



Deliverable D3.16

Final version of the fully implemented and publically accessible metadata catalogue of the Carpathian Atlas, containing all metadata generated during all three modules of the project

Contract number: OJEU 2010/S 110-166082
Deliverable: D3.16
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Date: 17.05.2013
Version: Final

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1. Introduction

The aim of this deliverable is to describe the Final version of the fully implemented and publically accessible metadata catalogue of the Climate Atlas of the Carpathian Region, containing all metadata generated during all three modules of the project.

The metadata catalogue of the CARPATCLIM Digital Atlas is based on the Open source software **Geonetwork [1]**. This deliverable will describe the main features of this software and how it is integrated within the CARPATCLIM Digital Atlas Web portal.

2. Geonetwork

GeoNetwork is a catalog application to manage spatially referenced resources. It provides powerful metadata editing and search functions as well as an embedded interactive web map viewer. It is currently used in numerous Spatial Data Infrastructure initiatives across the world.

GeoNetwork has been developed to connect spatial information communities and their data using a modern architecture, which is at the same time powerful and low cost, based on the principles of Free and Open Source Software (FOSS) and International and Open Standards for services and protocols (a.o. from ISO/TC211 and OGC).

The software provides an easy to use web interface to search geospatial data across multiple catalogs, combine distributed map services in the embedded map viewer and publish geospatial data using the online metadata editing tools and optionally the embedded GeoServer map server. Administrators have the option to manage user and group accounts, configure the server through web based and desktop utilities and schedule metadata harvesting from other catalogs.

2.1 Features

Geonetwork includes the following features:

- Immediate search access to local and distributed geospatial catalogues
- Up- and downloading of data, graphics, documents, pdf files and any other content type
- An interactive Web Map Viewer to combine Web Map Services from distributed servers around the world
- A randomly selected Featured Map
- Recently updated entries, also accessible as RSS news feeds and as GeoRSS.
- Online editing of metadata with a powerful template system
- Native support for ISO19115/ISO19119/ISO19139/ISO19110 and ISO Profiles, FGDC and Dublin Core formatted metadata

- Scheduled harvesting and synchronization of metadata between distributed catalogues (GeoNetwork, CSW, Z39.50, OGC WxS, WebDav, Thredds, Local file system, OAI-PMH)
- Support CSW 2.0.2 ISO Profile, OAI-PMH, Z39.50 protocols
- Fine-grained access control
- Group and user management
- Multi-lingual user interface (Chinese, Deutsch, English, Español, Français, Nederlands, Portuguese, Russian)

2.2 Implemented standards

Geonetwork supports a wide range of standards. Metadata standards (ISO19115 / ISO19119 / ISO19110 following ISO19139, FGDC and Dublin Core), Catalog interfaces (OGC-CSW2.0.2 ISO profile client and server, OAI-PMH client and server, GeoRSS server, GEO OpenSearch server, WebDAV harvesting, Geonetwork to Geonetwork harvesting support) and Map Services interfaces (OGC-WMS, WFS, WCS, KML and others) through the embedded GeoServer map server.

2.3 Supported platforms

A single, platform independent installer allows installing and running the software on a PC or a server on Windows, Linux and Mac OS X. The installer can be downloaded as an executable Windows file or as a platform independent .jar installer. It creates a Start menu on Windows computers. Command line installations are also possible for remote installations.

3. Integration of Geonetwork software and Carpatclim Digital Atlas Portal

Upon successful installation the Geonetwork service can be accessed on the address:

<http://www.carpatclim-eu.org:10000/geonetwork>

Entering this address will result in opening the Geonetwork homepage (Fig. 1)

