents/ICC_proceedings/ICC2015/papers/21/fullpaper/T21-516_1430431470.pdf. Accessed 26 February 2016.

National Land Survey of Finland (2015) Data and services, Digital products, Product descriptions, Geographic names, http://www.maanmittauslaitos.fi/en/digituotteet/geographic-names. Accessed 26 February 2016