SGIS
User Manual

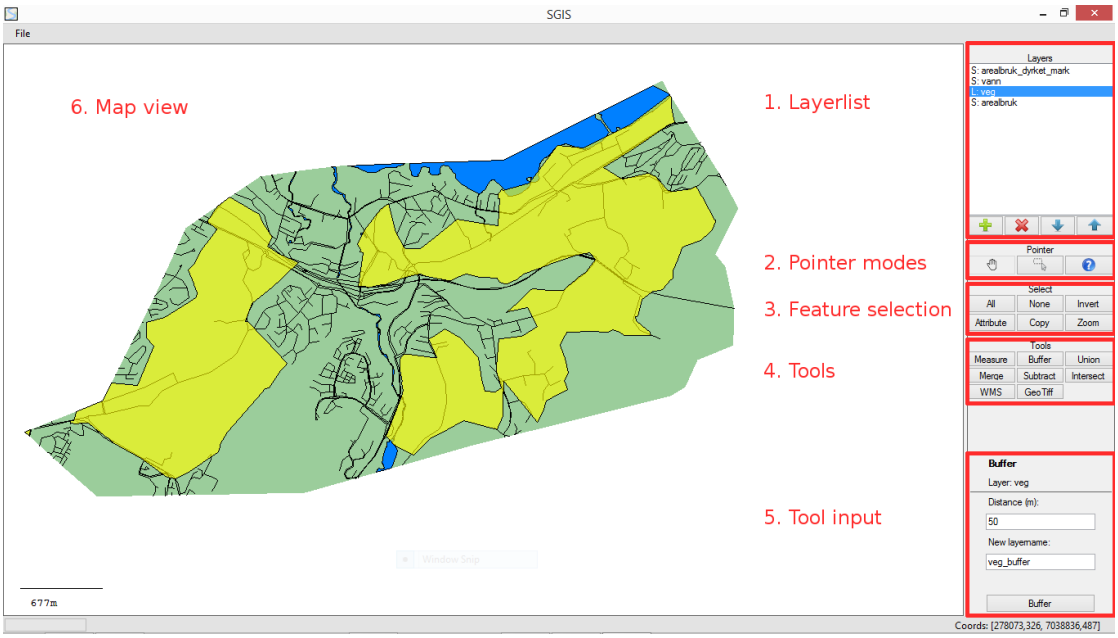
December 18, 2014

Contents

1 Introduction

SGIS is an application developed with the intention of being a Simple Geographical Information System. It has only the most basic functions for modifying spatial data, as to not be daunting for new users, but when these are combined, they can perform quite complex analyses.

2 User interface



1. List of the imported layers. The selected layer has a blue background.
2. The different pointrs available. Only one may be used at once.
3. Tools for selecting features
4. Tools for analysing or manipulating spatial data
5. Input for the currently selected tool
6. Map view of all the currently visible layers

3 Installation

To install SGIS simply run the provided file names *setup.exe*. You can then start SGIS by either opening the windows start menu and selecting SGIS or use the icon created on your desktop.

If you recieve an error when opening SGIS, make sure you are logged in as an administrator.

To uninstall SGIS, use the windows provided settings panel named *Add or remove programs*.

4 Layers

Manipulating spatial data in SGIS is done using layers. Each layers represents geometrical features of one type, points, lines or polygons, with one style. The layers are drawn such that the topmost layer is drawn last and thus obscuring the layers underneath. Tools which operate on one or more layers, use the currently selected layer as their first input.

4.1 Adding

Adding a layer to the map is done by clicking the button with the green cross beneath the list of layers. SGIS is currently only able to read .shp-files. Attributes in .dbf-files with the same name in the same location will automatically be added to the layer. Also, SGIS will use projections defined in similarily named .prj-files. Note that the original .shp-file will never be modified by SGIS.

4.2 Deleting

To delete a layer from SGIS, simply select the layer in the list of layers and click the button with the red cross. You can also right click on the layer you whish to delete, and select *Delete*. Beware, there is no way to undo the deletion of a layer.

4.3 Styling

By right clicking on a layer in the layer list, you can choose to style the layer by clicking *Style*. This will allow you to set the line color, fill color, opacity, line width and point size where applicable.

4.4 Exporting

It is currently not possible to save the modified data in vector format. By using the GeoTiff tool you can howerver export to a raster format. This is explained in section 7.8.

5 Pointer modes

5.1 Drag

The default mouse mode, with the hand icon, is used to drag the map.

5.2 Select

By using the select mouse mode, you can select features within a drawn rectangle. Only features in the currently selected layer may be selected. To learn more about selecting features, see section 6.

If *ctrl* is pressed when selecting features, the selected features will be added to the already selected features.

