Starter Manual to Quantum GIS for GRASS GIS

GRASS Development Team

QUANTUM GIS INTRODUCTION

This Manual is valid for QGIS version 0.8+ (http://www.qgis.org) **Start QGIS**, the first time it should look like Fig. 1

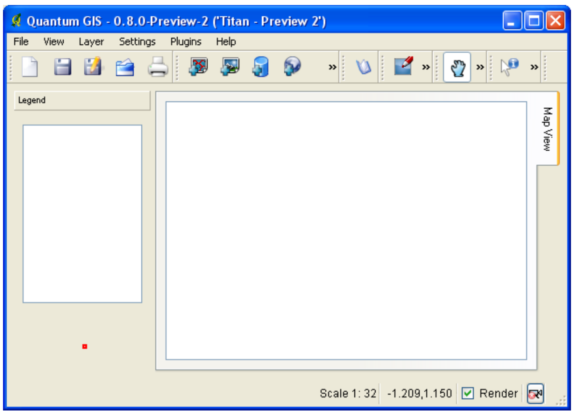

Figure 1:

Open some vector layers from QGIS sample data set Fig. 2

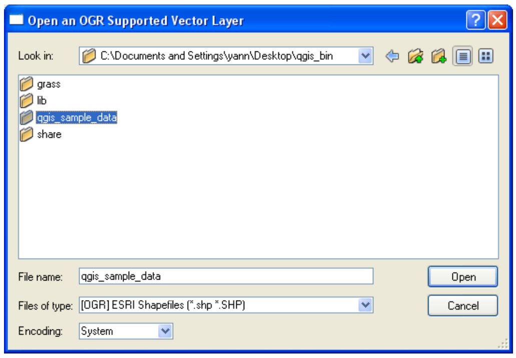

Figure 2:

Select all the layers (Ctrl+a) Fig. 3

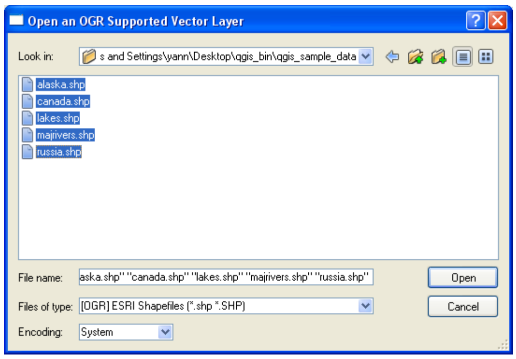

Figure 3:

The layers displayed should look like Fig. 4

Contents of this volume:

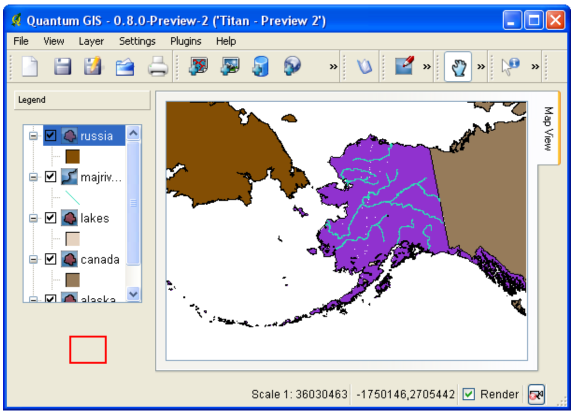

Figure 4:

Zoom to all layers extents... Fig. 5

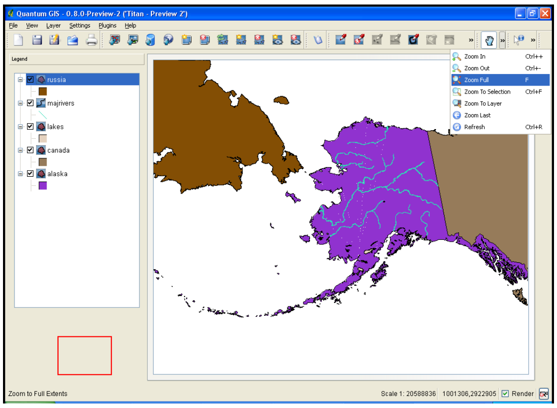

Figure 5:

Result after zooming to all layers Fig. 6

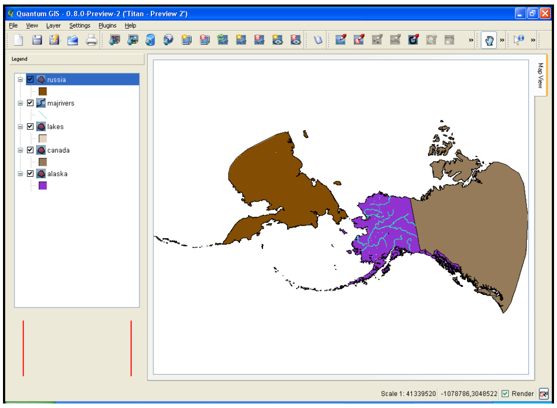

Figure 6:

Set the first layer in the overview frame Fig. 7

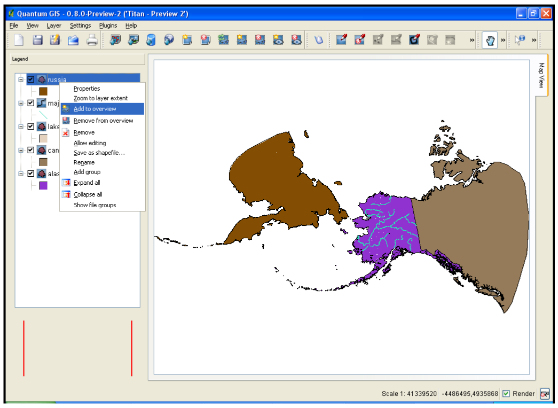

Figure 7:

Result... Fig. 8

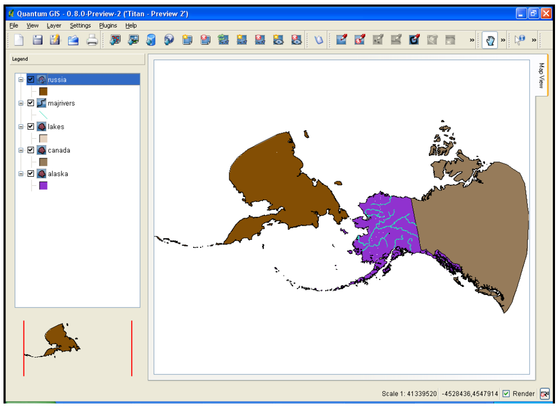

Figure 8:

Open the plugin menu Fig. 9

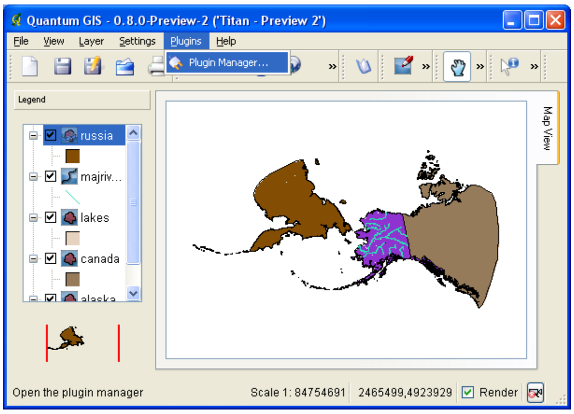

Figure 9:

It should look like this Fig. 10

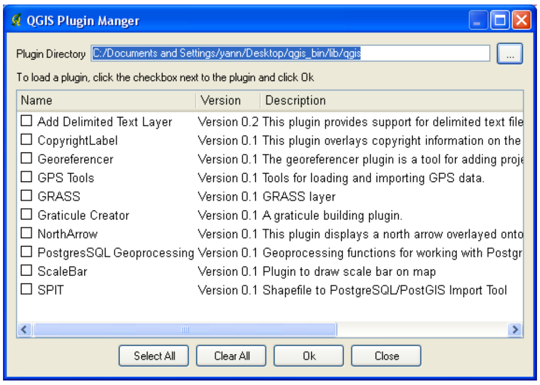

Figure 10:

Select those plugins Fig. 11

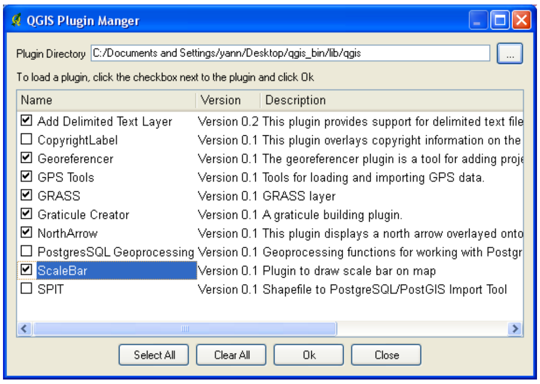

Figure 11:

Some new menus have appeared! Fig. 12

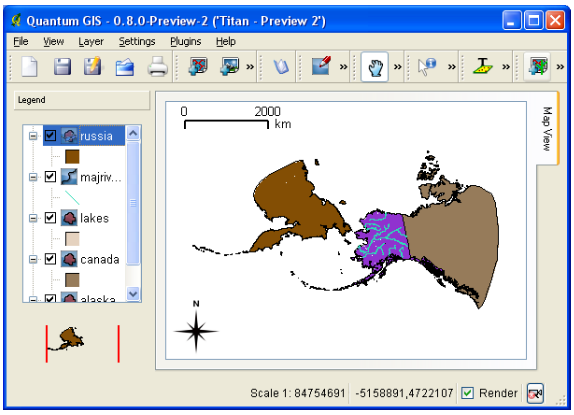

Figure 12:

Maximizing QGIS makes more icons appearing... Fig. 13

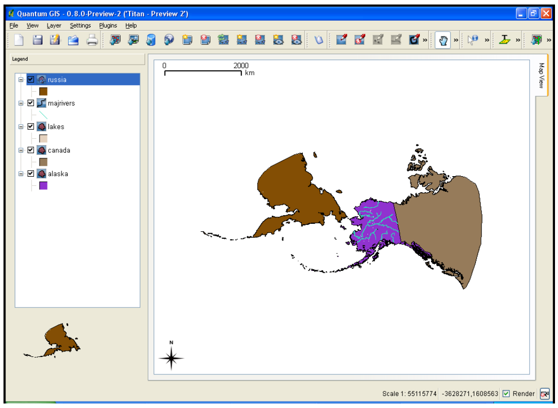

Figure 13:

Drag the new menus below to make them glue to a second level of toolbars... Fig. 14

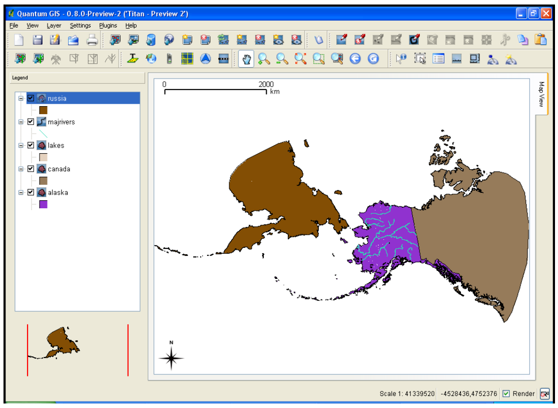

Figure 14:

QUANTUM GIS GRASS PLUGIN

Open a GRASS raster layer by clicking on the second button from the left Fig. 15

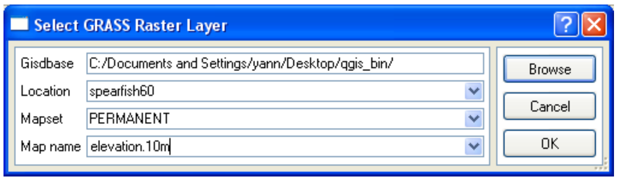

Figure 15:

This is the contextual menu that opens, select the Map name as “elevation.10m” Fig. 16

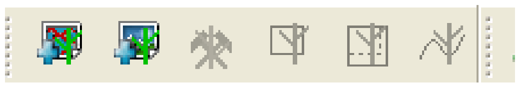

Figure 16:

This is the result of loading the GRASS Raster Layer Fig. 17

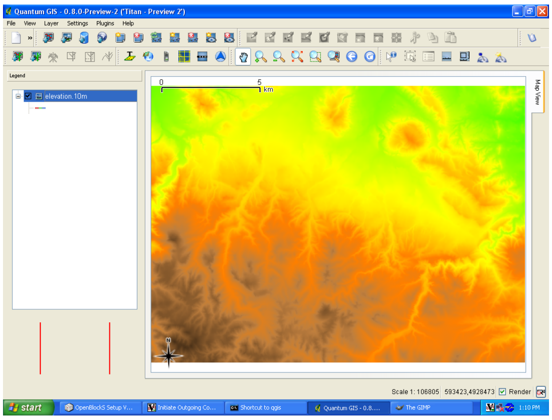

Figure 17:

Very similarly with other types of data, add the layer to overview Fig. ??

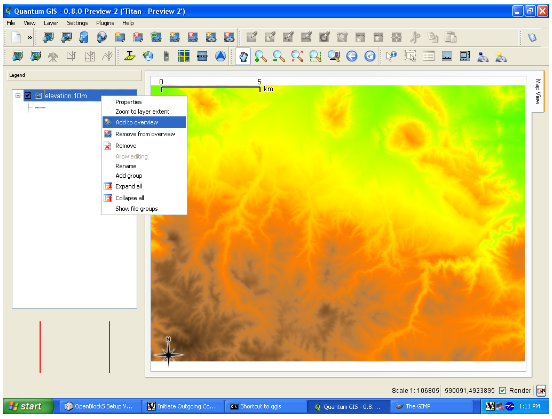

Figure 18:

Result Fig. 19

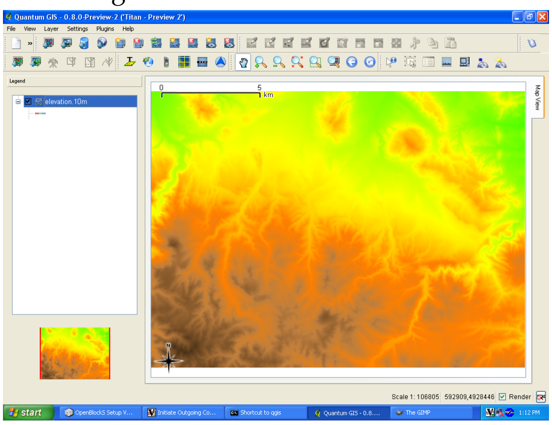

Figure 19:

Add a GRASS Vector Layer by selecting the first Icon from the left Fig. 20

Figure 20:

This is the contextual menu that opens, select the Map name as "streams" and the layer name as "1_Line" Fig. 21

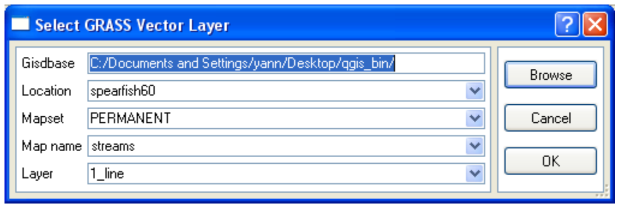

Figure 21:

This is the streams vector layer, open the properties by a right-click on the name Fig. 22

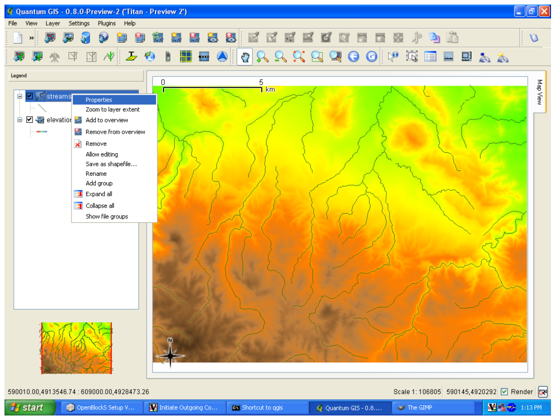

Figure 22:

The Properties box looks like this, and select the "fill color" button to open a color selection dialog box. Change the color to a common Blue and apply Fig. 23 Fig. 24

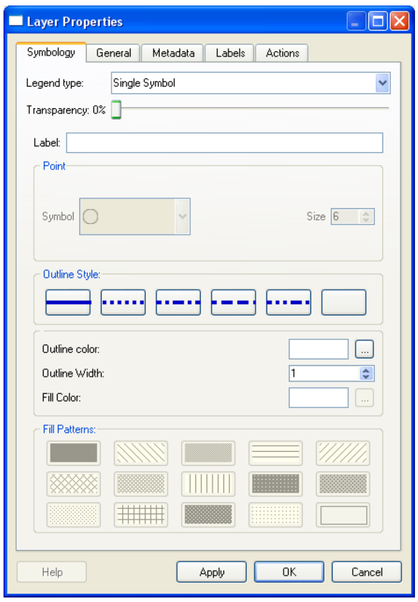

Figure 23:

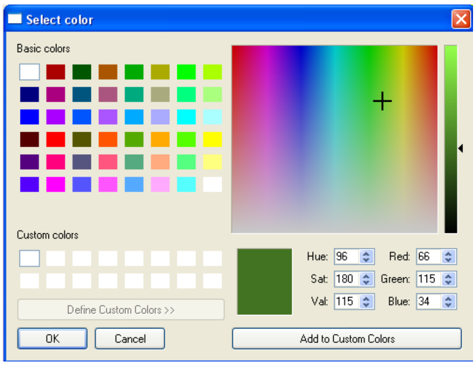

Figure 24:

Select the first button on the right side to start GRASS vector editing module Fig. 25

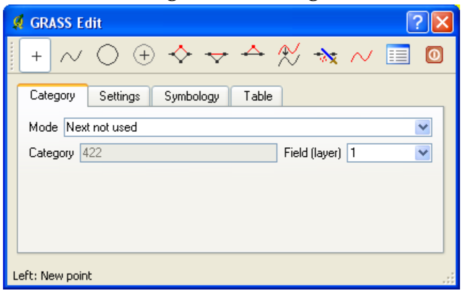

Figure 25:

The Edit GRASS Vector dialog box can only be opened when a vector is selected in the main QGIS window Fig. 26

