GeoNode – Basic Use in Spatial Data Infrastructure

THE WORLD BANK
Working for a World Free of Poverty

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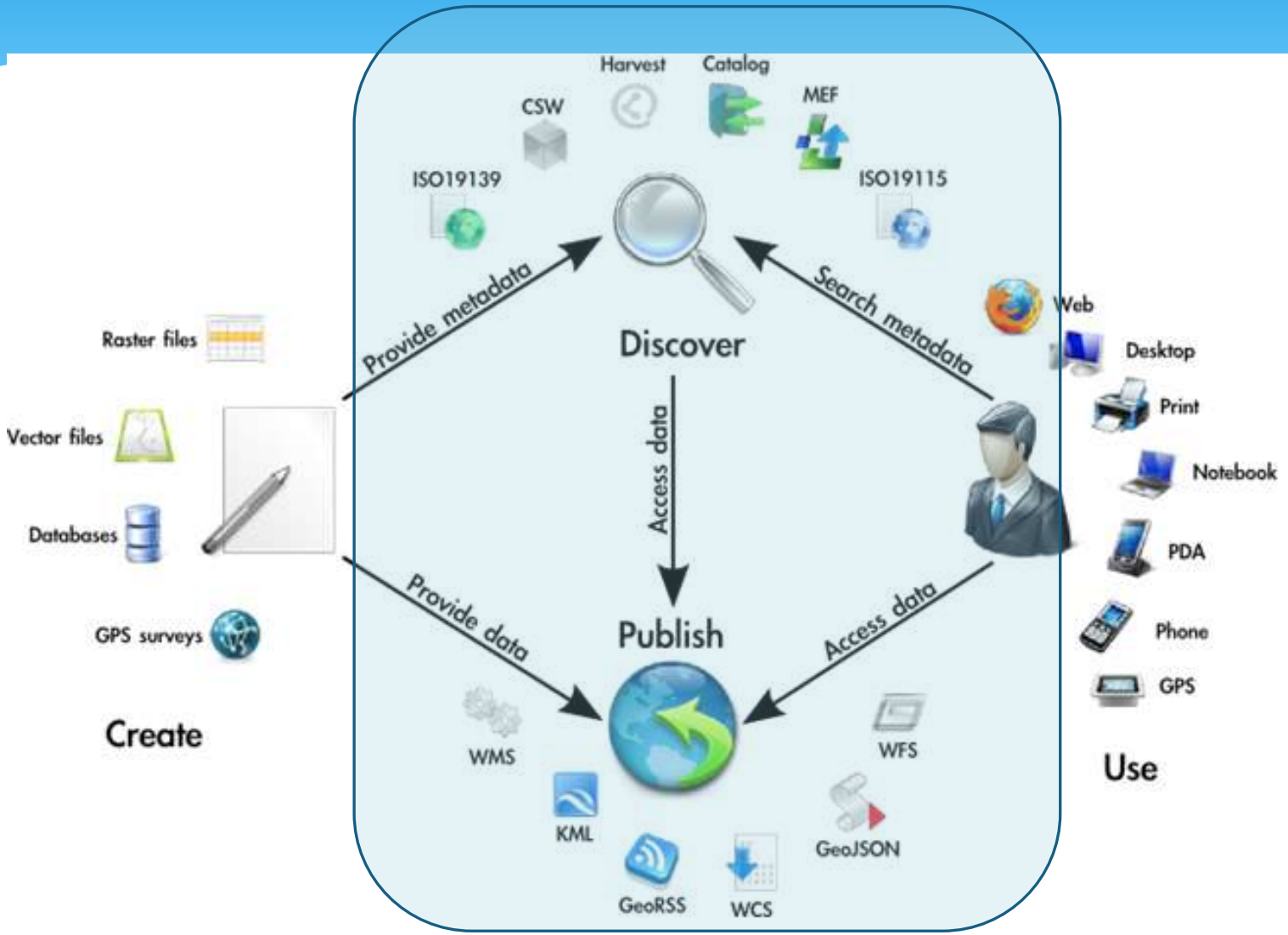
GeoNode scope

* The main goal of GeoNode is to provide a quick and complete installation of an SDI-compliant node ('SDI-in-a-box' concept)
* The lack of simple integration was a weakness of open-source SDI solutions. A complete stack had to be integrated by hand
* GeoNode includes a complete set of *data* and *service* layer components, so Web and GIS clients can access these resources via standard Web services
* GeoNode also provides an *application* layer component (Web client), so it's easy to build a full geoportal

GeoNode scope

* GeoNode makes easier to:
  * Upload data to shared databases
  * Make maps for online viewing
  * Publish maps in Web sites
  * Create metadata
  * Catalog documents
  * Connect SDI and GIS desktops
  * Add social interaction to SDIs
  * Control access and permissions
  * Connect services from different nodes

GeoNode scope



GeoNode scope

Rolando Peñate

Rolando Peñate joined CAPRA on May 15, 2009 and has shared **352 data sets** and created **17 maps**.

Description:
I make maps, I help make software for making maps, and I generally spend too much time around maps.

Languages:
English (Preferred), Spanish

Location:
Brooklyn, NY, USA 11238

Organization:
OpenGeo
349 W 12th Street #3
New York, NY 10014

Edit profile

Following (4)

Easy metadata generation!

General Details	
Dataset Title:	Domestic Energy Consumption, 2006
Time Period of Dataset(s):	01/01/2006 to 31/12/2006
Geographic Coverage:	England and Wales
Lowest Area Output:	Middle Layer Super Output Areas (MSOA)
Supplier:	Department of Energy and Climate Change (DECC)
Department:	Energy Statistics
National Statistics Data?	National Statistics
Revisions:	None

Data Quality

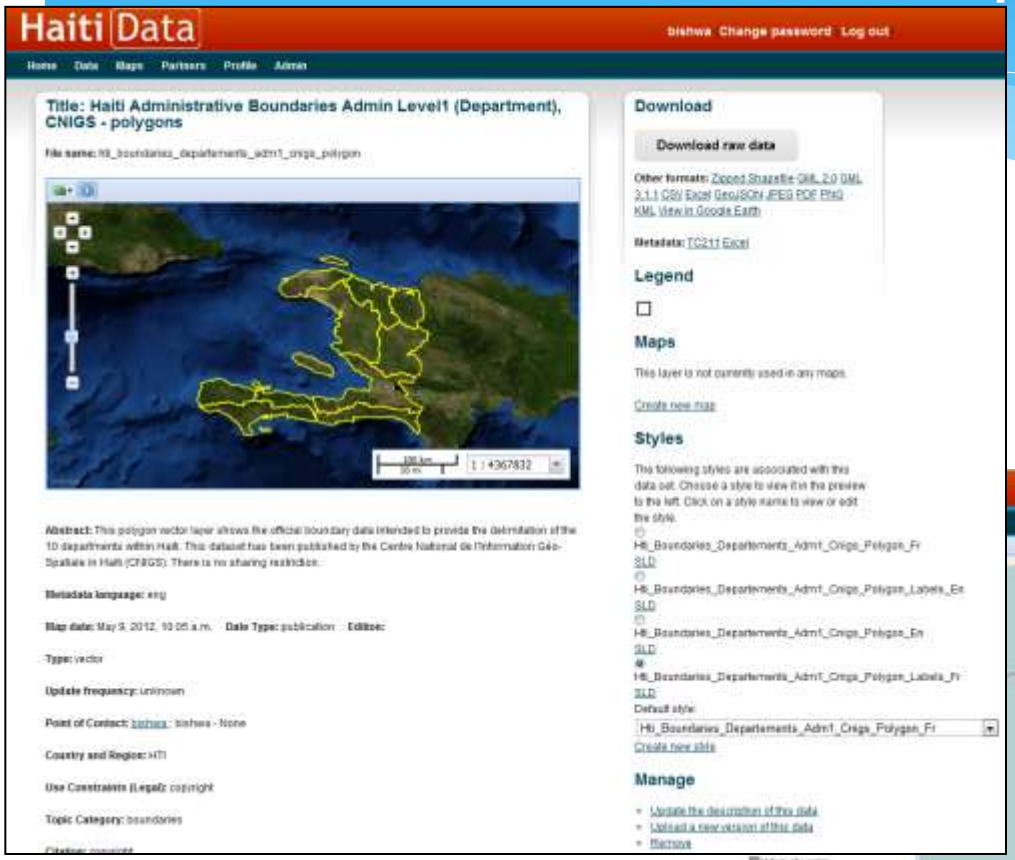
This document provides a range of information that describes the quality of the data and details any points that should be noted when using the data.
ONS has developed Guidelines For Measuring Statistical Quality ; these are based upon the six European Statistical Service (ESS) Dimensions of Quality developed by Eurostat. The dimensions are:

- Relevance
- Accuracy
- Timeliness and Punctuality
- Accessibility and Clarity
- Comparability
- Coherence

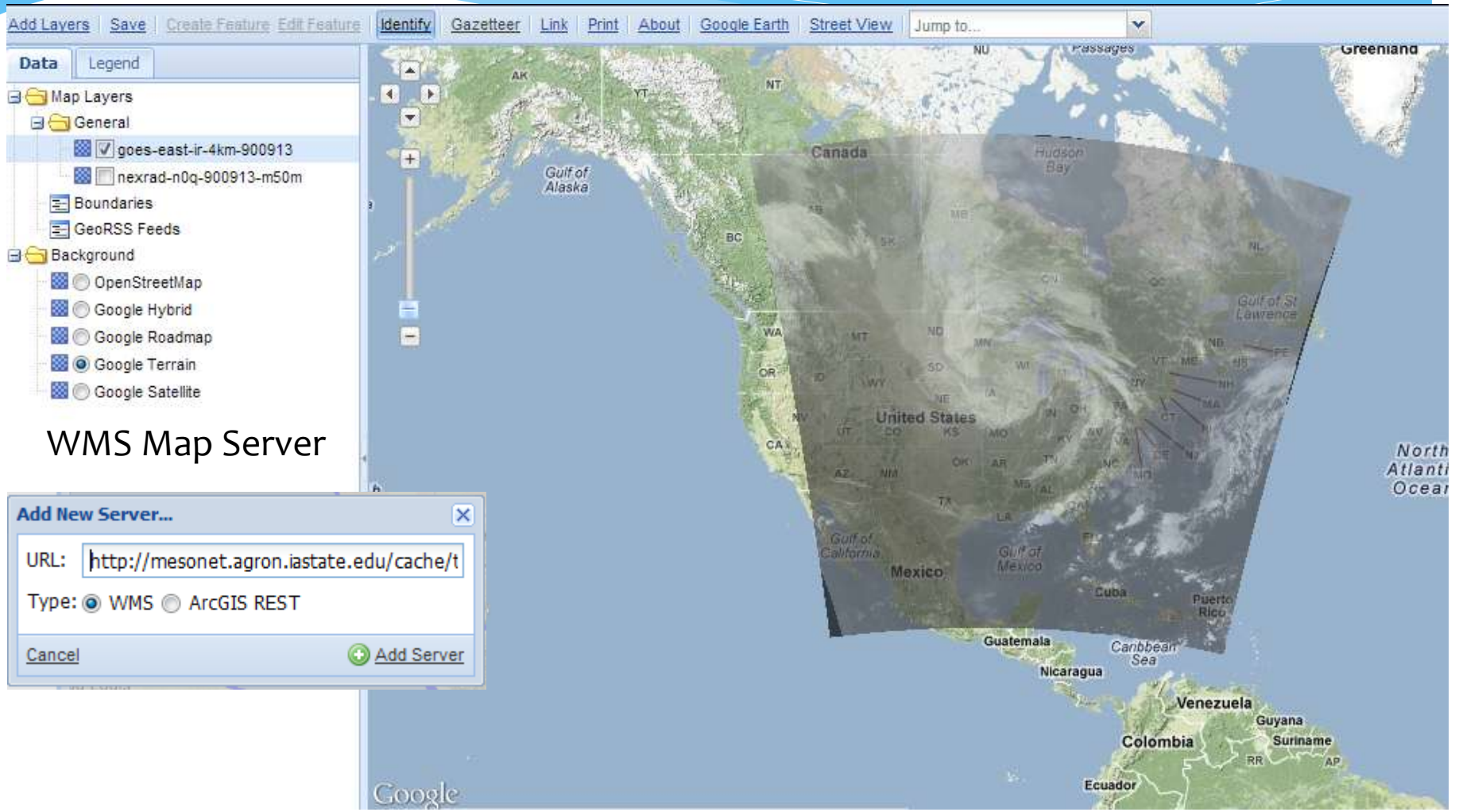
About the dataset
(including the quality dimensions: Relevance and Timeliness and Punctuality)

The dataset provides total and average consumption of domestic ordinary electricity, economy 7 electricity and gas as well as counts of meter points at Government Office Region (GOR), Local

