

User's Guide

Edition Plugin



INPE / FUNCATE

TerraAmazon 4.6.3

Edition Plugin User's Guide

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1st Edition published August 30th, 2015

2nd Edition published March 30th, 2016

3rd Edition published April 29th, 2016

4th Edition published August 29th, 2016

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www.funcate.org.br

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The information in this document is subject to change without notice.

Acknowledgments

The *TerraAmazon Edition Plugin User's Guide* editions were written, edited and designed by André Savio Pinto and Vanildes O. Ribeiro of FUNCATE.

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Preface

Welcome to TerraAmazon

TerraAmazon is a GIS tool designed to be a multi-user editor of geographic vectorial data stored in a TerraLib model database. It engages land use and land cover classification tools as well as spatial operations between vector data, allowing transitions analysis among other applications. TerraAmazon keeps work time records for project control. It's functionalities are extensible through plugins, such as the already existing TerraImage (PDI) and TerraPrint (plotting).

TerraAmazon was first developed by INPE and FUNCATE in early 2005. It was initially applied to SISPRODES project and quickly conquered space in other projects, such as DETER and DETEX, among others, due to its multi-user characteristic. Until late 2009, TerraAmazon was used only within FUNCATE, being widely applied to many of its projects. With the creation of CRA, INPE's Amazon Regional Center, located in Belém, TerraAmazon reached international space, having regular trainings being held in CRA's facilities for both national and international specialists.

Nowadays, TerraAmazon is constantly being updated and having tools and system enhancements, pursuing national and international approval.

TerraAmazon is part of Brazil's attempt to become an international reference on forest monitoring programmes.

TerraAmazon is free and open source provided under GPL license as published by Free Software Foundation at www.gnu.org.

TerraAmazon is available for download at www.terraamazon.org.

Involved Institutions

The following institutions are involved in TerraAmazon's development process.

INPE, Brazil's *National Institute for Space Research*, founded in 1961. It is engaged on many research fronts in various areas of space science and their applications. INPE is involved with TerraAmazon in the political sphere and settling agreements between countries and institutions.

www.inpe.br

INPE Amazon (CRA, Amazon Regional Center) is an INPE unit settled in Belém, State of Para, and east of the Brazilian Amazon. Founded in 2007 to support researches and fieldwork in the Amazonian region, this unit became fully operational in 2009 and since 2010 implemented the *International Course on Tropical Forests Monitoring*. This capacity building activity is based on the knowledge of the TerraAmazon System, for which documentation and training tutorials were developed enabling participants from Latin America, Africa and Asia countries to monitor their forests, as Brazil has been doing for more than 20 years.

www.inpe.br/cra

FUNCATE, *Foundation for Space Science, Technology and Applications*, is a non-profit private organization founded in 1982. It is engaged on national projects involving land use and land cover classification, estimating GHG emissions due to land use as well as many others. It has technical agreements with Brazilian research partners, such as INPE, CTA (Aerospatial Technical Center, Brazilian Air Force) and others. FUNCATE is involved with TerraAmazon by programming the software, developing and enhancing tools, testing, writing user's guides such as this one, developing and maintaining the website as well as other related activities.

www.funcate.org.br

TerraAmazon Documentation

TerraAmazon has the following documentation available for download at www.terraamazon.org:

User's Guide Administrator: defines the administrator roles and presents the use of each interface related to administration procedures.

User's Guide Operator: defines the operator roles and presents each procedure for working on multi-user environment and the use of each vectorial edition tools.

Edition Plugin User's Guide: presents each procedure for image edition.

Digital Image Processing (DIP) Plugin User's Guide: presents each procedure to process digital image.

Digital Terrain Model (DTM) Plugin User's Guide: presents each procedure to model digitally terrain surfaces.

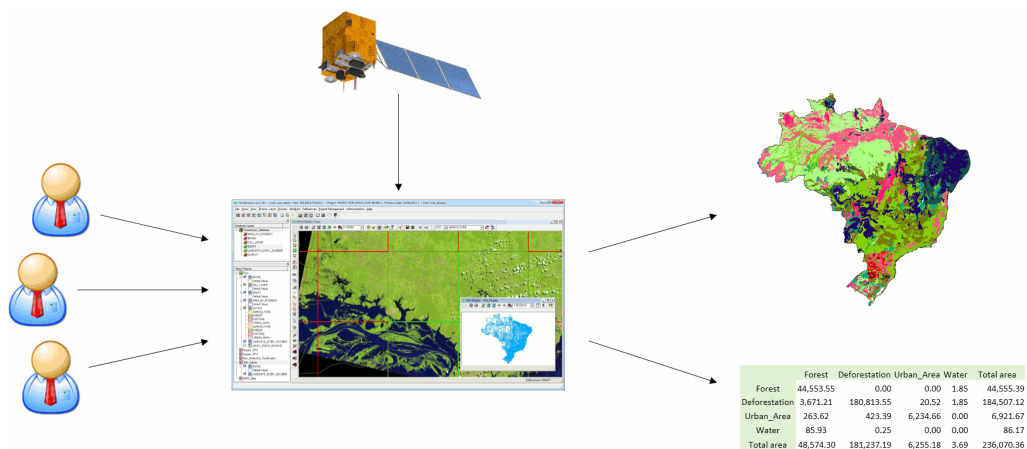
1 Introduction to TerraAmazon

WHAT IS TERRAAMAZON	1
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What is TerraAmazon

TerraAmazon is a GIS tool designed to be a multi-user editor of geographic vectorial data.

It was developed to improve the corporate production of geographic data in order to provide accurate measurement of deforestation, forest degradation, land use and land cover change and similar applications.



In TerraAmazon, several users can work simultaneously in the same data following a methodology fixed by Administrator Users. This reduces the time of project execution and ensures that the final data is entirely produced under the same methodology.

The spatial operations between vector data allows transitions analysis among other applications.

The system has a built-in structure to allow experienced users to audit the data produced. It also provides reports so Project Managers can follow and analyze the evolution of the work.

The data is stored in a TerraLib model database (www.terralib.org) and is worked within a client-server environment.

Database

A TerraAmazon database encloses the whole set of data, either raster or vector data.

Layer

Vector or raster data. Every vector or raster data stored in the database is presented to the user as a layer in the Layers Tree (see main interface on page 3).

Vector data can have three types of representation: polygons, lines or points.

Layers are visible to all users.

Theme

A theme is the structure that defines which data from one particular layer will be visualized and how will it be displayed on the screen. Themes are user-related, that is, if a user creates a certain theme, he will be the only one able to see it, change it or remove it.

No user can see other user's themes, not even having administrator privileges.

View

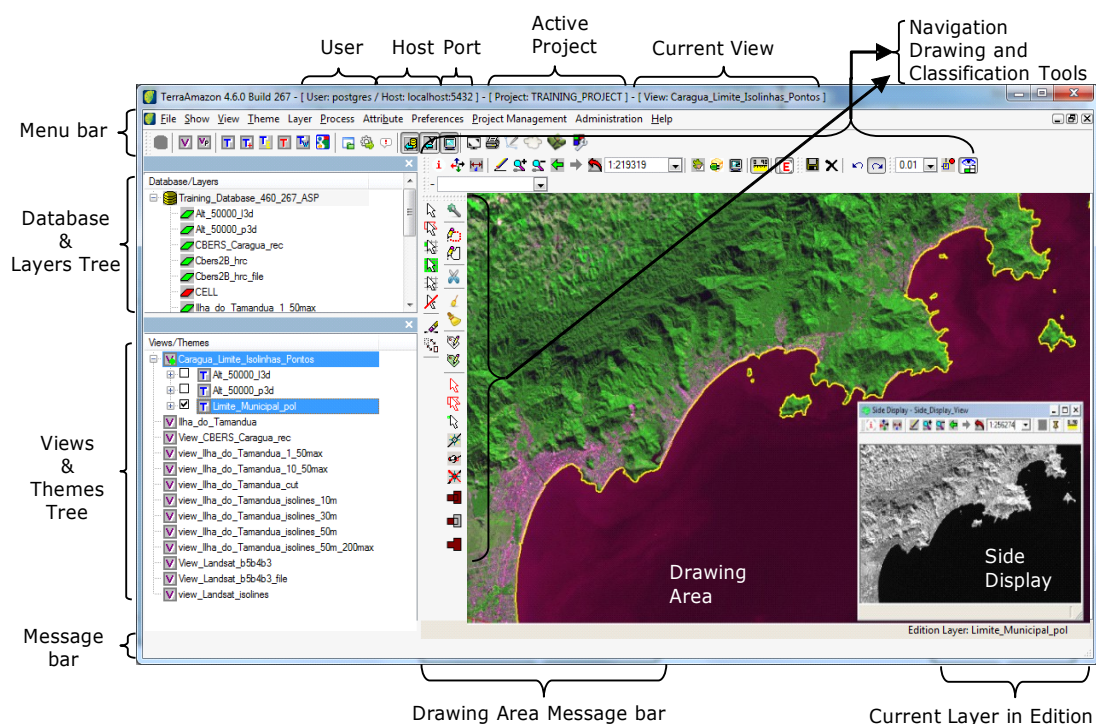
A view is a structure that defines the data that will be visualized and manipulated simultaneously. That is, if the user needs to visualize a satellite image and a vectorial data at the same time, both these data must be added to the same view. Views are user-related, that is, if a user creates a certain view, he will be the only one able to see it, change it or remove it.



No user can see other user's views, not even having administrator privileges.



Presenting the Main Interface

The following figure presents the main interface. It has three main areas:

- Database & Layers Tree
- Views & Themes Tree
- Drawing Area.



In the *Database & Layers Tree*, the icon  identifies the currently connected Database, while the icon  identifies the layers. This tree is shown the same way for every user, since it contains every single layer in the database.

In the *Views & Themes Tree*, the icon  identifies the views, while the icon  identifies the themes. This tree is different for each user, since both views and themes are user custom.

The drawing area displays the data from the selected themes in the current view.

The other items in the interface are shown only in specific conditions. The *Drawing and Classification Tools*, as well as the *Current Layer in Edition*, only show when the user opens the edition mode. The *Navigation Tools* are shown all the time. The number of the connection Port is shown only when informed by the user at the moment of database connection.


2 Accessing the Database

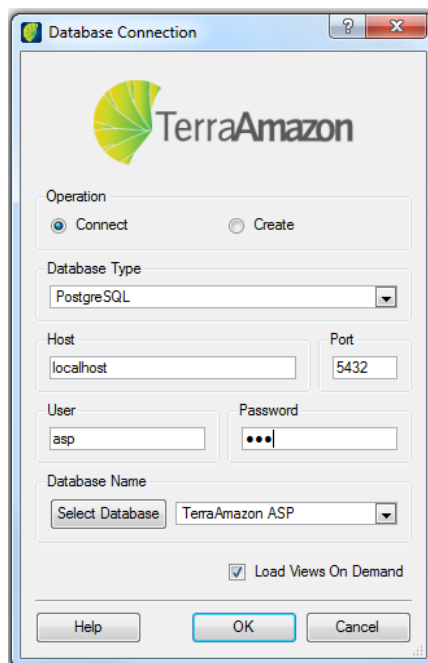
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Procedures to perform the connection with an already existing database, previously configured by an Administrator User.