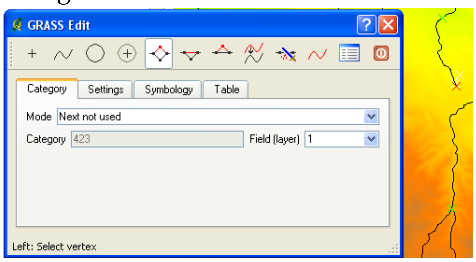

Figure 26:

Select the "moving vertex" button (5th from the left) and move the red cross on the map Fig. 27

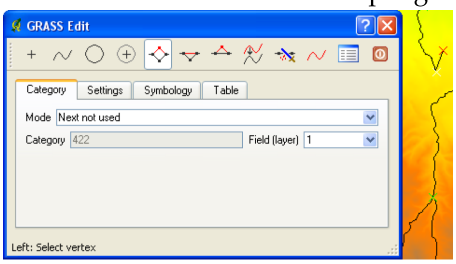

Figure 27:

The result should look like this (Fig. 27). The last button in the toolbar will commit the modifications to the vector layer and rebuild it Fig. 28

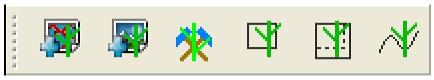

Figure 28:

In the launching terminal, the commit changes are described Fig. 29

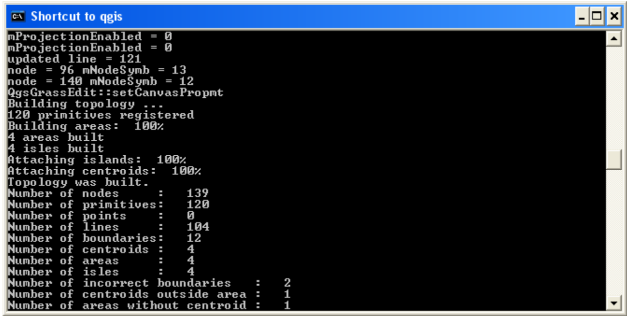

Figure 29:

Set GRASS plugin environment for processing... Fig. 30

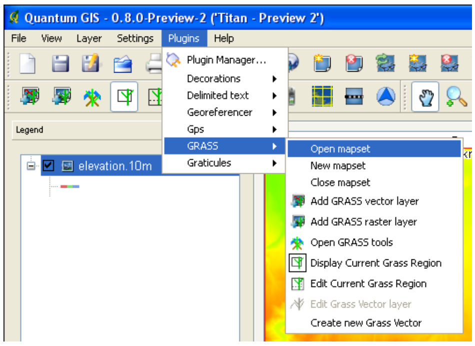

Figure 30:

Following this, select the 3rd icon from the left on the GRASS toolbar. This will open the GRASS processing tool as shown (mostly) in the next three pages. This GRASS tool is a thin representation of the GRASS GIS capacities, but it will serve the purpose of this introduction. It comes with a browser of the GRASS mapset used. It also acts as a data management interface. Fig. 31

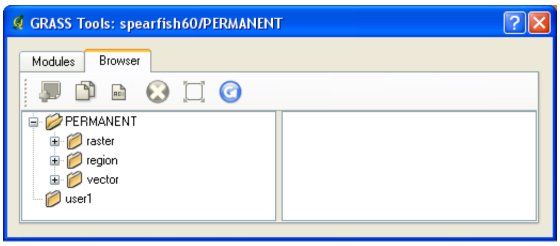

Figure 31:

The browser has the capacity to expand header information and metadata pertaining to the layer selected Fig. 32

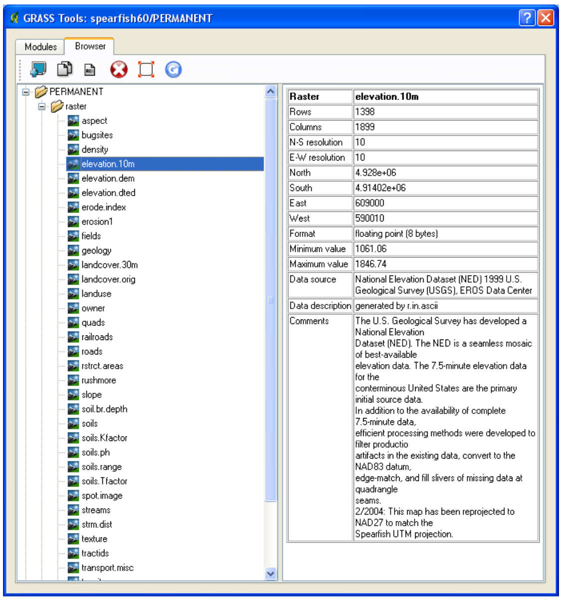

Figure 32:

The GRASS modules available are listed in the next two pages. More are being ported everyday. The actual number of GRASS GIS modules exceeds 400, you can see that there is still some work to do, and the community of volunteers are working on it Fig. 33 Fig. 34

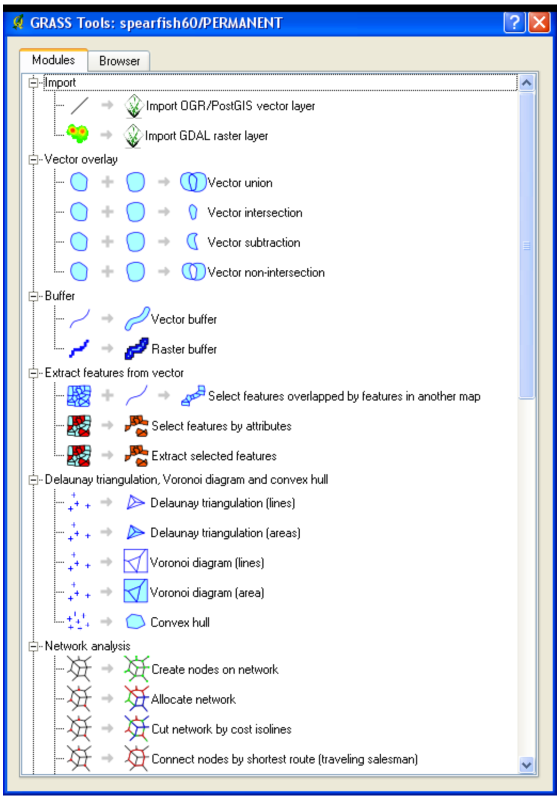

Figure 33:

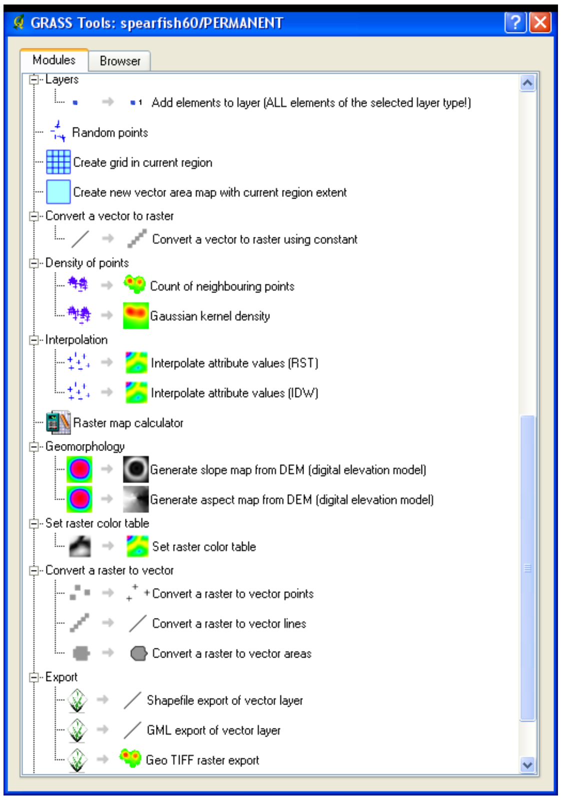

Figure 34:

GRASS PLUGIN PROCESSING

Let us create some buffers... Select buffering of vectors from the Modules list. It should looks like this. Choose 500 meters buffer size Fig. 35

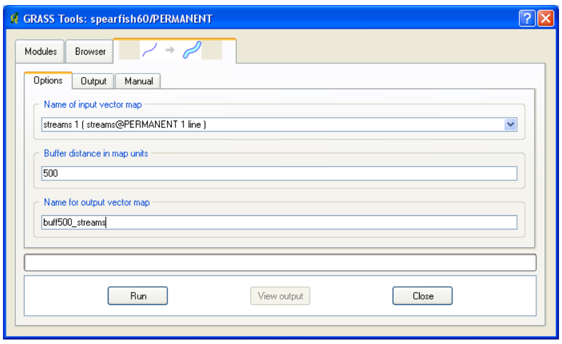

Figure 35:

Processing is going on... Fig. 36

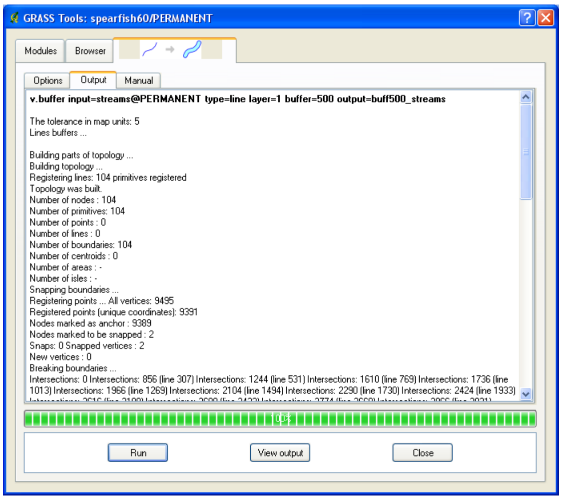

Figure 36:

Finishing the processing Fig. 37

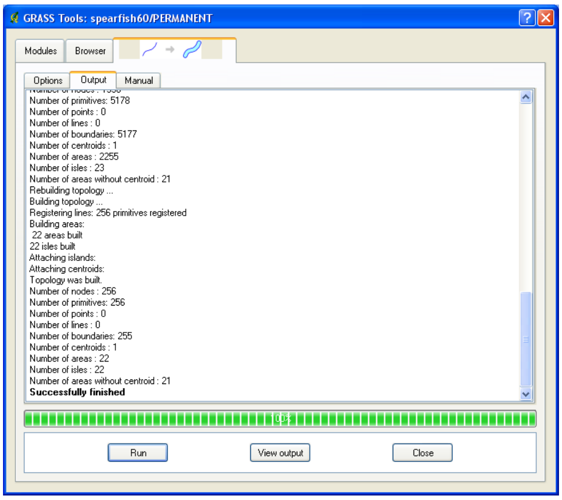

Figure 37:

Result should look like this (you have to load the map yourself!) Fig. 38

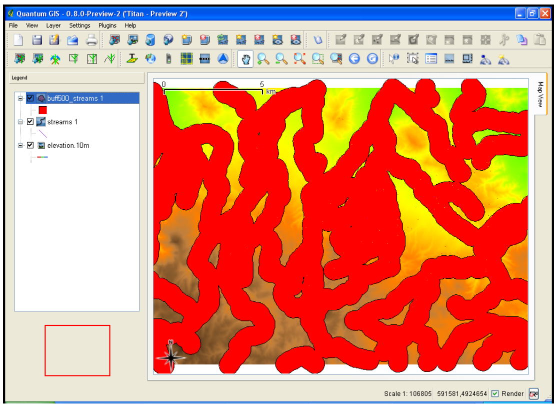

Figure 38:

Now create another buffer from streams but this time at 100 meters... Like this Fig. 39

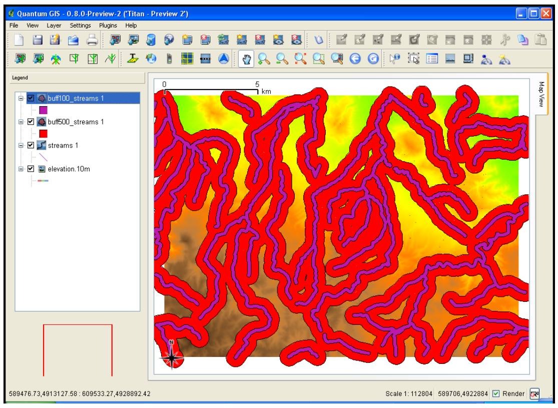

Figure 39:

Now we are going to subtract the 100m buffer to the 500m buffer, because we want to exclude the streams and its proximity from our area of selection. Find this module! Fig. 40

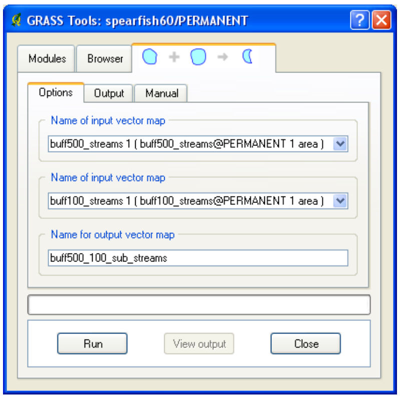

Figure 40:

Processing the overlay with boolean operator "NOT" Fig. 41

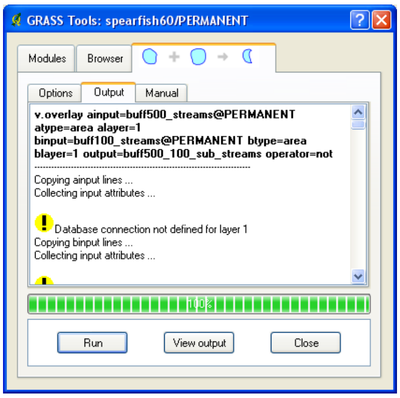

Figure 41:

Result is discarding all under 100m from the streams, and all above 500 meters from the streams. Fig. 42

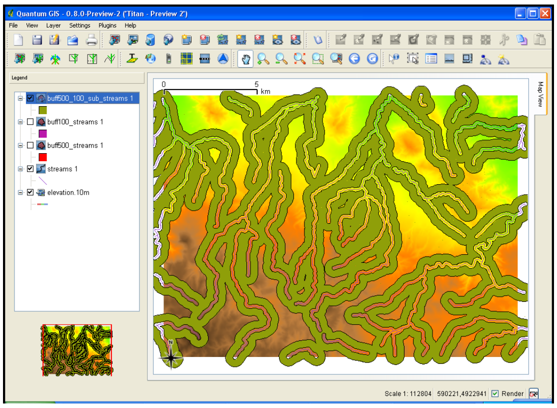

Figure 42:

Process an aspect map from the elevation map Fig. 43

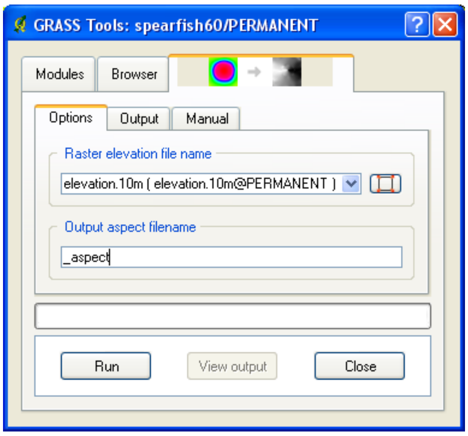

Figure 43:

Processing... Fig. 44

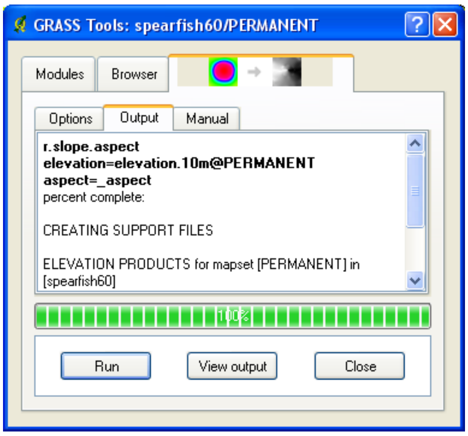

Figure 44:

Result Fig. 45

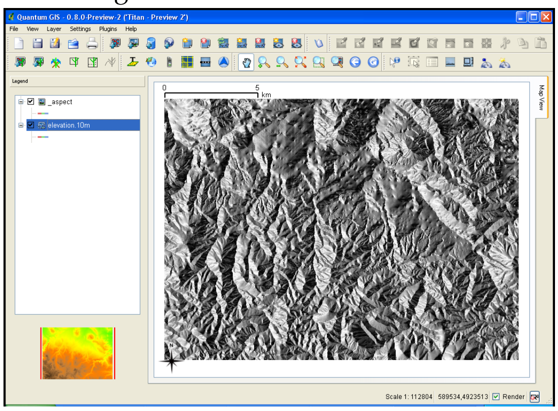

Figure 45:

GRASS Development Team
http://grass.itc.it
webmaster@grass.itc.it

Starter Manual to GRASS GIS

GRASS Original

GRASS Development Team

Introduction

This screenshot is GRASS GIS running natively on Windows (http://geni.ath.cx/grass.html).Fig. 1

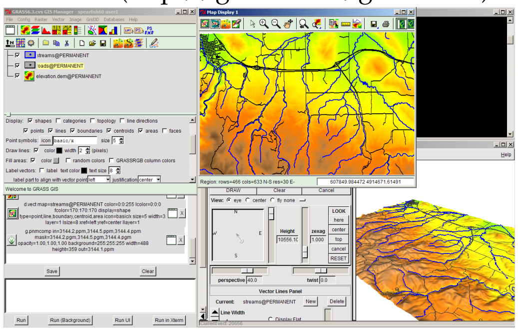

Figure 1: Windows Native GRASS

Starting GRASS GIS: Select Spearfish60 Location by a click on "Enter GRASS":Fig. 2

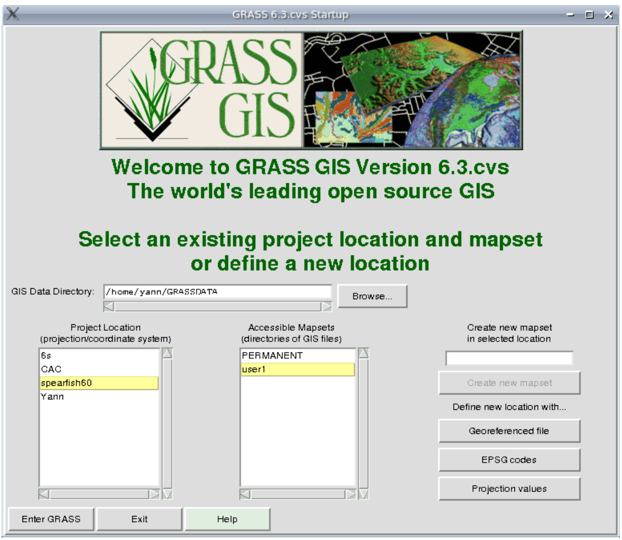

Figure 2: Welcome Screen

At this point it should (somewhat) look this way: Fig. 3

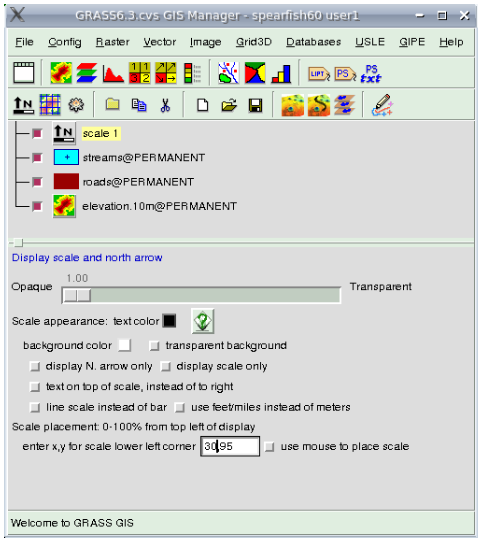

Figure 3: GIS Manager

Some more GRASS GUI information is found in Appendix A 2.