Search, Collaborate and Create Interactive Map

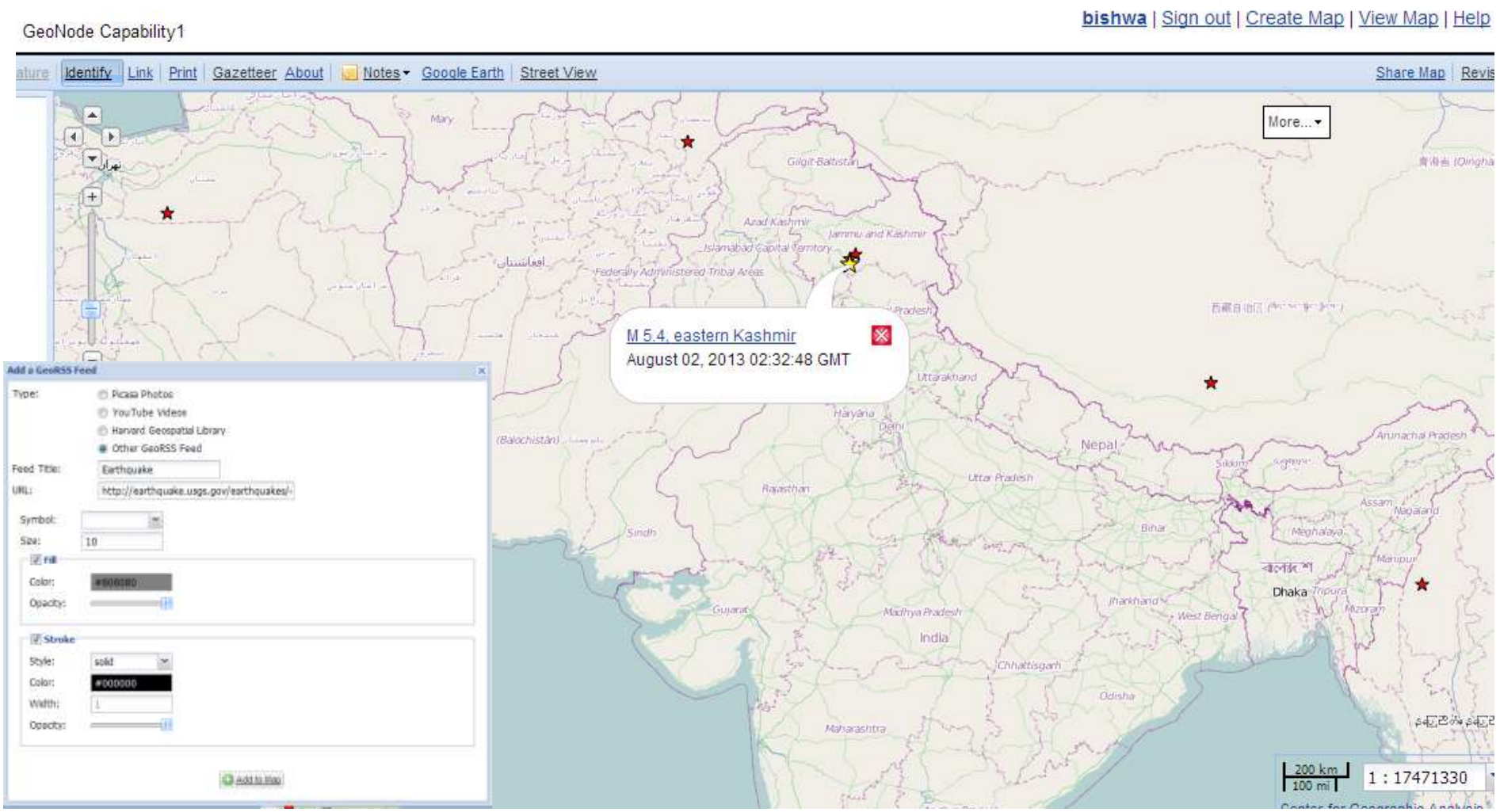


Add Data From External Source



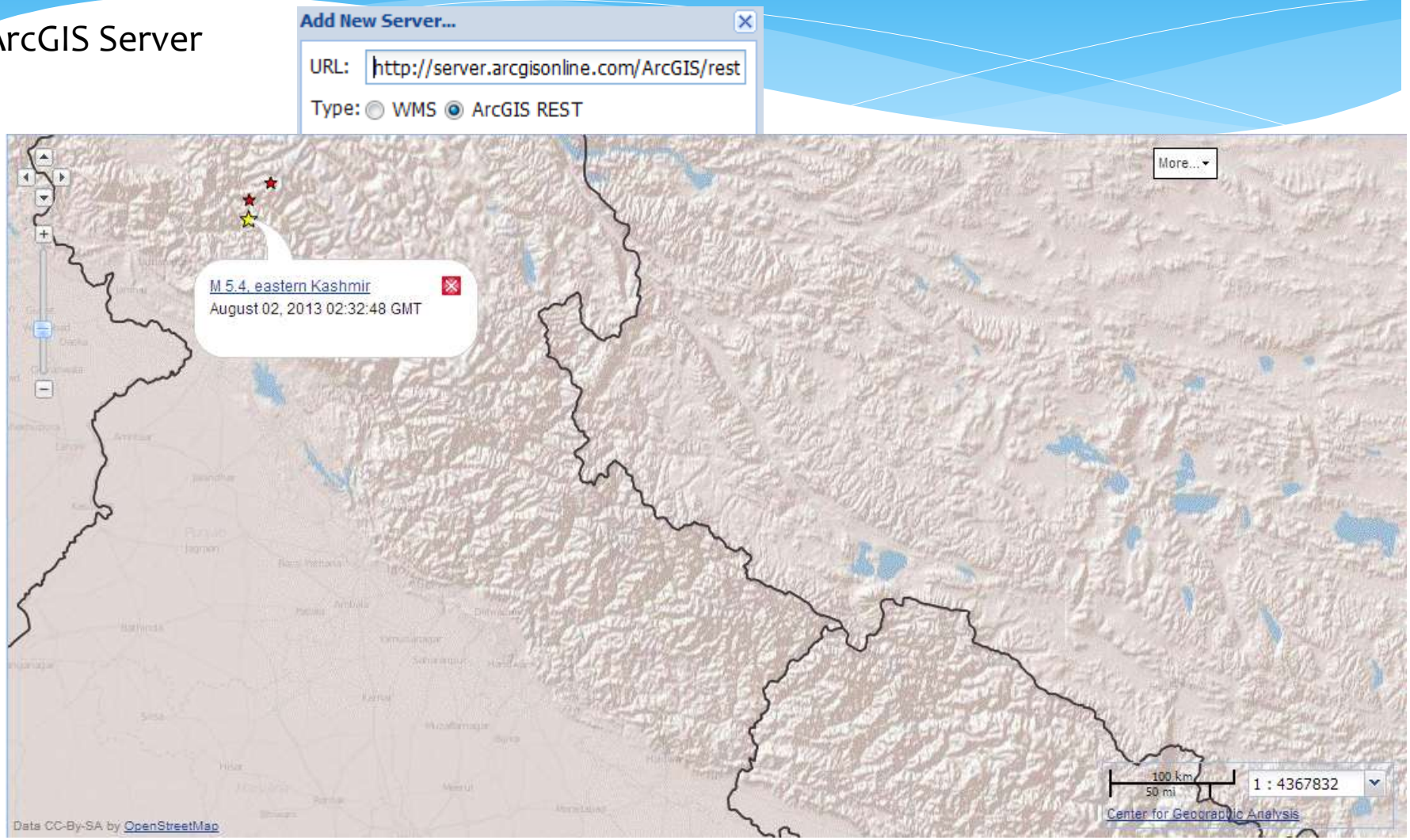
Add Data From External Source

GeoRSS Feed



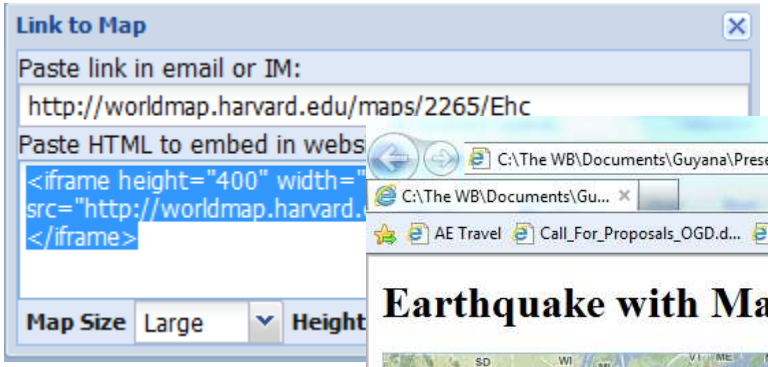
Add Data From External Source

ArcGIS Server



Share Map

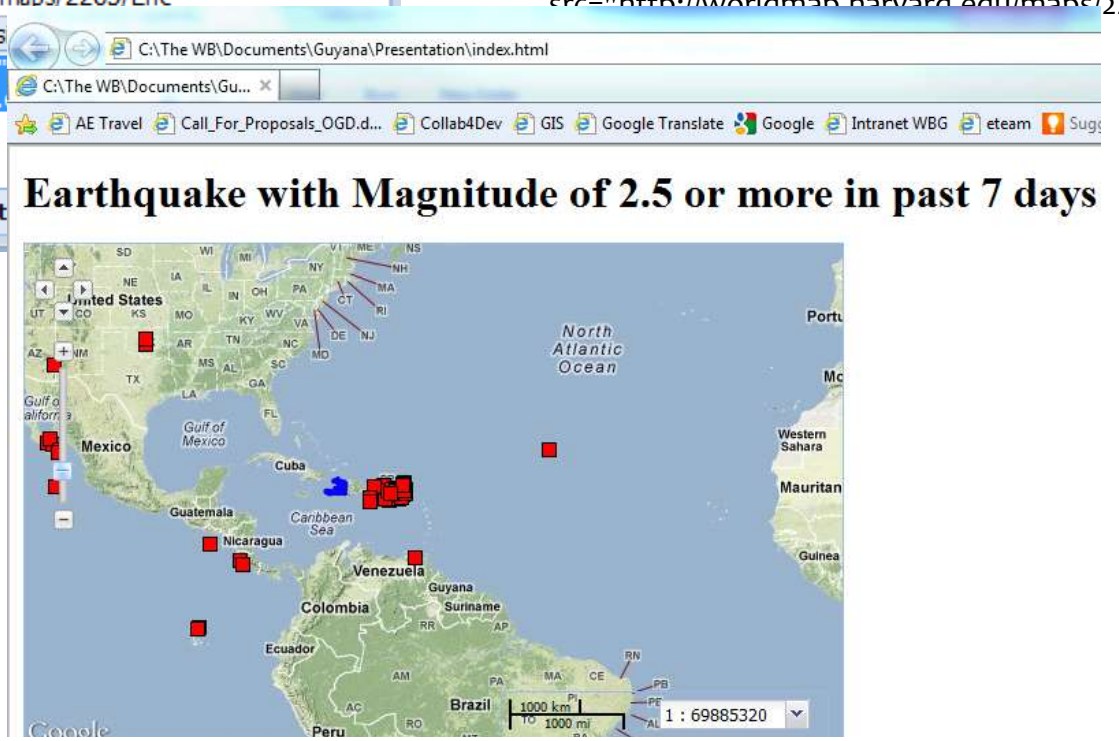
Copy the html code



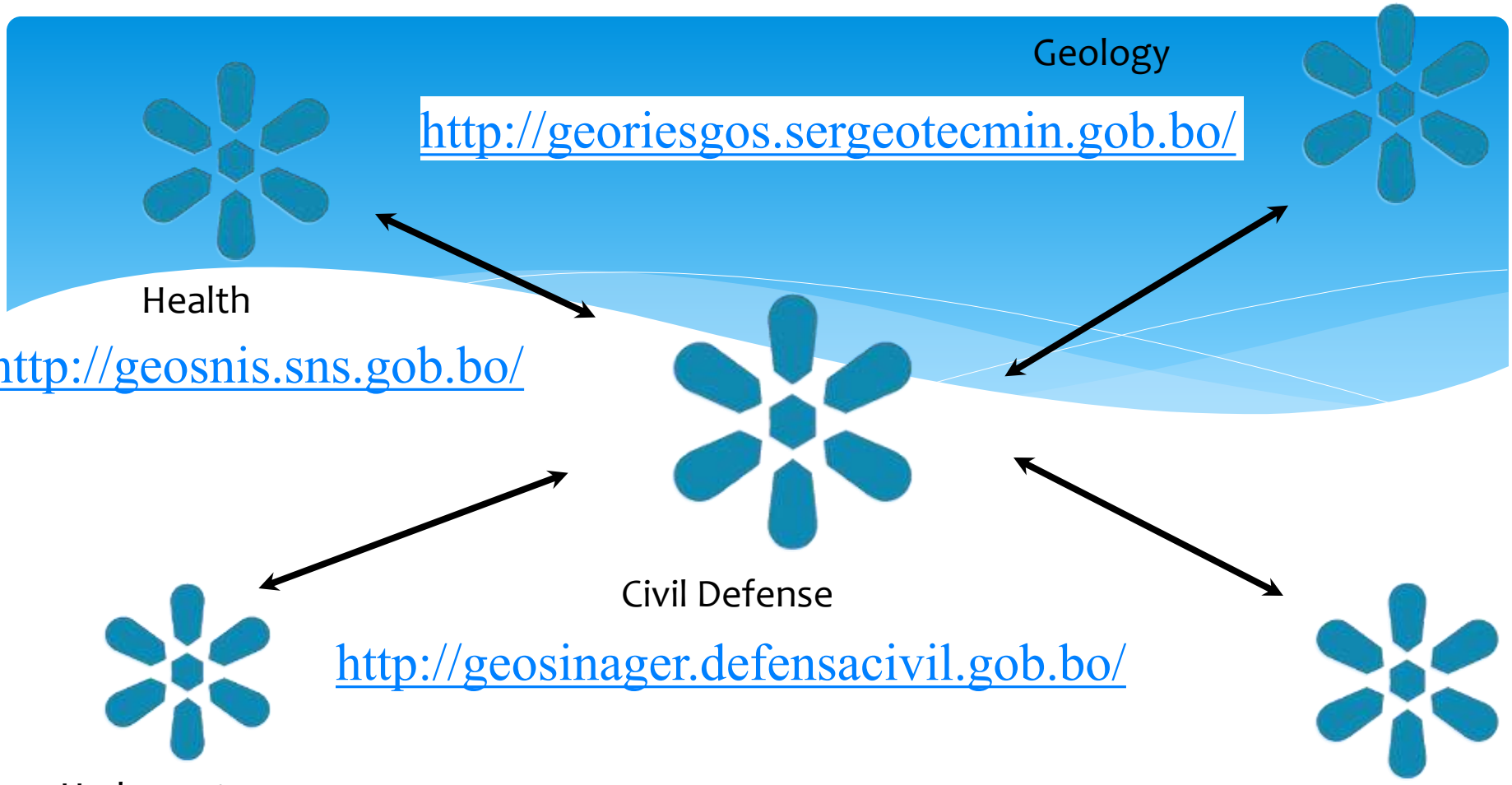
Paste the html code in your web application

<h1>Earthquake with Magnitude of 2.5 or more in past 7 days <h1>/

<iframe height="400" width="600"
src="http://worldmap.harvard.edu/maps/2265/Ehc/embed"></iframe



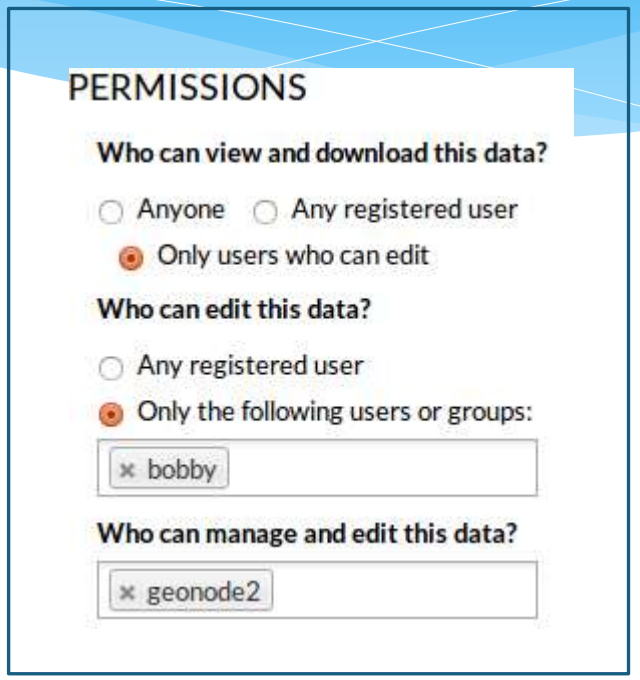
Map is embedded in your Web Application



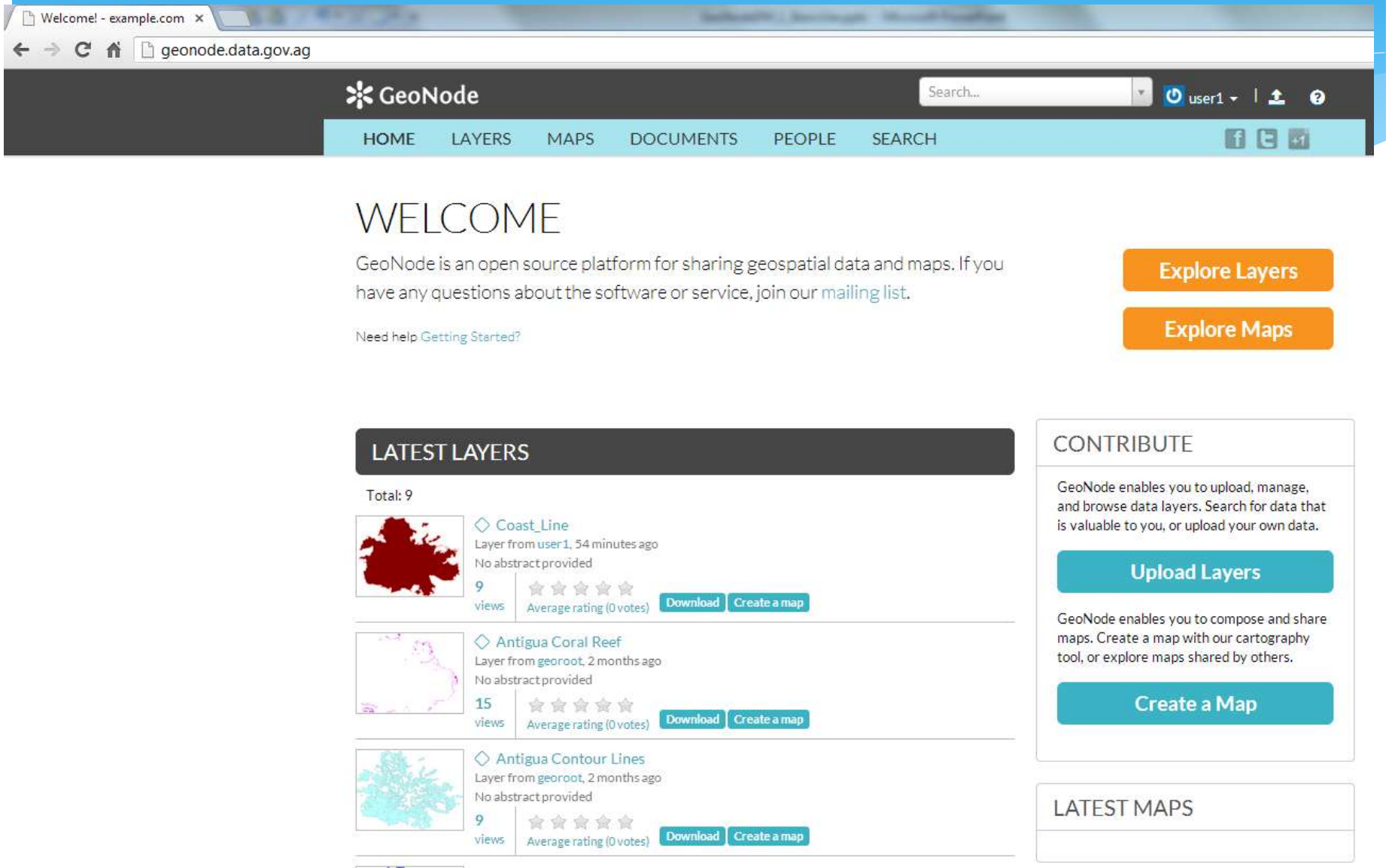
GeoNode Bolivia – Federation Model

GeoNode scope

Easy access control!



Starting Geonode

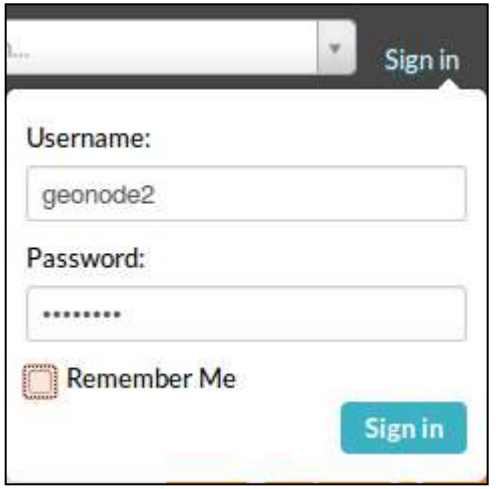


Registration / logging in

* Some GeoNode sites have enabled user registration. If so, you can *register* (sign up), wait for the confirmation email, and use this account to sign in:

* Otherwise, the GeoNode administrator needs to create a user for you to *sign in*

In the workshop, sign in with the account and password provided by the instructor



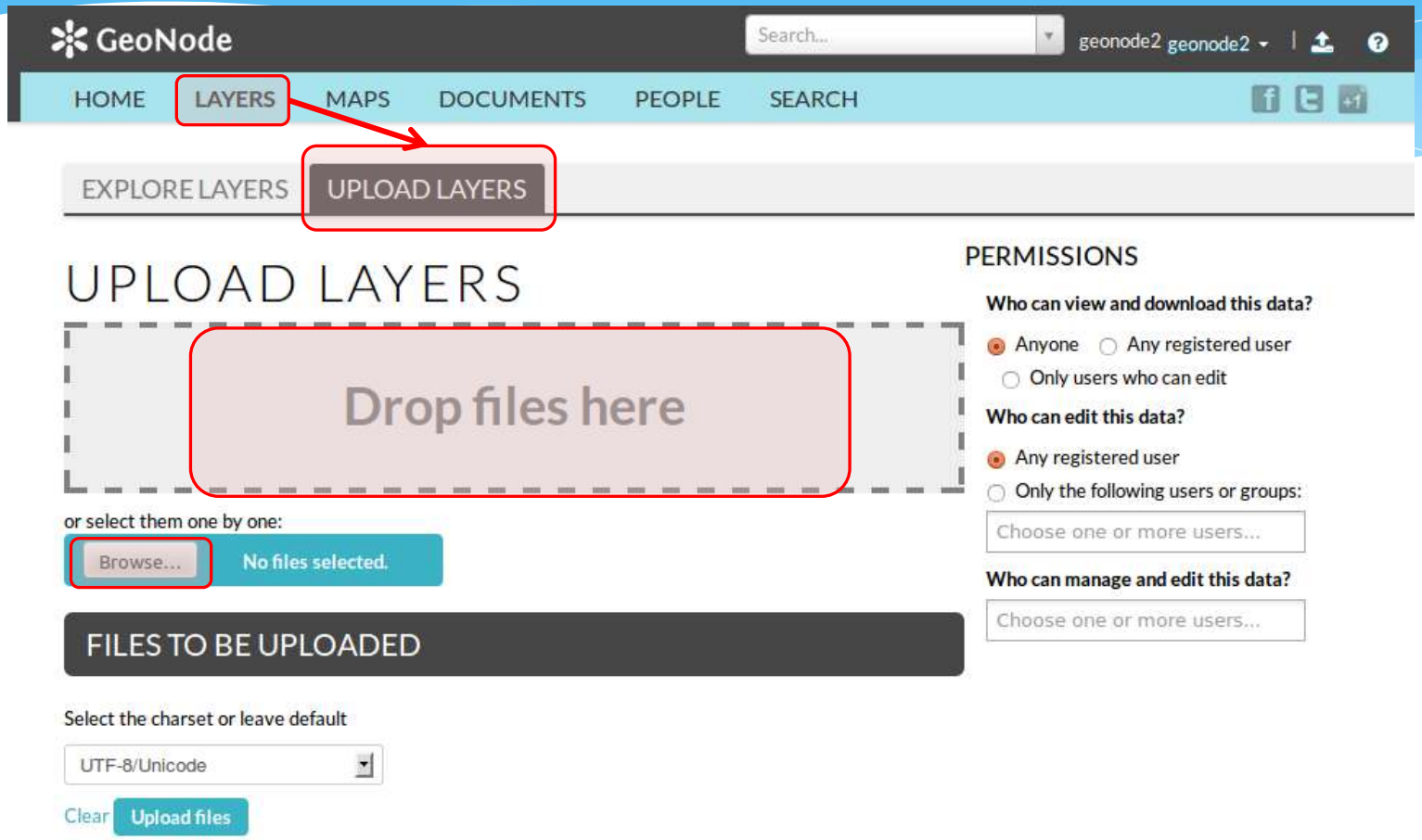
Uploading data

* GeoNode can directly upload **vector data** (points, lines, polygons) from shape files and **raster data** (images, elevation grids) from geoTIFF files

* Go to the 'LAYERS' main tab, and then 'UPLOAD LAYERS' subtab

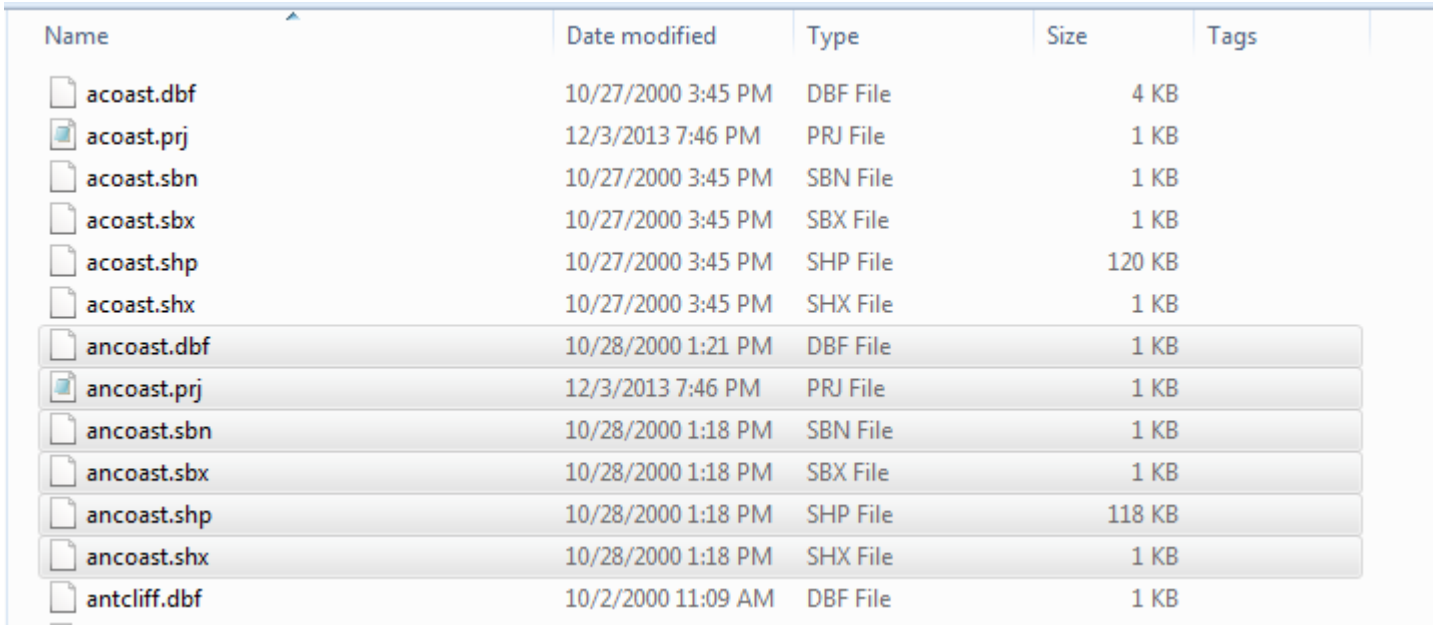
* There, you can 'drag and drop' files, or use the 'Browse…' button to select and load

Uploading data



Uploading data: shape files

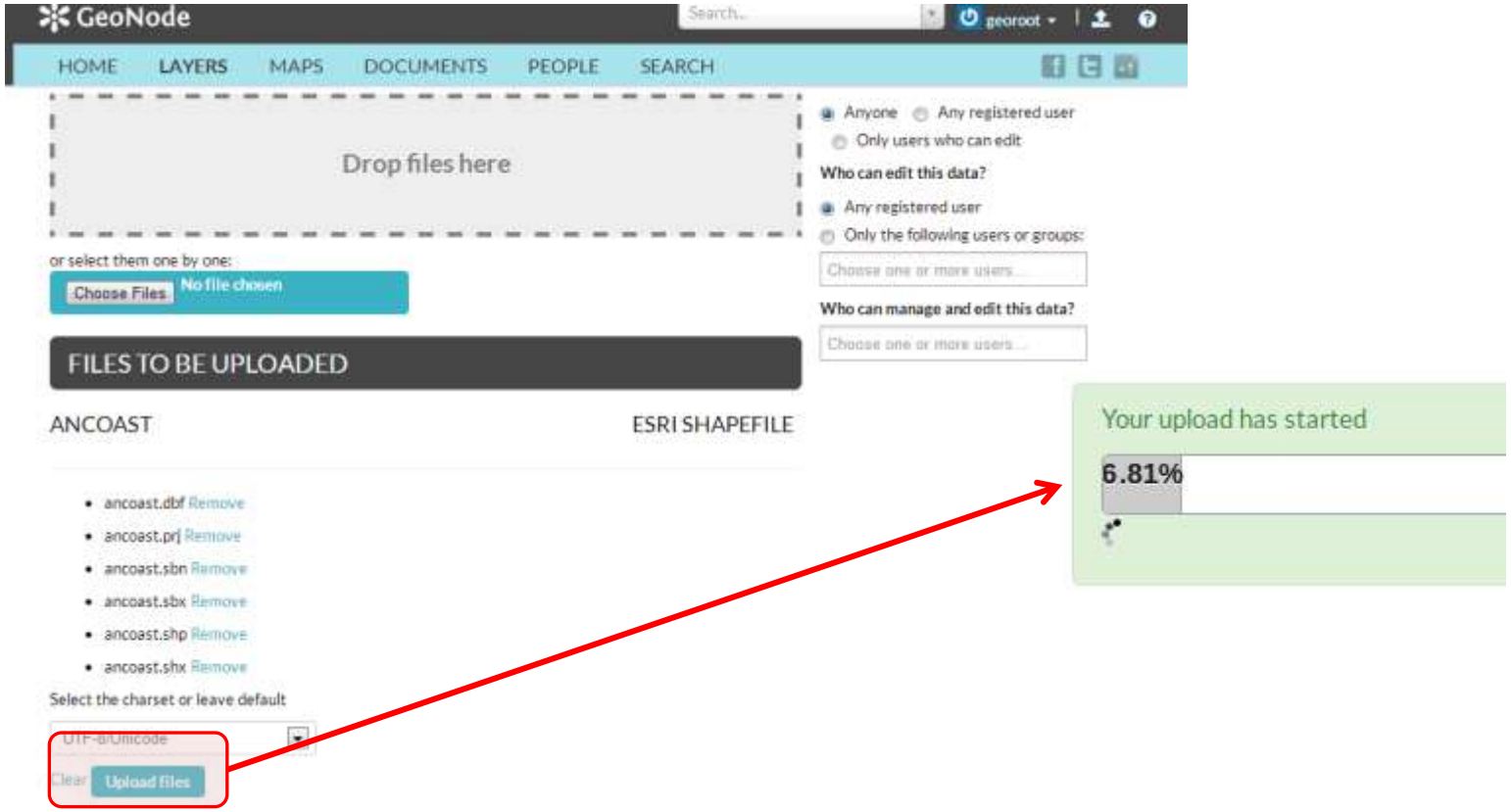
* Browse for the shapefiles directory and select all with the same name in the workshop's data folder



Name	Date modified	Type	Size	Tags
acoast.dbf	10/27/2000 3:45 PM	DBF File	4 KB	
acoast.prj	12/3/2013 7:46 PM	PRJ File	1 KB	
acoast.sbn	10/27/2000 3:45 PM	SBN File	1 KB	
acoast.sbx	10/27/2000 3:45 PM	SBX File	1 KB	
acoast.shp	10/27/2000 3:45 PM	SHP File	120 KB	
acoast.shx	10/27/2000 3:45 PM	SHX File	1 KB	
ancoast.dbf	10/28/2000 1:21 PM	DBF File	1 KB	
ancoast.prj	12/3/2013 7:46 PM	PRJ File	1 KB	
ancoast.sbn	10/28/2000 1:18 PM	SBN File	1 KB	
ancoast.sbx	10/28/2000 1:18 PM	SBX File	1 KB	
ancoast.shp	10/28/2000 1:18 PM	SHP File	118 KB	
ancoast.shx	10/28/2000 1:18 PM	SHX File	1 KB	
antcliff.dbf	10/2/2000 11:09 AM	DBF File	1 KB	

