

Mapping Guide Appendix

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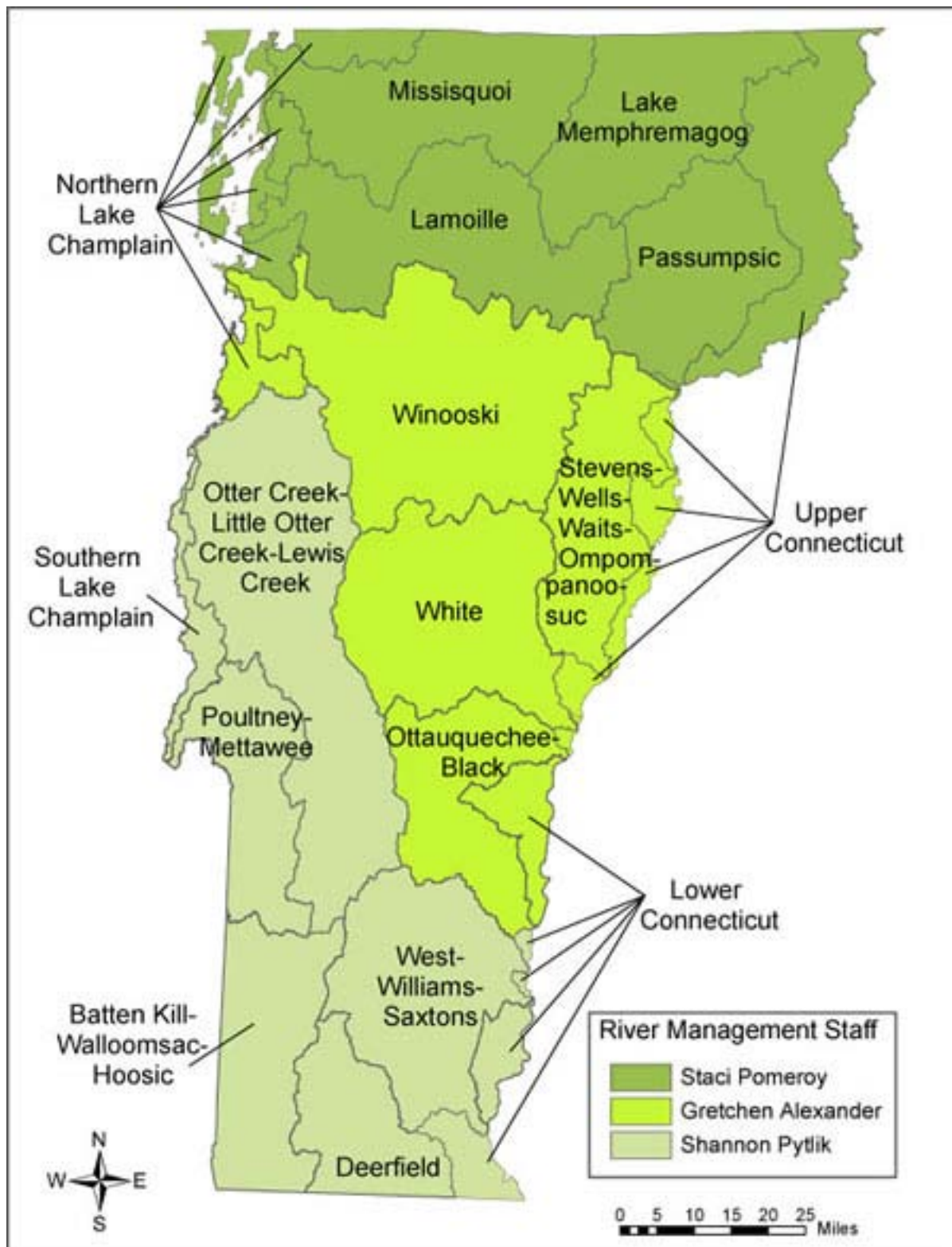
I. Acquiring Data

Data Locations:

1. Your regional river scientist
2. The River Management Stream Geomorphic Assessment Tool (SGAT)
3. The River Management Online Data Management System (DMS)
4. The Vermont Center for Geographical Information (VCGI)
5. Your local Regional Planning Commission (RPC)
6. The River Management FTP site

Required Data:

Source	Data
DMS	Phase1MappingExport.dbf
	Phase2MappingExport.dbf
SGAT Derived Data Folder (Project Folder)	S05swfinaldslv
	Seg01swseg
	S06rtps
	S09corridor
	Fit01ptimpactseg
	Fit01lnimpactseg
	S11sw
	S15WR emergency roads line.dbf
SGAT Base Data Folder (Project Folder)	Subwatershed theme (<i>User Created</i>)
VCGI	Vermont Road Data (<i>E911 recommended</i>)
	Vermont House and Driveway Data (<i>E911</i>)
	Ortho Photos (<i>NAIP recommended</i>)
	Vermont NWI Wetlands Maps
	Vermont State Political Outline
FTP	Corridor Plan Style
RPC	Parcel Data



Data Requirements:


If you are making a *Land use and Land cover map* you will need to use the S15WR_emergency_roads_line.dbf. This dbf is created by SGAT step 15. Check the “derived folder” in the SGAT project to see if this step has already been run. If not, this means you must have ArcView GIS 3.x, the extension (SGAT 4.59) and the most up to date SGAT project. If you are missing any of these, please contact your regional river scientist.

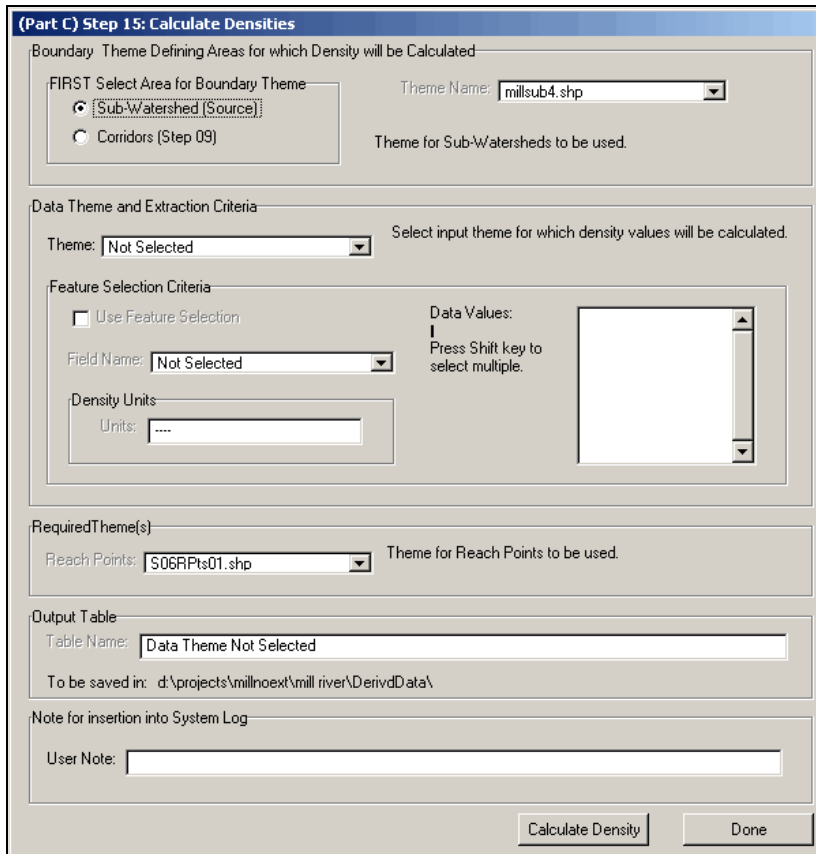
SGAT STEP 15:

When starting SGAT select the  button.

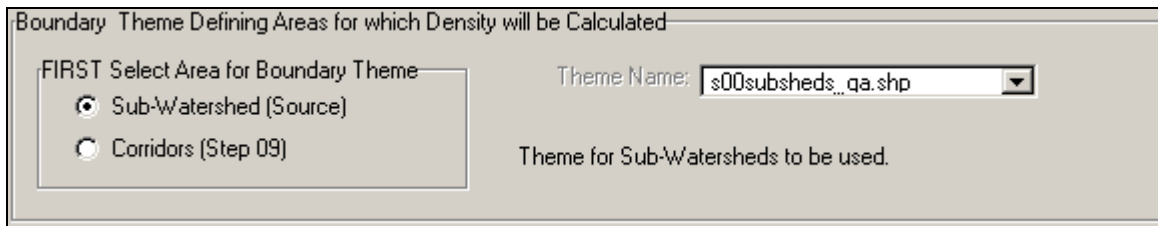
Because we want to conduct a density analysis, next choose the

 button

Now select . This will bring up the “(Part C) Step 15: Calculate Densities” window

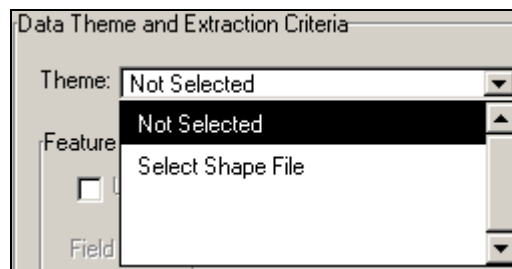


We are interested in the densities within the Sub-watershed boundary, so select the “Sub-Watershed (Source)” circle.



Once this is selected you must select the “Data Theme and Extraction Criteria” (the road shape file).

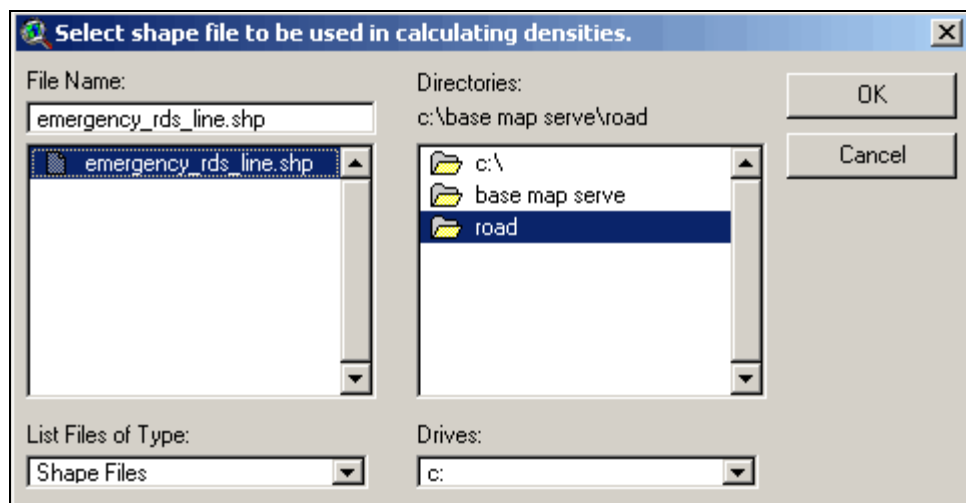
Click on the “Theme” drop-down arrow and choose the “Select Shape File” option.



When you choose “Select Shape File” from the drop down menu, the “Select Shape File” to be used in calculating densities.” window pops up.

For the sake of uniformity, we ask that everyone uses the Emergency E911 Roads File.

Navigate to the location where you have the E911 roads layer saved on your computer and press the “OK” button.



This will bring you back to the main “(Part C) Step 15: “Calculate Densities” window -Here you can see that an “Output Table, S15WR_emergency_rds_line.dbf and S15WU_emergency_rds_line.dbf” will be saved in your projects Derived Data folder.

Output Table

Table Name: S15WR_emergency_rds_line.dbf and S15WU_emergency_rds_line.dbf

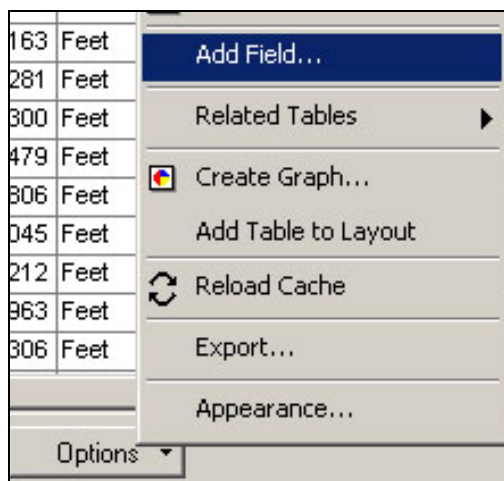
To be saved in: c:\projects\castleton\sgat_fit project files\DerivdData\

Calculating density:

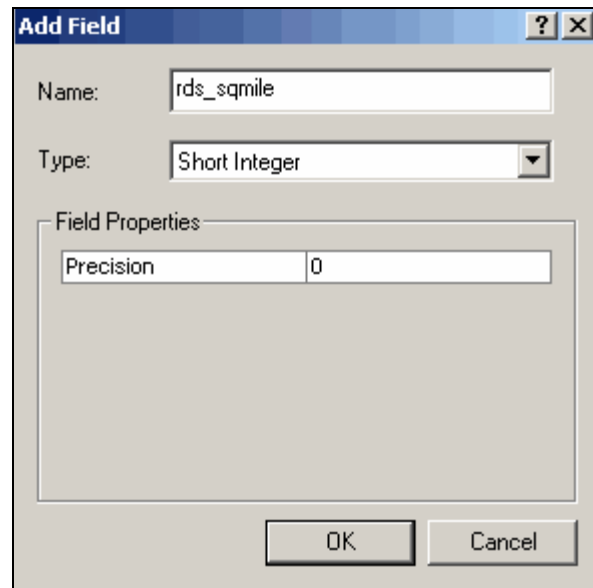
Add the “S15WR_emergencyroads.dbf” to your ArcGIS 9x project.

When SGAT created this “density” dbf, it didn’t actually create a density output; instead the dbf has a data column for area of subwatershed (ft²) [GEOSWAREA] and total length of roads per subwatershed (ft) [NUMUNITS]. For these maps we are interested in the density of Roads per subwatershed mi² (or another way of saying it is, miles of road per square mile of subwatershed (area)). In order to get this information we must do a simple calculation.

First open the attribute table for “S15WR_emergencyroads.dbf” and select “Options” → “Add Field...”



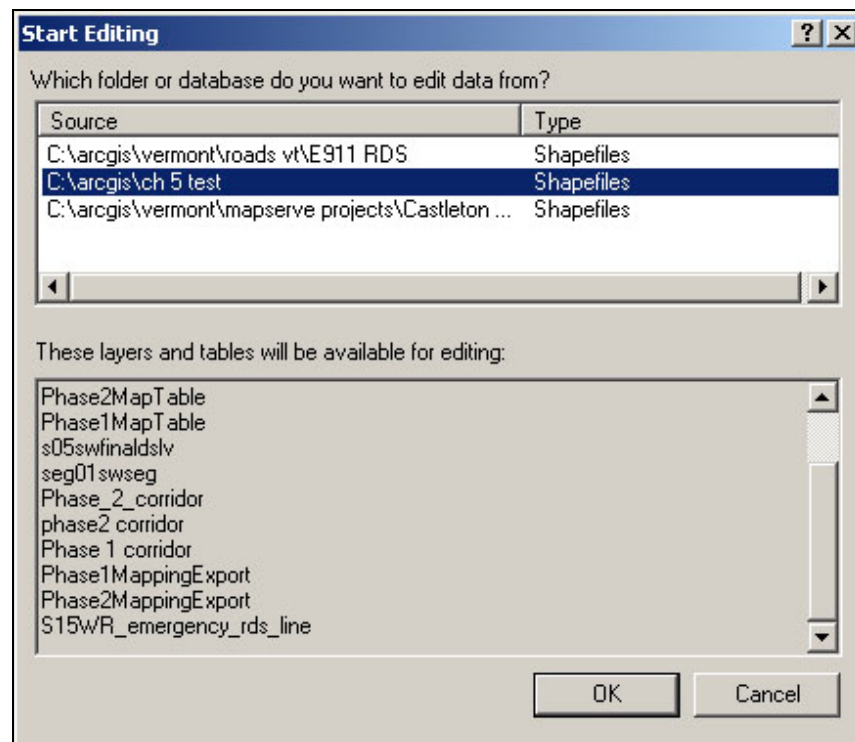
This will bring up the “Add Field” pop up window. Enter the “Name:” “rds_sqmile” and the “Type” “Short integer”



Press the “OK” button.

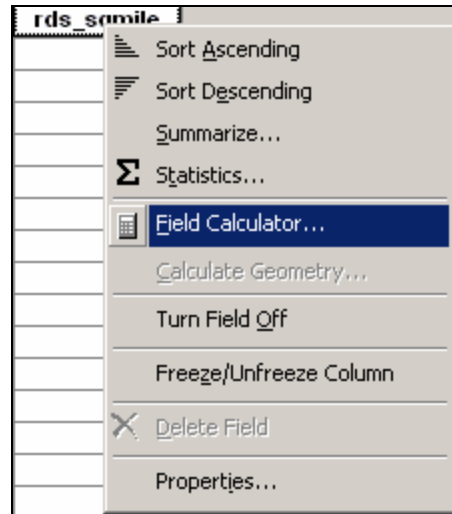
Now we have a new column. We want to populate this column with a calculated value. In order to do this we need to start editing this layer.

Open your editor toolbar. Choose “Editor”→ “Start Editing” and select the location where this dbf is saved. Make sure you see the “S15WR_emergency_rds_line” in the list of layers and tables available for editing.



Press the “OK” button.

Right Click on Field heading “rds_sqmile” and select “Field Calculator...” from the dropdown menu.



This will bring up the “Field Calculator” window. We want to write an equation that both divides the road length per subwatershed and by the area of the subwatershed and converts feet to miles.

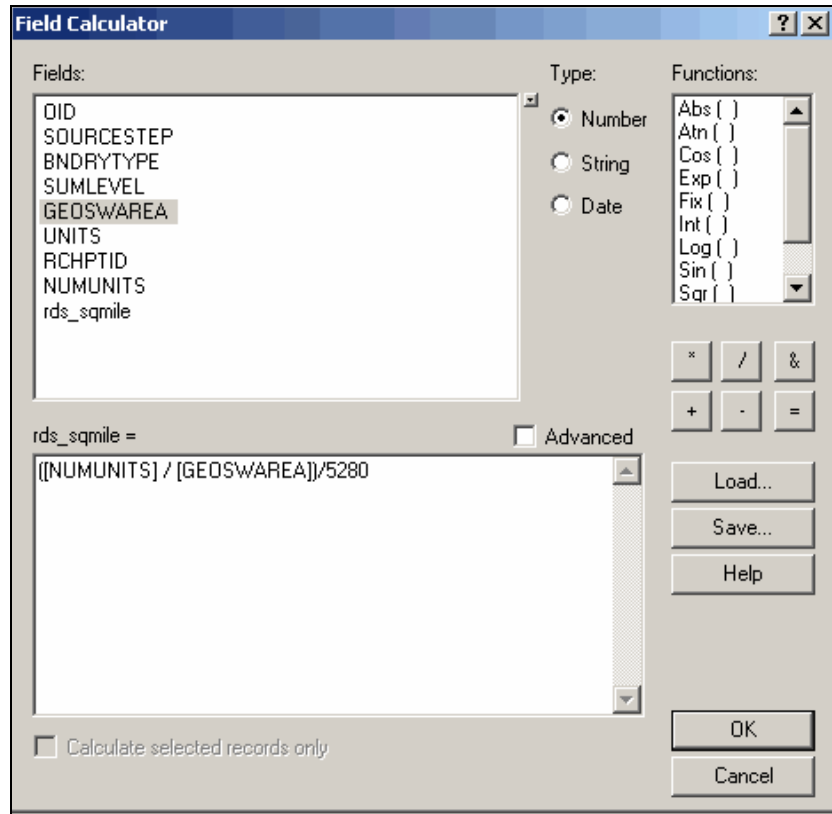
Type “(” and double click on “NUMUNITS” field, so that it populates the lower window.

Single click on the divide symbol

Now double click on the “GEOSWAREA” field and type “)”

Again single click on the divide symbol and type “5280” (this is the number of feet per mile)

Your equation should look like the one seen below.



Click on the “OK” button and this will populate your new field with road density values.

DMS:

Login to the DMS (<https://anrnode.anr.state.vt.us/ssl/sga/security/frmLogin.cfm>), using your user name and password.

Export Tables (dbf):

Select projects from the top menu

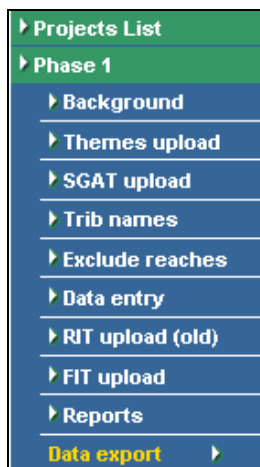


Choose Phase 1 from the menu in the left column and then in the main window navigate to your project

Once your project is open, select “Data Export” from the left column. This will bring up the “Export Phase 1 Data” page.

Before you export the data for Phase 1, be sure to check the “SGAT Upload” tab to see if the “S14LW12” table has been uploaded. If the table has not been uploaded, you will need to check

the SGAT “derived folder” to see if it has already been created. If not run SGAT Step 14 for the LuLc of the individual sub-watersheds to generate this table; then upload the “S14LW12” to the DMS. This table is needed to have accurate data for the Land-use/Land-cover map described on page 32. After the table has been uploaded into the DMS, you can export the Phase 1 data.



Here you will click on the “Export” button for the File called “Phase1MappingExport.dbf”. This will bring you to the “Phase 1 Exported DBF files for Project X” page.

Dataset	Description	Filename	Field List	Action
All data	The complete list of Phase 1 fields	Phase1.dbf	View	Export
Phase 1 Mapping Source	The list of Phase 1 Map Serve fields.	Phase1MappingSource.dbf	View	Export
Phase 1 Mapping Export	The list of Phase 1 Map Serve fields without extras	Phase1MappingExport.dbf	View	Export

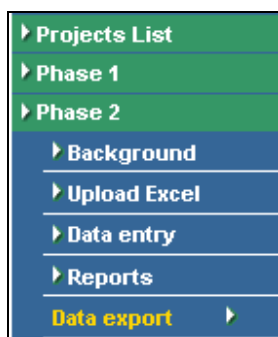
You are only interested in the “Phase1MappingExport.dbf”, so right click on it and choose “Save Link As...” (or “Save Target As...”)

File Name	File Size	Date Exported
PHASE1.DBF	170,402 kb	04/13/2007 11:53
Phase1MappingExport.dbf	41,356 kb	07/20/2007 11:10

[Open Link in New Window](#)
[Open Link in New Tab](#)
[Bookmark This Link...](#)
[Save Link As...](#)

Select Phase 2 from the left column and again navigate to the project you are working on.

Once your project is open, select “Data export” from the left column. This will bring up the “Export Phase 2 data” page.



Click on the “Export” button for the File called “Phase2MappingExport.dbf”. This will bring you to the “Phase 2 Exported DBF files” for “Project X” page.

Dataset	Description	Filename	Field List	Action
All data	The complete list of Phase 2 fields	Phase2.dbf	View	Export
Controls	Grade control data for Phase 2	Controls.dbf	View	Export
Constrictions	Channel constriction data for Phase 2	Constrict.dbf	View	Export
FEH data	SGAT data for Flood Erosion Hazard	StrmCorDat.dbf	View	Export
Phase 2 Mapping Source	The list of Phase 2 Map Serve fields.	Phase2MappingSource.dbf	View	Export
Phase 2 Mapping Export	The list of Phase 2 Map Serve fields without extras.	Phase2MappingExport.dbf	View	Export

You are only interested in the “Phase2MappingExport.dbf”, so right click on it and choose “Save Link As...” (or “Save Target As...”)

File Name	File Size	Date Exported
Phase2.DBF	41,354 kb	11/08/2006 08:25
Phase2MappingExport.dbf	31,270 kb	07/20/2007 11:27
StrmCorDat.D	8,328 kb	08/28/2006 08:28

Open Link in New Window

Open Link in New Tab

Bookmark This Link...

Save Link As...

Be sure to open and look at the Phase 1 and Phase 2 export tables prior to working with them in the next steps. It is valuable to review the tables to make sure the data was exported as expected and that there are no obvious errors in the tables (for example data missing from a reach you were expecting there to be data for) before getting too far into the process.

Vermont Center for Geographical Information VCGI:

If you do not already possess road data, building data or ortho-photography for the project, navigate to <http://www.vcgi.org/dataware/> here you can access road data for the entire state.

Using the “Theme” pull down menu, navigate to the transportation networks page.

A screenshot of a web interface titled "Theme". It features a pull-down menu with "Transportation Networks" selected. To the right of the menu is a "Go" button.

Download the data layers with file names “EmergencyE911_RDS”* and “EmergencyE911_ESITE” (These are free downloads). These downloads provide you with roads and data for houses driveways, phone booths, and hydrants.


If you do not have NWI wetland data, navigate to the “Freshwater Resources” page.

Download the theme called “WaterWetlands_NWI”. These are the national wetland inventory maps for the state of Vermont. This would be a very large file for the entire state, so VCGI has broken it down into quads (make sure to get all of the themes that cover your project area).

If you do not have a political outline of Vermont, navigate to the “Boundaries (Admin – Political)” page.

Download the theme called “BoundaryState_VTBND”. This is an outline for the entire state of Vermont

*, “EmergencyE911_RDS.zip”, “EmergencyE911_ESITE” and Wetlands are folders that have been compressed or “zipped. Zipping is a file compression technique, designed to make files more manageable. Once this file is downloaded to your computer you must un-zip it. If you do not currently possess the ability to un-zip a folder please download WinZip from www.winzip.com (\$29.95) or another zipping utility.

10) If you do not possess ortho-photography for your project you will be able to order a DVD of 2003 NAIP Photographs for the entire state (\$150). Navigate to the theme page for Imagery and Photographs and click on the “more info”  button for NAIP2003.

A screenshot of a web interface titled "Theme". It features a pull-down menu with "Imagery and Photographs" selected. To the right of the menu is a "Go" button.

If paying \$150 is not feasible contact your regional river scientist or your local RPC for another option.

Local RPC:

If you are making the Sediment regime departure map it would be helpful to have the Parcel data for your projects watershed.

This data is not available though the VCGI website.

Contact your local RPC and ask for the shape file of parcel data.

The FTP Site:

Navigate to <ftp://ftp.anr.state.vt.us/> and login. If you do not possess the proper login information, contact your regional river scientist.

Once you are logged in, navigate to the folder called “corridor plan”. Save the contents of this folder on your computer in the same location you have saved everything else.

In this folder there is a file which contains symbology for each line and point file you will be creating for each map. If you feel that the provided symbology does not fit your needs feel free to symbolize as you see fit. You are not required to use the provided symbology. By using the symbology provided the symbols will offset correctly from the stream to help better display your data. If you chose not to use the provided symbology, you may want to look at offsetting your symbols from the stream line to better display your data.

II. Getting Started

Note: the maps can be developed using *other* GIS mapping software, however the images and instructions below were developed using ArcGIS 9.3.

Open a new ArcMap9x project.

Setting the projection:

Right click on the “Layers” data frame and select properties from the drop down menu. Select the “Coordinate System” tab and in the lower box select a coordinate system in “Predefined” → “Projected Coordinate Systems” → “State Plane” → “Nad 1983” → “NAD 1983 State Plane Vermont FIPS 4400”.

Click the “OK” button.

Add all layers to the project, (S15WR emergency roads. dbf, Phase1MappingExport.dbf, Phase2MappingExport.dbf, S05swfinaldslv.shp, Seg01swseg.shp, S06rpts, S09corridor.shp, Fit01ptimpactseg.shp, Fit01lnimpactseg.shp, S11SW.shp, SubWatershed.xxx, Vermont Road Data (E911 recommended), Vermont House and Driveway Data (E 911), Ortho Photos (NAIP recommended), Vermont NWI wetland layer and the Vermont State political outline.), Vermont State Political Outline, Parcel Data.

Click on “Tools” from the upper menu. Select “Styles → Style References” from the drop down menu. Click on the “Add” button and then navigate to the “Ch5_Map” style. Click “OK” followed by “OK”.

Note: if you are making a LU/LC map you must run SGAT step 15 (Calculate features densities for selected boundaries)

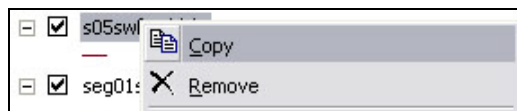
Save the Project! Follow the old adage “save early, save often! This will save you much heart ache and consternation.

Creation and Joining of Tables

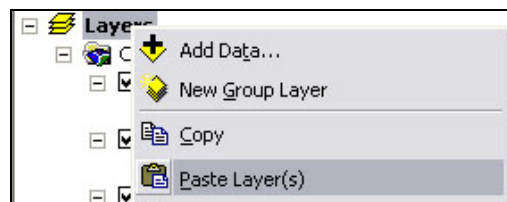
Create new data layer by joining “s05swfinaldslv” to “Phase1MappingExport.dbf”.

