# DIVA-GIS v5 - Tutorial

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This tutorial guides you through some commands in DIVA-GIS, in order to become familiar with the some of the most basic aspects of the program.

More details can be found in the manual and in the exercises.

The data used in this tutorial can be downloaded from the Internet at http://www.diva-gis.org. You can place these in any folder, but here we assume they are in the "C:\DIVA\tutor\" folder, and we will refer to this folder as the "data folder".

1. Layers

Start DIVA-GIS and Click on *Layer – Add Layer*
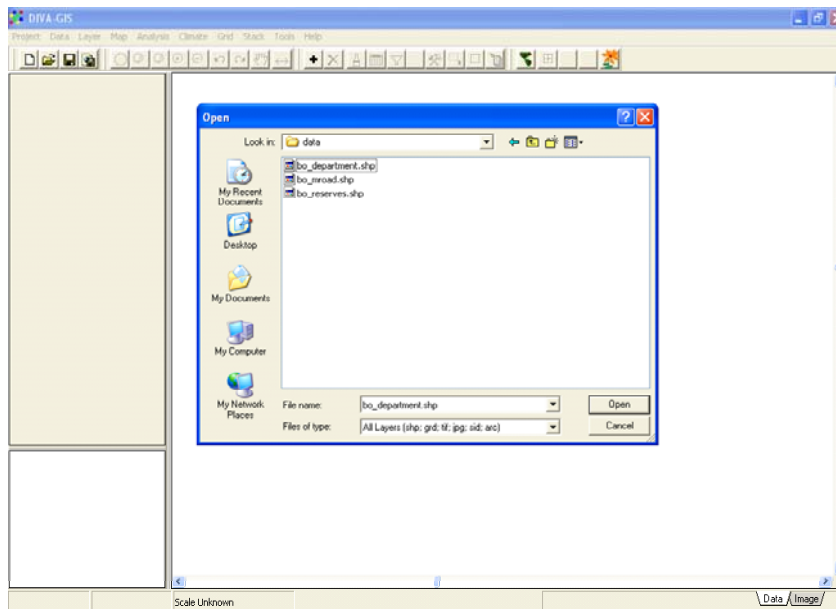
The "*Open*" window appears. In this window, go to the data folder and select the file bo_mroad and press the Open button.

Again do *Layer-Add Layer* and select the file bo_department.shp and press "Open".

Two "layers" should now be present in the "Table of contents (TOC)" (left hand side of the window) of DIVA. You can see these layers on the map, by clicking on

the checkboxes next to their names in the TOC. After that, your screen should show a map of the Departments and main roads in Bolivia. This map was created by adding two "shapefiles" to the map. Shapefiles are files representing points, lines, or polygons (areas) and associated data.

Right-click on the "bo-department" layer in the TOC, and select "Add to overview map".
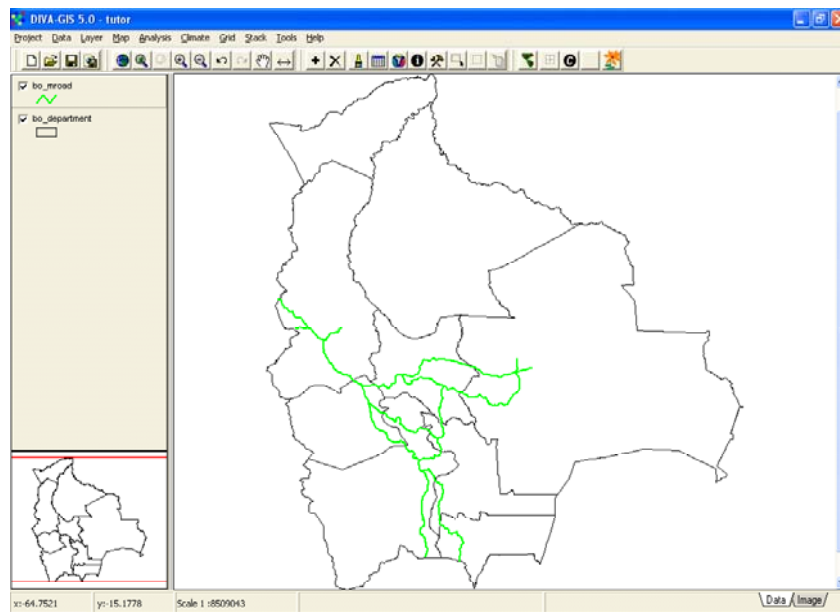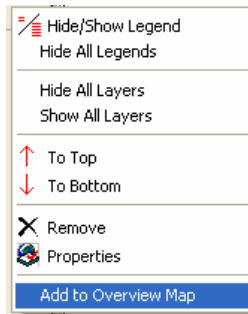
Now try out zooming in and out, and "pan" (moving the center of the map after zooming in), using the commands from the *Map* menu or from this toolbar:

