

PROJECT GEONETCAST WS 2009/2010

# eWater – SDI for water resource management

Technical Documentation

# I. GEONETWORK

## 1. Installation

e-Water uses the software package GeoNetwork comes bundled with GeoServer and Intermap, Apache Tomcat as the web server, and PostgreSQL/PostGIS as the database. We install it using default options. The installation manuals can be found on their official websites.

## 2. Configuration

### 2.1. GeoNetwork and Tomcat

GeoNetwork comes with an embedded Jetty web server, but you can run it under Apache Tomcat. There are three web applications (webapps) in GeoNetwork; you will find them in the web directory of the installation: geonetwork, intermap, and geoserver. For GeoNetwork to function correctly in Tomcat, you must publish at least geonetwork and intermap; the following instructions publish all three webapps.

- a. From GeoNetwork installation, copy all of the subdirectories of the web directory to the webapps directory of Tomcat.
- b. Replace data folder in Tomcat root directory with the ones from GeoNetwork installation.
- c. In GeoServer's web.xml, set the value of the parameter 'GEOSERVER\_DATA\_DIR' to "/path\_to\_Tomcat\_installation/data/geoserver\_data".  
When opening GeoServer page, if the map does not show up, you need to give an absolute address, for example: "C:\Program Files\Apache Software Foundation\Tomcat 6.0\data\geoserver\_data".
- d. In GeoNetwork's config.xml, set the value of the parameter 'profiles' to "/path\_to\_Tomcat\_installation/data/tmp" and 'dataDir' to "/path\_to\_Tomcat\_installation/data".
- e. Make sure you allocated enough Java heap space if you get an error like this:  
`java.lang.OutOfMemoryError: Java heap space`
- f. If you can't find your log files, make sure you edit GeoNetwork and Intermap's log4j.cfg. Set the value of the parameter 'log4j.appender.jeeves.file' to wherever directory you want to have your logs.
- g. Restart Tomcat.

### 2.2. GeoNetwork and PostgreSQL

GeoNetwork comes with an internal DBMS server, the McKoi SQL database, but you can replace it with PostgreSQL. Here are the steps needed to add PostgreSQL JDBC connection settings:

- a. Create a new database named 'geonetwork' in PostgreSQL.
- b. Using GAST (Start – All Programs – GeoNetwork opensource – Start GAST), you can import some sample metadata into the database.
- c. In GeoNetwork's web.xml, find the parameter 'resources'. In McKoi section, set 'enabled=false' to disable GeoNetwork's connection to McKoi.

- d. Copy these lines. Set the value of the parameter ‘user’ and ‘password’ relevant to your PostgreSQL username and password.

```
<resource enabled="true">
  <name>main-db</name>
  <provider>jeeves.resources.dbms.DbmsPool</provider>
  <config>
    <user>username</user>
    <password>password</password>
    <driver>org.postgresql.Driver</driver>
    <url>jdbc:postgresql://localhost:5432/geonetwork</url>
    <poolSize>10</poolSize>
  </config>
</resource>
```

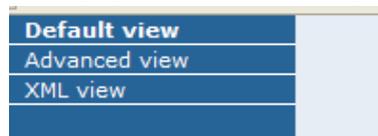
- e. Restart Tomcat.

### 3. Metadata management

#### 3.1. Create new metadata

This function allows user add new metadata into this application using predefined templates. You have to login as an Editor or higher.

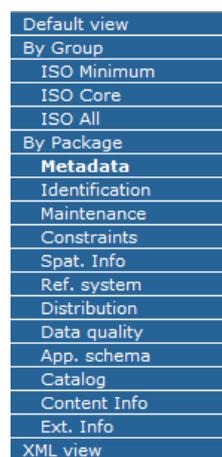
After login, click “Administrator – New metadata” to reach the metadata creation page, choose the metadata standard to use and group of users which will own the metadata, then click “Create”. When you create a new record, you can choose the following view by click the options on the left of the page as showed in Figure 1:



**Figure 1**

Default View: shows the main fields of information from different categories in single view.