Join using “REACHPTID” field. Rename this layer for future recognition. Rename this layer: “Phase1MapTable”

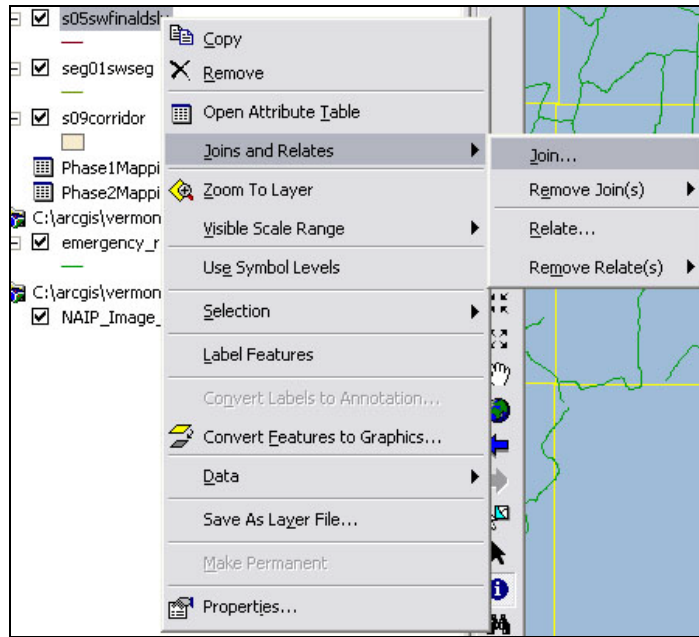
Right click on the s05swfinaldslv shape file and select “Copy”.



Right click on the data frame (Layers) and select “Paste Layer(s)”



Right click on the new “s05swfinaldslv” layer and select “Joins and Relates” → “Join”.



This will bring up the Join Data window. For option #1 “Choose the field in this layer that the join will be based on:”

Choose “RCHPTID”

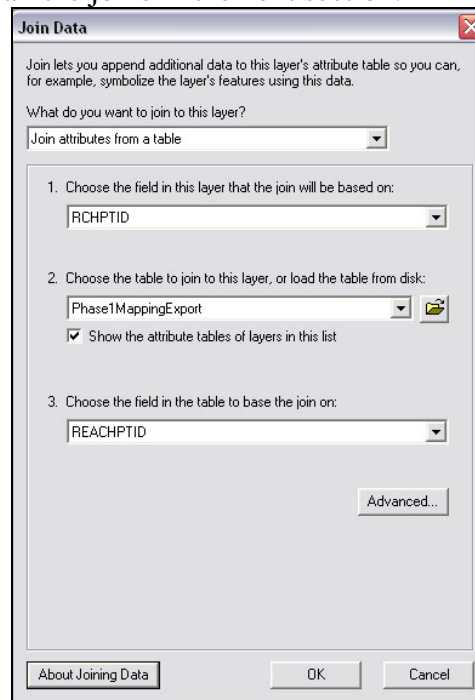
For option #2 “Choose the table to join to this layer, or load the table from disk:”

Choose “Phase1MappingExport”

For option #3 “Choose the field in the table to base the join on”

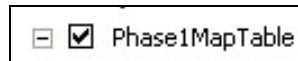
Choose “REACHPTID”

Follow these directions for all the joins in the next section.



The click “OK”

In order to recognize this layer in the future rename this layer: “Phase1MapTable”



Create new data layer by joining “seg01swseg.shp” to “Phase2MappingExport.dbf”. Join using “PH2SEGID”. Rename this layer for future recognition. Rename this layer: “Phase2MapTable”.

Create new data layer by joining “s09corridor.shp” to “Phase1MappingExport.dbf”. Rename this layer for future recognition. Rename this layer: “Phase1CorridorMapTable”. Follow “join” directions provided above.

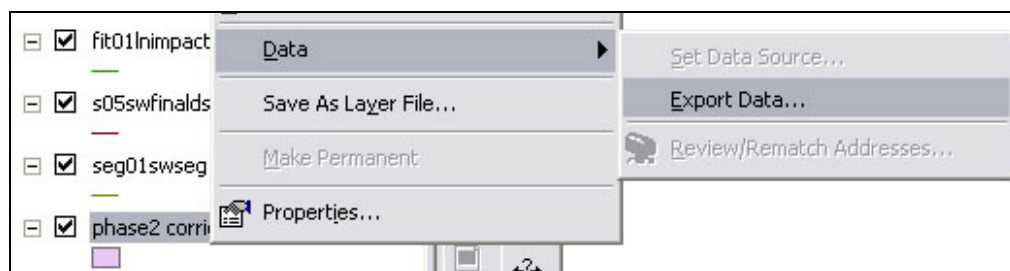
Create new data layer by joining “subwatershed” to “Phase1MappingExport.dbf”. Rename this layer for future recognition. Rename this layer: “Phase1Subshed”

Note: Be sure to open and look at the attribute tables of the new data layers after you have done the joins to see that the data was joined correctly before moving on to the mapping.

Create new data layer by joining “subwatershed” to “S15WR_emergencyroads.dbf”. Rename this layer for future recognition. Rename this layer: “Roads Subwatershed”

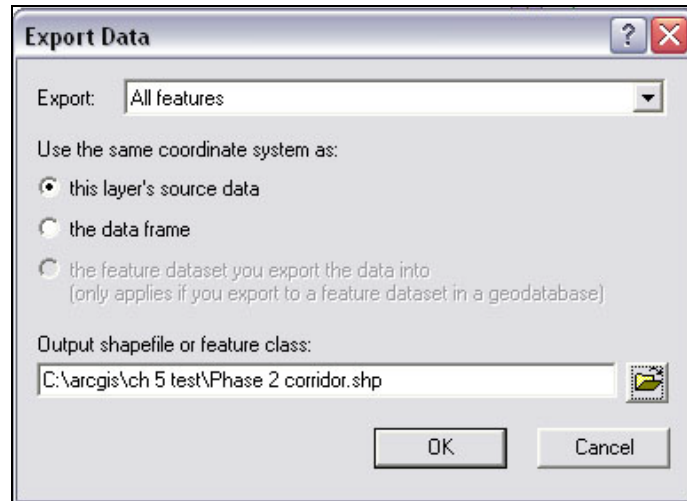
Create new data layer by editing “s09corridor.shp” to include segment breaks developed in Phase 2

Now because we are editing the shape file we must make this a new shape file (in order to preserve the non-segmented s09corridor shape file). Right click on one of the “s09corridor layers” and select “Data” and “Export Data” from the drop down menu.



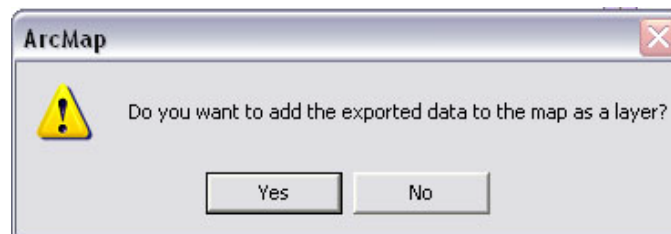
Export “All features” using the “layer’s source data” for the coordinate system (though the data frame should have the same coordinate system).

Choose a location where you want the file saved on your computer (we recommend keeping all your data in the same location). Rename this layer: “Phase_2 _corridor”

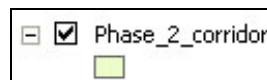


Click the “OK” button.

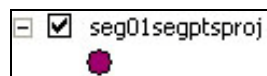
A pop up window will ask you if you would like to add this data to the map as a layer. Click “Yes”.



This layer will be added to your table of contents.

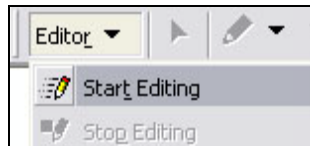


We are going to modify (segment) the corridor based on the Phase 2 segment points, so change your “seg01segptsproj” (segment points) symbol to something larger and recognizable.

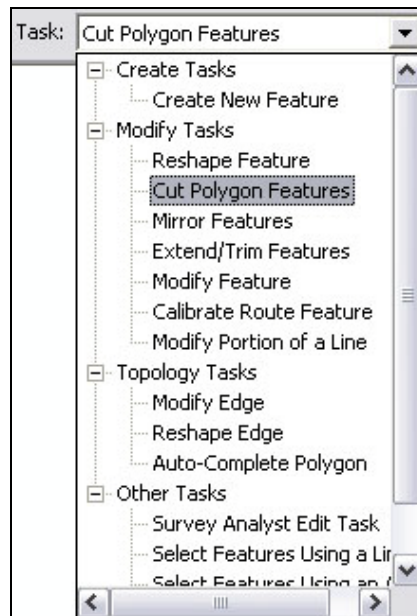


Editing:

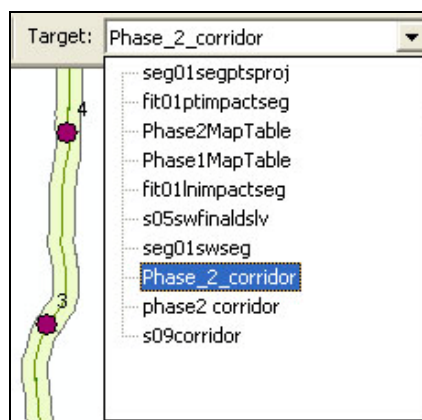
If your editor window is not already open. Select View → Toolbars → Editor.
Left click on the Editor button and select “Start Editing”.



Choose the “Cut Polygon Features” option from the “Task:” drop-down menu (found under the subheading “Modify Tasks”).




Make sure you select the proper layer from the “Target” drop down menu.




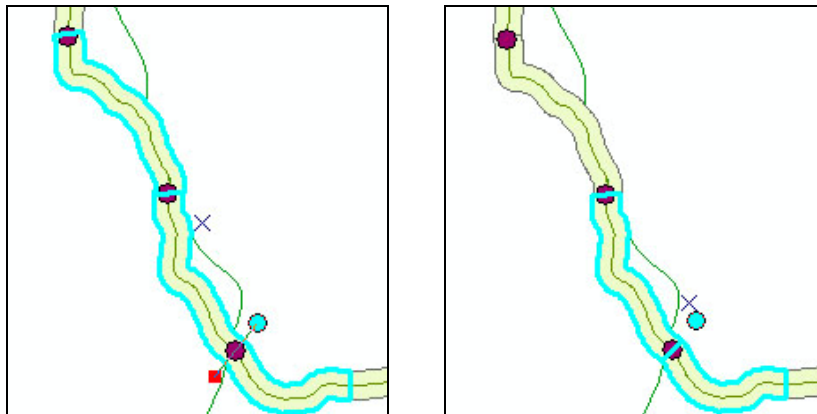
Your editor tool bar should look like this.



Select the “Edit Tool” (the arrow-like pointer)

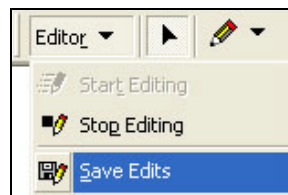
Use this  tool to select the polygon that you want to segment. This will create a halo (usually yellow or blue in color by default) outlining the polygon you selected.

Once the polygon is selected, change to the  “Sketch Tool”. Use this tool to draw a line that cuts the polygon at the segment point. First click once on one side of the polygon (creating a red square) and drag the mouse to the other side of the polygon. Make sure the thin gray line falls on top of the segment point. Double click on the opposite side. This will segment that shape and add a new entry to the attribute table.



Repeat these editing steps slicing the “Phase_2_corridor” at all the segment point locations for your project.

Remember to save your edits often by left clicking on the “Editor” button and selecting “Save Edits” from the drop down menu.



Once all polygons cuts have been made, we must rename the new polygon with phase 2 segment names. Open the attribute table for the “Phase_2_corridor”.

If there were no segments made within a reach the segment will not need to be edited.

Make sure the attribute table window is small enough so that you can look at the “Phase_2_corridor” in the back ground.

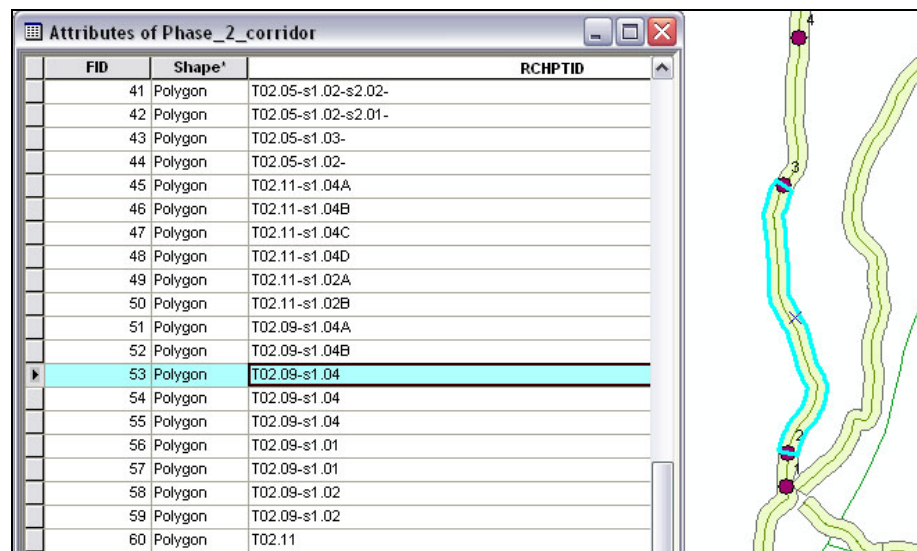
Select a single entry in the table by clicking on the gray box to the far left on the entry. This will highlight the feature in the table and in the background map.

Navigate to this location of the map.

Looking at the entire reach, figure out where this segment is located on the reach, e.g. “A” “B” , “C” etc.

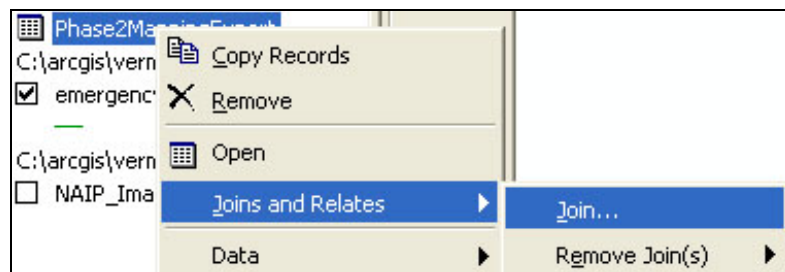
Below you see a table with the Feature ID 53 highlighted. On the map the feature is also highlighted. This Segment is located between the 2nd and 3rd segment points (seg01segptsproj) from the downstream end. This means that it is the 3rd segment or segment “C”.

Click the curser inside of the “RCHPTID” field for this feature and add the letter “C” to the T02.09-s1.04 so that it reads T02.09-s1.04C.



Repeat this until all segments are renamed in the “RCHPTID” field.
Save your edits and stop editing.

Right click on the “Phase_2_corridor” and select “Joins and Relates” → “Join” from the drop down menu.



This will bring up the Join Data window. For option #1 “Choose the field in this layer that the join will be based on:”

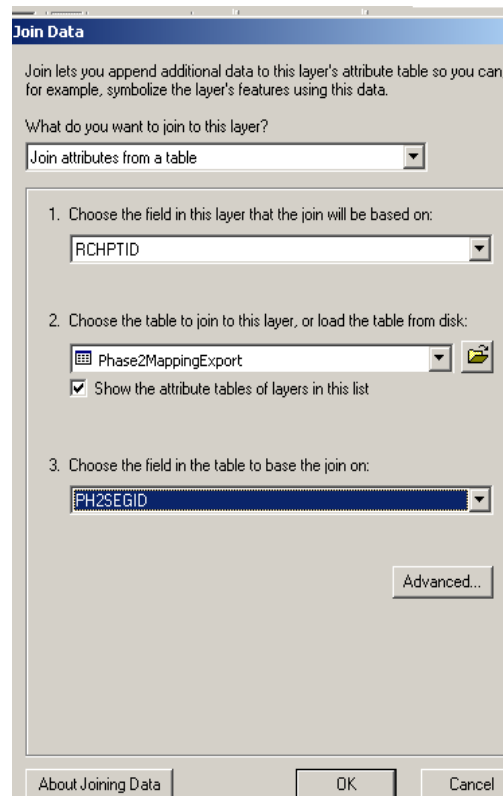
Choose “RCHPTID”

For option #2 “Choose the table to join to this layer, or load the table from disk:”

Choose “Phase2Mapping Export table”

For option #3 “Choose the field in the table to base the join on”

Choose “PH2SEGID” (this is the field that you just modified to hold the Phase 2 segment IDs)



Click “OK”

Displaying Unique Data From Within Data Sets:

In ArcMap there are two ways in which you can display unique data. You can either set a definition query or use a unique value in symbology (both options work equally as well). These directions require the user to know how to do both.

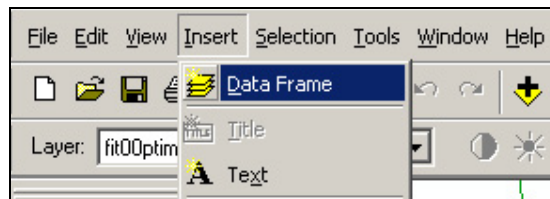
If you have questions about setting definition queries or symbology please refer to the ArcMap 9.x help menu, or contact your regional scientist.


IV. MAPS

Location Map

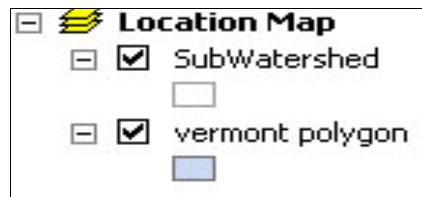
In order to have a Location or Reference Map shown in layout view we must make this map as a separate data frame.

Select “Insert” → “Data Frame” from the upper menu

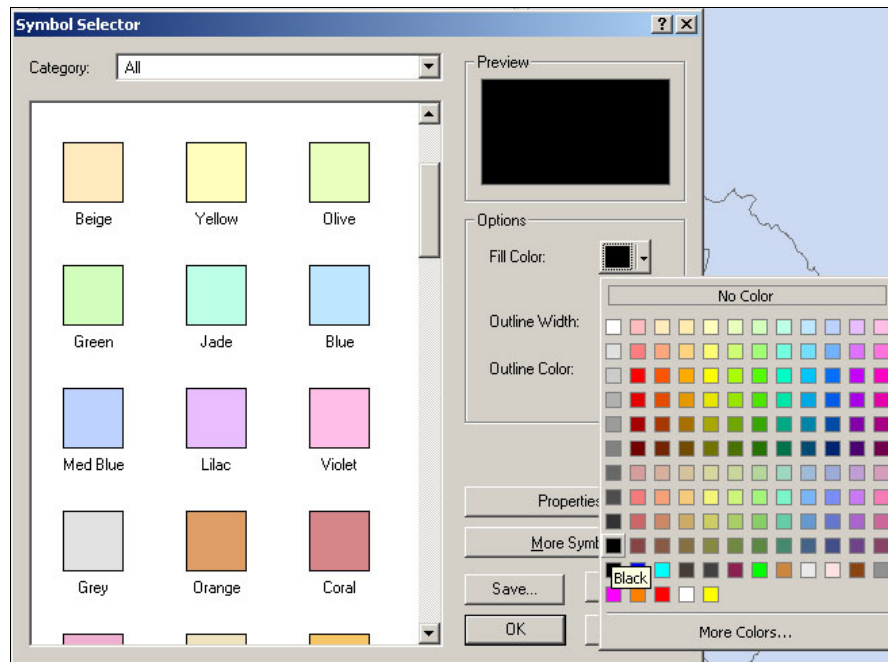


The new data frame will appear in your table of contents. Rename (by left clicking once to highlight “New Data Frame”, clicking a second time and then typing over this and hitting enter) this data frame “Location Map”  **Location Map**

This data frame is going to show the location of the sub-watershed overlain on the entire state of Vermont. To do this, add the political Vermont boundary shape file and the SubWatershed shape file.



Change the fill color for “SubWatershed” to black by single clicking on the map symbol in the table of contents and then selecting black from the color pallet drop down menu. Click “OK”.



Click on the zoom to full extent button  to see the entire state of Vermont.

Note: For the next series of maps, data needed for the maps will be shown in a couple formats, 1) a list of data layers and the number of copies needed for each layer, and 2) a “mapping data” table.

The “mapping data” table provides you information about why certain parameters are used, the range of values a parameter may have, and the export code used for that parameter in the Phase 1 and/or Phase 2 export tables.

Data calculations and/or normalizations that are described in the “attribute information” column for the “mapping data” table have already been done in the DMS. The Phase 1 and Phase 2 export tables contain the appropriate data values needed for each map.

For each map the “mapping data” table may have several parameters listed. Many of them contain an “and/or” descriptor. This is an indication that the user may chose to show either both types of data described, or may chose to only show one of the parameters; depending on which parameter (or both parameters) best displays the data. The “or” parameter indicates that there are several display options available. For those with an “and”, include all the data suggested.

Use your best judgment when making these maps as to how to display your data so that you can read and use the maps. If you can not create the maps such that you can read and use the data, change the map, for example: try reducing the amount of data displayed and spread the information over a few maps instead of on one; or change the scale of your maps – you may choose to show your watershed over a couple maps so that it is a larger scale. Map size can be an important aspect of cartography. When displaying data at the reach scale data, 8x10 maps are

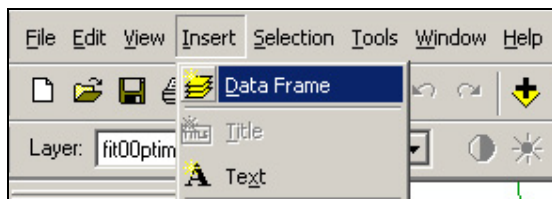
adequate, but 11x17 maps should be used, if possible, for watershed scale maps. The goal of these maps is to help display your data in a visual format; allowing you to look at your data in a comprehensive way. Attention to format and mapping techniques will help you in the long run use the maps and the data more affectively.

You may or may not have all the parameters/impacts discussed for the map in your watershed. It may be valuable to note those features not present in the map legend and/or in the Corridor Plan section that discusses the results of the map.

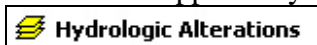
Hydrologic Alterations Map:

The hydrologic alterations map will show stormwater input data, number of stormwater inputs per mile, dams, flow regulations, and upstream flow modifications.

To keep the map organized we recommend that you create a new data frame for this map. Select “Insert” → “Data Frame” from the upper menu



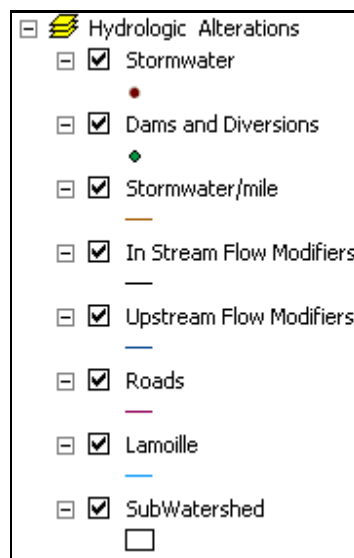
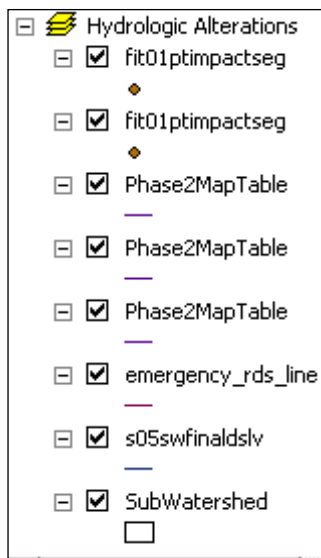
The new data frame will appear in your table of contents. Rename this data frame “Hydrologic Alterations”



Copy and paste all the data layers need for this map.

# of copies	Data
2	Fit01ptimpactseg
3	Phase2MapTable
1	Emergency Roads Line
1	S05swfinaldslv
1	SubWatershed

Note: Rename the data layers so that they represent the data being displayed

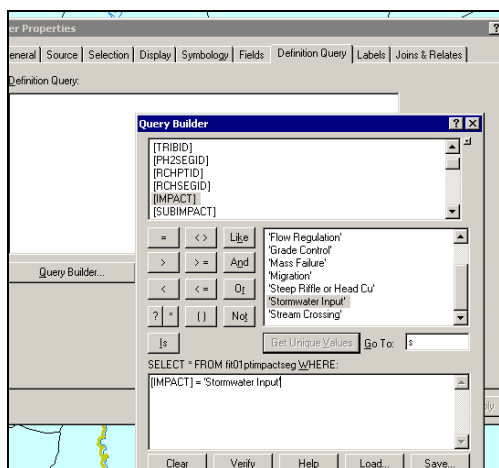


Mapping Stormwater Data:

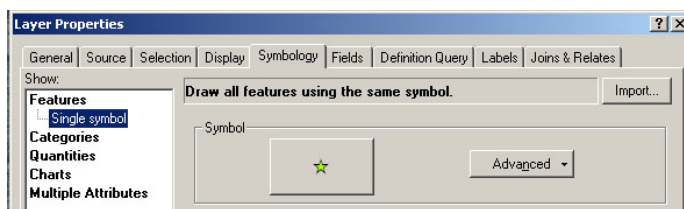
SGAT Feature Type	Attribute Information
FIT point data	Storm water discharges – the indexed ditch outlets, culverts, or pipes collecting and conveying stormwater to the segment (or reach)
AND/OR Stream segment - line data	Phase 2 data (Steps 4.6) attributing the segment line to indicate the number of storm water inputs ($0 \leq 2$; $>2 \leq 5$; >5)* Export Code: STRM_RNG * note: normalized values - # storm water inputs(5,280)/segment length
Additional Resources	
Storm water outfalls inventories – point data obtained through DEC Storm water Section, regional or municipal planning agency	

Use the “Stormwater” data layer to display any points that have an “Impact” equal to “Stormwater input”. Set the definition query to “Impact = Stormwater input” or by categorizing by “Unique Value” in “Symbology” based on the “Value Field” “IMPACT”. Add the value “Stormwater input”:

Be sure to uncheck the “all other values” field, so you only display the impact you are interested in.



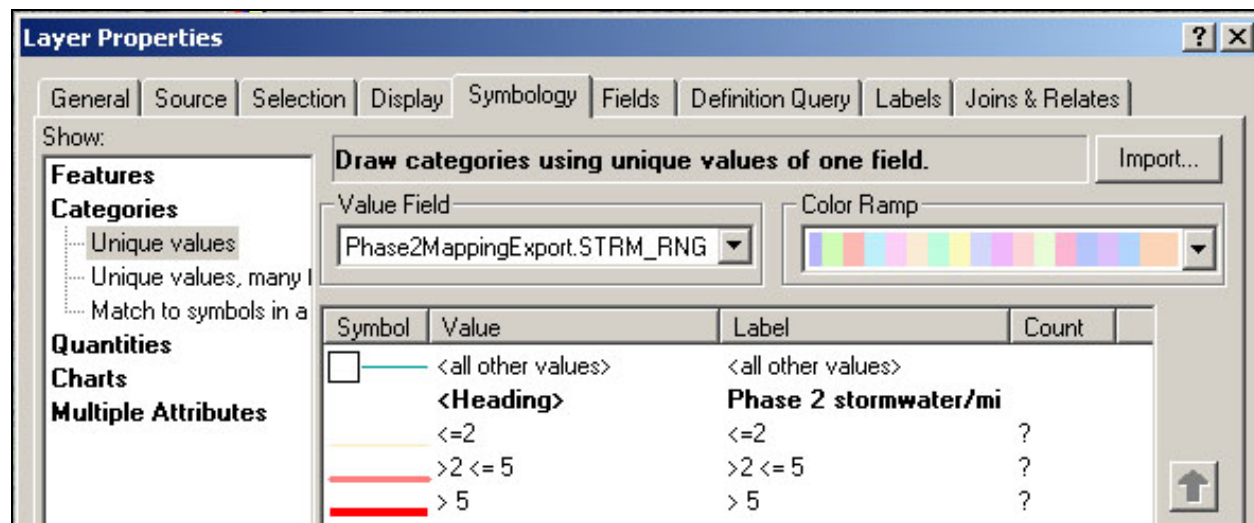
Definition Query



Symbology

Change the symbol to the green “stormwater” symbol.
Delete the <Heading> “IMPACT”

To map the number of storm water inputs per segment use the “Stormwater/mile” data layer and categorize by “Unique Value” with a “Value Field” of “Phase2MappingExport.STRM_RNG”. The range categories are (≤ 2), ($>2 \leq 5$) and (>5). Add all relevant values.



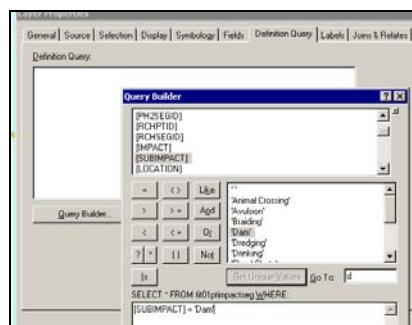
Unique Value in Symbology

Change symbol lines to the varied thickness red stormwater lines for (≤ 2), ($>2 \leq 5$), and (>5) respectively.
Change the “<Heading>” “STRM_RNG” to say “Range” (by left clicking on the heading and then typing over it).