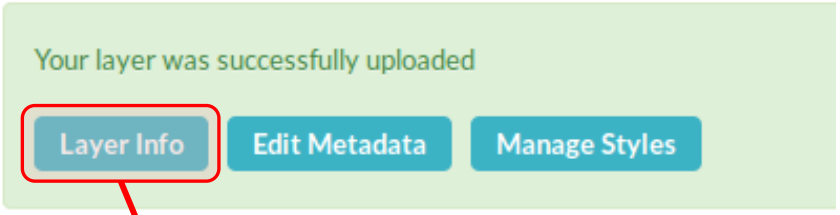
Uploading data: shape files

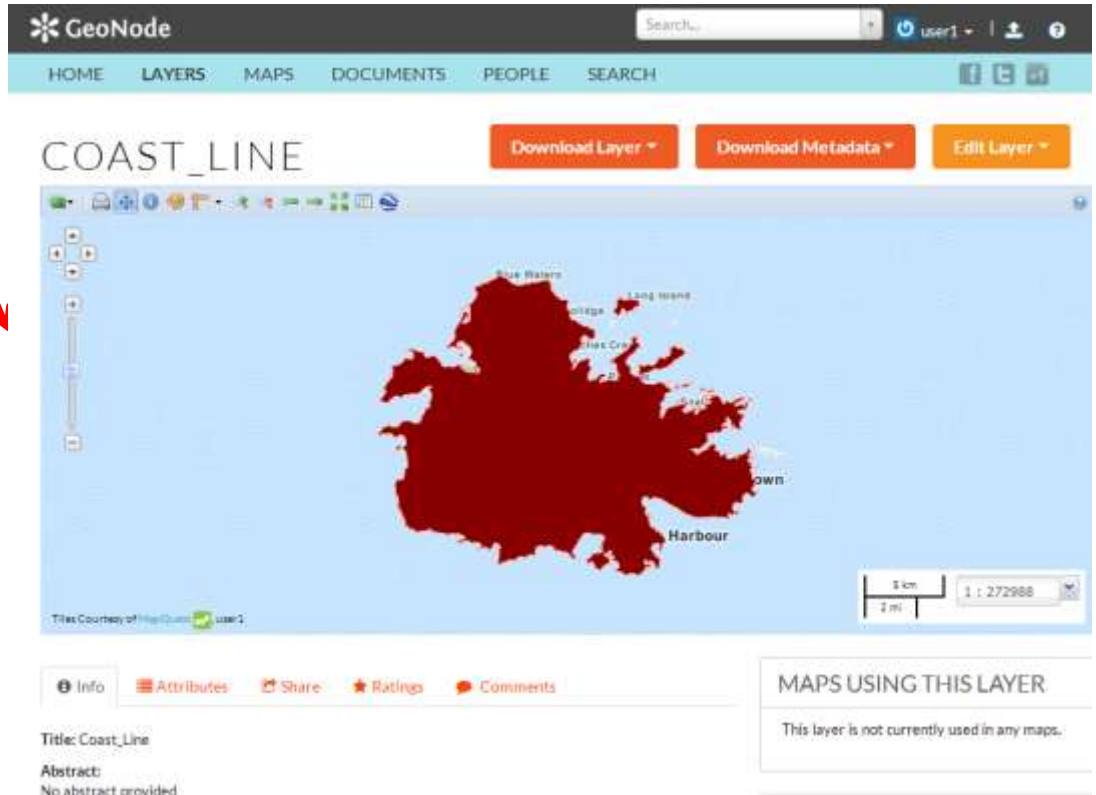
* Verify that the data is recognized (title should appear and no ‘missing’ error messages)
* Click on ‘Upload files’



Uploading data: shape files

* After the data is uploaded as a layer, you have different options





See the layer (with default style) on a map, and access its properties

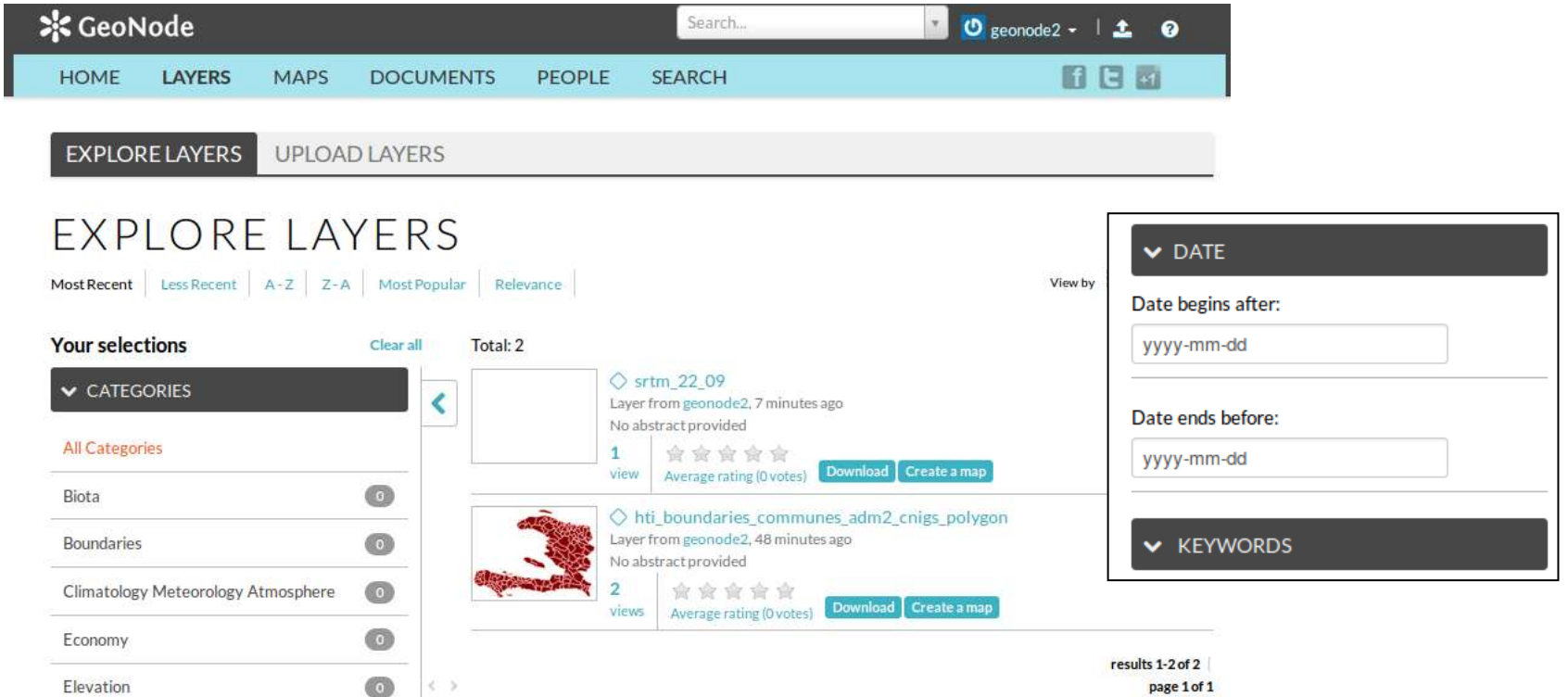
Uploading data: shape files

* Exercise:

Upload some shapefiles from the workshop data folder
Don’t worry about the metadata for now

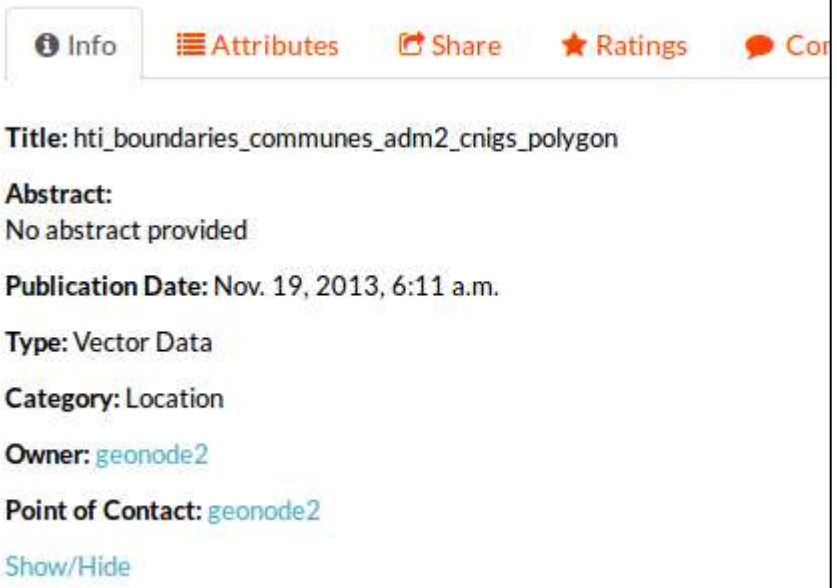
Managing data

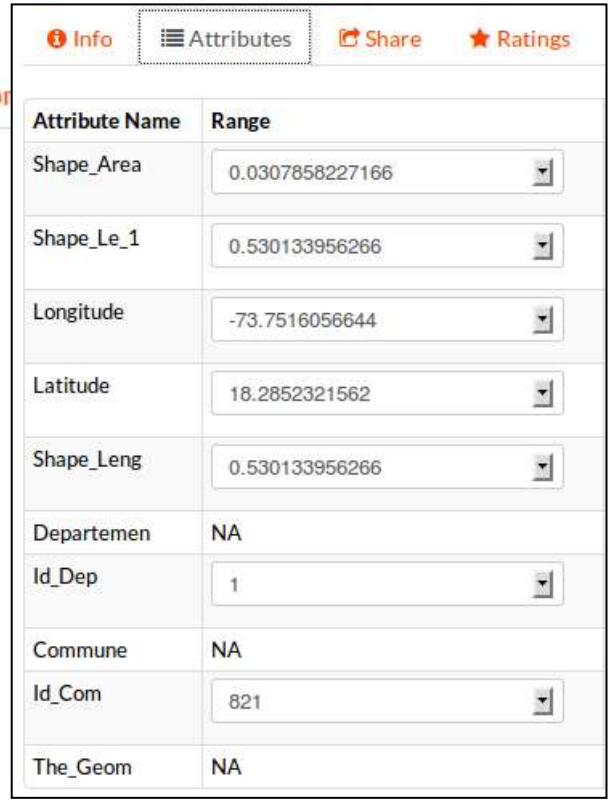
* We can find layers in the ‘Layers / Explore Layers’ tab
* We can filter by category, popularity, date or keywords



Managing data

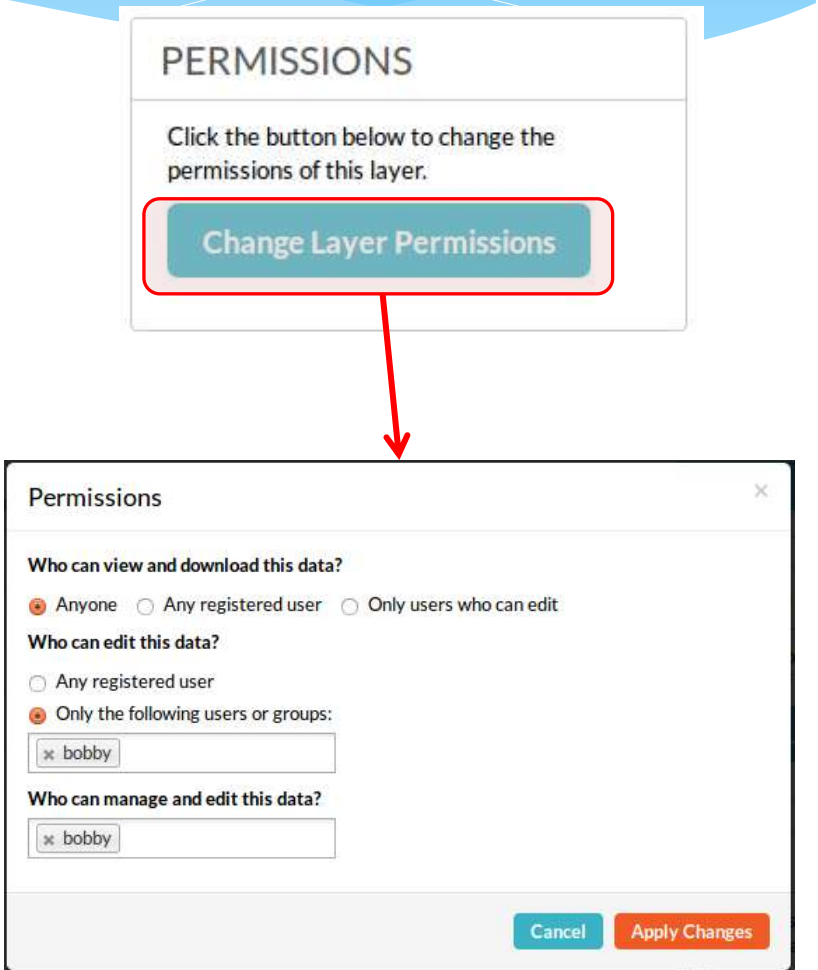
* From the list of layers, click on the layer name to go to the **Layer Info page** that we saw earlier
* In this page we can see and change the layer properties





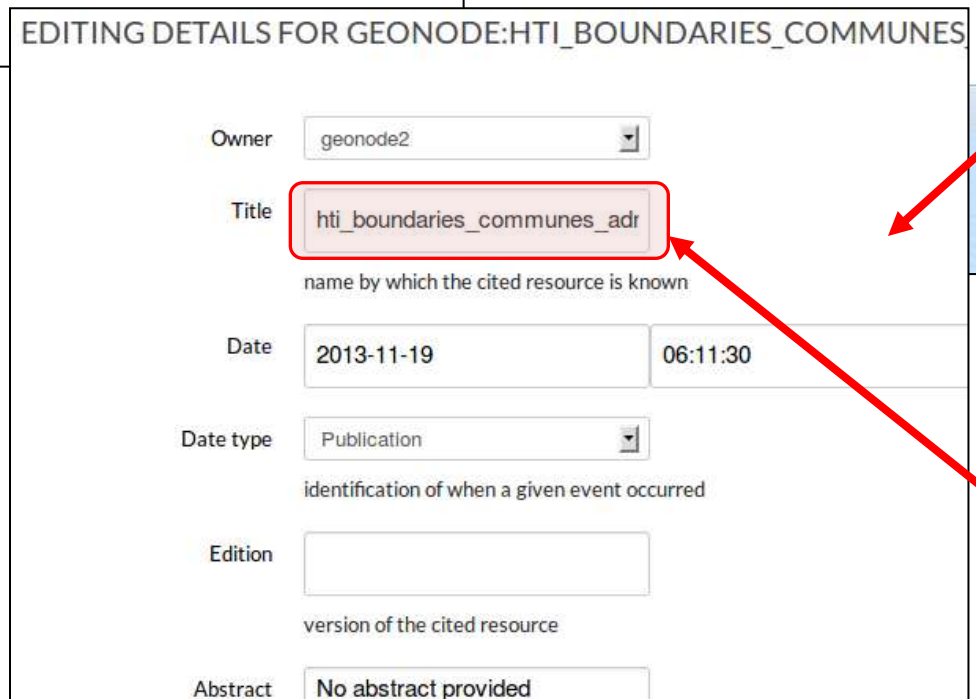
Managing data: permissions

* By default, all users will be able to view and download the data you upload, but only you can change them
* To modify this default, you can manage permissions from the layer info page
* You can give separate permissions to
  * *View and download* the layer
  * *Edit* (modify metadata, styles)
  * *Edit and manage* (delete, change permissions)



Managing data: metadata

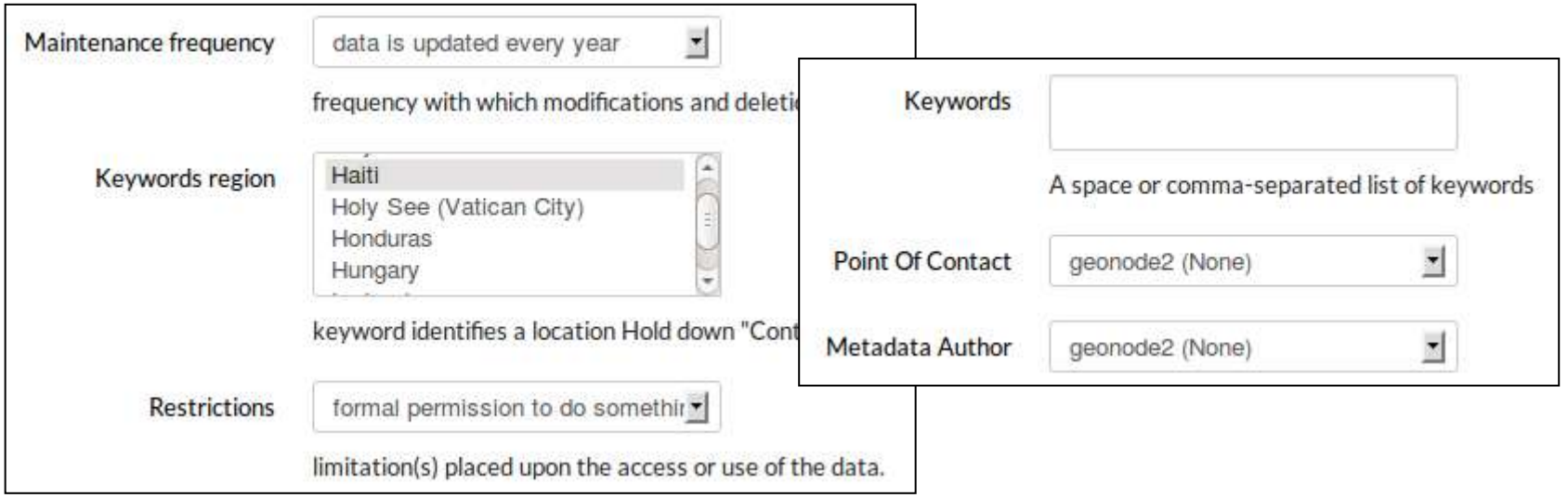
* You can also find all layer editing options at the top of the Layer Info page, including ‘Edit Metadata’



This is where you can change the name of the layer

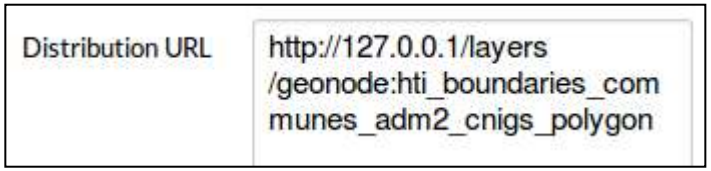
Managing data: metadata

* This information is very important in the context of an SDI
* Some of the metadata are hidden, like the Geographic Bounding Box, and others are automatically populated by GeoNode but can be changed



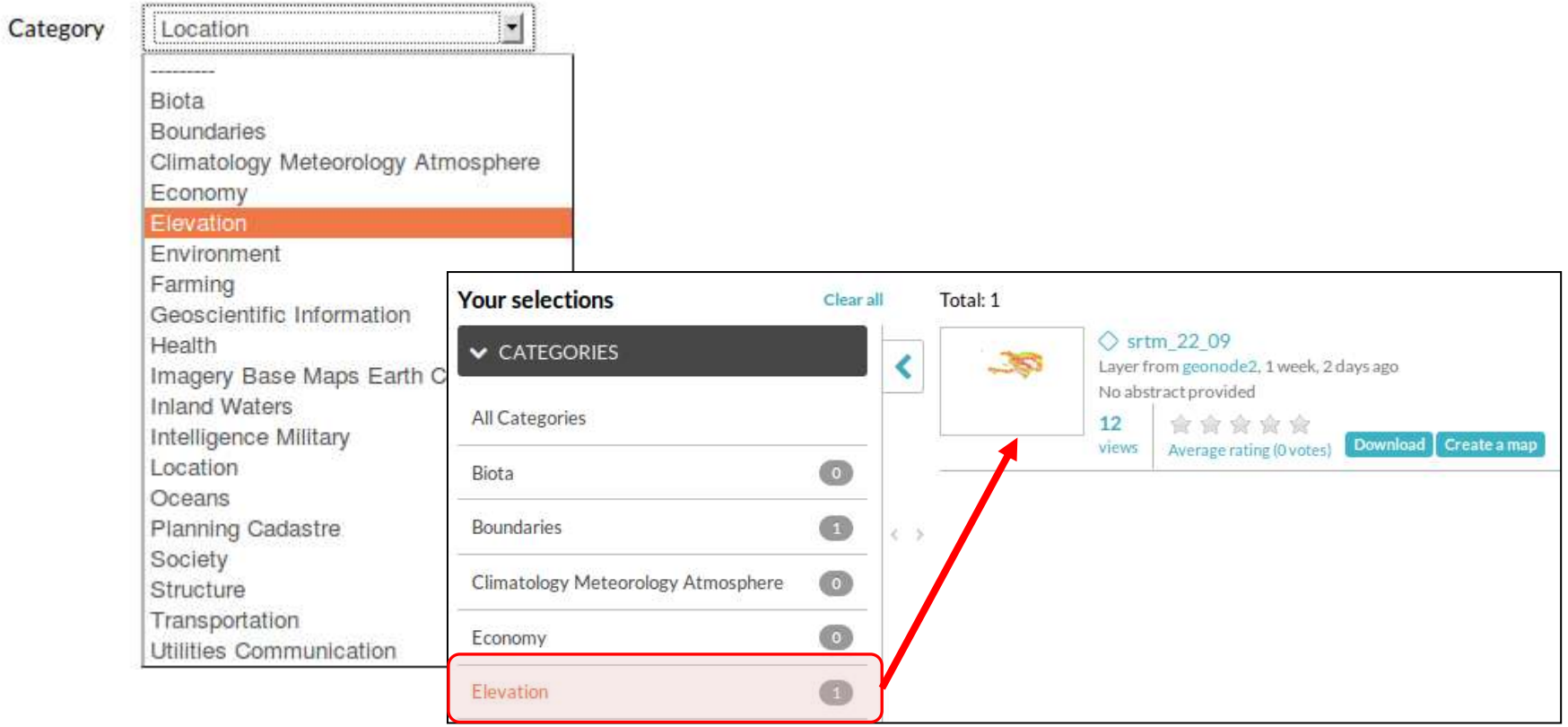
The distribution URL is the address of the layer info Web page

(it can not be changed here)



Managing data: metadata

* The category is used by Geonode to organize the resource (layer, map or document) in groups in the 'Explore' tabs