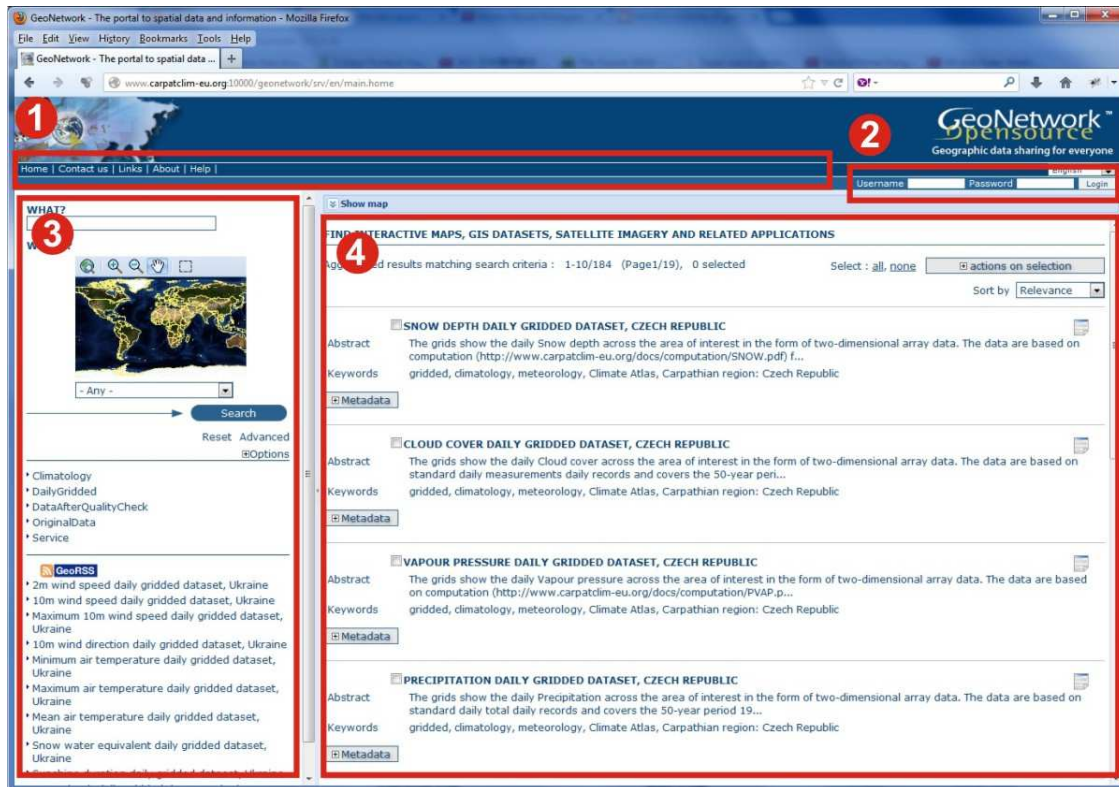


Figure 1. Geonetwork homepage

The main parts of the Geonetwork homepage are as follows:

1. Main Menu
2. Login Form
3. Search Panel
4. Results Panel

3.1 Main Menu

The Geonetwork main menu consists of the following menu items:

- **Home** – enables a quick link to the Geonetwork homepage.
- **Administration** – enables access to the Geonetwork administration panel. This Item is visible only when the user has entered a valid user name and password in the login panel.
- **Contact** – enables access to the contact page. This option enables guest users to send feedback comments to the Geonetwork administrator user.
- **Links** – enables access to the links page. The links page contains relevant links regarding Mapping services as well as various geospatial standards.

- **About** – enables access to the about page. This page contains relevant information regarding Geonetwork software (usage/purpose/standards)
- **Help** – enables access to detailed online Geonetwork documentation. The Geonetwork documentation contains all necessary information for users and developers required for optimal setup and usage of the Geonetwork services.

3.2 Login Form

Geonetwork offers basic user authorization features in order to control access to various types of metadata meaning that some metadata will be hidden for public users and visible only for authenticated users. In the case of CARPATCLIM, all metadata will be public. Nevertheless administrator rights are required for uploading new metadata.

Detailed information about user administration can be found at:

<http://www.geonetwork-opensource.org/manuals/2.8.0/eng/users/admin/index.html>

3.3 Search Panel

Geonetwork offers various options for basic as well as advanced searching of metadata. All search options are divided in three groups:

WHAT group (Fig. 2) contains entries designed specifically to perform search queries by keywords, titles and abstracts.

The image shows a search panel titled "WHAT?". It contains several input fields and checkboxes. The fields are: "Either of the words" (with a dropdown arrow), "Exact phrase", "What?", "Without the words", "Title", "Abstract", and "Keywords". Below these are checkboxes for "Map type" (Digital, Interactive, Hard copy, Downloadable) and "Search accuracy" (Precise, Imprecise). The "Precise" radio button is selected.