Notice how you can also pan through your map by clicking on the overview map (when the map is zoomed in).

To change the way this layer is displayed, click once on the bo_department layer in the table of contents (not on the checkbox, but next to it). This makes that

layer the "active Layer". Now click on *Layer/Properties* and the *Properties* window appears. (This window also appears after double clicking on the layer in the table of contents). Now you can change display properties such as the color and border size.

Fill style

Border on/off   Border color
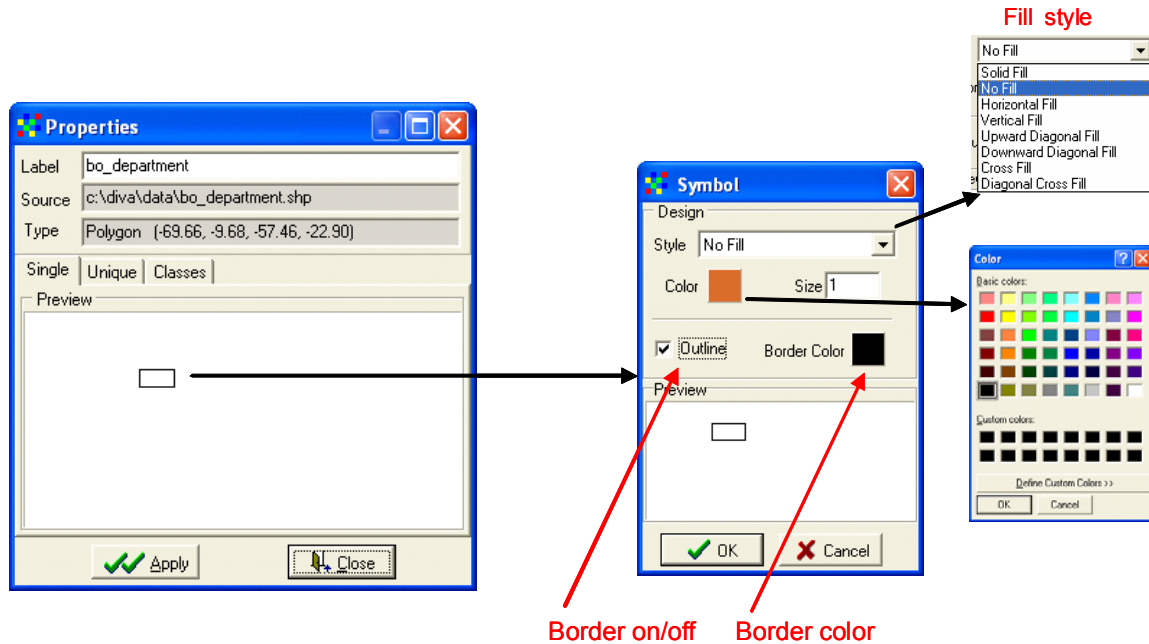
Change the *Style* to "SolidFill", and the *Fill Color* to green (double click on the rectangle in the Preview to show the color palette). Change the *label* to "Departments". Click on *Apply* and *Close*. The departments layer should now be green.

Now go to the Properties of the departments layer again. Go to the "Unique" tab, select the field "Departments", press *Reset Legend* and *Apply*. Each department should now have a different color.

Change the color back to green.

Double click on bo_mroad (in the table of contents) and change the *Style* of the lines to "Dash line", the *Color* to red, the *Size* to 3. Change the *label* to "Main roads".

To be able to see the roads layer, drag (click on it and move it while keeping the mouse button down) it to the top in the TOC.

Save your work using the *Save* or *Save As* commands in the *Project* menu and save the "Project" in a folder of your choice. Then use *Project-Close* to close the project and *Project-Open* to open it again. (note that you can also pick this file from the "recently used files" list in the Project menu).

