

National Registries of Sites and Monuments in Norway – Developing GIS-based Databases

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Abstract

The Directorate for Cultural Heritage of Norway is the owner of several national registries of sites, monuments and buildings. This is a presentation of some of the work in progress aimed at establishing these databases on a GIS-platform. Among these databases is the Registry of Archaeological remains; the Foundation for Nature Research and Cultural Heritage Research is responsible for updating and developing it into a GIS-based database in collaboration with the Directorate. Another important new database is the National Registry of Buildings. This paper presents the status for the work done so far, and includes a short description of plans for the future.

Key words: national databases, registries, GIS, archaeology, buildings

1. Introduction and historical background

For more than a century the sites, monuments and buildings of cultural-historical value have been recorded in various registries and by different institutions. The five Archaeological museums located in the cities of Oslo, Stavanger, Bergen, Trondheim and Tromsø (figure 1) concentrated their efforts towards recording prehistoric sites and monuments while the Medieval towns, churches and buildings were covered by Riksantikvaren, the forerunner of the Directorate of Cultural Heritage. The institution became a Directorate ten years ago, and took on a broader set of cultural heritage management responsibilities, including the management of prehistoric sites and monuments as well. It is now one of five environment directorates; the others are the Norwegian Pollution Control Authority, the Directorate for Nature Management, the Norwegian Mapping Authority and the Norwegian Polar Institute. The directorates reside under the Ministry of Environment. In addition, a new regional body of cultural heritage management on the county level was set up. Currently there are 19 regions, each with at least one archaeologist and one buildings specialist, who do the bulk of new registrations and perform the planning and management duties. The Archaeological museums now concentrate their efforts mainly towards excavation of prehistoric sites, while the Foundation for Nature Research and Cultural Heritage Research (NIKU) do the various kinds of registrations and conduct excavations in the Medieval towns.

2. Legal points of importance

The Norwegian Cultural Heritage Act states that all Cultural remains from before the Reformation, which means from before 1537 AD, are automatically protected by law. The same rule applies to Sami remains older than 100 years. The law thus distinguishes between two different age divisions concerning automatic protection, one static and one dynamic. The legal protection for both kinds automatically includes a safety zone stretching 5 meters out from the border of the site. This zone is easy to define around clearly delimited site types, but difficult to define in other cases. Figure 2 shows examples of this. The data used comes from two different registrations. The runic R on the map marks objects

recorded as part of the Economic Mapping registrations in 1968, while the dwelling-sites and find-spots were recorded during a survey of plans for new railway tracks in 1995 (Berg 1995). The area between the two collections of grave mounds is cultivated land so the registration method was field walking. Dwelling sites are identified as collections of artefacts found within a restricted area, while find-spots are single artefacts with no immediately identifiable context. Represented among the find-spots on the map are an amber pearl and a broken whetstone. The security zone around a grave mound or a collection of grave mounds is relatively easy to define. Invisible sites like hunter/gatherer dwelling sites from the Stone Age or farming settlements from the Iron Age are far more difficult to define spatially, since their extensions are not known so well. These sites are defined on the basis of artefact finds in test-pits or in modern-day fields, and most often simply marked by a point on the map. Find-spots where single artefacts are found are not automatically protected, but are mainly used for prediction purposes at evaluating an area.

Changes in the Cultural Heritage Act, which are due to take effect in 2001, provide that registration of an automatically protected object or area shall be regarded as such until proven otherwise. The Directorate is the sole authority with the right to search for and record cultural Heritage remains according to this section of the Act, but may delegate this authority to the regional level, NIKU or the Archaeological museums, authorising them to carry out the registrations. Furthermore, the field registration must be followed by an entry into an *official, national registry*. A formal procedure for entry and deleting the records in the Registry must be worked out, because of the legal implications of entering an object into such a registry. This is a reversal of current legal procedures. In the past, when an object was partially or wholly destroyed, the cultural heritage authorities had to prove that it was automatically protected. Now the Directorate will be given the authority to decide whether an object is automatically protected or not.

