

## **geoNorge.no – The New Norwegian geoPortal**

An implementation of a geoPortal using Arc\_IMS Portal toolkit

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### **Abstract**

In January this year, the Norwegian geoPortal was pre-launched. The portal is one of the first implementations worldwide based on the Arc\_IMS Portal toolkit. The feedback and attention of the portal has been overwhelming.

The portal is a key component in the Norwegian NSDI, and will be a central building block in the further development of the GI infrastructure as well as in the Norwegian e-government initiative. The presentation cover aspects of technical and organizational challenges we have been facing so far, with focus on standards, interoperability and content quality.

The presentation also outlines the 2004 activities on further development, education, training and information – ending up with an interoperable, content comprehensive and easy to use geoPortal.

### **Background**

In Norway as in most countries the development of a national Spatial Data Infrastructure(NSDI) has evolved over a long period. Several factors, such as new technologies, e-government initiatives, demanding new user groups etc., have increased focus on high quality and easy accessible geospatial information. In may 2003 the government white paper 'Norway Digital' was published. This paper was approved by the Parliament, and is now regarded as the basis of the future development of our NSDI.

A major concept in the white paper is the establishment of a portal for geographic information and services and increased focus on dissemination of geospatial data. As a response to this point the Norwegian Mapping Authority contracted the Norwegian ESRI distributor Geodata AS to develop the first version/a prototype of the Norwegian geoPortal based on Arc\_IMS portal toolkit..

This work is now continued in the geoPortal project, a co-operation project between several national, regional and local agencies and communities. The project is co-financed by the Norwegian Research Council. The project is regarded as an important step in the practical implementation of the Norwegian SDI.

This paper will highlight some experiences gained in the work with Norwegian geoPortal so far. It will also focus on some key issues in the successful development of our SDI so far based on the view of the core elements in a NSDI as shown figure 1 below.

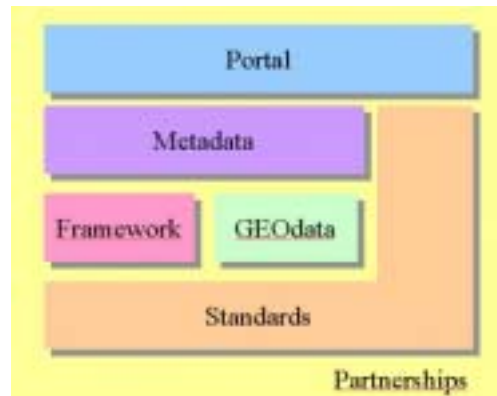


Figure 1. Core elements in a spatial data infrastructure(From Alan R.Stevens (1))

### Partnerships

The Norwegian geo-community has a strong tradition in co-operation and partnerships. In particular two programs have been of vital importance.

GEOVEKST is a nation-wide program for co-operation on establishing digital geographic data. The basic concept is pooling money for jointly executed projects for establishing, improving and maintaining large scale digital geographic data. A general agreement on the Geovekst programme includes all the major national services. The Norwegian Mapping Authority undertakes the co-ordinating role both on national and regional level. The practical work is organised as individual projects through which digital data is established. The projects are based on an agreed set of standard rules and manuals, which facilitate the exchange and sharing across administrative boundaries.

AREALIS is a national program initiated by the Norwegian Ministry of Environment. The main objective of the project is to make environmental data and land use information available at national, regional and local level. One of the important elements in Arealis is co-operation. Several activities stimulating increased co-operation between sectors, making their efforts known to each other, in turn often stimulates to further co-operation, has been carried out. Today more than 10 Norwegian ministries and 20 of their agencies are involved in Arealis, either as data suppliers or as potential users of the information accessible through Arealis. In addition a number of county agencies and municipalities take part. The Norwegian Mapping Authority is co-ordinating the programme.

The above mentioned programs will continue and will be strengthened and even more co-ordinated in the new Norway Digital concept given in the 'Norway Digital' white paper. The concept covers both national, regional and local authorities and agencies. Agreements on partnership and joint venture funding will continue and a main focus is to achieve easier access to geospatial data to all 'members' in Norway digital. The public will have free access to Internet map services provided by the partnership. A delivery service to non-members will be provided by a public limited company. The Norway Digital 'model' is shown in figure 2.



Figure 2. The Norway Digital model.

## Standards

Achieving horizontal and vertical interoperability is of course an ultimate goal in our work. Although we are far from there, we are all the time taking small steps in the right direction. The present and upcoming standards on Geographic information is an important factor in achieving interoperability.

Among the context standards in the ISO19xxx family the geoPortal project currently have focus on the ISO19115 metadata standard. This standard is mandatory and essential. We are currently implementing a service catalogue based on UDDI. OGC's WMS spesification is accepted and used by the geoPortal partners. We have not yet established any fully operable mapservices based on the OGC WFS spesification, but both WFS and WCS implementation activities are planned. Other web-services like gazetteer search and address search are based on SOAP

In this context our national de facto context standard SOSI (translated to : 'Standardized description of geographic information') must be mentioned as particularly in feature cataloguing. This standard has been a key factor to the success achieved in the above mentioned Geovekst and Arealis partnership programs. As a part of our national standardization work the process of mapping the SOSI de facto standard to GML has started.