Figure 2. WHAT search group

WHERE group (Fig. 3) contains entries designed specifically to perform search queries by region. It is possible to perform queries by a specific bound box (by entering Lat (min), Lon(min), Lat(max), Lon(max)) or by country region.

Figure 3. WHERE search group

WHEN group (Fig. 4) contains entries designed specifically to perform search queries by time periods.

Figure 4. WHEN search group

3.4 Results Panel

The **Geonetwork results** panel (Fig. 5) displays the results of the last query. Besides offering the classical result list view, Geonetwork enables visual representation of nested metadata properties (Fig. 6).

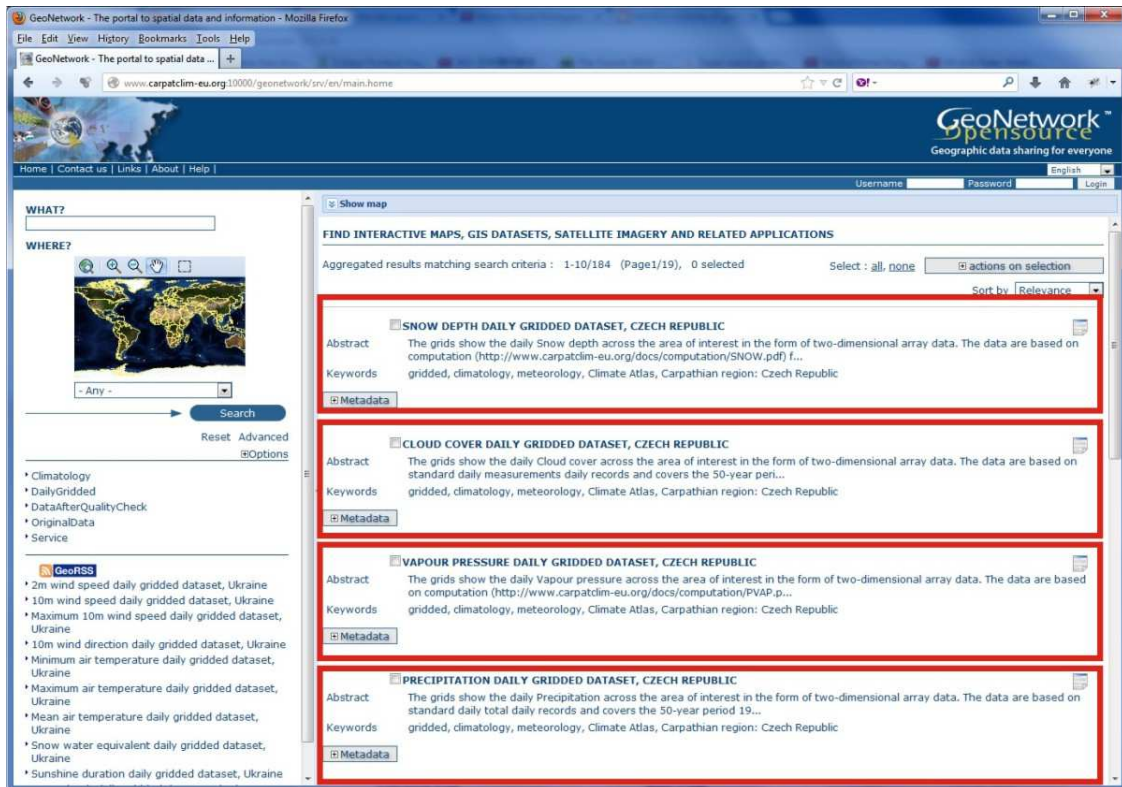


Figure 5. Geonetwork results panel

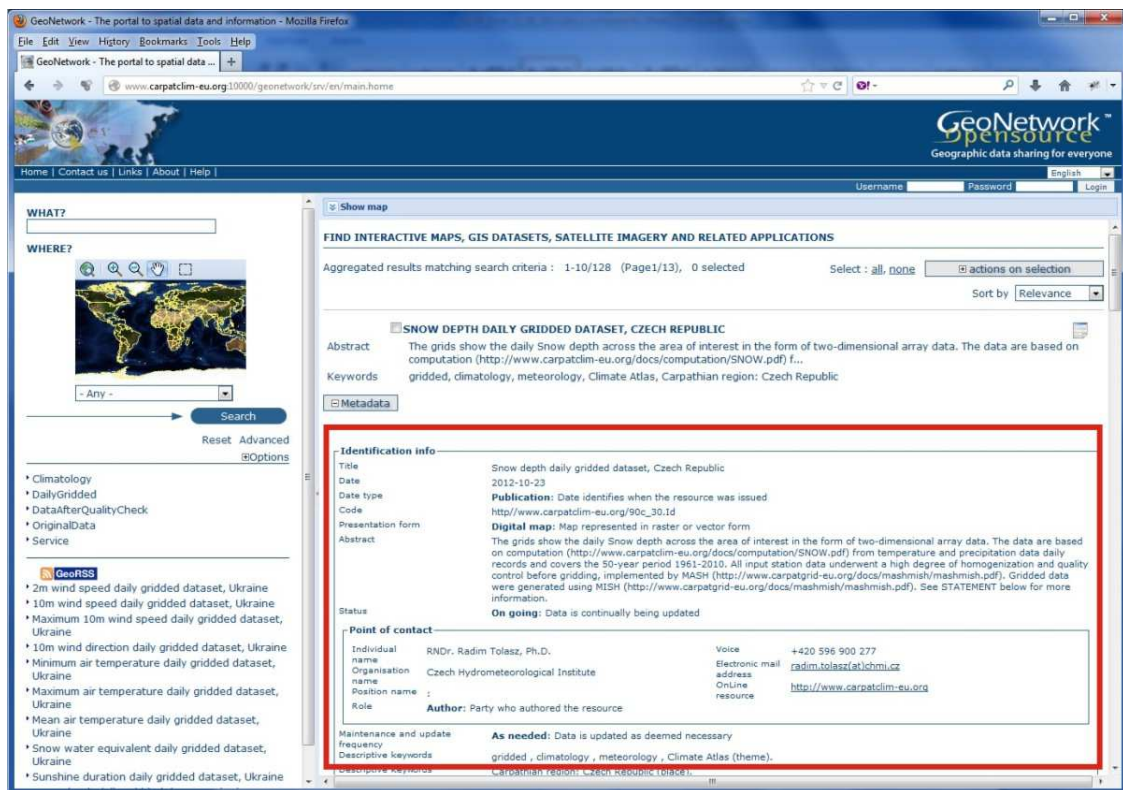


Figure 6. Nested Metadata view

Finally it was necessary to make the Geonetwork interface consistent with the CARPATCLIM portal. This is accomplished by using a <iframe> element to avoid any major changes to the Geonetwork interface. The final result is shown on Fig. 7. In this way the Geonetwork metadata interface can be accessed on the following address as well:

<http://www.carpatclim-eu.org/pages/metadata/>

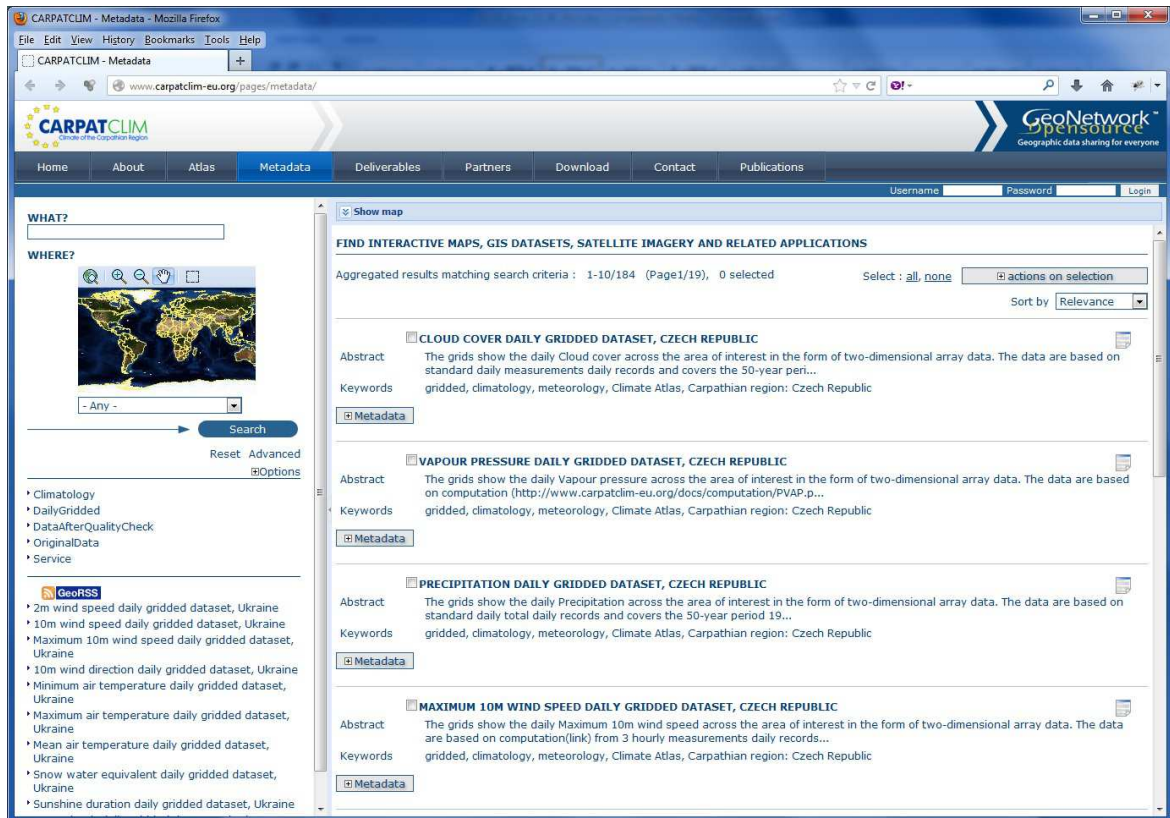


Figure 7. Geonetwork interface embedded inside the CARPATCLIM portal Web template

4. Loading Metadata into Geonetwork

Managing metadata, especially inserting new metadata in Geonetwork database is performed through the Geonetwork administration panel (Fig. 8).