Managing data: metadata

* Exercise

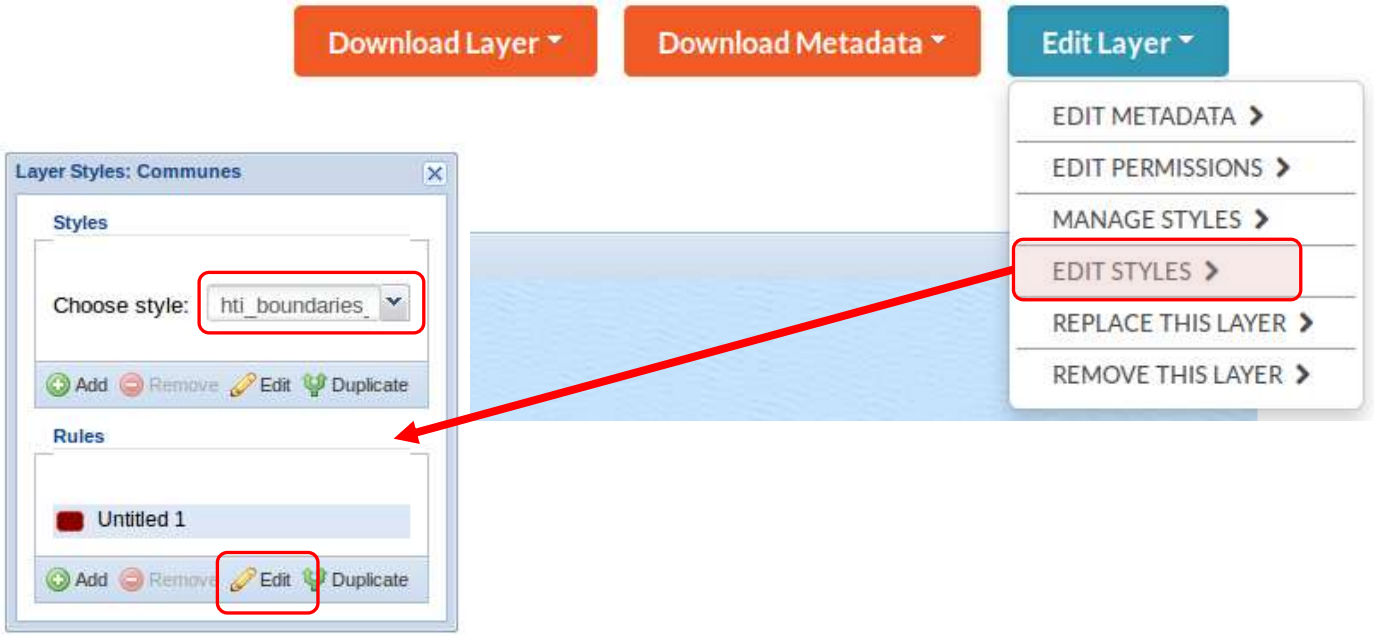
Edit metadata for at least one layer

Set the proper category for all the layers you have uploaded

Managing data: styles

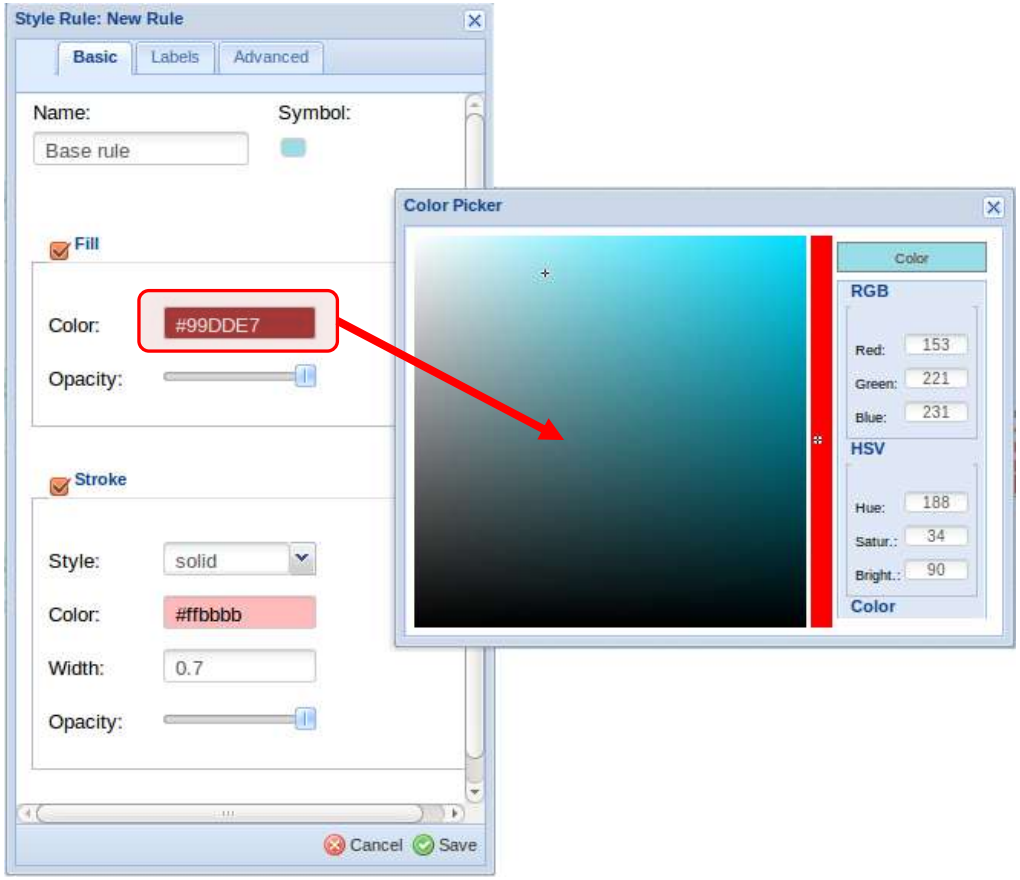
* A style specifies how data is displayed. It is defined by one or more rules
* The default style contains one rule that applies the same color to all features

* To change a rule, we must select it in the list, and then click on 'Edit' to open the rule editor



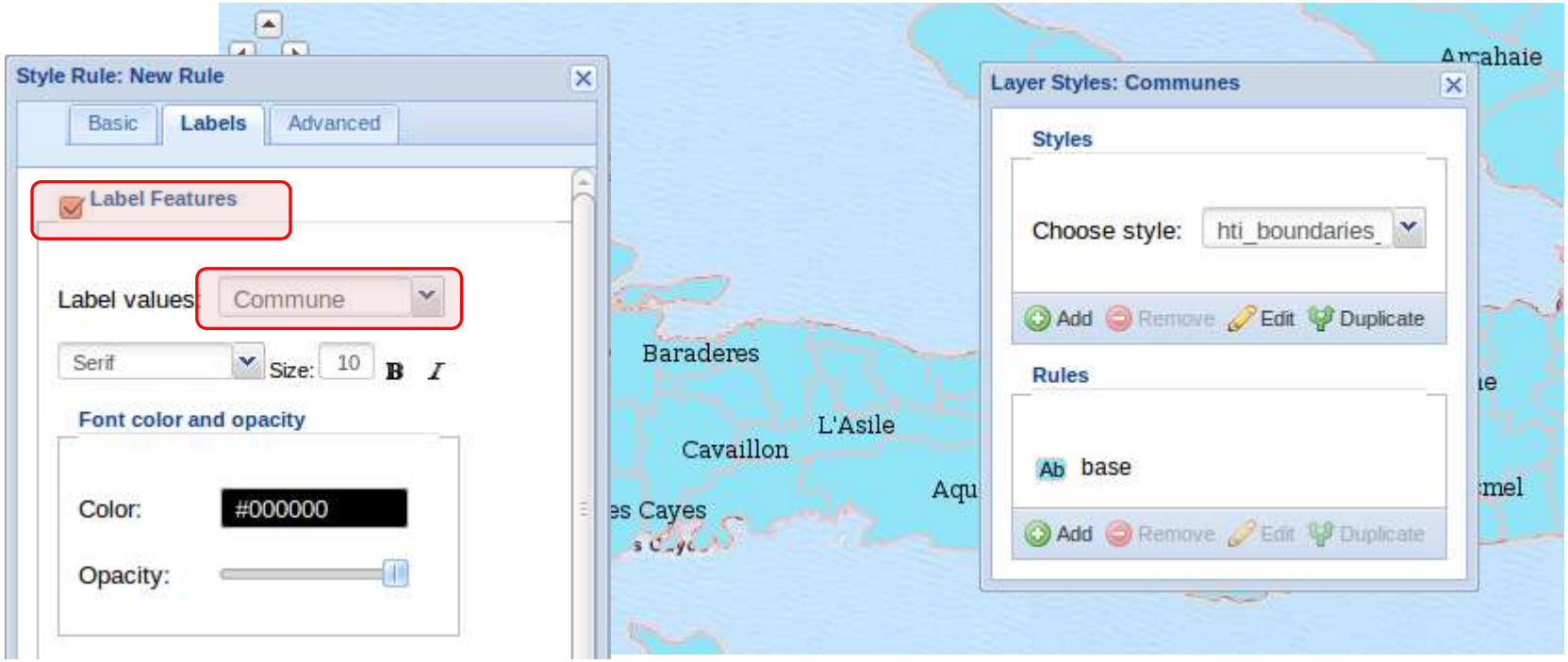
Managing data: styles

In the *Basic* tab, we can change the fill and stroke properties applied by the rule (double-click on the color selector to apply)



Managing data: styles

The *Labels* tab in the rule editor allows us to display texts taken from an attribute (field) or our data



Managing data: styles

The ‘Advanced’ tab allows us to limit the rule application by geographic scale or by a condition on the feature attributes

For instance, “apply this border only to communes in this department”

Managing data: styles

We can use the ‘Duplicate’ tool in the Style editor to create many related versions of the same rule

For instance, try creating a multiple classes of features with different colors

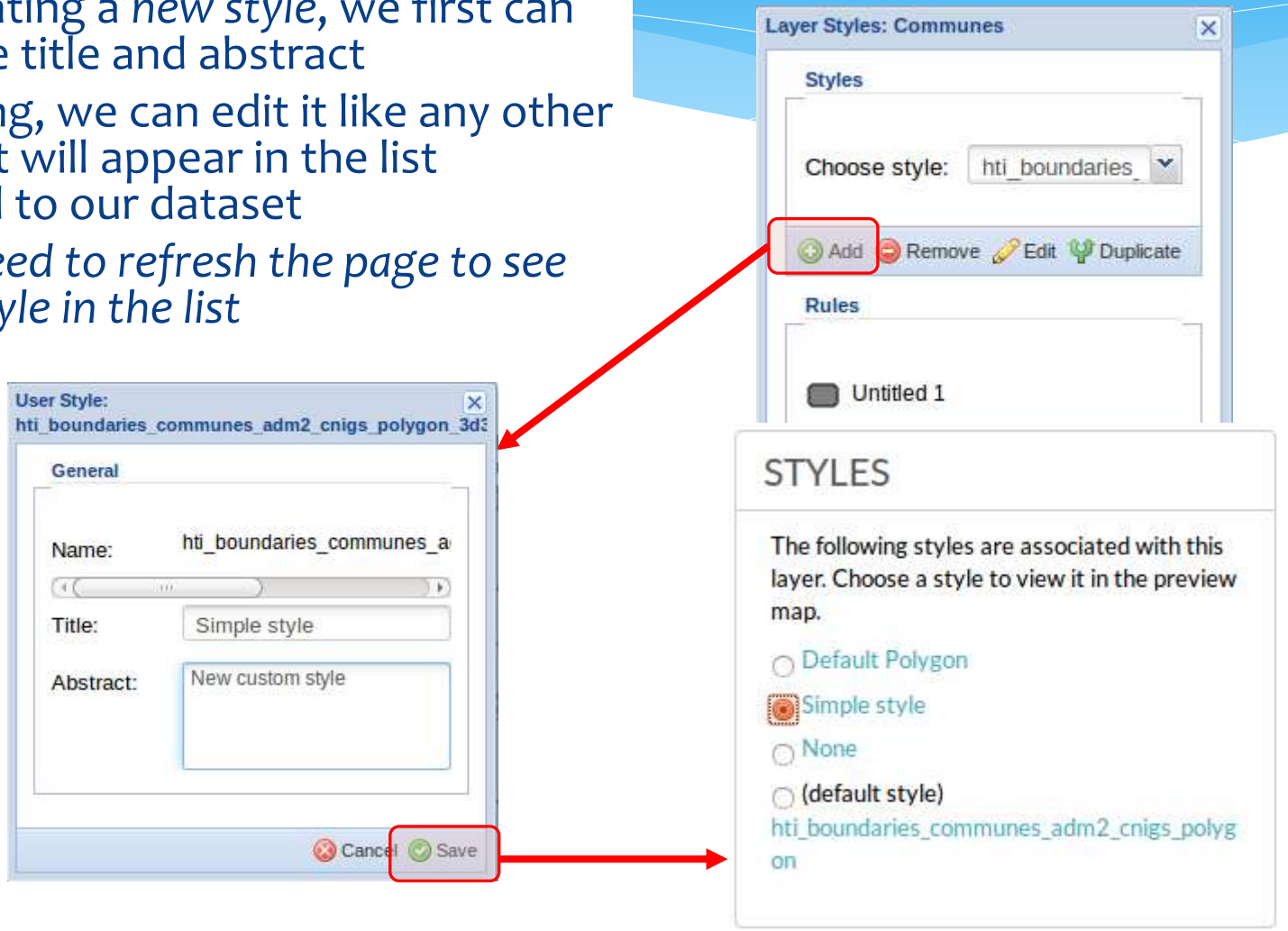
It may be cumbersome to create styles in this manner, since the base symbols are very simple

Managing data: styles

When creating a *new style*, we first can specify the title and abstract

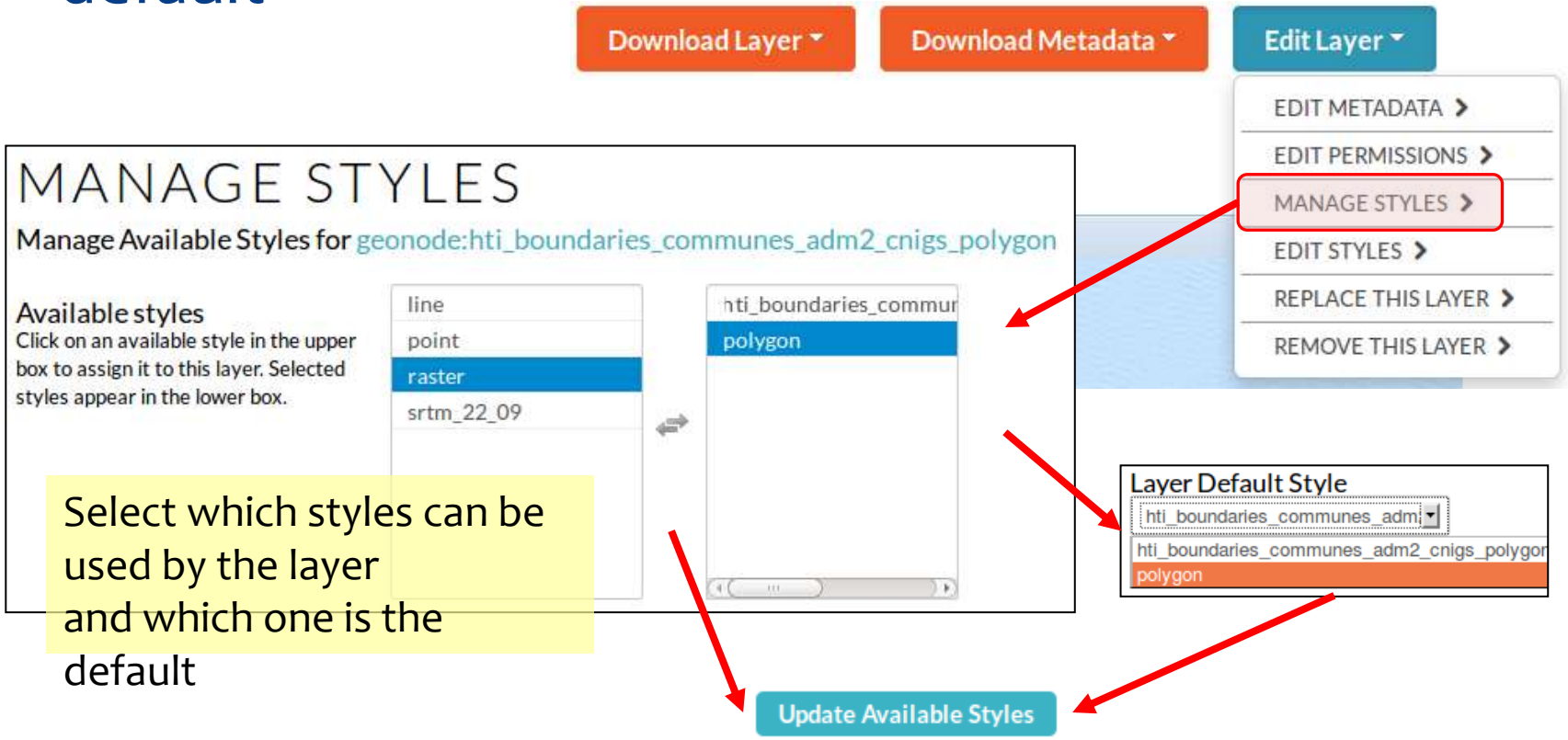
After saving, we can edit it like any other style and it will appear in the list associated to our dataset

We may need to refresh the page to see the new style in the list



Managing data: styles

* With the ‘Manage styles’ menu, we can select which styles are available for each layer, and the default



Select which styles can be used by the layer and which one is the default

Managing data: styles

* The current style can be selected in the layer info page, from the available list

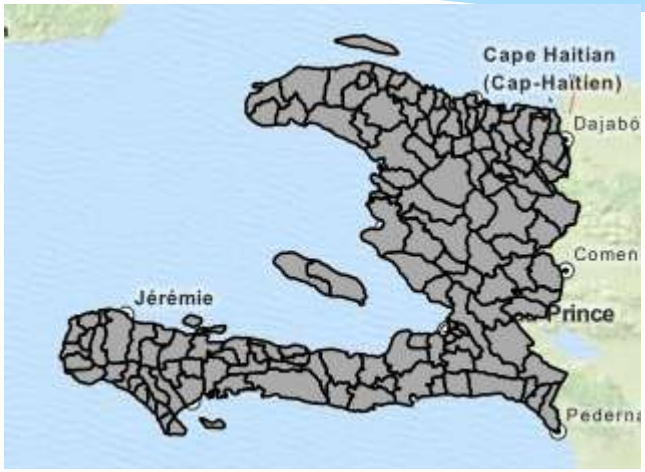
STYLES

The following styles are associated with this layer. Choose a style to view it in the preview map.

(default style)

hti_boundaries_communes_adm2_cnigs_polygon

Default Polygon



STYLES

The following styles are associated with this layer. Choose a style to view it in the preview map.

(default style)

hti_boundaries_communes_adm2_cnigs_polygon

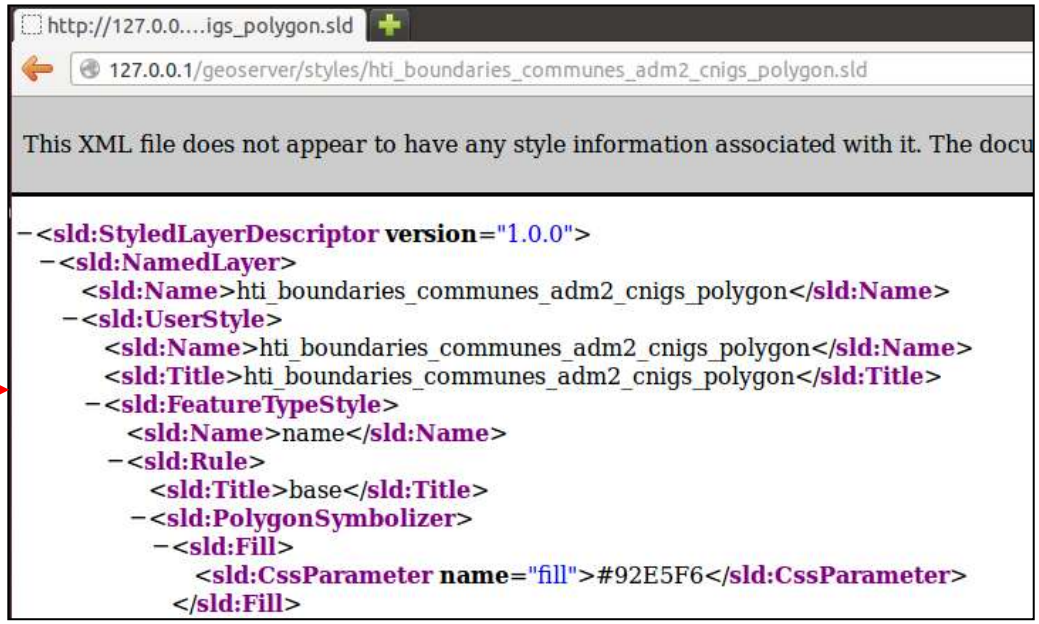
Default Polygon

Managing data: styles

* Exercise:
  * Change and create new styles for a feature layer
  * Use a condition in the advanced tab to give different colors to different features

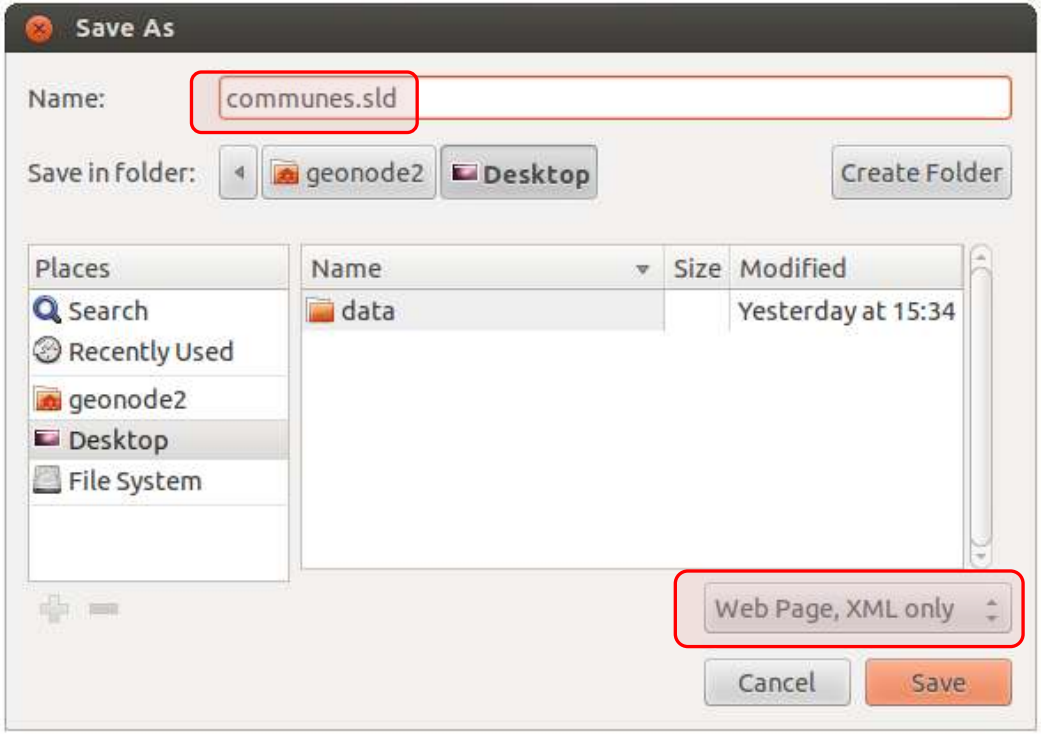
Managing data: saving styles

* Internally, Geonode (actually, Geoserver) uses the SLD style standard format to store the symbols definition
* We can save the style as an *SLD file* together with the data, for future use, although the style will be available in the Geonode for other layers via the style manager
* If you click on the style name, Geonode will open its SLD code in the Web browser



