GIS CLOUD USER GUIDE

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Introducing GIS Cloud

What is GIS Cloud?

GIS Cloud is the first purely web based GIS powered by cloud computing that provides full desktop GIS features enriched by the web. GIS Cloud offers easy and efficient visualization, analysis and exploration of geographic information. The primary goals of the GIS Cloud platform is to simplify exchange of geographical information between users and offer an easy way to analyze this information regardless of the location of its users. By using GIS Cloud our users access the full power of desktop GIS, allowing for such activities as geospatial analysis, spatial intelligence, the creation of customized mapping reports and publishing geographic analysis on the Web.

Create an Account

Go to giscloud.com and click on "Free Signup", it will direct you to the page where you can create a new account.

<u>Main User Interface</u>

When you begin to use GIS Cloud you must first get acquainted with the user interface. It is a part of platform which offers complete oversight of projects, as well as functionality for working with the
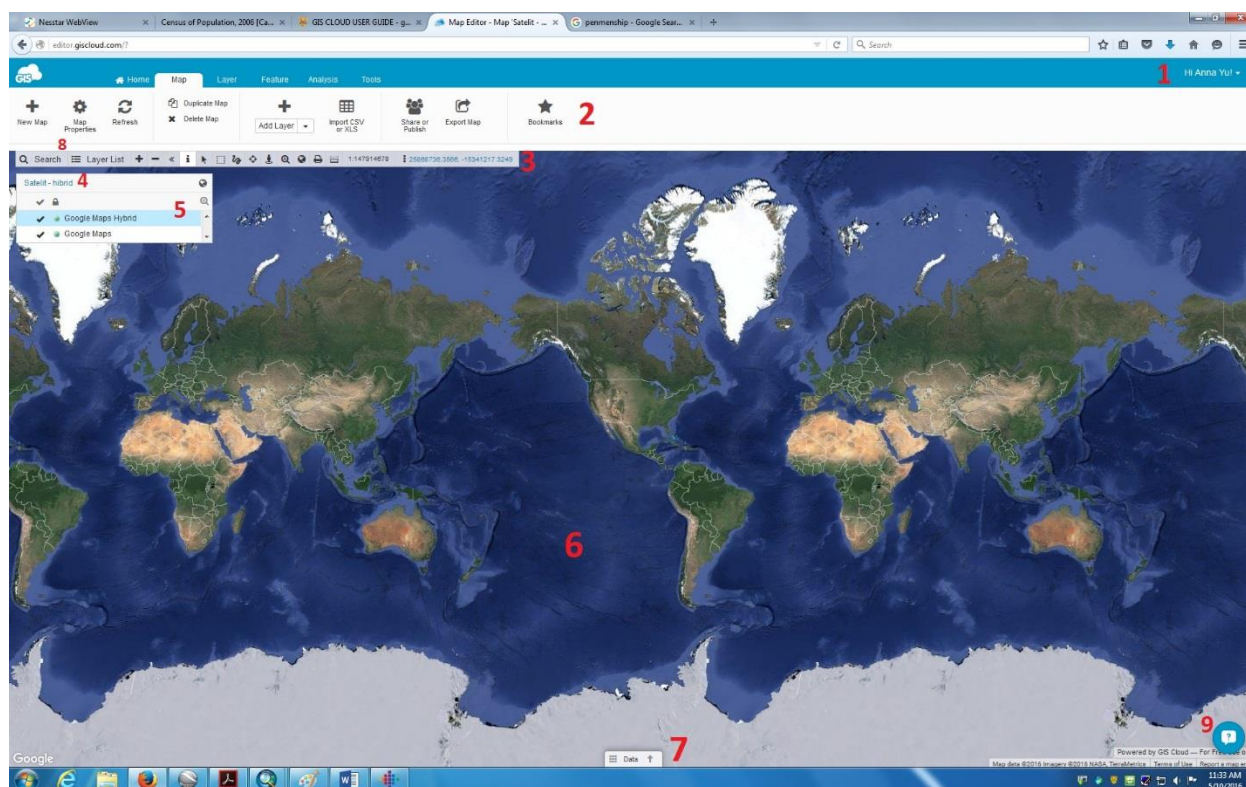

geospatial data itself.

In this manual, we have placed a red number over each pictured interface; that number corresponds to the instructions for each product feature.

1. **Login and My Account** – You need to log in using your User Name and Password to access Map Editor. After that you will be able to use the application fully. After logging in, you will be able to modify your user account.

2. **Tool Ribbon** – Here we offer complete access to the application's features: creating projects and maps, adding layers as well as conducting your analysis and performing data management. The tabs above the ribbon reveal additional tools. Tool Ribbon functions are described in the separate chapter Tool Ribbon.

3. **Toolbar** – Provides the tools needed for basic operations with maps. Toolbar functions are described in the separate chapter Toolbar.

4. **Project Name bar** - Displays the project name as a link. You can send someone a link to the map by using the address that the link points to, or you can refresh the map by clicking on the link.

5. **Layer panel** –A "table of contents" type of display for the active project.The layer

panel offers the following functionality:

6. **Map Viewer** – Map display of visible layers and cartographic features.

7. **Layer Data Table** – Table displaying all attribute records and fields of a selected dataset.

8. **Info Table and Search tool** - View info about selected feature and search for specific features.

9. **GIS Cloud Team Help –** start a conversation with a GIS Cloud Member for help

For better viewing experience we've implemented an option to hide tool ribbon and layer panel. The red dots (on picture below) mark positions of the sliders where you can toggle the ribbon, the layer panel and the info panel (hidden by default) on and off.
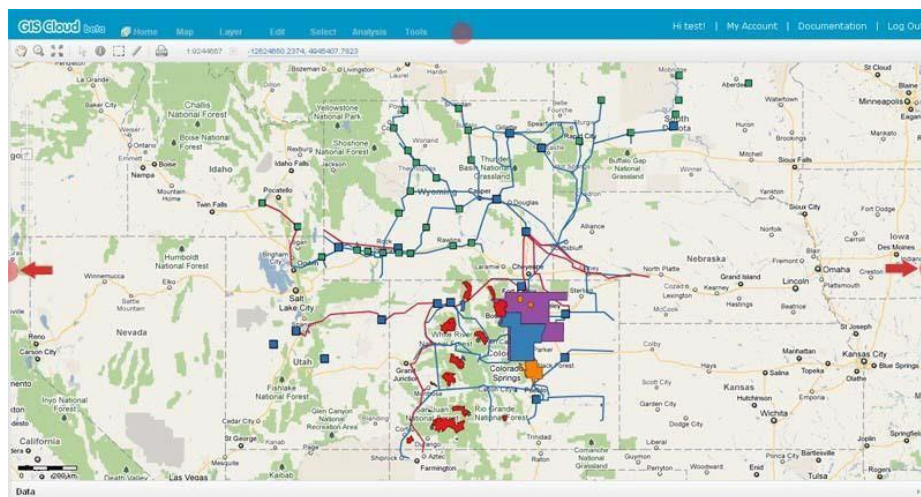
Home Tab

The Home tab is a centralized place to access all maps you have access to - your own maps, maps someone has shared with you, or public maps. The menu on the left (1) provides not only easy access to all of your maps, but easy discovery of and access to new maps and data. You can browse available maps by directories, search for maps or just go for the recently open maps. The gallery (2) provides easy access to all of the maps available to your user account, whether the maps are created by you, shared with you or pub

all of the maps available to your user account, whether the maps are created by you, shared with you or pub

Tool Bar

Q Search ☰ Layer List ✚ ▬ « i ▸ ☐ ⅔ ✛ ↧ ⊖ ◉ ⊟ ⊟ 1:147914678 ⋮ 13462700.9178, 2582960.0598
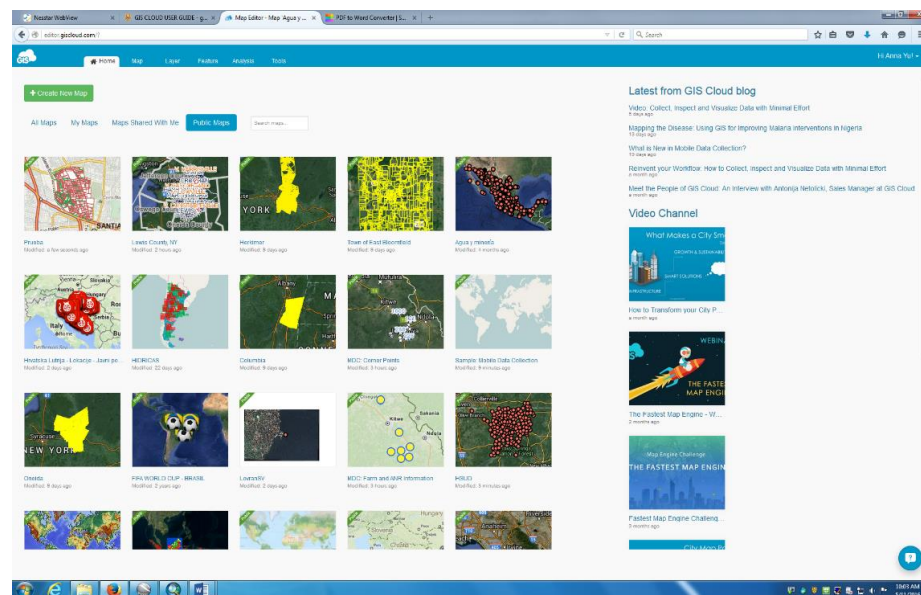
The tool bar functions are:

« **Show/Hide Toolbar –** shows or hides the toolbar

⊟ **Measure Tool -** measures the distance from one point to another

◉ **View Entire Map –** Zooms out showing the entire map

↧ **Show google street view –** Shows the street view of an selected point

✛ **Zoom to current location -** Locates your current location

⅔ **Freehand Selection –** Enables the user to draw freely. The drawn area is than selected

▬ **Zoom out –** when clicked, it zooms out from the center

✚ **Zoom in –** When clicked, it zooms in from the center

▸ **Pan –** enables the user to interactively move the Map View position

ⓘ **Identify** - Identifies an element on the map and shows its attribute information.

☐ **Area Selection** - Clicking and dragging a rectangular box with the mouse creates a selected set of a features from an active layer. More about the Select tool in the chapter "Selecting Layers and Objects".

✎ **Measuring Tool** - Interactive display of distances on the Map View. Left clicking will allow distance display over multiple vertices.

🖶 **Print** - Any created map can be printed.

1:9244667 **Scale**

-12869248.7279, 5552012.0388 **Jump to Coordinates** - Zoom to a set of coordinates – The current coordinates of the mouse cursor are displayed. To define specific coordinates and have the view zoom to the specified position, left click; enter coordinate information.

1 selected objects. **Number of Selected Objects on the Map**

Tools Ribbon Overview

The Tool Ribbon provides you with clear view of all tools within their categories. Easy access to tools through the ribbon allows you to use GIS Cloud more efficiently. The following is a brief

overview of the tools on the ribbon; a more detailed description of the tools will follow.

Layers Panel

The Layers panel shows all of the layers of a selected project. The Layer panel also functions as a legend. The following cartographic options are available:
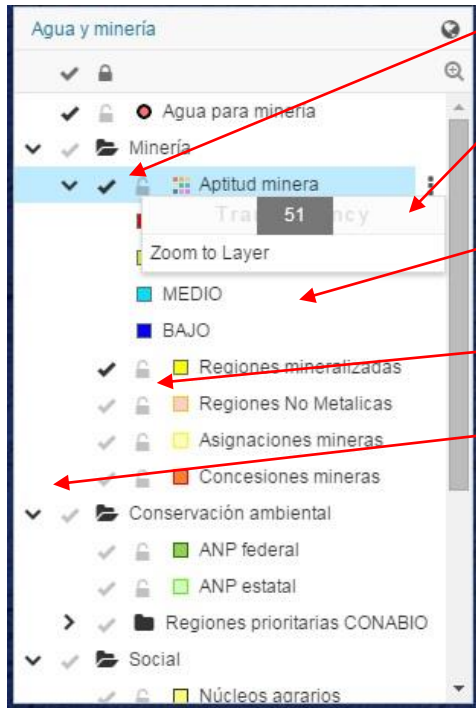
Eye tool – used to hide or show a layer

Slider – sets the transparency of the layer

Adjust layer – drag layer in desired order

Lock layer – layers can't be edited when activated

Folder layer - hides the content within the folder in the panel but not on the map

*other features to change layer features are found in the layer panel toolbar

Info Panel and Data Grid

On the Map Editor's main interface, you can access the table overview of the selected feature's attribute data. This information is available in two ways:

1. **Info Panel** – Use the info tool to select a feature and attribute data is shown in the info panel
2. **Data Grid** – You can see all the data within a layer with the grid. Select the layer and open the data grid; this is an easy to access the data and an understanding of which data in table is visualized as objects
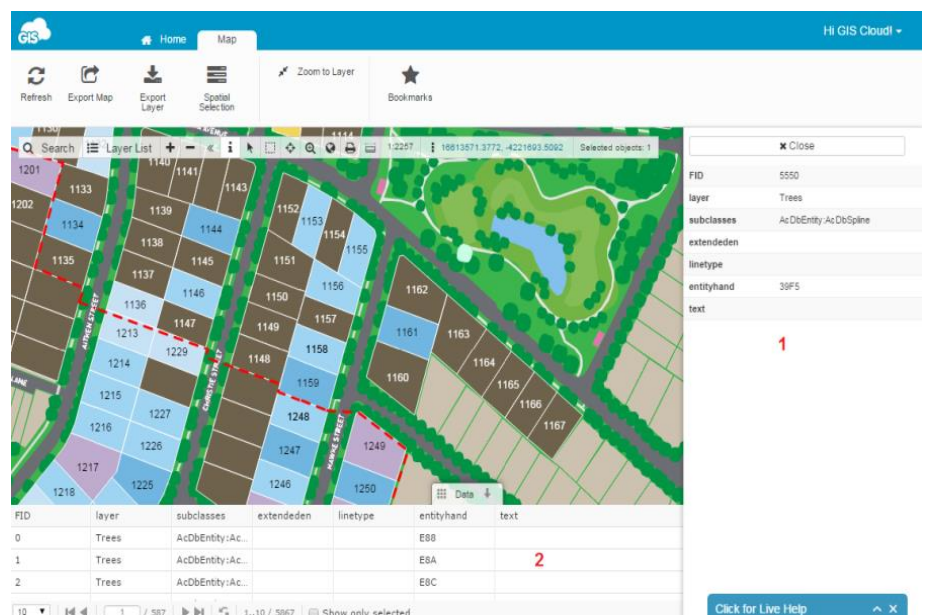
on the map. Select a row in the table and it will be shown on the map.