Load the elevation.10m layer by clicking on the raster display button (second button from left):Fig. 4

Figure 4: Basic Display

Once selected, the main GRASS GUI will have a new layer like one of these:Fig. 5

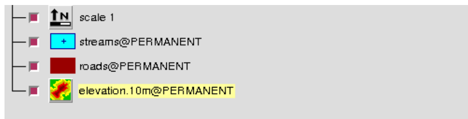

Figure 5:

By selecting the new layer, you will be given a contextual menu below:Fig. 6

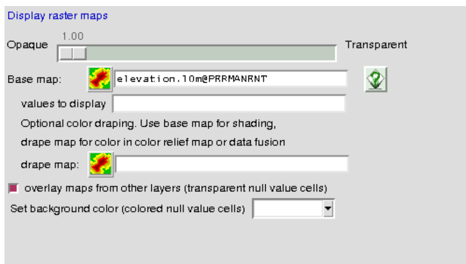

Figure 6:

Then add a vector using the 8th icon from the left. Fig. 7

Figure 7:

Add a stream layer (blue color) and a road layer (brown color). Below is the example for the streams Fig. 8

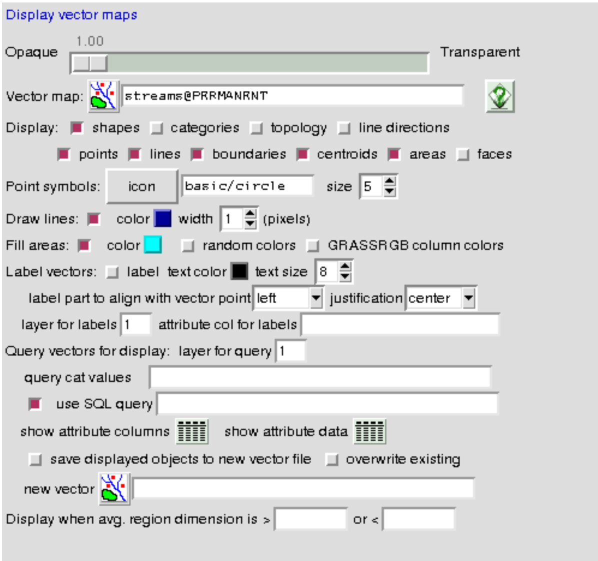

Figure 8:

Result should look like this (somehow):Fig. 9

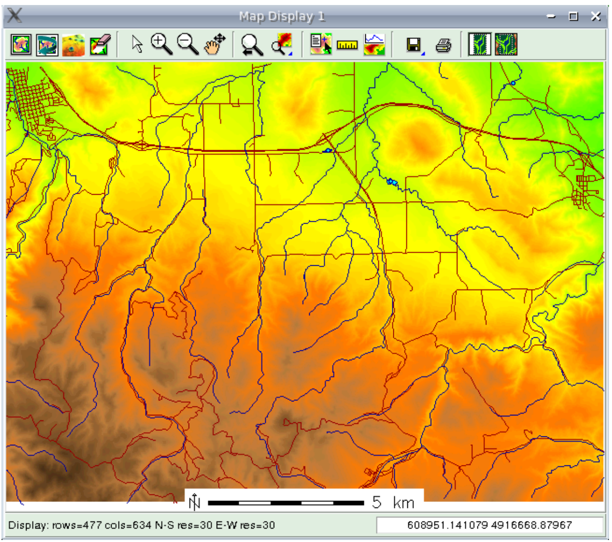

Figure 9:

DEM MANIPULATIONS

Display a dem:Fig. 10

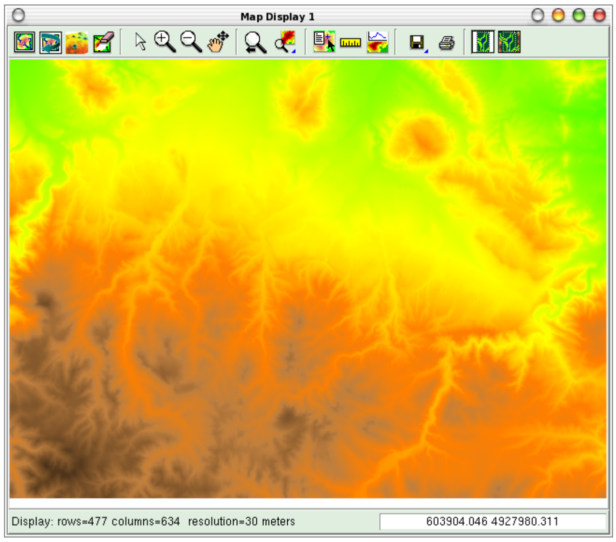

Figure 10: Display a DEM

Compute slope and aspect

Raster/Terrain Analysis/Slope and Aspect. Fig. 11

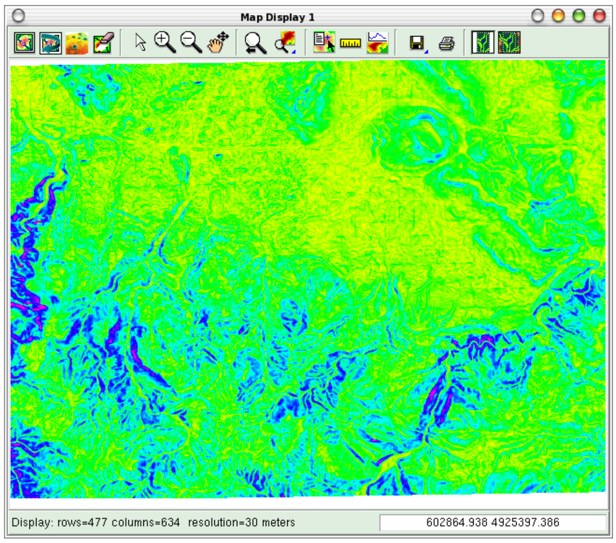

Figure 11: Slope

Compute a shaded relief map (in Raster/Terrain Analysis/Shaded Relief Map). The Shaded Relief map should be like this when a elevation.10m map is overlaid to it with 0.75 opacity: Fig. 12

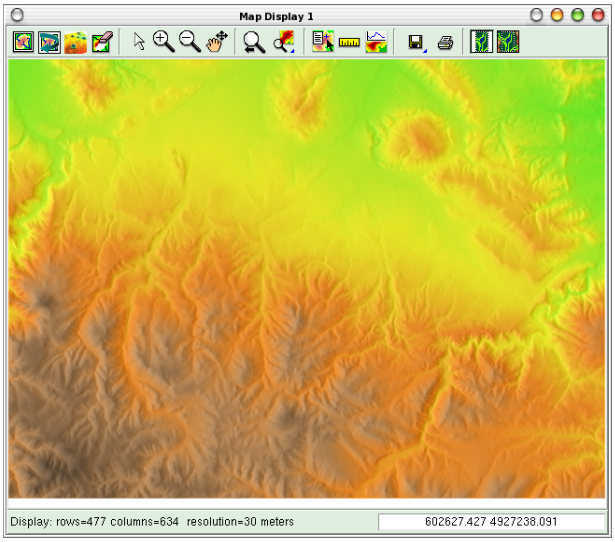

Figure 12: Shaded Relief

Watershed Basin Analysis Program

Raster/Hydrologic modeling/Watershed Analysis. Fill in the Elevation input map with "elevation.10m". The minimum size of an exterior watershed basin should be 5000 cells. Fill up output names for all the output maps available (i.e. "_cells_nbr", "_drain_dir", "_drain_dir", "_basins", "_streams", "_half_basins", "_visual", "_LS", "_S").

Output should state the following:
SECTION 1a (of 6): Initiating Memory.
SECTION 1b (of 6): Determining Offmap Flow.
SECTION 2: A * Search.
SECTION 3: Accumulating Surface Flow.
SECTION 4: Length Slope determination.
SECTION 5: Watershed determination.
SECTION 6: Closing Maps.