Operator Users cannot create new databases. Contact an Administrator user if needed.

Connecting to a Database

To connect to an existing database, that is, to start a working session in TerraAmazon, click on the icon  or go to the menu FILE→ OPEN DATABASE.



The *Connect* operation must be selected.

Contact an Administrator User to inform the options to be chosen or typed on the fields *Database Type*, *Host* and *Port*.

Type your user name and password. For your first connection, an Administrator User must create both user name and password for you. Once you connect, it is advised to change your password and keep it safe (refer to Changing Password, on page 7)

Next, click on the **Select Database** button and choose the database you need to connect to.

The option *Load Views On Demand* determines if the contents of the views owned by the user will be loaded at the time of connection:

- If selected, then only the list of views on the Views Tree will be loaded and connection will be faster. In this case, the user must click on the each desired view in order for its themes to be loaded and enabled for visualization and work.
- If unselected, every theme from every view owned by the user will be loaded during connection. This will increase time demanded for the connection if the user has many views and each one having many themes. It is advised not to uncheck this box when working on the corporate environment.

Changing Password

Operator users may change their own password at any time by going to the menu FILE→ CHANGE PASSWORD after connecting to the database.

Inform the old password and type the new password on their respective fields. Repeat the new password on the field *Repeat*.

Click on **Save** button to apply the password change.



If the user has forgotten his password, contact an Administrator User to have a new password set up.


3

Edition Plugin

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Vector Data Edition

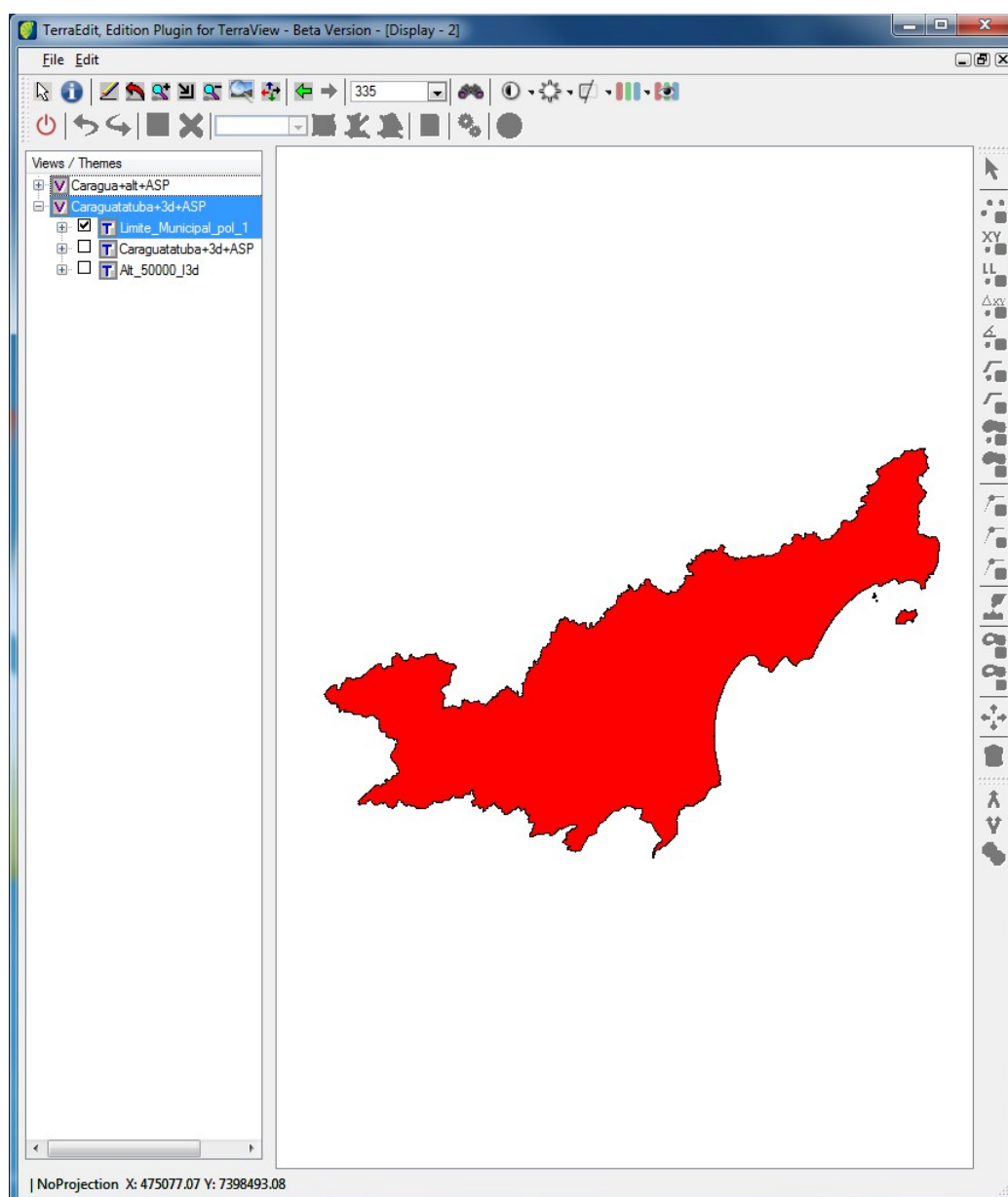
This plugin allows editing a vector layer with geographical information in geometric representations of line, polygon and/or point types.


The tools in vector edition will be enabled and will be specific to the active theme representation, for instance, point, line or polygon. When a theme has more than one representation, the user should select through the representation list of showed theme in the field  which representation would like to work with.

Besides geometry edition it is possible to edit all alphanumeric data associated to the theme.


Edition Plugin Main Window

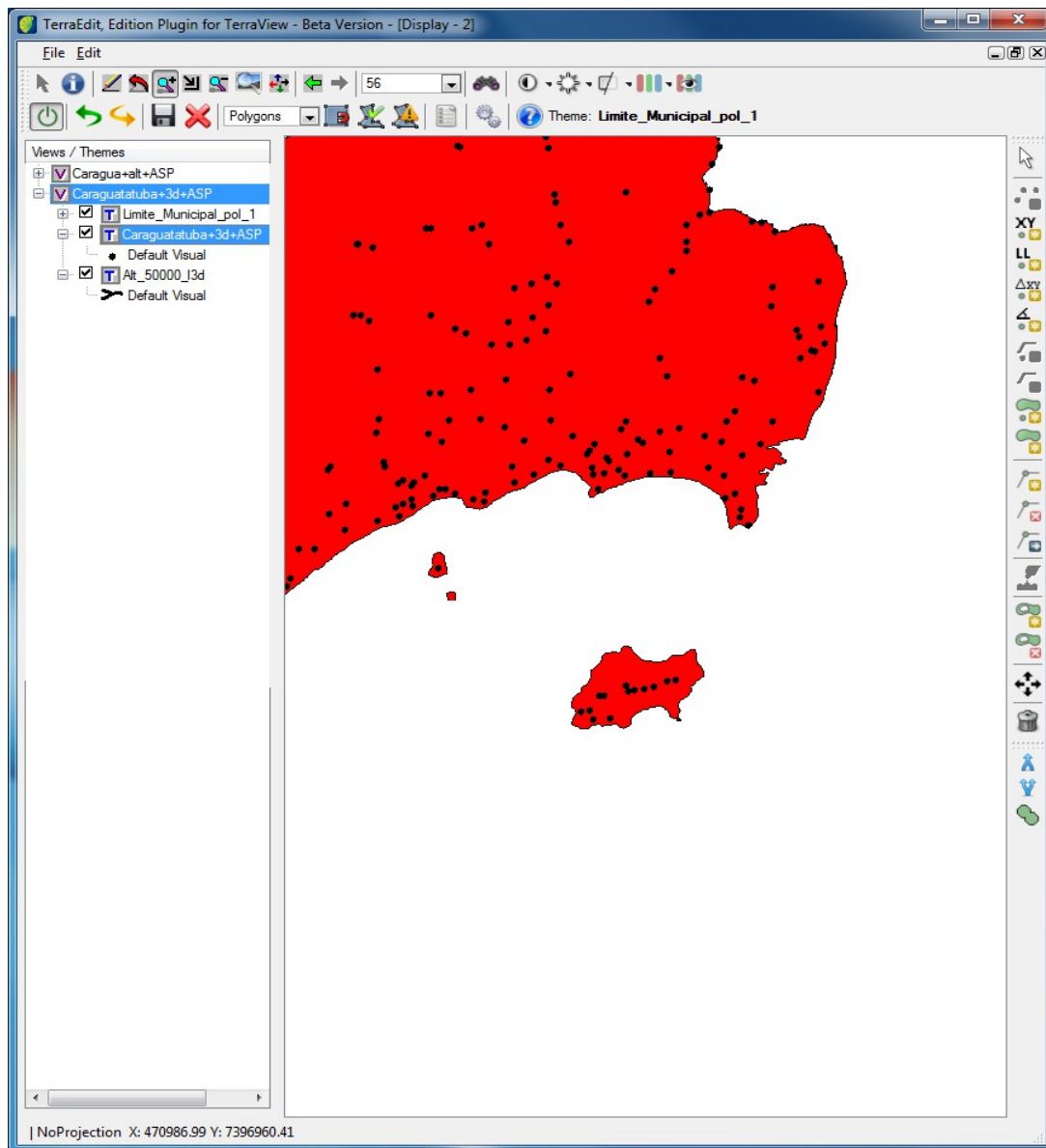
To start edition in TerraAmazon click on the icon for Edition plugin  in the main menu. Edition main window opens.



After entering in Edition plugin select the theme to be edited followed by the icon .

The basic tools of Edition mode will be enabled and colored in right menu.

To start the graphical edition process it is recommended to use the tool zoom in  to enlarge the area of interest for edition, and therefore, the geometry details are more visible.

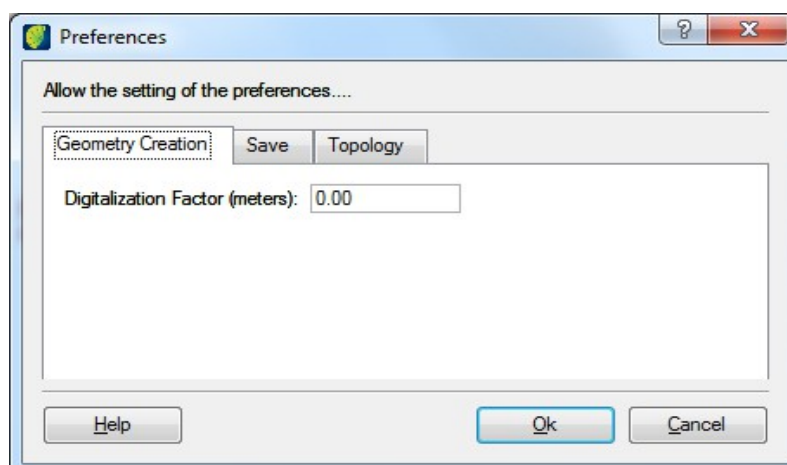


To exit the edition mode click on the icon .