The project file only stores the names of layers and some information about them, not the data. If you want to save the project with the data in a single file, you can use *File-Export*. This can be handy for sending a project to somebody else.

Make the bo_department layer active by clicking on it in the TOC.
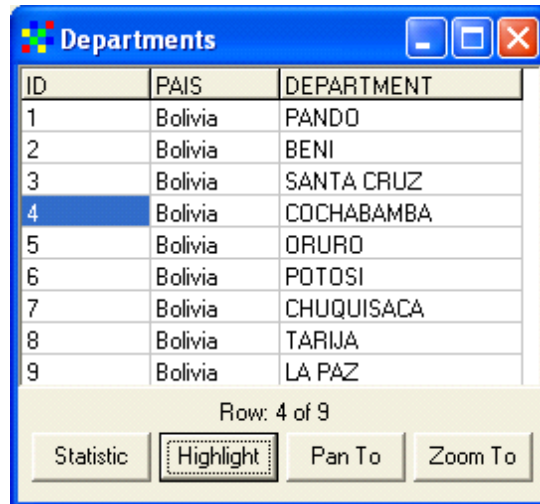
Choose the option *Layer – Identify Feature* from the Layer menu or from the toolbar:

After that, click on any part of the map of Bolivia. The *Identify* window will appear and show the data that are associated with the part of the map you clicked on (e.g., the name of the department).
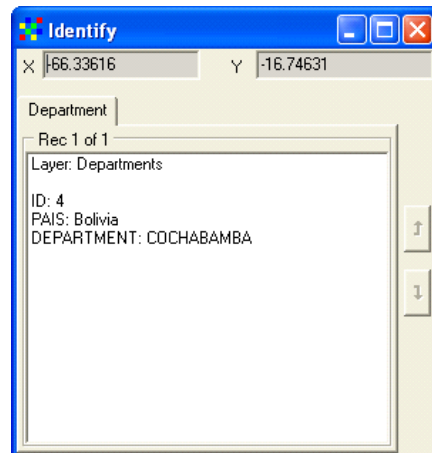
Click on *Climate/Point* and then click anywhere on the map (where there is land) to find out what the climate is like at that location (if you have a climate database installed – you can download these from the diva-gis website).

To see the whole table related to the active layer, click on *Layer-Table* or on this icon:

You can select a record in the database and then use *Highlight, Pan To* or*, Zoom To,* to see the location of the object related to this record on the map.

You can save a map as a graphics file using *Project/Map to Image* and copy the map to the clipboard. Try pasting it again into Powerpoint.

You can also make a more elaborate map by clicking on the "image" tab at the lower right of the DIVA window. There you can add a legend, scale, and more (e.g. text).

Start with adding the main map. Then you can set where other objects are displayed by selecting them in the toolbar, setting some options on the left hand panel, and then by clicking on the map.

It may take a couple of rounds of trial and error to get the placement and properties right. You can repeat the placement of an object (e.g. scale bar) until you have found the place you like. The settings are stored in the text boxes and the objects can be placed on the exact spot on the map again by pressing OK (instead of clicking on the map). Thus, you can go through all the objects, and then start all over again with a fresh map, and only press the OK buttons.