Advanced View: shows metadata structure organized in sections. You can click the tabs on the left of this view page as in Figure 2 to edit metadata descriptions to adapt to different needs.



**Figure 2**

XML View: shows the metadata in the hierarchical structure using XML as in Figure 3. The XML structure is composed of tags and corresponding closing tags. Using this view required knowledge of XML.

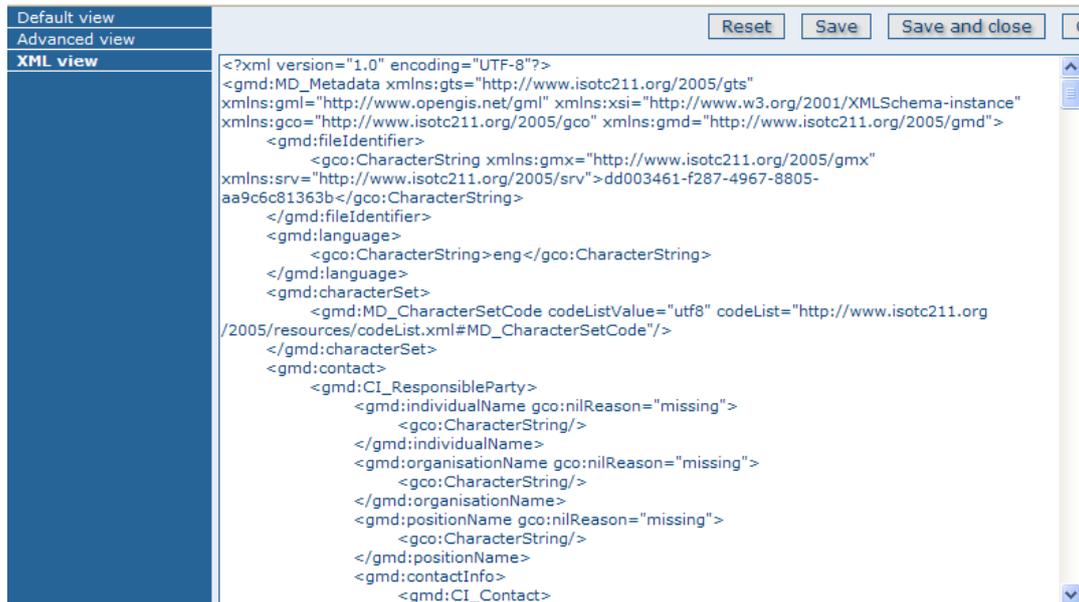


Figure 3

### 3.2.Import metadata

#### 3.2.1. Single file

This function allows user import metadata using a single XML or MEF file. You have to login as an Editor or higher.

After login, click “Administration – Metadata insert”, you will reach the page as Figure 4:

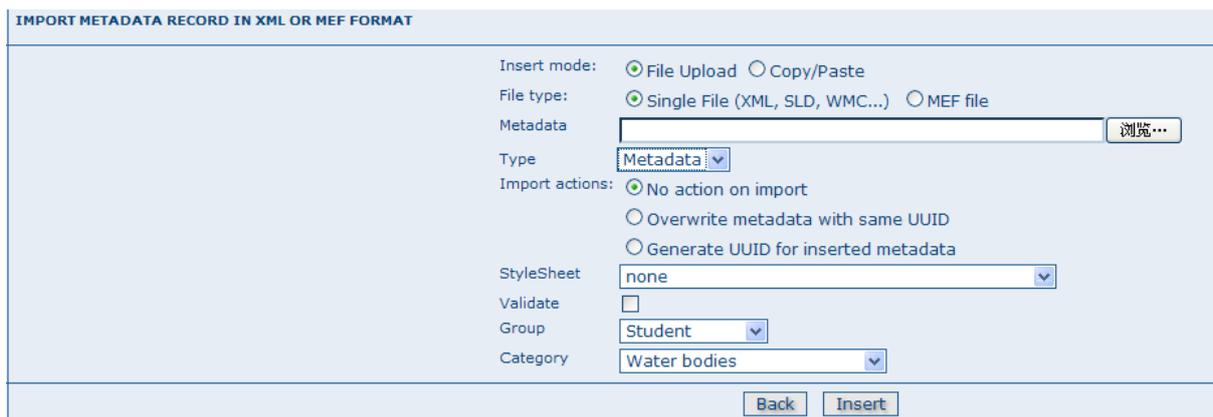


Figure 4

If you choose file upload, you could also choose actions during import as following:

- a. No action on import: nothing to be done.
- b. Overwrite metadata with same UUID: delete existing metadata with the same UUID and then add the new one.
- c. Generate UUID for inserted metadata: force new UUID for each new metadata.

For XML file import option, there are still other parameters to be set:

- Stylesheet: choose a stylesheet for XSL transformation.
- Validate: when choose to perform, the metadata is validated against its schema.
- Group option: select a group to associate to the metadata.
- Category option: select one category to associate to your metadata.

If you choose the button Copy/Paste, you will reach the page showed in Figure 5, here you could directly copy or paste your metadata record to perform a XML insert. But the import actions option is not available in this method.

IMPORT METADATA RECORD IN XML OR MEF FORMAT

Insert mode:  File Upload  Copy/Paste

Metadata

Type: Metadata

StyleSheet: none

Validate:

Group: Student

Category: Water bodies

Back Insert

Figure 5

### 3.2.2. Batch import

This function allows user import a set of metadata in one time. You have to login as an Editor or higher.

After login, click “Administration – Batch Import” to reach the page as Figure 6:

IMPORT ALL XML FORMATTED METADATA FROM A LOCAL DIRECTORY

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: Student

Category: Water bodies

Back Upload

Figure 6

The Directory option is the full path of the directory need to scan on the server's system. The application will look for and try to import all XML files present into this directory. This is the directory on the server machine and not on the client of the user that is doing the import. The other options please refer to 3.2.1.

After set all parameter, click "Upload" to start the import process. When the process is completed, the count of imported metadata will be shown. Files which start with "." or do not end with ".xml" will be ignored.

## **4. Harvesting and synchronization of metadata**

### **4.1. Harvesting**

This function allows collecting remote metadata from distributed servers, then storing them locally. You have to log in as Administrator to manage this function.

After login, Click "Administration – Harvesting management" to reach the harvesting management page, here you can click "add" to add different kinds of new harvesting nodes, when you set up a new node, active it. The existing nodes will be shown in the main page of this function in a table, the columns are as following:

- a. Select: select one or more nodes when you want to edit them (start, stop, run, and remove).
- b. Name: the node's name, given by the administrator.
- c. Type: the node's harvesting type chosen when the node was created.
- d. Status: reflects the node's current status (inactive, active, running)
- e. Errors: reflects if the last harvesting run is successful or not.
- f. Every: how much time is there between two consecutive harvesting
- g. Last run: the date of the most recent harvesting run.
- h. Operation: all possible operations on a node.

Besides, there are two rows of buttons which allow you edit these node helped by the Select check box mentioned above. Using this function, this application can do the scheduled synchronization by setting the time between two harvesting from one node.

### **4.2. Synchronization**

Please refer to the harvesting section.

## **5. User and group management**

### **5.1. User**

For user management, you have to login as an Administrator or User administrator.

After login, click "Administration – User management" to reach the page, here you can edit the information, reset the user's password and add a new user.

When click "Add a new user", you will reach the user insert page, here you can add information of the new user, and have to set which group the user belongs to, and which

kind of profile the user has. User must have one profile and belong to at least one group. The profile defines which function of this application the user can use. The User administrator can only edit and add users in its own group, and can not set the Administrator profile.

## **5.2. Group**

This application has 3 user groups: Professor, Staff, and Student. Different groups restrict user access to the data. Only Administrator can create the new group of users.