Search Tools

Search tools enable you to search for attribute data in the tables or search Google Maps addresses and locations. You can find Search option in the toolbar.

There are two ways to search data:

1. You can search attribute data from the layers by clicking on the GIS Cloud button or
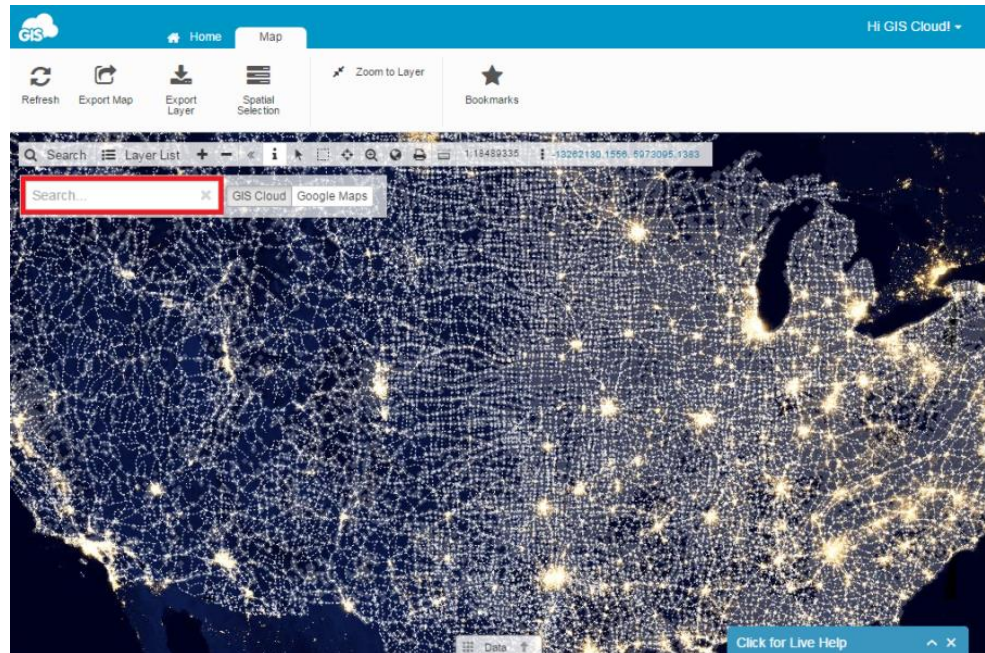2. you can search Google maps by clicking on the Google maps button.

Creating a New Map

A map is created in the following way:

1. Select the Map tab.
2. Select New Map.

A map can be created from the Home tab as well by selecting Create New Map in the upper left corner.

The next steps are to provide a map name and select a base map.

Additional information about the map can be edited under the Map Tab in *Map Properties.*
You can set the following parameters:

- **Map name**
- **Map Description**
- **Map Copyright** – Allows for text to appear in the lower right corner of the map.
- **Projection** – Select or change a projection from the list. Note that for maps with basemaps it is not possible to a
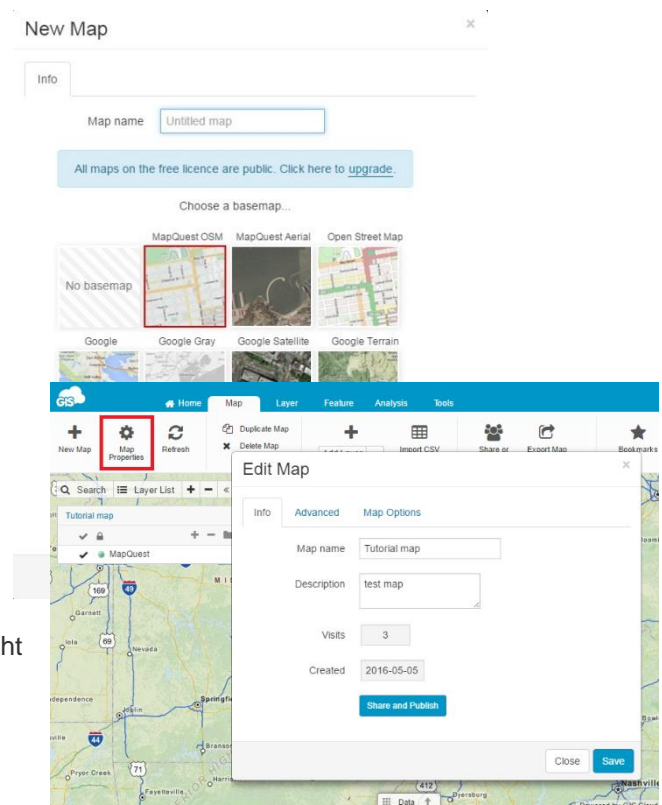
change a projection.

The projection can be defined by:

- Searching for a projection by entering its EPSG number or
- Searching for a projection by using keywords
- **Map units** – Select from Meter, Degree, Foot or Foot_us.
- **Background color** – Defines background of the Map View.
- **Max zoom –** Optional setting for scale dependency which limits the scale at which the layer is visible
- **Bounds –** Saves coordinates of your current view or manually imputed coordinates. Every time you refresh your map or click on View entire map you get the view extent of map you bounded to
- **Clear map tiles** – if you experience any problems with the map display, you can clear layer tiles or reinitialize the map.

Import and Export Data

Upload Data
You can upload various types of data including:

- Spatial Vector files: .shp, .mif, .mid, .tab, .kml, .gpx
- Spatial Raster files: .tif, .tiff, .jpg, .gif, .img, .ecw, .sid, .jp2
- Image files: .jpg, .gif, .swf, .png, .img, .ecw, .sid, .jp2
- Excel 2003 and CSV: .csv and .xls

The four methods of uploading files into GIS cloud are:
1. Drag & Drop
   You can drag and drop files in the Home Tab/Map Gallery or inside of a map. Either way data will be uploaded into your File System. Make sure that you drag and drop all files that are part of your data (for example, if you want to drop shapefiles then you have to drag and drop all the files that are part of a particular shapefile).
2. Upload through file manager
3. Upload through the SFTP client

Import CSV or XLS

If you have data geocoded with location coordinates you can upload it as an Excel table or CSV. This data can then be visualized as a layer. See the sample data table below.

Latitude	Longitude	Precision	Address	City	State	Zip	Name	Description
51.514.151	-0.093609	address	109 Cheapside	London	UK	ec2v 6	GIS Cloud	Web based GIS in the Cloud
38,967291	-77,380416	address	555 grove street	herndon	va	20170	Juice Analytics	Great data analysis site.
37,416402	-122,025078	address	701 first ave	sunnyvale	ca	94089	Yahoo	Good address matching service.
37,423186	-122,085995	address	1600 amphitheatre parkway	mountain view	ca	94043	Google	Home of Google Earth
47,643727	-122,130474	street	One Microsoft Way	Redmond	Wa	98052-6399	Microsoft Corp	Home of Excel
41,132518	-73,704348	city	1 New Orchard Road	Armonk	NY	10504	IBM	The granddady of computer technology

To perform data import, go to the Layer Tab and select the Import function.

Browse for the data table on your computer and upload it to GIS Cloud. Set the table parameters and select the coordinate fields. When everything is set browse the output file for which the dataset needs to be created in PostGIS database. The action is set by default for now. Now select Import and your data is ready to use.
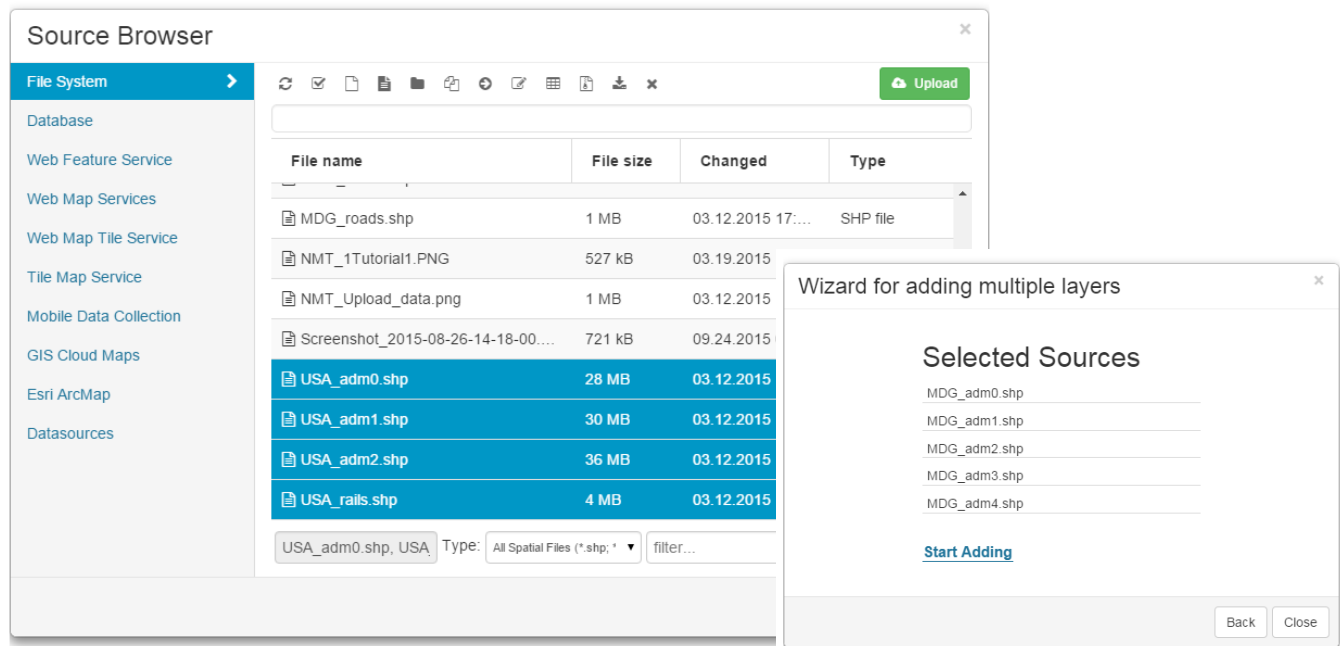
Adding Layers

To add layers, first you have to open the Source Browser by selecting Add Layer option that can be found in the Map tab and in the Layer tab or by selecting Add Layer button in the Layer List.
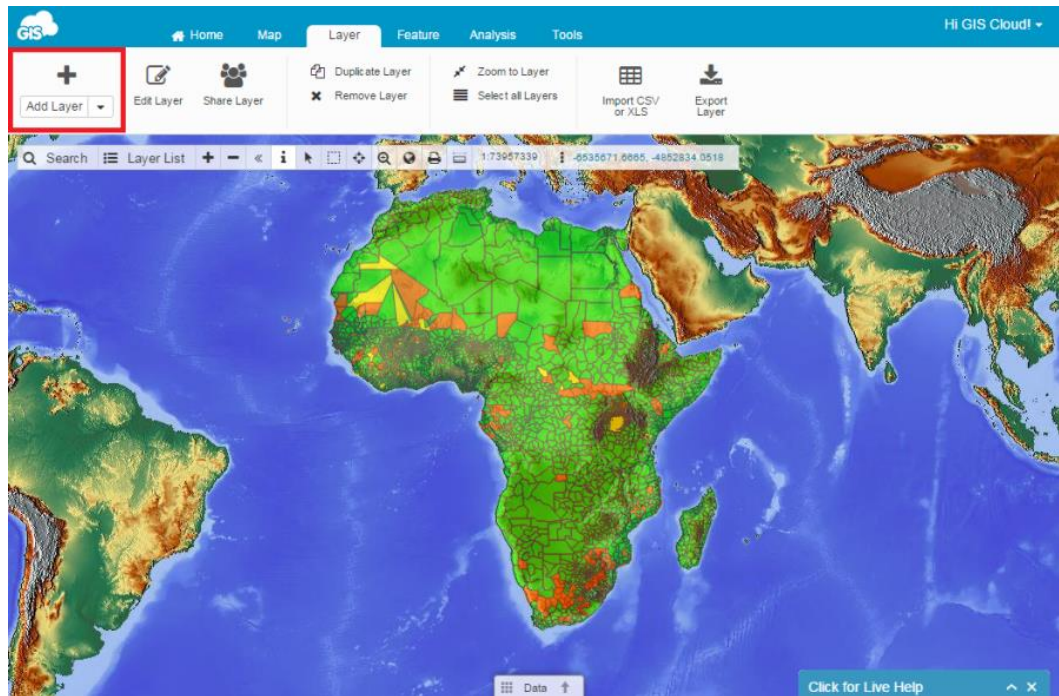
Layers can be added from several sources: local computer/File System, Database, Web Map Service, Tile Map Service (Open Street Maps, Google maps etc.), GIS Cloud Maps, Mobile Devices and/or Arcmap extension.

