Digitizing and editing vector layers in v.digit

Below are old instructions I created so that one could digitize the outlines of land elements from a photograph. This instruction sheet is useful for understanding how the vector layer editing proceeds in v.digit and it is important for understanding h ow the digitizing should be done. Unless you are using GRASS and the attached digitizer to make the vector map, you will have already digitzed the lines somewhere else and you'll need to **1) snap the nodes, 2) manually edit unclosed or leacky are as** and then **3) label the outlined areas**. If this is the case read through instructions 1-9 and use them as a guideline for digitizing. Then start with instruction 10 for vector editing.

Instructions for online digitizing using GRASS4.1

September 12, 1994

1. Open Grass in Location/mapset containing the photo/map to be digitized.

2. Start v.digit giving a name for the new vector file.

You will be asked to provide information in a panel as shown below. It is all self-explanatory except for the scale. If you are digitizing from an aerial photograph, use a scale of 1:1 or use the scale of the photographs, such as 1:1600.

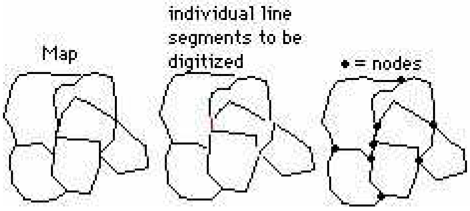
3. The main "menu" of v.digit is shown below. Each option contains about a dozen sub-options which are clearly defined in the manual or you can use the help function on the screen.

```
|--------------------------------------------------------------------|
| GRASS-DIGIT Version  4.10                               Main menu  |
|--------------------------------------------------------------------|
| MAP INFORMATION                        | AMOUNT DIGITIZED          |
|   Name:         v.digit.ex             |   # Lines:        0       |
|   Scale:        1                      |   # Area edges:   7       |
|   Person:       Harbor                 |   # Sites:        0       |
|   Dig. Thresh.: 0.0300 in.             | - - - - - - - - - - - - - |
|   Map Thresh.:  0.0000 units           |   Total points:   87      |
|                                        |                           |
|--------------------------------------------------------------------|
| OPTIONS:                               |                           |
|                                        |                           |
|     Digitizer:     Disabled            |                           |
|                                        |                           |
|                                        |                           |
|                                        |                           |
|                                                                    |
|--------------------------------------------------------------------|
| Digitize  Edit  Label  Customize  Toolbox  Window  Help  Zoom  Quit  *  !  ^|
|                                                                    |
|                                                                    |
|GLOBAL MENU: Press first letter of desired command. [Upper Case Only]|
|--------------------------------------------------------------------|
```

4. From the Customize Menu (to get it, type a captial **C** when you from the above menu) you will choose **B** to have GRASS portray the aerial photo scan in the **background** so that you can digitize from it. Type a lower-case **q** to q uit the Customize menu.

5. **D** selects the digitize menu. You will be digitizing in **point** mode, where you must depress the mouse for each point. Stream mode allows you to keep the mouse depressed and GRASS records a point after it has moved a pre-set distance. Str eam mode is disabled when digitizing from the screen.

Area edge lines are what we will use to digitize the maps. The other modes are disabled when using the screen digitizing option. Given a map that contains boundary lines between different units, one must digitize it such that each unit is completely en circle but each line is only digitzed once. This is done by digitizing separate line segments and connecting them at junctions, which are known as **nodes**. This is illustrated below.



Prior to digitzing, it may be helpful to mark the nodes on the map to be digitized so that the line segments or arcs are clearly shown. Once you have made line segment, you can **cut** it or place a node along the line. **NOTE**, it is much much much easier to to make sure that you include sufficient notes during the digitizing mode rather than in the editing mode.

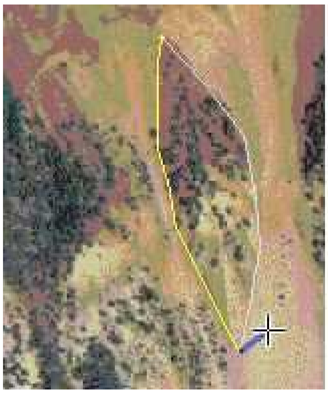
6. Select the area you are going to work in and zoom in on using the zoom menu. Once you have an enlargement you like to work with, you can move around on the map by using the **pan** menu within the **Zoom** menu. (type **Z** from almost any menu)

```
|
|Buttons:
|Left:   Select new window
|Middle: Abort/Quit
|Right:  Zoom/Pan MENU
|
```

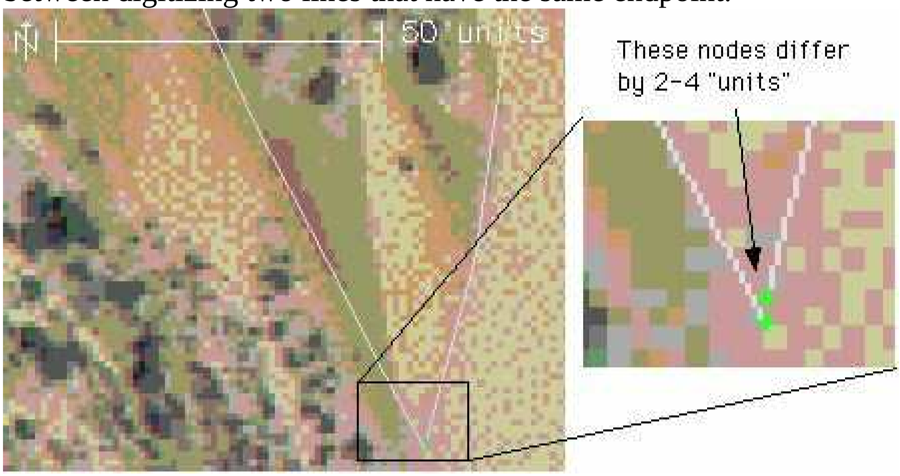
Panning allows you to move without changing the zoom.