Output of "_basins" should look like this:Fig. 13

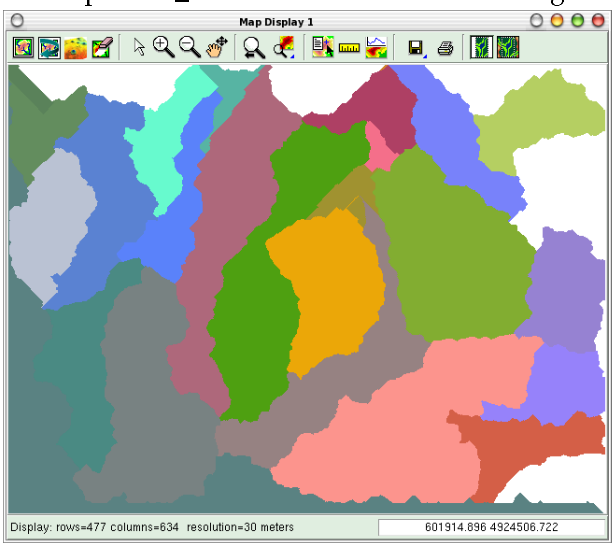

Figure 13: Generated Basins

Output of "_streams" should look like this: Fig. 14 compare it with the vector map "streams".

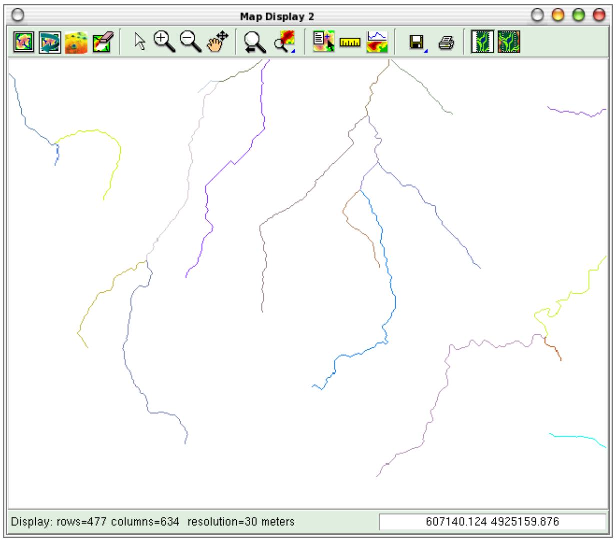

Figure 14: Generated streams

Relaunch with various values instead of 5000 cells, i.e. 2000 and 10000. Compare by vectorizing the streams generated. Vectorization follows these steps: 1-Raster/Neighborhood Analysis/Thin Linear Features 2-File/Map Type Conversion/Raster to Vector Map 3-Vector/Develop Map/Create-Rebuild Topology (optional)

Stream Pollution Monitoring Station site identification

Assuming a Wood Processing Factory is requesting permit to setup a new processing plant in the country side. It is remote from major mapped streams (598713.35(E) 4920069.15(N)), the local council gave you a notice to assess the path of some minor effluents that may be draining to the major stream from the future factory, and especially their meeting point coordinates where the council will establish an automatic monitoring station. Use Raster/Terrain Analysis/Least Cost Route Or Flow, your output should look like this: Fig. 15

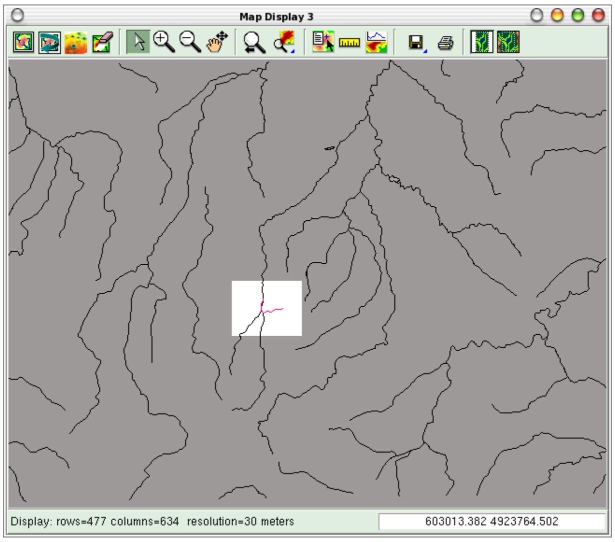

Figure 15:

What is the location (Easting,Northing) of the generated stream crossing the mapped stream where it is proposed to install a monitoring station?

GRASS GIS Habitat Analysis

Introduction

http://www.udel.edu/johnmack/frec682/682proj2.html

This course is available online under the course name "FREC 682 Spatial Analysis". This material is a modified version to accommodate with GRASS 6.3+.

In this session, the features needed are the following essentially (look in RASTER from the main interface): The BUFFERING Module: Raster/Create buffers Fig. 16 The MAP CALCULATOR Module: Raster/Map Calculator Fig. 17

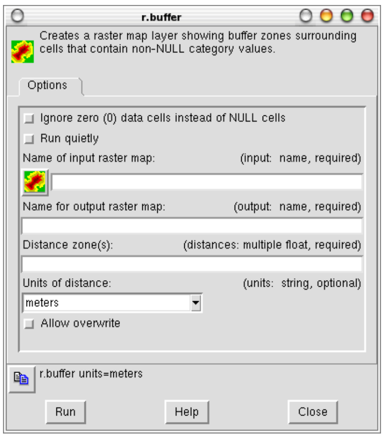

Figure 16: BUFFERING

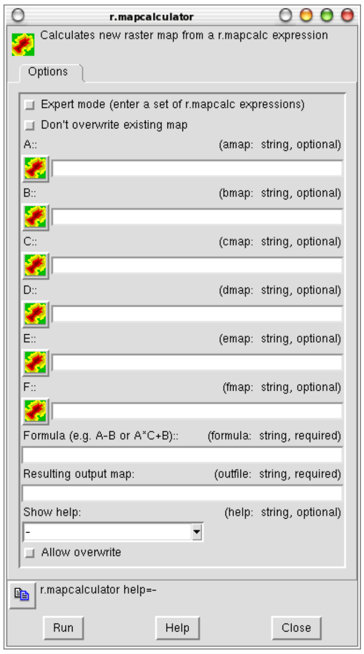

Figure 17: MAP CALCULATOR

Additional modules for the later part of the lab

Query map with mouse: In the Map display window, look for: Fig. 18

Figure 18: Query Map with mouse

NULL values: Raster/Develop Map/Manage Null values

CLUMP: Raster/Transform features/Clump small Areas

STATISTICS: Raster/Reports & Statistics = General statistics

R2V: File/Map type Conversions/Raster to vector

Vector Build: Vector/Develop Map/Create/Rebuild Topology

Vector Export: File/Export/Vector map/Various format using OGR (SHAPE, etc)

Start New Display Window: In the main GRASS GUI look for: Fig. 19

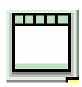

Figure 19: Launch New Display

Erase Display: In the Map display window, look for: Fig. 20

Figure 20: Erase Display Icon

Redraw map: In the Map display window, look for: Fig. 21

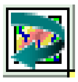

Figure 21: Redraw Icon

HABITAT PRESERVATION MISSION

The pickled strumpet (Trollopensus bibulosa) has recently been added to the Endangered Species List, and the Fish and Wildlife Service is identifying likely habitat areas in the Spearfish area for protection from development. They have constructed the following habitat scoring system based on the species observed habitat preferences:

HABITAT SCORING SYSTEM (from Fish and Wildlife Service)

Map number Environmental conditions Score to be given 1 within 500 meters of streams where slope <= 5 degrees +2 points 2 within 500 meters of streams where slope >5 degrees +5 points 3 within 500 meters of a road -5 points 4 coniferous forest +4 points 5 mixed forest +1 point 6 northern exposure (aspect from NW to NE) +3 points 7 western or eastern exposure (SW to NW or SE to NE) +1 point 8 1200-1400 meters elevation +2 points 9 1400-1600 meters elevation +4 points 10 over 1600 meters elevation +2 points

Use r.buffer (..=> Create buffers) and r.mapcalc (..=> Map calculator) to create an aggregate habitat score map of the entire area, summing all the partial scores as defined above. (hint: you have to convert all null values of buffer output maps into zero values) When finished with numbers 1 to 10 above, sum all the maps in a map that you may call scoreindivsum. Then identify suitable habitat areas by converting to zeroes all cells with overall habitat scores below 9, and all cells within 100 meters of a road (hint: you have to make a new buffer map here, and remove its null values for calculations). Make a final scoring map that you may call scorefinal and change 0 values to NULL (..=>Manage null values) for next laboratory part.

PROCESSING THE SCORING MAPS

In the processing of number 1 and 2, please use the Map Calculator with an input following an 'if statement'. The structure goes this way:

```
if(condition, action_if_true, action_if_not_true)
```

In the case of a map application use it this way:

```
if(MapA==value1, score_value1, score_value2)
```

Since one may want to give two input maps together, a double if statement can be formulated this way:

A practical example for number 1:

```
if(stream_buff_500==2,if(slope=5,2,0),0)
```

In case one wants to select a range of values (inclusive or exclusive), use of OR and AND is necessary. Query to check aspect map (..=>Query with mouse), East=1 and North=+90 degrees.