Preference setup

It allows user to setup parameters that influence Edition Plugin behavior during the edition process.

Click on the icon  main menu.



Geometry Creation tab:

Enter the value for digitalization factor in meters.

Save Tab:

Auto save after creating a geometry: clicking on this box, the attribute window will be showed to every ended geometry, otherwise the system only presents the attribute window when a user selects the **Save All Edition** button.

Do not request attributes values when creating a geometry: clicking on this box, system will generate the column automatically and will not present the attribute window.


Topology tab:

Eliminate overlay of polygons: when a new geometry is completed and overlaps another already drawn, the overlapped part is immediately cut from the new geometry, eliminating the overlap.

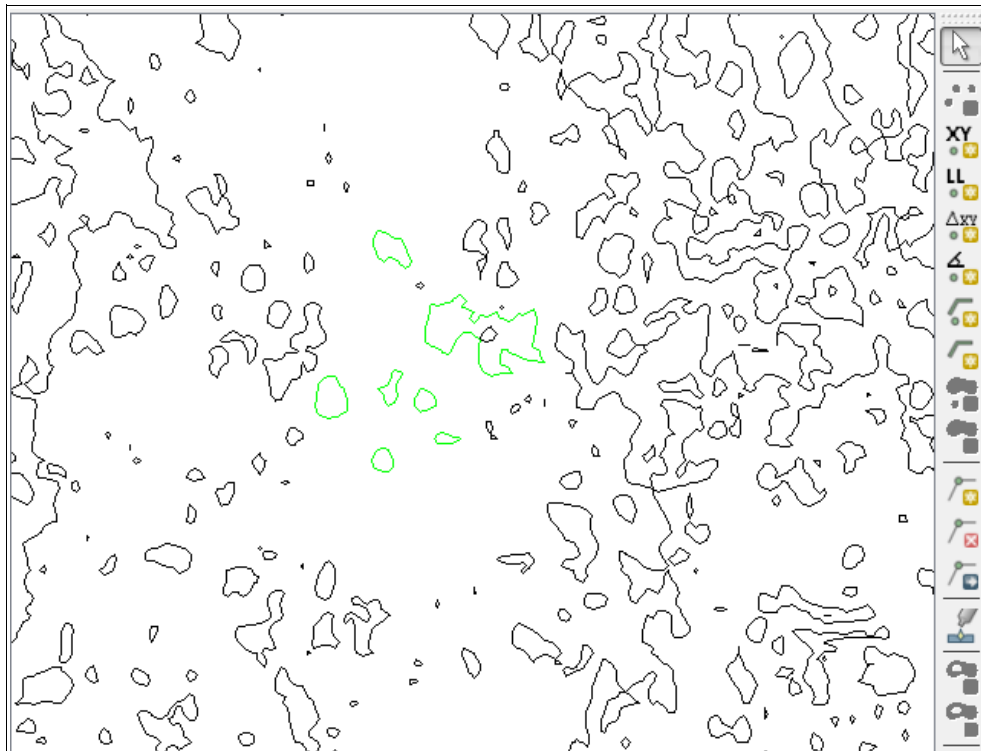
Break lines in crossing point: when drawing a new line over another drawn line the new line will be split in the intersection point.

Selecting a Geometry

This tool enables the pointer to select by clicking on a geometry in the visualization area.


Click on the icon  and move pointer in visualization area and click on the geometry.

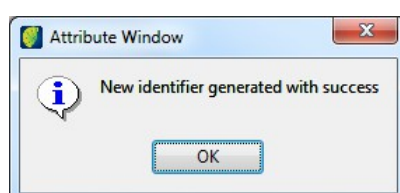
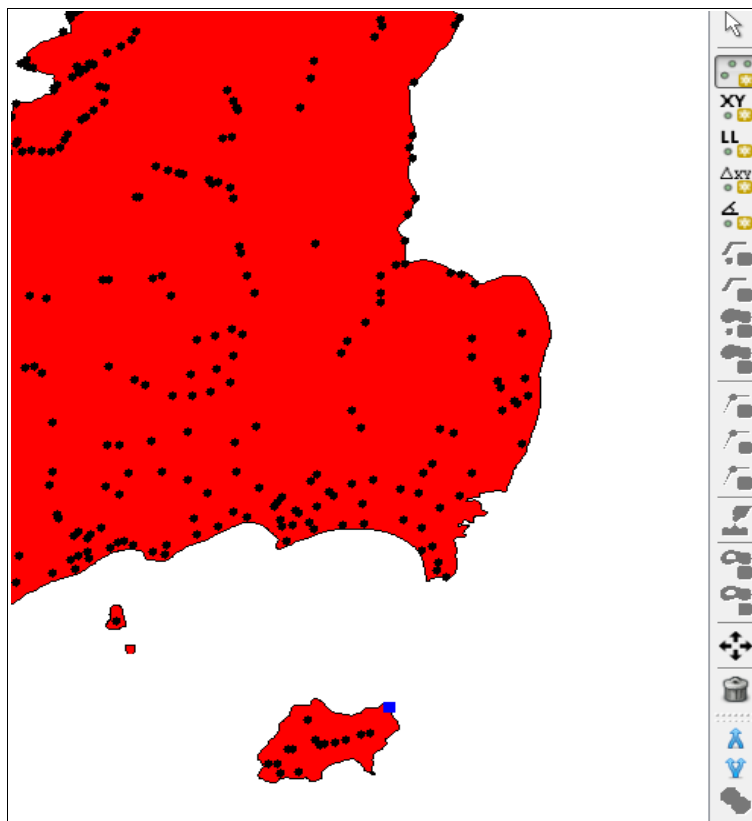
To select several geometries keep CTRL key pressed and click as many as wanted geometries.



Creating points

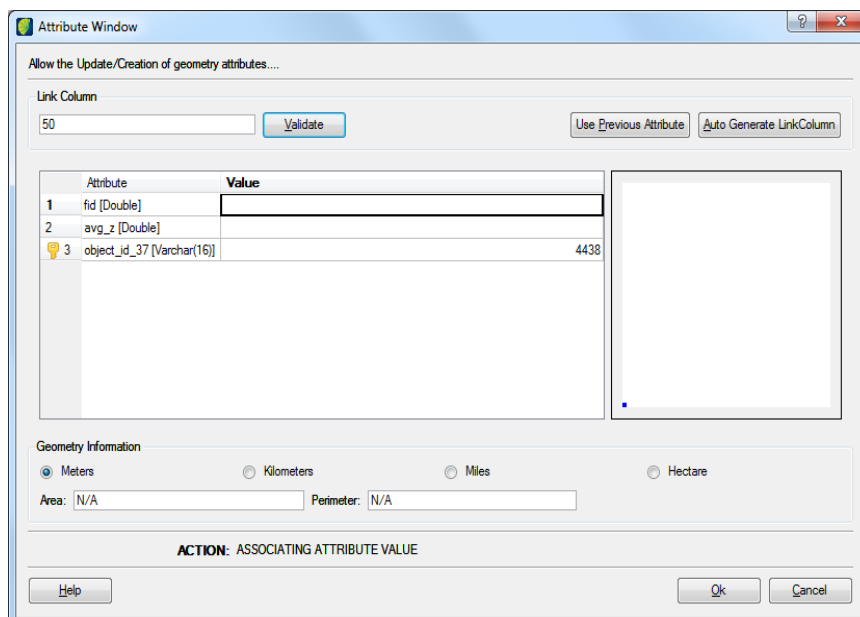
To enable this tool, the active theme should be associated to a layer with point vector representation.

Click on the icon  followed by selecting where the point will be inserted. An attribute window will be presented to the user to inform associated descriptive attributes to this geometry.



Click on **OK** button.

Define a value to the Link Column.



To enter an existent value to the link column, click on **Validate** button. It will be loaded in the attribute window the stored values correspondent to that value. If the user saves all loaded values a new geometry will also be associated to that register, i.e., there will be more than one geometry associated with a certain alphanumeric register.

If the user wants to use the previous link column value, click on the **Use Previous Value** button. This case is similar to last one but there will be also more than one geometry to the same register and the existent values will be loaded in the window, being useful when geometries of each group are drawn in sequence, becoming easy to associate with the same element.

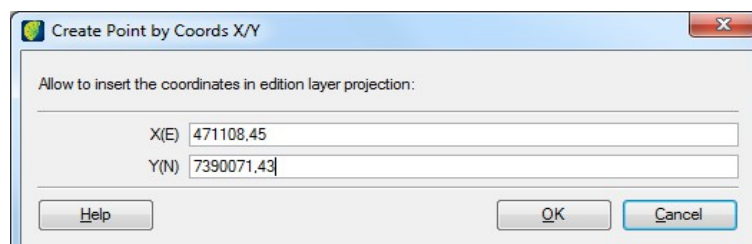
If the user wants the system generates automatically a value to the link column click on the **Generate Automatic Identification** button. This is the most common case when each geometry has a set of specific attributes.

Click on the **OK** button to save geometry and attributes.

Creating point using X and Y coordinates

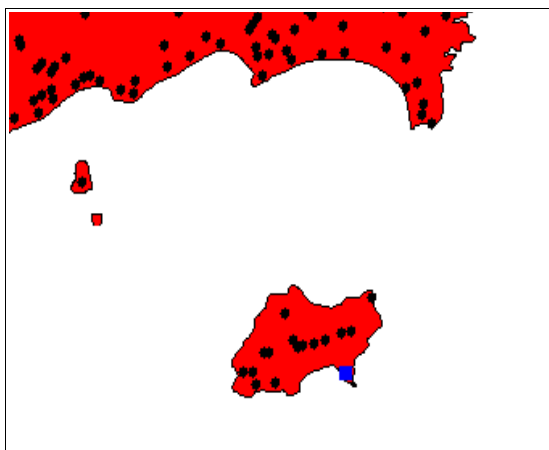
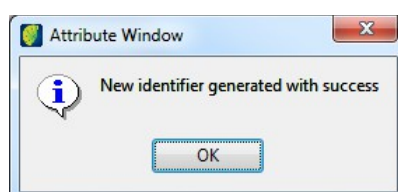
Click on the icon  on the right menu.

Enter the X and Y coordinate values.