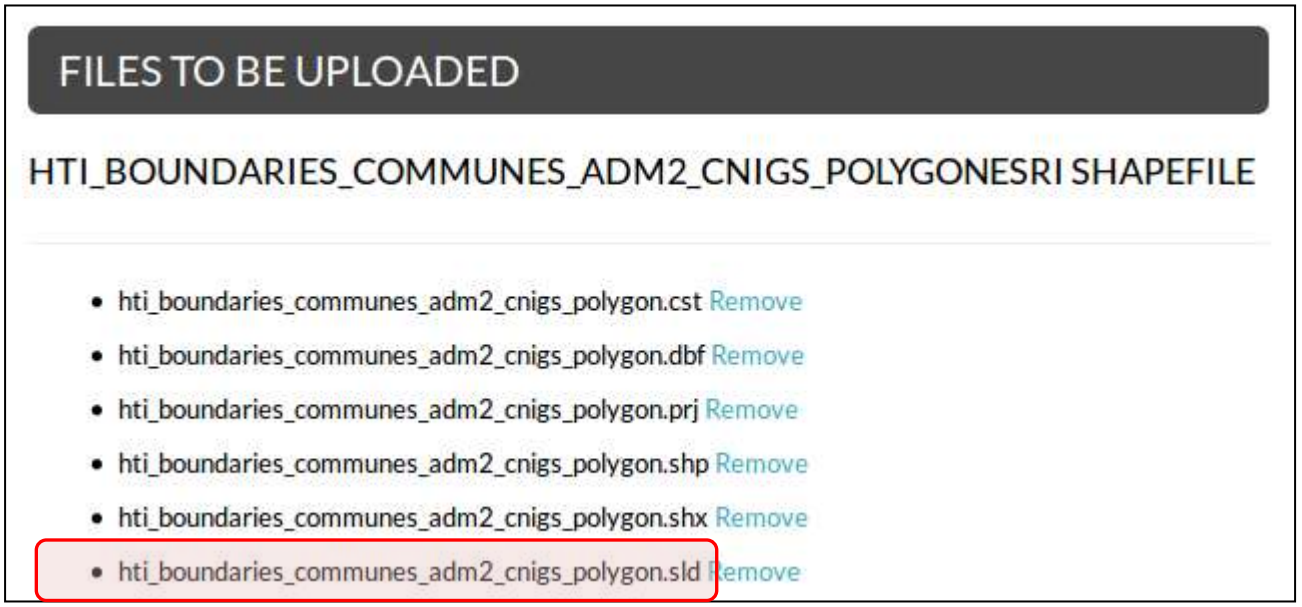
Managing data: saving styles

* We can save the SLD file *as XML* from the Web browser



Managing data: uploading styles

* We can use saved SLD files when we upload feature or raster data, but…
  * We must give the same name to the SLD file as the data files
  * We must select the SLD file together with the other ones (otherwise it won't be recognized)
* We can also use saved SLD files in GeoServer (see later)

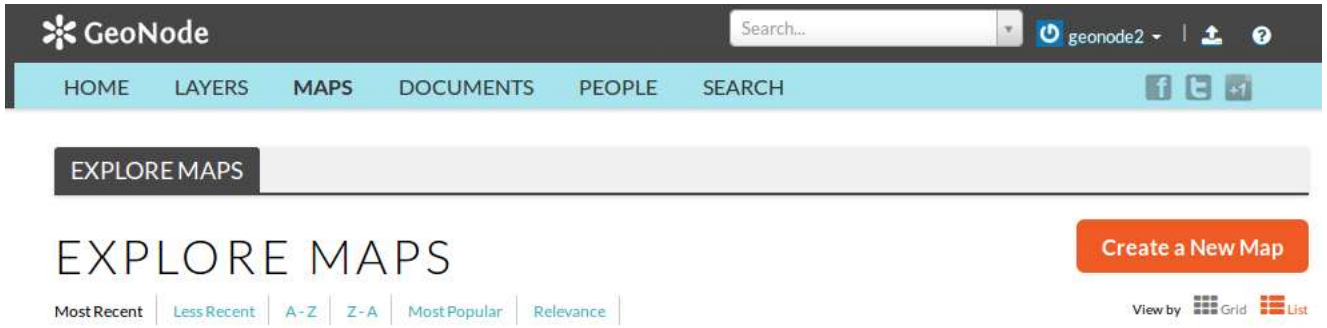


Managing data: styles

* Exercise:
  * Save a style SLD file and upload data again with this file included
  * Check that the default style matches your SLD

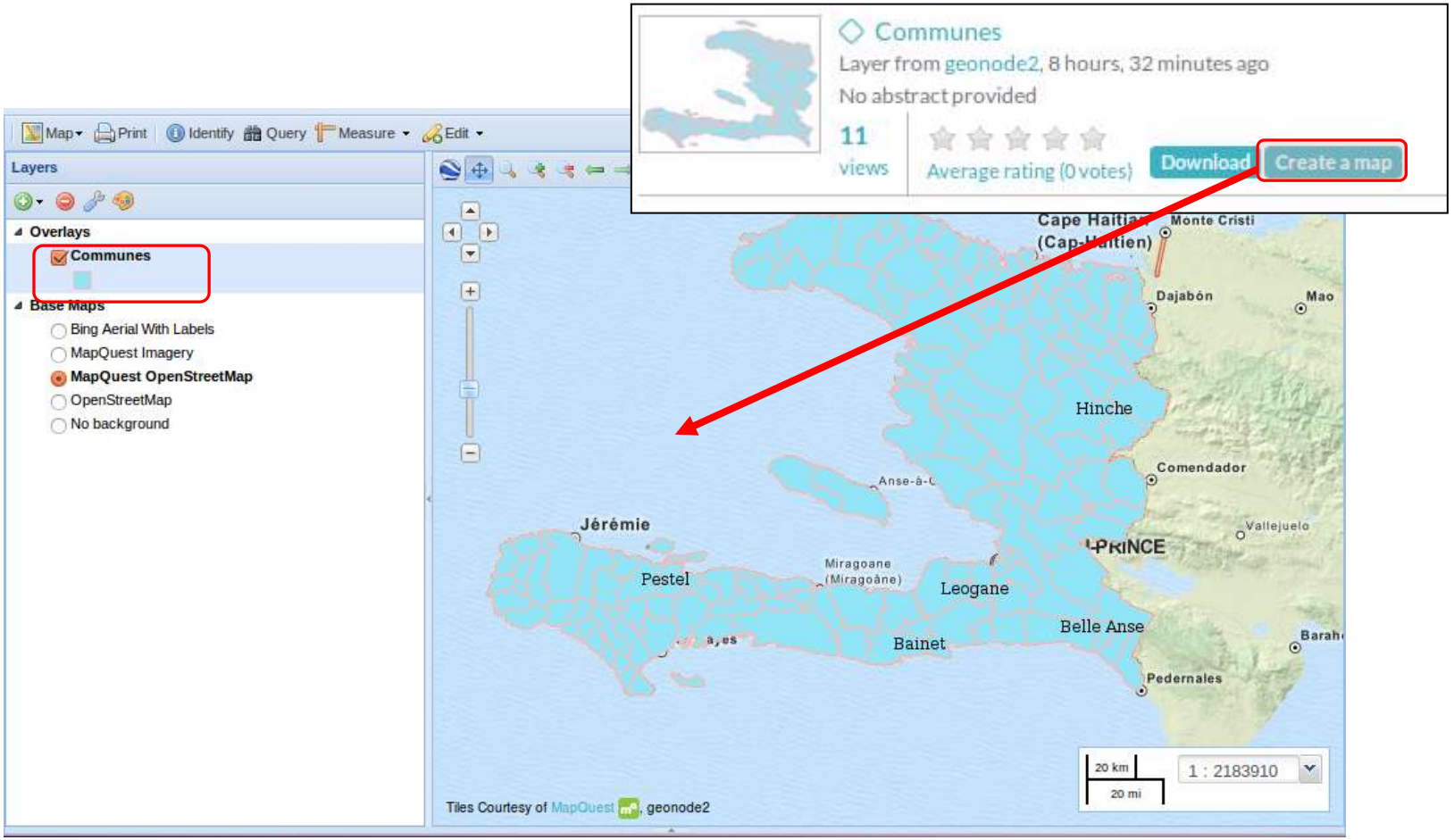
Creating maps

* Maps are made of one or more *layers*
* Each layer in a map can be ours or from other users, or can be from *external sources* like WMS services
* We can create maps from at least 3 places! ☺



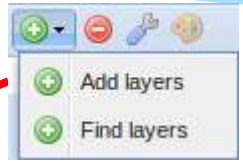
Creating maps

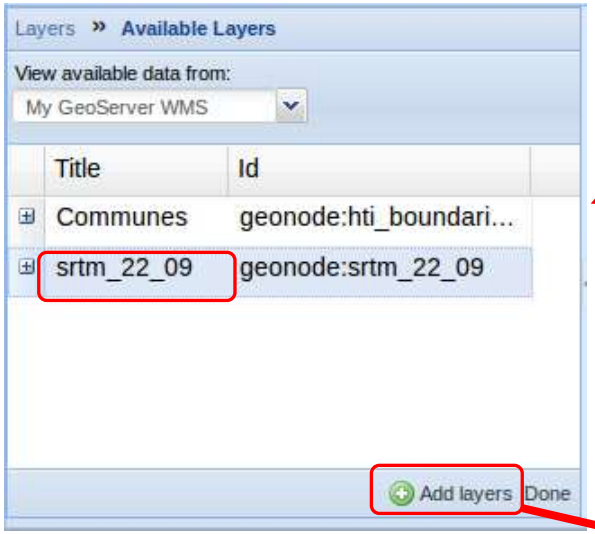
* When we create a map from a layer, we'll see it in the table of contents of a new map in the Map Viewer

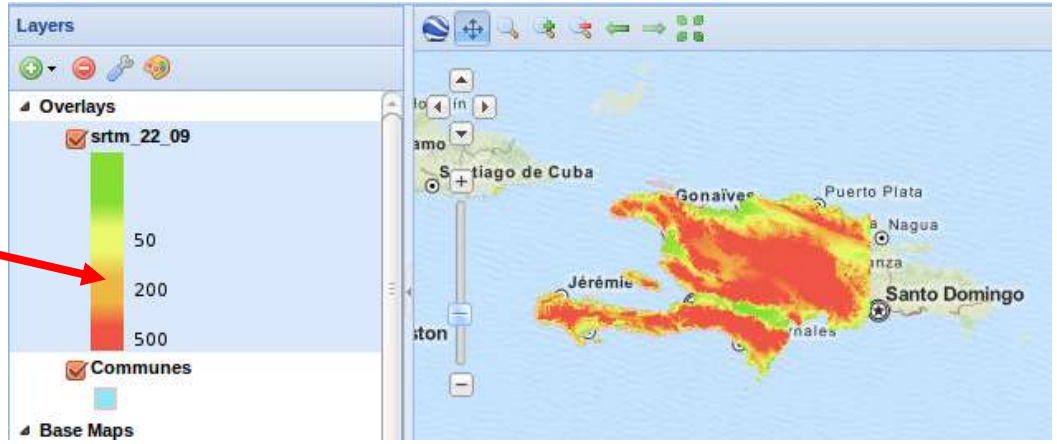


Creating maps: adding layers

* More layers can be added to the map using the Add and Find layer tools in the map viewer

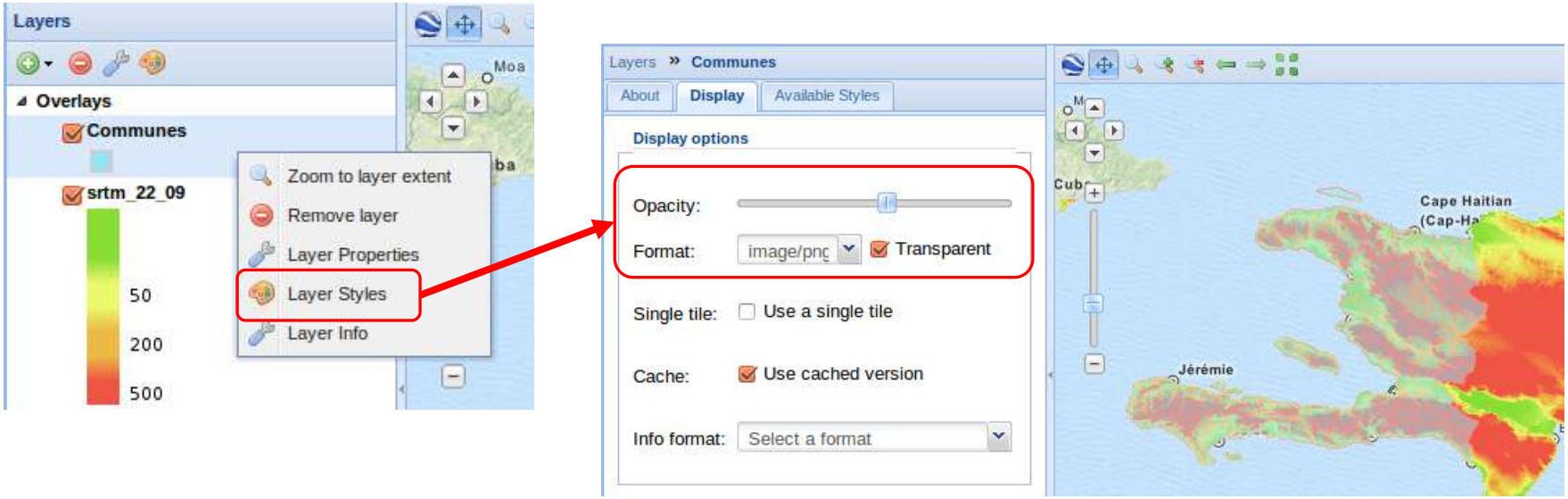






Creating maps: layer visibility

* We can change the drawing order by clicking on a layer and dragging it up or down in the Table of Contents (Legend)
* If we need to change a layer's opacity to be able to see through it (blend it with layers below it), we can use the right-click menu on the layer and edit the layer properties ('display' tab)

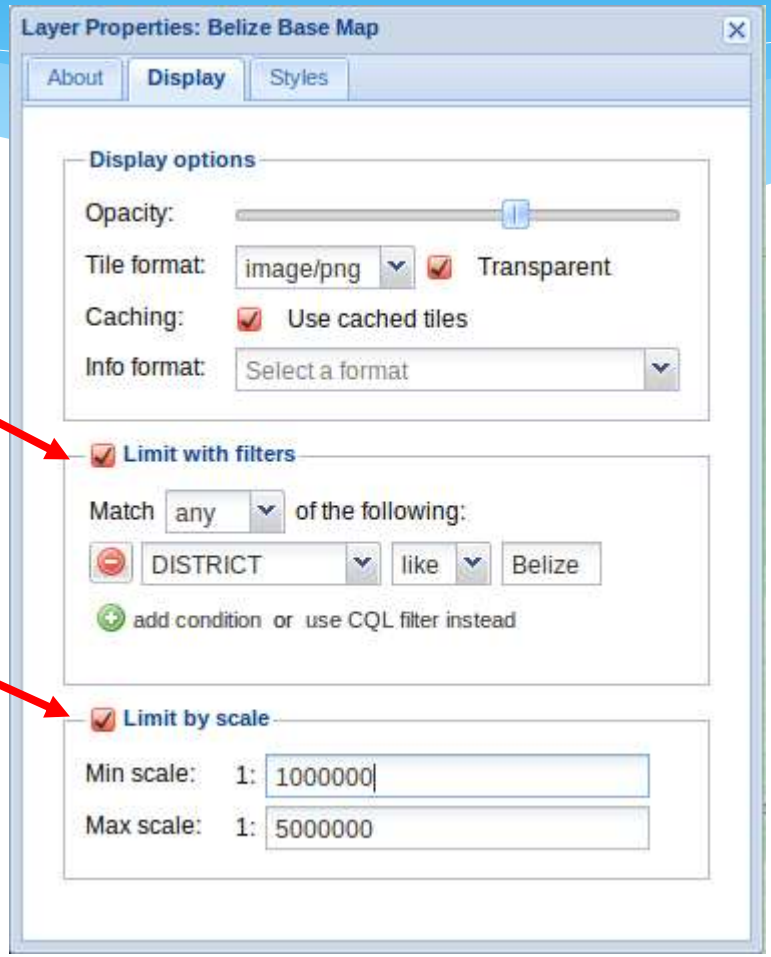


Creating maps: layer visibility

* We can also limit the features we display of a layer by setting a *filter (this will apply to any style)*

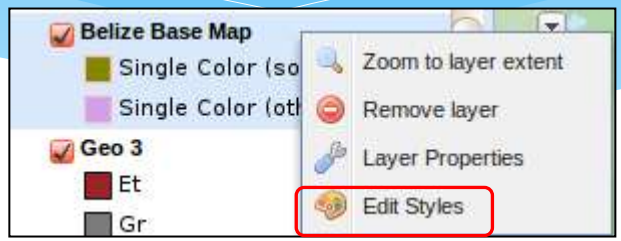
* And we can control in which scales the layer is visible by setting *scale limits*

The latter technique is very important to provide adequate map services, hiding information for scales that do not match the data quality or precision

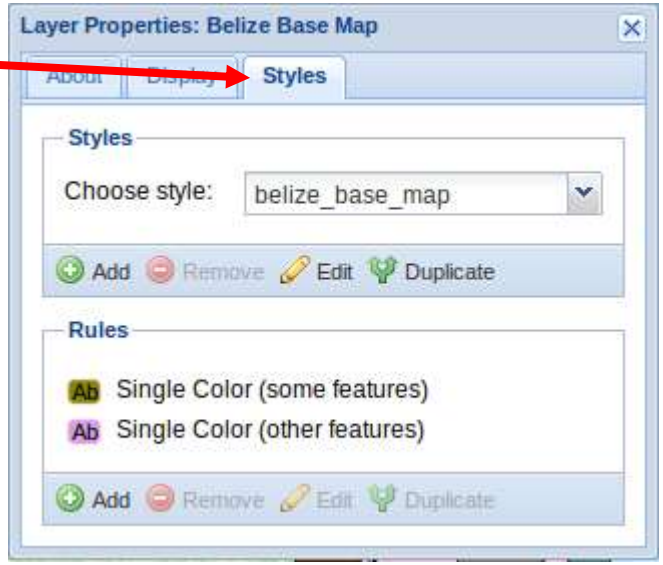


Creating maps: layer styling

* We can select, edit and create the styles for the layers in the map by clicking on 'Edit Styles' in the right-click menu



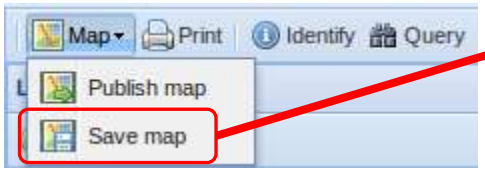
* Or by using the 'Styles' tab in the Layer Properties

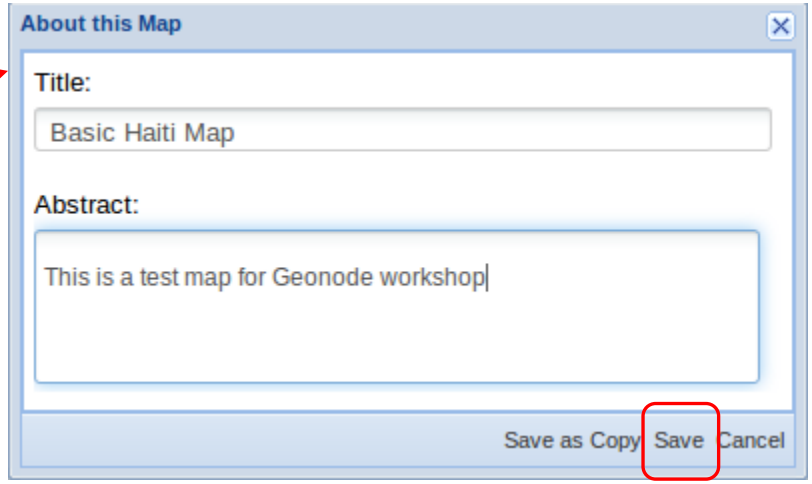


* The styling process is identical to the one we saw from the dataset page

Creating maps: saving

* To *save* the map, so other users can see it and we can publish it, use the 'Save map' command
* Fill in the basic metadata to identify and describe your map to others

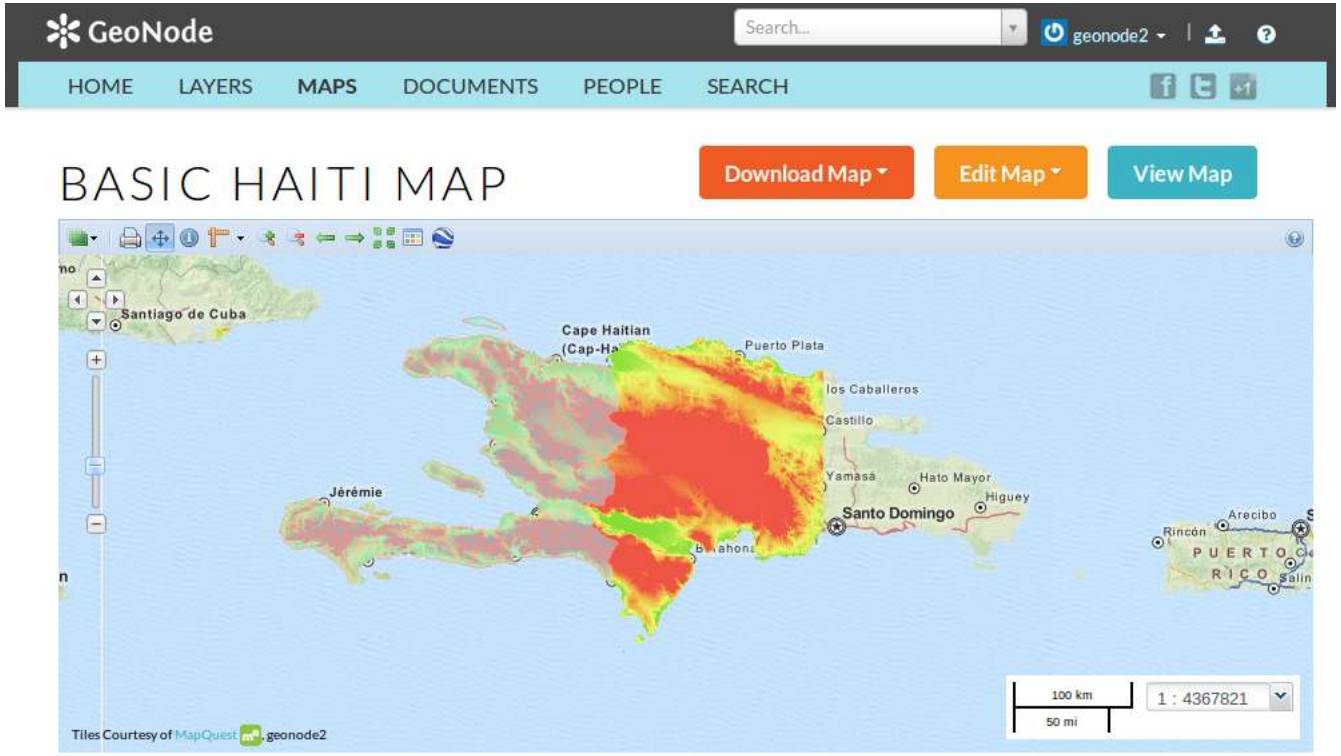




Now the map will be visible in Geonode's Maps tab

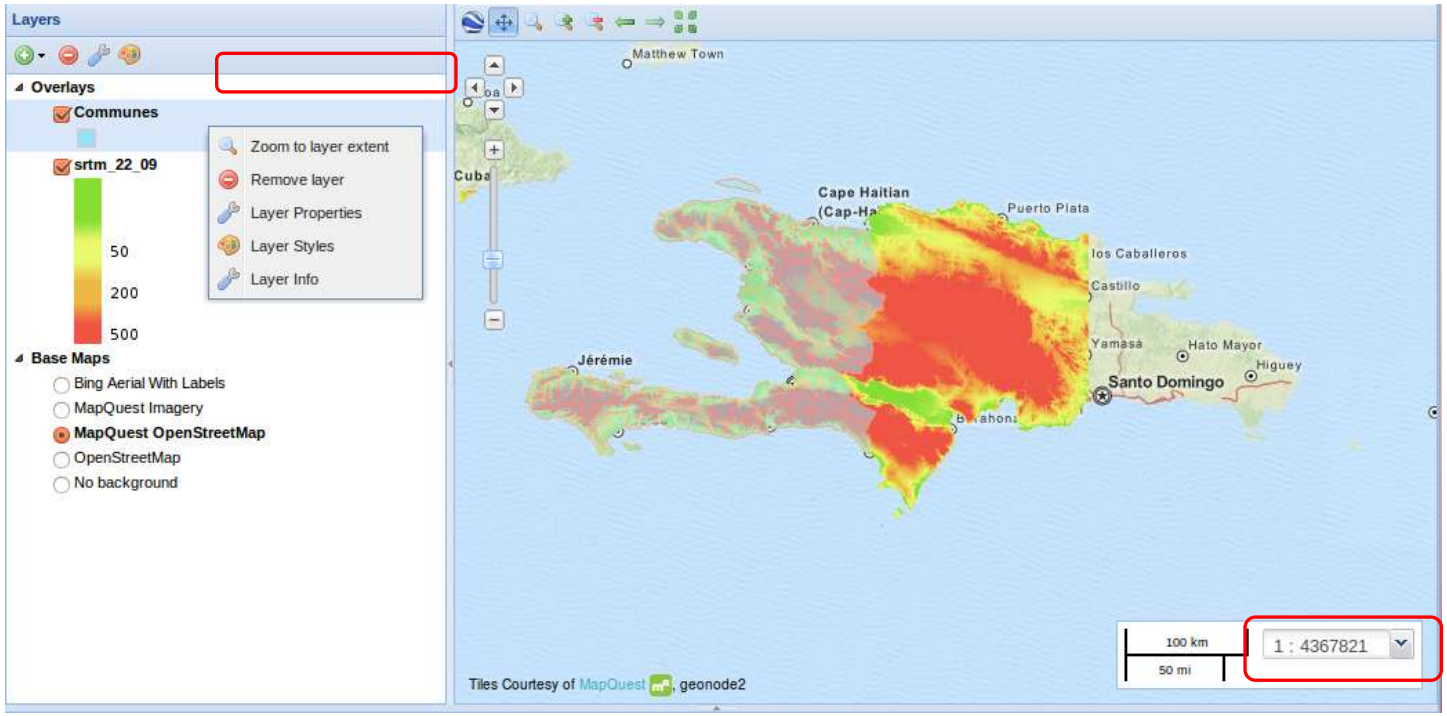
Creating maps: managing

* Similarly to layers, we can access each *map's page* from the general Maps tab to change it, manage permissions, edit metadata and download the map's layers