In some cases it can be easier to add additional pieces to the map in Powerpoint or comparable program.
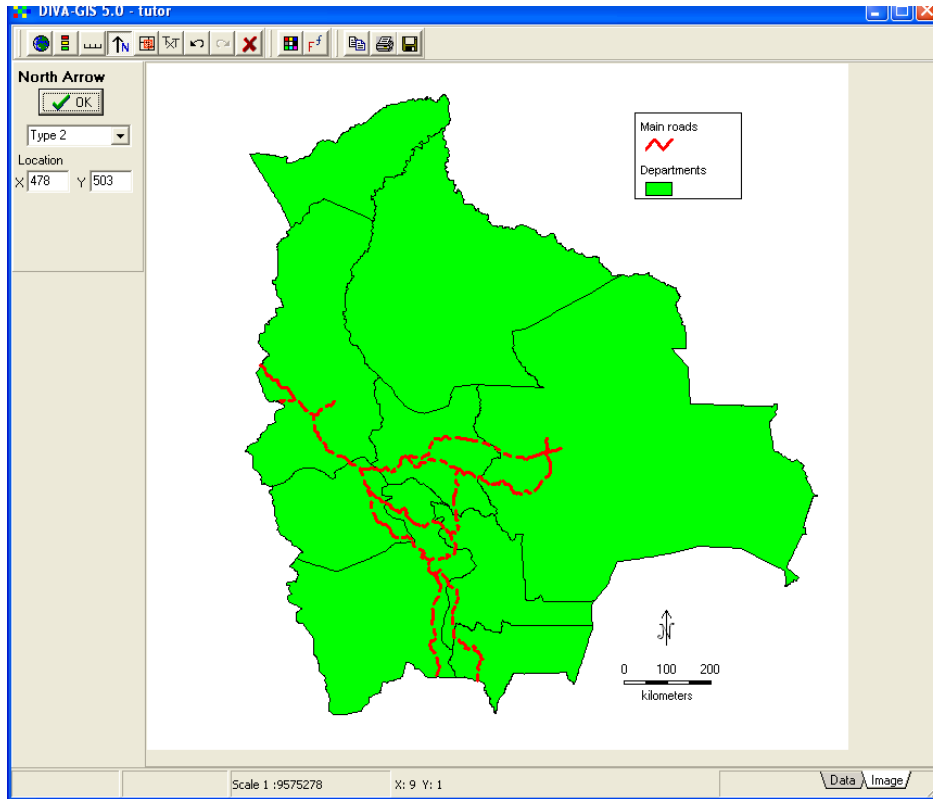
Open the file bolivia_wp.txt with Excel (or other spreadsheet program). Each record (row) in this file describes localities where wild potatoes have been collected.

First complete the LATITUDE and LONGITUDE columns by filling them with coordinate data in decimal degrees. Use the columns LATD, LATM, LATH,

LOND, LONM, LONGH. LATD y LOND have degrees data, LATM y LONGM have decimal minutes (not minutes and seconds)), LATH and LONGH indicate the hemisphere (N/S and E/W). To calculate Latitude use a formula like "=-1*(LATD+LATM/60)" (but replace the variable names by the cell references in excel). The values in the first data row have already been calculated.

It is important that in Excel you set the format of the cells to a certain number of decimals (e.g. 5). Otherwise, all the decimal numbers may be cut off when exporting the file.

When you are done save the file under a different name. After that, save it as a TAB delimited text file again (.TXT).

Use *Data/Points (text) to Shapefile* to create a shapefile from the TXT file you just made with Excel. Select the TXT file as *Input File*, and for Longitude and Latitude select the columns LONGITUDE and LATITUDE.

Click on *Output file*, Set the name of the output file to "bolivia_wp". Click Apply.
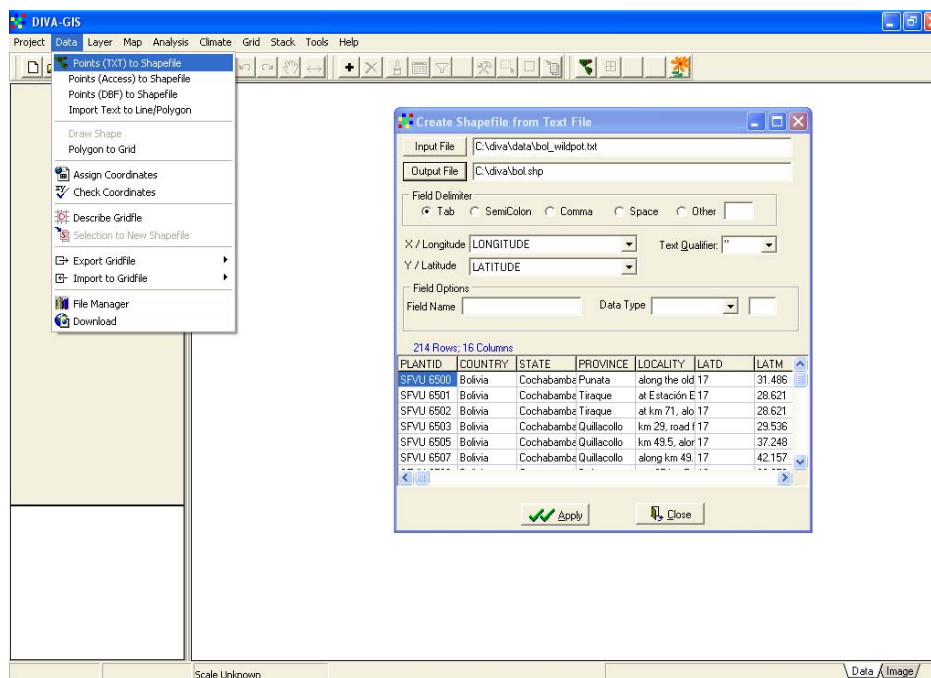
When the program finishes it will add the shapefile to the map*.*