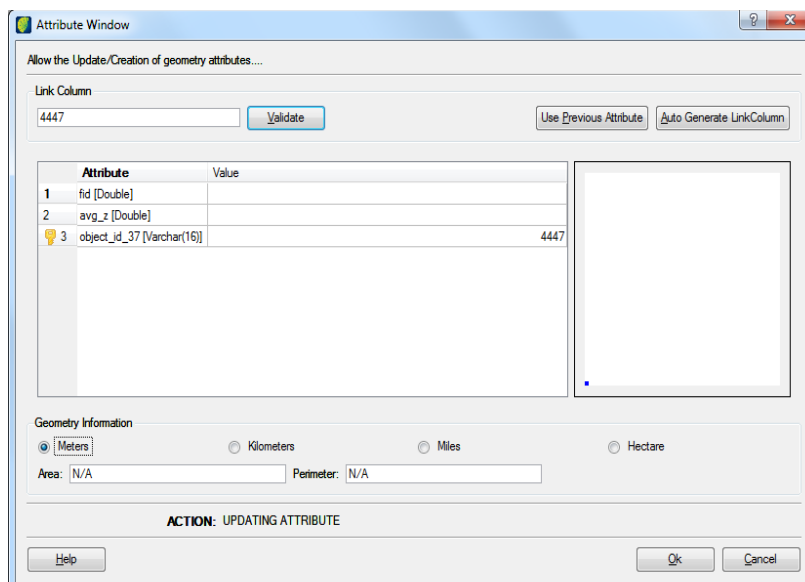


Click on the **OK** button.

Note: X and Y values will be accepted with either point or comma decimal character.



Define a value to the Link Column.



To enter an existent value to the link column, click on **Validate** button. It will be loaded in the attribute window the stored values correspondent to that value. If the user saves all loaded values a new geometry will also be associated to that register, i.e., there will be more than one geometry associated with a certain alphanumeric register.

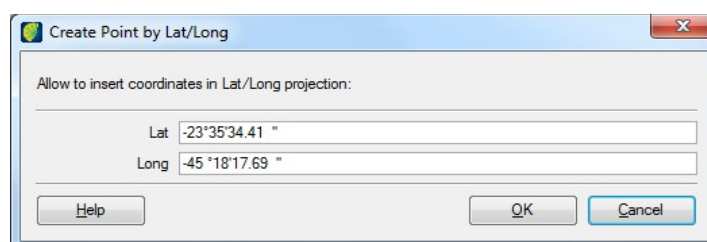
If the user wants to use the previous link column value, click on the **Use Previous Value** button. This case is similar to last one but there will be also more than one geometry to the same register and the existent values will be loaded in the window, being useful when geometries of each group are drawn in sequence, becoming easy to associate with the same element.

If the user wants, the system generates automatically a value to the link column click on the **Generate Automatic Identification** button. This is the most common case when each geometry has a set of specific attributes.

Click on the **OK** button to save geometry and attributes.

Creating point using latitude and longitude

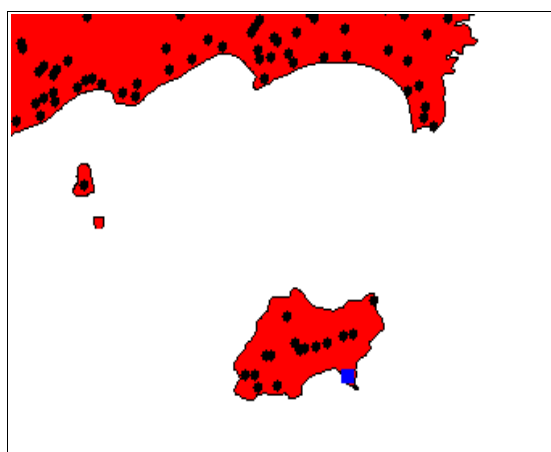
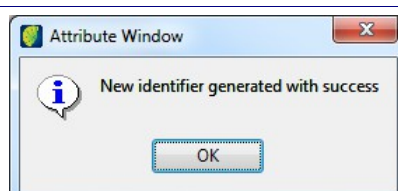
Click on the icon  on the right menu.



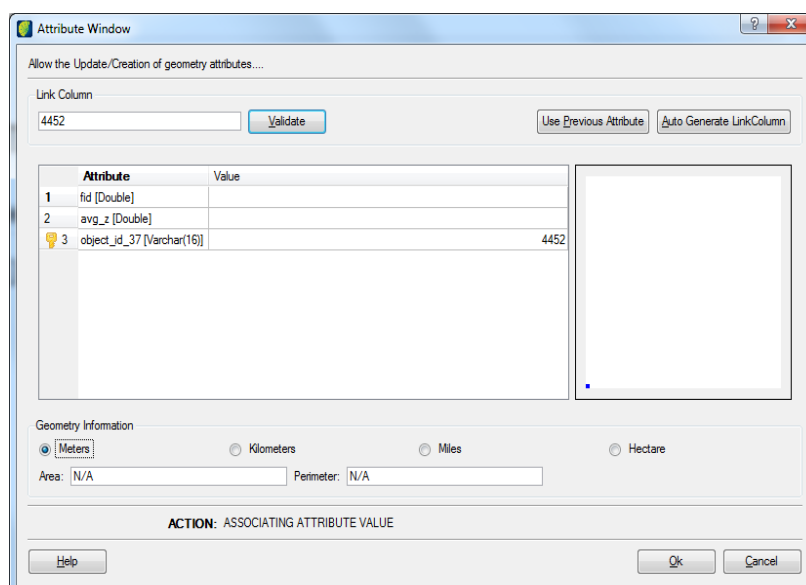
Enter the wanted latitude and longitude values.

Click on the **OK** button.

Note: lat/long window has a mask separating degree, minute and second fields and dot as the decimal character.



Define a value to the Link Column.



To enter an existent value to the link column, click on **Validate** button. It will be loaded in the attribute window the stored values correspondent to that value. If the user saves all loaded values a new geometry will also be associated to that register, i.e., there will be more than one geometry associated with a certain alphanumeric register.

If the user wants to use the previous link column value, click on the **Use Previous Value** button. This case is similar to last one but there will be also more than one geometry to the same register and the existent values will be loaded in the window, being useful when geometries of each group are drawn in sequence, becoming easy to associate with the same element.

If the user wants, the system generates automatically a value to the link column click on the **Generate Automatic Identification** button. This is the most common case when each geometry has a set of specific attributes.

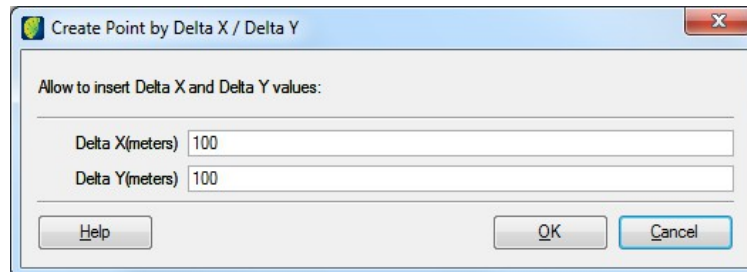
Click on the **OK** button to save geometry and attributes.

Creating point from the Delta X/Delta Y

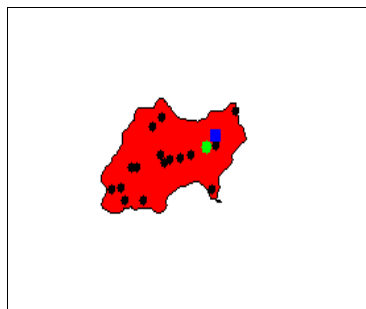
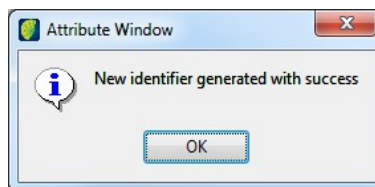
Select the point to be used as a reference.

Click on the icon  in menu.

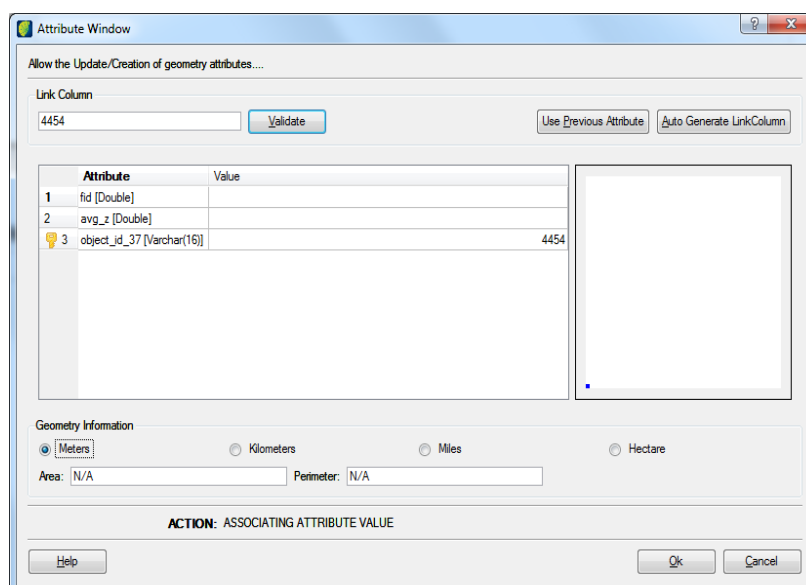
Enter the X and y delta values in meters where the new point will be located.



Click on the **OK** button.



Define a value to the Link Column.



To enter an existent value to the link column, click on **Validate** button. It will be loaded in the attribute window the stored values correspondent to that value. If the user saves all loaded values a new geometry will also be associated to that register, i.e., there will be more than one geometry associated with a certain alphanumeric register.


If the user wants to use the previous link column value, click on the **Use Previous Value** button. This case is similar to last one but there will be also more than one geometry to the same register and the existent values will be loaded in the window, being useful when geometries of each group are drawn in sequence, becoming easy to associate with the same element.

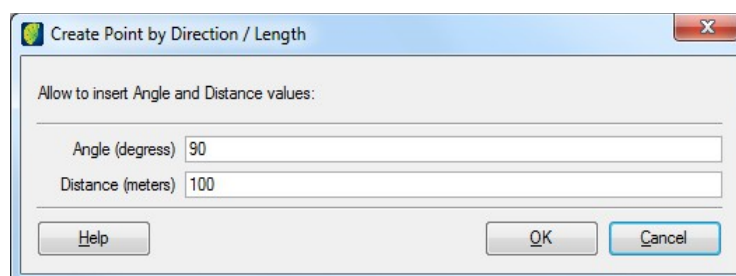
If the user wants, the system generates automatically a value to the link column click on the **Generate Automatic Identification** button. This is the most common case when each geometry has a set of specific attributes.

Click on the **OK** button to save geometry and attributes.