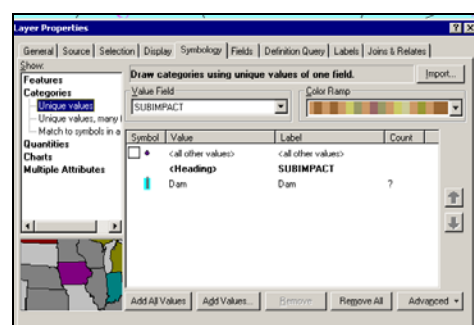
Mapping Dams and Diversions Data:

SGAT Feature Type	Attribute Information
FIT point data	Flow regulation points attributed as large withdrawals (diversions) and/or large store and release impoundments.
OR Stream segment – line data	Phase 2 data (Steps 4.5) attributing the segment line to indicate that large withdrawals (diversions) and/or large store and release impoundments exist within the reach, Export Code: SIG_FLOW_REG and Step 4.6 data indicating that upstream flow regulation or water withdrawal are affecting the reach. Export Code: UPSTR_FLOW
OR Stream reach – line data	Phase 1 (Step 5.1 data) attributing the reach line to indicate the existence of large withdrawals (diversions) and/or large store and release impoundments Export Code: SIG_FLOW_REG
Additional Resources	
Vermont Dam Inventory (VCGI) – GIS point data selected and coded with “purpose” and “status” attributes which indicate that the dam significantly affects flow	

Using the “Dams and Diversions” data layer, display any points that have a subimpact equal to Dam. This can be done by setting a definition query or by using Unique Value in Symbology with “SUBIMPACT = Dam”, based on the field “SUBIMPACT”:



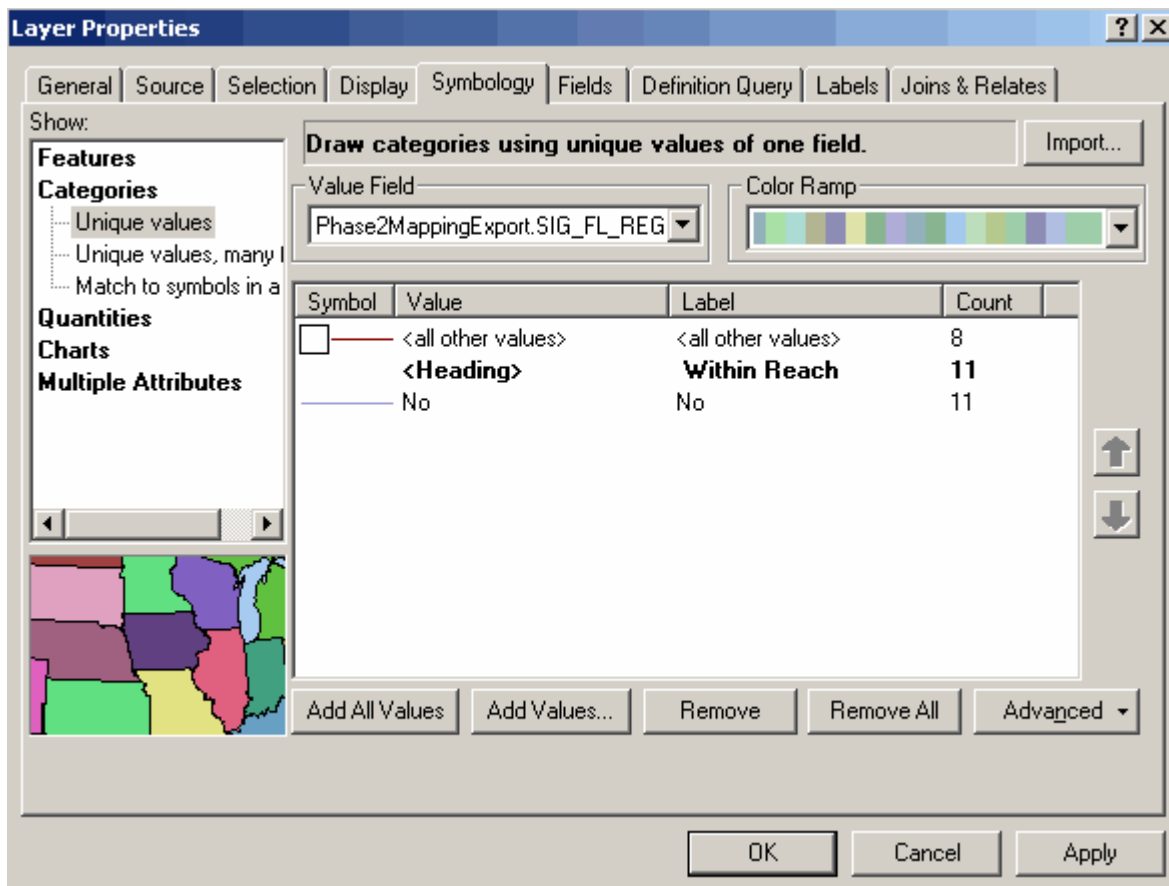
Definition Query



Unique Value in Symbology

Change the symbol to the blue and grey Dam symbol.

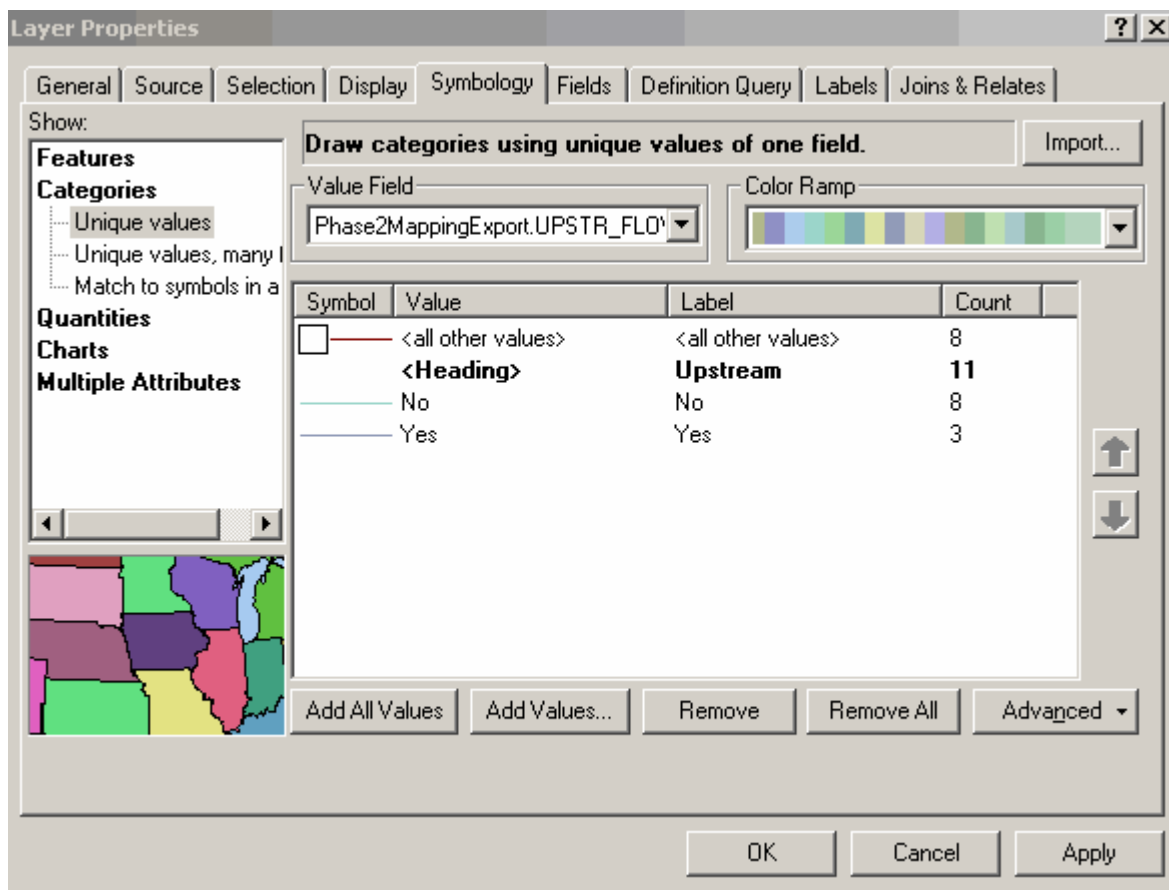
Use one of the Flow modifiers data layers to see if there is a flow regulation within the reach. Categorize by “Unique Value” to display “SIG_FLOW_REG = Yes”, based on the “Value Field” “Phase2MappingExport.SIG_FL_REG”. Add the Value “Yes”:



Unique Value in Symbology

Change symbol to the closed circle “in-reach flow mod” line symbol.
Change the “<Heading>” to say “Within-Reach”

Use the other Upstream Flow modifiers data layer to show if an upstream flow regulation exists. Categorize by “Unique Value” to display “UPSTR_FLOW = Yes”, based on the “Value Field” “Phase2MappingExport.UPSTR_FLOW”. Add the value “Yes”:



Unique Value in Symbology

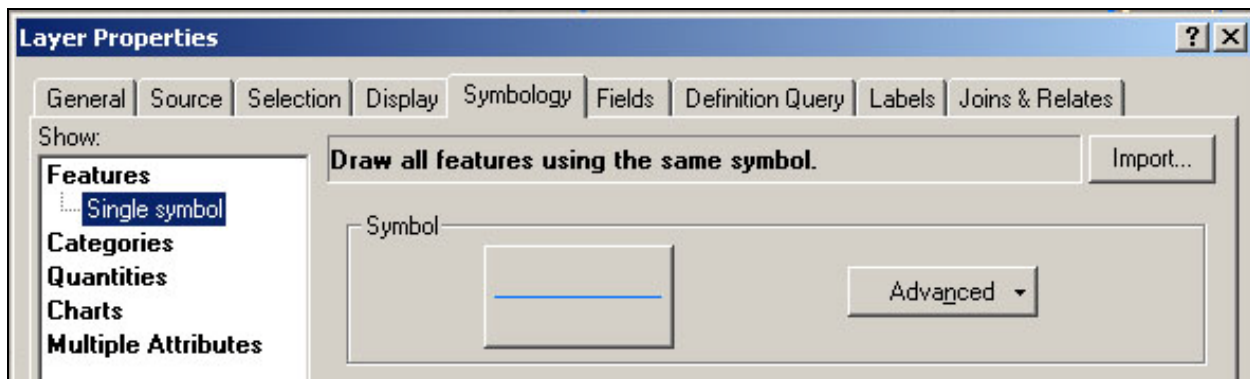
Change symbol to open circle “upstream flow mod” line symbol.
Change the “<Heading>” to say “Upstream”

If you do not have Phase 2 data and/or you would like to show areas where Phase 2 data may not have been collected you may chose to use the Phase 1 Map Table to display where there are flow modifiers within the reach. You may need to add a copy of the Phase 1 Map Table to your data frame if you are going to show the Phase 1 data. Rename the layer to “Phase1 Flow Modifiers”. Use this layer to categorize by “Unique Value” to display “SIG_FLOW_REG = Yes”, based on the “Value Field” “Phase1MappingExport.SIG_FL_REG”. Add the Value “Yes”:

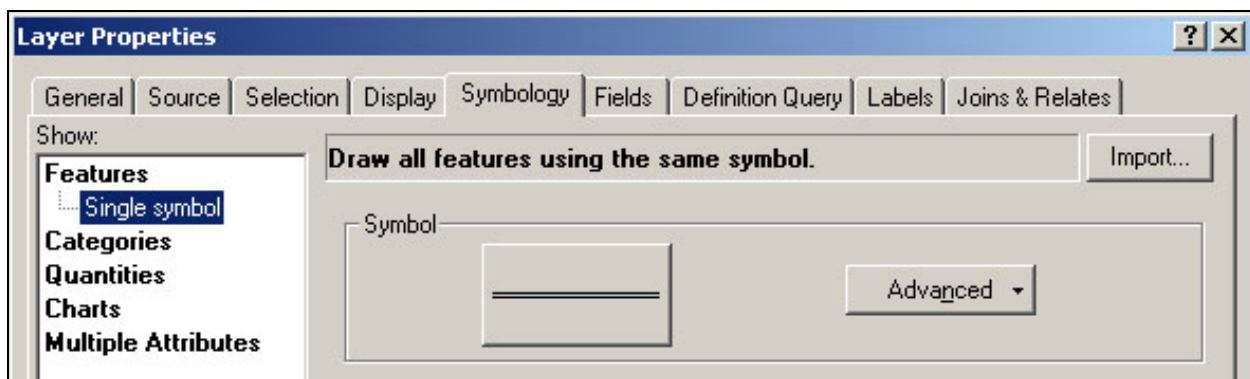
Mapping Base Data:

Note: The following directions apply to the base data for each map within this guide.

Change S05 river line to the blue river line.

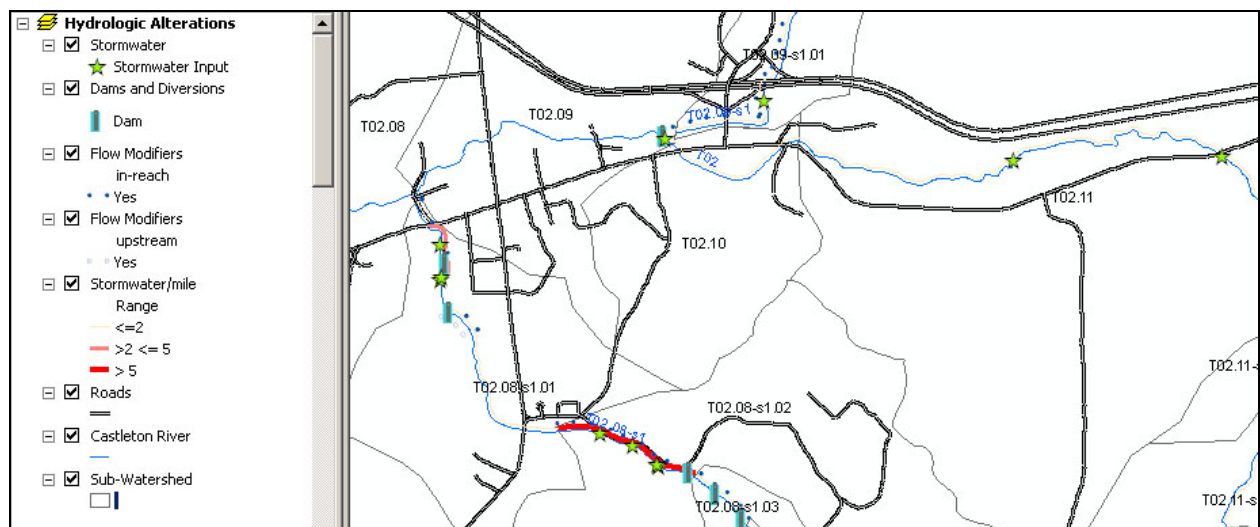


Change the Emergency Roads Line to the black and grey roads line.



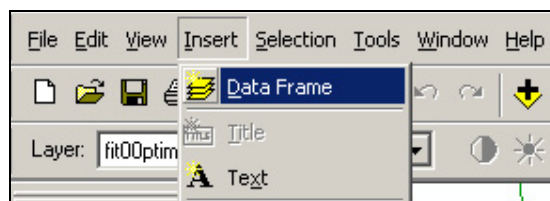
Add the subwatershed layer to your map.

Sample Hydrologic Alterations Map:




Land Use / Land Cover Map

The Land Use / Land Cover map will show urbanization, wetland loss, and road densities. To keep the map organized we recommend that you create a new data frame for this map. Select “Insert” → “Data Frame” from the upper menu



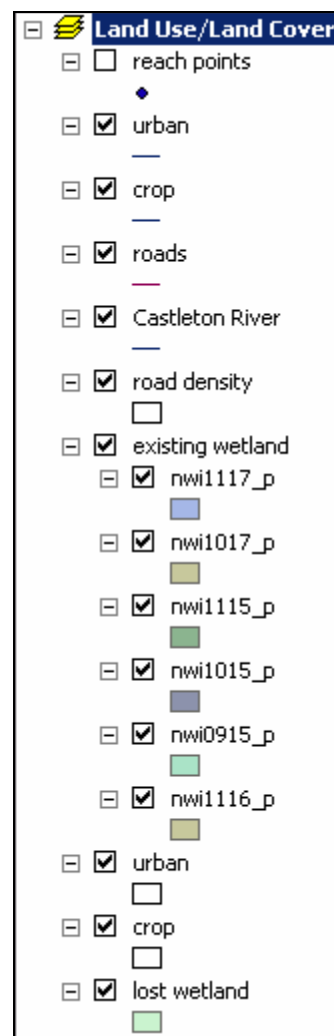
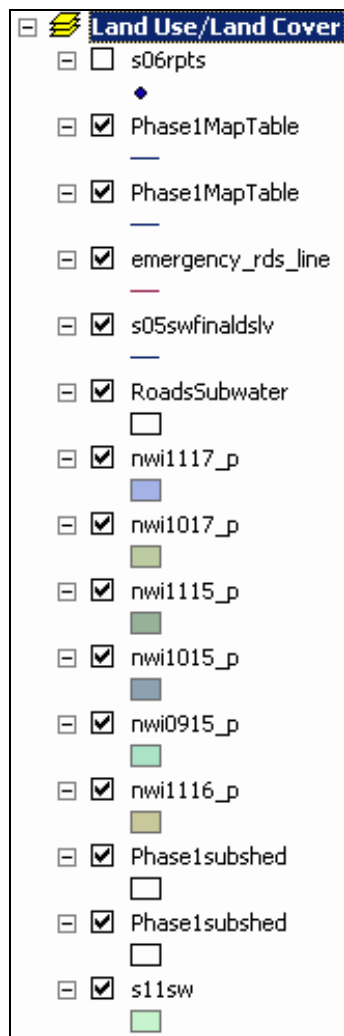
The new data frame will appear in your table of contents.

Rename this data frame “Land Use / Land Cover”  **Land Use / Land Cover**

Copy and paste all the data layers need for this map.

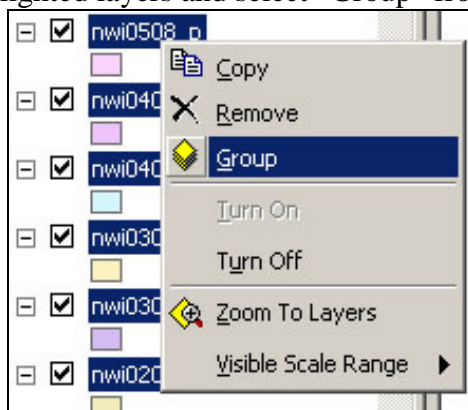
# of copies	Data
2	Phase1MapTable
2	Phase1Subshed
-	NWI Wetlands
1	S06rpts
1	Emergency Roads Line
1	S05swfinaldslv
1	S11sw
1	Roads Subwatershed

Rename the layers in the Sediment Load Data frame.



The NWI wetland layers were also grouped.

To do this hold “shift” or “Ctrl” key and select all layers that you want in the group. Then right click on these highlighted layers and select “Group” from the drop down menu.

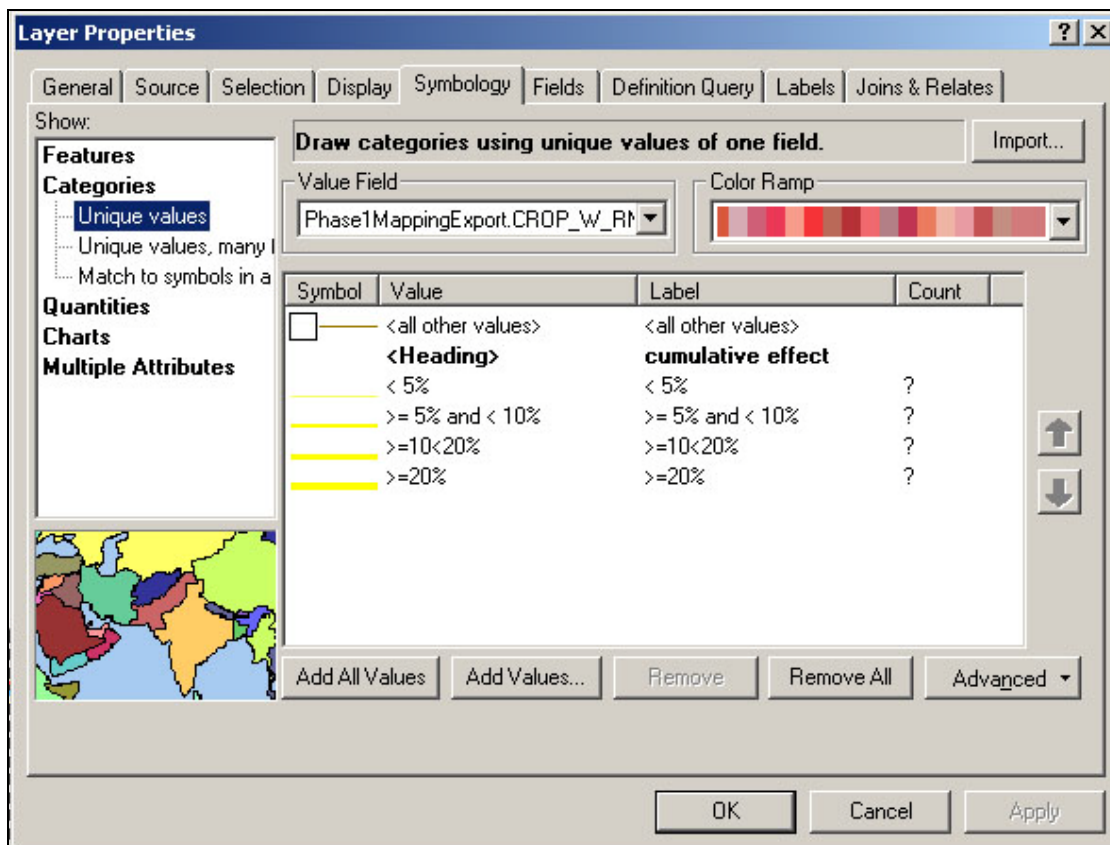


Mapping Crop Data:

SGAT Feature Type	Attribute Information
Stream reach – line data	Phase 1 (Step 4.1 data) attributing the reach line to indicate the category of significant crop land use (moderate $\geq 5 < 10\%$; high $\geq 10 < 20\%$, extreme $\geq 20\%$). This is showing the cumulative upstream percentage of crop land for the reach. Export Code: CROP_W_RNG
AND Sub-watersheds – polygon	SGAT table S14LC12.dbf, codes of interest 22, 24, 211, and 212 attributing the sub-watershed polygon indicating the category of significant crop land use (moderate $\geq 5 < 10\%$; high $\geq 10 < 20\%$, extreme $\geq 20\%$) This is showing the percentage of crop within the individual sub-watershed. Export Code: CROP_S_RNG

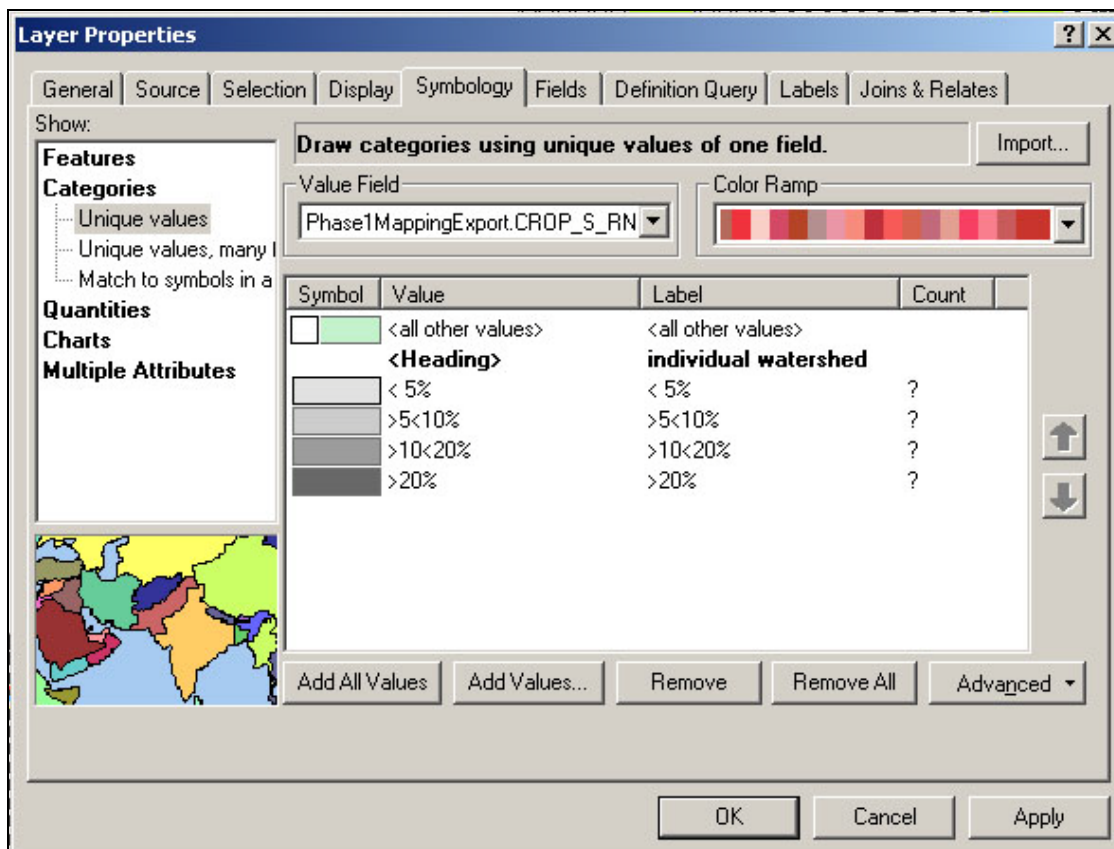
Crop data will be displayed as both line and polygon data.

To show the cumulative effect of crop along the river, use the “Crop” line layer and categorize by “Unique Value” with the “Value Field” “Phase1MappingExport.CROP_W_RNG”. The range categories are (<5%), ($\geq 5\%$ and $< 10\%$), ($\geq 10\%$ and $< 20\%$) and ($\geq 20\%$). Add relevant values.



Change the symbol lines to the increasing thickness yellow crop lines for (<5%), (>= 5% and < 10%), (>=10 < 20%) and (>=20%).
 Change the “<HEADING>” “CROP_W_RNG” to say “cumulative effect” (by left-clicking and typing over it).

To show the effect of crop for each unique subwatershed, use the “Crop” polygon layer and display by unique value, with a value field of the “Phase1MappingExport.CROP_S_RNG”. The range categories are (<5%), (>= 5% and < 10%), (>=10 < 20%) and (>=20%), but often not all are present, so just add the ones that are (the relevant values).



Change the symbol fills to the varied shades of grey crop fills for (<5%), (>= 5% and < 10%), (>=10 < 20%) and (>=20%).

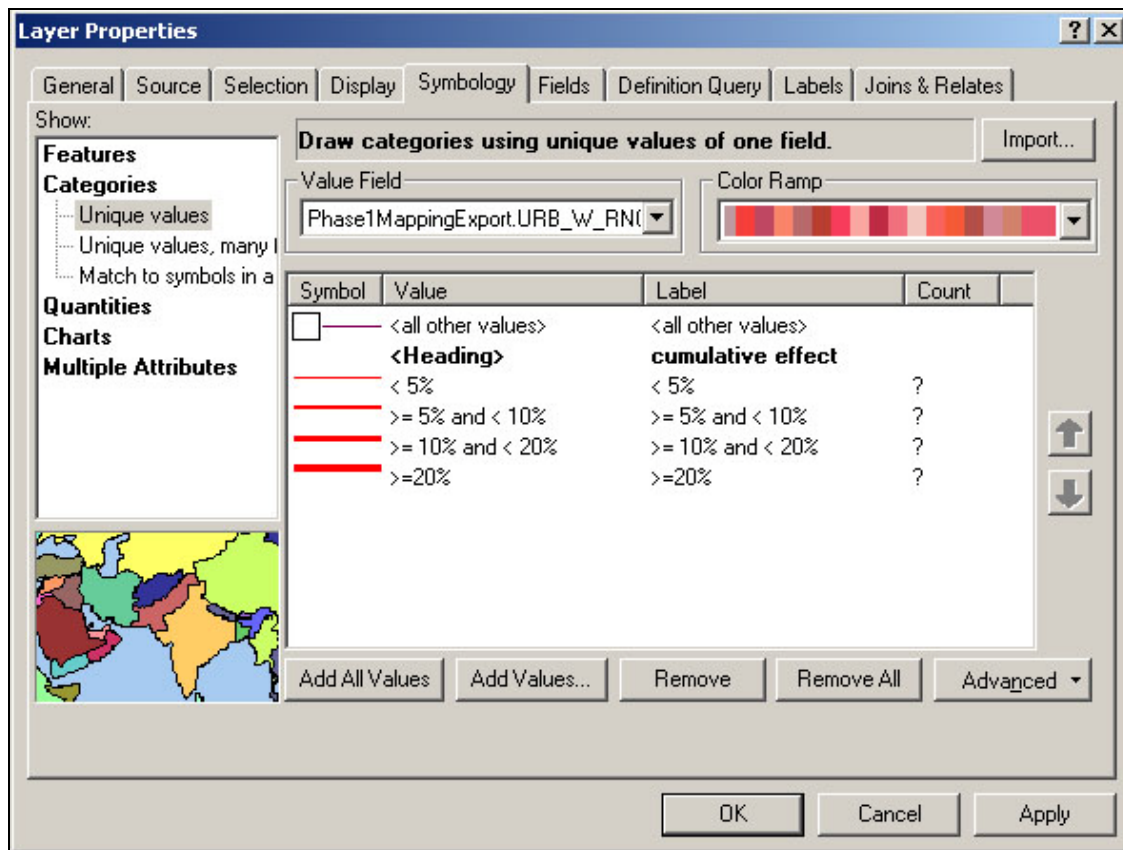
Change the “<HEADING>” “CROP_S_RNG” to say “individual effect” (by left-clicking and typing over it).