Select source and the desired layers you wish to add and press Select to add layers.
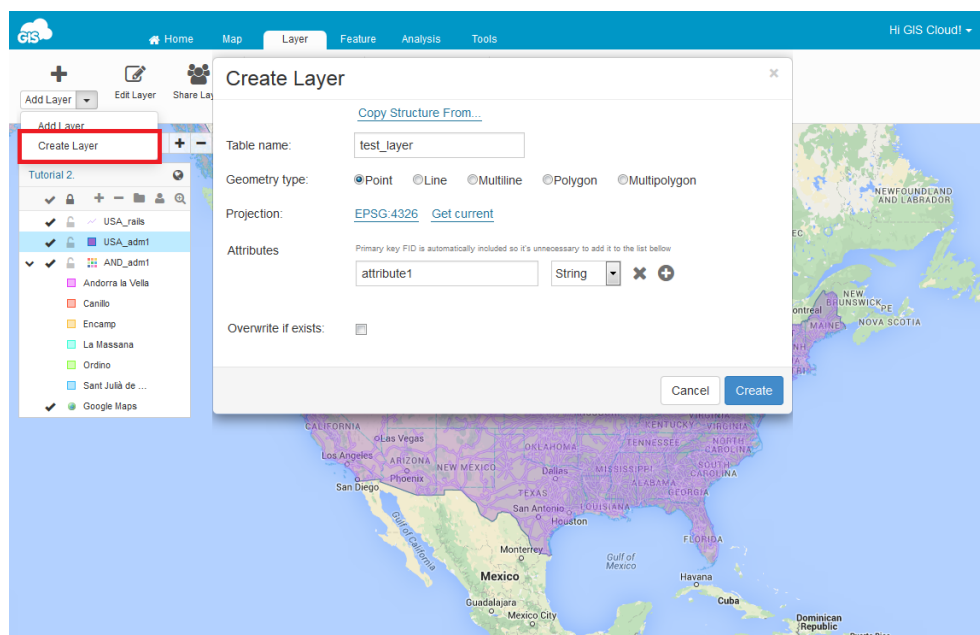
Click Start Adding button to add layers into the map. **Note:** hold CTRL key on your keyboard for multiple selection.

Creating and Editing Layers

Creating Layer
In addition to uploading data layers, you can also create new layers by:
1. Select the Layer Tab
2. Select Create Layer from the Add Layer dropdown menu

Choose or enter the data (attributes) that the layer will have:

1. **Table name** - Enter the name of your new GIS data layer.

2. **Geometry type** - Select point, line or polygon as your feature type.

3. **Projection** - Select a new projection or select an existing one being used in the active map.

4. **Overwrite if exists** - You have the option to overwrite an existing data layer if it bears the same name as your new data layer.

5. **Copy Structure Form** - You may define the structure of your data layers' table by copying the attribute table from another existing layer. This operation does not define point, line or polygon geometry.

6. **Attributes -** Enter the desired field names for your new data layer and define the field type:
   - String - Input any text
   - Real - Input numbers containing a decimal point
   - Integer - Input whole numbers

Editing Layer

A layer can be edited through Layer Properties. You can access it by:
- Double clicking on the layer in the Layer list
- Select a layer and edit layer tool from the Layer tab
- Select Edit Layer function from the dropdown menu
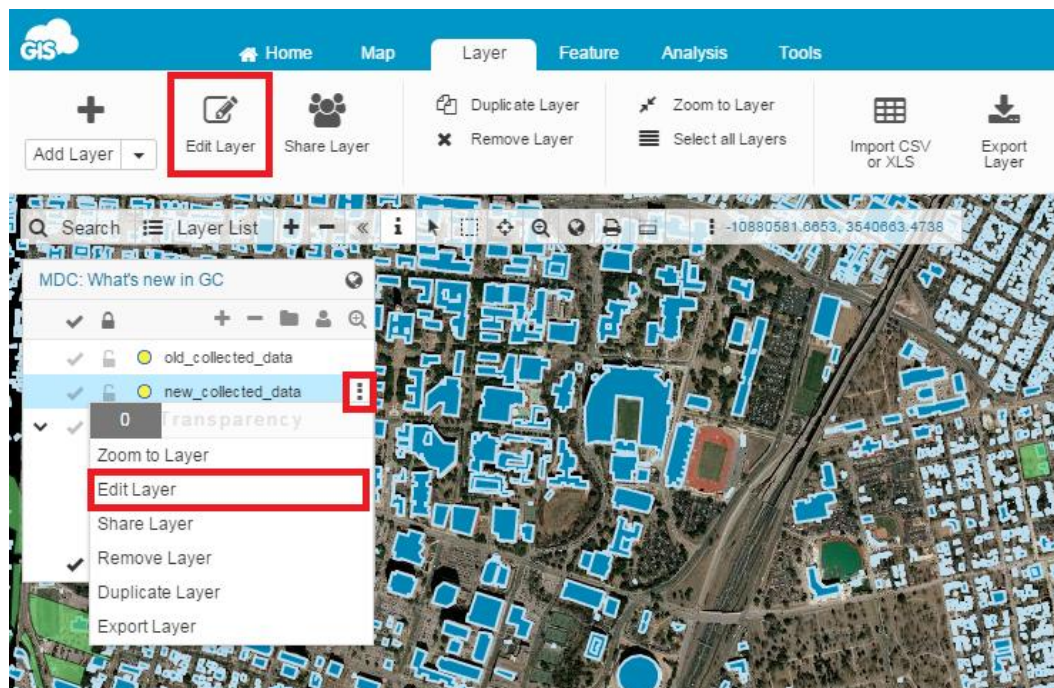
Geometry editing

The layer can be modified by using edit tools.
Features in the layer can be edited by
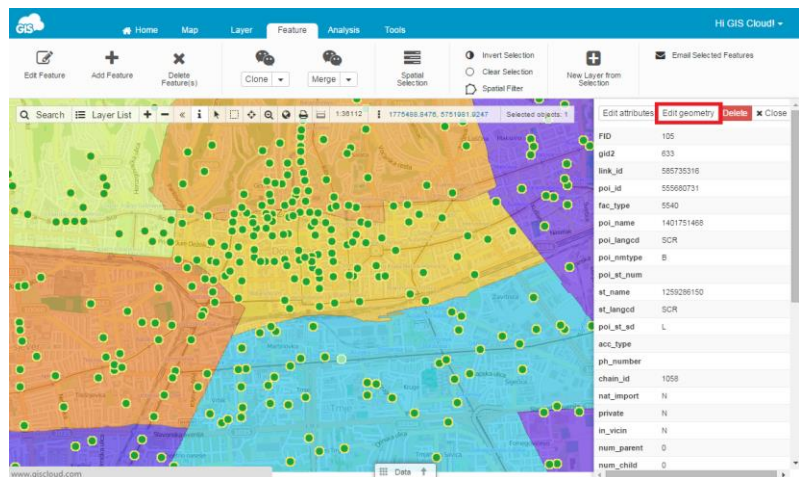the following step:

1. Select a <u>database</u> layer from
   the Layer List.
2. Select the Edit feature from
   the ribbon (on the Feature
   tab).
3. Select the feature which
   geometry you wish to edit
   and move the vertices to the
   desired location.
4. Choose Save to save a new
   point location or Cancel to
   undo editing.
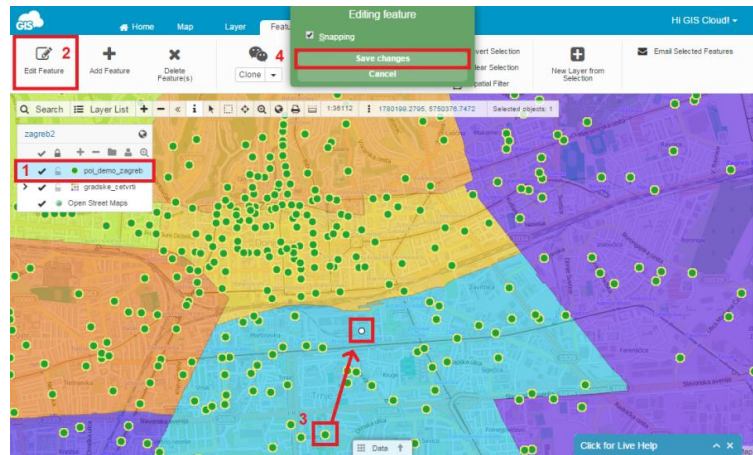
***Note:** to perform higher accuracy select Snapping Option.
It is also possible to edit feature geometry through the Info Panel.

1. Select a feature.
2. From the Info Panel
   choose Edit Geometry.
3. Change a location of the
   feature.
4. Click Save button.

Adding Features

To add new features, edit geometry or perform analysis, layer has to be imported into the database. Add
new point features to the layer by following these steps:

1. Select a database layer from the Layer List
2. Select the Add feature from the ribbon (on the Feature tab)
3. Select Snapping and/or Measuring option (optional)
4. Click on the map to add new feature
5. When done editing press Enter on your keyboard or:
   a. End line by clicking in the last added point
   b. End polygon by clicking on the first polygon point
6. Enter attributes in the feature table form and choose Save.

A layer can be edited by following these steps:

1. Select a point layer on the Layer Panel.
2. Select the Edit feature from the ribbon (on the Edit Tab).
3. Select the layer displayed on the map.
4. Move point to the desired location.
5. Choose Save.
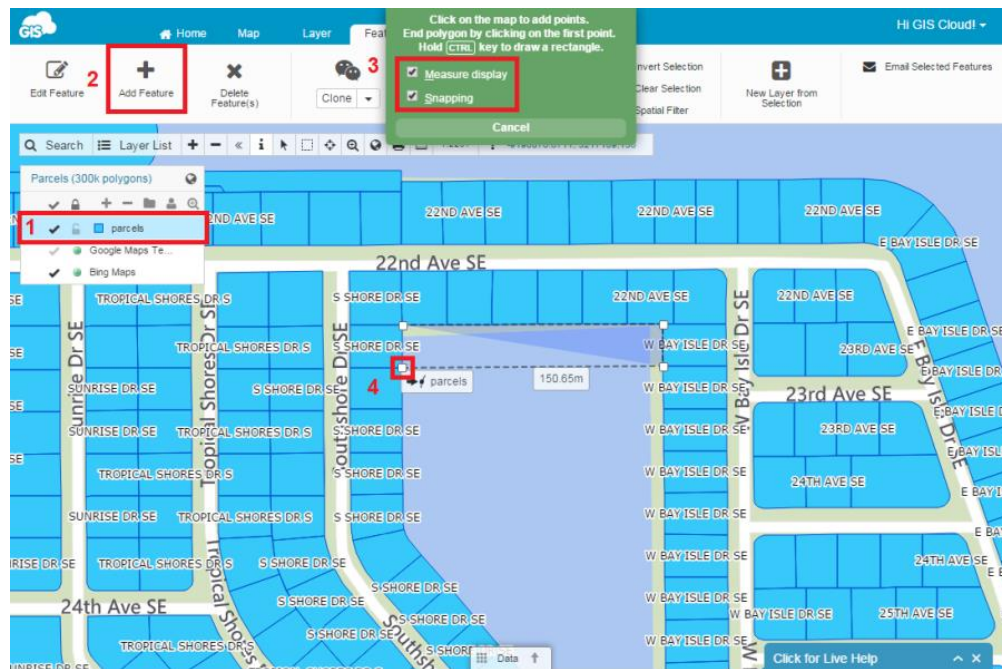
Selecting Layers and Objects

Any feature can be selected. Selected sets allow operations to be performed on your layer, geographic area or feature of choice.