The changes in the Act mean that we have to work out better procedures for informing owners of land with automatically protected sites about the location and type of object. Laymen are not expected to recognise sites like Stone Age dwelling sites with no visible markers above ground, or to understand that a pit in the

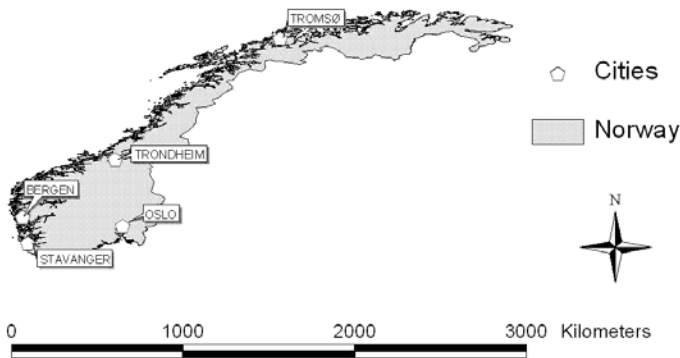


Figure 1: Map showing the location of the five cities with Archaeological museums responsible for recording Archaeological sites and monuments.

ground really is a Viking Age - Medieval coal-pit used in iron extraction.

More precise placement of the location of objects and areas by coordinates. The most widely used method of placement of registrations is still by marking the location on a large-scale map, and digitising it later on. With the increasing use of GPS to determine precise locations, this procedure will be reduced to one stage instead of two. Another important document is the Norwegian Mapping authority's new standard for property information (1999). This document clearly states that coordinates and a representation point must delimit the location of the areas protected by the Cultural Heritage Act. The decision on how the location of single objects is to be represented is left to the Cultural Heritage authorities. Here we will have to define the margin between object and area. Since we no longer map at a specific map scale, single objects, such as big grave-mounds, may cover an area large enough to be represented as a coordinate - enclosed area, not as a single point in the case of large map scales 1:1000, 1:500 or bigger.

Improving the quality of location data for existing sites and monuments already in the registry. There are several examples that this data is not always precise enough, and sometimes completely wrong. This work must be done mainly in connection with the planning of the work, new surveys or registrations in an area, by checking the location against the map and by new GPS measurements.

3. Existing databases

The table 1 shows the databases kept by the Directorate of Cultural Heritage. Of these only the National Registry of Buildings, the Archaeological Remains Registry and the Rock-Art database are available on-line for management authorities on different levels. The rest are strictly internal registries, and the Directorate must be contacted if anyone wants to get information about objects in them. This situation cannot continue as such, it will be essential to convert these registries into a more coherent and usable form.

3.1. National Registry of Buildings

This registry is a novelty that came into being February 2000. The contents are a merger of two building registries. One is the Buildings part of GAB (short for property, addresses and buildings in

Elvestad farm, Råde municipality, Østfold county

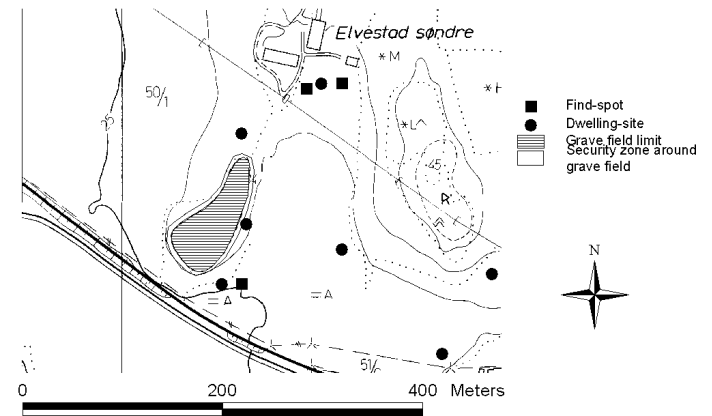


Figure 2: Elvestad farm, examples of various site types and security zone.

Existing databases	
Buildings and Installations	Archaeological remains
National Registry of Buildings	Archaeological remains Registry
Registry of legally protected Buildings and Installations	Rock-Art database
Church Registry	Medieval ruins Registry
Project databases:	Medieval cemeteries Registry
Light-house Registry	
Industrial sites Registry	Post-Medieval sites not automatically protected by law
Historical Gardens Registry	
20th century Architecture	