Practical examples for 7a and 7b:

```
7a) if(aspect<225 && aspect>135, 1, 0)

7b) if(aspect<45 || aspect>314 && aspect!=0, 1, 0)
```

Example 7b has an added constraint "&& aspect !=0" because aspect value 0 means no aspect was calculated (usually out of data boundary in the image).

This Set of instructions shows how GRASS GIS does the reclassification work under scripting mode. This is useful when you need to reuse the same set of GIS manipulations/models several times on different or new datasets.

HABITAT SCORING SCRIPT

Map number Environmental conditions Score to be given:

1) within 500 meters of streams where slope <= 5 degrees: +2 points

```
r.buffer input=streams output=_bstreams500
 distances=500 units=meters --overwrite

r.null map=_bstreams500 null=0

r.mapcalc _rbstreams500="if(_bstreams500==2,1,0)"

r.null map=_rbstreams500 null=0
```

2) within 500 meters of streams where slope >5 degrees: +5 points

```
r.buffer input=roads output=_broads500 distances=500
 units=meters --overwrite

r.mapcalc _s_sl="if(_rbstreams500==1,if(
 slope<=5,2,5),0)"
```

3) within 500 meters of a road: -5 points

```
r.mapcalc _rbroads500="float(if(
 _broads500==2,-5.0,0))"
```

4) coniferous forest: +4 points

```
r.mapcalc _for="if(vegcover==3,4,0)"
```

5) mixed forest: +1 point

```
r.mapcalc _for1="if(vegcover==5,1,0)"
```

6) northern exposure (aspect from NW to NE): +3 points

```
r.mapcalc _exp3="if(aspect<=135.0 && aspect>=45.0
 && aspect != 0,3,0)"
```

7a) western or eastern exposure (SW to NW or SE to NE): +1 point

```
r.mapcalc _exp1="if(aspect<45.0 || aspect>314.0,1,0)"
r.mapcalc _exp2="if(aspect<225.0 && aspect>135.0,1,0)"
```

7b) 1200-1400 meters elevation: +2 points

```
r.mapcalc _elev1="if(elevation.10m<1400
 && elevation.10m>1200,2,0)"
```

8) 1400-1600 meters elevation: +4 points

```
r.mapcalc _elev2="if(elevation.10m<1600
 && elevation.10m>=1400,4,0)"
```

9) over 1600 meters elevation: +2 points

```
r.mapcalc _elev3="if(elevation.10m>=1600,2,0)"
```

FINALIZING THE SCORING MAP

```
r.buffer input=roads output=_br100
 distances=100 units=meters --overwrite

r.null map=_br100 null=0

r.mapcalc _add="float(_s_sl+_rbroads500+_for+
 _for1+_exp1+_exp2+_exp3+_elev1+_elev2+_elev3)"

r.mapcalc _clas="if(_add>9,1,null())"

r.mapcalc _class="if(_clas==1&&_br100==0,1,null())"
```

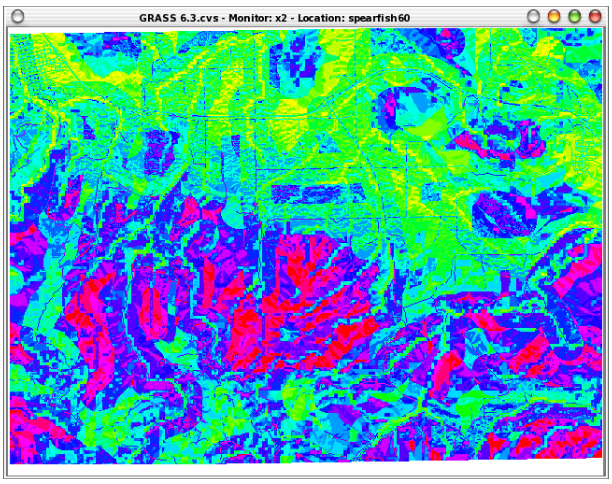

Figure 22: Scoring Map

CLUMPING SUITABLE AREAS

WARNING: This part of the Laboratory involves the use of the command line (command prompt).

What is "clumping"? Recategorizes data in a raster map layer by grouping cells that form physically discrete areas into unique categories.

Now find the discrete areas (clumps) of aggregated habitat scores. Run *r.clump (..=>Clump Small Areas)* on the *"score_final"* map to give each clump its own category number. You may call the output *"score_clumped"*.

```
r.clump input=score_final output=score_clumped
```

Display your newly clumped map *"score_clumped"*. It should somewhat look like this one:Fig. 23

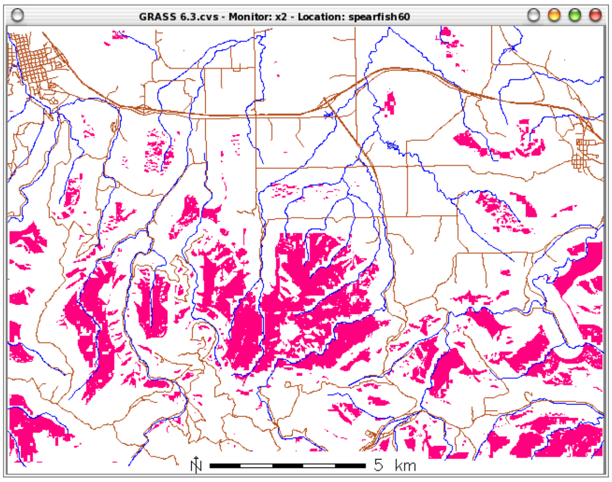

Figure 23: Clumped map

Since this species is most viable in larger clumps, extract the clumps greater than 50 hectares to a separate map. You may use the command line for reclassification by area threshold to select area superior to 50 hectares:

```
r.reclass.area input = score_final greater=50
 output=selected_habitat_area
```

Output "selected_habitat_area" at this level should be similar to this one:Fig. 24

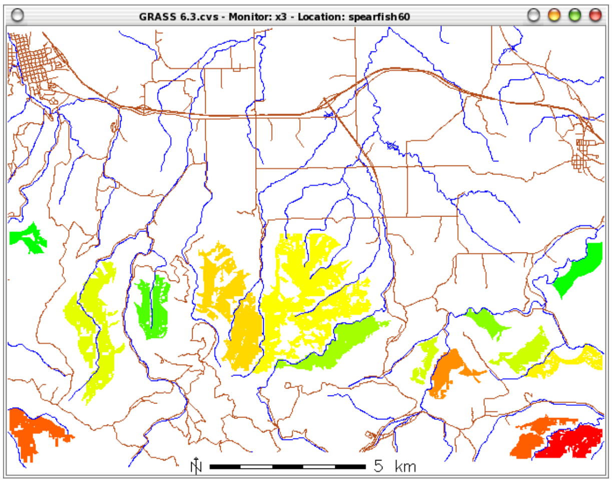

Figure 24: Seleceted Habitat Areas

EXPORT RESULTS TO VECTOR

Since the users work in vector GIS, we are going to convert the results in vector format and export them from GRASS GIS to shapefile.

Vectorize the clumped map you just produced (File/Map type conversion/raster to vector) and check that you have effectively created a polygon vector map by displaying your vector using random colors.Fig. 25

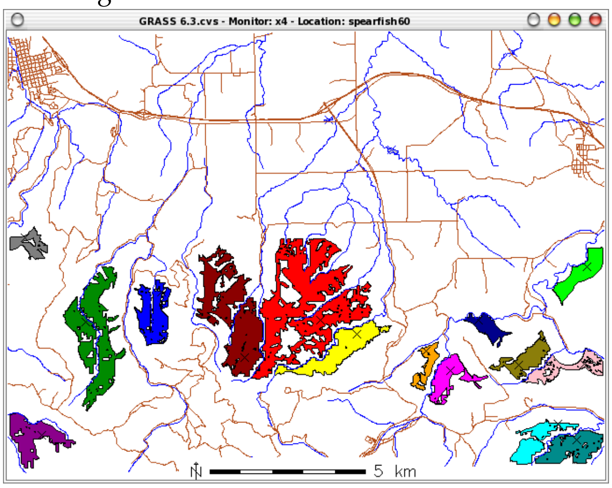

Figure 25: Vector Export

Export this selected habitat vector file along with the "*roads*" and "*streams*" vector files into shapefile. Please be sure that you export the same type of vectors (areas for "*selected_habitat_area*" and lines for "*roads*" and "*streams*"). Display and query them using Quantum GIS.

```
v.out.ogr input=selected_habitat_area type=area
 dsn=QGISDATA layer=1 format=ESRI_Shapefile
```

```
v.out.ogr input=roads type=line dsn=QGISDATA
 layer=1 format=ESRI_Shapefile
```

```
v.out.ogr input=streams type=line dsn=QGISDATA
 layer=1 format=ESRI_Shapefile
```

Additional processing.....

The pickled strumpet is quite intolerant of edge disturbances, so you would like to weight interior areas of the habitat clumps more highly than edge areas. Create interior 100-meter-interval buffers within the large habitat clumps, where interior pixels within 100 meters of a clump edge have a weight of 1, interior pixels 100-200 meters from a clump edge have a weight of 2, interior pixels 200-300 meters from a clump edge have a weight of 3, etc., and pixels outside the largest clumps have a weight of zero.