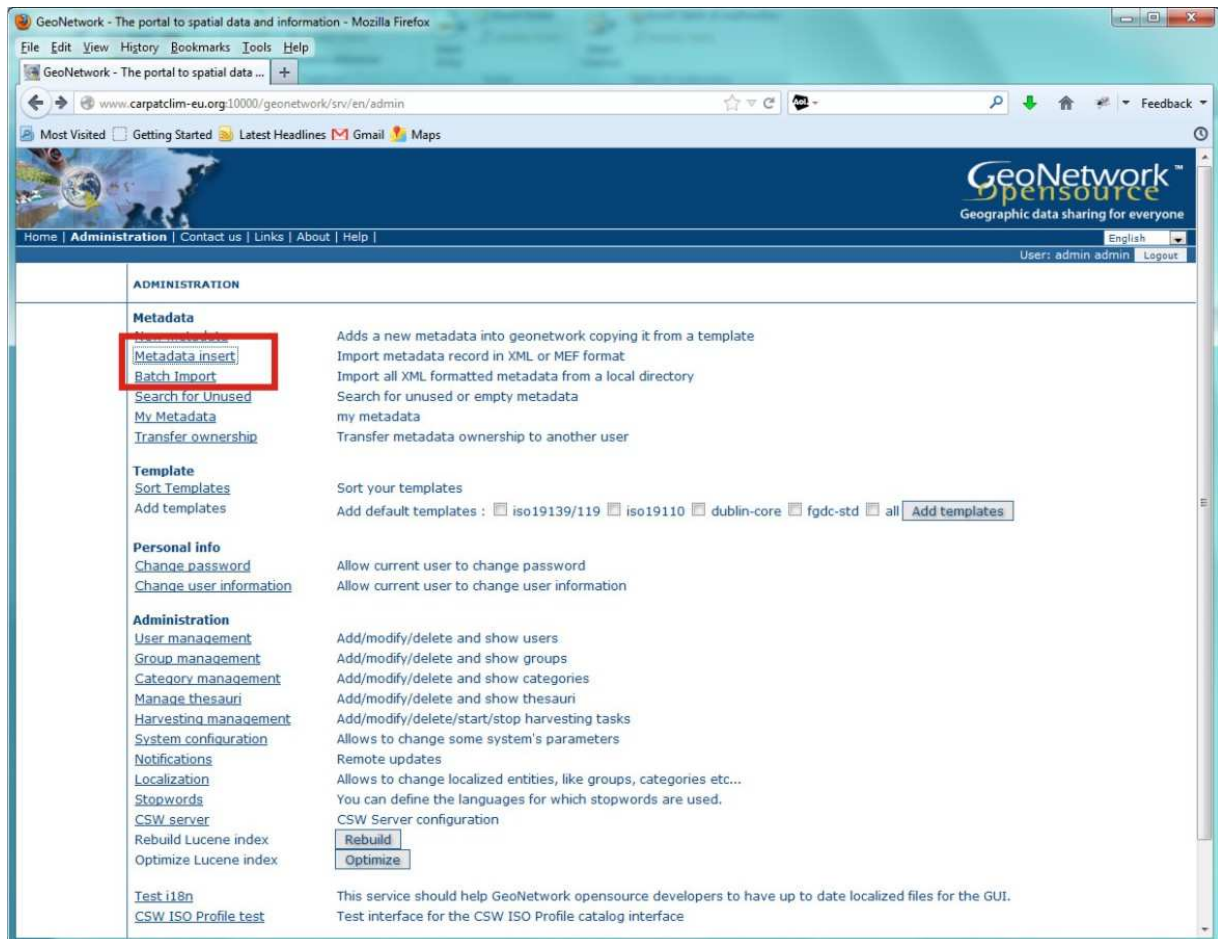
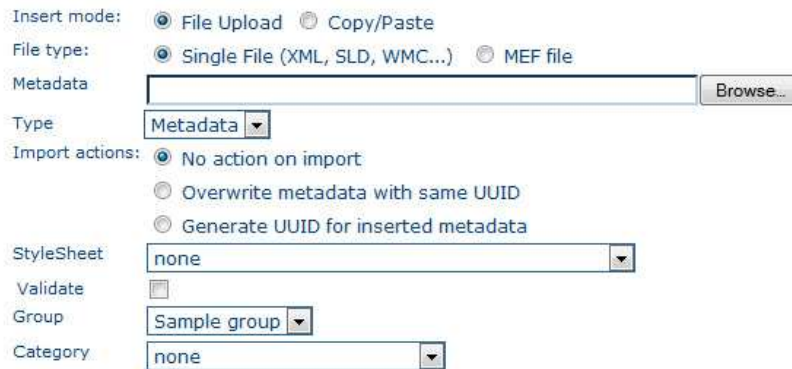


Figure 8. Geonetwork administration panel

There are two options for inserting of metadata:

- Metadata insert
- Batch Import

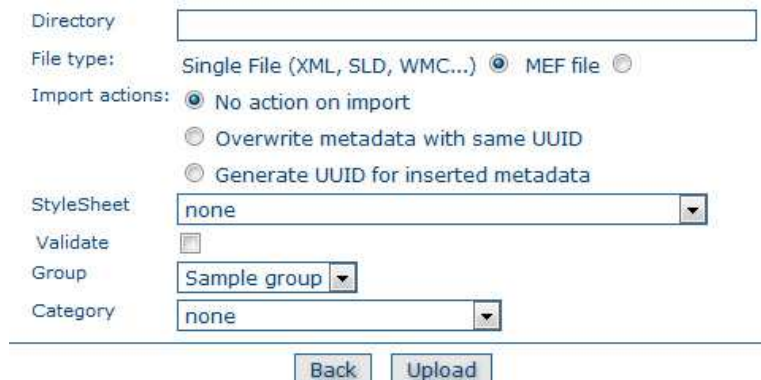
The **metadata insert** option enables easy insert of one metadata. In order to insert a single metadata the user is required to have the Metadata in XML format and to browse and upload the required metadata file (Fig. 9)



Insert mode: File Upload Copy/Paste
File type: Single File (XML, SLD, WMC...) MEF file
Metadata: Browse...
Type: Metadata
Import actions: No action on import
 Overwrite metadata with same UUID
 Generate UUID for inserted metadata
StyleSheet: none
Validate:
Group: Sample group
Category: none

Figure 9. Metadata insert panel

Metadata batch import enables insertion of multiple metadata files from a specific directory. In order to insert a multiple metadata the user is required to store all Metadata XML files in a specific folder and enter the name of that folder inside the Directory field (Fig. 10). In the case of CARPATCLIM metadata this option is preferred rather than single metadata insert considering that there are approximately 150 metadata XML files.