Exploring maps: navigation

* There are several ways you can zoom in GeoNode's map viewer:
  * Map navigation tools include the standard zoom bar and map drag
  * Roll your mouse wheel
  * Choose a scale from the scale bar readout
  * You can right-click on a layer name and select *Zoom to Layer Extent* to zoom to that layer

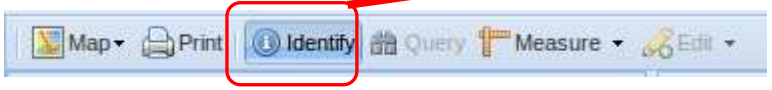


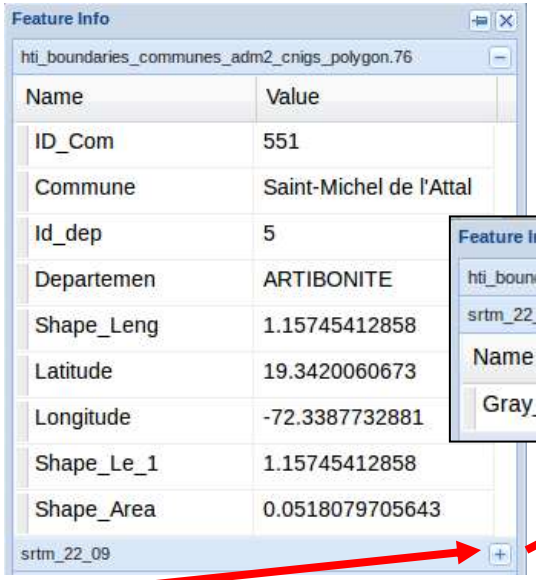
Creating and exploring maps

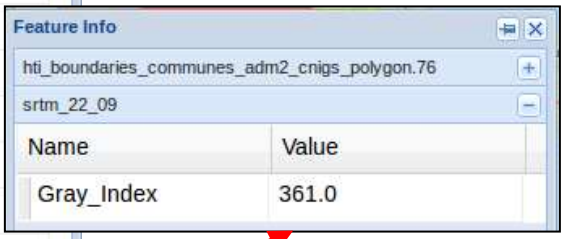
* Exercise
  * Create 3 different maps by combining layers and setting appropriate styles for different themes (e.g. boundaries and location, human environment, physical and biological environment)

Exploring maps: identify

* Since layers are visible in the map via an WMS service, we can use the GetFeatureInfo request to get attribute information about features on the map
* To do this, enable the *Identify* tool and click on the map view



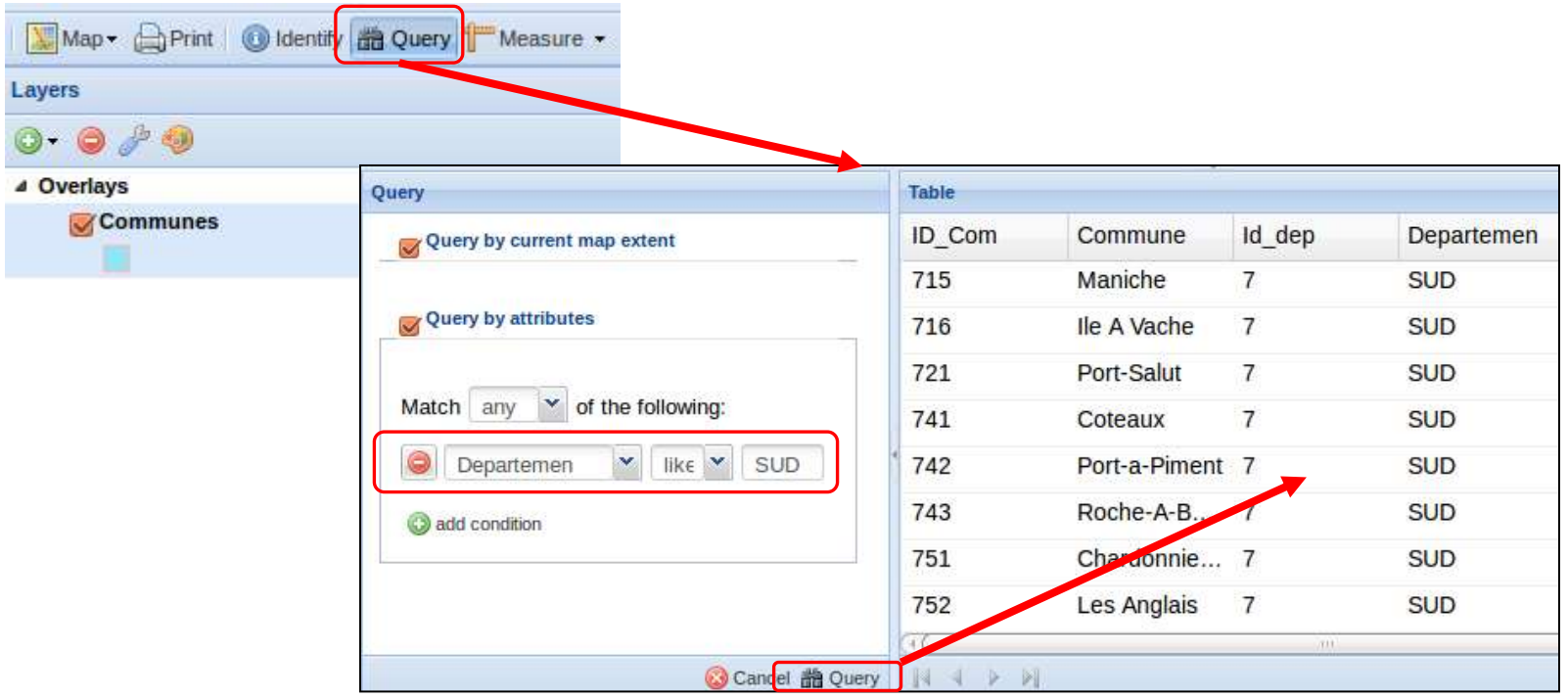




Expand each layer's dropdown to see the feature or raster info for that layer

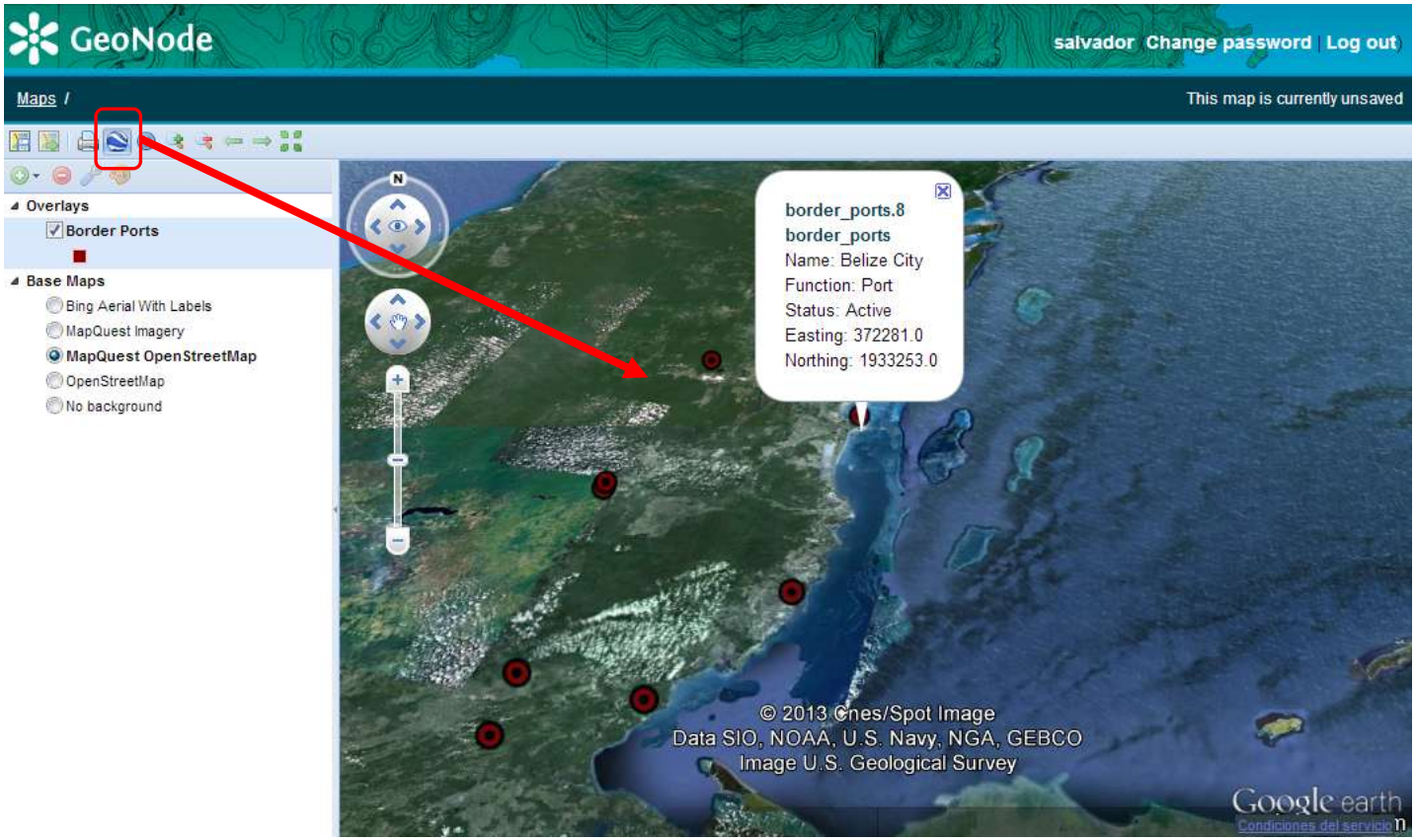
Exploring maps: query

* Because layers are also published with WFS service, we can query their attributes with a spatial and/or value query
* To do this, select the feature layer and enable the *Query* tool to open the query and table result windows



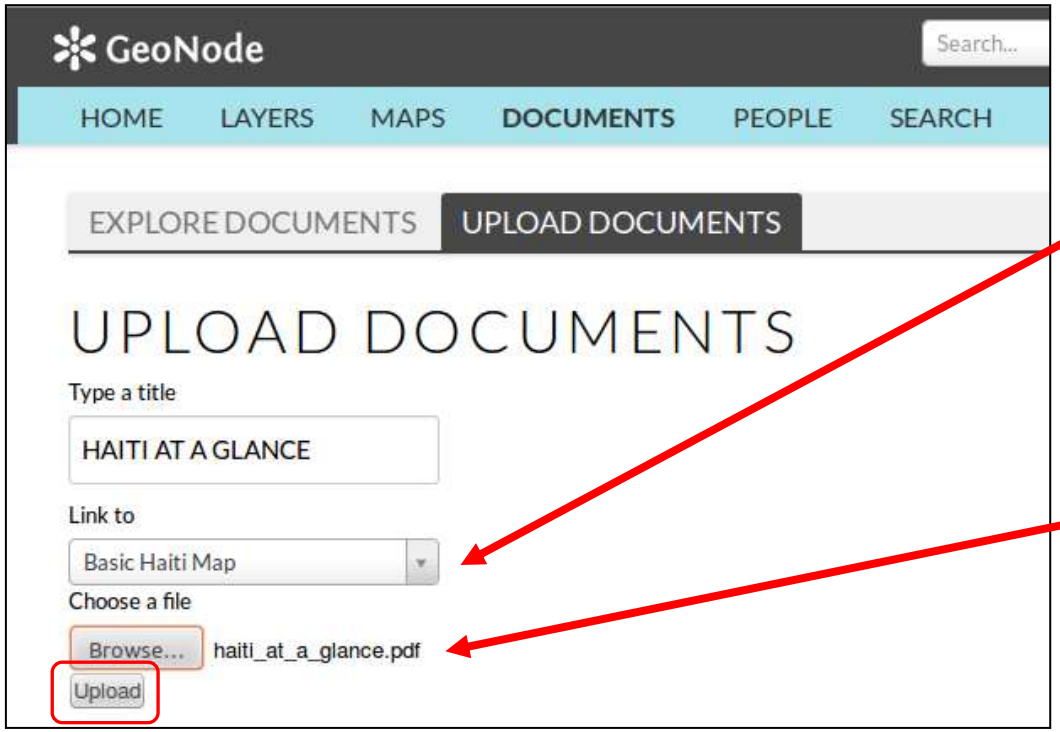
Exploring maps: 3D view

* On Windows and MacOS, GeoNode integrates a Google Earth control which can be used to have a 3D view of the maps



Managing documents

* With version 2 of Geonode, we can upload and manage documents with geographic metadata, as we do with layers and maps. Use the *Documents/Upload documents* tab

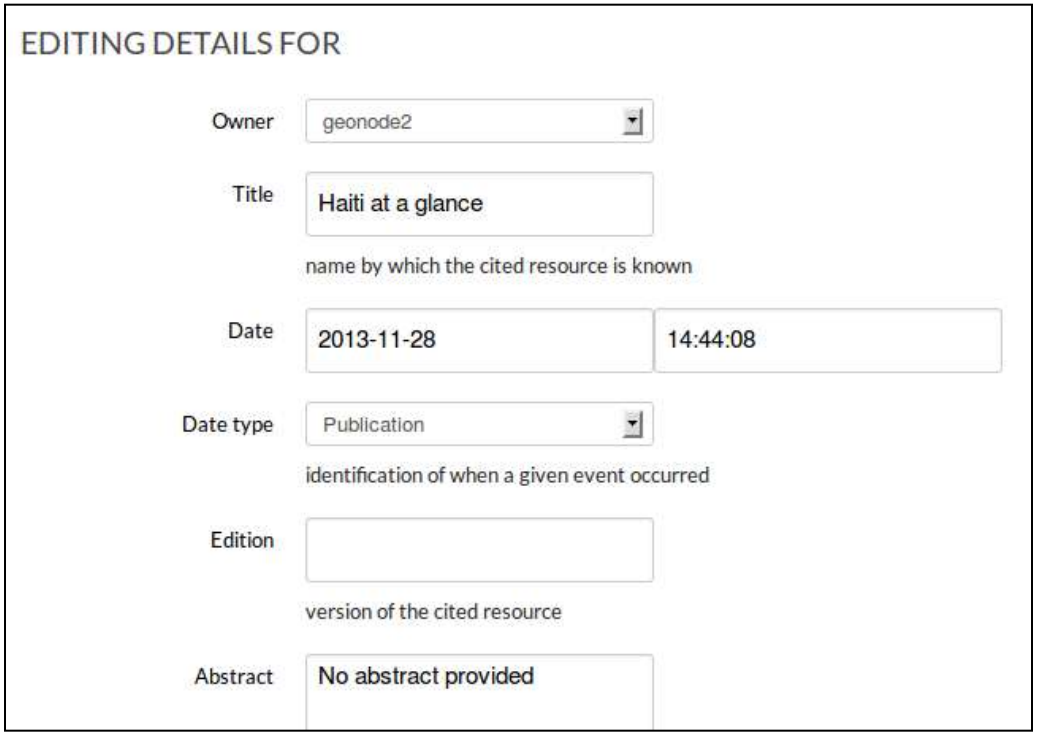


You can link your documents to existing layers or maps

Browser to find your document

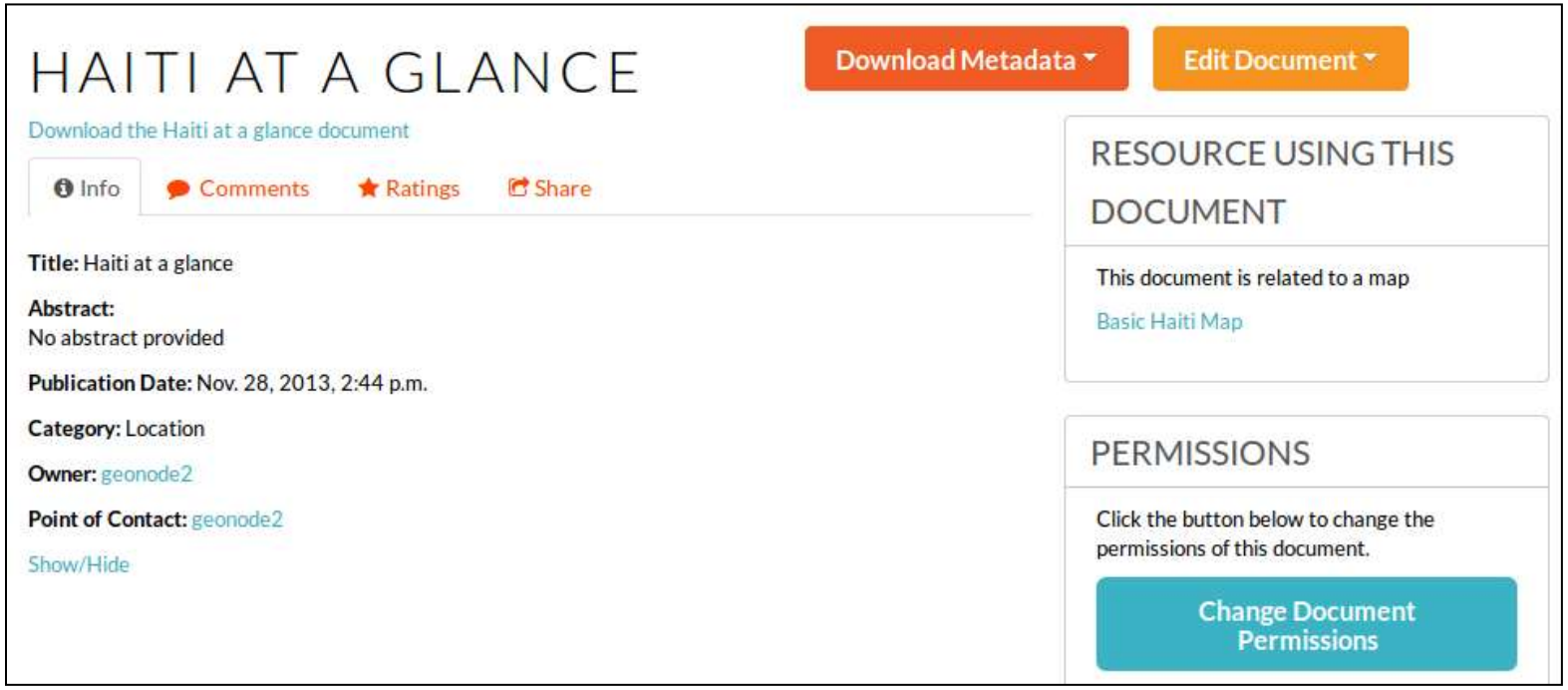
Managing documents

* As with layers and maps, after uploading we can edit documents' metadata, including the thematic category



Managing documents

* And documents have their own Web page with information, comments, ratings, etc.



