Schleswig-Holstein Provides Environmental Data for the German Geo Data Infrastructure and Offers a Public Available Geo Thesaurus

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1. The geo data infrastructure

Germany built a complex administrative network to ease the way to construct a homogenous geo data infrastructure (GDI DE). The administrative office is situated at the federal agency for cartography and geodesy (BKG) in Frankfurt. The federal states are involved. Their coordinators are typically representatives of the land surveying offices or the Federal Ministries of the Interior. This is quite the same for the geo data infrastructure of Schleswig-Holstein (GDI SH).

The standards to establish have to base on the ogc specifications as to mention the web mapping service (wms), web feature service (wfs), and web catalogue service (wcs). So the goal for each geo data partner is to take care for his own data and to provide it by the specified standards.

To make things more complex, the geo data in the federal states are distributed over a number of administrative and other sites and they are not necessarily homogenous. The goal for each federal state is to offer this distributed data with one portal. Fortunately the ogc services are cascaddable. So the distributed geo data may reside where they are as long as they are queryable by the ogc protocols.


All involved servers span a tree. The root of the german tree will be the German geo portal (www.geoportal.bund.de). This concept was published at the fair “Intergeo” in Düsseldorf last year.

In the future there will also be a european root one day as specified by the Initiative “Infrastructure for Spatial Information in Europe” (Inspire).

2. The Environmental Atlas of Schleswig-Holstein

We reported about the environmental atlas continuously (Jessen/Schneberger 2002, Görtzen et. al. 2003 and 2004). Its base is the open source Minnesota map server in version 4.x. It is part of the environmental report of Schleswig-Holstein (www.umweltbericht-sh.de) and is also accessible directly as www.umweltatlas-sh.de in the internet. A fine grained rights concept was developed and implemented.

The latest improvements were realized in the year 2005. The OGC Web mapping and web feature services (WMS and WFS) were included into the rights administration. Name based operations and services were provided. Several process support mechanisms for named users were realized.

3. Web map service and web feature service

All themes in the environmental atlas must explicitly be granted for OGC web map and web feature service (wms and wfs). As a result a separate configuration file is generated for the ogc queries.

In addition the environmental atlas administrator registers the web mapping servers by ip address who are allowed to query wms and wfs themes. This part of the query handling is not specified by the ogc standards. If the server is not registered for ogc queries an error message returns.
4. Data provider for the GDI SH and GDI DE

The environmental atlas of Schleswig-Holstein will be a data provider for the geo data infrastructure of Schleswig-Holstein (GDI SH) and as a consequence also a data provider for the GDI of Germany (GDI DE). Therefore the environmental atlas is already mentioned on the German geo portal in the section "geo viewers" and the subsection "map offers" (see chapter...gdi...).

According to the concept of the digital atlas of Schleswig-Holstein the environmental atlas is a leaf of the gdi tree as specified above.

Technically it is no problem for the environmental atlas to rise to a node. This could be necessary if there are environmental data from district administration servers to integrate.

5. Name based operations

The environmental atlas offers two name based functions.

The first function is the tooltip facility. For one marked theme it shows the name of the geo object of that theme if the mouse moves over it.

The second function is the name based search. It provides a query mechanism to search geo objects from one or more themes by their name. This function may be executed interactively while using the environmental atlas. On the other hand this function may be used as web service. The user controls the way the result is presented. More information about this web service is provided in the chapter "the geo thesaurus".

6. The geo thesaurus

The geo thesaurus has been introduced in the chapter “name based operations”. It is a web service to find geo objects by name. The following params may be specified. At the moment only german vocabulary is supported. The exact german values are specified in brackets.

<table>
<thead>
<tr>
<th>Param name</th>
<th>Permitted values</th>
<th>Required</th>
<th>Default value</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function (Funktion)</td>
<td>Search (Suche)</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theme (Thema)</td>
<td>Comma separated list of theme names</td>
<td>No</td>
<td>(All themes)</td>
<td>Themes to be shown on the map. Omit defaults to all themes.</td>
</tr>
<tr>
<td>Search theme (Suchthema)</td>
<td>Comma separated list of theme names</td>
<td>No</td>
<td>(All themes)</td>
<td>Themes to be searched. Omit defaults to a search in all themes.</td>
</tr>
<tr>
<td>Search string (Zeichenkette)</td>
<td>Any string</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison (Vergleich)</td>
<td>Exact (exakt) beginning (anfang) / contained (enthalten)</td>
<td>No</td>
<td>Exact (exakt)</td>
<td>Type of comparison</td>
</tr>
<tr>
<td>Ignore case (Grosse-Kleinignoren)</td>
<td>Yes (ja) / no (nein)</td>
<td>No</td>
<td>Yes (ja)</td>
<td></td>
</tr>
<tr>
<td>Result (Rueckgabe)</td>
<td>HTML / XML / Atlas</td>
<td>No</td>
<td>Atlas</td>
<td>If Atlas is specified the hits are shown in this format.</td>
</tr>
</tbody>
</table>

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environmental atlas, else the hits are listed in html or xml format.

<table>
<thead>
<tr>
<th>Zoom</th>
<th>Yes (ja) / no (nein)</th>
<th>No (Nein)</th>
<th>Zoom to the hits in the map if param &quot;result&quot; evaluates to &quot;Atlas&quot;</th>
</tr>
</thead>
</table>

The result is presented in the environmental atlas by default. If you specify the result (Rückgabe) as "HTML" or "XML" you get the appropriate results as formatted text for further evaluation. The Html hits are hyperlinks to start the environmental atlas with the matched pattern in the specified theme.

7. Environmental data for the geo data infrastructure

Quite a lot of information about air quality, soil, nature conservation, ground water, coastal waters, lakes and rivers as well as waste treatment plants are provided in the internet. The information is generated at query time from copies of the production database in the demilitarized zone. Typically these are informations about the measurement points with some measurement values.

8. Water frame directive data for the geo data infrastructure

The water management administration decided to provide water frame directive data in the environmental atlas of Schleswig-Holstein. The water types and water bodies for ground water, coastal waters, lakes and rivers are available. Phytoplankton data for lakes and rivers shall be provided this year.

The digital river network for Schleswig-Holstein was reconstructed completely. All facilities at or near or over the rivers are referenced. The information rests upon the maps of the 450 water and soil associations in Schleswig-Holstein.

9. Prospects

The geo thesaurus will be enhanced to a real gazetteer in the following way: Similar to universal name fields for each atlas theme there will be provided a universal number field for each theme. This is typically the identifying number field for the object as specified by the theme experts. So the gazetteer will provide a search facility by means of a name and / or a number.

The OGC web catalogue service (wcs) is not implemented yet. If this is wished we have to learn from the PortalU and the Nokis++ Teams more about these technique and its implementation.

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Bibliography


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