A layer showing locations where wild potatoes were collected in Bolivia should be shown. Your screen should look similar to this:
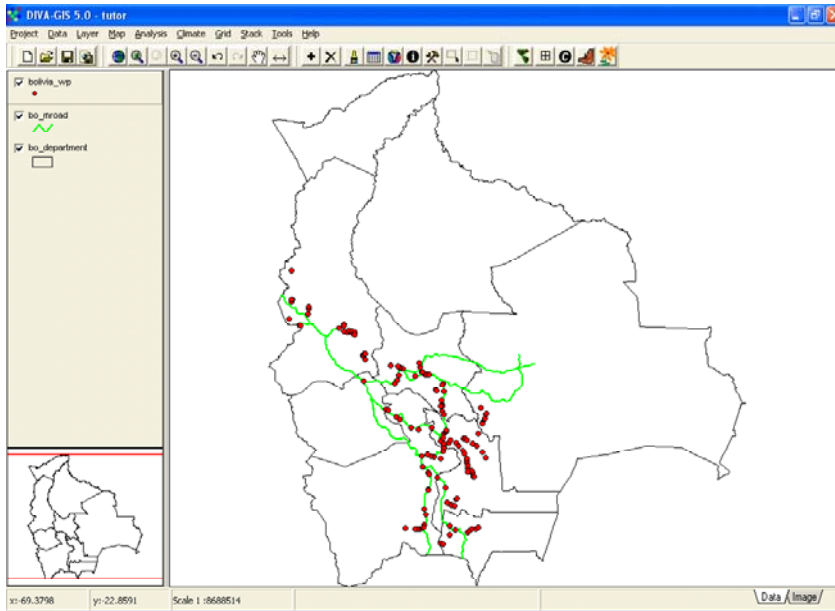
Now add a new layer "bol_alt.grd" to the map, rearrange the layers and zoom in to make a map like this:
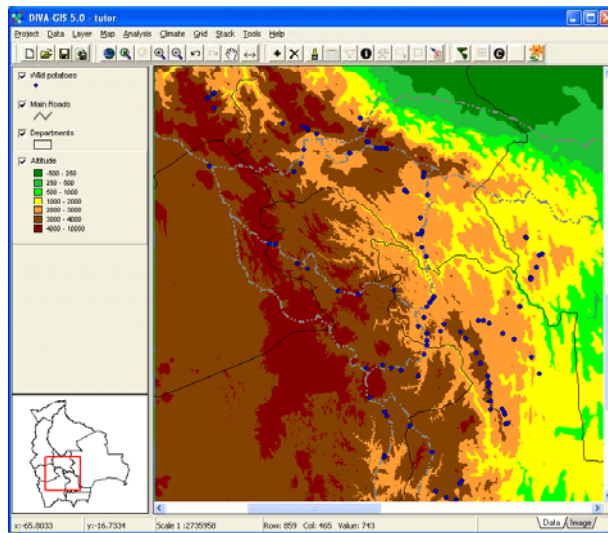

This layer is made from a "gridfile", which is a different file type than the files previously used. It does not store features such as points, lines, or polygons, but rather it stores a rectangular raster (grid) of values. In this case, the values represent altitude (in meters above sea level).