Mapping Urban Data:

SGAT Feature Type	Attribute Information
Stream reach – line data	Phase 1 (Step 4.1 data) attributing the reach line indicating the category of significant urban land use (moderate $\geq 5 < 10\%$; high $\geq 10 < 20\%$, extreme $\geq 20\%$). This is showing the cumulative upstream percentage of urban land for the reach. Export Code: URB_W_RNG
AND Sub-watersheds – polygon	SGAT table S14LW12.dbf , codes (for urban) to attribute the sub-watershed polygon indicating the category of significant urban land use (moderate $\geq 5 < 10\%$; high $\geq 10 < 20\%$, extreme $\geq 20\%$). Showing the percentage of urban land use within the individual sub-watershed. Export Code: URB_S_RNG

Urban data will be displayed as both line and polygon data.

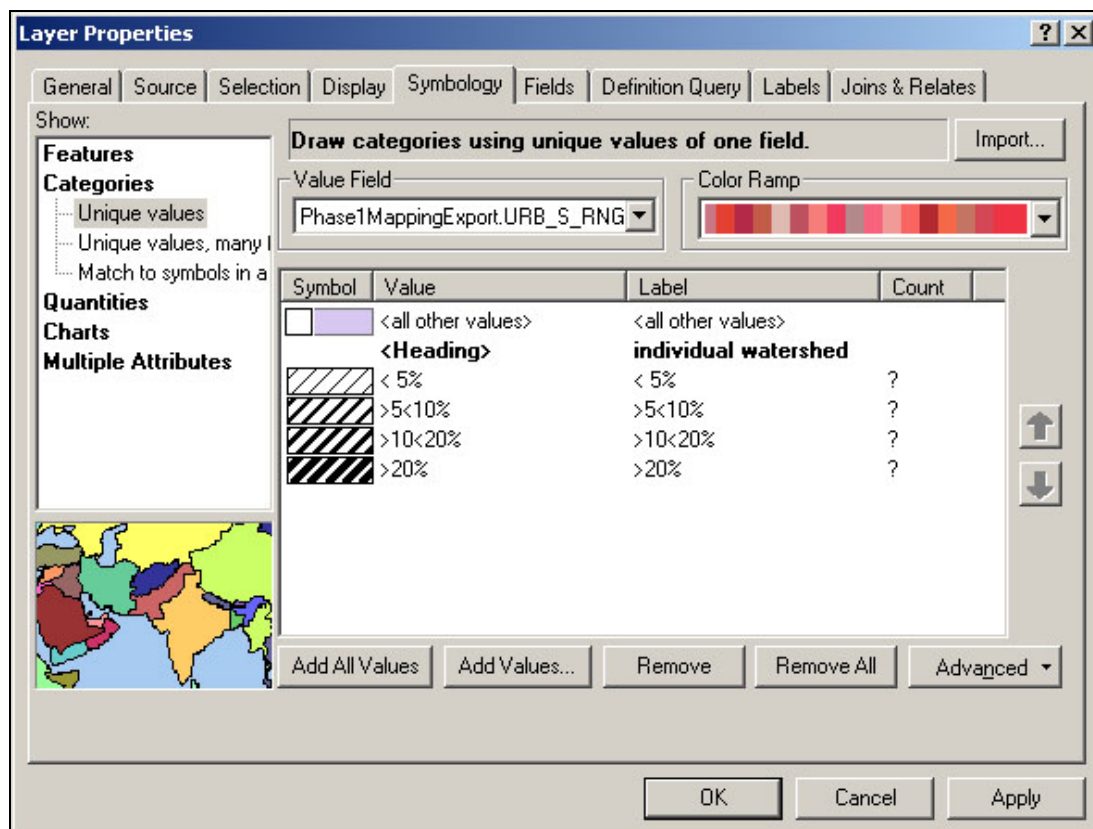
To show the cumulative effect of urban land use along the river, use the “Urban” line layer and categorize by “Unique Value” with the “Value Field” “Phase1MappingExport.URB_W_RNG”. The range categories are ($<5\%$), ($\geq 5\%$ and $< 10\%$), ($\geq 10\%$ and $< 20\%$) and ($\geq 20\%$), but often not all are present, so just add the ones that are (the relevant values).



Change the symbol lines to the increasing thickness red urban lines for (<5%), (>= 5% and < 10%), (>=10 < 20%) and (>=20%).

Change the “<HEADING>” “URB_W_RNG” to say “cumulative effect” (by left-clicking and typing over it).

To show the effect of urban land use for each unique subwatershed, use the “Urban” polygon layer and display by unique value, with a value filed of the “Phase1MappingExport.URB_S_RNG”. The range categories are (<5%), (>= 5% and < 10%), (>=10 < 20%) and (>=20%), but often not all are present, so just add the ones that are (the relevant values).



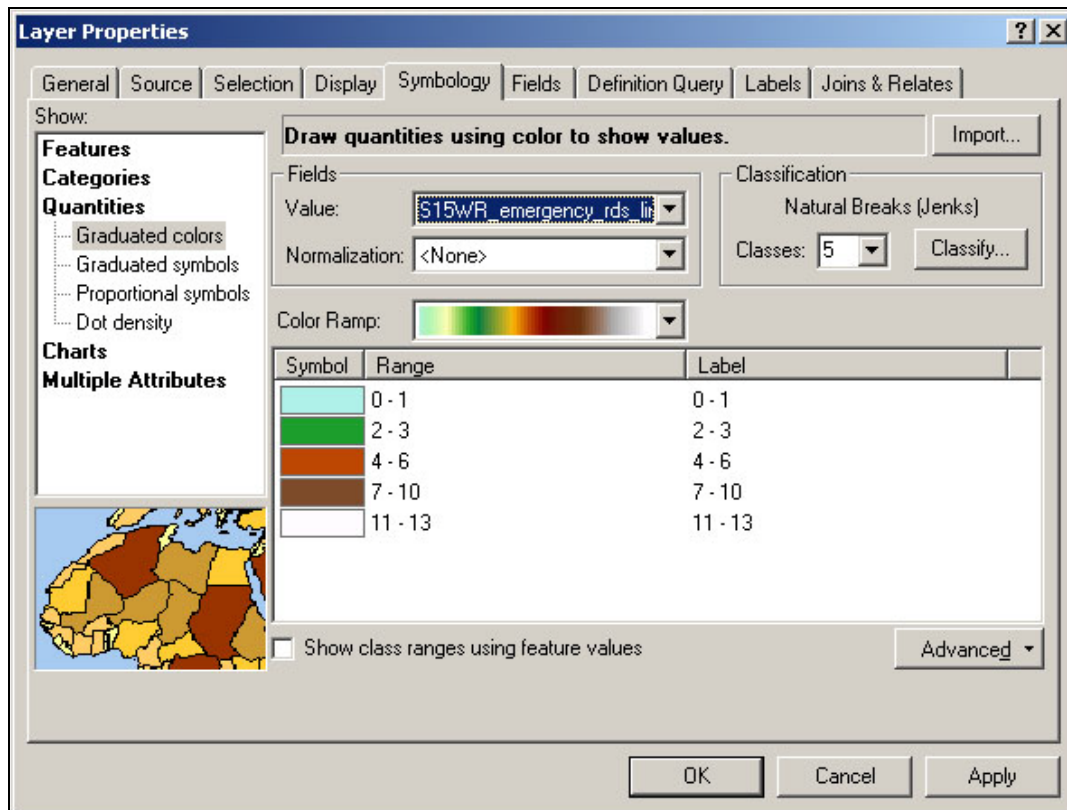
Change the symbol fills to the varied thickness 45 degree line urban fills for (<5%), (>= 5% and < 10%), (>=10 < 20%) and (>=20%).

Change the “<HEADING>” “URB_S_RNG” to say “individual watershed” (by left-clicking and typing over it).

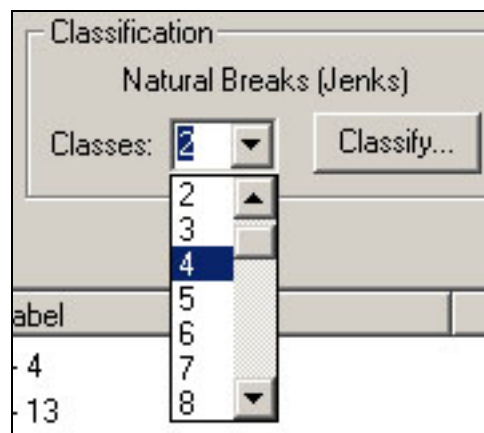
Mapping Road Densities:

Use the “Road Density” data layer to display four ranges of road densities (0-2, 3-4, 5-6, and ≥ 7). The instructions for creation of the S15WR emergency line layer can be found on pages 6-11.

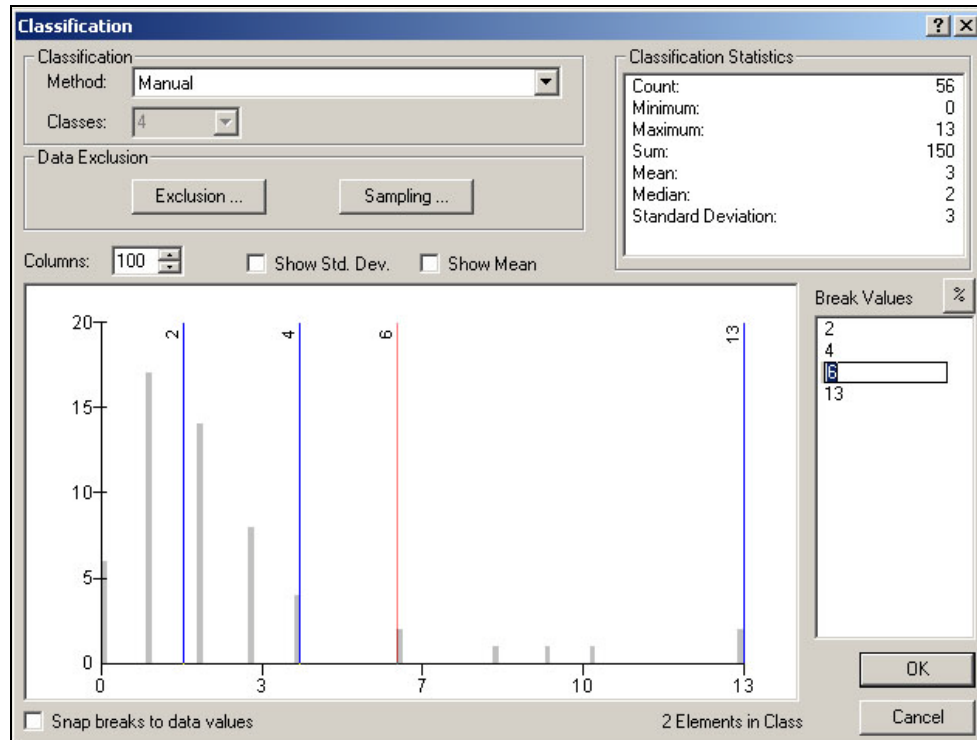
Use Graduated colors to symbolize quantities within the Field of the “S15WR_emergency_rds_line.mi_sqmile”.



Click on the Classes drop down arrow and select 4 classes

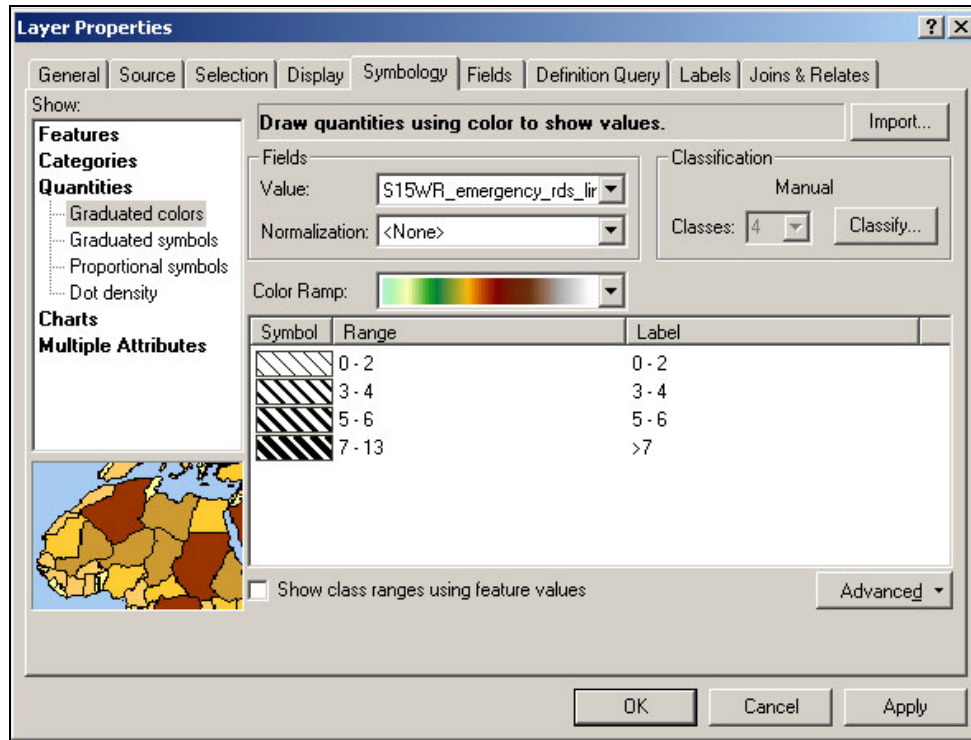


In order to set our desired breaks click on the **Classify...** button. This will bring up the “Classification” window. Here you can see a bar graph showing the values for your field in gray and the default divisions of the classifications in blue. On the right side of this window type in the values of your cut offs, because you are interested in the ranges 0-2, 2-4, 4-6, and >7, make the values 2, 4, 6, and then what ever the maximum value is for your project (maximum value can be found in the “Classification Statistics” portion of this window).



Press the “ok” button.

Change the symbol fills to the varied thickness 45 degree line urban fills for (<5%), (>= 5% and < 10%), (>=10 < 20%) and (>=20%). Road densities



Change the last “label” to say “>=7” (by left-clicking and typing over it).

Mapping Wetlands:

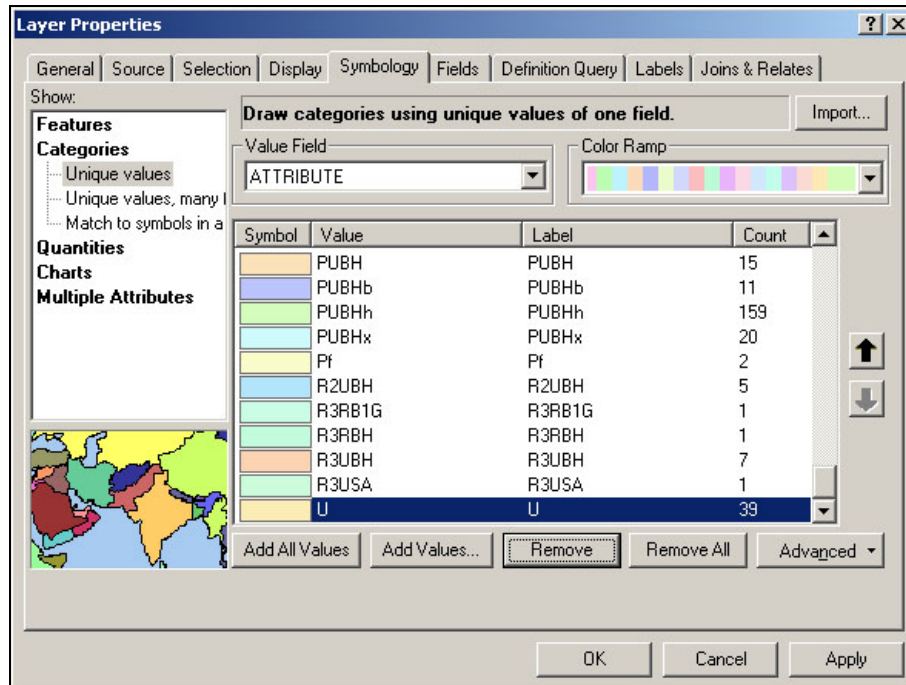
To show the location of current wetlands use the NWI wetland layer (you must follow these steps for each individual NWI wetland quad you have).

Categorize by “Unique Value. Set the “Value Field” to “ATTRIBUTE”.

Add all Values and scroll to the bottom of the list.

Click to highlight the value labeled U (this represents all polygon layers with unknown values).

Click on the  button to remove it.

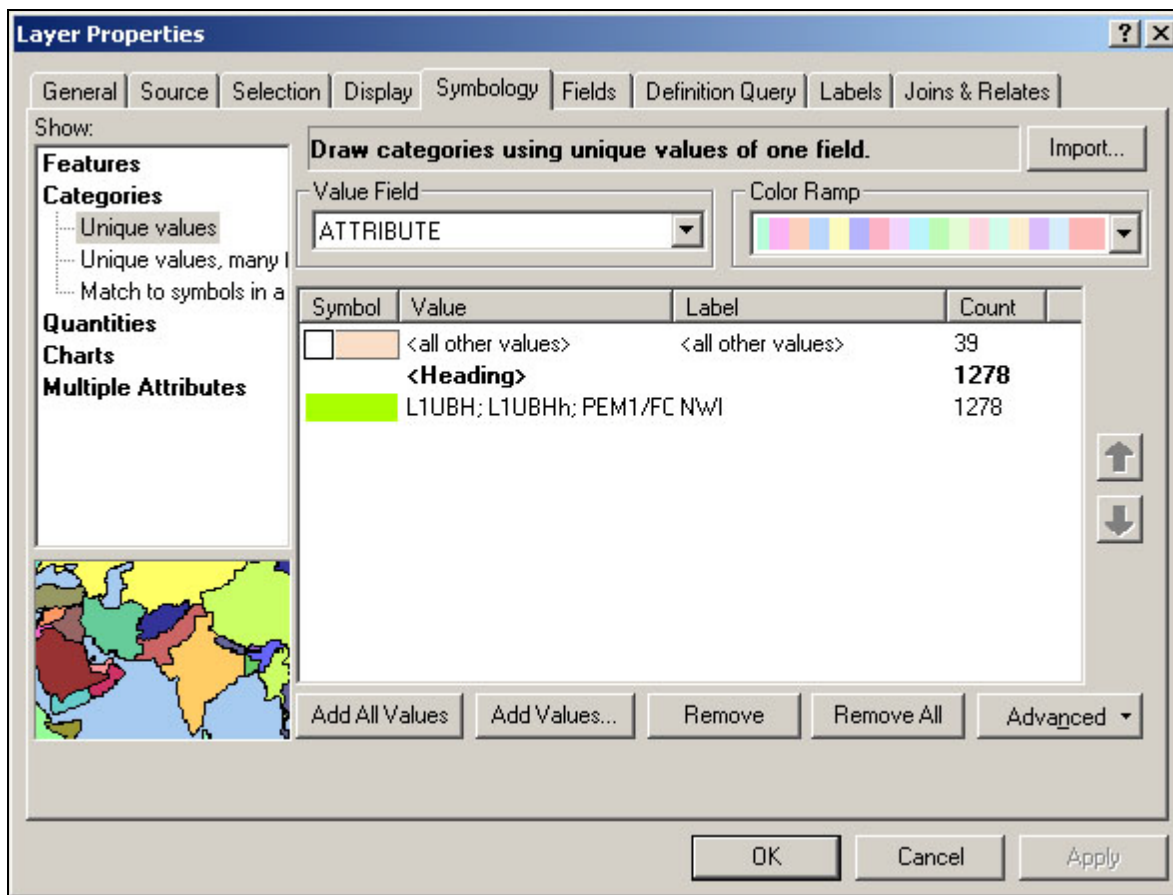


Hold the “shift” key and select all the remaining values.

Right click on these values and select “Group Values” from the pop up menu.



Uncheck the <all other values> box



Change the fill symbol to the NWI fill and change the “label” to say “NWI” (by left-clicking and typing over it).

Click on the “ok” button

Mapping Previously Existing Wetlands:

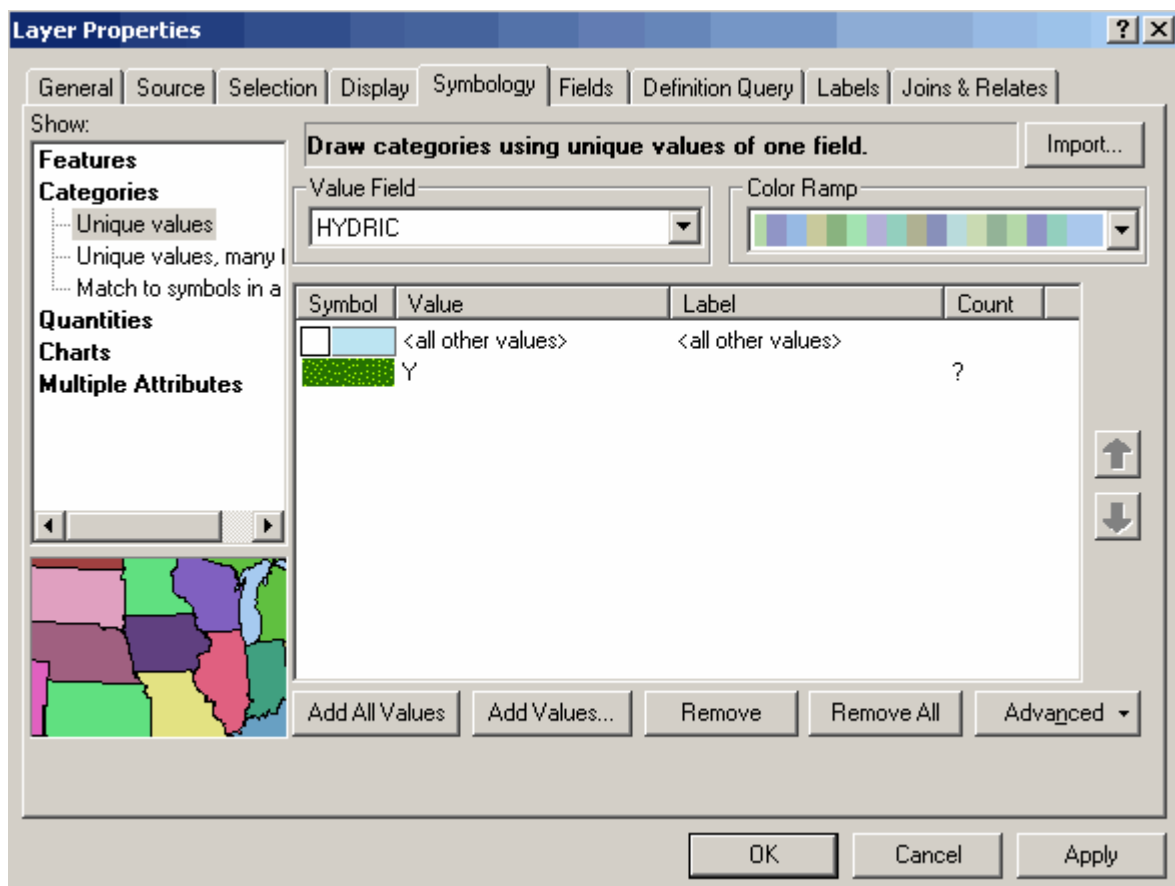
SGAT Feature Type	Attribute Information
Sub-watershed polygon for soils – S11sw	Hydric soils = “Y” - use light, solid shading of polygons to contrast with darkly outlined NWI (existing) wetlands.
AND Sub-watershed polygon	Length of roads in sub-watershed calculated by running the SGAT tool, Step 15 to derive the density of roads within the sub-watershed. <i>This data is not included in the DMS export table.</i>
Additional Resources	
AND Vermont NWI wetlands maps – use outline of existing wetlands	

This layer is created in Part C Soils, Land Cover and Density Analysis, Step 11 “Clip Data Themes to Selected Boundaries” of the SGAT Tool. **If you do not have the S11sw file you will need to run through the steps in Part C. Please see the SGAT Handbook for further instructions.**

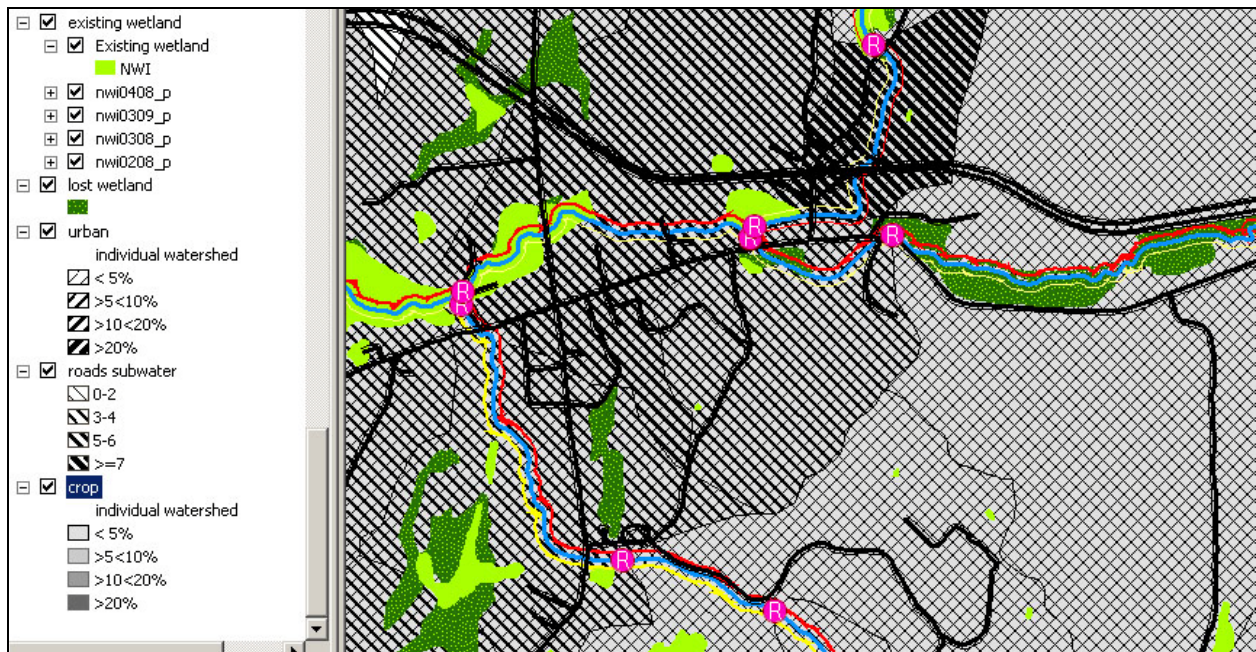
To display the locations where crop and/or urban features intersect with hydric soils, use the S11sw (Lost Wetlands) data layer. These are areas where there is a likely loss of wetlands. Categorize by “Unique Value”. Set the “Value Field” to “HYDRIC”. Add all “Y” values. Uncheck the “all other values” field, and delete the heading.

If your S11SW layer does not have the “hydric” information in the attribute table; you will need to join the table to the NRCS “Top_20” table. This can be found in the SGAT “base data” folder. You will use the “MUID” field for the join. Once the table has been joined to the S11SW layer you can display the information as described.

Symbolize with a single symbol using the lost wetlands fill.

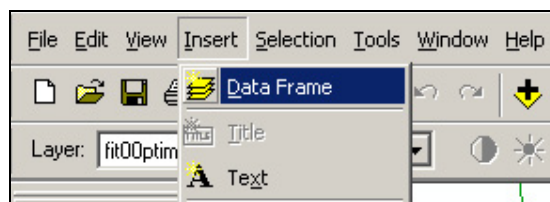


Sample Land Use and Land Cover Map:



Sediment Load Indicators Map

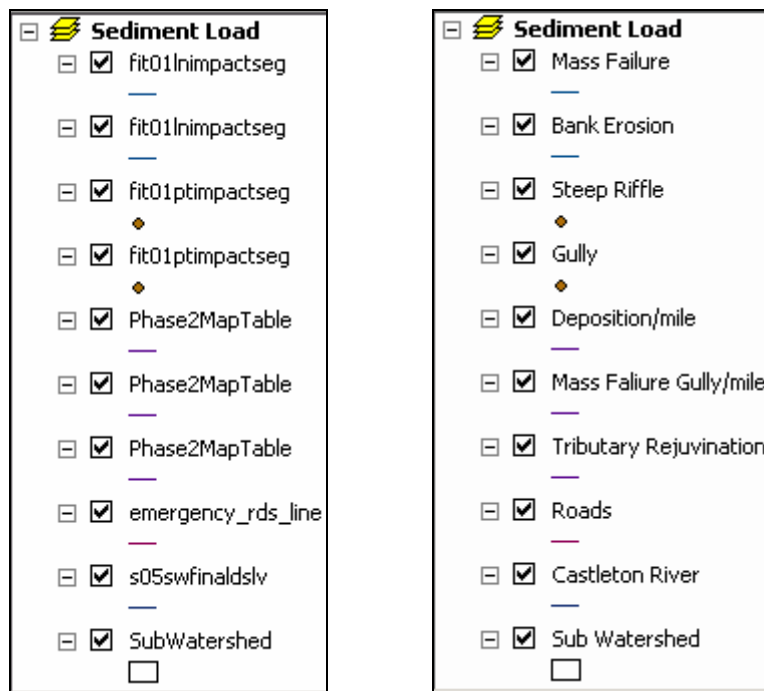
The Sediment Load Indicators map will show steep riffles, mid-channel bars, delta bars, flood chutes, avulsions, braiding, erosion, mass failures, Gullies, and tributary rejuvenations. To keep the map organized we recommend that you create a new data frame for this map. Select “Insert” → “Data Frame” from the upper menu



The new data frame will appear in your table of contents.
Rename this data frame “Sediment Load”
Copy and paste all the data layers need for this map.