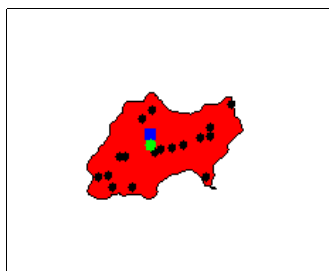
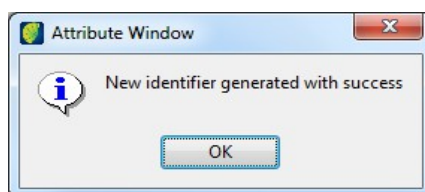
Creating Points from Direction/Distance

Select the point to be used as a reference.

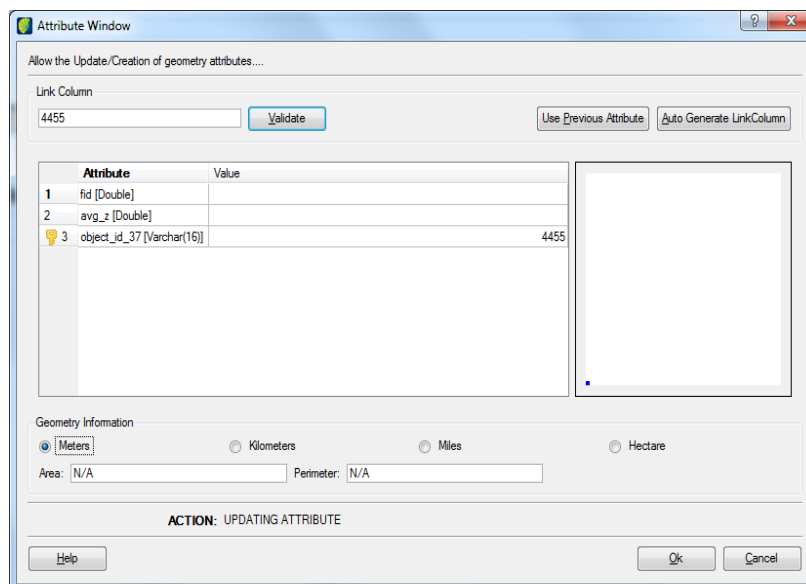
Click on the icon  in menu. Enter angle value in degrees and distance value in meters.



Click on the **OK** button.



Define a value to the Link Column.



To enter an existent value to the link column, click on **Validate** button. It will be loaded in the attribute window the stored values correspondent to that value. If the user saves all loaded values a new geometry will also be associated to that register, i.e., there will be more than one geometry associated with a certain alphanumeric register.



If the user wants to use the previous link column value, click on the **Use Previous Value** button. This case is similar to last one but there will be also more than one geometry to the same register and the existent values will be loaded in the window, being useful when geometries of each group are drawn in sequence, becoming easy to associate with the same element.

If the user wants, the system generates automatically a value to the link column click on the Generate Automatic Identification button. This is the most common case when each geometry has a set of specific attributes.

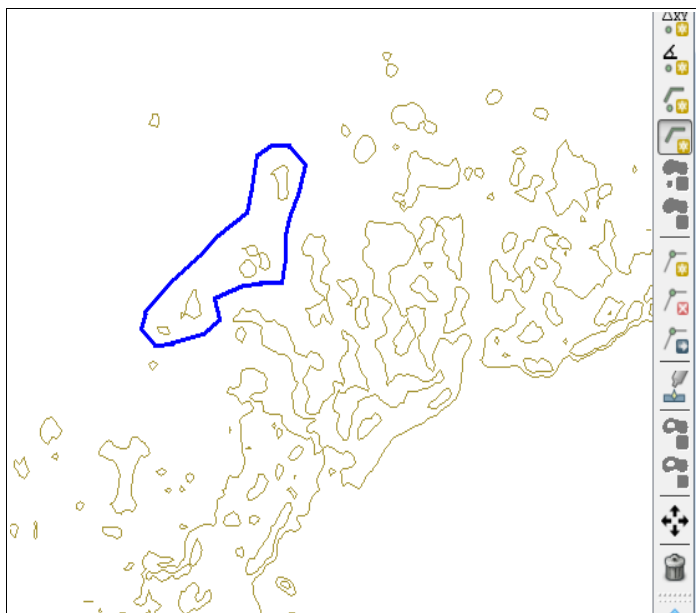
Click on the **OK** button to save geometry and attributes.

Creating Lines

To enable these tools, an active theme should be associated to a layer with line vector representation.

To insert lines click on the icon  or the icon  in menu. The first tool creates line by clicking the initial and final points in the visualization area. The second tool will create a continuous line by pressing the mouse left button and dragging the pointer in the visualization area.

When finished click with right button.



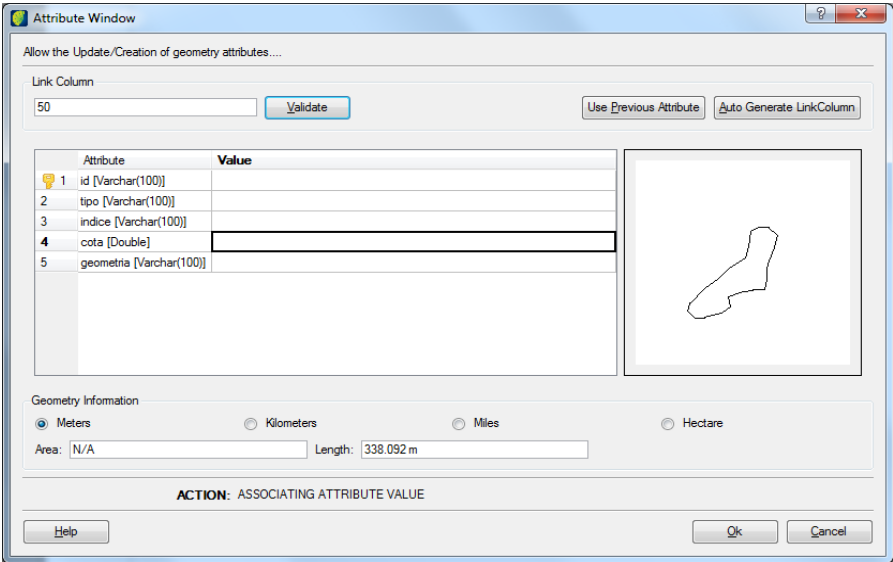
Define a value to the column in *Link Column* field.

To enter an existent value to the link column, click on **Validate** button. It will be loaded in the attribute window the stored values correspondent to that value. If the user saves all loaded values a new geometry will also be associated to that register, i.e., there will be more than one geometry associated with a certain alphanumeric register.

If the user wants to use the previous link column value, click on the **Use Previous Value** button. This case is similar to last one but there will be also more than one geometry to the same register and the existent values will be loaded in the window, being useful when geometries of each group are drawn in sequence, becoming easy to associate with the same element.

If the user wants, the system generates automatically a value to the link column click on the **Generate Automatic Identification** button. This is the most common case when each geometry has a set of specific attributes.



Click on the **OK** button to save geometry and attributes.



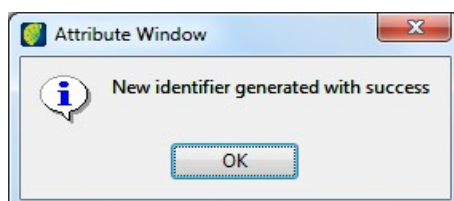
Use the **Save** button to store informed attributes and the graphic edition. The image will be presented in the visualization area with the edition.

Creating Polygons

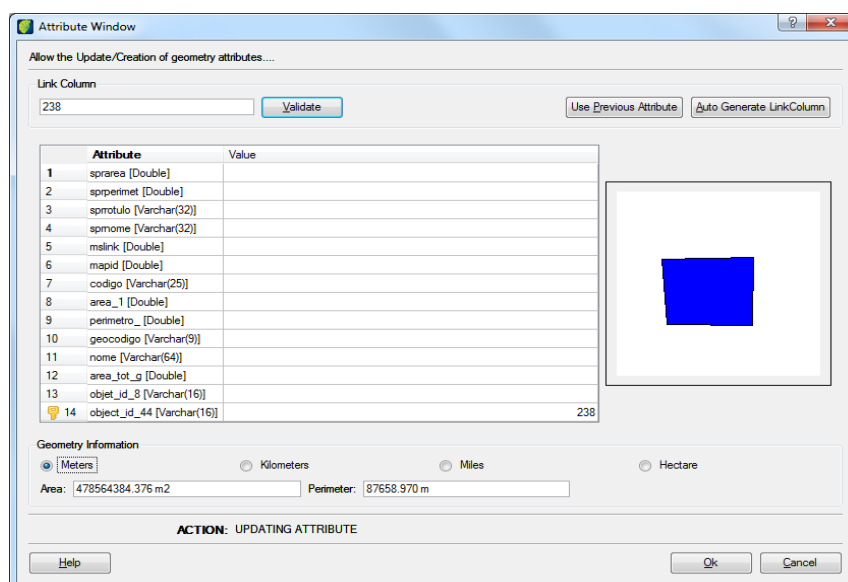
To enable these tools an active theme should be associated to a layer with polygon vector representation.

To insert lines click on the icon  or the icon  in menu. The first tool will create a polygon line by clicking the initial and final points of each polygon side. The second tool will create polygon continuously by pressing mouse left button and dragging pointer on visualization area.

When finished click with right button and polygon will be automatically closed.



Attribute window opens.



Define a value to the column in *Link Column* field.

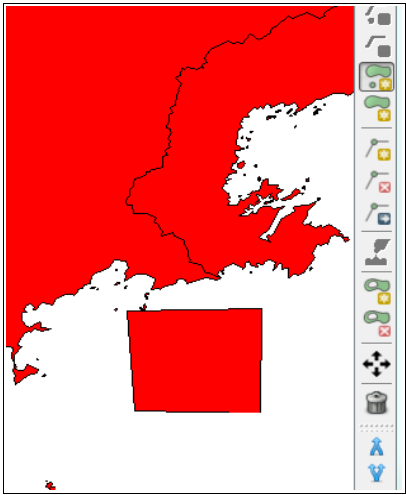
To enter an existent value to the link column, click on **Validate** button. It will be loaded in the attribute window the stored values correspondent to that value. If the user saves all loaded values a new geometry will also be associated to that register, i.e., there will be more than one geometry associated with a certain alphanumeric register.

If the user wants to use the previous link column value, click on the **Use Previous Value** button. This case is similar to last one but there will be also more than one geometry to the same register and the existent values will be loaded in the window, being useful when geometries of each group are drawn in sequence, becoming easy to associate with the same element.

If the user wants, the system generates automatically a value to the link column click on the **Generate Automatic Identification** button. This is the most common case when each geometry has a set of specific attributes.


Click on the **OK** button to save geometry and attributes.


Use the **Save** button to store informed attributes and the graphic edition. The image will be presented in the visualization area.