Select feature attributes
There are a few ways to see features attribute data:

*Data Grid* displays all features attributes of the selected layer.
1. Select layer in the Layer List
2. Hold and drag Grid button from the bottom of the map view to expand Data Grid
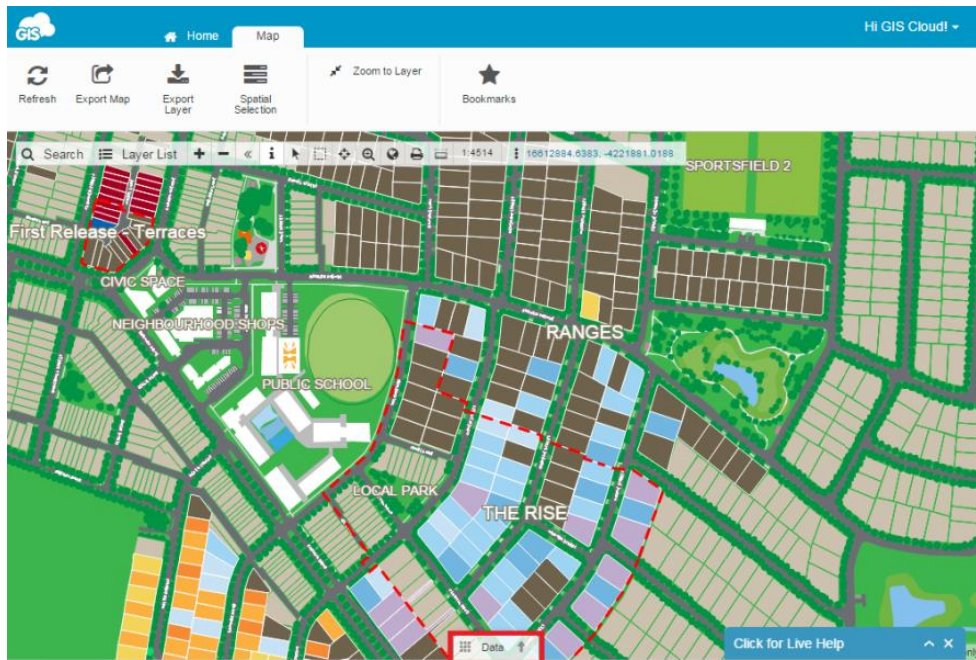
3. Browse through attribute data associated to each feature of selected layer

The selected feature is zoomed and highlighted when you click on the attribute associated with it. *Identify tool* enables you to see attribute data of the selected feature in the info panel. When the tool is used the Info Panel appears on the right side of the screen.
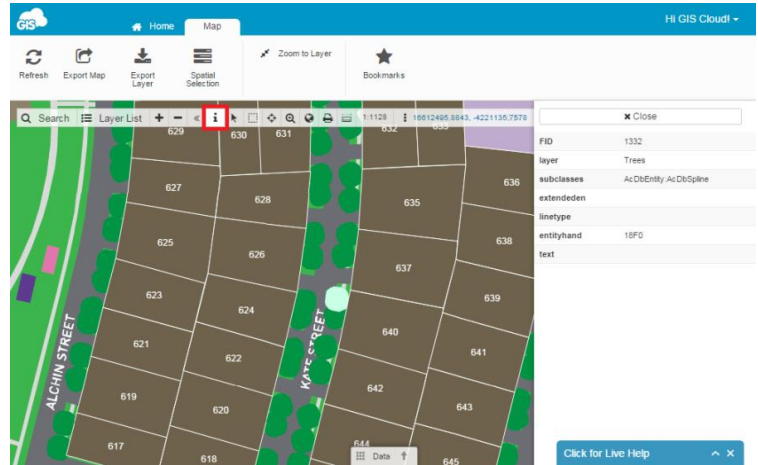
Multi-select Method

Multiple features may be selected at once. There are two methods for multiselection. The first method is the **Select Tool.**

1. Click the select tool on the Map View toolbar.

2. Hold the CTRL button to select multiple features in a layer
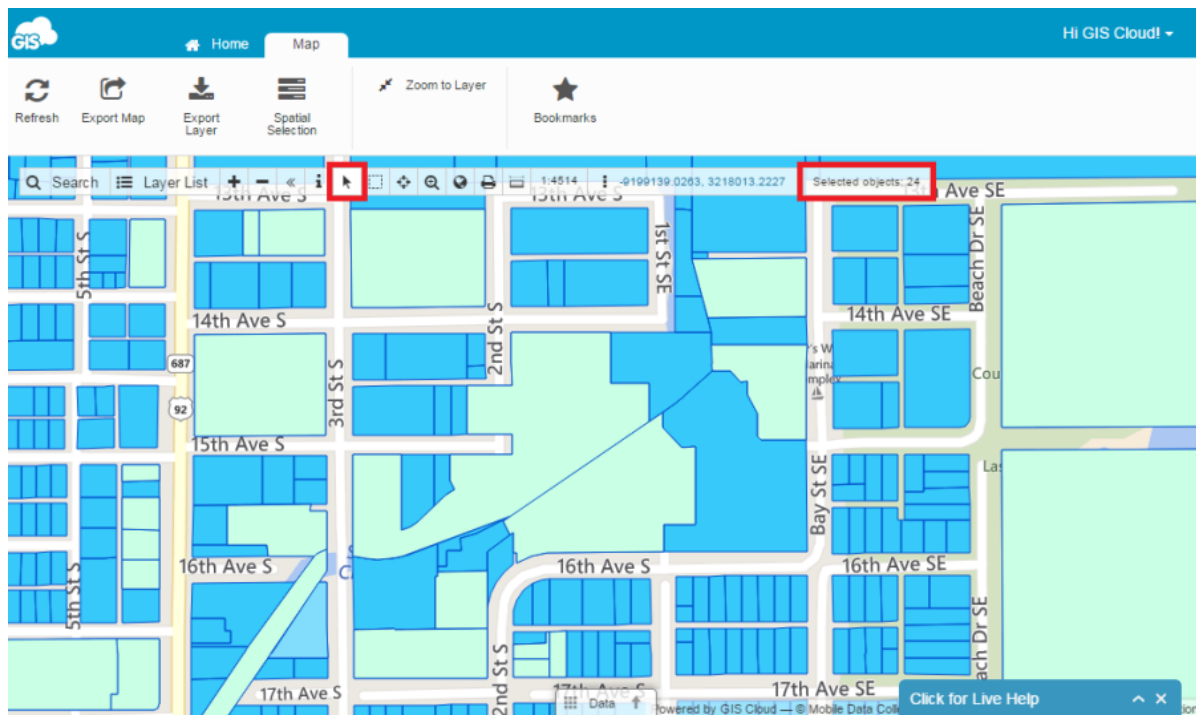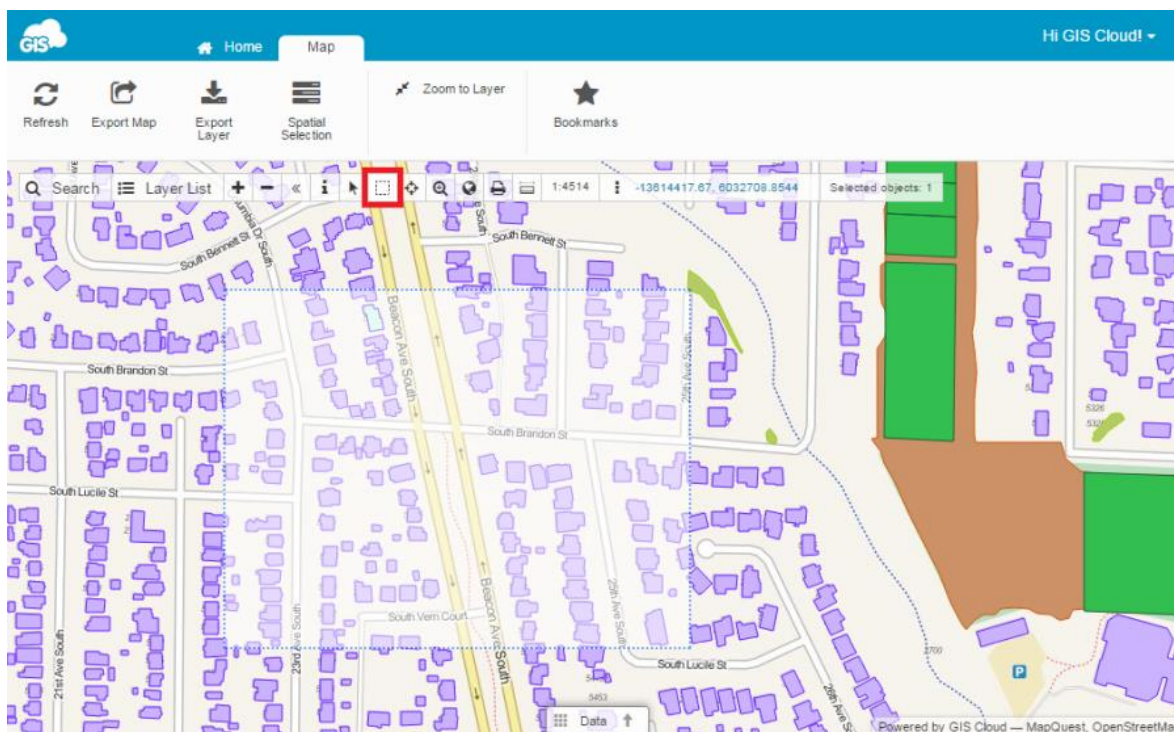

The second method is the **Area Selection tool**.

1. Select the layer in the layers' panel on which you wish to do a multiselection.

2. Click the Area Select tool on the Map View toolbar.

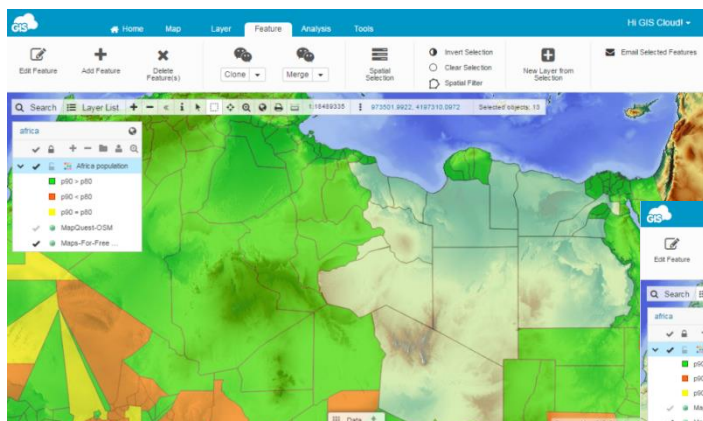3. Drag a box to define the area of selected features.

The selection of objects can be cleared with the Clear Selection function from the Feature tab.

Invert Selection Tool

This tool is use to select the unselected layer elements, and unselect the selected ones. The invert selection tool is found under the Feature tab.

Before:

After:
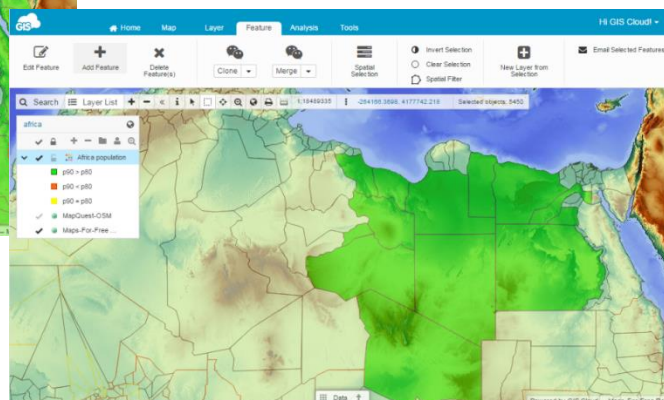
Creating a New Layer from Selection

New layers may be created from selected sets.
1. Select features by using:
   - Select tool from the Toolbar (Ctrl + Select) or
   - Area Selection tool from the Toolbar
2. In the Feature tab choose New Layer from Selection

The new layer result should look like this:

Spatial Selection

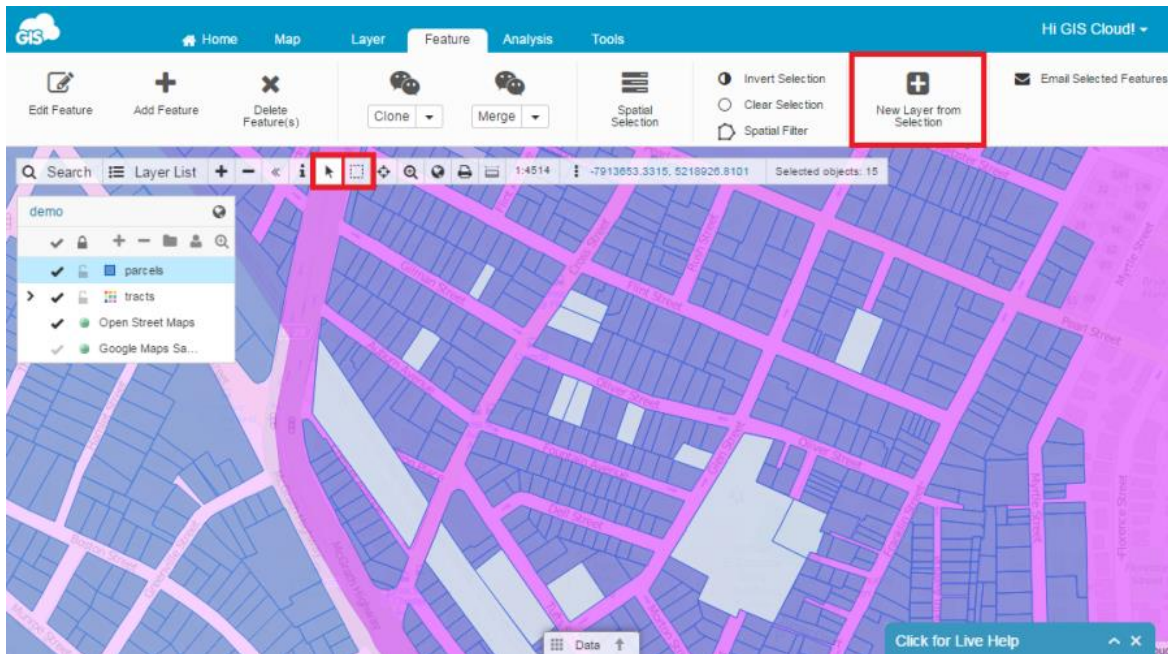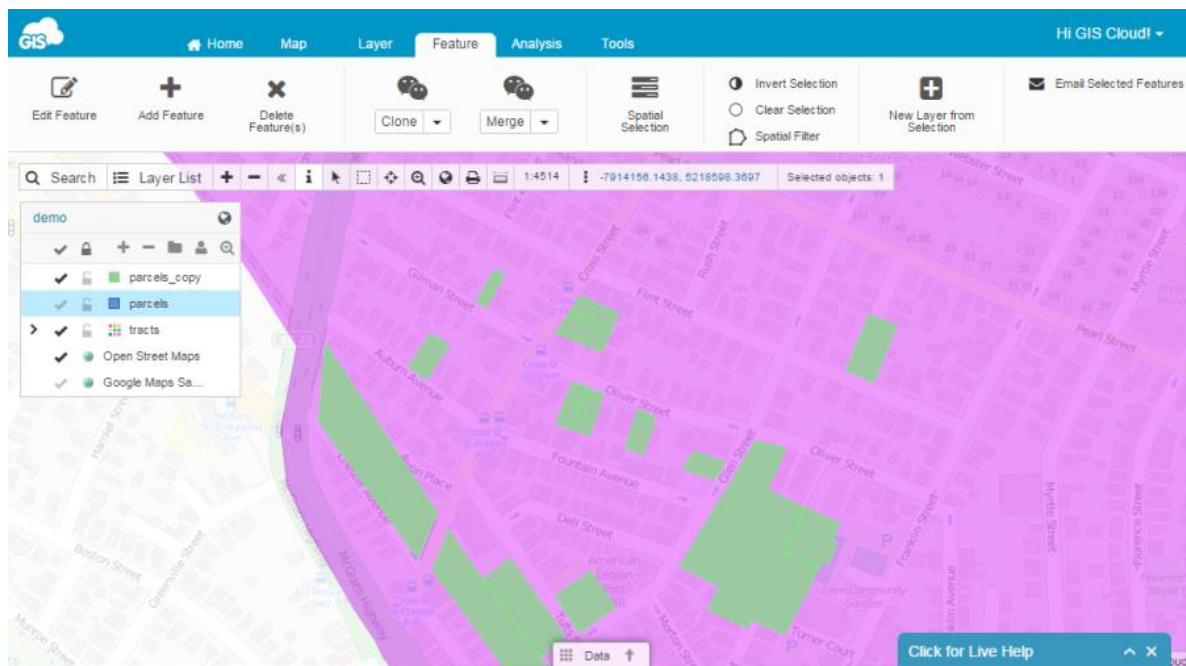Note: spatial selection only works with database layers, not with files. If you want perform spatial queries, please import the files into the database first (See database manager or exercise) Spatial selection allows you to create database queries for layers that reside in the database.

This tool allows you to select any database feature from any database layer in your Map View. You can select by attributes or by location depending on what do you need.

1. Click the Select tab

2. Select Spatial Selection
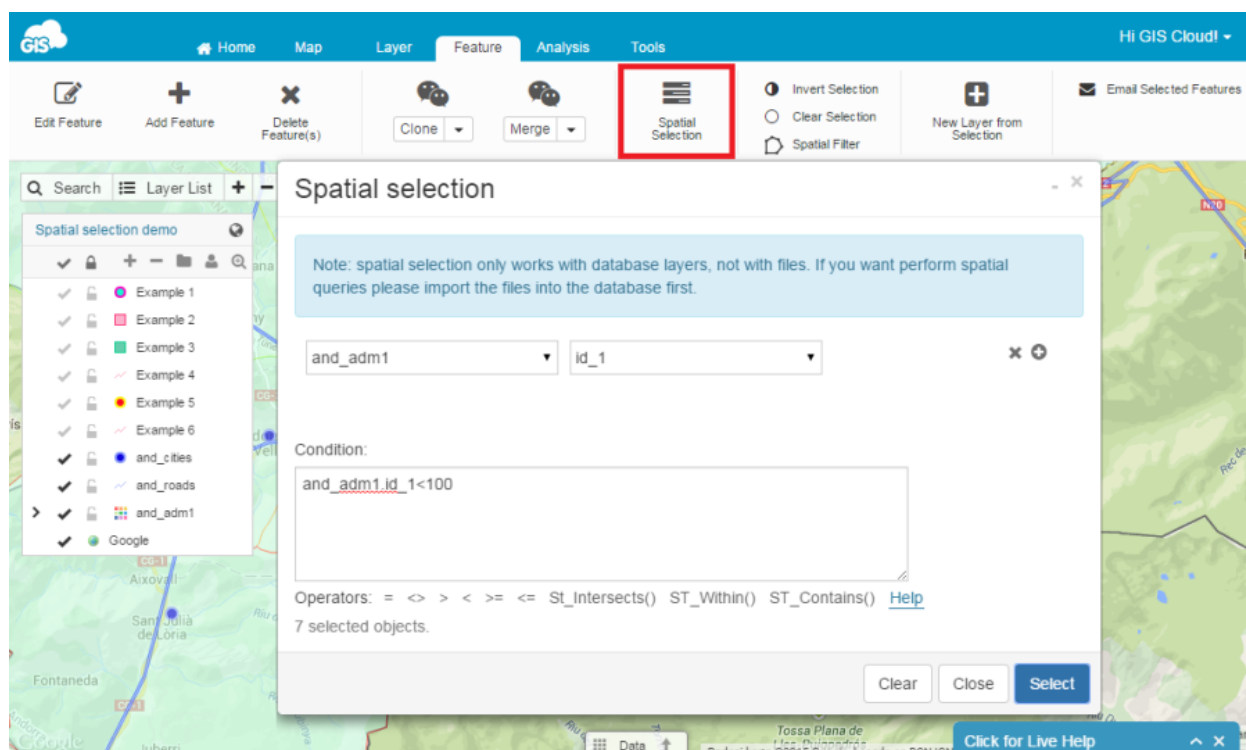
Example 1: Base the selection with polygons that have id attribute less than 1800

Select column from the dropdown list.
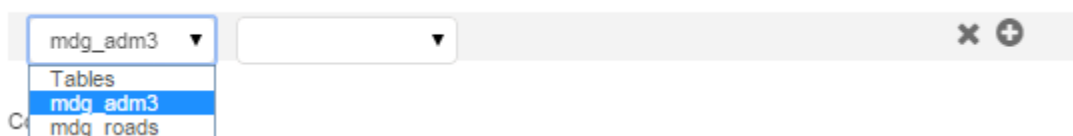
Select column from the dropdown list

Write condition "i.e. <1800" then Click Select

Click New Layer from Selection then click clear selection

Example 2: Select lines within the polygons:

1. Click ST_within() or write it into the Condition bar

Condition:

```
ST_Within( )
```

Operators: = <> > < >= <= St_Intersects() ST_Within() ST_Contains() Help

Select line layer and geometry column (wkb_geometry)

mdg_roads ▼ | ▼ | ✕ ⊕

__owner
__modified
__created
isocountry
iso
f_code_des
rtt_descri
med_descri
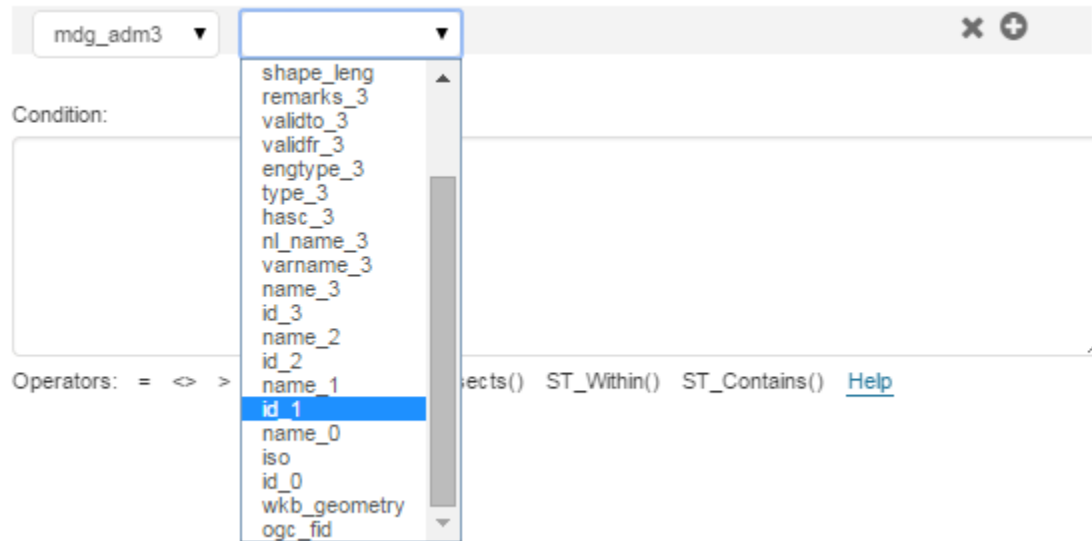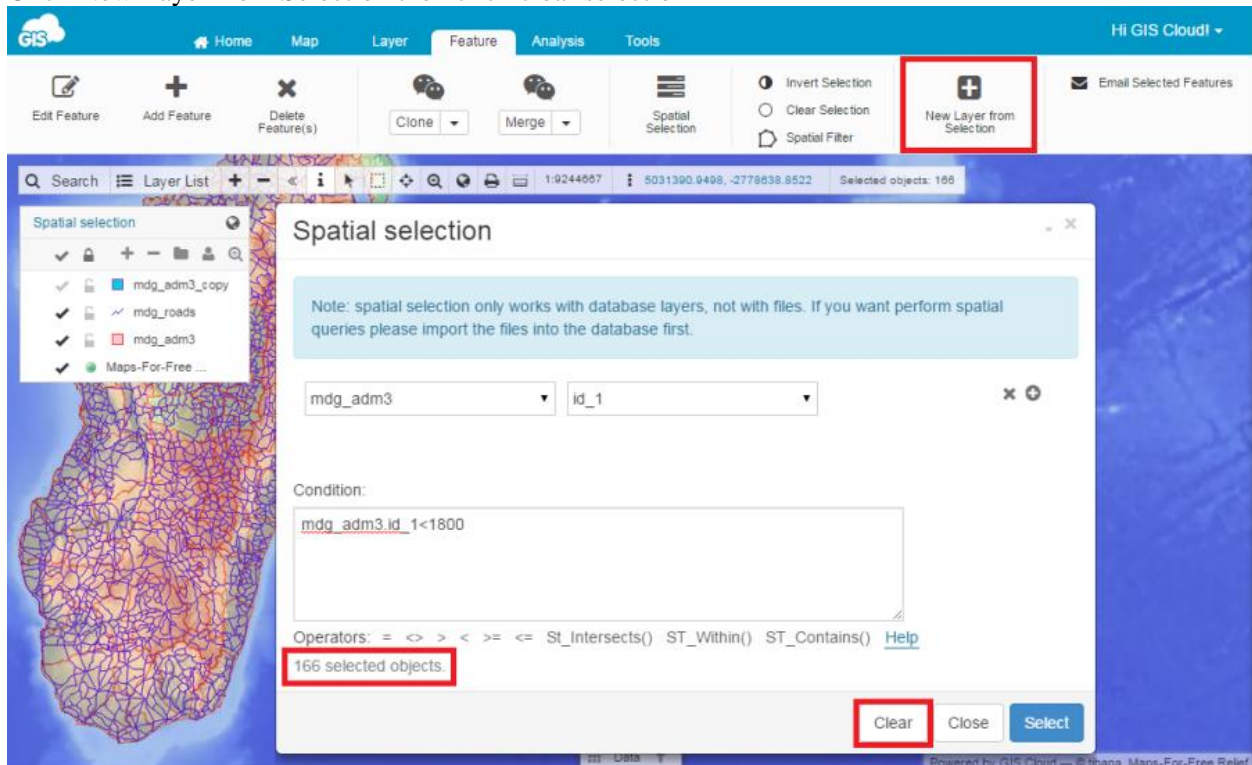**wkb_geometry**
ogc_fid

Condition:

```
ST_Within(, )
```

2. Click "+" button to add another table

Spatial selection — ✕

Note: spatial selection only works with database layers, not with files. If you want perform spatial queries please import the files into the database first.
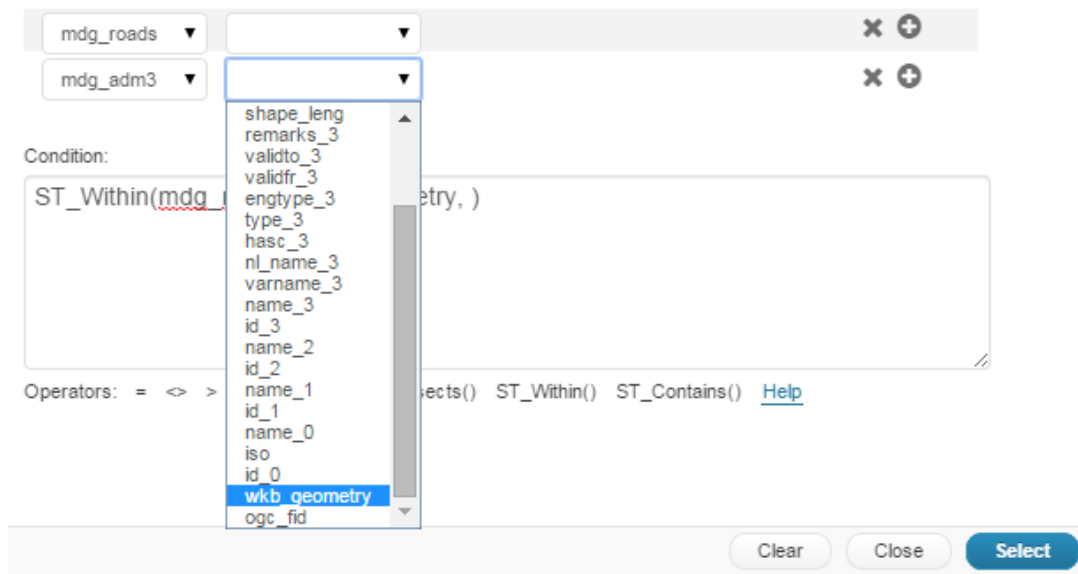
mdg_roads ▼ | ▼ | ✕ ⊕

Condition:

```
ST_Within(mdg_roads.wkb_geometry, )
```

Operators: = <> > < >= <= St_Intersects() ST_Within() ST_Contains() Help

Clear   Close   Select

3. Select polygon layer and geometry column (wkb_geometry)

4. Click Select button
5. Click New Layer from Selection
6. Click Clear selection

GIS Analysis

All spatial data included in a project can be analyzed using the following tools:
1. Area analysis
2. Buffer analysis
3. Heatmap analysis
4. Near analysis

To access analysis tools go to the Analysis tab

Note: you can perform Analysis only with layers added to the map from a database.