Make the bol_alt the active layer and move your mouse over the map. Note that you can see the values of the layer displayed on the status bar (the bottom of the window).
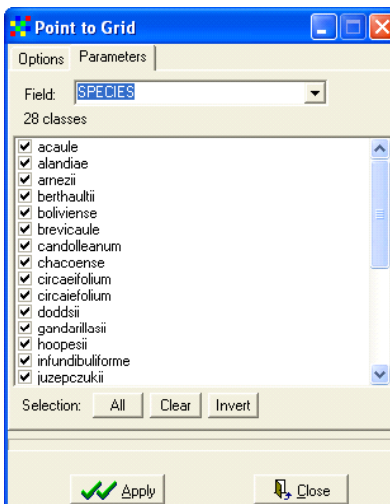
2. Data analysis

Let's make a new gridfile with the number of observations of wild potatoes in Bolivia. Make Bolivia_wp the active layer, and then click on *Analysis – Point to Grid -Richness.*

Choose which field in the database should be used for analysis

Define parameters (x, y, resolution) of the new grid or use those from an existing gridfile.
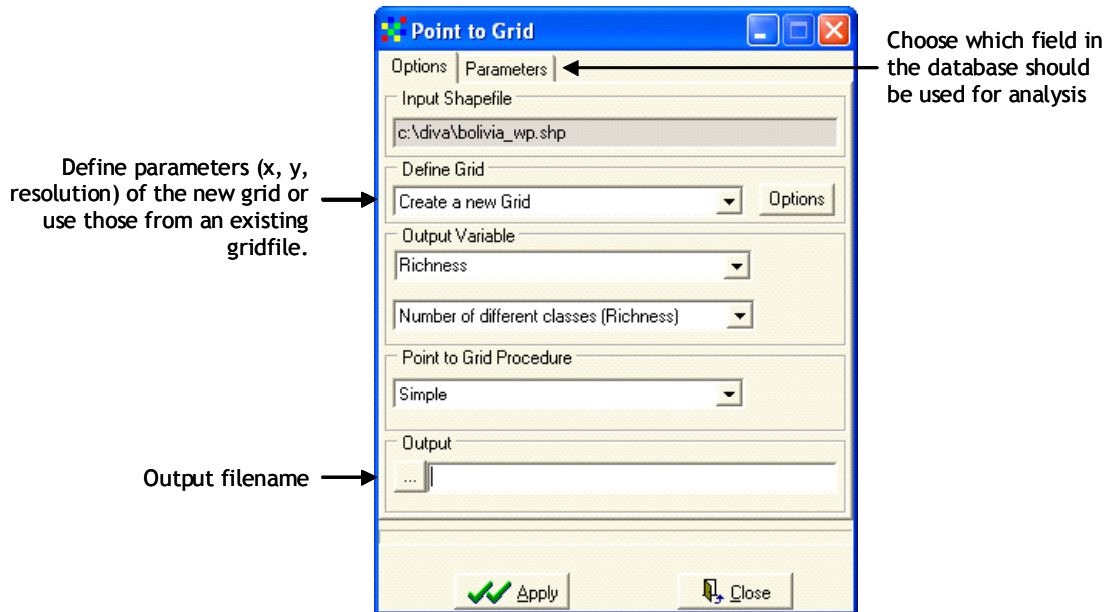
Output filename

Go to the *Parameters* tab and select the field "Species".

Go back to the *Options* tab, choose an output filename and press *Apply*.

When the program is finished, drag the bo_department layer to the top and change (in the *Properties* window) its *Style* to *No fill.*

