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Schleswig-Holsteins Environmental Atlas for the Public and for Special Interest Groups

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Abstract

Etwa 70% der Umweltinformationen haben einen Raumbezug. Auf einer Karte lassen sich die Informationen oft leichter vermitteln. Die Darstellung erfolgt heutzutage auf interaktiven Karten mit sogenannten Web Mapping Produkten.
Auch Schleswig-Holstein – das nördlichste Bundesland Deutschlands, zwischen Nord- und Ostsee gelegen – verfolgt diesen Ansatz des Internet-basierten Angebots von raumbezogenen Umweltinformationen (Jessen/Schneberger 2002).
Die Basistechnologie ist der Minnesota MapServer. Auf dieser Basis wurde eine Anwendung im Layout der Landesregierung entwickelt (MUNL 2003b).
In dem sich anschliessenden Projekt haben das Landesamt für Natur und Umwelt Schleswig-Holstein (LANU) und die T-Systems GEI GmbH (Leipzig) im Rahmen der Initiative „New Media Schleswig-Holstein“ eine Reihe weiterer Funktionalitäten erarbeitet (Görtzen et. al. 2003, LANU/T-Systems 2003). Dazu gehören eine Nutzer-Rollen- und Themenbasierte Rechteverwaltung und die Unterstützung der Mehrsprachigkeit. In der ersten Ausbaustufe ist der Umweltatlas in deutscher und englischer Sprache nutzbar.

1. Introduction

Schleswig-Holstein, the northernmost german federal state between the seas – the North Sea in the west and the Baltic Sea in the east – has built up an environmental atlas in the internet basing on the map server of the university of Minnesota (Lime 1996-2001). The changes and improvements over the years are documented in the corresponding articles accompanying the development, i. e. Jessen/Schneberger 2002, Görtzen et. al. 2003 and this paper in 2004.

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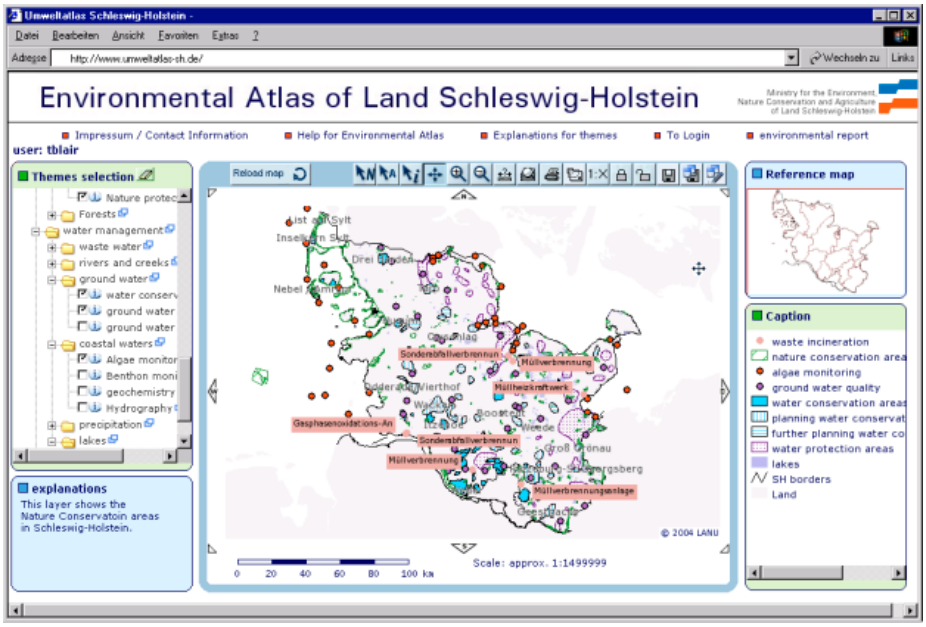

Figure 21: The Environmental Atlas Schleswig-Holstein for a named user with all available system rights

This article focuses on the atlas user point of view in terms of the powerful rights administration. According to the rights defined for the particular atlas user more or less items are shown in the theme explorer. The theme explorer is part of the presentation layer. It is arranged in the frame „Themes selection“ on the left hand side of the atlas (see Figure 21). The structure of the items in the theme explorer is identical to the environmental report Schleswig-Holstein (MUNL 2003, Rammert/Hosenfeld 2003) down to the second level. Every leaf in the theme explorer represents a theme, including typical environmental themes like lakes or nature conservation areas.

2. Rights administration and its meaning for the atlas user

The environmental atlas is available via internet (MUNL 2003b). Its appearance, however, and the scope of service can vary substantially. This is caused by the powerful rights administration.

2.1 Idea of minimal changes to the base

The environmental atlas is a considerable wrapper application around the Minnesota MapServer. But from the very beginning of the development the idea was to change as much as required but no more than needed. In this sense the map file of the Minnesota MapServer hardly hasn't changed. There is a so called default map file that holds all available themes for the environmental atlas along with the presentation rules of these themes. A particular difficulty was to develop the multilingual support of the atlas. Any number of languages is supported. The default map file may contain any number of language keys which are exchanged with the appropriate language elements for each language by the administration application. In the first increment we offer the atlas in german and english language.

2.2 The rights administration

The rights administration holds all named users plus the anonymous user in an oracle data base. It is possible to map an atlas user to a user on an LDAP server anywhere in the world.

Additionally all roles are stored. Users may have any number of roles. With the roles concept it is possible to assign a user to any number of closed user groups. This gets clearer with the following explanations.