Area analysis

Area analysis calculates the surface area of a selected polygon.

1. Select database polygon layer
2. Select layer's feature
3. Click Analysis tab
4. Click Area icon
5. Select units of measurement from the drop down list
6. Click calculate for selection button
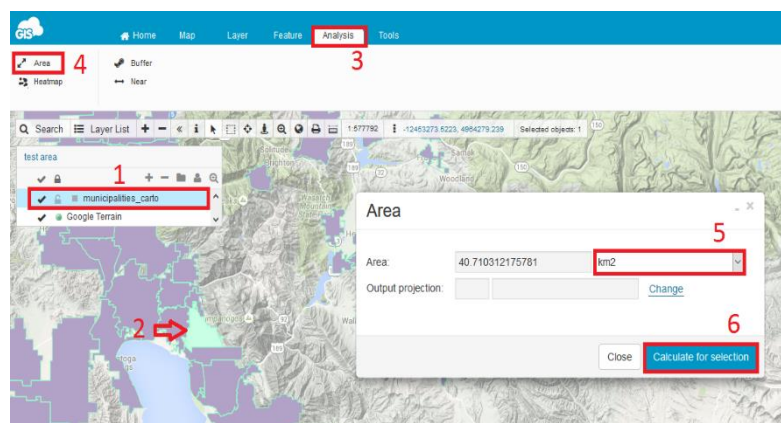
Buffer Analysis

Buffer analysis creates a zone around a point, line or polygon. You can identify whether there are objects of interest inside the zone or outside the zone and make conclusions based on this analysis. After selecting Buffer analysis from the analysis tab you need to set following options:

1. Select Analysis tab
2. Click Buffer icon
3. Write Analysis name
4. Select database layer from the dropdown to perform analysis on
5. Define buffer distance and the unit of measure
6. Choose whether you want to group (merge) buffers
7. Define the symbology of the buffer polygon
8. Click Show buffer button
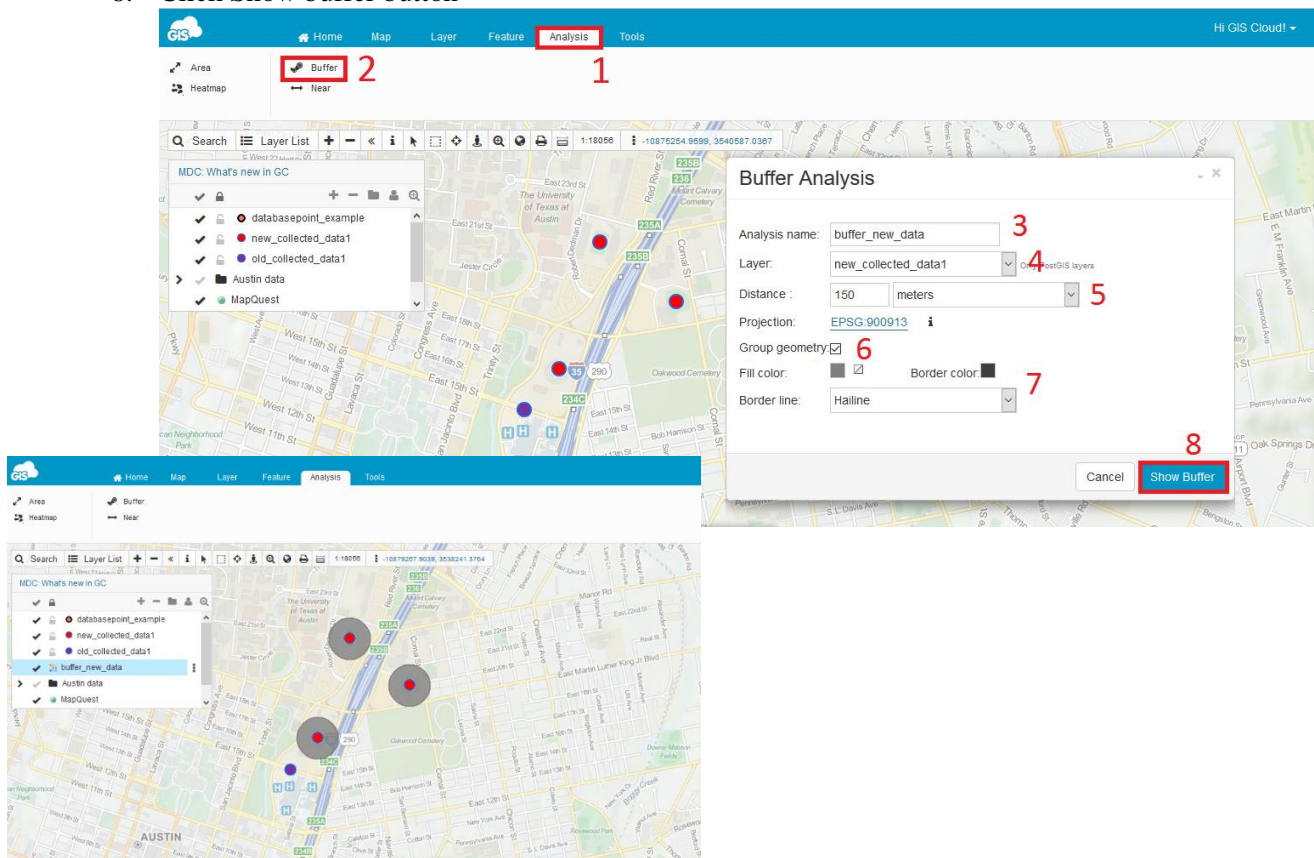
Heatmap Analysis

Heatmap analysis is a graphical representation of data that visualizes the density of points in a layer. It is possible to perform Heatmap analysis on the point layers that reside in the File System or in the Database.

To calculate density of points in a layer and display it on the map:
1. Select Analysis tab
2. Click heatmap icon
3. Select database point layer
4. Set minimum distance between points taken into consideration to calculate density

5. Select show hotspots to see the results
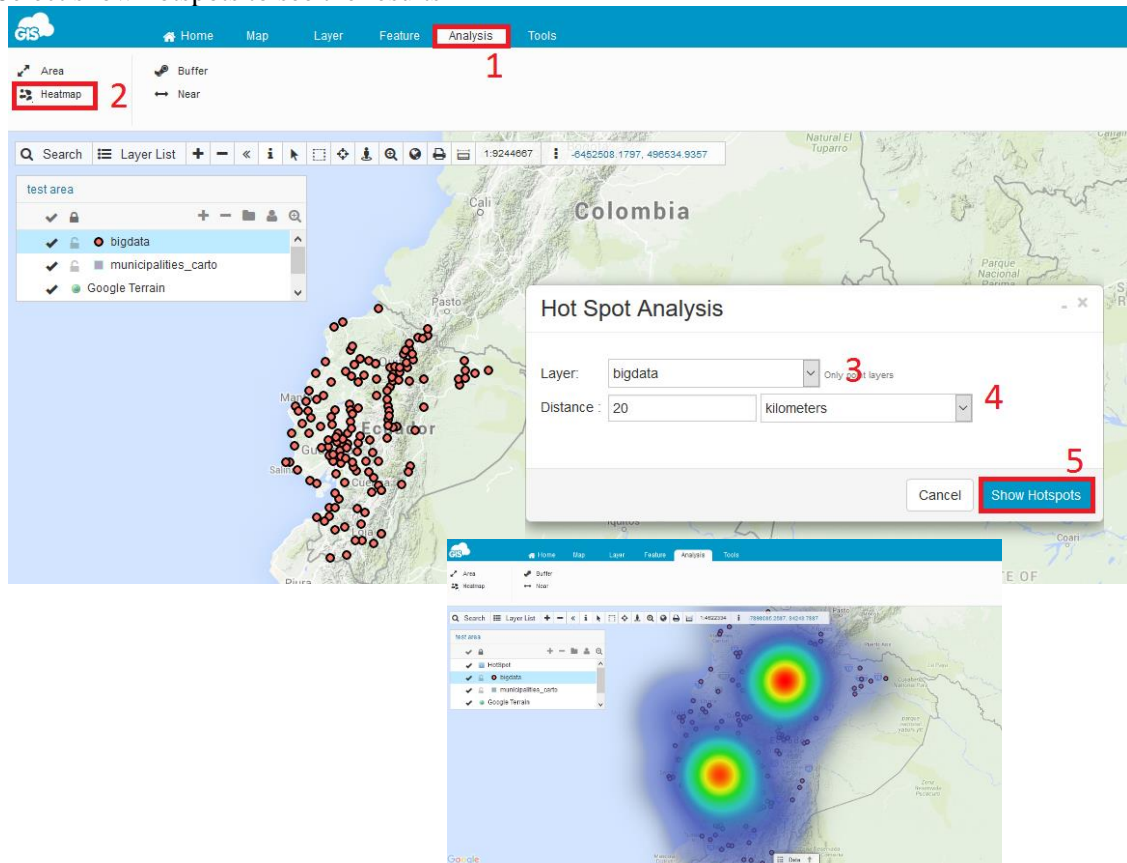
Near Analysis

Near analysis is a tool with which you can determine the distance from each feature in a layer to the nearest feature in the same layer, within the specified search radius.

To perform a near analysis:
1. Select Analysis tab
2. Click near icon
3. Select database point layer
4. Set distance (search radius) and units of measure. **Note:** you can speed up the process time by setting bounds to local region
5. Click run button
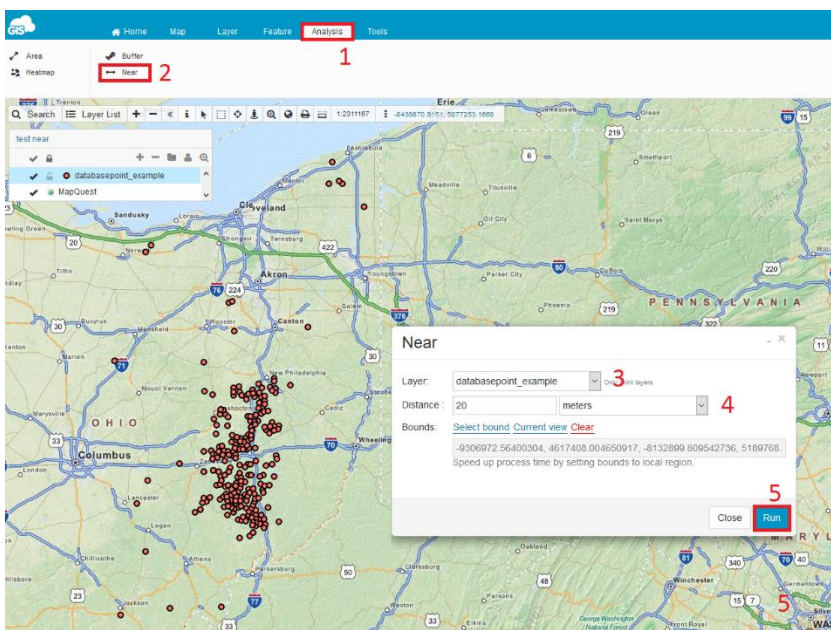
You can see the number of selected features in the Toolbar. You can also create a new layer from selection: Feature tab > New layer from Selection.
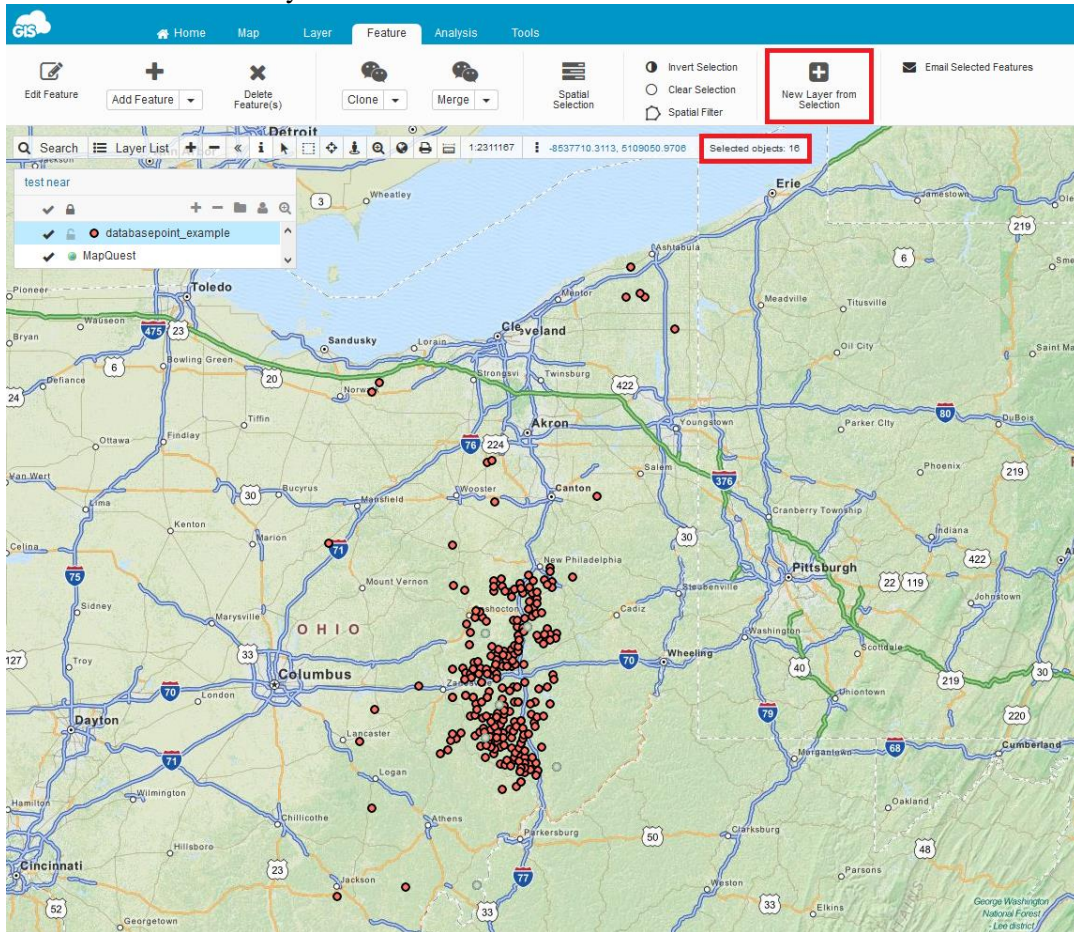
Tools Tab