Directory:
File type: Single File (XML, SLD, WMC...) MEF file
Import actions: No action on import
 Overwrite metadata with same UUID
 Generate UUID for inserted metadata
StyleSheet: none
Validate:
Group: Sample group
Category: none
Back Upload

Figure 10. Metadata batch import

5. Searching metadata

The Geonetwork web interface offers various options for metadata search. One of the most common ways of metadata search is by keywords and by categories.

5.1 Searching by keywords

Searching metadata by keywords is performed by entering a part or the whole name of the variable which is being searched. On Fig. 11 an example of searching by the keyword “temperature” is shown and as a result Geonetwork shows a search result of 28 items found.

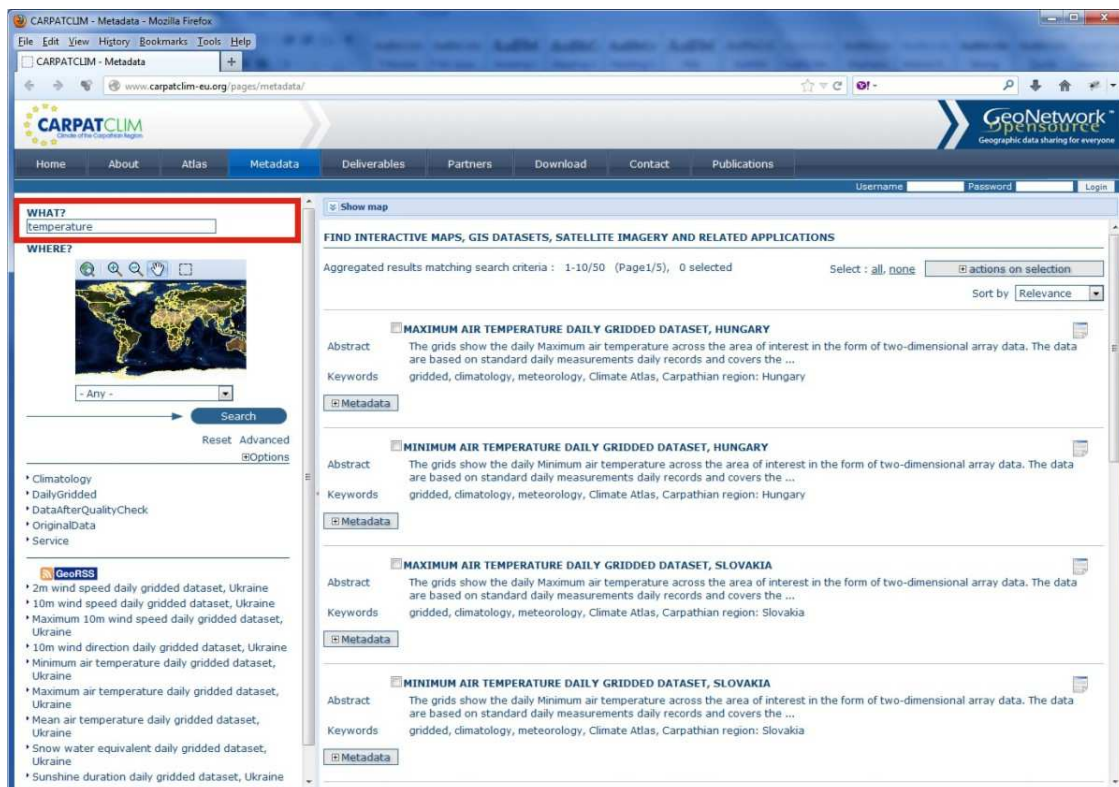


Figure 11. Search by keywords

5.2 Searching by category

Searching metadata by categories can be very useful considering that all data is divided in five categories: Station Data original, Station Data after Homogenization & Quality Control, Daily Meteorological Grids per Country, Climatological Grids (Variables & Indicators), Web Service. On Fig. 12 an example of searching by the category “climatology” is shown and as a result Geonetwork shows a search result of 55 items found. Also what is important to notice is that due to some limitations of the Geonetwork software blank characters are not supported in the category names so for that purpose shorter category names are being used:

- **OriginalData** - Station Data original
- **DataAfterQualityControl** - Station Data after Homogenization & Quality Control
- **DailyGridded** - Daily Meteorological Grids per Country
- **Climatology** - Climatological Grids (Variables & Indicators)
- **Service** - Web Service

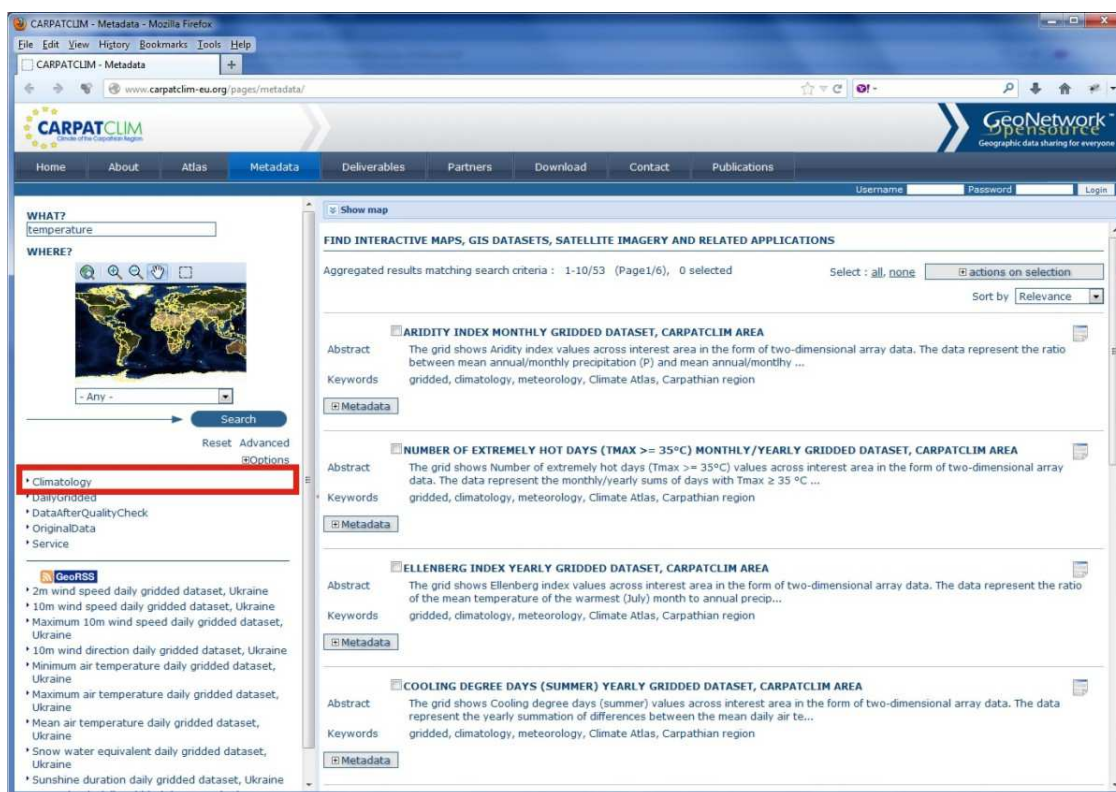


Figure 12. Search by category

6. REFERENCES

<http://www.geonetwork-opensource.org> – Official portal for the Geonetwork software.

- D1.13 Proposal of the metadata profile to be applied to all metadata generated during the project
- D2.10 Final version of metadata per country of all national gridded datasets created within Module 2

ISO 19115/Cor.1:2006, Geographic information – Metadata, Technical Corrigendum

ISO 19139:2006, Geographic Information - Metadata – XML Schema Implementation

INSPIRE Directive,

(<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:108:0001:0014:EN:PDF>)

INSPIRE Metadata Implementing Rules

(<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008R1205:EN:NOT>)

INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119

(http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/metadata/MD_IR_and_ISO_20090218.pdf)