A data repository for named places and their standardised names integrated with the production of national map series

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(Full ICC 2015 paper)
Finland: Places with parallel names in up to five languages

- Official state languages: Finnish, Swedish
- Official Saami languages in Lapland: Inari Saami, North Saami, Skolt Saami
Repository: Geographic Names Register (GNR)

Place Name Register (PNR)
- Primary dataset; 800 000 named places and their standardised names in different languages
- No cartographic information
- Location and elevation of places
- Feature type of places (some 140 feature classes)
- Approved spelling of names
- Language of names
- Status of names (e.g. official, standardised, other)
- Persistent unique identifiers of places and place names
- Timestamps of creation, modification and deletion of places and place names

Map Name Register (MNR)
- Operational cartographic dataset for names presented in national maps in 1:25 000–1:8 million (9 scales)
- Integrated with the PNR
- Selection of PNR names to be presented as map names in different cartographic products
- Placement of map names (text position, direction, bending, spacing)
- Typography of map names (font, text size, slant and colour, capitals indicator etc.)
- Persistent unique identifier of map names
- Timestamps of creation, modification and deletion of map names
GNR data model: Places, Place names, Map names

- **Places** and **Place names** build up the PNR
- **Map names** (names in maps), together with the PNR data, build up the MNR
Realisation of GNR data model

**Place** (named feature)
- object co-ordinates (mouth of the river)
- height above the sea level
- feature type (river)
- place id

**Place name(s)**
- spelling (Vantaa, Vanda å)
- language (Finnish, Swedish)
- place id, place name id

**Map names by product**
- selection of names
- possible repeated occurrences
- unique position, direction, spacing and bending
- unique typography, capitalisation
- place name id, map name id

"A river flowing into the Gulf of Finland in Helsinki"

PNR

MNR
## Renewed PNR feature classification

### Terrain Features
- **Landforms**
  - Group of islands or islets
  - Island or islet
  - Boulder in water or boulders in water
  - Cape
  - Isthmus
  - Shore or waterside
  - Group of elevations
  - Elevation
  - Depression
  - Shallows
  - Deep
- **Terrain areas**
  - Forested area
  - Marsh or paludified area
  - Field
  - Meadow or pasture
  - Blockfield or rocky area
- **Detailed terrain features**
  - Boulder
  - Tree
  - Other terrain features
  - Former dwelling place
  - Other terrain feature

### Hydrographic Features
- **Water areas**
  - Baltic sea and its main parts
  - Part of sea
- **Group of lakes or ponds**
  - Lake or pond
  - Part of lake
- **Reservoir**
- **Part of reservoir**
- **Watercourses**
  - Watercourse
  - Part of watercourse
- **Rapids**
- **Detailed hydrographic features**
  - Spring
  - Water pit
- **Other hydrographic features**
  - Other hydrographic feature

### Populated Places
- **Population centres and villages**
  - City or town or population centre
  - Village or neighbourhood
- **Parts of population centres**
  - Part of town or population centre
  - Park
  - Market place or square
- **Houses**
  - House
  - Other populated places
  - Other populated place

### Transport Sites
- (17 feature types)

### Production and Industrial Units
- (13 feature types)

### Administrative Units and Public Services
- **Administrative units**
  - (5 feature types)
- **Administrative buildings and offices**
  - (5 feature types)
- **Religious buildings**
  - (3 feature types)
- **Burial services**
  - (2 feature types)
- **Social and health services**
  - (4 feature types)
- **Safety and defence units**
  - (14 feature types)
- **Educational and research units**
  - (6 feature types)
- **Waste management services**
  - (3 feature types)
- **Other administrative units and public services**
  - (1 feature type)

### Protected Sites
- **Nature reserves**
  - (3 feature types)
- **Other protected sites**
  - (6 feature types)

### Cultural and Recreational Services
- **Cultural services**
  - (5 feature types)
- **Sports and exercise sites**
  - (10 feature types)
- **Recreational services**
  - (11 feature types)
GNR database and object version management

- Oracle Spatial database enabling efficient spatial operations
- Object tables Place, Place name, Map name
- Object version tables Place version, Place name version, Map name version
- Before any modification or the deletion of Place, Place name or Map name, the unaltered object is inserted into the respective version table and identified by an incremental version number
- Enables temporal cross-sections of GNR data
- Enables complete change-only updates for GNR data dissemination

Diagram:

```
Place --1-- 1..* Place version
|         |
|         |
1         |
|         |
1..*      |
|         |
Place name --1-- 0..* Place name version
|         |
|         |
1         |
|         |
0..*      |
|         |
Map name --1-- 0..* Map name version
```
GNR transaction management

- Oracle Workspace technology enabling absolutely necessary transactions of long duration
  - Isolation of data changes during the production, and the detection and automatic and semi-automatic resolution of possible object conflicts during the merge
- Hierarchical workspace structure may have 1–3 temporary workspace levels, each of which consisting of one or several workspaces for different kind of production tasks
GNR data maintenance

- GNR production functionality is integrated into NLS Topographic Database production application, based on Smallworld technology
- PNR production is maintenance of Places; Place names are maintained as attributes of Places
- MNR production is maintenance of Map names of a certain cartographic product (selection, placement, typography)
- PNR is integrated into the MNR production, e.g. the spelling of the names is stored in the PNR only
- 13 special tools to ensure the consistency between the PNR and MNR, and between the Map name layers of different cartographic products
GNR production lines

- PNR production is carried out by an NLS team devoted to the task
  - Quality management covers both linguistic and technical aspects
  - Overall process for the resolution of reclamations, feedback and change requests concerning the PNR data and the names in national maps
  - Linguistic treatment is carried out, online, by the Institute for the Languages of Finland (Finnish and Swedish names) and University of Oulu (Saami names)
- MNR production is a part of normal production and compilation of Basic Maps 1:25 000, Topographic Maps 1:50 000 and small scale maps 1:100 000–1:8 million
  - May include requests to the PNR production team for the necessary operations, such as the addition of a new Place and/or Place name to be included as a Map name
- Amounts of geographic names in national map series:
  - Basic Map 1:25 000 ca. 810 000 names
  - Topographic Map 1:50 000 ca. 360 000 names
  - Topographic Map 1:100 000 ca. 170 000 names
  - Topographic Map 1:250 000 ca. 45 000 names
  - Topographic Map 1:500 000 ca. 13 500 names
  - General Map 1:1 million ca. 2 500 names
  - General Map 1:2 million ca. 600 names
  - General Map 1:4.5 million ca. 200 names
  - General Map 1:8 million ca. 25 names
GNR services and products

- GNR datasets are available through NLS Web Feature Service (WFS) interfaces and as respective GML data products
- Two XML-schemas for PNR (Places, Place names), with equal data contents but different structure, and one XML-schema for MNR (Map names)

National Land Survey of Finland data policy

- NLS has made its topographic datasets globally available free of charge
- NLS open data products and services include e.g.
  - Topographic Database
  - GNR names data
  - Elevation models
  - Orthophotos
  - Laser scanning data
  - Small scale map datasets in scales 1:100 000–1:8 million
  - Raster maps in scales 1:5000–1:8 million
Fields of application of GNR services and data products

- National and international standardisation of geographic names; clear and consistent use of nationally standardised 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; geoparsing (geocoding place names occurring in text documents)
- Interoperability within the national and international spatial data infrastructure, based on persistent unique identifiers; linked data; place and place name ontologies
- 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 the cultural heritage related to inherited geographic names and respective places
Thank you