# of copies	Data
3	Phase2MapTable
2	Fit01ptimpactseg
2	Fit01lnimpactseg
1	Emergency Roads Line
1	S05swfinaldslv
1	SubWatershed

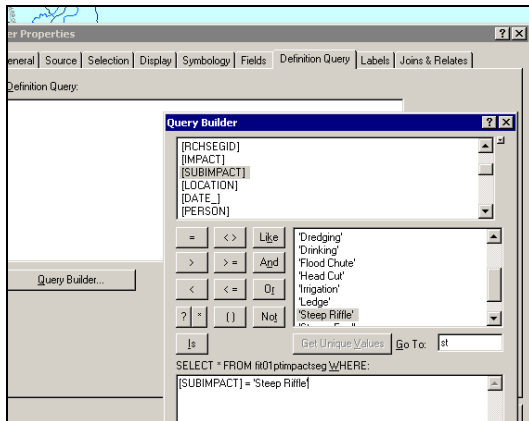
Rename the layers in the Sediment Load Data frame.



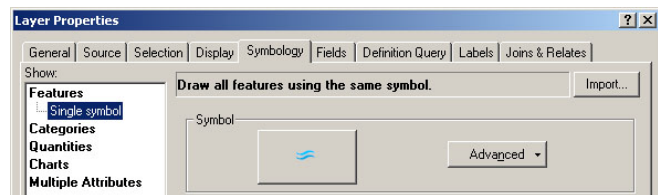
Mapping Erosion and Deposition Features Data:

SGAT Feature Type	Attribute Information
FIT point data	Steep riffles, flood chutes, avulsions, and braiding
AND Stream segment – line data	Phase 2 data (Steps 5.1, 5.2, and 5.3) attributed to the stream segment line indicating the quantity of steep riffles, mid-channel bars, delta bars, flood chutes, avulsions, and braiding. ($0 \leq 2$; $>2 \leq 5$; >5)* Export Code: DEP_RNG * note: normalized values - # features(5,280)/segment length
OR Stream reach – line data	Phase 1 (Step 6.3 data) indicating low or high impact rating for depositional features Export Code: I_DEPOSIT

Use the “Steep riffle” data layer, to display any points that have a Subimpact equal to Steep Riffle. This can be done by setting a definition query with “SUBIMPACT = Steep Riffle” or by categorizing by “Unique Value” in “Symbology”. Set the “Value Field” to “SUBIMPACT”. Add “Steep Riffle”:



Definition Query

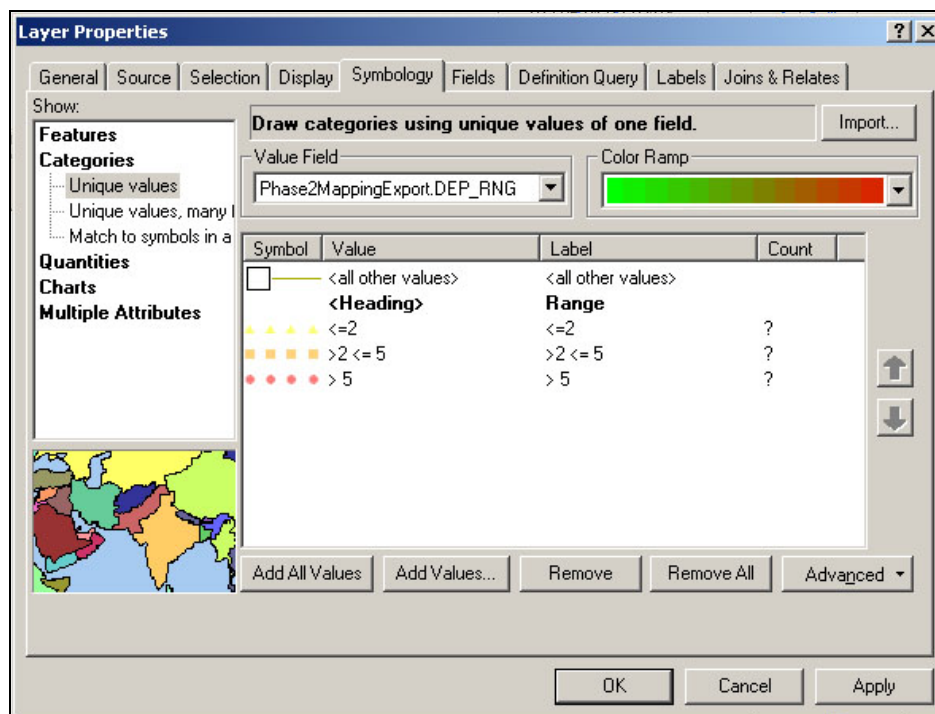


Unique Value in Symbology

Change symbol to blue “steep riffle” symbol.

Delete the “<Heading>” and the label and uncheck the “all other values” box

Use the “deposition/mile” data layer to show the number ranges of depositional features per mile. This can be done by categorizing by “Unique Value”. Set the “Value Field” to “Phase2MappingExport.DEP_RNG”. Add all relevant values.



Unique Value in Symbology

Change symbols to red, orange and yellow hashed “deposition” lines.
Change the “<Heading>” “DEP_RNG” to “Range”

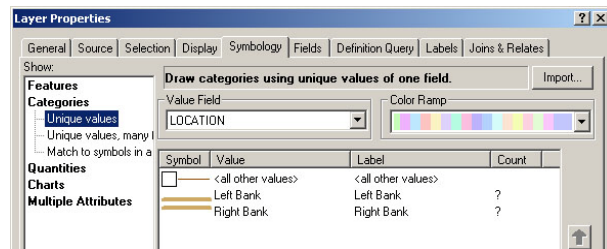
Mapping Bank Erosion Data:

SGAT Feature Type	Attribute Information
FIT line data	Erosion (right and/or left bank)
OR Stream segment – line data	Phase 2 data (Steps 3.1) attributed to lines offset left and right from segment line indicating the percentage of the reach / segment (right and left bank) length eroding ($\geq 5 < 20\%$; $\geq 20\%$) Export Code: L_EROS_RNG & R_EROS_RNG
OR Stream reach – line data	Phase 1 data (Step 7.2) attributed to the reach line indicating the percentage of the reach length eroding ($\geq 5 < 20\%$; $\geq 20\%$). Export Code: EROS_P_RNG

Use the “Bank Erosion” data layer to display all location of erosion along the river. This can be done by setting a definition query to “IMPACT = Erosion. Categorize by “Unique Value”. Set the “Value Field” to “LOCATION”. Add the values Left Bank, and Right bank:



Definition Query



Unique Value in Symbology

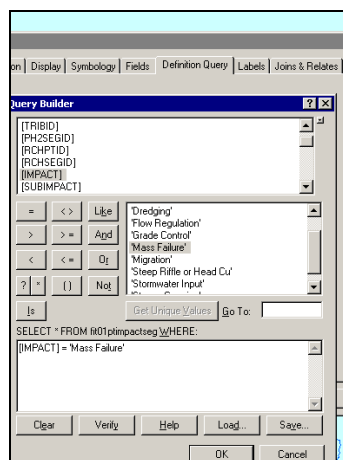
Change symbols to brown “erosion right” and brown “erosion left” lines.
Delete “<Heading>”.

Mapping Mass Wasting Sites and Gully Data:

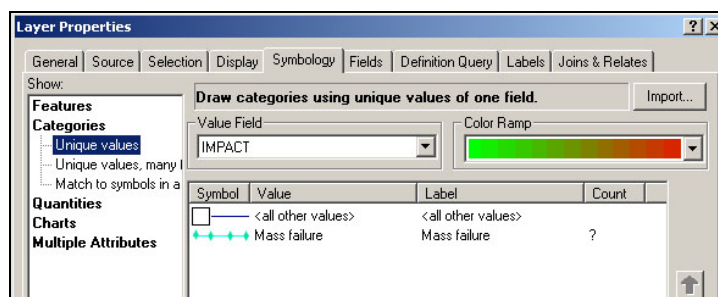
SGAT Feature Type	Attribute Information
FIT point data	Mass failure or gully
AND/OR	Phase 2 data (Steps 3.1) attributed to the segment line indicating

Stream segment – line data	the number of mass wasting sites or gullies ($0 \leq 2$; $>2 \leq 5$; >5)* Export Code: MF_GUL_RNG * note: normalized values - # features(5,280)/segment length
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Use the “Mass failure” data layer to display any lines identifying mass failures. This can be done by setting a definition query to “IMPACT = Mass Failure” or categorizing by “Unique Value” in Symbology. Set the “Value Field” to “IMPACT”. Add the value “Mass Failure”:



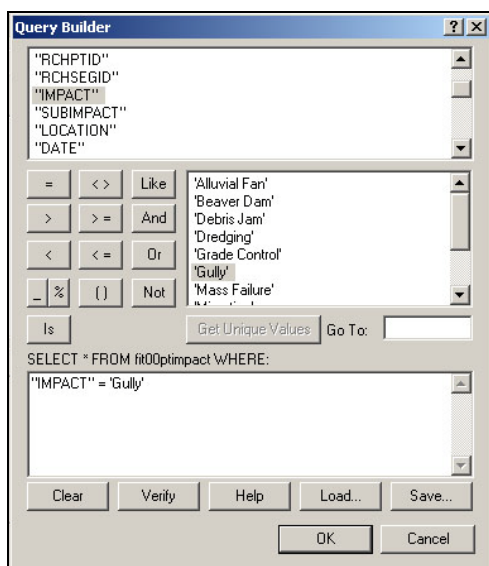
Definition Query



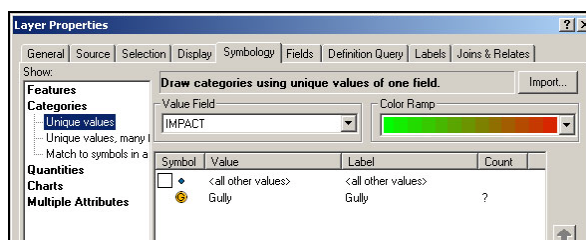
Unique Value in Symbology

Change symbol to the teal “Mass failure” line symbol.
Delete the “<Heading>” and the label.

Use the “Gully” data layer to display points identifying gullies. This can be done by setting a definition query to “IMPACT = Gully” or Categorizing by unique value in Symbology. Set the “Value Field” to “IMPACT”. Add the value “Gully”:



Definition Query

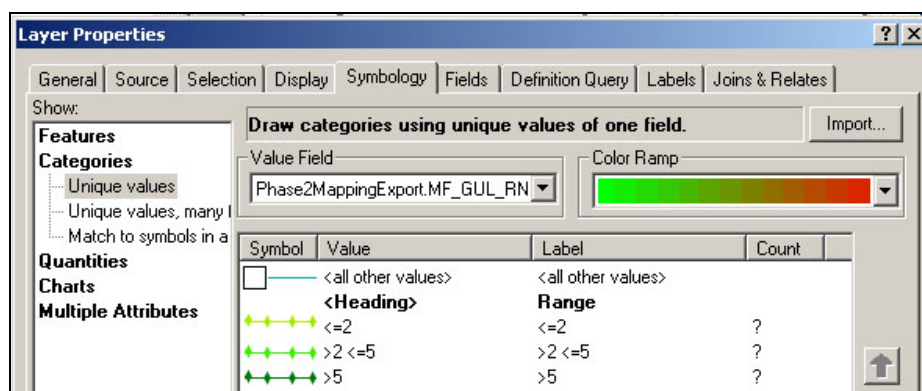


Unique Value in Symbology

Change symbol to the orange “Gully” circle.
Delete the “<Heading>” and the label.

Note: In earlier projects Mass Failures were recorded as points and not lines. Depending on the FIT project you are using, you may have to look for Mass failures in the Fit01ptimpact layer (use the teal “mass failure” diamond symbol).

If you do not have access to good FIT data, use the “Mass failure and gully/mile” data layer to show the ranges of mass failures and gullies per mile for the segment/reach, categorize by “Unique Value”. Set the “Value Field” to “Phase2MappingExport.MF_GUL_RNG”. Add all relevant values:



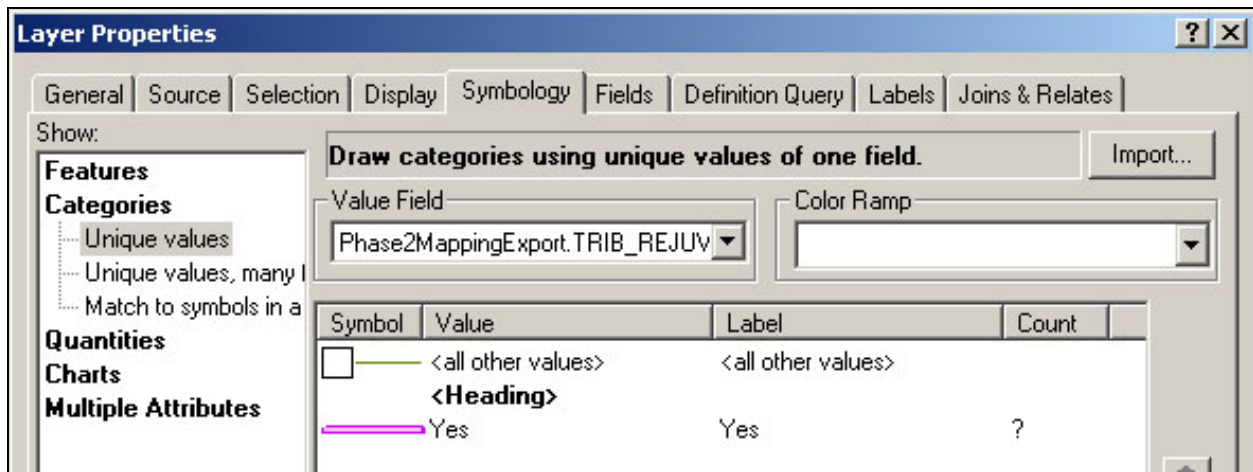
Unique Value in Symbology

Change symbols to green “mass failure gully” lines.
Change the “<Heading>” to “Range”

Mapping Rejuvenating Tributary Data:

SGAT Feature Type	Attribute Information
Stream segment – line data	Phase 2 (Step 5.3) indicating the presence of tributary rejuvenation. Export Code: TRIB_REJUV

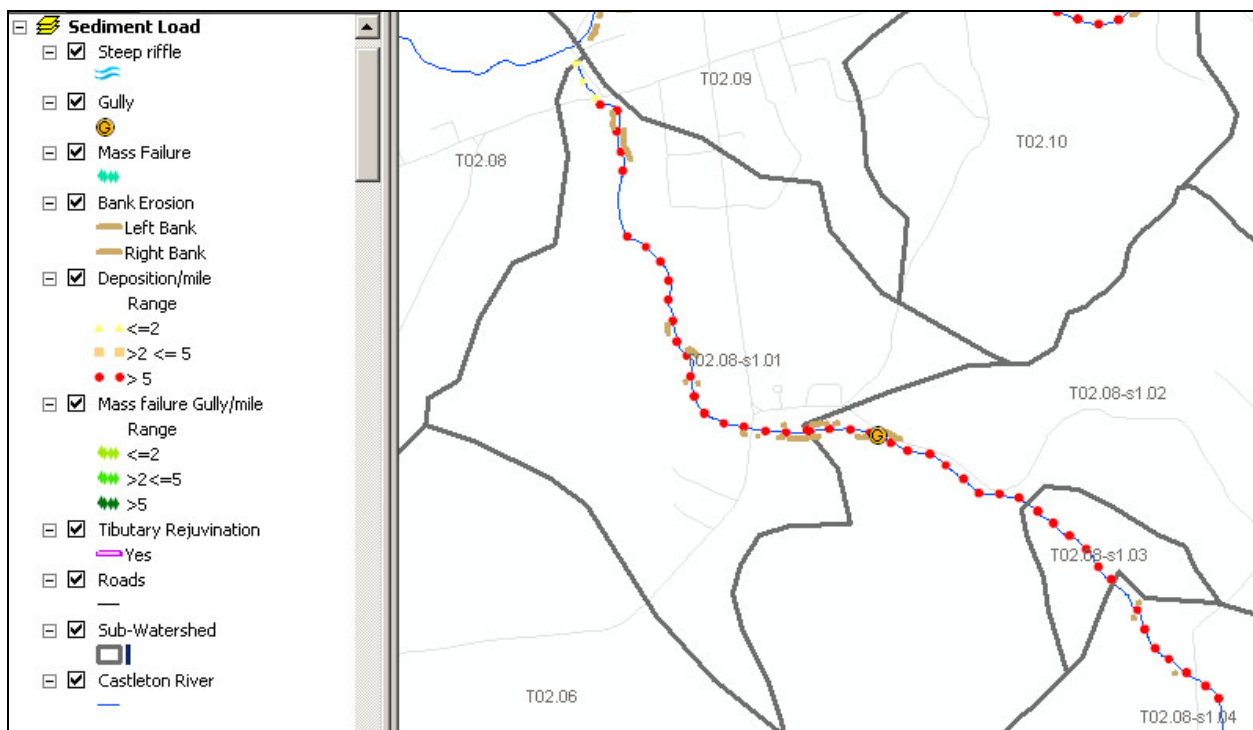
Use the “Tributary Rejuvenation” data layer to show whether tributary rejuvenation has occurred on every segment/reach. Categorize by “Unique Value”. Set the “Value Field” to “Phase2MappingExport.TRIB_REJUV”. Add value “Yes”.



Unique Value in Symbology

Change symbol to the thick pink “Rejuvenating tribs” line for trib_rejuv = yes.
Delete the “<Heading>” “TRIB_REJUV”

Sample Sediment Load Indicators Map:



E. Channel Slope Modifiers Map

The channel slope modifiers map will show head cuts, straightening, encroachments and development within the corridor, grade controls and constrictions, and beaver dams.

To keep the map organized we recommend that you create a new data frame for this map.

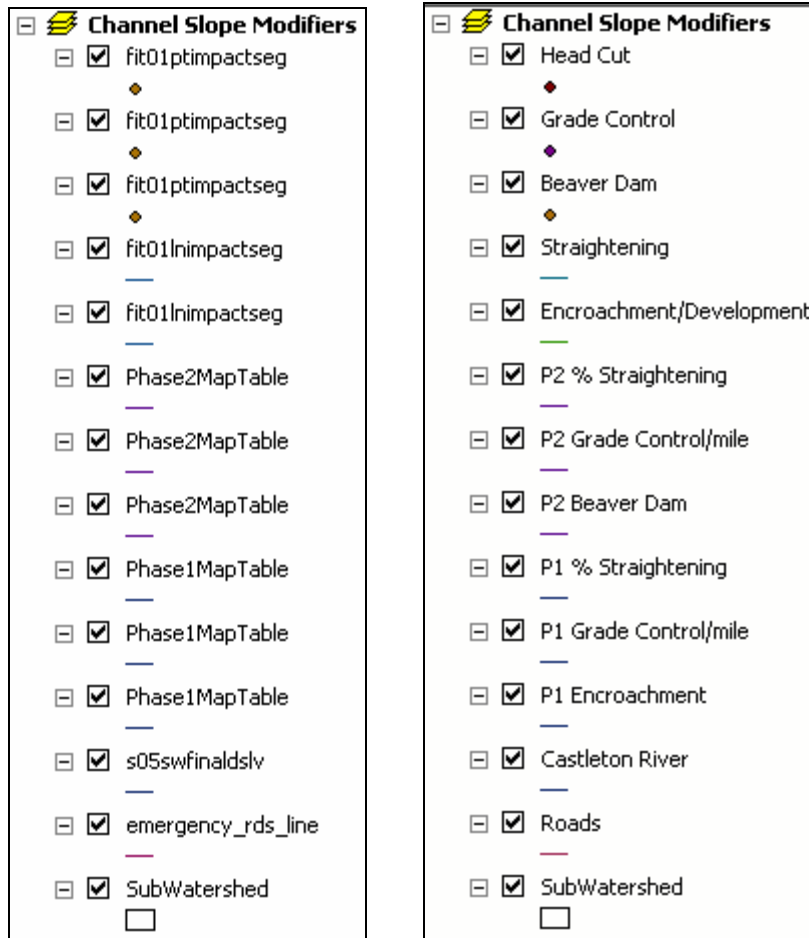
Select “Insert” → “Data Frame” from the upper menu.

Rename this data frame “Channel Slope Modifiers”.

Copy and paste all the data layers need for this map.

# of copies	Data
3	Phase1MapTable
3	Phase2MapTable
2	Fit01ptimpactseg
2	Fit01lnimpactseg
1	Emergency roads line
1	S05swfinaldslv
1	SubWatershed

Rename the layers in the Channel Slope Modifiers Data Frame.

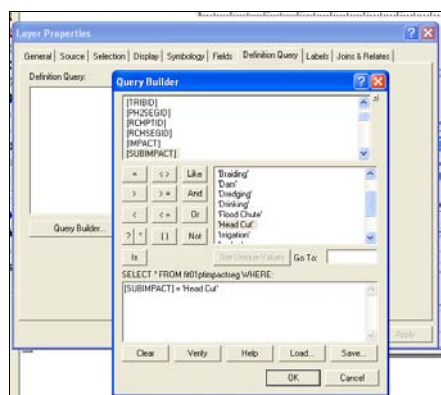


Mapping Slope Increases

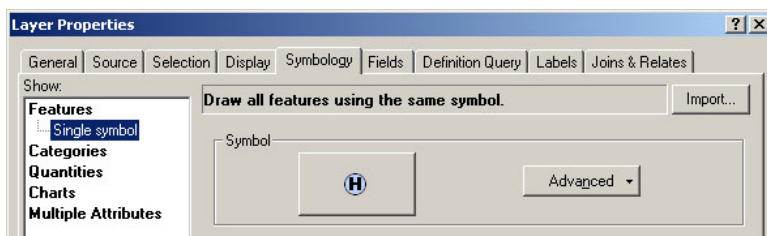
Straightening and Channelization Data:

SGAT Feature Type	Attribute Information
FIT data	Head cuts, Straightening , Straightening with Windrowing
OR Stream segment – line data	Phase 2 data (Step 5.5) indicating percentage of the reach / segment length straightened ($\geq 5 < 20\%$; $\geq 20\%$) Export Code: P_STRT_RNG
OR Stream reach – line data	Phase 1 data (Step 5.4) indicating the percentage of the reach length straightened ($\geq 5 < 20\%$; $\geq 20\%$) Export Code: STRAI_RNG

Use the “Head Cut” data layer to display any points identifying headcuts along the entire river. This can be done by setting a definition query to “SUBIMPACT = Head Cut” and then displaying with a single symbol.



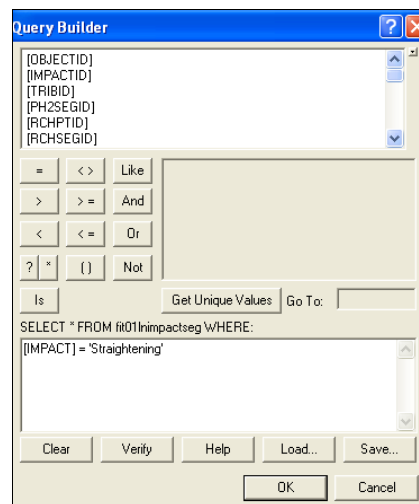
Definition Query



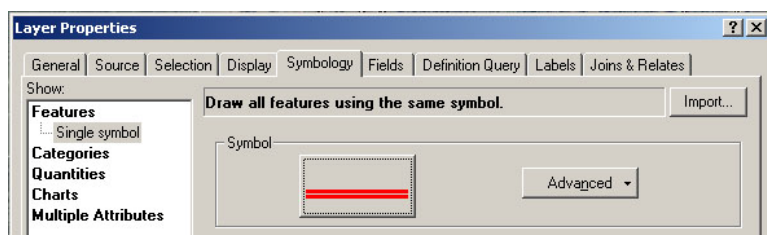
Single symbol Symbology

Change the symbol to the blue “head cut” circle

Use the “Straightening” data layer to display any lines indicating straightening. This can be done by setting a definition query to “IMPACT = Straightening” and then symbolizing by a single symbol.



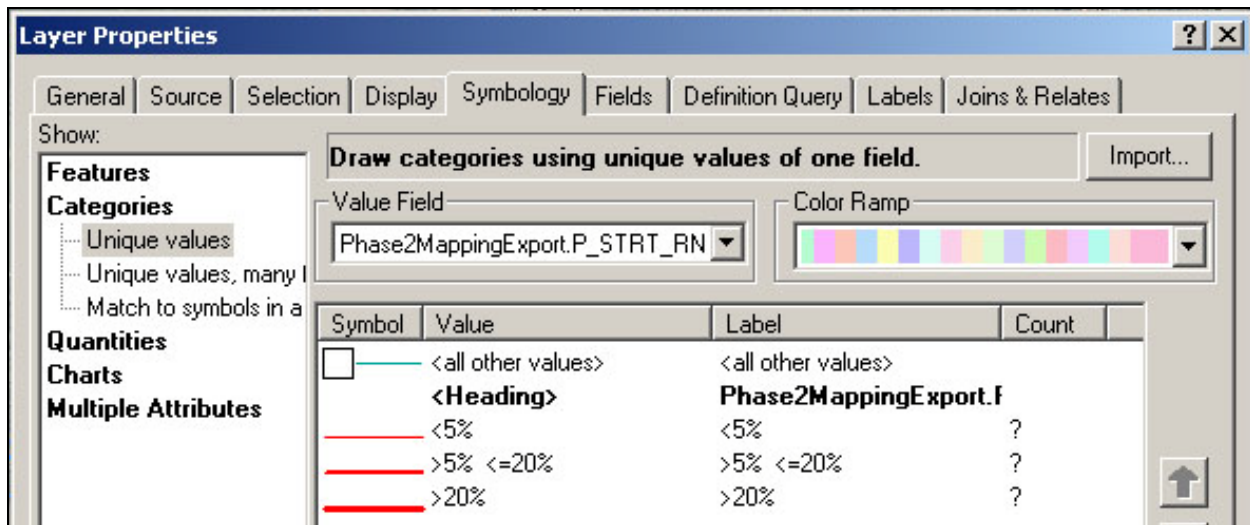
Definition Query



Single symbol Symbology

Change the default line symbol for straightening to the red double lined “Straightening” line symbol.

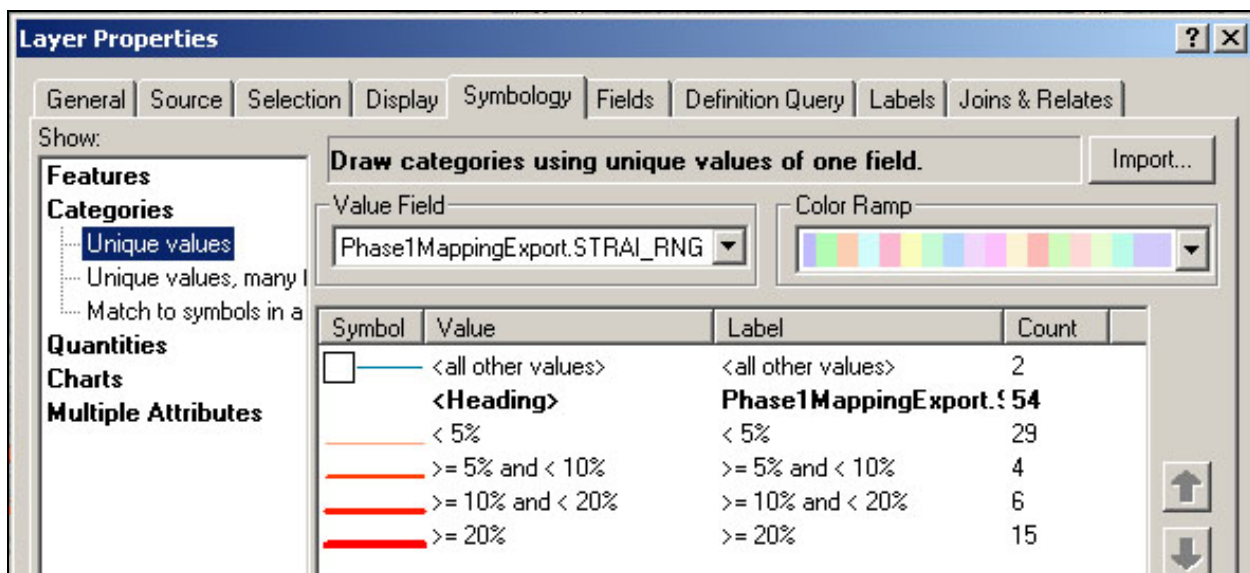
If you do not have FIT data, use the “P2 % Straightening” data layer to show the various percentages of straightening within different reaches/segments. Categorize by “Unique Value” in “Symbology”, set the “Value Field” to “P_STRT_RNG”. Add all relevant values.