After login as an Administrator, click “Administration – Group management” to reach the page, here you can edit, delete or add a new group.

# **II. GEOSERVER**

## **1. Configuration**

Please refer to the section of GeoNetwork configuration.

## **2. Publishing of OGC Services**

### **2.1. Shapefile**

Here are the steps needed to publish a shapefile with GeoServer:

- a. Move the folder containing the shapefile you want to publish into GeoServer data directory, “/path\_to\_geoserver\_data\_dir/data”.
- b. Login to GeoServer. Navigate to “Config – Data – DataStores – New” to create a new data store. Choose “Shapefile” and type a name. Click the “New” button.
- c. In the URL field, specify the location of the shapefile, followed by filename. For example: data/boundaries/gboundaries.shp. Click “Submit”.
- d. In the FeatureType editor, set the layer style by choosing from a list of predefined style. Make sure that the style is designed for the same data type (point, line, or polygon). Otherwise, the layer will not be displayed.
- e. Set the value of SRS (Spatial Reference System) by clicking “Lookup SRS”. Sometimes you have to manually provide the value, e.g. EPSG:4326.
- f. Generate the bounding box value by clicking “Generate”.
- g. Provide any other relevant information and click “Submit”.
- h. To apply the changes, click the three buttons located in the upper left of the page; “Apply”, “Save”, and “Load”.

### **2.2. PostGIS**

Here are the steps needed to publish a vector data stored in PostgreSQL/PostGIS database with GeoServer:

- a. If you have not uploaded the shapefile to the database, you can do so by using the Shapefile loader/dumper. It is easier to do the same thing using Quantum GIS. But if

there is any error encountered during the process, Quantum GIS will abort the whole process.

- b. Move the shapefile you want to upload into PostgreSQL bin directory, “/path\_to\_Postgresql\_installation/8.4/bin”.
- c. Open Command Prompt (cmd) and navigate to the same directory. Type “shp2pgsql -I shapefile\_name.shp table\_name > sql\_filename.sql”. Once the process is finished, type “psql -d database\_name -f sql\_filename.sql -U postgresql\_username”.
- d. Login to GeoServer. Navigate to “Config – Data – DataStores – New” to create a new data store. Choose “Postgis” and type a name, e.g. XX. Click the “New” button.
- e. Specify the connection parameters to the database. Click “Submit”.
- f. Go back to “Data” and navigate to “FeatureTypes – New” to create a new data store. Select the table name that you want to publish. It is in the form of XX:::table\_name (refer to point d). Click “New”.
- g. In the FeatureType editor, set the layer style by choosing from a list of predefined style. Make sure that the style is designed for the same data type (point, line, or polygon). Otherwise, the layer will not be displayed.
- h. Set the value of SRS (Spatial Reference System) by clicking “Lookup SRS”. Sometimes you have to manually provide the value, e.g. EPSG:4326.
- i. Generate the bounding box value by clicking “Generate”.
- j. Provide any other relevant information and click “Submit”.
- k. To apply the changes, click the three buttons located in the upper left of the page; “Apply”, “Save”, and “Load”.

### **2.3. GeoTIFF**

Here are the steps needed to publish a GeoTIFF file with GeoServer:

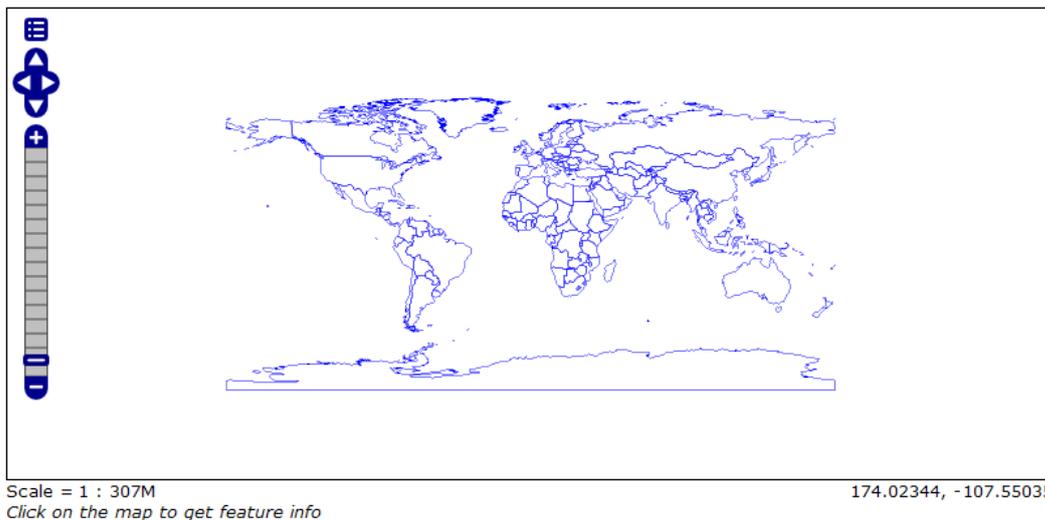
- a. Move the folder containing the GeoTIFF file you want to publish into GeoServer data directory, “/path\_to\_geoserver\_data\_dir/coverages”.
- b. Login to GeoServer. Navigate to “Config – Data – CoverageStores – New” to create a new coverage store. Choose “Tagged Image File Format with Geographic information” and type a name. Click the “New” button.
- c. In the URL field, specify the location of the GeoTIFF file, followed by filename. For example: coverages/BlueMarble\_world/bluemarble\_jpeg\_small.tiff. Click “Submit”.
- d. In the Coverage editor, set the layer style by choosing from a list of predefined style. By default, “raster” will be selected.
- e. Set the value of SRS (Spatial Reference System) by clicking “Lookup SRS”. Sometimes you have to manually provide the value, e.g. EPSG:4326.
- f. Generate the bounding box value by clicking “Generate”.
- g. Provide any other relevant information and click “Submit”.
- h. To apply the changes, click the three buttons located in the upper left of the page; “Apply”, “Save”, and “Load”.

After publishing your data as OGC services, you need to verify that your data is properly published. Go back to the Welcome page and navigate to “Demo – Map Preview”. A new page containing the list of published map data is displayed. You can click on each link to preview the layer.

## My GeoServer

### Mini-map preview of the enabled FeatureTypes.

Layer (NameSpace:FeatureType)	Preview Map
<a href="#">gn:gboundaries</a>	<a href="#">OpenLayers</a> <a href="#">KML</a> <a href="#">GeoRSS</a> <a href="#">PDF</a> <a href="#">SVG</a>
<a href="#">gn:places_europe</a>	<a href="#">OpenLayers</a> <a href="#">KML</a> <a href="#">GeoRSS</a> <a href="#">PDF</a> <a href="#">SVG</a>
<a href="#">gn:points_europe</a>	<a href="#">OpenLayers</a> <a href="#">KML</a> <a href="#">GeoRSS</a> <a href="#">PDF</a> <a href="#">SVG</a>
<a href="#">gn:railways_europe</a>	<a href="#">OpenLayers</a> <a href="#">KML</a> <a href="#">GeoRSS</a> <a href="#">PDF</a> <a href="#">SVG</a>
<a href="#">gn:waterways_europe</a>	<a href="#">OpenLayers</a> <a href="#">KML</a> <a href="#">GeoRSS</a> <a href="#">PDF</a> <a href="#">SVG</a>
<a href="#">gn:europe</a>	<a href="#">OpenLayers</a> <a href="#">KML</a> <a href="#">GeoRSS</a> <a href="#">PDF</a> <a href="#">SVG</a>
<a href="#">gn:world</a>	<a href="#">OpenLayers</a> <a href="#">KML</a> <a href="#">GeoRSS</a> <a href="#">PDF</a> <a href="#">SVG</a>



## III. INTERMAP

### 1. Configuration

Please refer to the section of GeoNetwork configuration.