Use *r.mapcalc* to multiply the aggregate habitat score map by these interior buffer weights. Now run *r.volume* on this buffer-weighted habitat score map to obtain the sum and average of each clump s cell habitat scores. Use *awk* to create reclass rules files, then use *r.reclass* to map the largest clumps by sum and average habitat scores. Which clump has the highest weighted total habitat score? Which has the highest weighted average habitat score? Use *r.grow* to create a map of clump edges only (subtracting the input map from the output map). Use the edge map to index the perimeter of each of the major clumps. Calculate the compactness (area divided by perimeter squared) of each clump. Map the largest clumps by compactness. Create a jazzy display script to demonstrate your procedures and explain your findings. (See)

A script for some parts of the Lab is in **Appendix B** 2.

Appendix A: Overview of Grass GUI

Overview of the available commands in the modules:Fig. 26 Fig. 27 Fig. 28

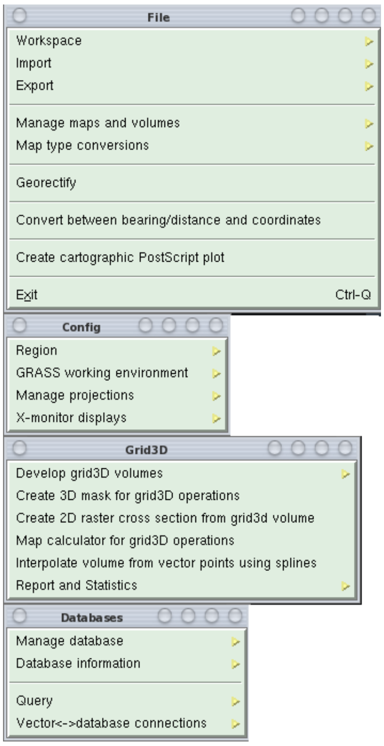

Figure 26: GRASS Menus (1/3)

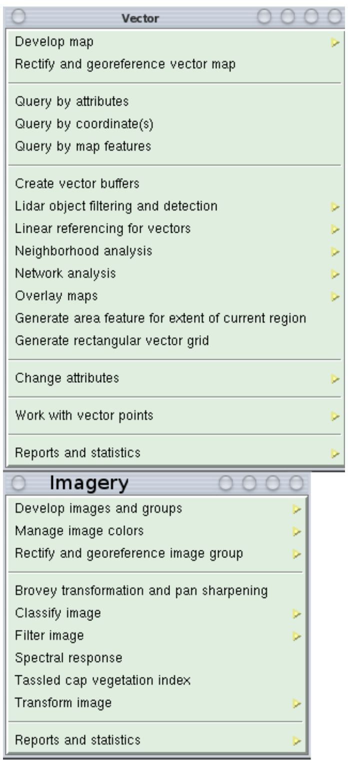

Figure 27: GRASS Menus (2/3)

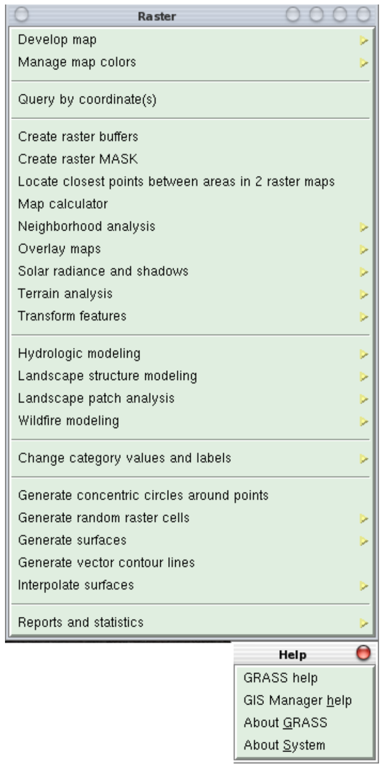

Figure 28: GRASS Menus (3/3)

Appendix B: GRASS SCRIPT

Please put this into a file that you may name *script.sh*and from a *Terminal* type: “chmod 0755*script.sh*”. Then you can run the script by typing the command: “./script.sh”.

```
#!/bin/bash
# main map names variables
dem=elevation.dem
r=roads
s=streams
# buffer streams and roads variables
_bs=_bstreams500
_br=_broads500
# reclassed buffer streams and roads variables
_rbs=_rbstreams500
_rbr=_rbroads500
#---------------------------------------------------
# General Presentation: Start Monitor 0
#---------------------------------------------------
d.mon start=x0
d.erase color=grey
d.rast map=\$dem
sleep 1
d.vect map=\$r color=brown
sleep 1
d.vect map=\$s color=blue
sleep 1
d.barscale bcolor=white tcolor=black at=30.0,95.0
sleep 2
#---------------------------------------------------
# Buffering: Start Monitor 1
#---------------------------------------------------
d.mon start=x1
d.mon select=x1
d.erase color=grey
r.buffer input=\$s output=\$_bs distances=500
 units=meters --overwrite
r.null map=\$_bs null=0
d.rast map=\$_bs
d.vect map=\$s color=blue
d.barscale bcolor=white tcolor=black at=30.0,95.0
r.buffer input=\$r output=\$_br distances=500
 units=meters --overwrite
r.null map=\$_br null=0
d.rast map=\$_br
d.vect map=\$s color=blue
d.barscale bcolor=white tcolor=black at=30.0,95.0
#---------------------------------------------------
# Reclassification: Start Monitor 2
#---------------------------------------------------
d.mon start=x2
d.mon select=x2
d.erase color=grey
echo "...Reclassify..."
r.mapcalc \$_rbs="if(\$_bs==2,1,0)"
r.mapcalc _s_sl="if(\$_rbs==1,if(slope<=5,2,5),0)"
r.mapcalc \$_rbr="float(if(\$_br==2,-5.0,0))"
r.mapcalc _for="if(vegcover==3,4,0)"
r.mapcalc _for1="if(vegcover==5,1,0)"
r.mapcalc _exp1="if(aspect<45.0 || aspect>314.0 &&
 aspect != 0.0,1,0)"
r.mapcalc _exp2="if(aspect<225.0 && aspect>135.
 0,1,0)"
r.mapcalc _exp3="if(aspect<=135.0 && aspect>=45.0,
 3,0)"
r.mapcalc _elev1="if(\$dem<1400 &&\$dem>1200,2,0)"
r.mapcalc _elev2="if(\$dem<1600 &&\$dem>=1400,4,0)"
r.mapcalc _elev3="if(\$dem>=1600,2,0)"
#---------------------------------------------------
r.buffer input=\$r output=_br100 distances=100
 units=meters --overwrite
r.null map=\_br100 null=0
r.mapcalc _add="float(_s_sl+\$_rbr+_for+_for1+
 _exp1+_exp2+_exp3+_elev1+_elev2+_elev3)"
r.mapcalc _clas="if(_add{>9,1,null())"
r.mapcalc _class="if(_clas==1&&_br100==0,1,null())"
echo "Reclassification...done."
d.rast map="\$_rbs"
sleep 1
d.rast map="_s_sl"
d.rast map="\$_rbr"
d.rast map="_for"
d.rast map="_for1"
d.rast map="_exp1"
d.rast map="_exp2"
d.rast map="_exp3"
d.rast map="_elev1"
d.rast map="_elev2"
d.rast map="_elev3"
d.rast map="_br100"
sleep 1
#r.colors color=grey map="_add"
d.rast map="_add"
sleep 1
d.rast map="_class"
sleep 1
#d.erase
d.vect map="\$s" color=blue
d.vect map="\$r" color=brown
d.barscale bcolor=white tcolor=black at=30.0,95.0
sleep 5
g.remove
rast="\$_rbs,_s_sl,\$_rbr,_for,_for1"}
g.remove
rast="_exp1,_exp2,_exp3,_elev1"}
g.remove
rast="_elev2,_elev3,_br100,_add"}
g.remove rast="\$_bs,\$_br,_clas"}
sleep 1
echo ""
echo "finished"
sleep 1
#---------------------------------------------------
# Clumping: Start Monitor 3
#---------------------------------------------------
d.mon start=x3
d.mon select=x3
d.erase color=grey
g.remove rast=_clump.clump._rclumpnew
r.clump input=_class output=_clump --overwrite
r.colors color=gyr map="_clump"
d.rast map="_clump"
```

```
sleep 1
r.reclass.area input=_clump greater=50
 output=_rclumpnew --overwrite
r.colors color=gyr map="_rclumpnew"
d.erase color=white
d.rast map="_rclumpnew"
sleep 1
d.vect map="streams" color=blue
d.vect map="roads" color=brown
d.barscale bcolor=white tcolor=black at=30.0,95.0
sleep 1
g.remove rast="_clump,_class"
#---------------------------------------------------
# R2V and Export: Start Monitor 4
#---------------------------------------------------
d.mon start=x4
d.mon select=x4
d.erase color=white
r.to.vect -s input=_rclumpnew output=rclump
 feature=area --overwrite
d.vect -c map=rclump type=area color=black
d.vect map="streams" color=blue
d.vect map="roads" color=brown
d.barscale bcolor=white tcolor=black at=30.0,95.0
sleep 1
v.out.ogr input=rclump type=area dsn=QGISDATA
 layer=1 format=ESRI_Shapefile --overwrite
g.remove rast="_rclumpnew"
g.remove vect="rclump"
d.mon stop=x4
d.mon stop=x3
d.mon stop=x2
d.mon stop=x1
d.mon stop=x0
```

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