

NOKIS - Information Infrastructure for the North and Baltic Sea

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Abstract

1. General

The initial motivation for the project NOKIS (German title: Nord- und Ostsee-Küsteninformationssystem) was the absence of an infrastructure for the exchange of geodata across administrative boundaries between the German wadden sea national parks and other governmental administrations (e.g. from water management and administration of waterways and navigation) on federal and state level. Today, within NOKIS around 20 partners from administration, research and industry are cooperating. The focus of the participants moved from the mere goal of an information system towards the shared internet-based use of existing geodata.

The technologies and concepts in NOKIS reflect the common objectives of the participating partners, but they also grew from their different interests, problems and tasks. Some of the frequently discussed topics in the project since its start in the year 2000 are data and privacy protection, criteria for the distribution of data and the handling of the copyright of data. The micro cosmos of federalism in Germany can be seen as a biotope, in which the tasks, problems and their handling of the data exchange across institutional and administrative boundaries can be studied. First steps have been done to establish NOKIS as an institution.

2. Use of Standards

From the beginning, NOKIS made use of existing and emerging standards. In the field of geodata, the ISO 19100 suite of standards concerning the standardization of metadata is already the de-facto standard for the erection of new geodata infrastructures (GDI). The NOKIS network uses especially the parts ISO 19115 (ISO 2003), ISO 19119 (ISO 2005) and TS 19139 (ISO 2007). In the developing network of different GDI's, the use of exchange standards is important for the interoperability of systems. NOKIS contributes to the interoperable network by using standards from the Open Geospatial Consortium (OGC) and from the German implementation of the OGC ISO Application Profile for CSW (Catalog-Service for Web, CSW); Open Geospatial Consortium 2005) named DE-Profile (Länderübergreifender Arbeitskreis Metadaten 2005).

Within NOKIS, a profile of the ISO 19115 has been developed, which meets the needs of the coastal community. To enable the documentation of time series and research projects within the same system, metadata schemas have been developed to include the necessary information.

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3. Applications for NOKIS

3.1 Editor

The NOKIS editor is the central tool for the generation and maintenance of metadata records. This software helps the user in creating valid ISO 19115/19119 metadata by indicating missing or wrong elements and by providing aids for the editing of certain elements. It helps the user by providing template mechanisms for the generation of metadata for similar data sets and through the possibility to import metadata from other applications (e.g. ESRI ArcGIS Metadata).

In order to make the software usable in a context of greater institutions, a workflow mechanism is included. It allows for the restriction of the visibility and of the editing functions by the administrator.

A context-sensitive help system is included, which supports the editor in the creation of the necessary metadata elements. The experience in the first project NOKIS (2001-2004) showed, that the modern metadata standards are far from being intuitively comprehensible.

The editor itself is an application which uses a browser as the frontend. The content is generated using Apache MyFaces and different libraries which provide special implementations for the Java Server Faces specification (Burns 2006).