Unique Value in Symbology

Change the symbol for “P2 % straightening” line symbols to the Red lines of varied thicknesses “Straightening <=5%”, “Straightening >5% and <=20%” “Straightening >20%” line symbols. Change the “<Heading>” “P_STRT_RNG” to “RANGE”

If you do not possess FIT data or Phase 2 data, (or you’d like to show how straightening affected all your reaches) use the “P1 % Straightening” data layer, to show the various percentages of straightening within different reaches. This can be done by categorizing by “Unique Value” in “Symbology” and setting the “Value Field” to “STRAI_RNG”. Add all relevant values.



Unique Value in Symbology

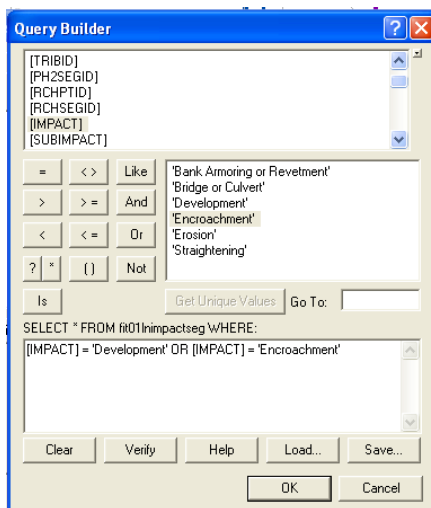
Change the symbol for “P1 % straightening” line symbols to the varied thickness “Straightening <=5%”, “Straightening >5% and <=10%”, “>10% and <= 20%” “Straightening >20%” line symbols.

Change the “<Heading>” “Phase1MappingExportSTRAI_RNG” to “RANGE”

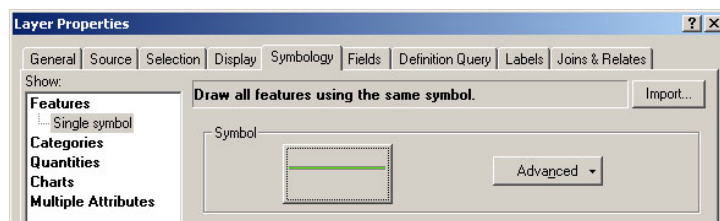
River Corridor Encroachments Data:

SGAT Feature Type	Attribute Information
FIT line data	Roads, railroads, improved paths, and development
OR Stream reach – line data	Phase 1 data indicating highest impact rating (low; high) assessed between the two parameters: river corridor development (Step 6.2) and berms and roads (Step 6.1). Export Code: ENCRCH_IMP

Use the “Encroachment/ Development” data layer to display any lines indicating development or encroachment. This can be done by setting a definition query to Impact = ‘Development’ or Impact = ‘Encroachment’ and then Symbolizing the features with a single symbol:



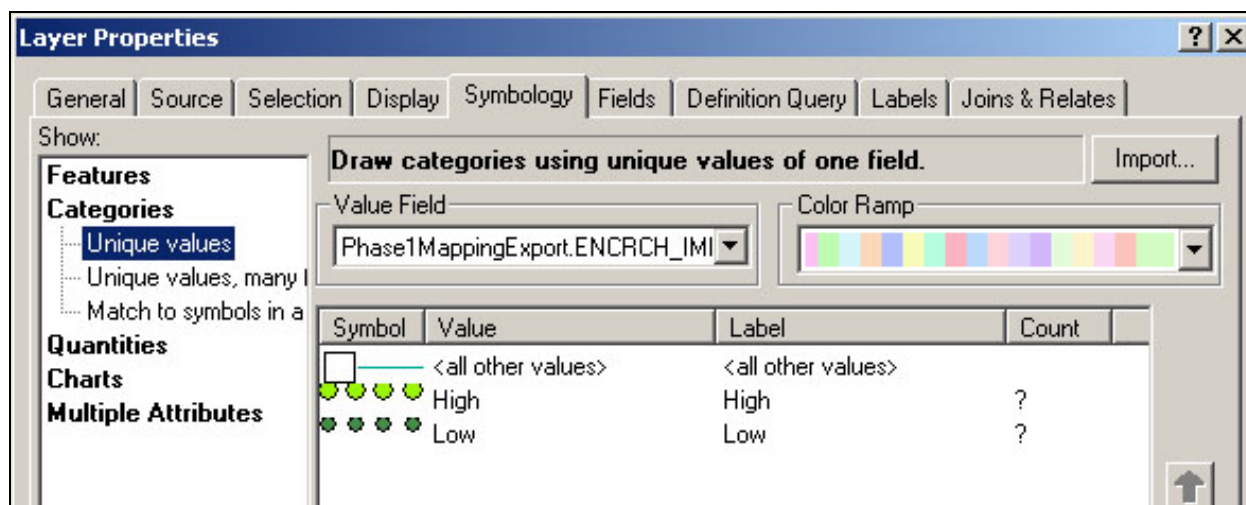
Definition Query



Single in Symbology

Change the symbol for the “Encroachment/Development” line to the black and green “Development/encroachment” line symbol.

If the FIT data is not available, use the “P1 Encroachment” data layer to display the impact rating of reaches (assigned in phase 1). Categorize by “Unique Value” by setting the “Value Field” to “ENCRCH_IMP” Add values High” and “Low” (or just the relevant values that exist):



Unique Value in Symbology

Change the P1_encroachment line symbols to the Green “P1 encroachment high” and “P1 encroachment low” dotted line symbols.

Delete the “<Heading>” “ENCRCH_IMPACT”

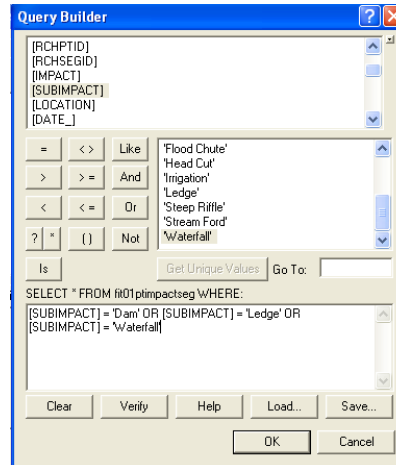
Mapping Slope Decreases

Grade controls and Channel Constrictions Data:

SGAT Feature Type	Attribute Information
FIT point	Natural grade control (waterfalls and ledge), human-constructed grade control (dams and weirs), bridge, or culvert (using different symbols for each)
OR Stream segment – line data	Phase 2 data attributing the stream segment line indicating the number of natural or man-made grade controls (Steps 1.6) and channel constrictions with deposition above (Steps 4.8) ($0 \leq 2$; $>2 \leq 5$; >5)* Export Code: CNSTR_CNTL * note: normalized values - # features(5,280)/segment length
OR Stream reach – line data	Phase 1 data attributing the stream reach line indicating the number of natural grade controls (Step 3.2) and bridges or culverts with a high or low impact rating (Step 5.2) ($0 \leq 2$; $>2 \leq 5$; >5)* Export Code: CNST_CNTL * note: normalized values - # features(5,280)/segment length
Stream segment – line data	Phase 2 data (Step 4.9) indicating the number of beaver dams ($0 \leq 2$; $>2 \leq 5$; >5)* Export Code: BVRDAM_RNG

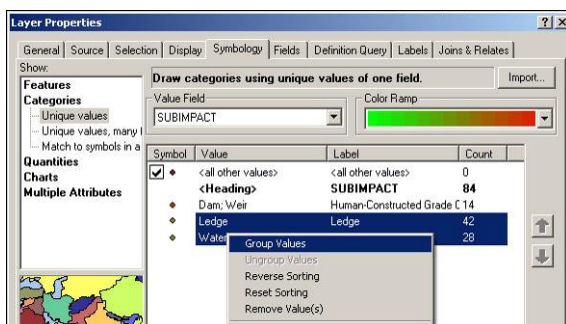
	* note: normalized values - # features(5,280)/segment length
Additional Resources:	
Bridge and culvert assessment – GIS point data, attributed to indicate whether mid-channel bars have forms in excess to ½ bank full height	
Vermont Dam Inventory (VCGI) – GIS point data indicating the presence of a dam	

Use the “Grade Control” data layer to set the definition query to SUBIMPACT = waterfall OR SUBIMPACT = ledge OR SUBIMPACT = dam OR SUBIMPACT = weir.

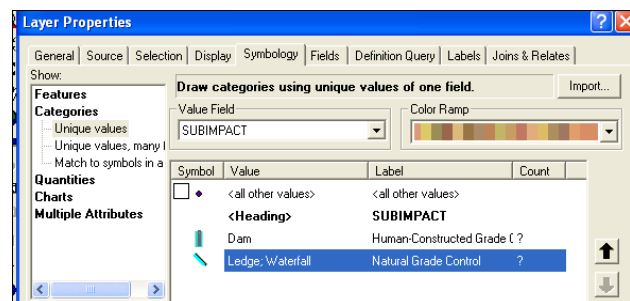


Definition Query

Then use Unique Value in Symbology to show all grade controls. Group the grade control by natural and human-constructed. Hold control button while clicking to select dam and weir. Right click on these and select “Group Values” from the drop down menu. Rename this group “Human Constructed Grade Controls”. Repeat these steps for the Ledge and waterfall, renaming them “Natural Grade Controls”:



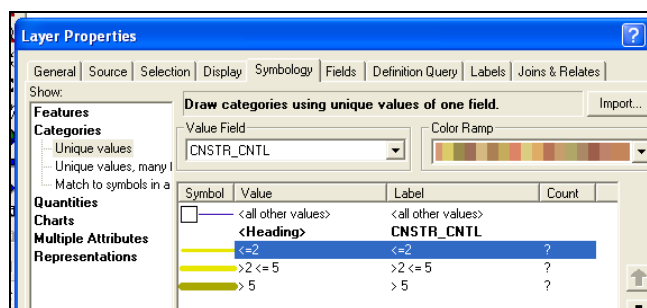
Grouping Unique Value in Symbology



Unique Value in Symbology

Change the “Human Constructed Grade Control” to the Grade Control Human Constructed” symbol and the “Natural Grade Control” to the Grade Control Natural symbol. Delete the “<Heading>” “SUBIMPACT”

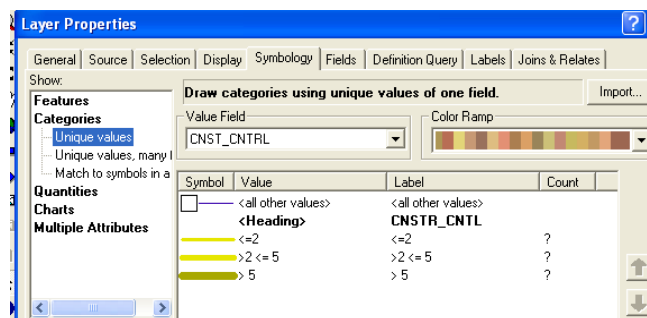
If you do not have FIT data, use the “P2 Grade ctrl/mile” data layer to display the range in number of grade controls per mile in specific reaches/segments. Categorize by “Unique Value”. Set the “Value Field” to “CNSTR_CNTL”. Add values (≤ 2), ($>2 \leq 5$), and (>5):



Unique Value in Symbology

Change the “P2 Grade ctrl/mile” line symbols to the various shades of yellow “constrict/mile ≤ 2 ”, “constrict/mile $>2 \leq 5$ ”, and “constrict/mile >5 ”, lines. Change the “<Heading>” “CNSTR_CNTL” to “RANGE”

If you do not have FIT data or Phase 2 data, use the “P1 Grade ctrl/mile” data layer to display the range in number of grade controls per mile in specific reaches. Categorize by “Unique Value”. Set the “Value Field” to “CNST_CNTRL”. Add the values (≤ 2), ($>2 \leq 5$), and (>5):

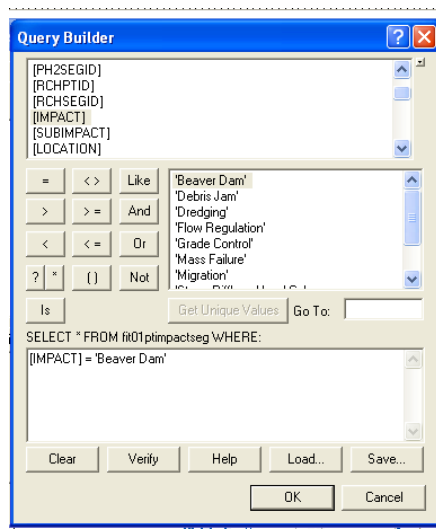


Unique Value in Symbology

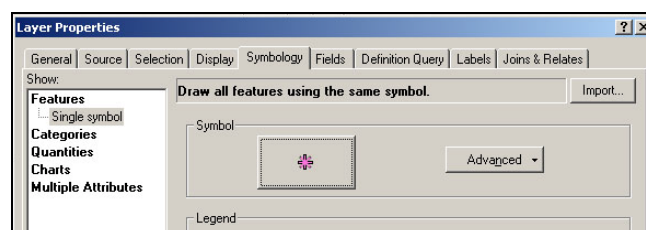
Change the “P1 grade ctrl/mile” line symbols to the various shades of yellow “constriction/mile ≤ 2 ”, “constriction/mile $>2 \leq 5$ ”, and “constriction/mile >5 ”, lines. Change the “<Heading>” “CNST_CNTRL” to “RANGE”

Beaver Dams:

Use the “Beaver Dam” data layer to show the locations of beaver dams along the river. To do this set the definition query to $\text{IMPACT} = \text{Beaver Dam}$. Then Symbolize features with a single symbol:



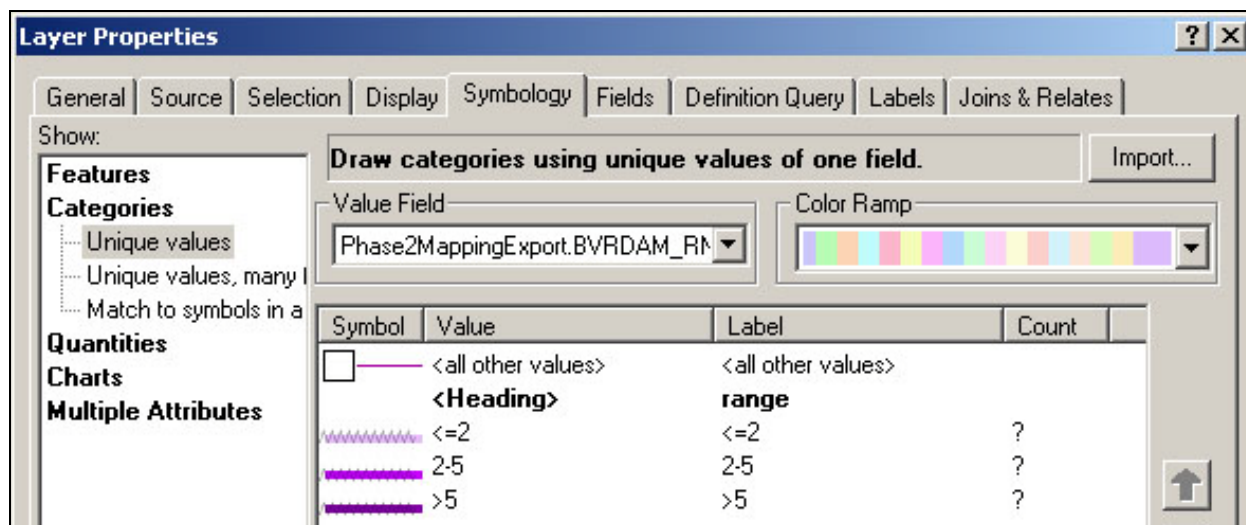
Definition Query



Single Symbol in Symbology

Change the “Beaver Dam” point symbol to the pink “Beaver Dam” symbol.

If you do not have FIT data, use the “P2 Beaver dam” data layer to show the ranges of beaver dams per reach/segment. To do this categorize by “Unique Value”. Set the “Value Field to BVRDAM_RNG”. Add the values (<=2), (>2 <=5), and (>5):

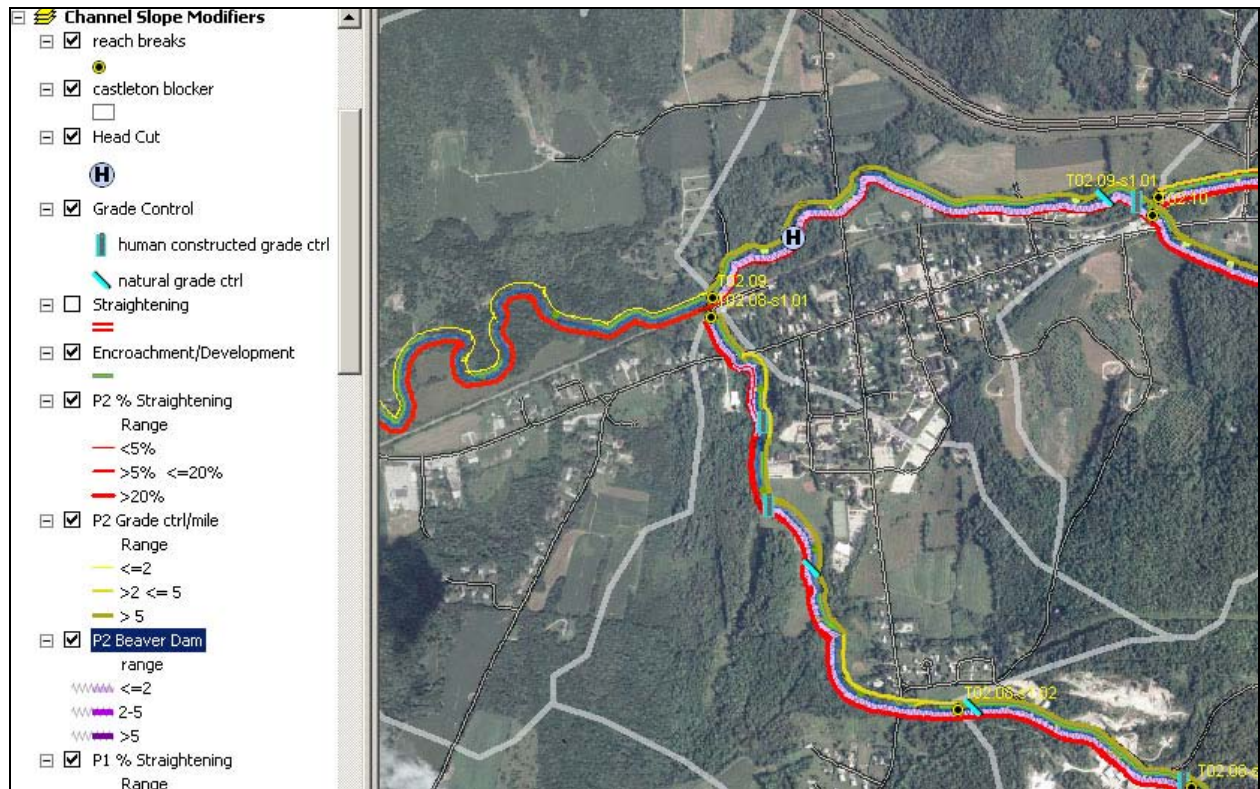


Unique Value in Symbology

Change the “P2 Beaver dam” line symbols to the various shade of purple “Beaver Dam <=2”, “Beaver Dam >2 <=5”, and “Beaver Dam >5”, lines.

Change the “<Heading>” “BVRDAM_RNG” to “RANGE”

Sample Channel Slope Modifiers Map:



Channel Depth Modifier Map

The Channel Depth Modifier map will show stormwater inputs, bridges and culverts, dredging, beaver dams, encroachments, and depositional features.

To keep the map organized we recommend that you create a new data frame for this map.

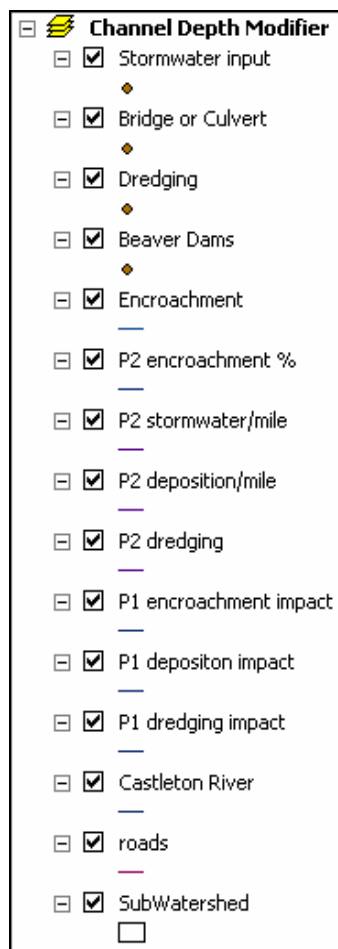
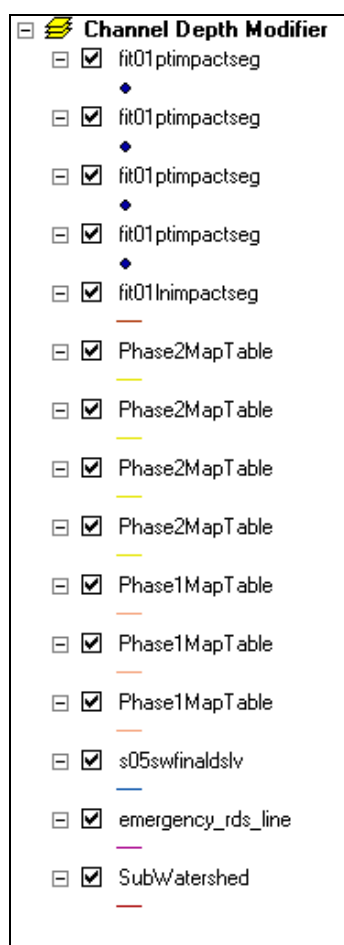
Select "Insert" → "Data Frame" from the upper menu.

Rename this data frame "Channel Depth Modifier"

Copy and paste all the data layers need for this map.

# of copies	Data
3	Phase1MapTable
4	Phase2MapTable
4	Fit01ptimpactseg
1	Fit01lnimpactseg
1	Emergency roads line
1	S05swfinaldslv
1	SubWatershed

Rename the layers in the Channel Depth Modifier Data Frame.

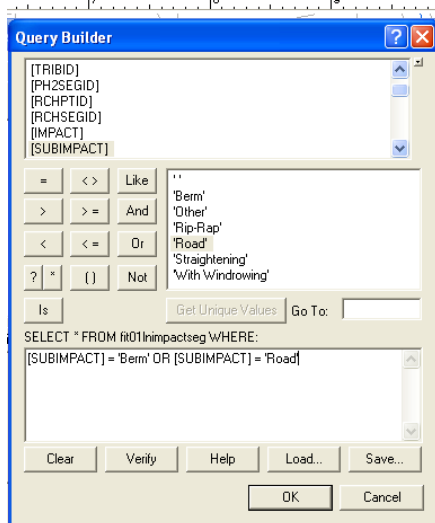


Mapping Increases in Depth

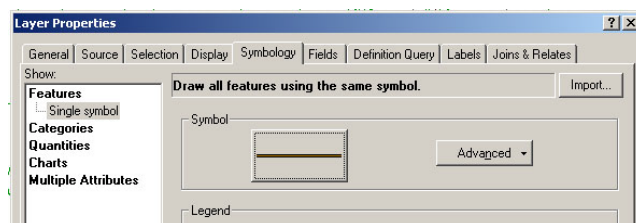
Berms, Roads, Railroads, Improved Paths Data:

SGAT Feature Type	Attribute Information
FIT line data	Berms, Roads, Railroads
OR Stream segment – line data	Phase 2 data (Steps 1.3) indicating the percentage of one bank / both banks encroached upon by berms, roads, railroads Export Code: ENCRCH_RNG ($\geq 5 < 20\%$; $\geq 20\%$)
OR Stream reach – line data	Phase 1 data (Step 6.1) indicating low or high impact rating associated with berms, roads and rail roads Export Code: ENCRCH_IMP

Use the “Encroachment” data layer to display any lines indicating berms, roads, railroads or improved paths. This can be done by setting a definition query to “SUBIMPACT = Berm” OR “SUBIMPACT = Road” OR “SUBIMPACT = Railroad” or “SUBIMPACT = Improved Path”. Then symbolize the features with a single symbol:



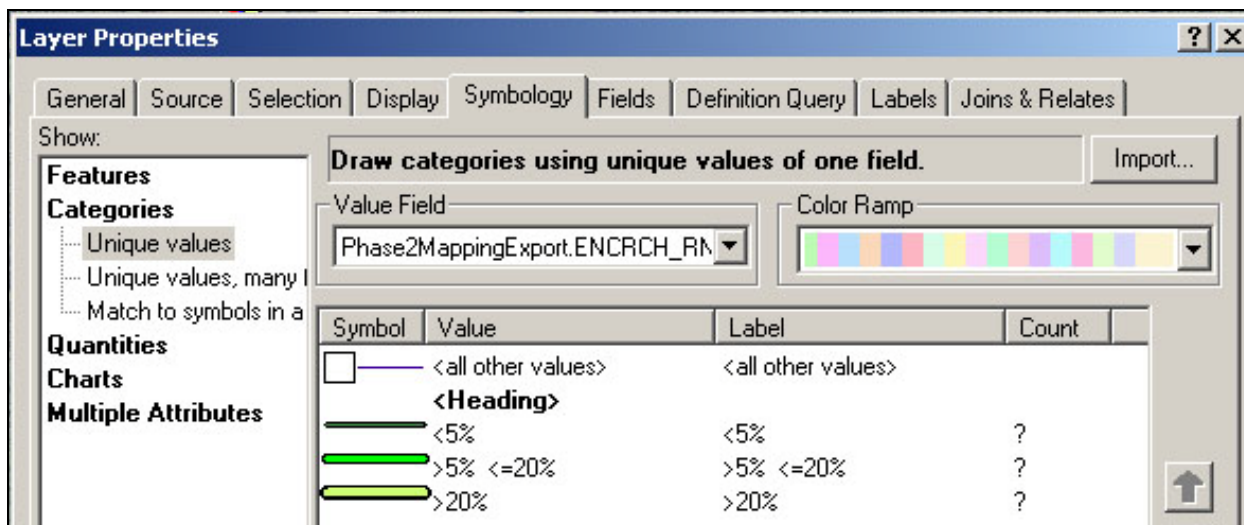
Definition Query



Single Symbol in Symbology

Change the “Encroachment” line symbol to the brown and black “roads, railroads, berm and improved paths” symbol.

If you do not have FIT data, use the “P2 encroachment %” data layer to show the various ranges in percent of encroachments per reach/segment. Categorize by “Unique Value”. Set the “Value Field” to “ENCRCH_RNG”. Add the values <5%, >5% & <20%, and >20%.

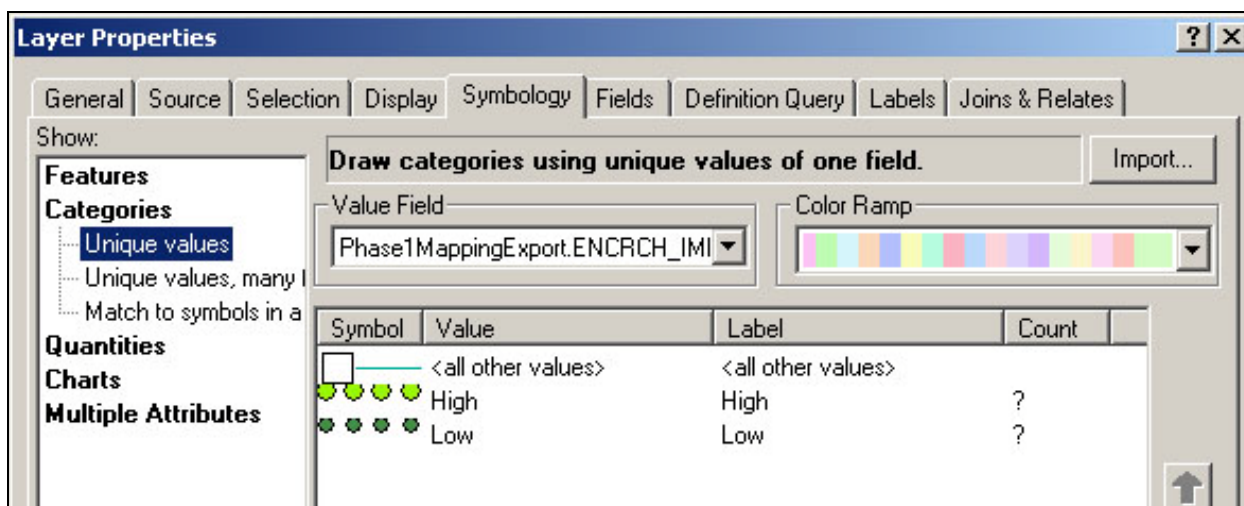


Unique Value in Symbology

Change the “P2 encroachment %” line symbols to the various green yellow orange scale for “P2 encroach <=5%”, “P2 encroach >5% <=20%”, and “P2 encroach >20%”, lines.