## Framework

The national framework provides a mandatory architecture and an overview of the standard involved. A new version of the framework document is worked out as an activity in the geoPortal project.

The framework also describes the structure of different types of portals and how they as a whole are acting together and will form the NSDI. Portals are defined on three levels : 1) The national one-stop shopping level(geoPortal), 2) agency portals and 3)thematic local and regional portals. This concept is shown in figure 3.

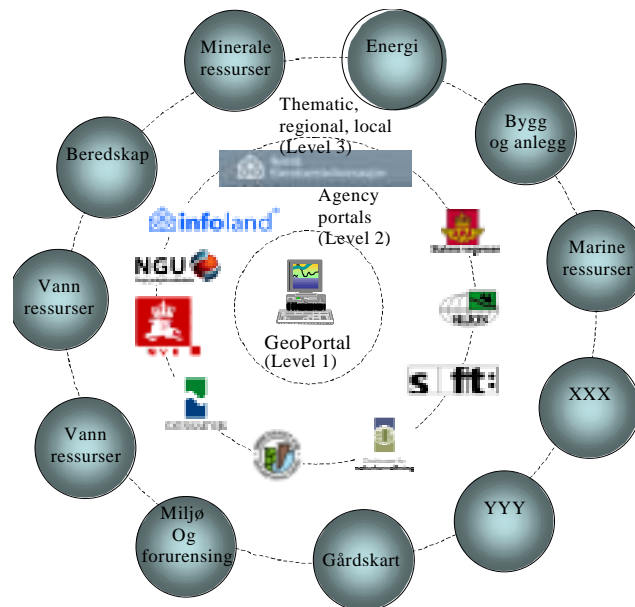


Figure 3. Three levels of portals

From a geoPortal point of view the framework's geoportal architecture is modular. The idea is to provide a rich set of national, regional and local components (examples are wms, wfs and web-services). These components are in turn used to build portals, both non-commercial and commercial of any of the above three mentioned categories.

Another important aspect is to describe the framework for operation and maintenance of geoPortals. Both 24/7 and content related issues are described.

### Geodata

Over the years an enormous amount of geodata has been established through various programs and initiatives. Reference data in scales up to 1:50.000 by the NMA and in large scale through Geovekst-projects. Thematic data has been established by Arealis and other agency initiatives. However, these data are mainly used and known by the producers/owners. The geoPortal will provide mechanisms making it a convenient tool for dissemination of geodata. These are :

- A wide variety of high quality WMS services (also WFS and WCS services are planned). All geoPortal partners have activities on improving existing wms services as well as authoring new WMS services.
- Tools for ordering and downloading GI

In addition one should take into account the growing amount of webmapping applications.

WMS-services on national level provided by national agencies like the NMA, the Norwegian Geological Survey (NGU) and others are well known and established. On the other side the regional and local level face problems as

- Limited resources
- Insufficient Competence

Currently we are testing out different concepts for establishing/setting up wms's on regional and local level. We realize that this process will take some time.

Use of geodata provided by partners in Norway digital will be free of charge. Non-member organizations will have to obtain the data through the delivery service and will be charged. A well known problem is the lack of authorizing and access mechanisms in the wms specifications. We are currently looking into this problem but have not reached the final conclusion.

The strategy for implementing downloading and ordering functions is to provide a common interface for ordering. The providers/owners of the geodata in turn implement their downloading solutions on that common interface.



Figure 4. Base maps from the NMA's topographic basemap wms service. Overview map(1:15000000) and large scale(1:1000) map viewed in geoPortal generic mapviewer.