If *alt* is pressed while selecting features, tje selected features will be removed from the already selected features.

5.3 Info

The info mouse mode is used to examine the attributes of a single geometric features. It is enough to click on or nearby a feature, the feature will then be selected and the attributes will be shown in a list.

By clicking on an attribute in the list, all features with the same value will be selected.

For more advanced selection based on attributes, see section 6.

6 Feature selection

SGIS has six buttons used for selecting features and interacting with selected features.

All and *None* select respectively all and none of the features in the current layer. *Invert* selects all the currently not selected features, and deselects all the currently selected features.

Copy lets you copy all the currently selected features to a new layer. This is useful if you only want to work on a subset of the data in a layer.

Zoom moves the view of the map such that all selected features just fits on the screen.

Attribute is a powerful tool that lets you select features based on the values on their attributes. For simplicity it lets you choose among the layes attributes and automatically adds it into the expression textbox. The expression syntax is:

```
[columnName] = value AND/OR [columnName] = 'stringValue'
```

7 Tools

SGIS implements some tools for analysis and editing of spatial data. They are described closer in the following sections. Note that all tools operating one or more layer will use the currently selected layer as it's first input. Also, all tools will operate on all features of a layer, wether they are selected or not. If this is not the desired effect, please use the *Copy* feature (section 6) to create a new layer of the selected features.

7.1 Measure

Measure shows information about the current layer. It will display the number of features, total length of lines, total circumference and total area for both the entire layer and for only the selected features. If a non-projected spatial reference system is selected, this tool will not give correct values.

7.2 Buffer

The *Buffer* tool creates a new layer with geometries such that all points within these geometries are inside or less than a specified distance from the geometries in the original layer. In the example of a single input point, the resulting layer will have a circle with radius equal to the given distance, and a center coinciding with the point.

The distance is given in meters. If a non-projected spatial reference system is selected, this tool will not work as intended. This buffer implementation is euclidian and will not be completely accurate when used for large areas or with large distance values.

7.3 Subtract

The *Subtract* tool creates a new layer containing only the geometries in the first layer which are not also in the second layer. The two input layers are required to contain the same type of geometries, that is, both has to contain either points, lines or polygons.

7.4 Union

The *Union* tool creates a new where all overlapping geometries in the original layer are represented as only one geometry. This is especially useful for speeding up later operations on the layer.

7.5 Merge

The *Merge* tool creates a new layer containg all geometries which are either in the first or the second layer. In the case that a geometry exists in both layers, the new layer will have two copies of this geometry. These duplicates can be removed using the *Union* tool. Both layers have to contain the same type of geometries.

7.6 Intersection

The *Intersection* tool creates a new layer with geometries covering the area that is covered in both the first and the second layer.

7.7 WMS

The *WMS* tool loads a map from a given WMS-server for the given map-view and displays it behind the layers. It will only load one zoom-level, but it is possible to load several maps at once and a larger can thus be covered. The *Clear*-button will delete all loaded maps.

The WMS-server is given as input. Below are some servers tested and know to work at the time of writing listed. After specifying the server press the *Get layers*-button to load a list of all the layers the server is offering. Choose a layer and press load to load the map into SGIS. Both getting the list of layers and loading the map can take a couple of seconds.

- http://wms.geonorge.no/skwms1/wms.kartdata2
- http://openwms.statkart.no/skwms1/wms.fjellskygge
- http://openwms.statkart.no/skwms1/wms.topo2
- http://129.206.228.72/cached/osm

More servers provided by the Norwegian Mapping Authority can be found here:
http://status.kartverket.no/tjenester/openwms.py

Note, SGIS includes no error checking for which areas or what kinds of projections a WMS-server is offering. This can result in a simple "Server error"-message or simply a white map. If this happens, please try another server or layer.

7.8 GeoTiff

The *GeoTiff* tool lets you export the current map to a georeferenced tiff-image. The zoom factor determines the resolution of the resulting picture. A number larger than 1 means higher resolution and better looking picture. A number less than 1 is not advised. As an exmaple, a zoom factor of 2 will give you a raster image with twice resolution of the map area in both width and height.

8 Options

8.1 Background Color

It is possible to change the background color of the map here. This is purely visual and will not be included in a raster export.

8.2 Spatial Reference System

SGIS wil due to it's intented use, default to the spatial reference system WGS 84 / UTM 33N. It is possible to change this by opening the File-¿Options-¿Spatial Reference System if for example the working area is not covered by UTM 33N. Using another projection than UTM is not advised as the tools *Measure* and *Buffer* which assumes a cartesian coordinate system not work.

A spatial reference system is given by its EPSG-code which can be found on websites such as http://spatialreference.org/