The rights assignment is identical for users and roles. If there is a group that needs a well defined set of rights on a well defined set of themes the atlas administrator assigns the rights to one or more roles representing this group. If the group members change the administrator simply adds or takes away the role to or from a user. So it is possible to define a group without knowledge about the members.

Scenarios for closed user groups are

1. the processing territory associations for the water frame directive,
2. engineering offices for special environmental projects and
3. the municipal administration of Flintbek – location of LANU.

2.2.1.1 System rights

The environmental atlas knows the following system rights:

1. general access: suspend user access if right is withdrawn
2. download: download the visible map as raster or vector graphic or download the attributes as csv
3. query: query the chosen theme on the map
4. bigmap: show map as image with 1024 x 768 pixels

5. print: generate layout of the visible map and legend ready to print
6. dzoom: free scale choice
7. nsearch: name based search, i. e. itemquery on a fixed attribute of the chosen theme
8. asearch: attribute based search. The idea is an itemquery on any attribute. This feature is a complete application. The search on external data base attributes is supported, simple comparison expressions may be concatenated to complex search expressions.
9. personin: store personalized data and queries
10. personout: load stored personalized data and queries
11. administrate: administrate the atlas application

The system rights control the general access to atlas features. For each user and role each system right is activated or deactivated.

2.2.1.2 Theme rights

The concept of theme rights for each atlas user or role is a highlight of the environmental atlas. To realize this concept it is necessary to store the themes in a data base. This is done automatically by the administration application by parsing the default map file (see chapter 0).

The atlas administrator is able to edit the theme rights for each user or role. It appears as a matrix. All available themes according to settings in the default map file are arranged one theme per line. The available theme rights are arranged per column. The administrator sets the theme rights by ticks in the matrix fields.

The system rights are stronger than the theme rights. If a user or role doesn't have a system right the corresponding theme right is ignored.

The available theme rights are

1. general access,
2. download,
3. bigmap,
4. print,
5. query,
6. nsearch and
7. asearch

according to the notations in 0.

So if the atlas offers 75 themes (actual number of themes in the beginning of 2004) the atlas administrator may assign up to 75 multiplied by 7 theme rights ticks. That is a total of 525 ticks per user or role!

Furthermore the atlas administrator may define the permitted map extent by two catercorner coordinates as well as the minimum and maximum allowed scale for each theme for each user and role!

2.3 Idea of minimal changes to the base, continued

The concept to have a map file that controls the behaviour of the Minnesota Map-Server is kept. The atlas rights administration is not mapped to the Minnesota Map-Server. Instead the rights are mapped to the atlas application. The theme explorer evaluates the rights of the user. Only those themes are offered that match the theme rights of the user or the theme rights of a role assigned to the user.

2.4 Behaviour of the atlas for different users

2.4.1.1 The open group of unnamed users

If an atlas user is not explicitely logged in he or she is treated as unnamed or anonymous user. The anonymous atlas user has a fixed set of rights and available themes with fixed theme rights as described above. Moreover the presentation layer is different. There are only these buttons to operate on the map:

1. refresh map,
2. query: the „i“ or „info“ button,
3. pan,
4. zoom in,
5. zoom out,
6. distance measure,
7. show full extent,
8. log in.

2.4.1.2 The named atlas user

For the atlas user who successfully logged in there may be more features in the presentation layer. Normally all buttons of the anonymous user plus a selection of the following may be available:

9. show map in 1024 x 768 pixels if system right „bigmap“ is activated,
10. print map if system right „print“ is activated,
11. name based search if system right „nsearch“ is activated,
12. attribute based search if system right „asearch“ is activated,

13. free scale choice if system right „dzoom“ is activated,
14. download if system right „download“ is activated,
15. store query if system right „personin“ is activated,
16. load stored query if system right „personout“ is activated.

The system rights are described in chapter 0. In the special case that all these system rights are deactivated for a user as well as the system right „query“ a named user has fewer features in the presentation layer than the anonymous user.

The stored queries are quite powerful. The complete context is stored including the theme explorer view, the chosen themes and the map extent of the visible map. Moreover the search expression of the attribute based search is stored if appropriate.

As described in chapter 0 the available themes in the theme explorer – in the upper left corner of the presentation layer, see Figure 21 – may vary for each user. There may be more or less themes compared to the anonymous user according to the intention of the atlas access.

As an example the closed user group of employees of the municipal administration of Flintbek wants to use the atlas as application for their own themes. These employees are named users with the common role „municipal_administration_flintbek“.

3. Prospects

We report about the environmental atlas in the third year now (Jessen/Schneberger 2002, Görtzen et. al. 2003). In the first year we were glad to have a cheap and valuable tool to view gis data at any workplace. In the second year we had visions to improve the tool. In this year we are proud to present our improved tool. Just mentioned briefly in chapter 0 is the support for the lightweight directory access protocol (LDAP, RFC 2251). If configured in the atlas administration application, the login procedure in the atlas application checks particular logins against LDAP user entries on registered LDAP servers.

The attribute based search is quite powerful. We mentioned it briefly with the system right „asearch“ in chapter 0. Another feature of the atlas is the multilingual support as referenced in chapter 0.

At the same time we try to implement our unsolved and new visions. A very concrete vision is support for a web map service (WMS) infrastructure. The concept is elaborated.

Another construction site is to establish the environmental atlas application for the whole government of Schleswig-Holstein. It shall be part of the geodata infrastructure of Schleswig-Holstein and shall be compatible with the metropolitan region of Hamburg. The WMS concept may help to master these challenges.

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