7. Begin digitizing by selecting **D** from the main menu, then pressing the space bar to activate the digtizing mode. Following the instructions for adding or removing points and accepting line segments, begin digitizing at a node and follow, using as many points as necessary, the outline of the map unit. Not until you select **stop digitizing** will the second node be located. All the intermediate points belong only to that line and cannot be used by any other lines. Nodes will appear as green dots. It is preferable to have many more points than necessary than to have too few. More points is helpful if you have to use the edit menu to move any of the points or cut the line to make a node. The yellow line shows the "completed" portion and the purple line connects the last point to the cursor.

The picture below shows the second line in the process of digitized; it started at one of the nodes of the first line and ended at the other. After digitizing the last point, depress the right mouse button (for **stop digitizing**) and it will be ma de into a node.



8. It will be virtually impossible for you to place new line endpoints exactly on the old nodes (see below). These **overshoots** or **undershoots** will create an unclosed or **leaky** area. Nodes with only one line coming out are green where as nodes that serve as the endpoint for multiple lines are plotted in red. Get as close as you can without wasting a lot of time positioning the mouse exactly. One hint is to not move the mouse i between digitizing two lines that have the same endpoint.



´9. Save your work frequently using the **Tools Menu** and selecting the "**write out session"** option.

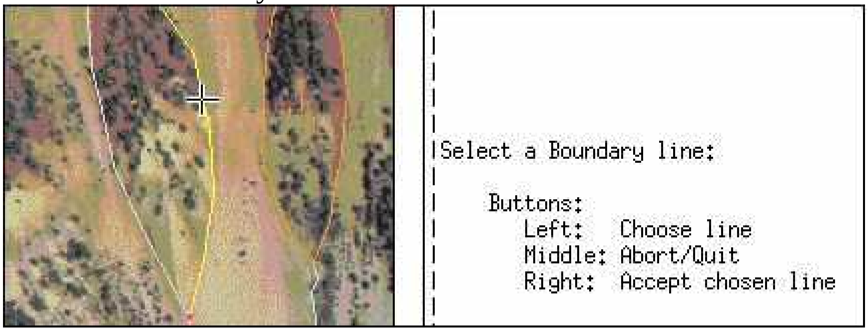
10. Once you have outlined all of the units in a portion of the map, you must **snap** those **near** but **not coincident** nodes onto each other. This can be done one node at a time in v. digit, but it can be accomplished for the entire map simultaneously using another routine in GRASS called **`v.support`**. You must exit **`v.digit`** prior to running v.support. **CAUTION: Make a copy of your file (using g.copy) before you proceed with v.support. Indeed it is w ise to make backup's of your file as you work on it in case the inevitable screw-up happens.**

11. Run v.support. The option you must choose is to build the **topology** for the vector file (the topology defines how it is pieced together). You will be asked whether you want to **snap** points, and thereafter, how close the threshold should be. Use a size < 10 units, especially if there are >2 unsnapped nodes in close proximity. I have had luck with five units as a snapping threshold.
Note: If you are running v.support on a map digitized from a 1:24000 sheet, choose a number like 50 m to start, and increase it if that doesn't work.

When this process is complete, re-enter v.digit to label areas.

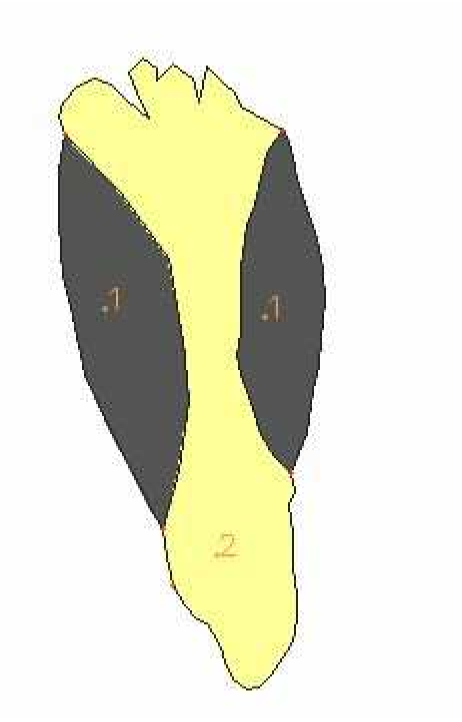
12. Now that you've encirlced all the areas on the map with closed polygons, you must label the interior of the area.(NOTE: if you created the digitized lines on the Mac, and if they are to be the edges of areas, you must first **retype** the lines to area edges. This is done within the edit menu.) While in the **Label Menu,** you can choose the **Toolbox Menu** and then select the option to display all the leaky or **open area lines**. This display helps illustrate where there will be problems with leaks.

Labeling an area is a three step process. Choose the location for the label, select one of the boundary lines, and then accept the area. Do all the areas of one unit and then change unit numbers. Follow the instructions carefully.



13. Once you have completed the entire area, exit v.digit and re-run v.support to edit the category (map unit label) file for the map. Following the prompt, enter the largest number for the units you used. Then fill in the blank with the name of the ma p unit that corresponds to each category.

´ 14. These categories and the vector map overlay can then be used to make a digital geologic (or whatever)map. First use the vector file to create a raster background map using the command**`v.to.rast`**. (I copied the figure below f rom the view in v.digit.) Then overlay the vector (border) map on the raster map.



When you're done, go back the the [Tutorial Page]

[HELP: send e-mail to harbor]