The tools tab gives access to the following operations in the ribbon:

1. Work with files
2. Work with the database
3. Join data from separate layers
4. Create source from various types of data
5. Create layers form
6. Set spatial projection options
7. Merge two shapefiles into one
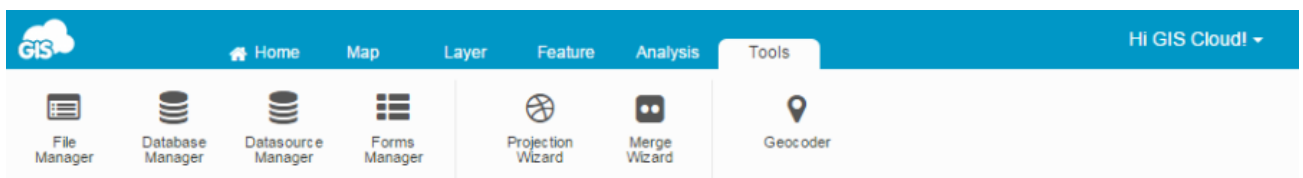
File Manager
This is used for managing and uploading new files to GIS Cloud.
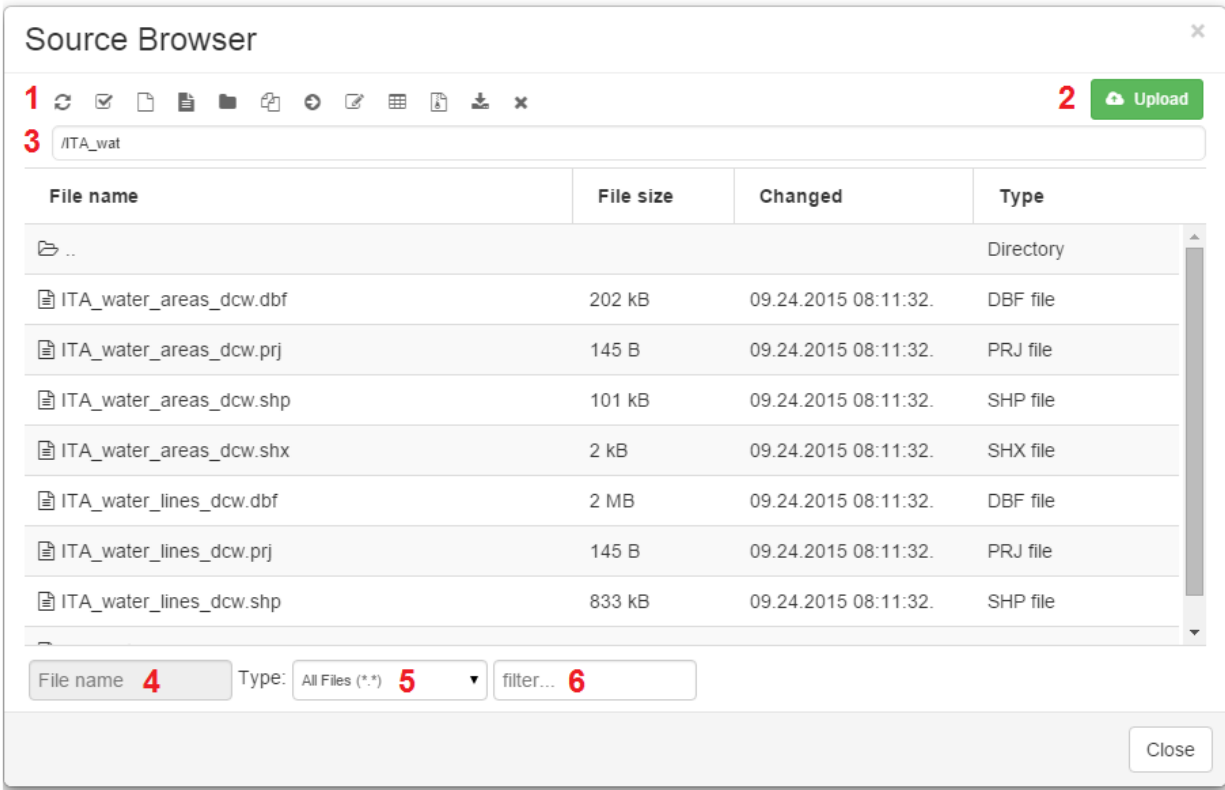
The file manager offers the following functionalities:

1. Tools
   - Refresh Current Folder
   - Select All
   - Create new file – file name can't contain '/' or '\' characters.
   - Edit text file
   - Create New folder
   - Duplicate file/folder
   - Move to different folder
   - Rename
   - Edit structure – at the moment only ESRI Shapefile is supported.
   - Unzip archive
   - Download selected file(s)
   - Delete
2. Upload data from local computer
3. Address bar
4. Name of the currently selected file/folder
5. Filter files by file type
6. Search files by name

Database Manager

To perform editing or data analysis, the layers you're working with must reside in the database. The Database Manager allows you to import layers into the database.

To import file into the database:

1. Click Tools tab and click Database Manager icon.
2. Click Import Geospatial file icon.
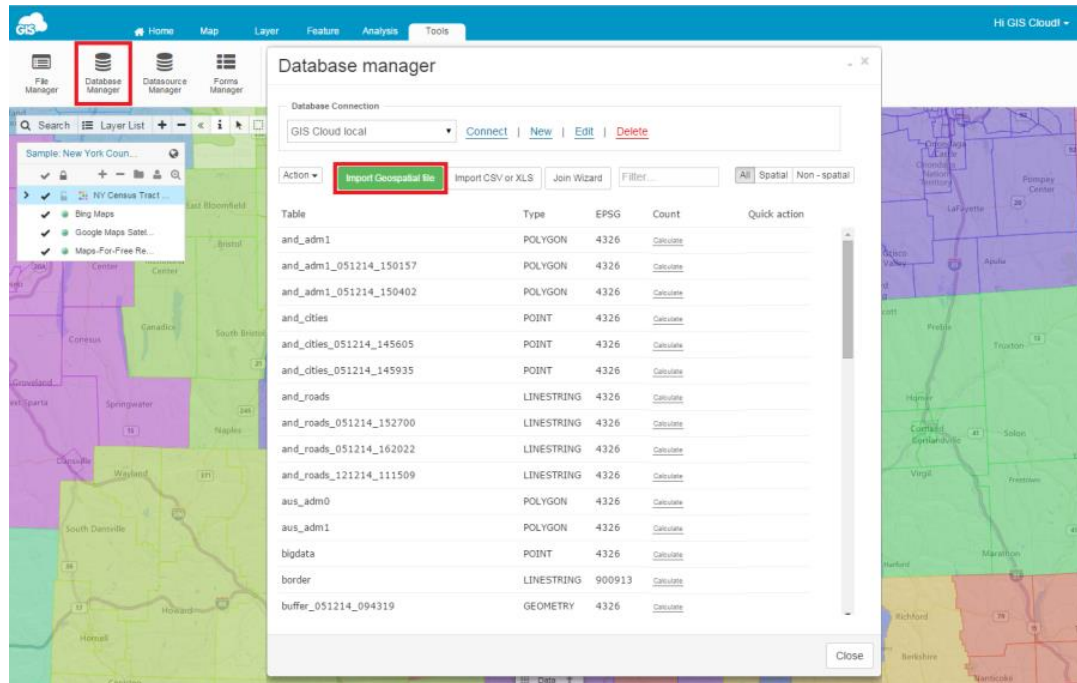
3. Select layer you want to import (or upload it to the GIS Cloud).
4. Click Select button.
5. Write table name.

   Note: when naming table: start with a letter or an underscore, use only English alphabet letters, digits and underscores, and use only lower cases

Projection – Info about layer projection

Reproject to – If box is checked, it's possible to reproject layer from original projection to another projection

Encoding – character encoding is used to represent a repertoire of characters. You can choose between encoding, but note that original layer has to have UTF-8 encoding

Geometry type – spatial data can be represented as point, line, polygon, multipoint, multiline or multipolygon. If original layer is multipoint, multiline or multipolygon type, check "Expolode geometry box since multigeometry can't be imported in the Database

Overwrite existing – Overwrites existing table with the same name

Explode collections – Explodes multigeometry features to the geometry (i.e. multipolygons to polygons)

Skip failures – Skips features that can't be imported to the database

Use shp2pgsql – Converts a shapefile into a series of SQL commands

6. After choosing layer and defining options click Import button.

   **Note:** make sure that layer has UTF-8 encoding.

Adding Database layer to map

After importing, database layer has to be added to a map. Database is the required data source for editing geometry and performing any data editing, calculations, or analysis.

Database layer is added to a map as shown below:

1. Select Add Layer from the Layer tab or Map tab.
2. Select Database from the dropdown menu.
3. Select a table.
4. Click Select button.
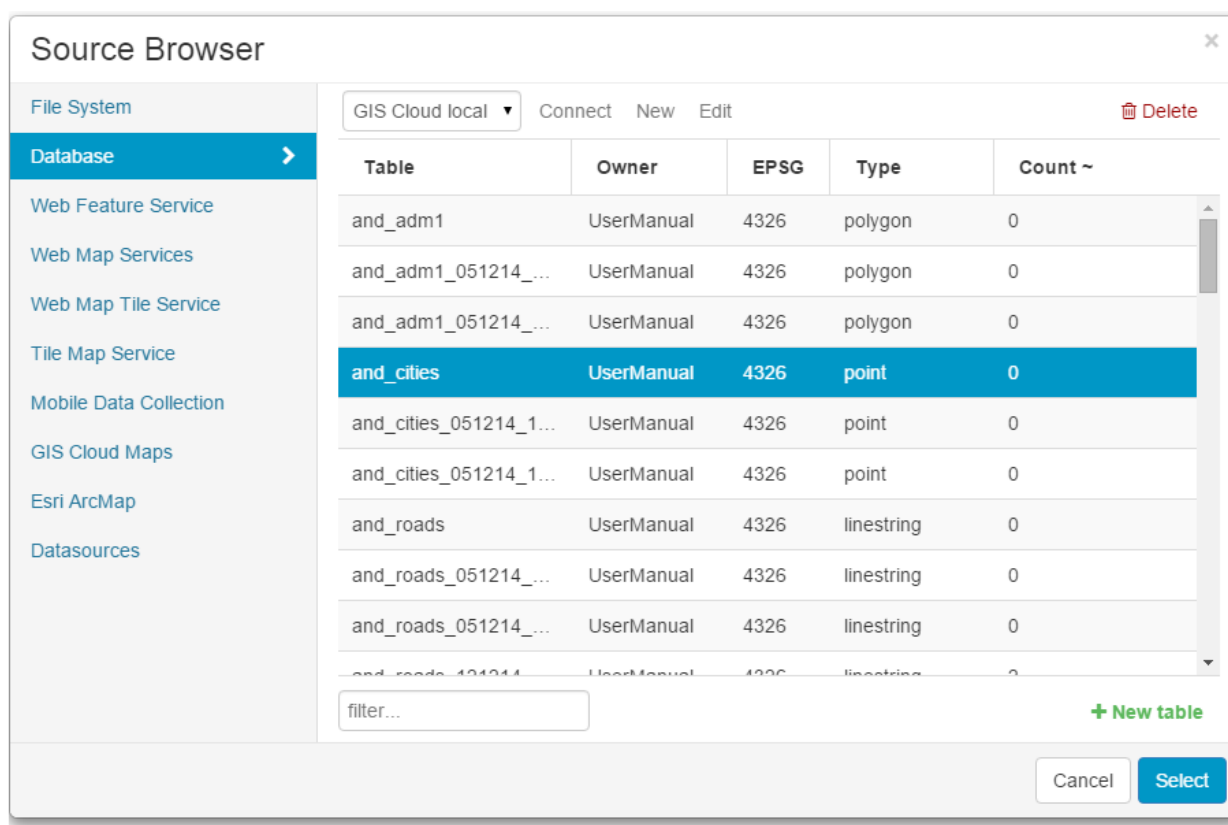
Projection Wizard

This tool enables you to change an existing layer projection. To access Projection Wizard, click on the Tools tab.