Table 1: List of databases kept by the Directorate of Cultural Heritage

the Norwegian language) maintained by the Norwegian Mapping Authority. This registry contains technical information used by local administrations on the municipality level, mainly for younger buildings. Local authorities update this registry on a daily basis. However, for older buildings, the information is inconsistent. The second registry was the result of a 25-year programme called SEFRAC, to record all buildings from before 1900 AD in southern Norway. In the northernmost part of the country the limit was 1940, as large parts of northern Norway were burnt at the end of the Second World War. The Directorate of Cultural Heritage and the regional authorities on the county level maintained this registry. It was difficult to properly update it, especially the information on ownership changes. By merging the two essentially identical registries, in the sense that both were concerned with standing buildings, resulted in a single registry, which is far easier to update and maintain. All the cultural and historical information collected during the SEFRAC-buildings registration is found in the new National Buildings Registry. It is still operated by the Norwegian Mapping Authority. The regional cultural heritage management authorities will update cultural and historical information, while technical and ownership information relating to buildings will continue to be updated by municipal authorities. This registry is primarily a building registry, not a cultural and historical database. Of the 500,000 buildings older than 1900/1940 probably less than 50 % are of a cultural or historical value. Those of such value will need a place where broader information

Archaeological Remains Registry		
Data sources	Site-types recorded	Coverage
Economic Mapping registrations from 1963	Automatically protected sites, mainly visible types like grave-mounds	Populated areas and agricultural land in all counties
Topographic registrations predating Economic Mapping	Almost exclusively visible, monumental types	Populated areas and agricultural land in some counties
Project registrations	All kinds of automatically protected sites, visible and invisible	Interior and coastal areas affected by large-scale construction projects
Small-scale registrations and surveys connected with zoning	All kinds of sites both automatically protected and post-Medieval sites visible and invisible	Nationwide, mostly populated and agricultural areas
Heritage management projects national and regional level	All kinds of sites both automatically protected and post-Medieval sites visible and invisible	Areas not well represented otherwise: mostly large interior woodland areas

Table 2: The Archaeological Remains Registry most important data sources.

than what the National Buildings Registry can provide will be stored.

All the data on the buildings in the registry is in digital form. During the year 2000 a small number of legally protected buildings registered in the internal database at the Directorate will be transferred to the National Buildings Registry and thus be digitised. These buildings were not a part of the SEFRAK programme registrations, and therefore could not automatically be included in the merging of the two registries.

3.2. The Archaeological Remains Registry

Table 2 shows the most important data sources that make up the Archaeological Remains Registry. The majority of registration work has been done in populated areas though some of it is associated with hydro-electrical projects, concentrated along river valleys in the mountainous parts of the country. Large parts of Norway's interior are therefore not covered by any kind of survey or registration.

Representation of different types of sites and monuments varies greatly. Visible monuments like grave mounds have the best geographical coverage, while invisible types like dwelling sites from the Early Mesolithic are to present day highly underrepresented. Site types common in woodland and outlying areas are also seriously underrepresented. They are mostly known from big projects where the registration methods covered all kinds of sites, not primarily the visible ones. This is mainly due to economic reasons: It is obviously more time consuming to look for invisible sites than to look for visible ones. At accepting or rejecting a construction plan the regional authorities, tend to use modern zoning registrations. This is an attempt to cover all kinds of sites, both automatically protected features, and the Sami remains. Large-scale registration projects connected with construction plans are often undertaken by NIKU, and also aim at including all kinds of cultural remains, regardless of visibility or age.

4. The purpose of the Database

The most important function of the database is Cultural Heritage management. The site type, age and location are prioritised. The information about the physical state of a site and whether or not it is included in an upkeep programme is recorded. Any legal dispensations must also be recorded. When a dispensation is granted,

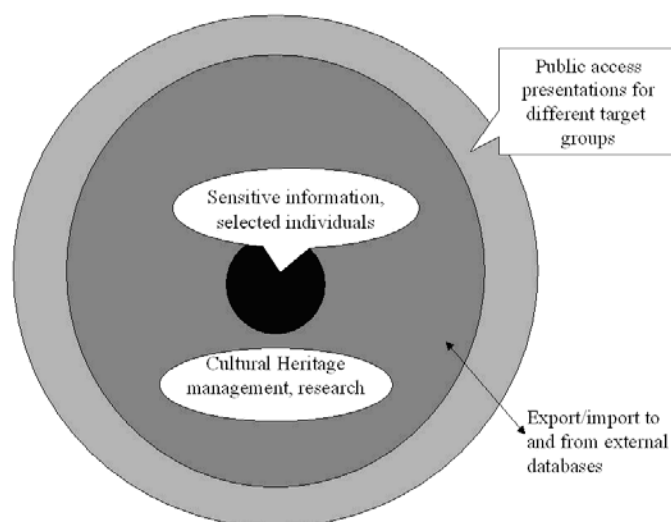


Figure 3: Principle of access to the Archaeological Remains Registry.

it is usually under the condition that excavations are conducted at the site and documented before construction works may commence. The Act contains several ways by which dispensations can be obtained. The most common way is in connection with zoning, but it also provides for finds occurring during construction work and for cases where there is no zoning plan in place. Another paragraph deals with research - excavations. The database must contain information about which paragraph and which section of that paragraph grants the dispensation. The status "automatically protected" is removed from the site, but the site itself is not deleted from the database. All information is kept for historical and research-purposes, but it no longer figures on the maps as a protected object or area.