The map shows a grid that consists of five colors, each indicating a range of the number of species per grid cell.
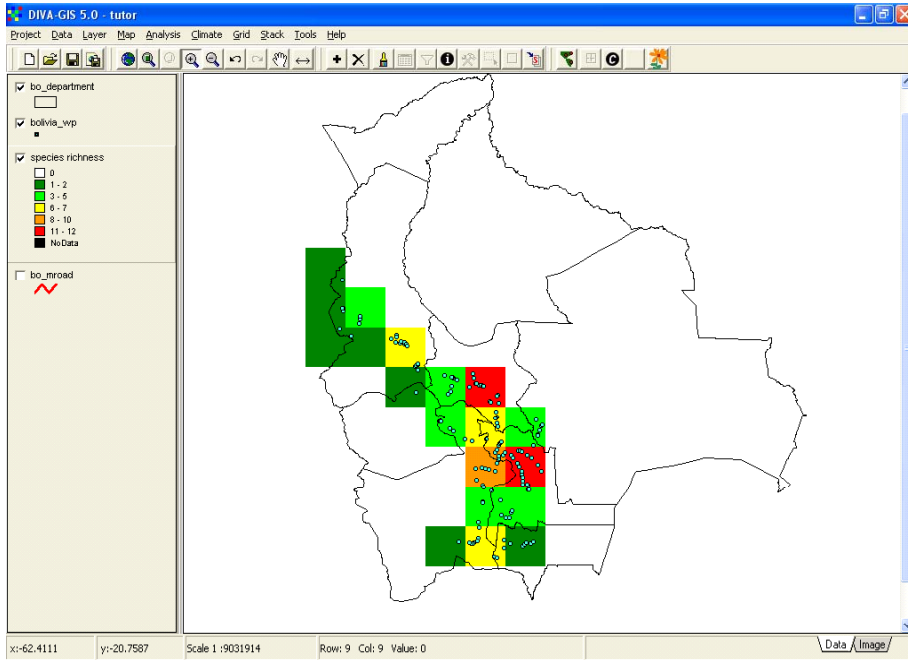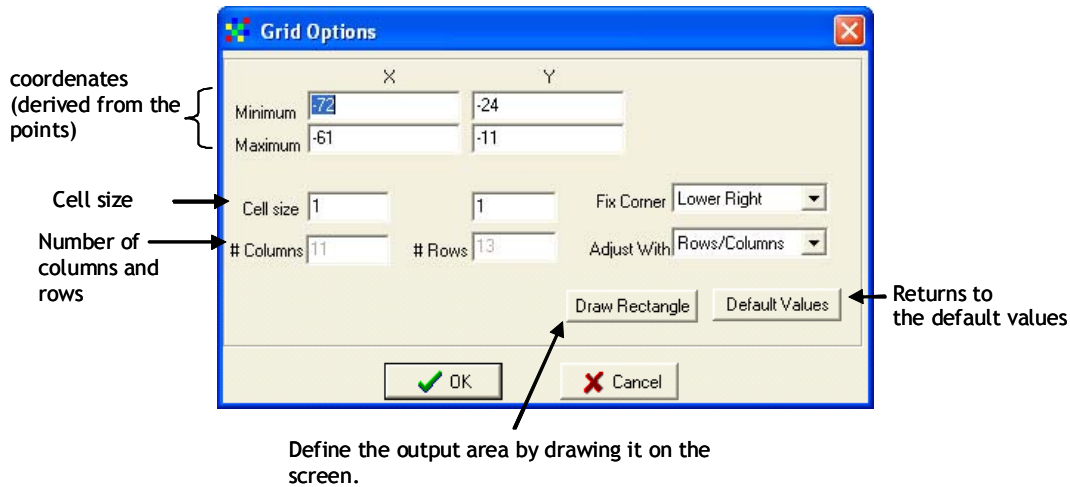

When the grid is the active layer, the row and column number and the value of the cell are shown at the bottom of the screen, when moving the mouse over the map.

To change the way the grid is displayed and show other ranges (e.g.,: 1-10, 10-20, etc), or individual values, double click on the grid. The grid *Properties* window appears. Click on a value in the "To" column and change it. You can also insert more rows (ranges) using "Insert row" (+).
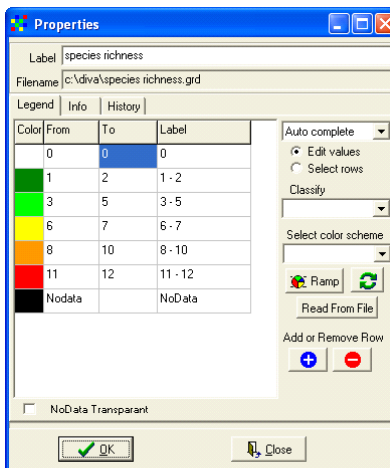
Make some more grids. First activate the bolivia_wp layer. Then select *Analysis/Point to Grid/Richness*. Select *Define Grid-Options.* In the *Adjust With* use Rows/Columns. Change the resolution (size) of the cells to 0.5 degrees and click OK. Then click Apply in the *Create Grid* window. The result is a grid with smaller cells than the previous grid (and hence with different values).

coordenates (derived from the points)

Cell size

Number of columns and rows

Returns to the default values

Define the output area by drawing it on the screen.

Make another grid using the same data, but now of the number of observations per grid cell. In *Output Variable* select *Richness / Number of Observations*. Choose an output file name and click on *Apply*.

Save your project (*Project / Save*).