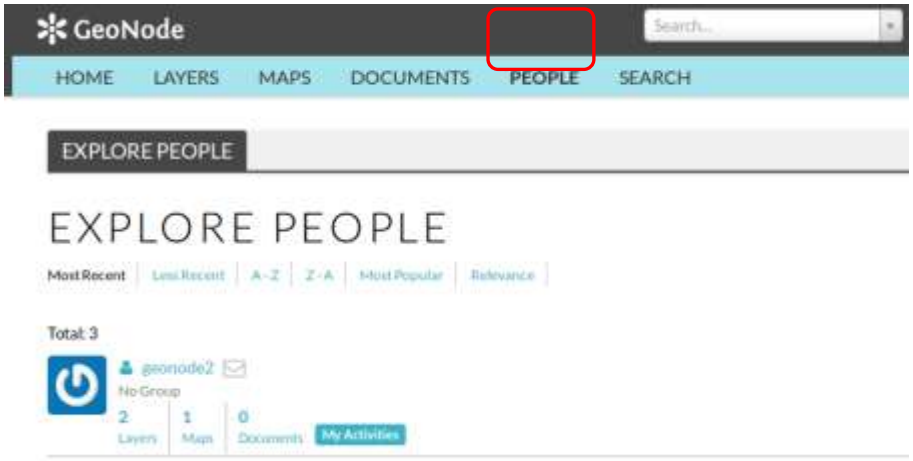
Note: for some reason, downloading does not work from Explore tab, but it does from the document page

Managing documents

* From a layer or map we can access all documents *linked* to it
* So this is a convenient way to attach any kind of file (images, videos, PDFs, etc.) to data layers and maps, providing complementary information

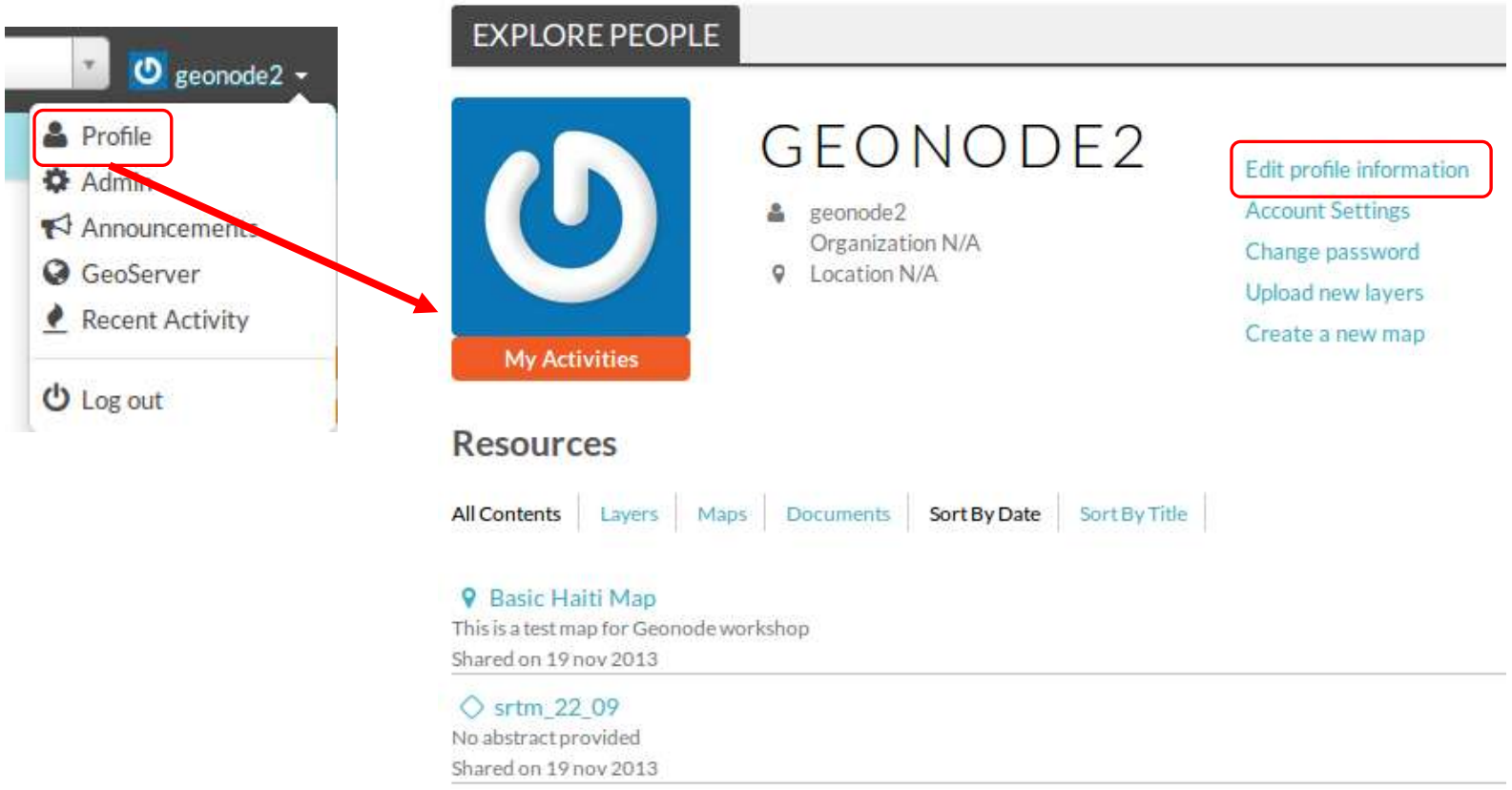
Sharing: people profiles and activity

* If you give viewing permissions to others, they will be able to see your data and maps
  * Visiting your GeoNode Web site
  * Connecting to your GeoNode services from other GeoNodes, Web and GIS clients (more about this later).
* By listing the layers and maps in the GeoNode, users can see who has updated which layer, and who has published maps
* In the *People* tab, you can see all users, and see what Activities each one has done



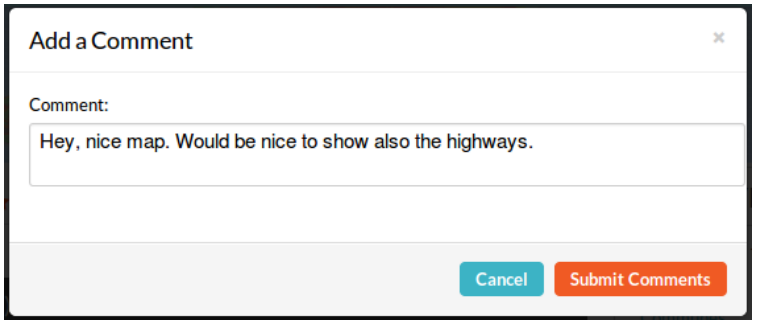
Sharing: your profile and activity

* From your user menu you can see and edit your profile
* You can list all the resources you have created



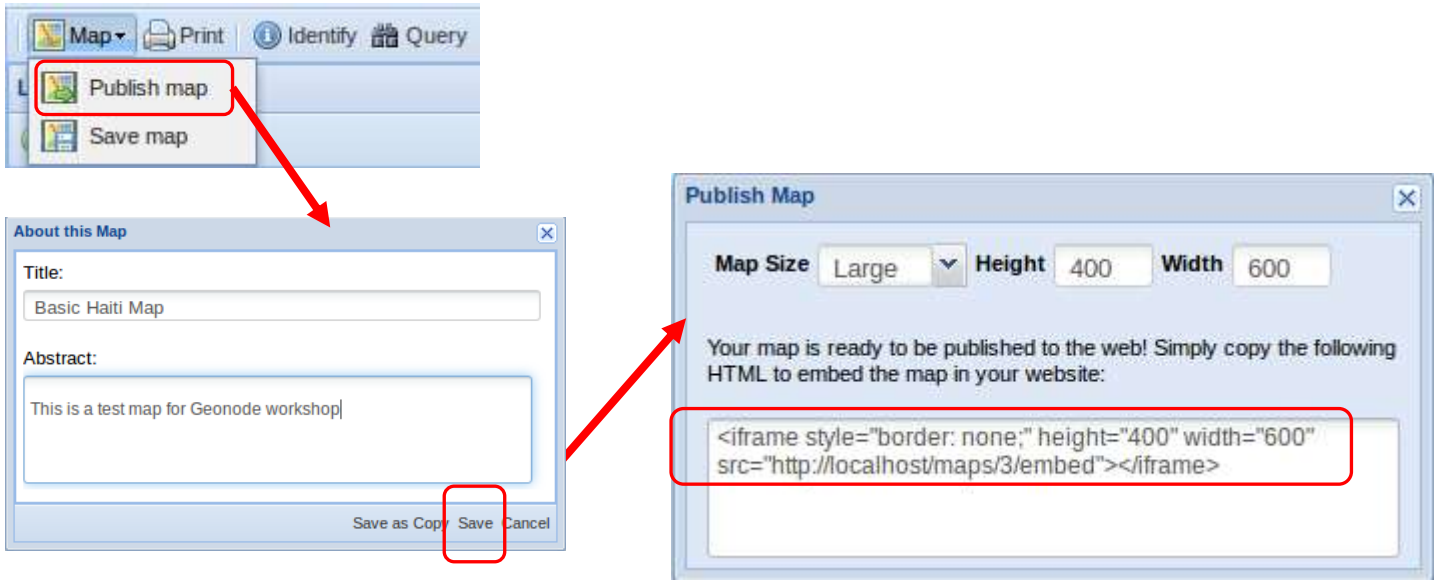
Sharing: social tools

* Other users can comment and rate your layers and maps to give you feedback
* You can also customize your GeoNode to add more social features using the Django Web framework



Sharing: publishing your maps

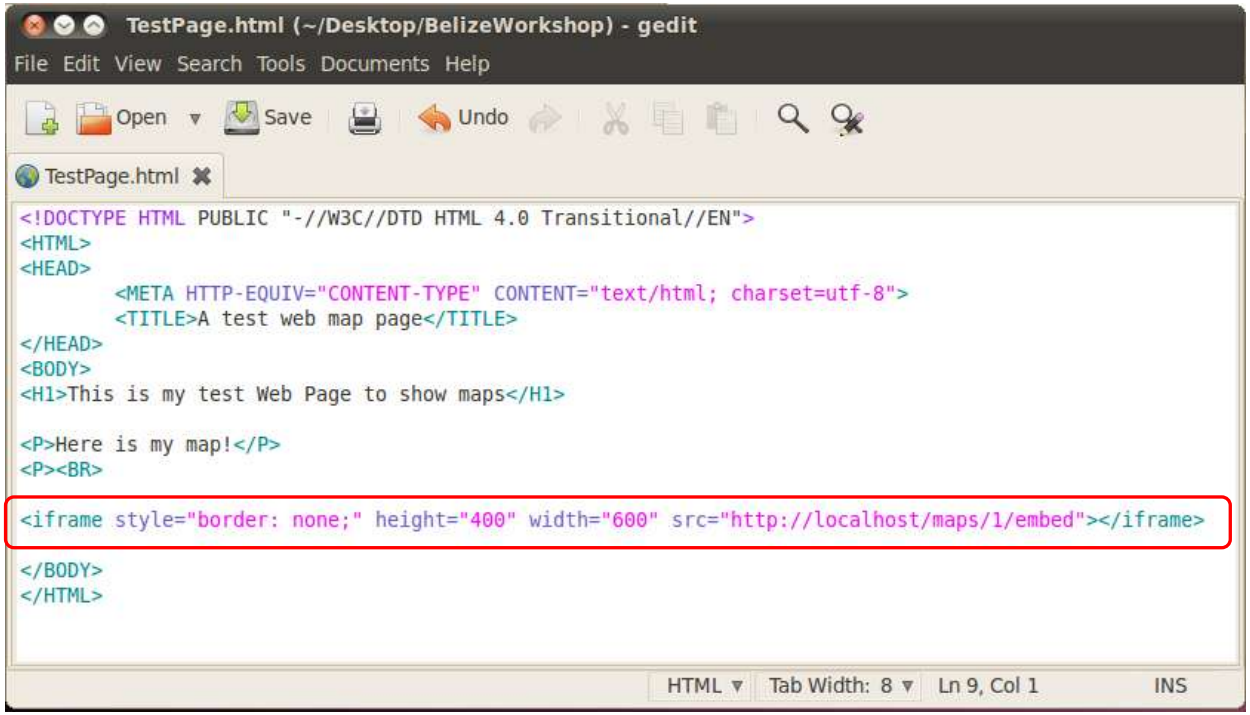
* If you want to include a view of one of your maps in a Web page, blog, etc. you can use the 'Publish Map' command in the Map Viewer toolbar (Map menu)
* The tool will open a dialog where you can set the size of the view in pixels and copy the HTML code to share it



Copy this into a Web page or blog

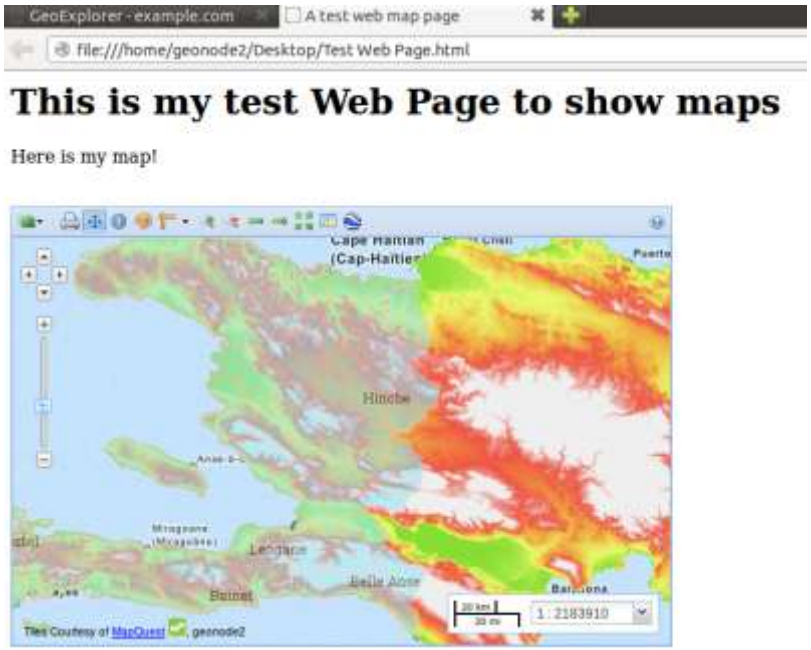
Sharing: publishing your maps

* Exercise:
  * Right-click on the *Test Web Page.html* file (in the desktop) and select the "Open with text editor" option
  * Paste the HTML code from the Publish Map tool, as shown:



Sharing: publishing exercise

* Save the HTML file to disk. Then, double-click on it to open in the Web Browser. After a few seconds, you will see the embedded map, which is a live map
* Try building a more complex page with multiple maps
* If you have a blog or Web page, try adding a GeoNode map

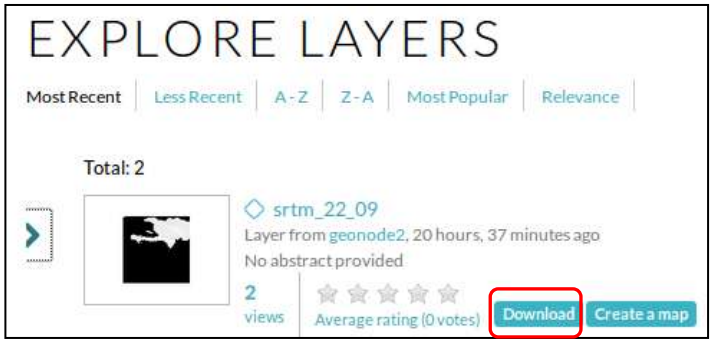


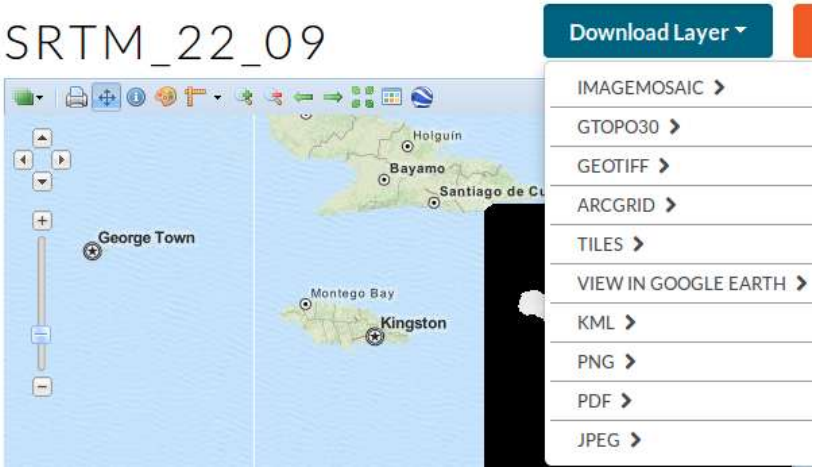
Sharing: publishing your maps as WMS

* All uploaded layers are automatically published as WMS map services
* You can also publish maps as WMS with a group of layers, so external user can add them to client applications (we'll see that later) by using a *name*
* From the map info page:

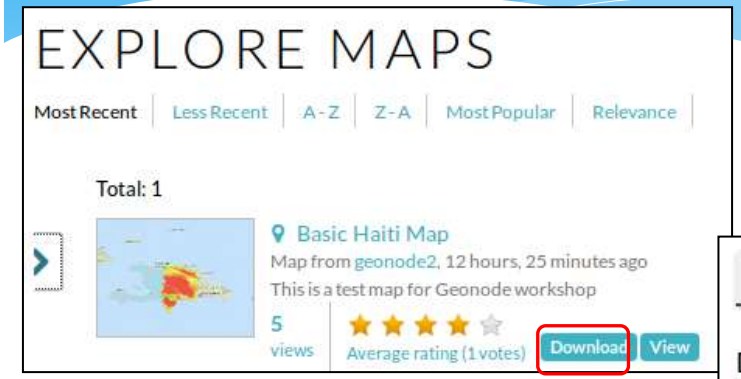
Sharing: downloading data

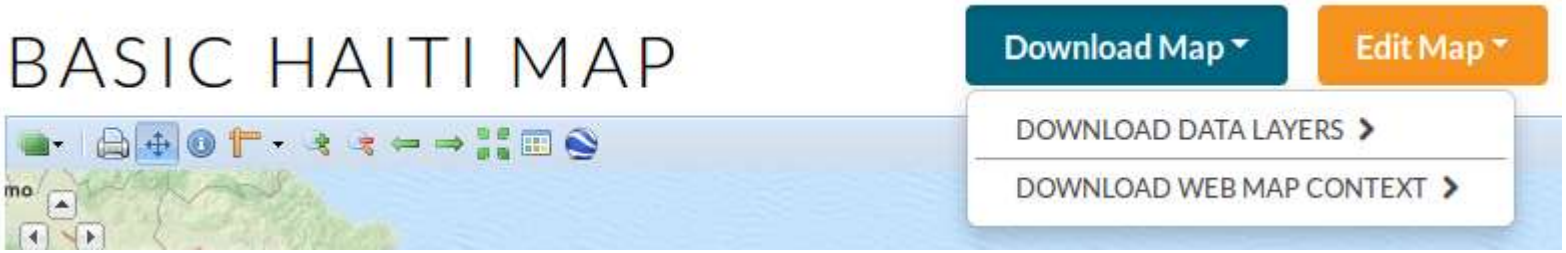
* Users with permission can download the data or images of your layers and maps
* However, in most cases it is a better practice to *use your data and maps via Web services*, so users always see the most updated version (more about external access later)





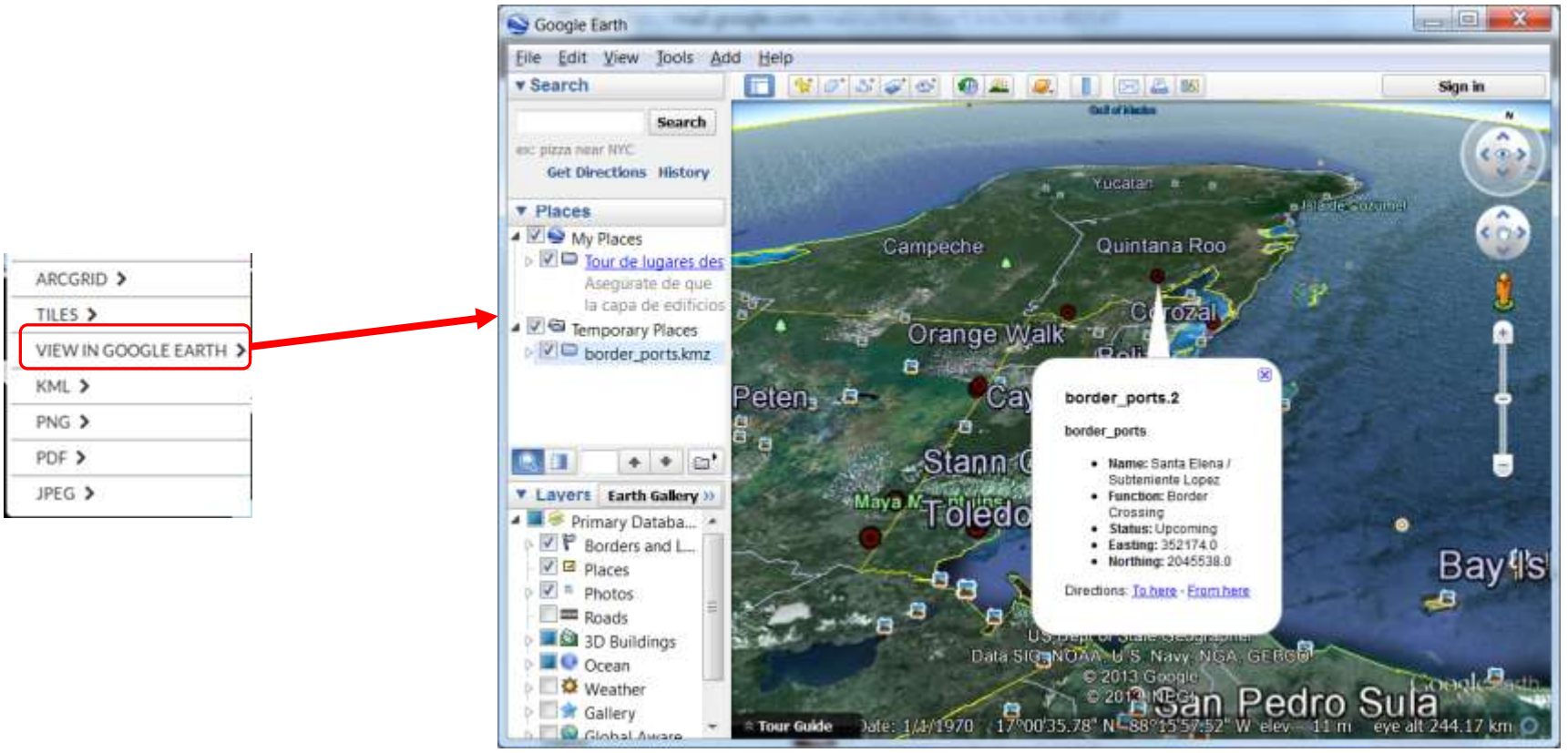
Sharing: downloading data





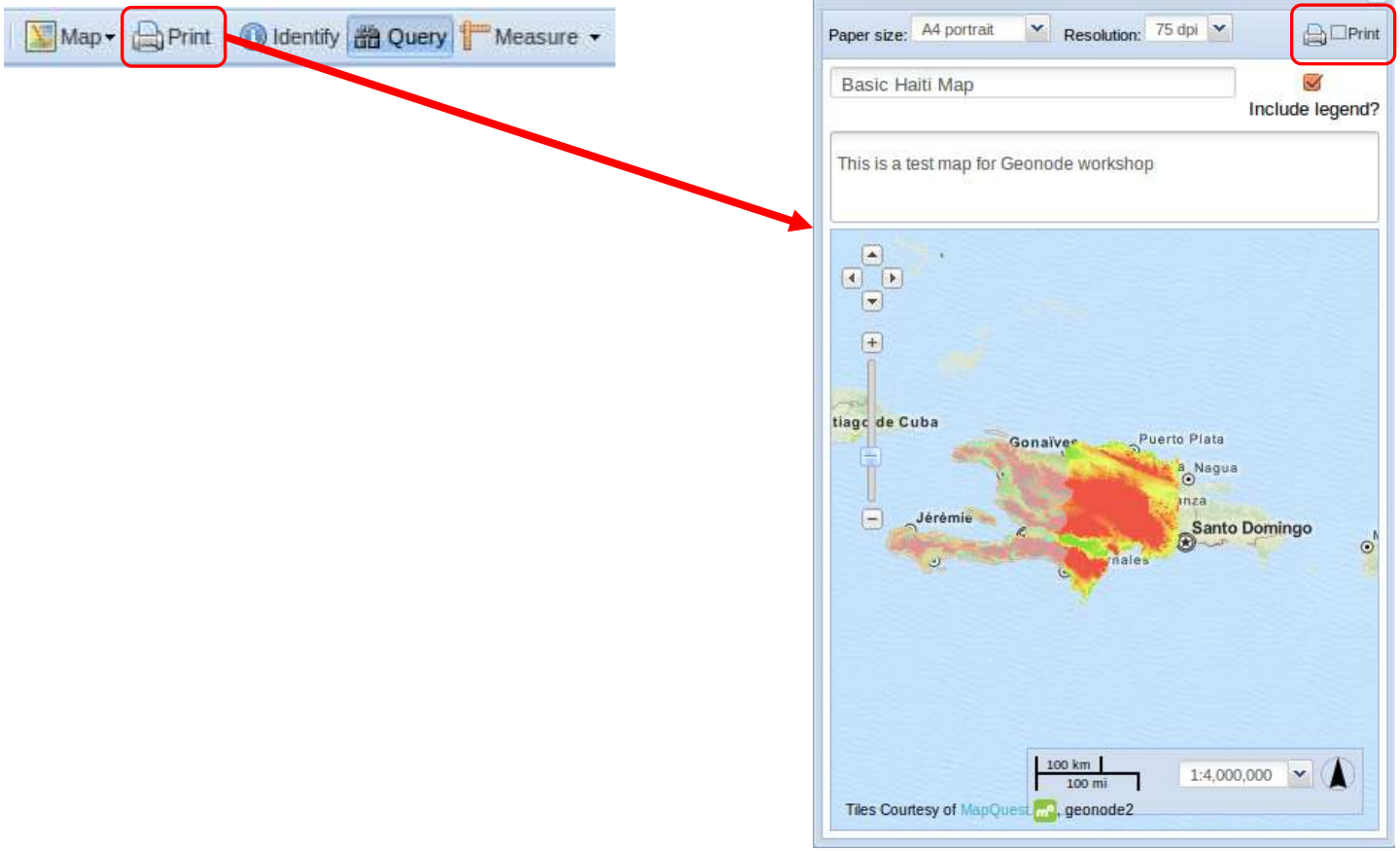
Sharing: viewing in Google Earth

* With the ‘View in Google Earth’ option, users will be able to display data exported as .kmz in GE