5. Who will have access to the Database

Figure 3 shows the principle of various degrees of access to the database. The outer ring represents information directed towards the public in the form of presentations aimed at specific target groups. The second level contains the bulk of the information in the database, except for extremely sensitive information. Access is provided by password. The primary users will be the Cultural Heritage authorities, Archaeological museums and university teaching establishments, and the Foundation for Nature Research

Rør søndre farm, Rygge municipality,
Østfold county

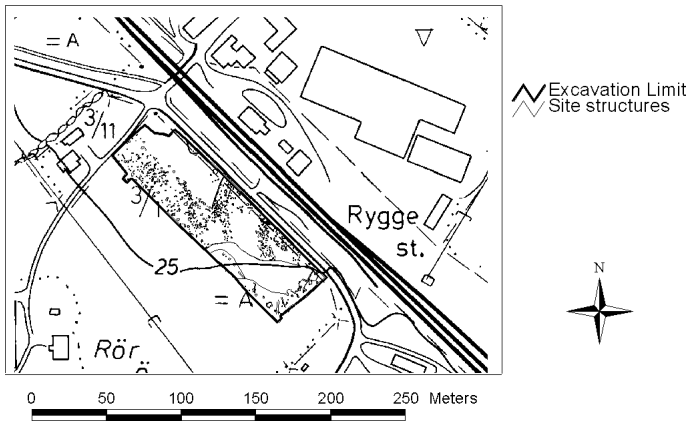


Figure 4: Rør søndre farm with excavated area and structures.

and Cultural Heritage Research (NIKU). The innermost ring represents information restricted to select individuals in cultural heritage institutions. What will be placed on this strict level must be determined in co-operation with several parties, especially the Sami cultural heritage authorities. Some of the Sami site types are sensitive in terms of the spreading of information.

The database will be linked to GAB to which it will transfer key information about automatically protected sites, including their coordinates. In return it will import updated information about ownership and about changes of the property boundaries. The last factor is important since the rural landscape is currently undergoing massive changes and farms are being merged into bigger units for economic purposes. GAB will also provide a good opportunity for solving the problem of notifying owners of the legal status of their property. Since all the updated information about owners, addresses and property is kept here, it is easy to mail information to the right people. GAB is the most important tool for municipalities regarding owners, addresses and property - and the information is regularly updated.

The general public will not gain access to the database in the form it is now. Presentations directed at different user-groups, for example schools, are planned but have not yet been initiated. This is due mainly to the fact that the work to establish the GAB connection is a priority task. After this link is well established, the public education orientated tasks will be undertaken.

6. What information the Database contains, and what it does not

Automatically protected sites, mainly prehistoric and medieval, outside of the Middle-Age towns, are the most numerous site types. The cultural layers in the medieval towns form a very complex situation when it comes to placing them into a database together with objects and areas far simpler in structure. Most of the information about medieval urban cultural layers will therefore be found elsewhere. A fair number of Sami cultural remains can be found here, but big databases are also operated by various Sami institutions. We must therefore solve the problem of what to incorporate in the database and what should be located elsewhere in co-operation with the Sami cultural management authorities.

Rør søndre farm, Rygge municipality,
Østfold county

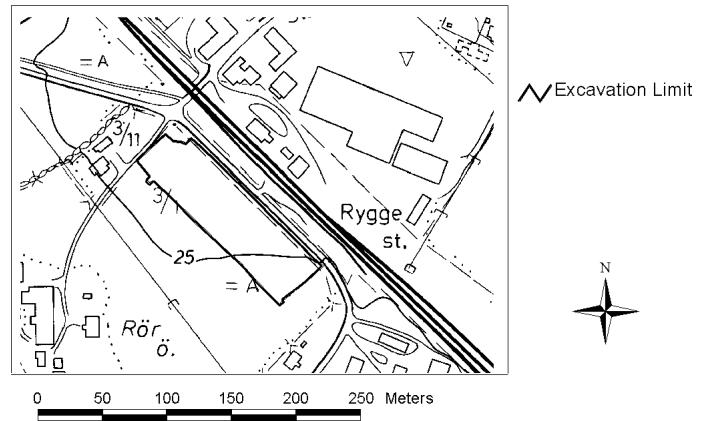


Figure 5: Rør søndre farm with excavation boundary shown.