1. Browse to a datasource layer. If the projection has been detected, it will appear in the form.
2. Select new datasource projection (SRS – Spatial Reference System Identifiers) and click Select to add it.

3. Choose Assign an output SRS to correct the current projection. If you wish to transform datasource from an existing projection to the newly selected one, choose Reproject/Transform to SRS on output.
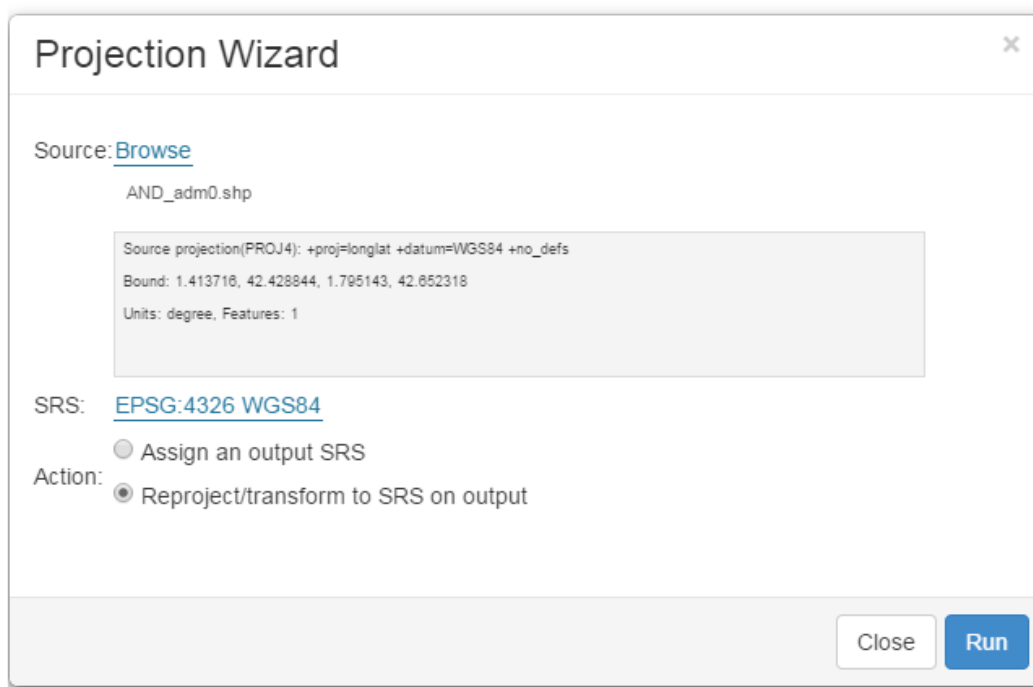
To help you find the projection you want, you have a search tool at your disposal. You can search by EPSG code or by all columns. For more informaiton on projections, visit http://www.spatialreference.org.

Merge Wizard
This enables you to merge several files into one. It is current supports forms in ESRI Shapefiles for vectors and GeoTiff files for rasters. If source files are stored in the File System then destination file has to be in the File Manager too. If all source files are stored in the Database, then destination file has to be in the Database too. If one of the source files is stored in the File Manager and other in the database, destination file has to be stored in the File Manager. Note that layers stored in the File Manager are not editable. Source layers have to have same geometry type (point, line or polygon). It is not possible to merge e.g point and polygon. It is also possible to merge data collected with MDC. MDC data is stored as a table in the Database.

To merge:
1. Select Merge Wizard from Tools tab
2. Browse files you wish to merge from the File System or Database
3. Browse Destination for a merged file. Follow the steps below depending if your layers are stored in File System or Database

Geocoder
With the Geocoder you can easily convert non-spatial location data into its matching spatial representation. Geocoding allows users to translate an address into coordinates and vice versa.

For geocoding you will need an excel table or a csv table containing data you want to geocode and the address model data that will be the basis for geocoding.
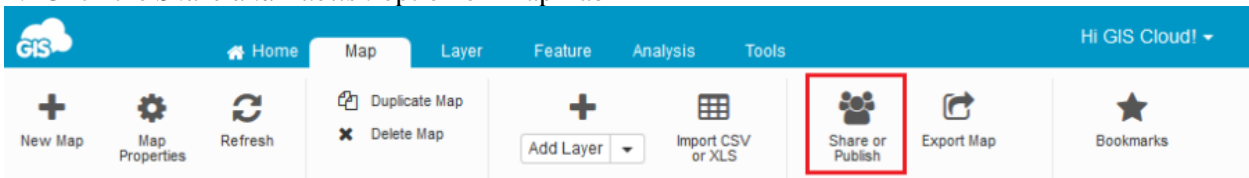
Sharing and Publishing

GIS Cloud has several options for sharing and publishing data. To share or publish data, first select the Map tab and then click Share or Publish from the ribbon. These related sections follow:

- Map Sharing with other GIS Cloud users
- Setting Layer Permissions
- Embedding Maps into a Web Page
- Web Map Service (WMS)

Map Sharing
1. Open map you want to share
2. Click the *Share and Publish* option on Map Tab

3. Start to write GIS Cloud username of the user you want to share a map.

4. Click Share and set Sharing Permissions for users

List of Share or Publish form functions include:
1. **Permalink** – The URL appearing in the permalink field allows you to share a direct link to your project from any browser.
2. **Open in Map Viewer** – opens a map in the Map Viewer application.
3. **Share with the User** – write username of the user you want to share a map with.
4. **Publicly available** – if box is checked maps are visible to everyone on the Home tab under Public Maps, whether they are registered or non-registered GIS Cloud users.
5. **Who has access** – Collaborate with other GIS Cloud users.

6. **Permissions**
   - Can view – will provide only viewing privileges to the person you have shared your map with.
   - Can share – will provide sharing privileges to the person you have shared your map with.
   - Can edit – will provide complete editing privileges to the person you have shared your map with.
   - Can export – will allow the person to export the map you have shared with him
   - Can collect – will allow the person in the field to send new data, without possibility to make changes to existing data or the one that he has already sent through <u>Mobile Data Collection</u> application.
   - Can update – will allow the person in the field to make attribute and geometry changes, without possibility to send new data through <u>Mobile Data Collection</u> application.
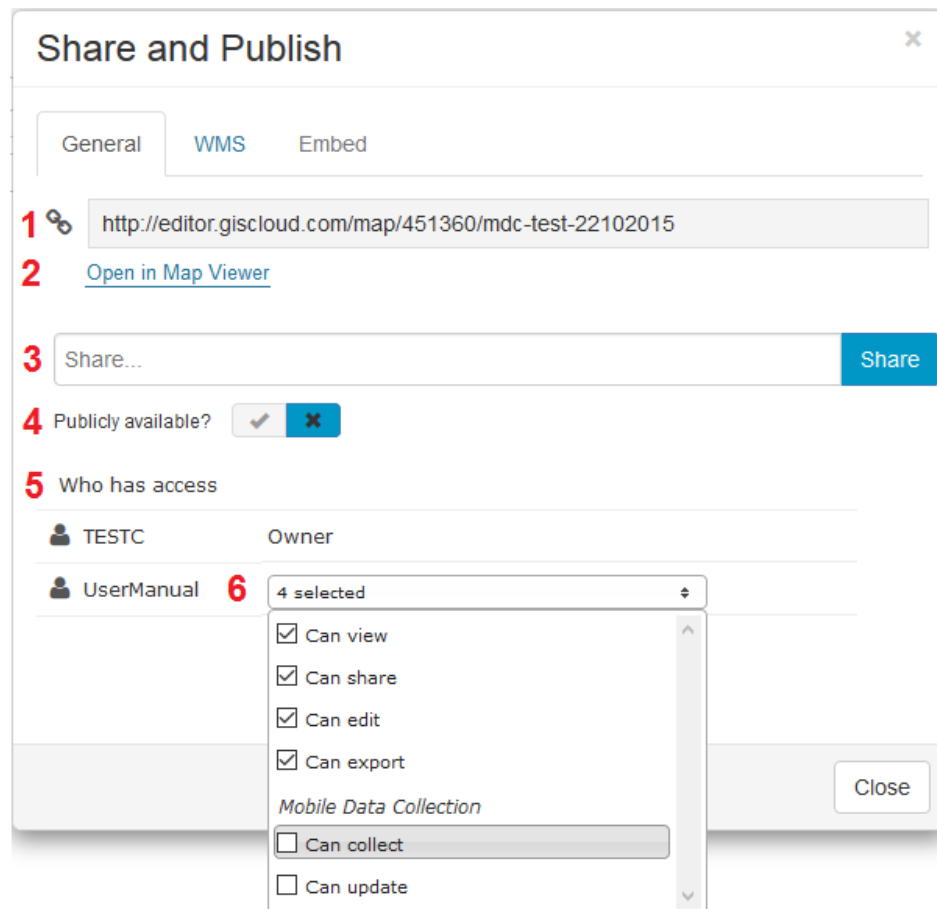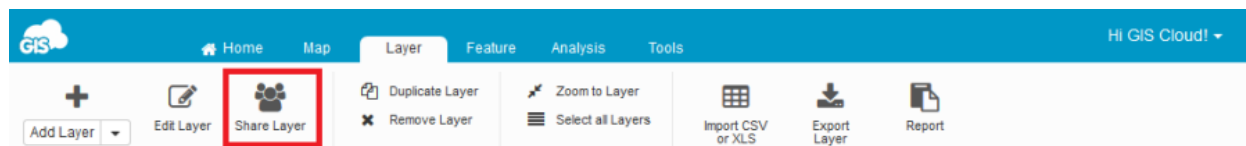

Layer Permission

Regardless of map privileges you have set for another user, there are additional sharing options you can set for each layer individually.

To share a layer follow these steps:

1. Select layer on the Layer list.
2. Choose Share Layer option.

1. Write username of the user you want to share layer with.
2. Set sharing permissions:

- **Can view** – will allow the person you have shared your map with only viewing privileges of specified layer, without possibility to edit or export it.
  E.g. If you gave other user edit privileges to the map, but want to make restricted privileges for a specific layer.
- **Can share** – will provide sharing privileges to the person you have shared your layer with.
  E.g. If you gave view privileges to the map, but want to enable other user to share a layer to another user. Person with share privileges can share layer to another user and assign him the same permissions he got from the layer owner.
- **Can edit** – will provide the person you have shared your map with complete editing privileges of specified layer.
  E.g. If you gave other user view privileges to the map, but want him to be able to edit a specific layer.
- **Can export** – will allow the person to export specific layers from the map you have shared with him.
  E.g. If you gave other user view privileges to the map, but want him to be able to export a specific layer.
- **Can collect** – will allow the person in the field to send new data to a specific layer, but without possibility to make changes to existing data or the one that he already sent through Mobile Data Collection application.
- **Can update** – will allow the person in the field to make attribute and geometry changes for features in a specific layer, but without the possibility to send new data through Mobile Data Collection application.
- **Publicly available** – makes the layer publicly available for all GIS Cloud users. After making layer public, it's also possible to choose between view, edit and/or export privileges.

Note: Sharing Layer and Sharing Layer's data source is not the same option. Shared Layer will allow other user to use layer only inside the map which you also need to share with them. Shared data source allows other users to use layer in any map, his own or the ones shared to him with edit privileges.

Embedding Maps into a Web Page

Choosing the embed tab on the Share and
Publish panel allows you to easily extract
code for the embedding of your map in a
3rd party website. The following settings
are available:

1. Define your preferred scripting
   platform:
   - GIS Cloud (Javascript)
   - Google Maps
     (Javascript)

2. Width X Height - Define the
   dimensions of the object

3. Choose your content display
   method

4. Options - Opt to include a toolbar,
   a Layer List (Legend) and/or Info
   Popups

5. Popup Preview – Examine a
   complete preview of your map
   prior to embedding

6. Code - Copy code into the part of
   the page where you want to show
   the map

There are some differences in the forms for each of the scripting platforms but in general the
settings are the same. If you experience any problems or issues with the maps, use Clear Tile
Maps and then try again.

Web Map Service – WMS

You can share your GIS Cloud map on a third party software as a Web Map Service (WMS). To share
a map as a WMS:

1. Click Share or Publish button from the Map tab.
2. Click Enable button.
3. Copy and paste WMS URL link to the third party software i.e. QGIS, Google Earth,
   ArcMap.

Updated on May 11, 2016 by Anna Yu