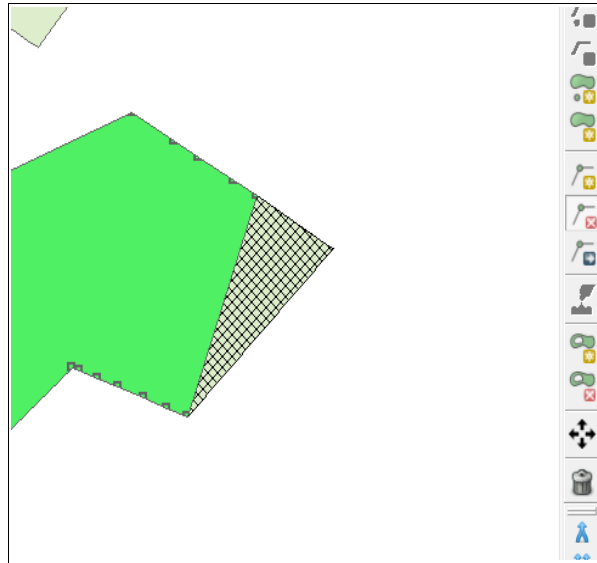



Vertexes

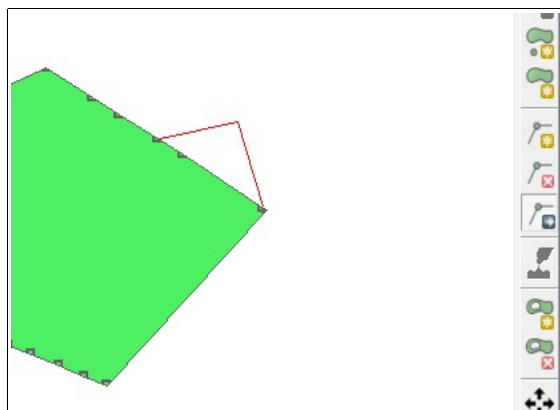
First, select a geometry which vertexes will be inserted, moved or removed. When activating the tool it will be showed all vertexes belonging to selected geometry making possible to choose the vertex that will be affected by the operation.

Click on the icon  to insert vertexes in lines or polygons and click where the vertex is to be inserted.

Click on the icon  to delete vertexes in lines or polygons and click on the vertex to be removed. As a result, the vertexes sequence is updated, i.e., the previous vertex and next vertex from the removed one become consecutive and therefore joined by a line.



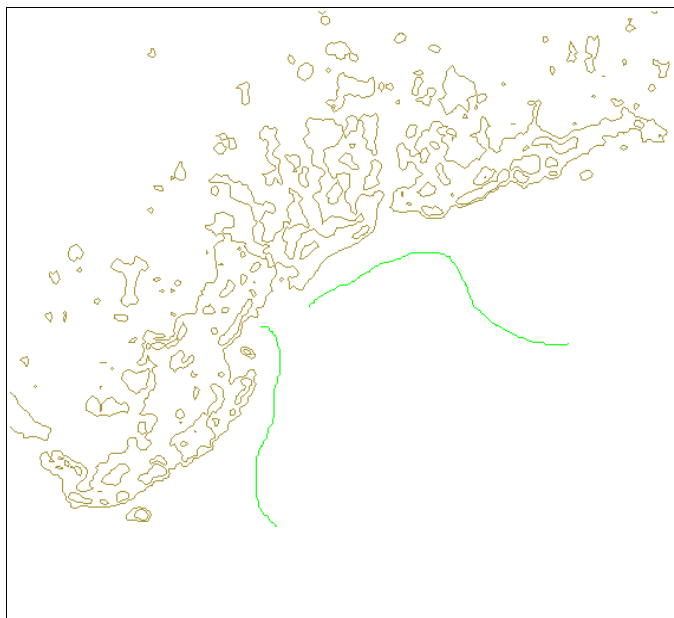
Click on the icon  to move any vertex to other place. This procedure updates dynamically the selected geometry containing the vertex. Observe the vertex sequence is not changed, previous and next vertexes to the moved one continue in same position.



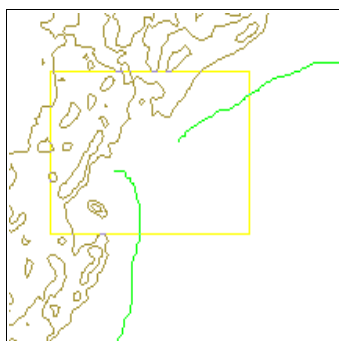
Joining Lines

This functionality acts on two lines making both to have a common end but keeping each one identity that continuing as independent lines.

Initially select two lines. Click on the first line, press the **CTRL** button in keyboard and click on the second line.



Click on the icon  in the right menu.



Drag the mouse between the selected lines so both ends are inside the square.

To conclude click on the icon .



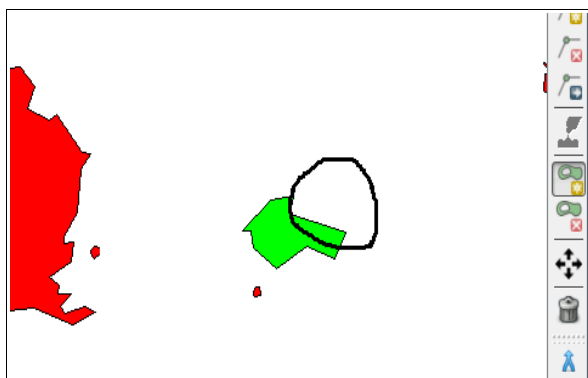
Aggregating Areas

This tool is used to increase the area of a polygon adding another polygon area that overlaps or at least touch the original polygon. The result will be a new polygon, the union of both polygons, with attributes of original polygon.

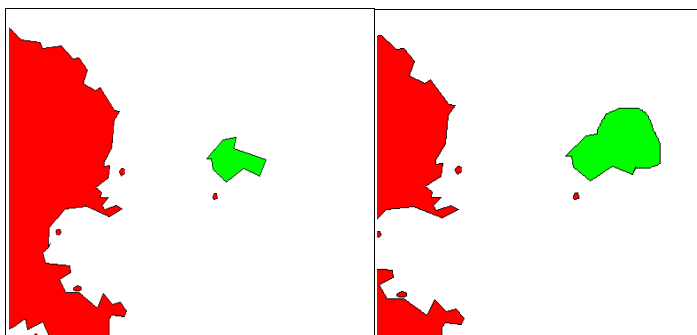
Select a polygon.

Click on the icon  in right menu.

Draw the area to be aggregated passing through the selected polygon.



To end click on the mouse right button.



To save click on the icon .

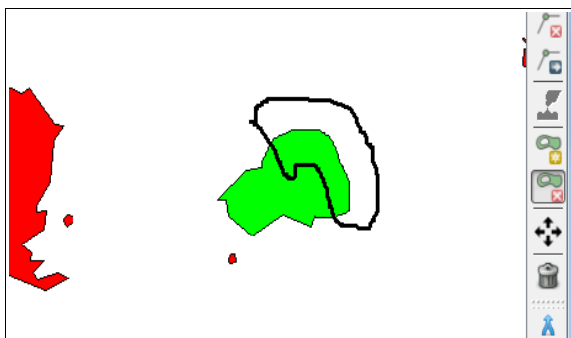
Subtracting an Area

This tool is used to decrease the polygon area removing the correspondent overlapped area to another polygon to be drawn. The result will be a polygon correspondent to subtraction of two polygons with attributes of original polygon.

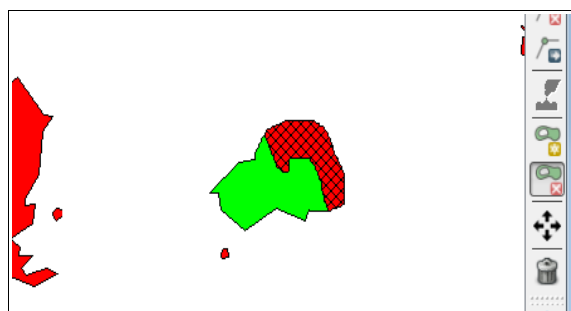
Select a polygon.

Click on the icon  in menu.

Draw the area to be subtracted passing over the selected polygon.




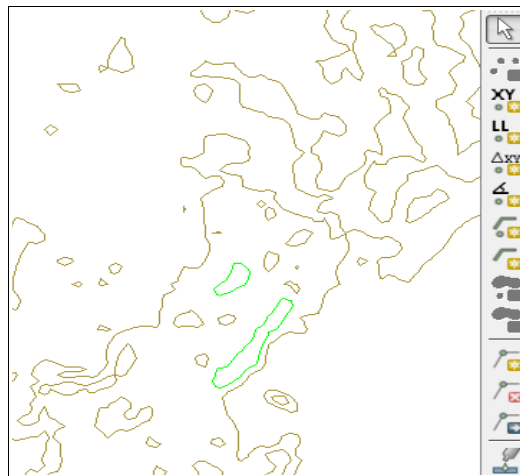
To end click on the mouse right button.




To save click on the icon .

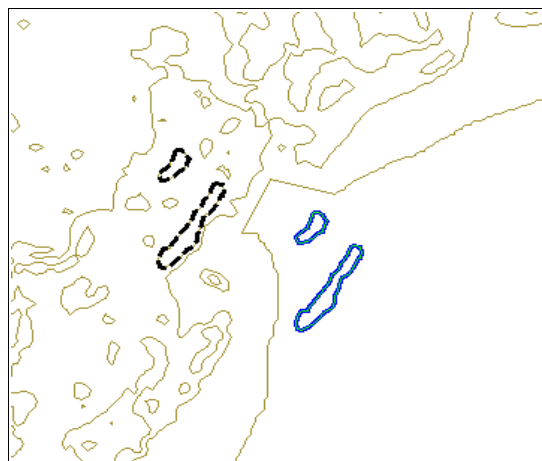
Moving a Geometry

Select one or more geometries using the tool .




Click on the tool .

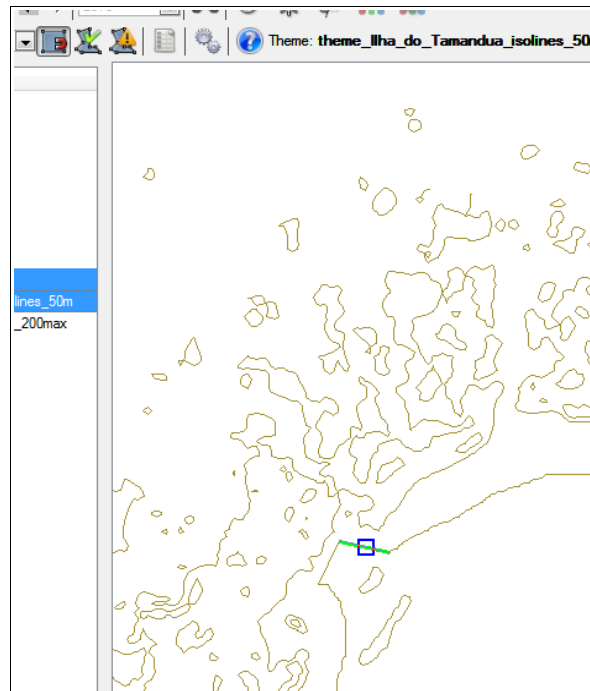
Drag the geometry to the new place. If more than one geometry is selected just drag one of them and remaining will suffer the same dragging.