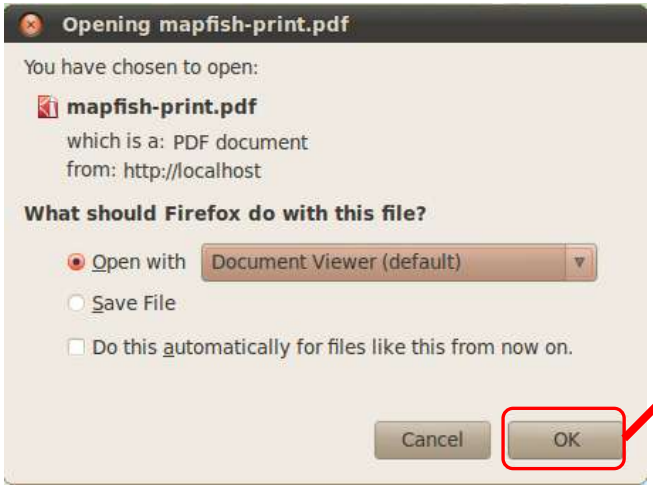
Sharing: printing

* The ‘Print’ tool in the map viewer will open a dialog to define a map print using a simple template



Sharing: printing

* If the following dialog does not pop up, enable popups for your GeoNode site (see the Preferences button that appeared at the top of the Web page) and try again

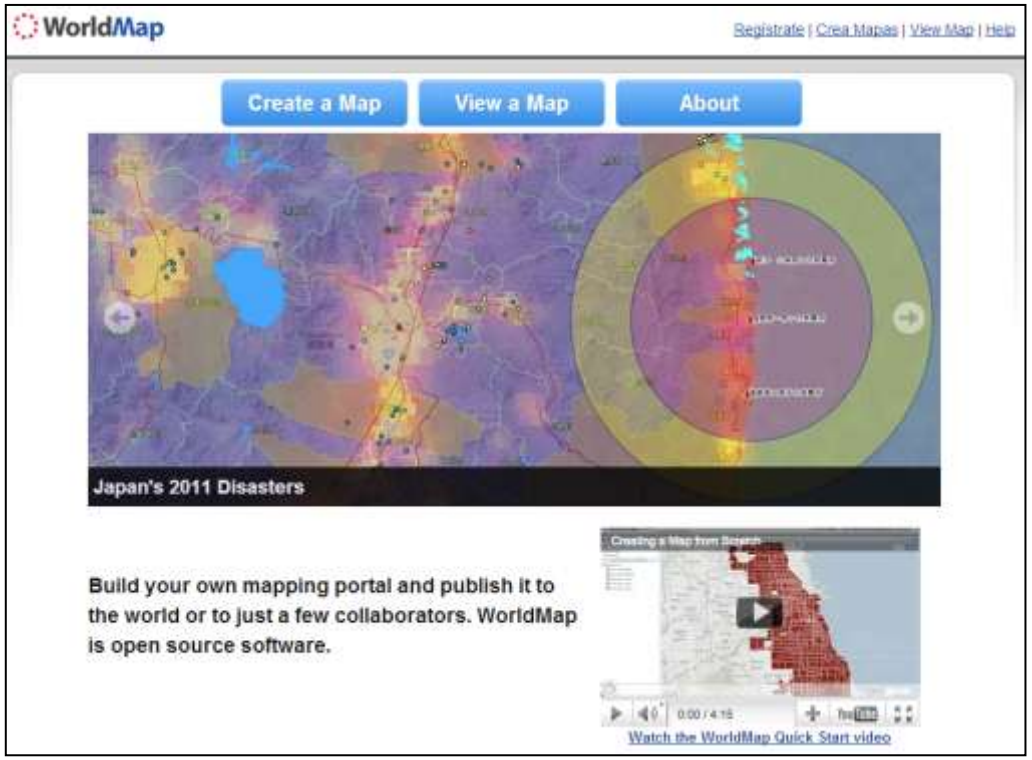


Save the PDF with the name and location you prefer

GeoNode Communities

* You can visit existing GeoNode servers, explore what they are publishing, interact with users and maybe join yourself!

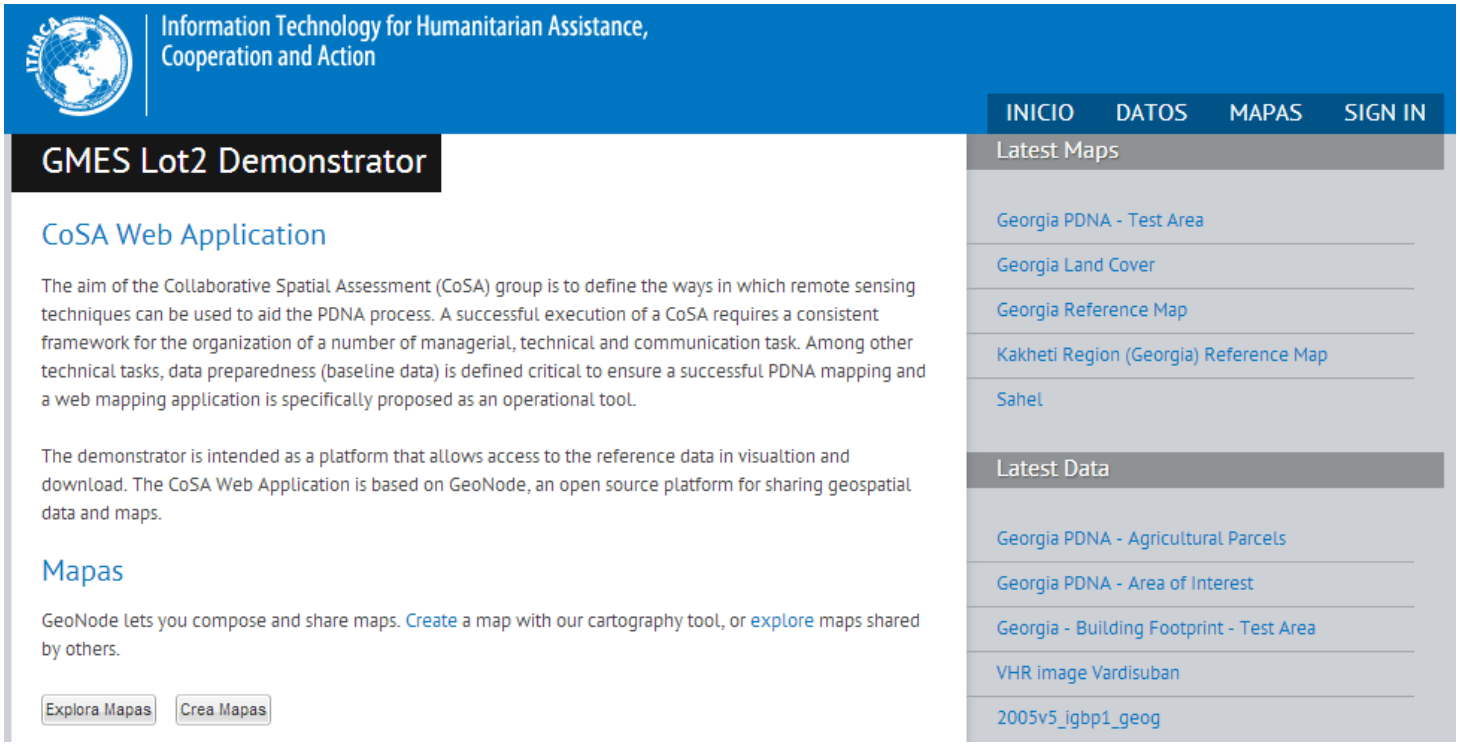
Harvard World Map
(http://worldmap.harvard.edu)



GeoNode Communities

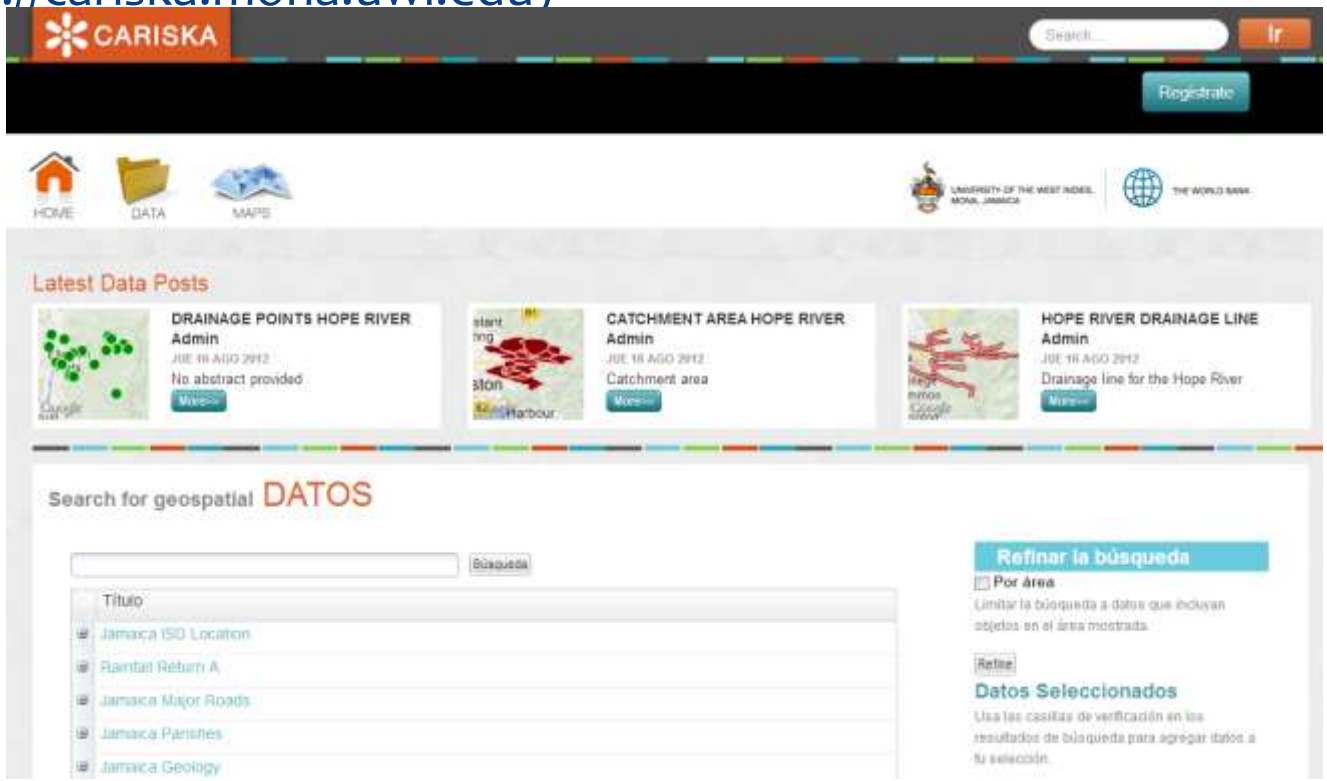
* Web application of the Collaborative Spatial Assessment (CoSA) group

  http://geonode.ithacaweb.org/



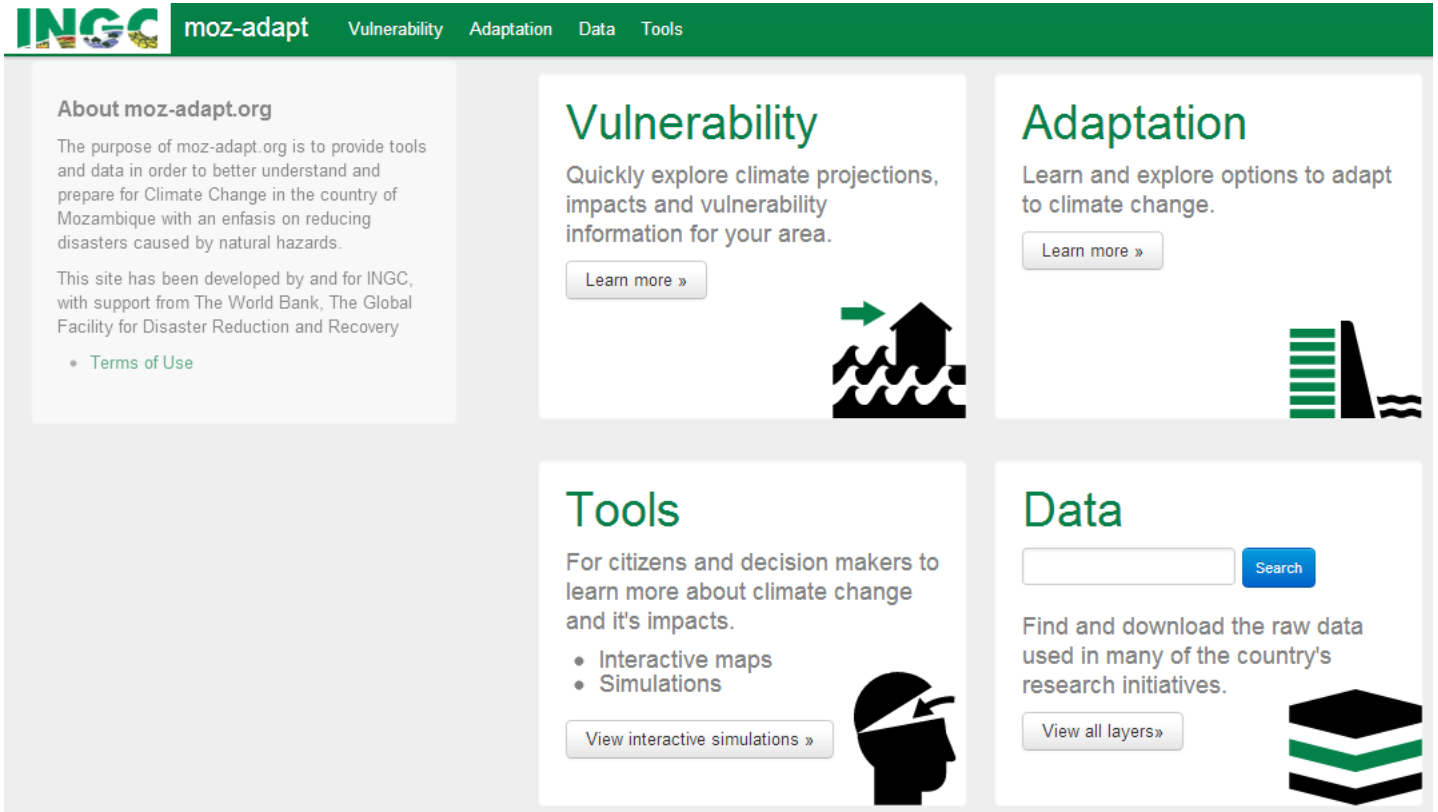
GeoNode Communities

* The University of the West Indies (UWI) Disaster Risk Reduction Centre (DRRC) and the World Bank collaborated on the "Caribbean Risk Atlas" project (http://cariska.mona.uwi.edu)



GeoNode Communities

* Moz-adapt (http://moz-adapt.org/) has been developed as a tool to better understand and prepare for Climate Change in the country of Mozambique



GeoNode Communities

* Malawi Spatial Data Portal (http://23.22.63.123/)

MASDAP *A Public Platform for Open Spatial Data to Support Development in Malawi*

Inicio Datos Mapas Documents Sign in

AGRICULTURE BOUNDARIES CLIMATE ECONOMY ELEVATION HYDROLOGY INFRASTRUCTURE LAND COVER POINTS OF INTEREST POPULATION

Malawi Spatial Data Portal

Welcome to the BETA version of MASDAP, a web-based data sharing tool launched in November 2012, managed by the National Spatial Data Center (in the Department of Surveys), in collaboration with the National Statistics Office and a number of technical Ministries.

This user-friendly platform is based on free and open-source software and will create a platform for improved inter-agency information collaboration and enhanced public access for awareness-building, research, further knowledge product creation and decision support.

Portal Functionalities

- Upload, Manage and Browse Spatial Data
- Explore, Compose and Share maps
- Search and Download Documents
- Profiles for Users

A substantial amount of data has already been collated, and it is envisioned that in the near future, MASDAP will include further information and visualization to the platform from various global and in-country sources, expanding institutional commitments to open data, supporting community mapping activities, and developing decision support tools that leverage open data to assist the Government of Malawi with contingency and land-use planning activities. MASDAP is receiving start-up support through the World Bank DRM program under the Open Data for Resilience Initiative. We do hope you can share your or your institution's datasets on the portal to enable others to benefit from this work.

GeoNode Communities

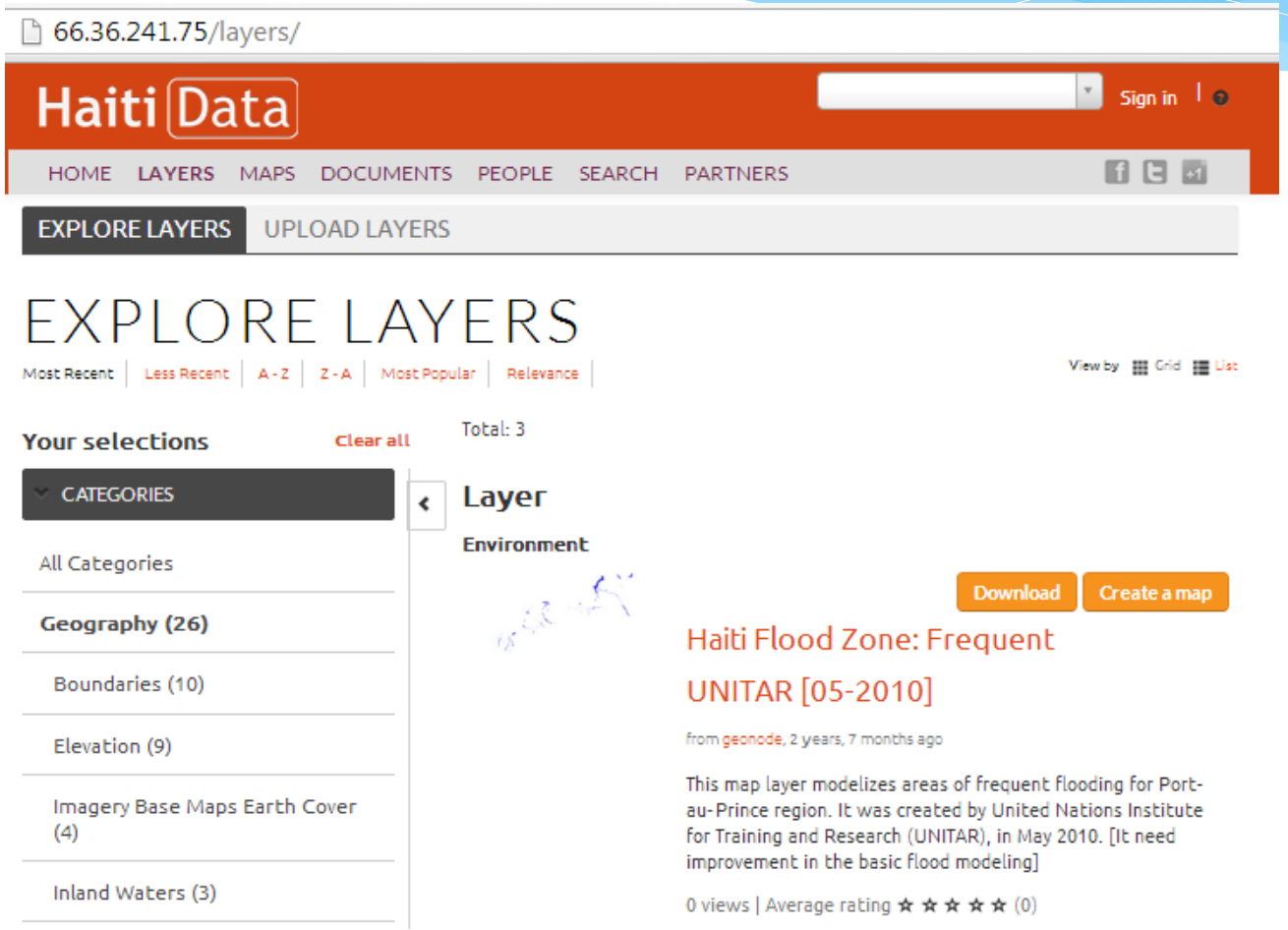
* UN World Food Programme: http://geonode.wfp.org

(customized with online editing for quick data generation in emergencies)

* Saint Lucia Integrated National Geonode: http://sling.gosl.gov.lc/
* St. Vincent & the Grenadines Geonode: http://geonode.gov.vc/
* Virtual Kenya project: http://maps.virtualkenya.org/
* Malawi Spatial Data Portal: http://23.22.63.123/
* Yemen Data for Resilience Initiative: http://yemen.rcdrrdri.org/
* Pacific Risk Information Systems (PaRIS): http://paris.sopac.org
* Haiti Data: haitidata.org
* Geographical Data Infrastructure for the National Information System for Risk Reduction in Bolivia (5 nodes), like http://geosinager.defensacivil.gob.bo

GeoNode Communities

* And a GeoNode 2.0 site for Haiti has been implemented!



GeoNode Use References

* GeoNode user documentation can be found at

http://geonode.org/workshops/user/ (2.0)

http://docs.geonode.org/en/latest/ (includes tutorials)

* Subscribe to the GeoNode users mail list and check previous discussions at

http://geonode.org/communication/