There are major differences with respect to the site types covered by various kinds of registration and surveys. These differences are reflected in the database. Representation is biased, focusing mostly on visible and monumental sites, while dwelling sites and other invisible site types are seriously neglected. This situation can only be improved through time, with new registrations being added to the database. In addition, there are several projects trying to tackle the problem of prediction, to compensate for the fact that it is impossible to register all invisible sites, and all the sites in large woodland areas, visible or invisible.

The most severely underrepresented category are the post-medieval sites that are not buildings or installations. No national programme for surveying and recording such sites has ever been initiated. The SEFRACK project did attempt to include such sites, but had to give it up due to time and financial limits. About 10 000 objects were recorded by SEFRACK, with large variations between the counties. These records are currently difficult to access, since they could not be included with the SEFRACK-buildings in the merger with GAB, but they will be incorporated into the Archaeological Registry. Some post-medieval objects were recorded during the Economic Mapping registrations, and a steady stream of new sites is coming into the registry from zoning registrations on the county level.

As of June 2000 roughly 73,000 sites have been recorded in the Archaeological Remains Registry. Of these, nearly 46,000 have been prepared for digitising and 29,000 of these are completed. Over the next couple of years the number of digitised objects will rise due to more effective procedures of digitising on raster-maps (NIKU 1. Half year report 2000). The most important work for the rest of 2,000 is to add these coordinates into the database, making it fully functional for GIS use.

7. The interface between the archaeological museums' topographic databases and the registry

After a rescue excavation conducted by one of the Archaeological museums or NIKU is completed, the quantities of documentation relating to finds and structures are amassed. This information belongs to the excavating unit, but it is also public in that it is the result of an official decision. The report is sometimes published,

most often not since most excavations are too small to be published alone. The report is a public document, and some of the information in it must be sent to the registry. The example used here in figures 4 and 5 is an excavation related to the building of a new railway line and new station in Rygge municipality, Østfold county, conducted by the author in 1996 (Berg 1997,1998).

7.1. Proposal of a division between management and museum's databases

This site contained the remains of a Roman Iron Age farm in the form of five house foundations, but also a series of traces of older activities. An early Bronze Age cultural layer/refuse area with remains of cereal threshing, a votive find of flint flakes from the Late Neolithic - Early Bronze Age and post-holes dated to the Late Neolithic, cooking-pits from Pre - Roman Iron Age, indicating that this site had been in use for a very long time, and that the discovered farm-houses represent the location of a mobile farm at a particular point in time. The excavation boundary is the extent of the zoning plan for the new railway station and line. There is every reason to believe that the site stretches further into surroundings on all directions. Construction and buildings have not destroyed the land only in the south-west direction towards the modern farm buildings. The Registry therefore needs the information about the exact location of the excavation boundary, the site type and the date. Coordinates should represent the boundary, the rest must be extracted from the documentation kept in the museum's electronic and manual archives. So, from this situation, the registry will need the *boundary coordinates*, but not the coordinates of each structure inside the area. These are stored in the museum's database with the rest of the documentation. Also the museum's artefact number will be stored in the Registry, to provide a link between databases.

7.2. Another such division is between finds and find-spots

If the find-spot of an artefact can be located well enough for it to be represented by a point coordinate, the information about the place and a short description of the artefact and dating information will be found in the Archaeological Remains registry, together with a reference in the form of the museum's artefact number. The traditional description of the find will then be available in the museum's database. Concerning finds which cannot be located precisely enough to give them a point coordinate, the information about artefact can only be obtained in the museum's database.

8. The future

Table 1 shows the numerous databases in existence. Now that we have finally managed to gather together the Archaeological

databases and merged them into one, and that we have only one Buildings registry, the next goal for The Directorate of Cultural Heritage of Norway is to expand the new Archaeological database to a comprehensive cultural-historical database about all kinds of monuments, buildings and sites. A plan and a rough data model for this merger has been approved (Steinnes et al. 2000), and will be forwarded to the regional level and the research institutions for comments and suggestions during the second half of 2000. The expanded database is expected to be in operation by the end of 2002. This new database is to be based on GIS and every object in the database will be digitised. By collecting all the various sites together in a GIS-structure the new possibilities for analysis and presentation will expand dramatically.

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