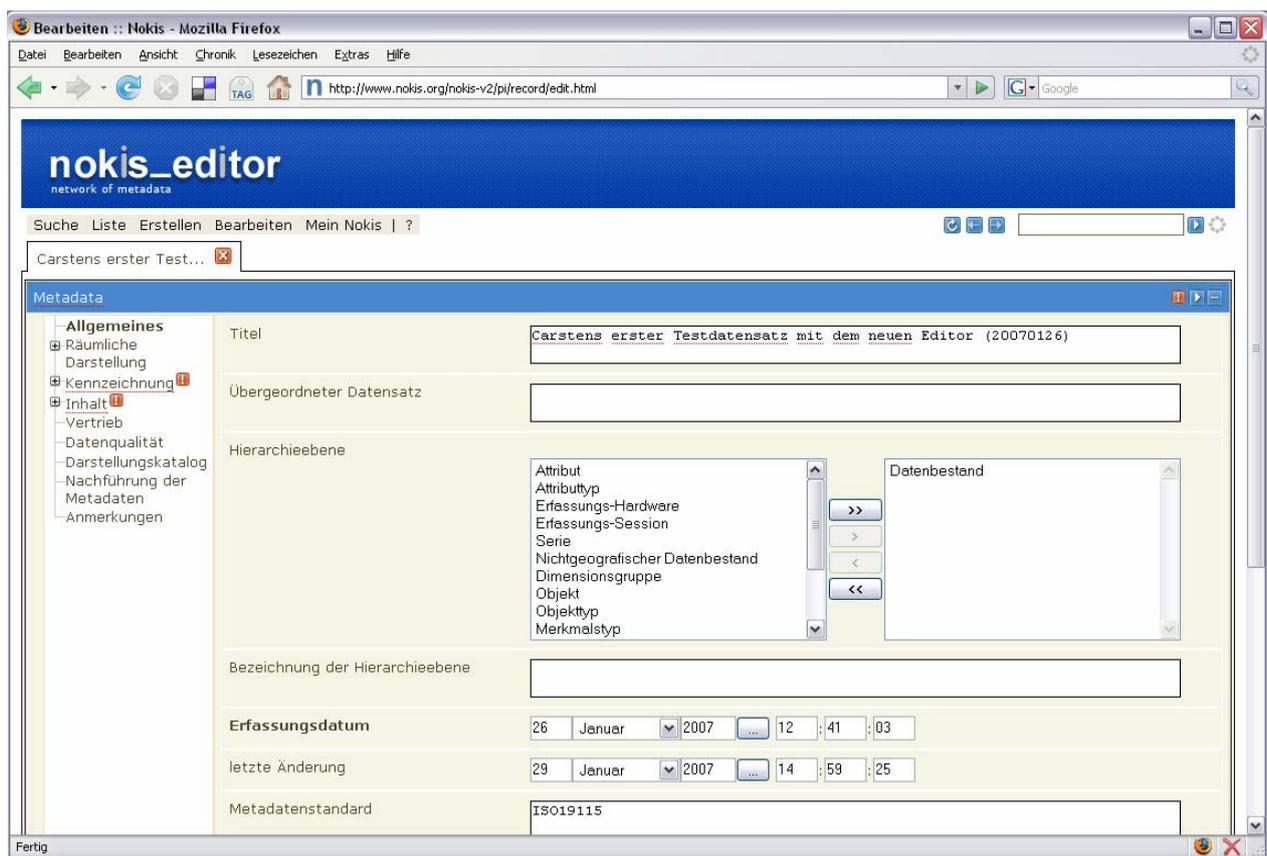


Figure 1: The NOKIS Editor

3.2 Planning Tool

One of the most asked-for applications within NOKIS is the planning tool. It exists in different customizations: as a planning tool for the coastal survey planning and as a monitoring network planning tool for the Water Framework Directive (European Parliament 2000). The Planning Tool offers the user a Rich Client Frontend for the generation of planning information. It allows data import from different GIS formats and stores its information in a configurable NOKIS metadata repository, making it searchable for other applications, using the CSW interface.