To save click on the icon .


Snap

Snap () is a tool used to facilitate the edition process helping to find specific geometry.

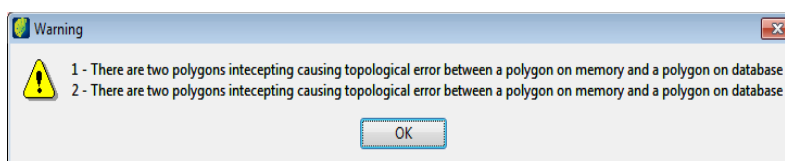


Verifying the Topology


This tool () enables or disables topology verification and can be activated at any time during a vector edition. Its purpose is to warn if exists some topology error such as overlapping among some not saved geometries in the database with other geometries, if they are saved, not saved or already existent in editing layer. In case some verification error occurs, the user can continue editing to correct the error or even disable the verification. The verification can happen in two situations:

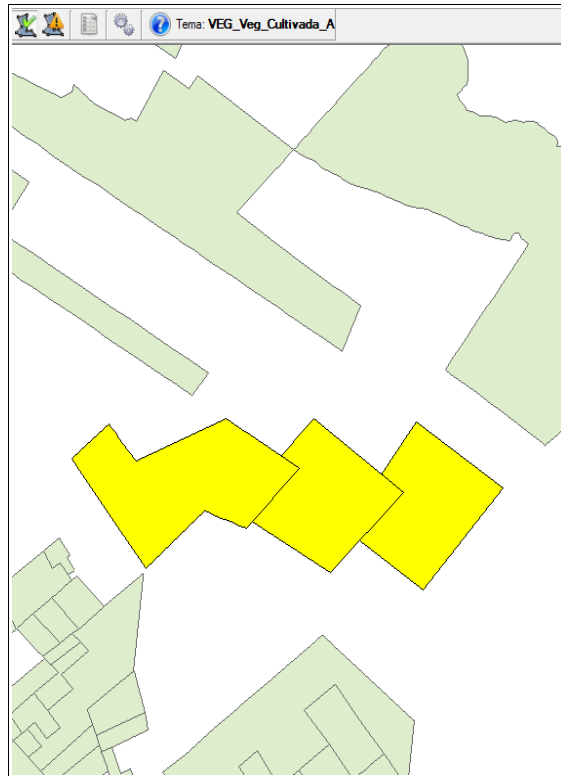
- a) When ending a geometry edition such as polygon closure;
- b) To save all edition (button ): in this case, the occurrence of any topology error will block the saving while the situation persists.

When the verification finds a topology error, a message will be showed:




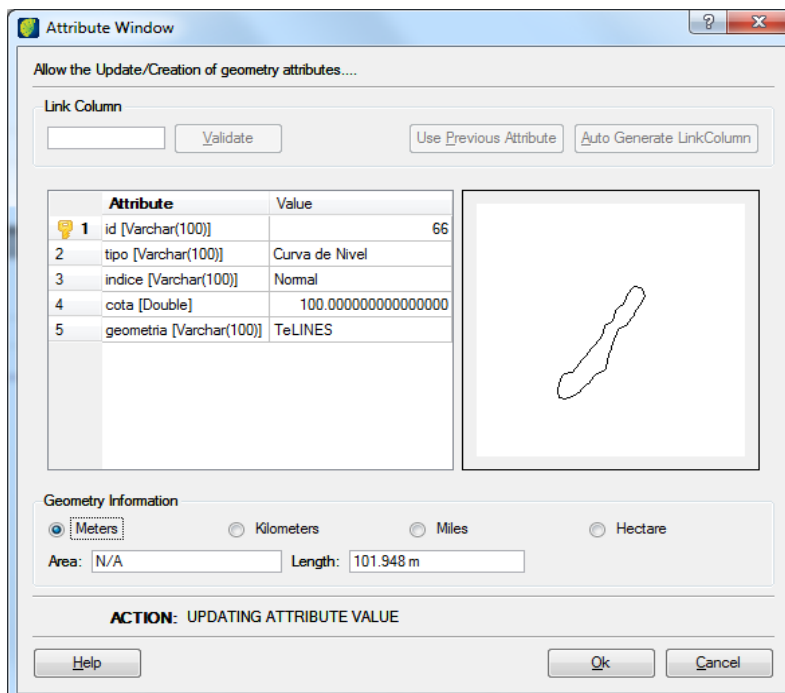
Showing Topology Errors

This tool () verifies the existence of topology errors signing in yellow the new objects that overlaps new objects or already saved objects in the database. Existent objects in the database are not checked.



Showing Attributes

When this tool () is activated in tool bar it will be showed the attribute window with data of selected object allowing its change. It also shows characteristic of correspondent geometry in geometry information area.



Attribute	Value
1 id [Varchar(100)]	66
2 tipo [Varchar(100)]	Curva de Nivel
3 indice [Varchar(100)]	Normal
4 cota [Double]	100.00000000000000
5 geometria [Varchar(100)]	TeLINES


Geometry Information

☒ Meters ☐ Kilometers ☐ Miles ☐ Hectare

Area: N/A Length: 101.948 m

ACTION: UPDATING ATTRIBUTE VALUE

All attributes can be changed except those marked with a key icon that is the link column. Observe that the components inside the link column area are not enabled once the link column value can not be changed anymore after object creation. When all changes are concluded click on the **OK** button.

Note: it is possible one selected object does not belong to attribute window when clicking on the correspondent button in tool bar. This may occur when its geometry just have been drawn but when the attribute window showed up automatically the user clicked in **Cancel** button. Observe this occurs only when the edition is happening only in memory, i.e., button  has not been clicked on.

This window is also showed when saving a geometry just after being created for the first time.

When attribute window is in insertion mode the attribute values are initially blank so they can be informed by the user. Besides the area components are enabled as the used attribute value as column must be informed.


There are three ways to define the link column value:

1) Filling in the link column and two situations may occur:

- a) If there is not any object containing the supplied value in its link column, when clicking in **Validate** button the value is transferred to the table of Attributes and Values, in attribute row assigned as link column.
- b) If there is already an object with a supplied value in its column, when clicking in **Validate** button the stored values in that object will be loaded in attribute window. If the user save the loaded values or even change theses values the new geometry just drawn will be also associated to that object, i.e., there will be more than one geometry associated with an object. This is needed, for instance, when an object with polygon representation has “islands”.

2) If the user wants to use link column value used just before, click on the **Use Last Attribute** button. This case is similar to above as there will be also more than one geometry for the same object and the existent values will be loaded in the window being useful when the geometries of each object are drawn in sequence becoming easy the association with the same element.

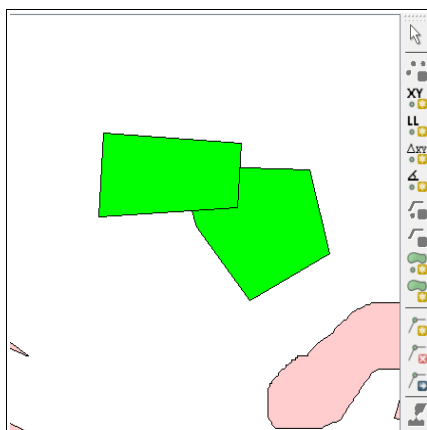
3) If the user wants, the system automatically generates a value to the link column click on the **Generate Identification Automatically** button. This is the most common case when each geometry has a set of specific attributes.

In any of the cases above do not forget to click on the **OK** button. If **Cancel** button is clicked the geometry that has been drawn will stay in the memory until its attribute values including the link column are informed in attribute window and save by clicking in **OK** button, or when the icon  is clicked to cancel the edition. In the last case all geometries in memory will be deleted.

Joining objects

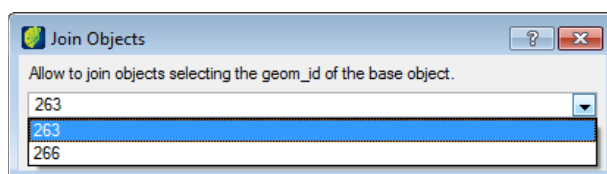
This functionality allows attribute the same identification (geom_id) to different objects. It can join n objects of same type (polygon, line and point). The user informs the identification to be attributed to the selected objects and the other identification (geom_id) will be discarded. A use example of this tool is in case of islands that have the same identification (countries or cities).

First select the objects of interest using the CTRL of keyboard. It is mandatory at least two objects to use this tool.



Click on the icon  in menu.

It will be showed a window where the user should select the identification that will be attributed to all selected objects. Click on the **OK** button.



To conclude click on the icon .

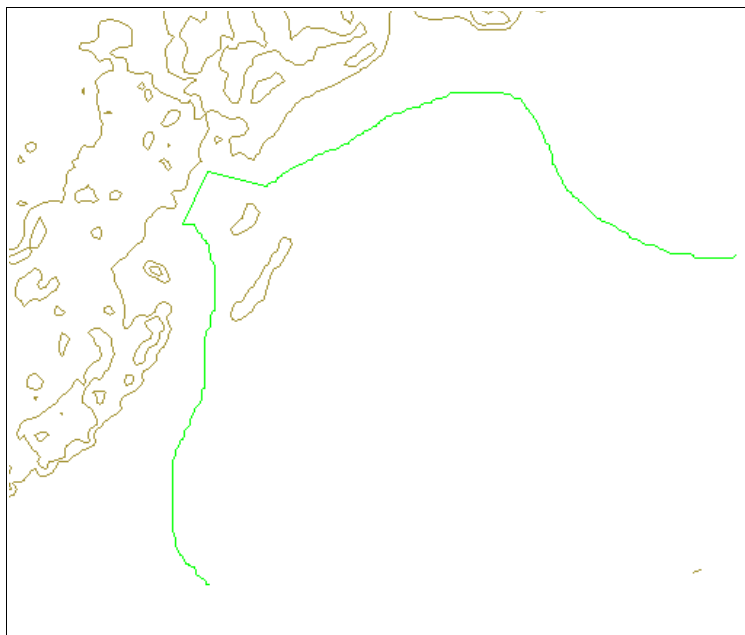
As operation result, it will obtain several objects/geometries with the same identification.

Note: when selecting a geometry (edition mode off) the remaining geometries with the same identification are selected as well.

Splitting objects

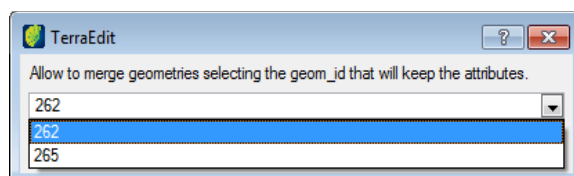
This functionality allows attributing new identification (geom_id) and different attributes to objects that originally have the same identification. It can be split in n objects of same type (polygon, line and point). The user informs the object to keep the attributes and creates attributes to remaining objects.