Change the “<Heading>” “Phase2MappingExport.ENCRCH_RNG” to “RANGE”

If you do not have FIT or Phase 2 data, use the “P1 encroachment impact” data layer to display the phase 1 encroachment impact rating of each reach. Categorize by “Unique Value”. Set the “Value Field” to “ENCRCH_IMP”. Add the values “High” and “Low”.



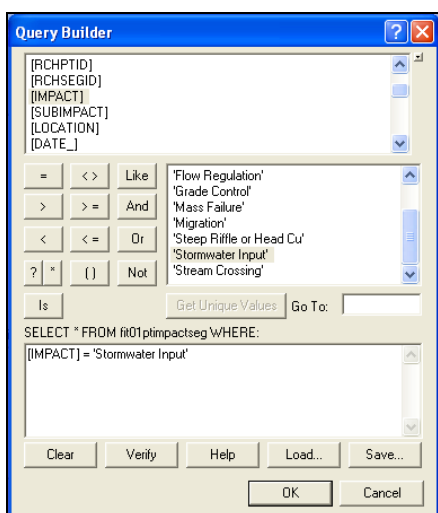
Unique Value in Symbology

Change the “High” line symbol to the light green dotted “P1 encroach High” line symbol and the “Low” line symbol to the dark green dotted “P1 encroach Low” line symbol.
Change the “<Heading>” “Phase1MappingExportENCRCH_IMP” to “Rating”

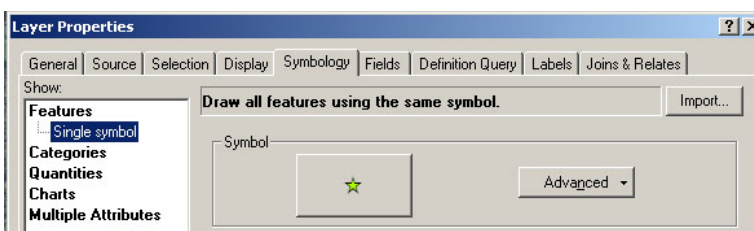
Storm Water Outfalls Data:

SGAT Feature Type	Attribute Information
FIT point data	Storm water discharges – the indexed ditch outlets, culverts, or pipes collecting and conveying stormwater to the segment (or reach)
AND/OR Stream segment - line data	Phase 2 data (Steps 4.6) attributing the segment line to indicate the number of storm water inputs ($0 \leq 2$; $2 < 5$; $5 < 5$)* Export Code: STRM_RNG * note: normalized values - # storm water inputs(5,280)/segment length
Additional Resources	
Storm water outfalls inventories – point data obtained through DEC Storm water Section, regional or municipal planning agency	

Use the “Stormwater input” data layer to display any points indicating stormwater inputs. This can be done by setting a definition query to `IMPACT = 'Stormwater Input'`. Then you can symbolize the features with a single symbol:



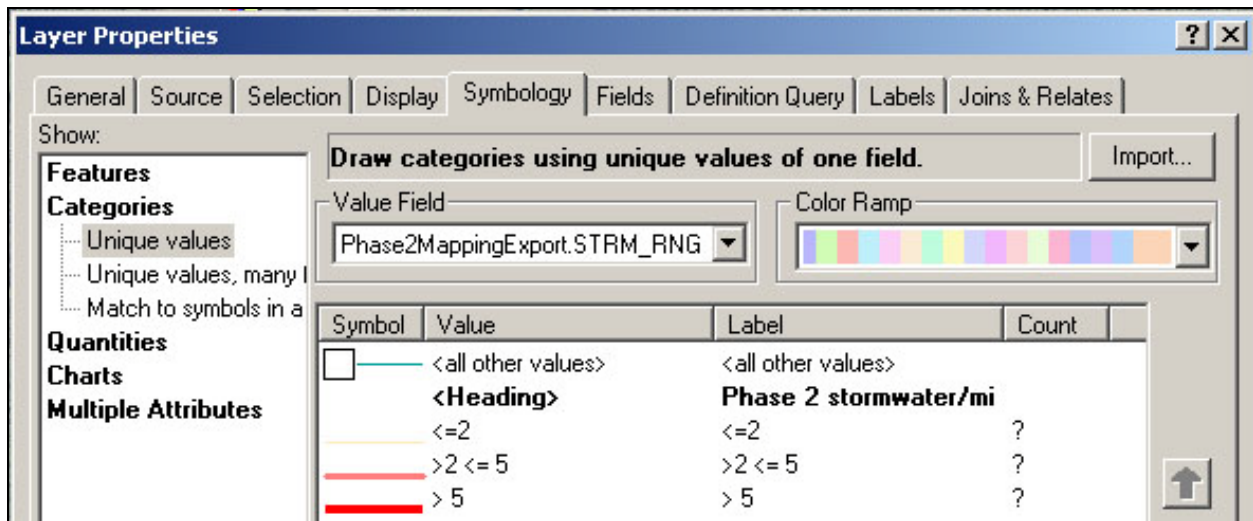
Definition Query



Single Symbol in Symbology

Change the “Stormwater input” point symbol to the green “Stormwater” symbol.

If you do not have FIT data, use the “P2 stormwater/mile” data layer to show the 3 quantity ranges for the number of stormwater inputs per mile for each reach/segment. Categorize by “Unique value”. Set the “Value Field” to “STRM_RNG”. Add all relevant values.



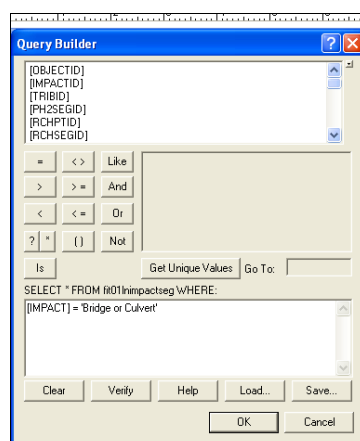
Unique Value in Symbology

Change the “P2 stormwater/mile” line symbols to the ramped shades of yellow - red “stormwater/mile <=2”, “stormwater/mile >2 <=5”, and “stormwater/mile >5”, lines. Change the “<Heading>” “Phase2MappingExportSTRM_RNG” to “RANGE”

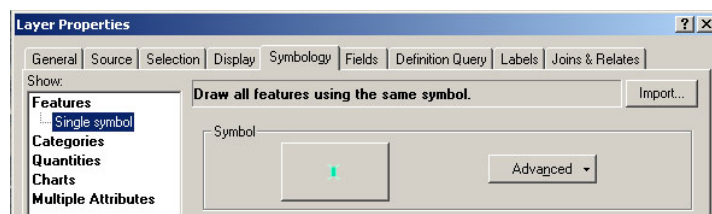
Bridge and Culvert Data:

Note: older projects (pre 2007) will have line data for bridges and culverts. Before mapping this you will have to convert the line data to point data. This is done in the SGAT project, under the FIT step. See the SGAT user manual for how to modify/remove FIT parameters.

Use the “Bridge or Culvert” data layer to display any points indicating bridge or culverts. This can be done by setting a definition query where “IMPACT = Bridge or Culvert”. Then symbolize the features with a single symbol:



Definition Query



Single Symbol in Symbology

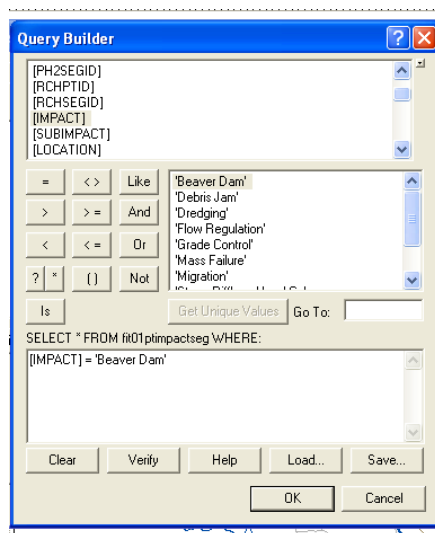
Change the “Bridge or Culvert” point symbol to the blue “Bridge/Culvert” symbol.

Mapping Decreases in Depth

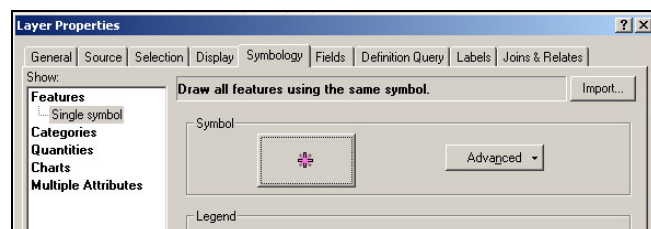
Delta and Backwater Deposits Data:

SGAT Feature Type	Attribute Information
FIT data	Impoundments, beaver dams
AND Stream segment – line data	Phase 2 data (Steps 5.1 and 5.3) indicating the presence the number of steep riffles, mid-channel bars, and delta bars ($0 \leq 2$; $>2 \leq 5$; >5)* Export Code: DEP_S_RNG * note: normalized values - # features(5,280)/segment length
OR Stream reach – line data	Phase 1 data (Step 5.1, 5.2, 6.3) indicating when low or high impact rating have been made for any of the following: impoundments, bridges and culverts, mid-channel or delta bars. Export Code: DEPTH_DEC
Additional Resources	
Vermont Dam Inventory – GIS points	
Bridge and culvert points from ANR assessments and/or shapefiles created during assessment	

Use the “Beaver Dam” data layer to show the locations of beaver dams along the river. To do this set the definition query to “IMPACT = Beaver Dam”. Then Symbolize features with a single symbol:



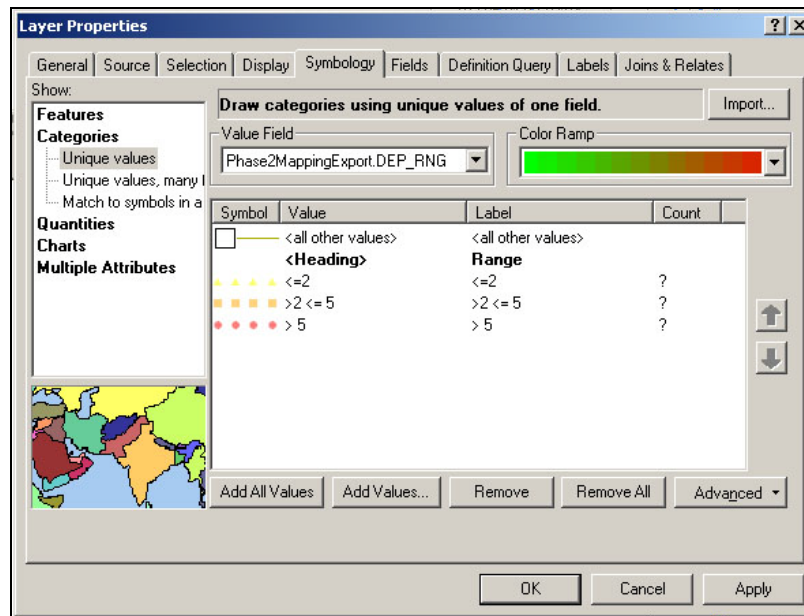
Definition Query



Single Symbol in Symbology

Change the “Beaver Dam” point symbol to the pink “Beaver Dam” symbol.

Use the “P2 deposition/mile” data layer to show the 3 quantity ranges of the number of depositional features (steep riffles, delta bars, and mid channel bars) per mile for each reach/segment. Categorize by “Unique Value”. Set the “Value Field” to “DEP_S_RNG”. Add all relevant values:



Unique Value in Symbology

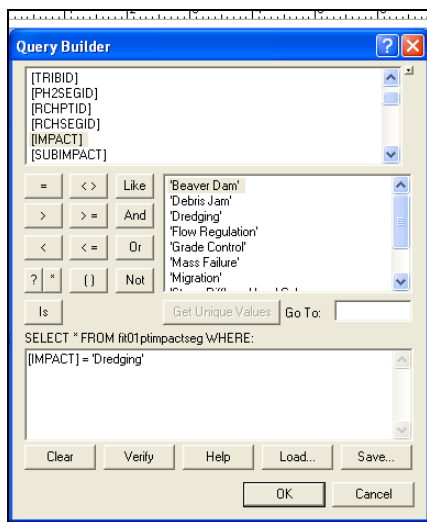
Change the “P2 deposition/mile” line symbols to the triangle, square, and circle “deposition/mile <=2”, “deposition/mile >2 <=5”, and “deposition/mile >5”, lines.
Change the “<Heading>” “DEP_S_RNG” to “RANGE”

If you do not have phase 2 data, use the “P1 deposition impact” data layer to show the deposition impact score for the entire reach. Categorize by “Unique Value”. Set the “Value Field” to “DEPTH_DEC”. Add all relevant values:

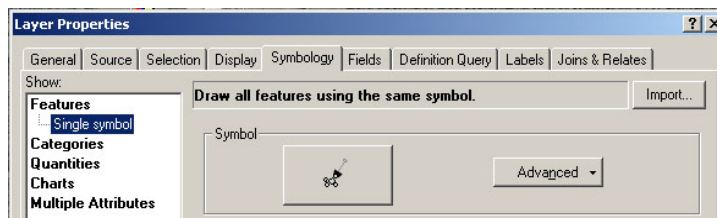
Gravel Mining and Bar Scalping Data:

SGAT Feature Type	Attribute Information
FIT point data	Dredging, gravel mining, or bar scalping
OR Stream segment – line data	Phase 2 data (Step 5.5) indicating the presence of dredging, gravel mining, or bar scalping Export Code: DREDGING
AND/OR Stream reach – line data	Phase 1 (Step 5.5 data) indicating low or high impact rating associated gravel mining and dredging Export Code: I_DREDGE

Use the “Dredging” data layer to display any points indicating dredging, gravel mining or bar scalping. To do this set the definition query to Impact = ‘Dredging’ OR IMPACT = ‘Gravel’ OR IMPACT = ‘Mining’ OR IMPACT = ‘Bar Scalping’. Symbolize features with a single symbol:



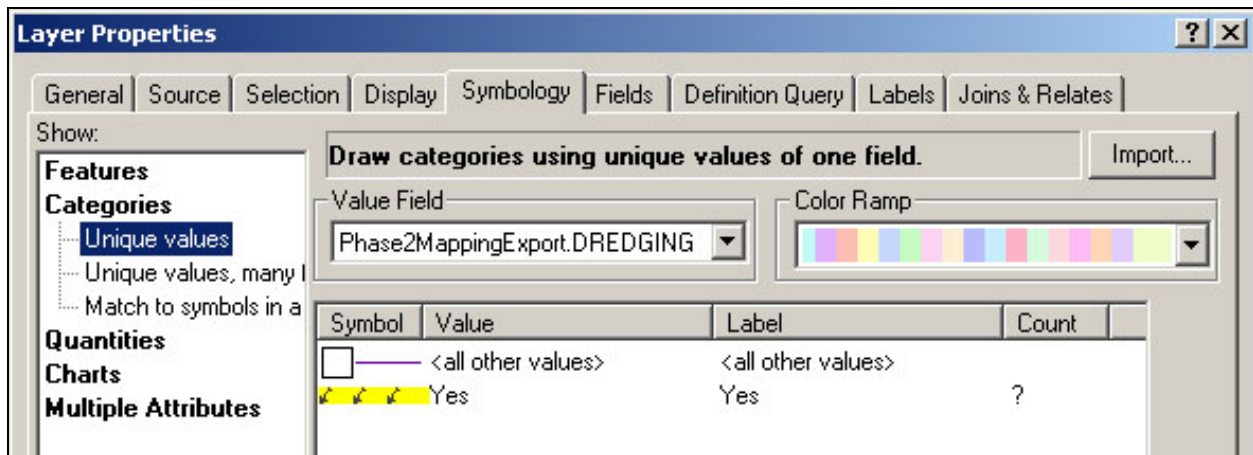
Definition Query



Single Symbol in Symbology

Change the “Dredging” point symbol to the shovel “Dredging” symbol.

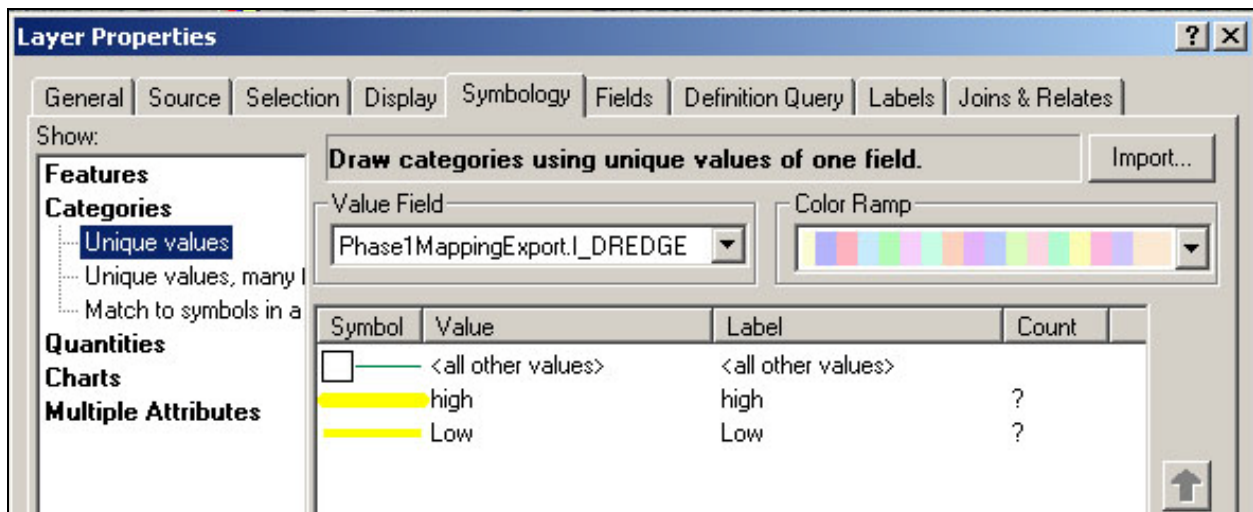
If you do not have FIT data, use the “P2 Dredging” data layer to display whether or not a reach/segment has been dredged. Categorize by “Unique Value”. Set the “Value Field” to “DREDGING”. Add the value “Yes”:



Unique Value in Symbology

Change the “P2 Dredging” line symbols to the yellow “Dredging Yes” line symbol.
Delete the “<Heading>” “Phase2MappingExportDREDGING”

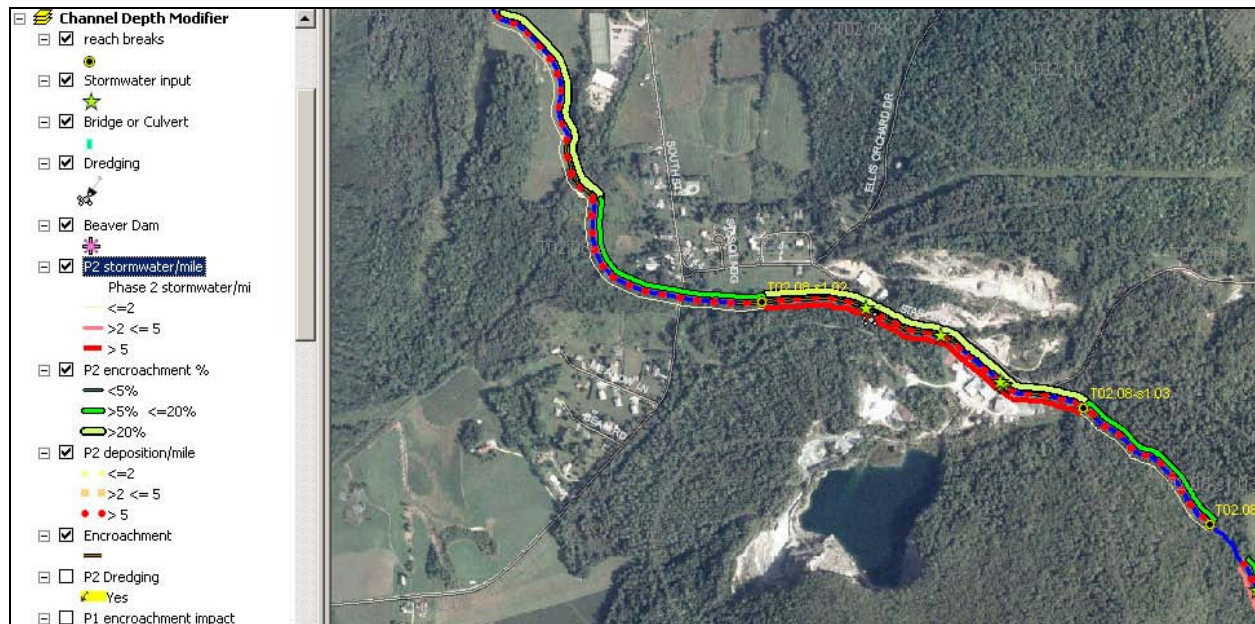
If you do not have FIT or Phase 2 data, use the “P1 dredging impact” data layer to show if the impact rating for the dredging of each reach is high, low or insignificant. Categorize by “Unique Value”. Set the “Value Field” to “I_DREDGE”. Add all the value relevant values:



Unique Value in Symbology

Change the line symbols to the thick yellow “P1 dredge high” and the thinner yellow “P1 dredge low” symbol
Delete the <Heading> “Phase1MappingExport.I_DREDGE”.

Sample Channel Depth Modifiers Map:



Boundary Conditions and Riparian Modifiers Map

The Boundary Conditions and Riparian Modifiers map will show areas where the vegetation buffers are less than 25 feet, the bank is composed of cohesive material, stream bed material, grade controls, bank armoring, bank erosion, and dredging.

To keep the map organized we recommend that you create a new data frame for this map.

Select “Insert” → “Data Frame” from the upper menu

Rename this data frame “Boundary Conditions and Riparian Modifiers”

Copy and paste all the data layers need for this map.

# of copies	Data
2	Phase1MapTable
8	Phase2MapTable
2	Fit01ptimpactseg
3	Fit01lnimpactseg
1	S15WR emergency roads line
1	S05swfinaldslv
1	SubWatershed

Rename the layers in the Boundary Condition and Riparian Modifiers Data Frame

<div> <input type="checkbox"/> Boundary Conditions and Riparian Modifiers <ul style="list-style-type: none"> <input checked="" type="checkbox"/> fit01lnimpactseg <input checked="" type="checkbox"/> fit01lnimpactseg <input checked="" type="checkbox"/> fit01lnimpactseg <input checked="" type="checkbox"/> fit01ptimpactseg <input checked="" type="checkbox"/> fit01ptimpactseg <input checked="" type="checkbox"/> Phase2MapTable <input checked="" type="checkbox"/> Phase2MapTable <input checked="" type="checkbox"/> Phase2MapTable <input checked="" type="checkbox"/> Phase2MapTable <input checked="" type="checkbox"/> Phase2MapTable <input checked="" type="checkbox"/> Phase2MapTable <input checked="" type="checkbox"/> Phase2MapTable <input checked="" type="checkbox"/> Phase1MapTable <input checked="" type="checkbox"/> Phase1MapTable <input checked="" type="checkbox"/> emergency_rds_line <input checked="" type="checkbox"/> s05swfinaldslv <input checked="" type="checkbox"/> SubWatershed </div>	<div> <input type="checkbox"/> Boundary Conditions and Riparian Modifiers <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Buffer less than 25 ft <input checked="" type="checkbox"/> Erosion <input checked="" type="checkbox"/> Armoring <input checked="" type="checkbox"/> Grade Control <input checked="" type="checkbox"/> Dredging <input checked="" type="checkbox"/> P2 R Buffer less than 25 feet <input checked="" type="checkbox"/> P2 L Buffer less than 25 feet <input checked="" type="checkbox"/> P2 Cohesive Bank <input checked="" type="checkbox"/> P2 Coarse Bed <input checked="" type="checkbox"/> P2 L Erosion % <input checked="" type="checkbox"/> P2 R Erosion % <input checked="" type="checkbox"/> P2 R Revetment % <input checked="" type="checkbox"/> P2 L Revetment % <input checked="" type="checkbox"/> P1 R Buffer <input checked="" type="checkbox"/> P1 L Buffer <input checked="" type="checkbox"/> Roads <input checked="" type="checkbox"/> Castleton River <input checked="" type="checkbox"/> SubWatershed </div>
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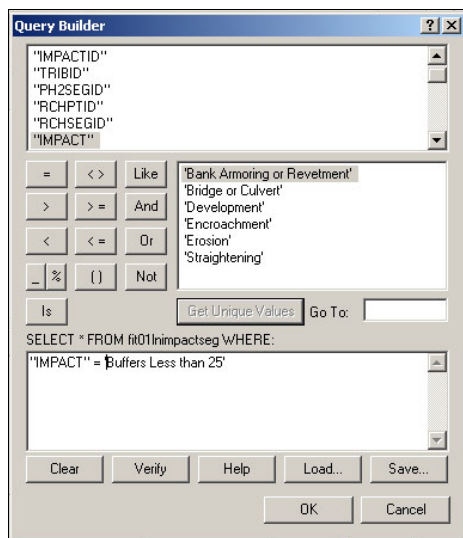
Mapping Increased Boundary Resistance

Riparian Vegetation and Bank Cohesiveness Data:

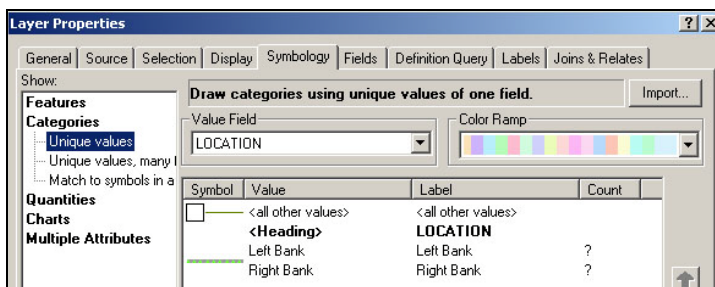
SGAT Feature Type	Attribute Information
FIT line data	Buffer less than 25 feet
OR Stream segment – line data	Phase 2 data (Step 3.2) attributed to lines offset right and left of the stream segment line indicating whether the 0-25 ft buffer category is the dominant buffer types within reach / segment (indicate separately for right or left bank). Export Code: L_BUFF_25 & R_BUFF_25
OR Stream reach – line data	Phase 1 data (Step 4.3) attributed to lines offset right and left of the stream segment line indicating whether the dominant right and left bank buffer category within reach / segment is less than \leq 25 ft. Export Code: L_NO_BUFF & R_NO_BUFF
AND Stream segment – line data	Phase 2 data (Step 3.1) attributed to the stream segment line indicating whether the right or left lower bank materials where comprised of cohesive materials. Export Code: COHESIVE

To show the exact location of areas where the vegetation buffer is less than 25 feet use the “Buffer less 25” data layer and set a definition query so that ”IMPACT = Buffer Less than 25”. Categorize by “Unique Value” set the “Value Field” to “LOCATION”. Add the values right bank and left bank.

Note: Projects done prior to 2007 may not have FIT data for buffers less than 25ft. This parameter was added in 2007 stream assessments.



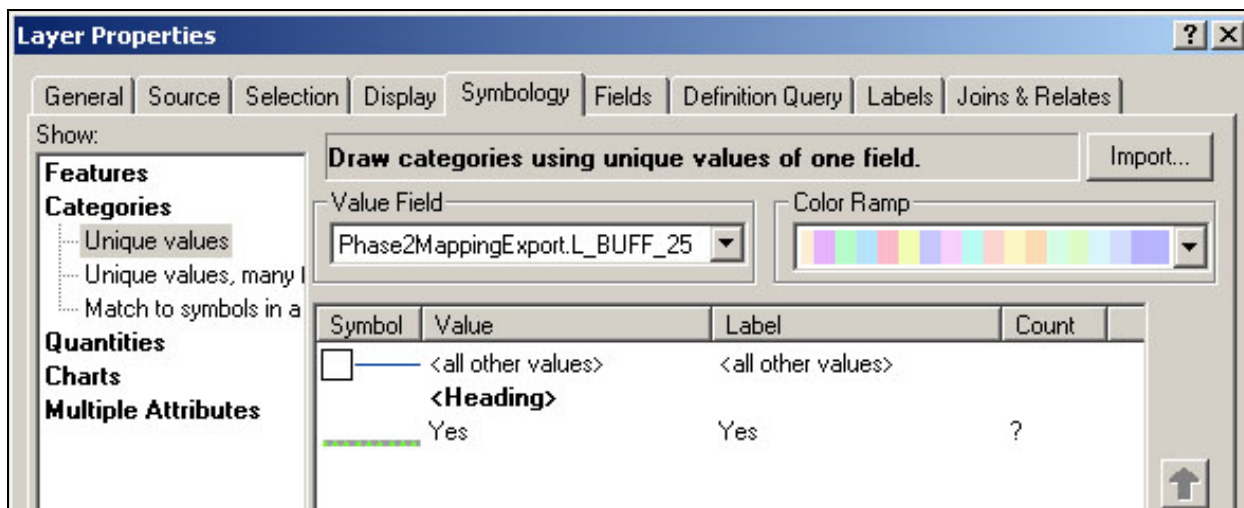
Definition Query



Unique Value in Symbology

Change the “Buffer less 25” line symbols to the grey and green “L Buff 25 yes” and “R Buff 25 yes” line symbols

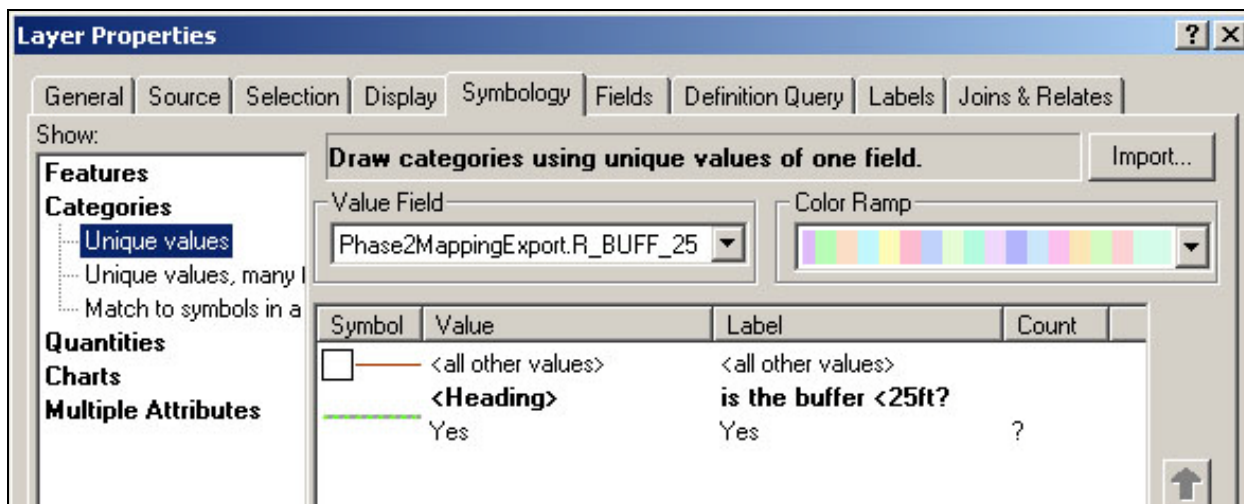
If you do not have FIT data, this will be done for both the left and right buffers. For the left buffer use the “P2 L Buffer25” data layer to show the left bank locations where the dominant width of buffer is less than 25ft. Categorize by “Unique Value”. Set the “Value Field” to “L_BUFF_25”. Add the value “Yes”.