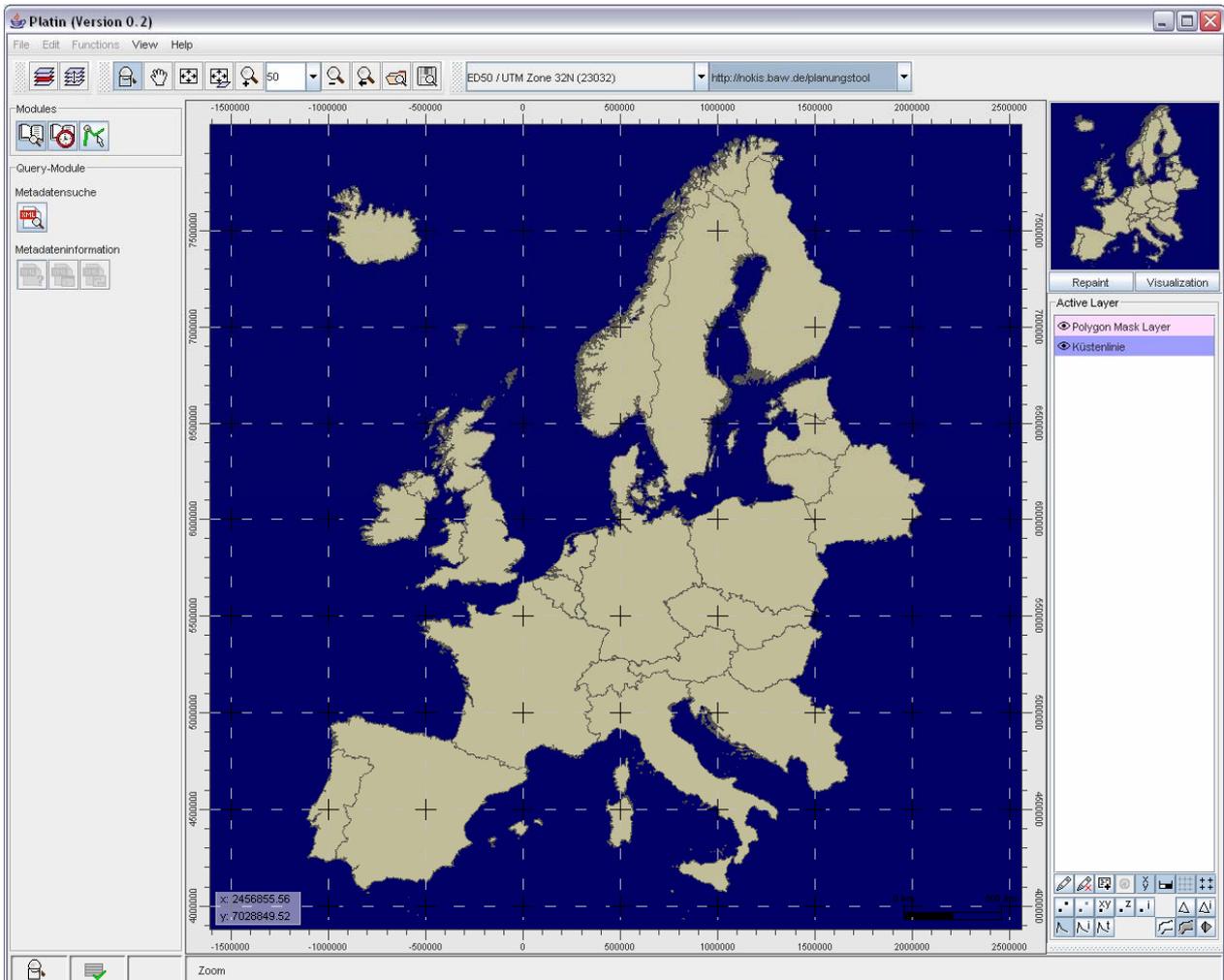


Figure 2: Planning Tool for Coastal Surveys

4. Services

4.1 Catalogue Services

The NOKIS infrastructure uses OGC Catalogue Services for the data exchange between different NOKIS metadata nodes or with other GDIs. The CSW interfaces delivers DE-Profile and NOKIS conformant

metadata. Through the use of this standardized interface, all services can operate with the same technology. With the upcoming release of the NOKIS software in version 2, a NOKIS instance will provide a OGC CSW interface for the OGC ISO Application Profile 1.0, ensuring an easy integration with existing infrastructures.

4.2 Coordinate Transformation Service

NOKIS provides a web service for the transformation of coordinates between different systems. It is based on the freely available projection library PROJ.4 (PROJ.4 2007). It provides the possibility to transform point coordinates between known and describable cartographic projections.

A web service for the transformation of complete ESRI shape files is planned for summer 2007. It also uses the projection library PROJ.4 and will be accessible for the partners of the NOKIS project.

4.3 Gazetteer

Geographic information is mostly associated with place names, which are themselves elements of a hierarchic system. To establish effective search procedures the systems of place names are modelled in a gazetteer which also allows to transform those names to representing geometries.

Data structures and services related to a gazetteer have been established during realization of the information system NOKIS. The investigation area of the gazetteer is the water zone of Germany's sovereign territory extending 50 km into the hinterland. For the word-pool heterogeneous material, with actual and historic names and geometries, is collected. It is used for critical examination of the present gazetteer concept and also to assess the deviation from the data-model and services.

4.4 Tools to analyze and present data

NOKIS contains metadata of coastal data. But also a direct link to the datasets could be stored and associated with services for presentation and basic analyses. For this a collection of tools will be prepared. Geodata could be displayed by Web-Map-Services, measurements of wind could be explored with an interactive tool. Other services will be add to this toolbox after an examination the primary requirements of the partners community.

5. NOKIS and the GDI.DE

NOKIS participates in the German Geodata Infrastructure (Geodateninfrastruktur Deutschland - GDI.DE) by providing metadata through its catalogue service. Members of the NOKIS project actively contribute to different working groups within GDI.DE and NOKIS propagates the German translation of the elements and code lists of the ISO 19115 standard.

6. Conclusions and Outlook

With its bottom-up approach towards the generation of metadata, NOKIS has met the requirements of the German coastal community. The inclusion of the actual stakeholders showed many difficulties of the prevailing attempts to implement metadata infrastructures without considering the needs of the data originating institutions.

In order to enable the further spread and development of the NOKIS system, a consortium will be established to fund and coordinate future action.

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