Initially, select the objects of interest using key CTRL in keyboard and clicking on objects. It is mandatory to select at least two objects to use this tool.




Click on the icon  to activate the tool.

It will be showed a window where user should select the object identification (geom_id) to keep the attributes.



Click on **OK** button.

To conclude click on the button .

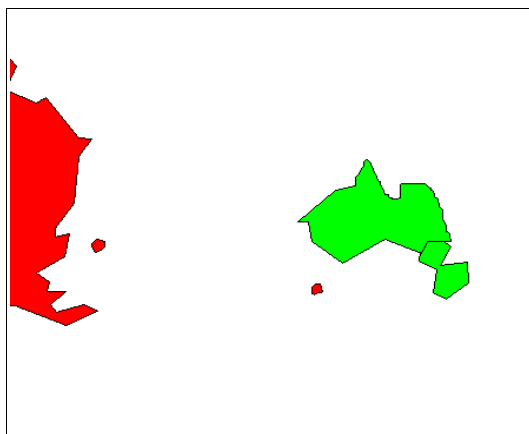
A new identification (geom_id) will be created to remaining objects and will be showed in Attribute window where the user can fill in geometry attributes followed by clicking on **OK** button.

As a result of this operation, each geometry will have unique identification and different attributes.

Merging Geometries

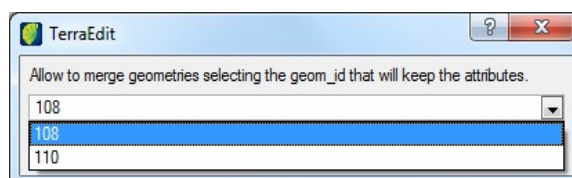
This functionality allows merge geometries and selects which identification the new object will keep. It can be merged n objects of the same type provided they touch each other (polygon and line). The user selects the identification to be attributed to the new object and remaining identifications (geom_di) will be discarded. A use example to this tool is to join neighbor lots that in the end will have the same identification.

First, select the geometries of interest, using the CTRL key in keyboard and click on the objects. It is mandatory to select at least two geometries to use this tool.

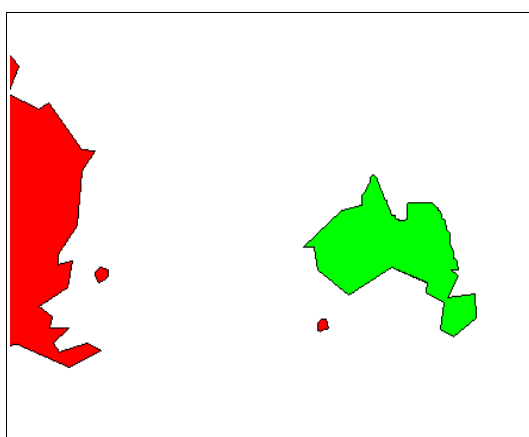



Click on the icon  to activate the tool.

It will be showed a window where user should select the object identification to be attributed to all selected geometries.



Click on the **OK** button.





To conclude click on the button .


Additional Information

When editing, observe that edited objects, but not yet saved, are highlighted in blue color.

Dotted style indicates objects that have been removed or moved to other place, staying like this while changes are not saved in the database. Once it is saved, that region will be updated with white color indicating object does not exist.

With point capture using option () Turn Snap On there is not a risk of stop working when visualization scale is big (more details are visible) because snap point limit becomes more difficult to be achieved. If snap point limit is reached, a part of geometry points inside of visualization area will not be captured during edition, impairing a good use of the feature. This may occur when visualization scale is low (fewer details are visible) and exist vector layers with several geometries, therefore with many points in existent points in the visualization area.

If during edition it is perceived some previous mistake, it can be used the tool Undo () to undo gradually each one of executed edition actions not yet saved.

If during an edition user decides to delete everything edited but not saved use the option to cancel ()

4 Tools

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TerraAmazon Edition Plugin has two tool bars in the main interface:

Visualization Tools

Tools to display and manipulate the both vector and raster data in the drawing area. All visualization tools are effective on the drawing area only.

To use these tools, you must have a theme pointing to the data (layer) you wish to visualize or manipulate.

To visualize the data for the first time after connecting to the database, select the themes to be displayed by checking their check boxes on the Views and Themes tree.

Click on the tool  to visualize it in the drawing area.

The time required by the system to display the data on the drawing area depends on the amount of data selected to be displayed and on how complex such data is. That is so because a theme can have restrictions in order to point only to part of the data, which as a consequence makes the display process concern only the data effectively pointed by the selected themes, instead of on the total amount of data in their respective layers. Also, the time will depend on the area selected to be visualized, that is, selecting the entire theme (using the *Fit Theme* option, for example) will result in a larger amount of data to be drawn than it would be if a small area would be chosen. For the same reason, visualizing data in a scale of 1:25.000 will be much faster than doing it on 1:100.000, since more data will be visualized.



Information Cursor: queries the geometry's attributes. Select the tool and on the desired geometry. It has an effect on the geometry of the theme, which is active in the Views and Themes tree.

When clicking in the intersection of two or more overlapped geometries the table will show all geometries and each one can be selected individually.



Pan cursor. Click and hold on the drawing area, move to the desired direction and release the click.



Draw tool. Triggers the data display in the visualization area. The data visualized are determined by the themes, which are selected on the Views and Themes tree. That means that TerraAmazon will display only the themes whose visualization scale range is within the scale defined to be drawn. Drawing data for the first time will entirely fit all the selected themes in the drawing area. However, the following visualizations will resume the previous one, even after TerraAmazon is closed.



Zoom in. Select the tool and delimit the area to be visualized by holding a click on the visualization area and drawing a rectangle involving the desired area.



Select an area to zoom.



Zoom out. Just click anywhere in the drawing area. Multiplies the visualization scale by two.



Fits the selected theme in the drawing area.

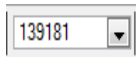


Previous and Next visualization.



Recompose. Visualization is recomposed to a box that entirely contains the selected themes. Only the themes whose visualization scale range is within the scale targeted by

the reset tool will be displayed. In case none of the selected themes are allowed to be drawn in the targeted scale, then only the empty box will be drawn.



Indicate scale of showed picture.



Find in visualization area the position indicated coordinate.



Adjust an image contrast showed in the visualization window.



Adjust the image bright showed in the visualization window.



Adjust image transparency in the visualization window.



Adjust the color of RGB channels.



Read pixel value indicated by the pointer.

Edition Plugin Tools

Tools available in Edition Plugin to process digital images and prepare for human visualization and analysis are listed below:



Select Edition Object: enables pointer to select geometries in visualization area. The user could select many geometries by clicking on (CTRL key pressed).



Create point: enables the pointer to create a point.



Create points by coordinates X/Y: the user creates point entering X and Y coordinates.



Create points by lat/long: the user creates points entering latitude and longitude coordinates.



Create point by Delta X/Delta Y: the user creates point entering X and Y coordinates delta from the selected point, in layer projection scale.



Create point by direction/length: user creates points entering value for direction and length.



Create line: creates a point-to-point line. To end the line the user should click on the mouse right button



Create continuous line: creates a continuous line. To end the line the user should click on the mouse right button



Create polygon: creates a point- to-point polygon. To end the polygon the user should click on the mouse right button, and the last point will be automatically linked to the initial point.



Create continuous polygon: creates a polygon in continuous format. To end the polygon the user should click on the mouse right button, and the last point will be automatically linked to the initial point.



Insert vertex: inserts vertex in a selected line or polygon.



Remove vertex: removes vertex in selected line or polygon.



Move vertex: moves vertex in selected geometries.



Join lines: join selected lines making them have a common point. Each one will continue existing.



Aggregate area: aggregates area to existent polygon. To use this tool click on the icon Select Edition Object and select one polygon followed by icon Aggregate Tool, drawing the area to be aggregated through the selected polygon, to end click on the mouse right button



Subcontract area: removes area from existent polygon. To use this tool click on the icon Select Edition Object, select a polygon followed by click on the tool Subtract Area drawing an area to be removed though the selected polygon, to end click on the mouse right button



Move selected geometries: move one or more selected geometries.



Remove selected geometries: remove one or more selected geometries.



Join objects: allow to attribute the same identification to different objects.



Split objects: allow attributing new identifications and different attributes to objects originally had the same identification.



Merge geometries: by clicking on this icon user can merge selected geometries.



Undo: undo the last edition action



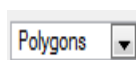
Redo: redo the edition action previously undone.



Save all edition: saves created and/or edited geometries in the database.



Cancel edition: cancel all edition actions that have not been saved in the database.



Geometry: represents geometry type that will be edited. When changed by user it will enable only tools that can be used to the type of selected geometry.



Turn on snap: when on (green color) it will be showed closest point to the mouse pointer position, which will be captured and used by tool if mouse button is pressed.



Check topology before save: force a topology check and avoiding save in error cases.



Show topological errors: verify existence of topological errors, signaling in yellow new objects that overlap new objects or already save objects in the database



Show attribute: show the attribute window with selected object data and allow changes. Double click on the mouse in value column of attribute interface and the domain values can be edited.



Preferences: allow the user to configure some edition preferences. (Geometry creation, save and topology).



Help: show the help window.

Abbreviations and Acronyms

CCD	Charge Coupled Devide
CRA	Centro Regional para Amazônica (Amazon Regional Center)
DEGRAD	Sistema de Detecção de Áreas de Degradação Florestal na Amazônia Legal Brasileira
DBMS	Database Management System
DEM	Digital Elevation Model
DESM	Dynamic Earth System Model
DETER	Sistema de Detecção do Desflorestamento da Amazônica Legal Brasileira em Tempo “Quase” Real
DETEX	Sistema de Detecção de Exploração Seletiva de Madeira na Amazônia Legal Brasileira
DIP	Digital Image Processing
DTM	Digital Terrain Model
EO	Earth Observation
ETM+	Enhanced Thematic Mapper Plus
GCP	Ground Control Point
GIS	Geographic Information System
HLS	Hue, Saturation, Lightness
HRC	High Resolution Camera
IHS	Intensity, Hue, Saturation
LUT	Look Up Table
OGC	Open Geospatial Consortium
PALSAR	Phased Array Type L-Band Synthetic Aperture Radar
PRISM	Panchromatic Remote-Sensing Instrument for Stereo Mapping
PRODES	Projeto de Monitoramento do Desmatamento na Amazônica Legal por Satélite
SWIR	Shortwave Infrared
TERRACCLASS	Projeto de Mapeamento de Uso da Terra na Amazônia Legal Brasileira
TIN	Triangle Irregular Network
TIR	Thermal Infrared
TM	Thematic Mapper
WFI	Wide Field Imager
WMS	Web Map Service

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