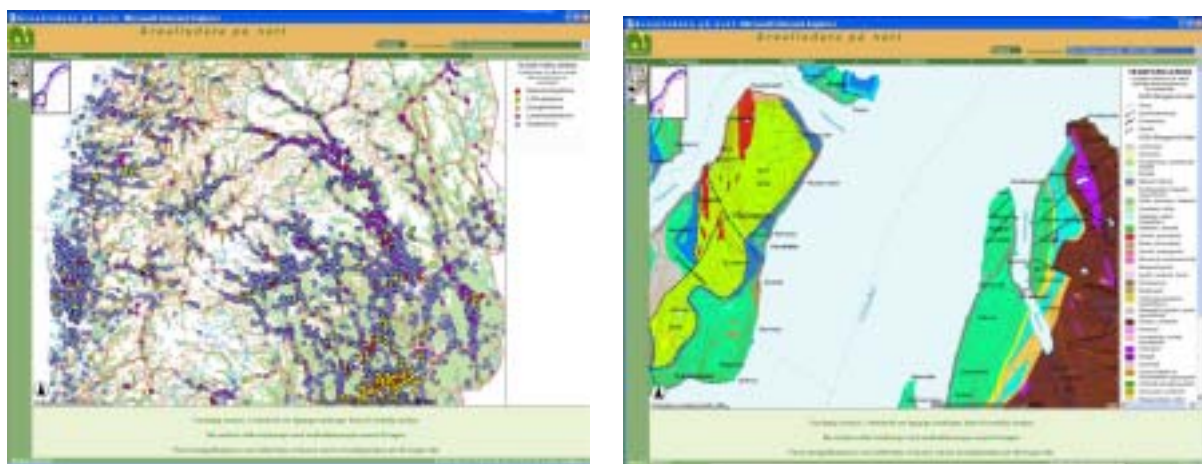


Figure 5. Thematic maps as wms services. Left map is a small scale view of ground water dwells in southern Norway. Left map is a detailed view of bedrock situations viewed in geoPortal thematic mapviewer.

## Metadata

From a geoPortal point of view the presence of metadata is mandatory. There are at least three main reasons for that.. 1) metadata make geodata searchable, 2) metadata + geodata = information and is of much higher value to potential users and 3) metadata is required to make GI interoperable (particularly documenting quality).

Unfortunately the situation in Norway is that there is an almost total absence of metadata. presented in a structured manner. The reasons for that are:

- Lack of international standard
- Lack of metadata authoring tools

- Bad habit – the job is done when the geodata are finished

Fortunately these problems are now about to be solved. The ISO 19115 Metadastandard is now an international standard. However it is voluminous (about 450 metadata elements) and hard to overview. In geoPortal we saw the need for deriving profile(s) from the standard. The work has so far resulted in ‘The Norwegian metadata profile for thematic vector data - based on ISO19115’ (credits to Per Ryghaug at NGU for contributions to this work). The profile suggests about 125 metadata elements. This profile is now build into metadata authoring tools like Arc\_Catalogue metadata editor and the web-based metadata editor included in the portal.

A similar profile for imagery and gridded data will be published late autumn 2004.

The geoPortal has almost no value without content. Metadata will form a vital part of the content. To help producers/owners of geodata and make bad habits better the geoPortal project until now has produced several documents/guidelines and started some other activities :

- The Norwegian metadata profile for thematic vector data - based on ISO19115’
- Recommendations on metadata implementation strategy
- Recommendations on using keywords and thesauri.
- Provide system vendors with metadata profile(s) to be included in metadata authoring tools
- Follow up activities with GI producers/owners

## Portal

The portal is build on Arc\_IMS Portal toolkit. The prototype was launched in January 2004. By August 2004 it will be ported to version 1.2 of the toolkit. During this year the geoPortal will be further developed and tuned to satisfy the main goal : *to provide means for users to search for, obtain information on and gain access to geospatial data and information.*

Our experiences with the toolkit so far are positive. It is easy to implement and provides a good framework for implementing a geoPortal. The portal pages are in Norwegian (unfortunately the only language in this version). We have found some discrepancies in the metadata implementation and are currently listing requirements to the metadata implementation in Arc\_catalogue/Arc\_ims metadata service to be conform with ISO19115.

In addition to translation and design work we have made the following changes and add-ons:

In the portal pages:

- Include link to thematic map viewer on homepage.
- Include list of last five published/updated metadata records in the catalogue – news focus
- Minor changes in page structure

In the mapviewer :

- Generate list of available wms services from UDDI catalogue
- Implement placename and gazetteer search over web-services
- Include current scale information (by denominator) in map view

In the search page :

- Display search map in utm (euref89) wgs 84 projection.

We feel that the geoPortal provide relevant and accurate information and is easy to use both as a user and a publisher/data provider. As mentioned earlier, the success of the geoPortal is totally dependent on its content. In the short term (2004) there is a variety of activities to be carried out in an attempt to get as much content as possible into the portal by the end of this year. Activities include:

- Follow up content providers
- Establish an editorial group

- Information and marketing activities
- Test and implement metadata harvesting

## Conclusions

The work with geoPortal so far has lead to the follwing four major conclusions

- The geoPortal is a vital part in the implementation of the Norwegian SDI 'Norway Digital'
- The geoPortal will provide effective mechanisms for dissemination of geospatial data
- The success of the geoPortal is totally dependant on its content

## References

*Stevens, Alan R.* US National Spatial Data Infrastructure: Common Standards ans System Interoperability Paper at GITA JAPAN 14<sup>th</sup> Conference nov.2003

*Douglas D.Nebert (ed.)* The SDI Cookbook, version 2.0. 25. january 2004.

## Links :

<a href="http://www.geonorge.no/portal">www.geonorge.no/portal</a>	The Norwegian geoPortal
<a href="http://www.gdsi.org">www.gdsi.org</a>	The GSDI web site
<a href="http://www.ogc.org">www.ogc.org</a>	The OGC web site
<a href="http://www.iso.org">www.iso.org</a>	The ISO web site
<a href="http://www.statkart.no">www.statkart.no</a>	The NMA web site

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