Unique Value in Symbology

Change the “L Bank Buffer 25” line symbol to the green and grey “L Buff 25 yes” line. Change the “<Heading>” “L_BUF_25” to “<25ft>”.

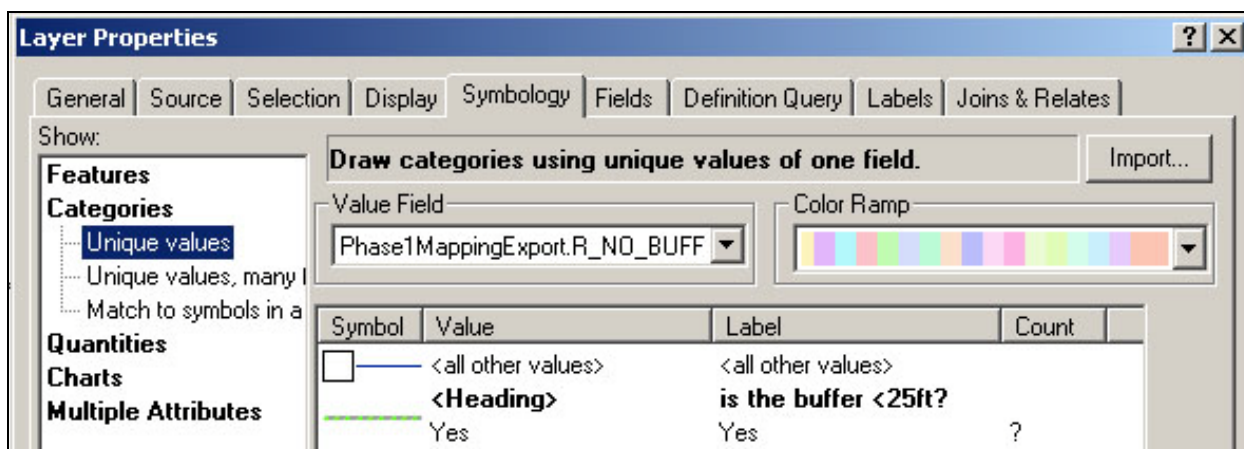
For the right buffer, use the “P2_R_Buffer25” data layer to display whether the reach has less than a 25 foot buffer for any part of the right bank. Categorize by “Unique Value”. Set the “Value Field” to “R_BUFF_25”. Add the value “Yes”.



Unique Value in Symbology

Change the “R Bank Buffer 25” line symbol to the green and grey “R Buff 25 yes” line. Change the “<Heading>” “R_BUFF_25” to “<25ft>”

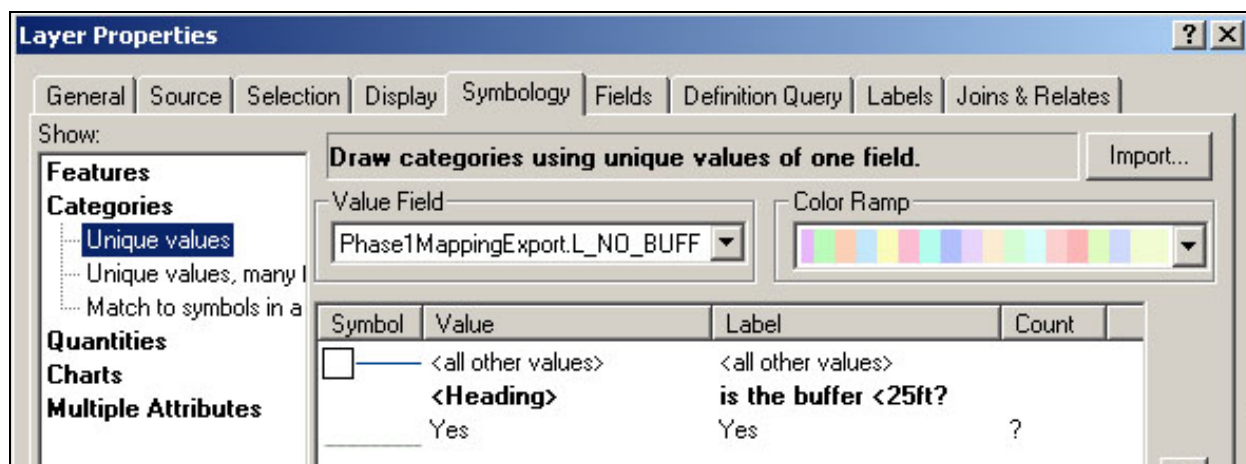
If you do not have FIT or Phase 2 data, this will be done for both the left and right buffers. For the left buffer use the “P1 L Buffer” data layer to display whether the reach has less than a 25 foot buffer for any part of the right bank. Categorize by “Unique Value”. Set the “Value Field” to “L_NO_BUFF”. Add the value “Yes”.



Unique Value in Symbology

Change the “P1 R Buffer” line symbol to the green and brown “R Buff 25 yes” line. Change the “<Heading>” “R_NO_BUFF” to “<25ft>”

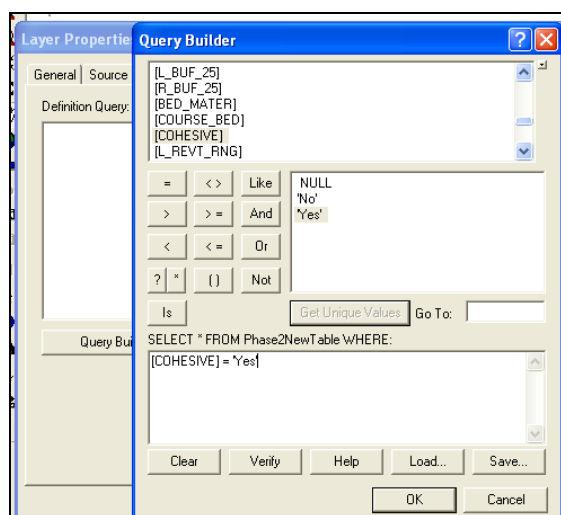
For the right buffer, use the “P1 R Buffer” data layer to display the percent of the reach that has no buffer for the left bank. Categorize by “Unique Value”. Set the “Value Field” to “R_NO_BUFF”. Add all relevant values.



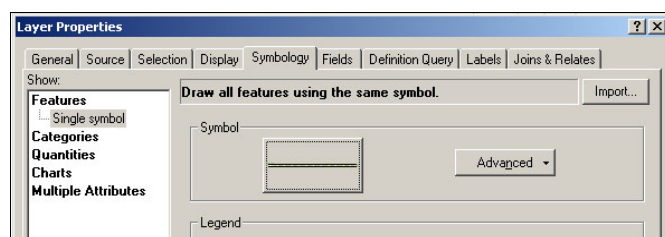
Unique Value in Symbology

Change the “P1_L_Buffer” line symbol to the green and brown “L Buff 25 yes” line. Change the “<Heading>” “L_NO_BUFF” to “RANGE”

Use the “P2 Cohesive bank” data layer to show if the banks of the reach/segment are made of cohesive materials. To do this set the Definition query to “COHESIVE” = “Yes” and then display using a single symbol.



Definition Query



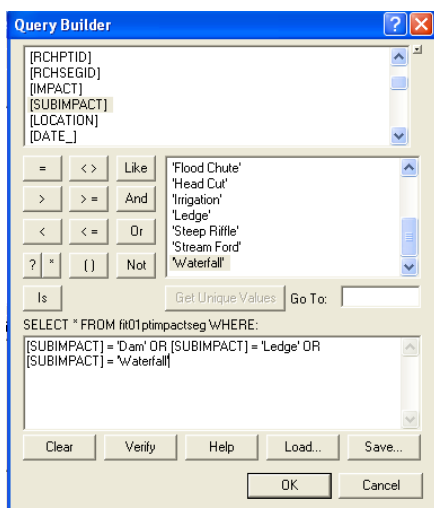
Single Symbol in Symbology

Change the default “P2 Cohesive bank” line symbol to the black and green “cohesive bank” line symbol.

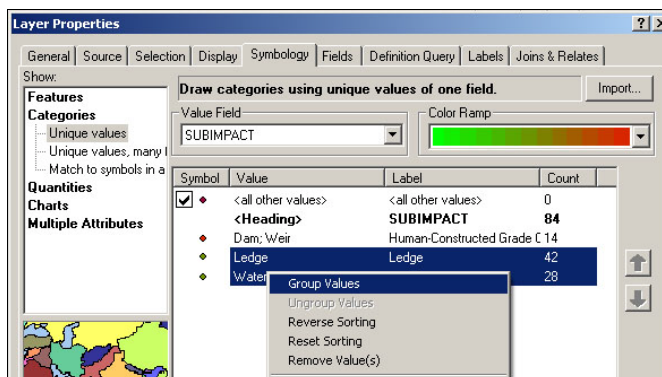
Grade Controls Data:

SGAT Feature Type	Attribute Information
FIT point and line data	Natural grade control (waterfalls and ledge) and human-constructed grade control (dams and weirs) (using different symbols for each)
AND Stream segment – line data	Phase 2 data (Step 2.12) indicating the bed substrate (D50) is equal to or greater than the course gravel substrate size. Export Code: COURSE_BED
Additional Resources	
Vermont Dam Inventory (VCGI) – GIS point data indicating the presence of a dam	

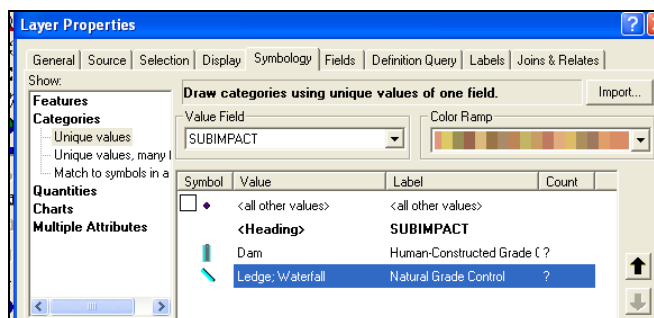
Use the “Grade Control” data layer to show the number and location of the grade controls for the entire river. To do this set the definition query where “SUBIMPACT = waterfall” or “SUBIMPACT = ledge” OR “SUBIMPACT = dam” OR “SUBIMPACT = weir”. Then use Unique Value in Symbolology to show all grade controls. Group the grade control by natural and human-constructed:



Definition Query



Grouping Unique Value in Symbolology



Unique Value in Symbology

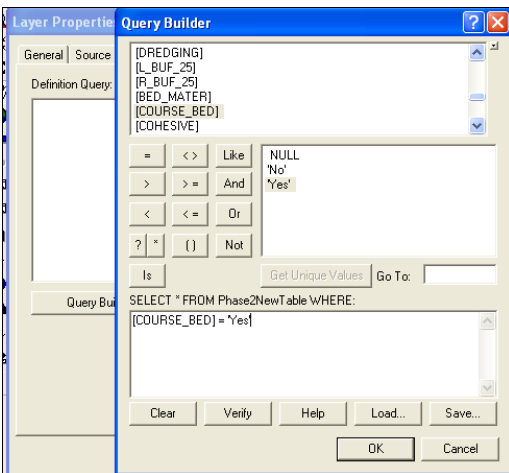
Change the “Grade Control” point symbols to the blue and grey “natural grade control” and “human constructed grade control” symbols.

Change the value title “Dam; Weir” to “Human-Constructed Grade Controls” and the value title “Ledge; Waterfall” to “Natural Grade Control”

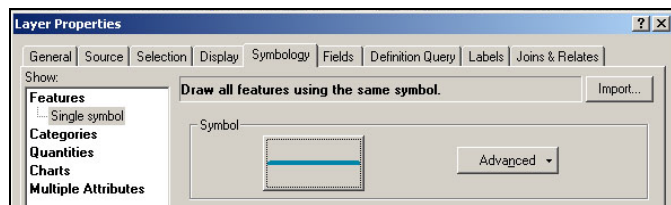
Delete the “<Heading>” “SUBIMPACT”

Substrate Data:

Use the “P2 Coarse Bed” data layer to indicate which segments/reaches have bed substrate that is equal to or greater than the coarse gravel substrate size. To do this use the query builder to select only those reach/segments that have “COURSE_BED = Yes”. Then display using a Single Symbol:



Definition Query



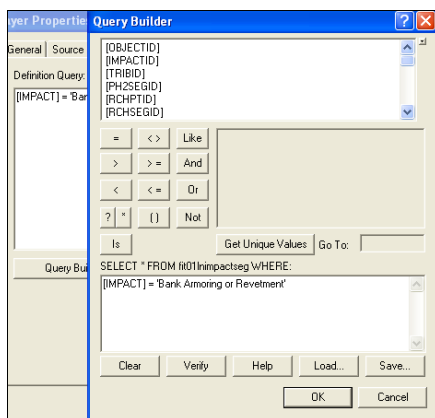
Single Symbol in Symbology

Change the “P2 Coarse bed” line symbol to the teal “Coarse bed material” line symbol.

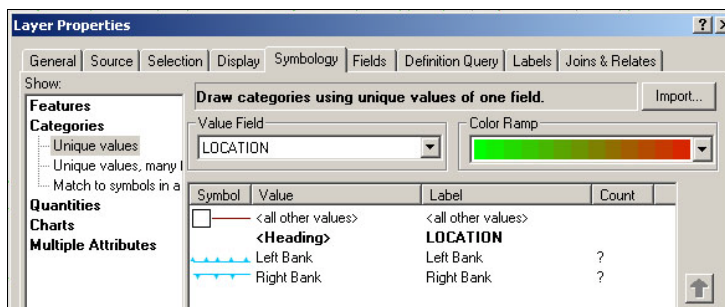
Bank Armoring and Active Bank Erosion Data:

SGAT Feature Type	Attribute Information
FIT line data	Bank armoring/revetment or erosion attributed separately (off-set for right and/or left bank separately)
OR Stream segment – line data	Phase 2 data (Steps 3.1) indicating the percentage of the reach / segment length (right and left bank) with bank revetment and eroding (≥ 5 <20%; ≥ 20 %) (using separate symbols for revetment and erosion) Export Code: L_EROS_RNG & R_EROS_RNG Export Code: L_REVT_RNG & R_REVT_RNG

Use the Armoring data layer to display bank armoring locations along the stream. Set the definition query to “IMPACT = Bank Armoring or Revetment” and then categorize by unique value. Set the “Value Field” to “LOCATION”. Add all relevant values to determine which side of the reach/segment the armoring occurred on.



Definition Query

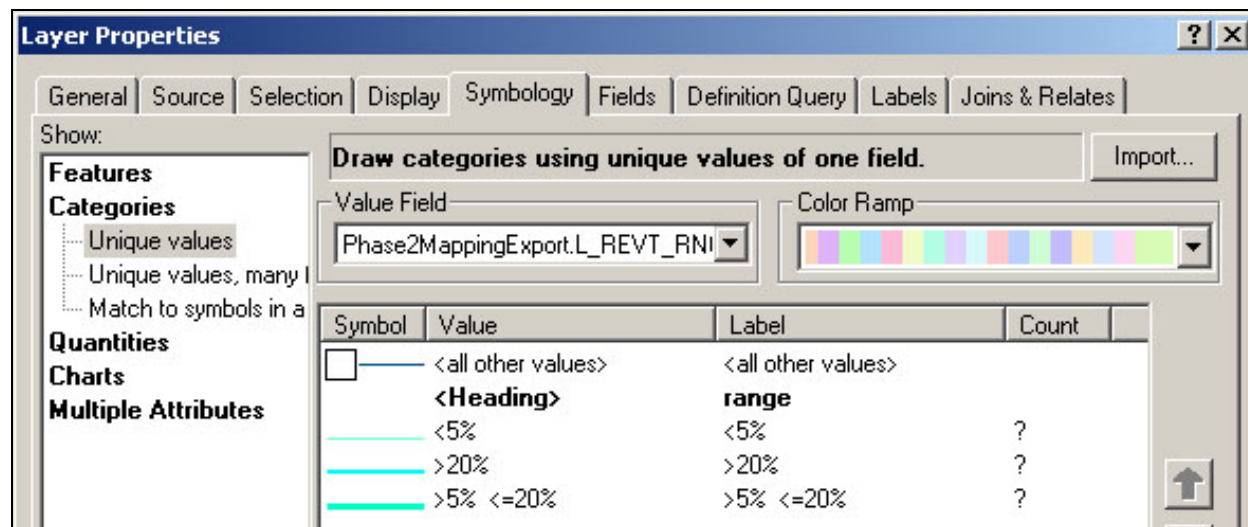


Unique Value in Symbology

Change the “Armoring” line symbols to the blue “Armoring right bank” and “Armoring left bank” line symbols.

Delete the <Heading> “LOCATION”

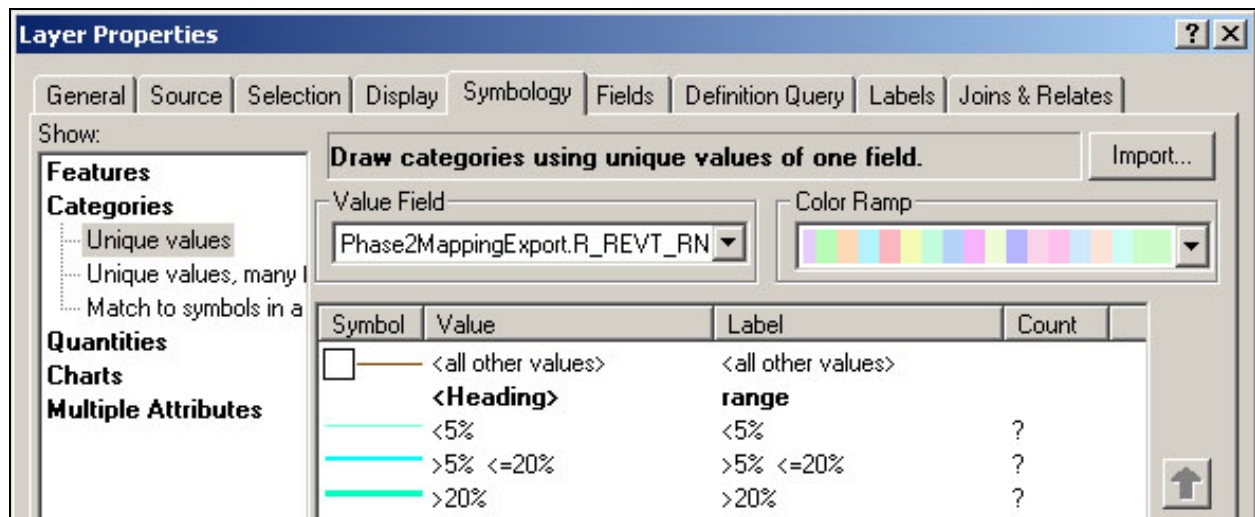
If you do not have FIT data, this will be done for both the left and right revetments. For the left revetments use the “P2 L Revetment %” data layer to display the percent of each reach/segment that is lined with left bank revetments. Categorize by “Unique Value”. Set the “Value Field” to “L_REV_RNG”. Add all relevant values.



Unique Value in Symbology

Change the grade “P2 L Revetment%” line symbols to the various shades of blue “Revetment <=5%”, “Revetment >5% <20%”, and “Revetment >20%”, lines.
Change the “<Heading>” “L_REVT_RNG” to “RANGE”

For the right revetments, use the “P2 R Revetment %” data layer to display the percent of each reach/segment that is lined with right bank revetments. Categorize by “Unique Value”. Set the “Value Field” to “R_REV_RNG”. Add all relevant values.

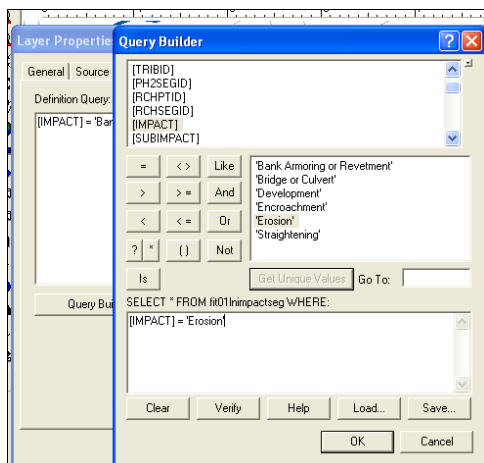


Unique Value in Symbology

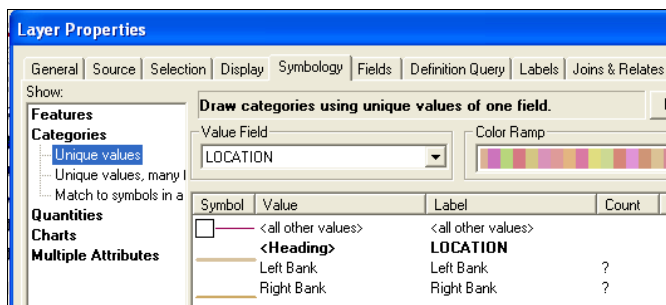
Change the grade “P2 R Revetment%” line symbols to the various shades of blue “Revetment <=5%”, “Revetment >5% <20%”, and “Revetment >20%”, lines.
Change the “<Heading>” “R_REV_RNG” to “RANGE”

Erosion Data:

Use the “Erosion” data layer to display the erosion locations for the entire stream. Set the definition query to “IMPACT = Erosion”. Categorize by “Unique Value”. Set the “Value Field” to “LOCATION”. Add right and left.



Definition Query

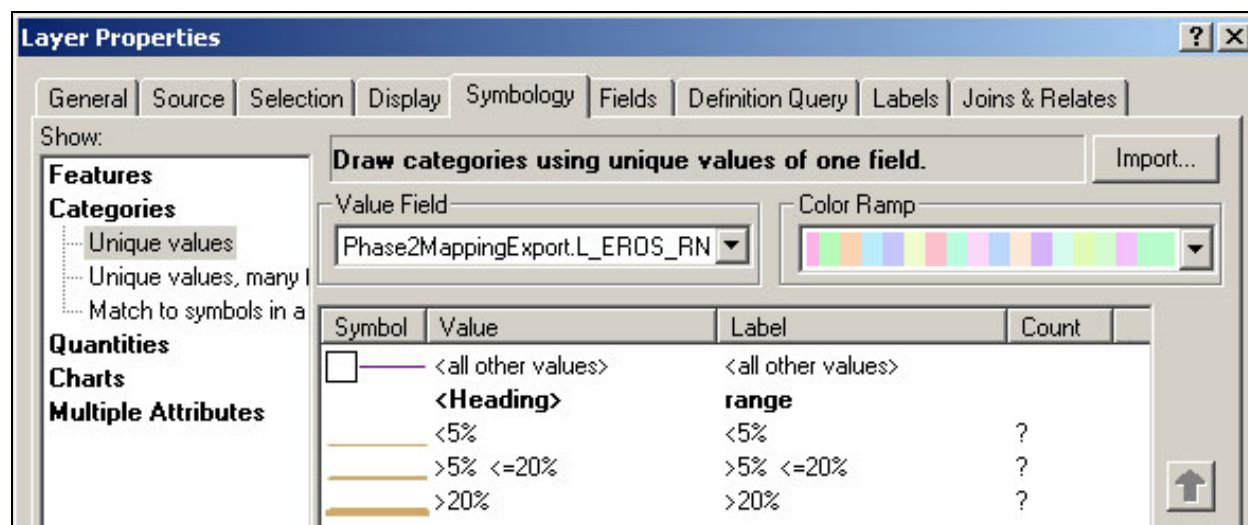


Unique Value in Symbology

Change the “Erosion” line symbols to the brown “Erosion left bank” and “Erosion right bank” line symbols

Delete the “<Heading>” “LOCATION”

If you do not have the FIT data, this will be done for both the left and right erosion. For the left erosion use the “P2 L Erosion %” data layer to display the left bank erosion range for each reach/segment. Categorize by “Unique Value”. Set the “Value Field” to “L_EROS_RNG”. Add all relevant values.

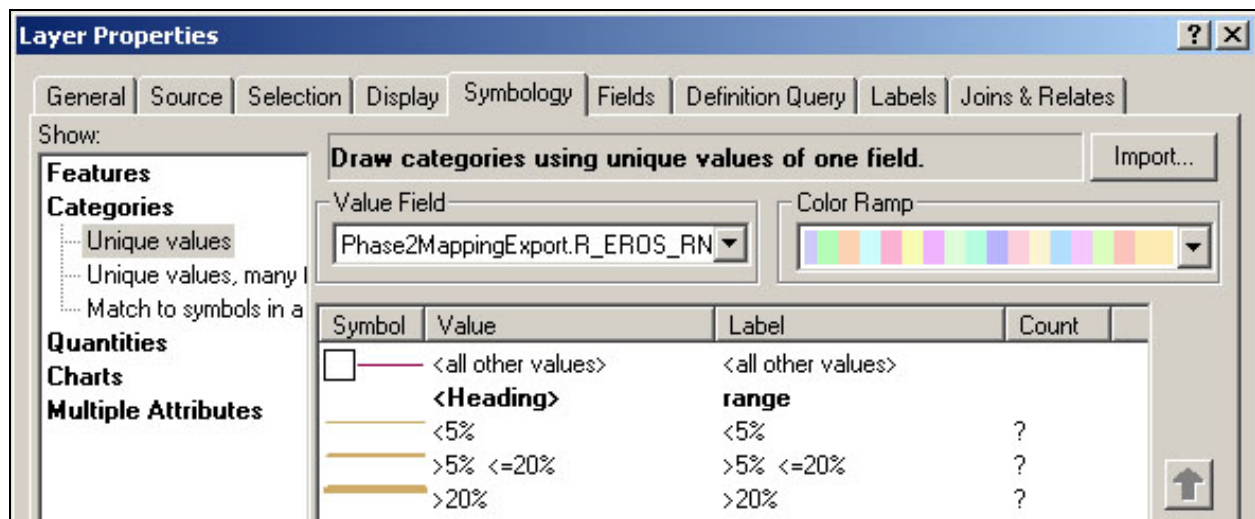


Unique Value in Symbology

Change the “P2 L Erosion%” line symbols to the various shades of brown “erosion <5%”, “erosion >5% <=20%”, and “erosion >20%”, lines.

Change the “<Heading>” “L_EROS_RNG” to “RANGE”

For the right erosion, use the “P2 R Erosion %” data layer to display the right bank erosion range. Categorize by “Unique Value”. Set the “Value Field” to R_EROS_RNG”. Add all relevant data.



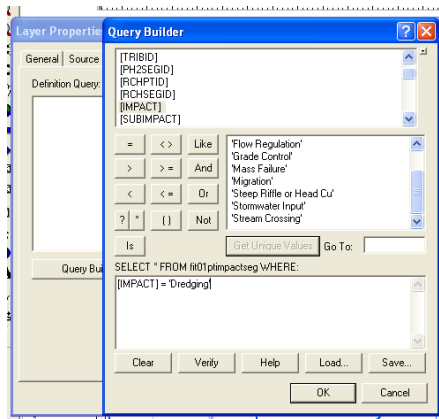
Unique Value in Symbology

Change the “P2 R Erosion%” line symbols to the various shades of brown “erosion <5%”, “erosion >5% <=20%”, and “erosion >20%”, lines.
Change the “<Heading>” “R_EROS_RNG” to “RANGE”

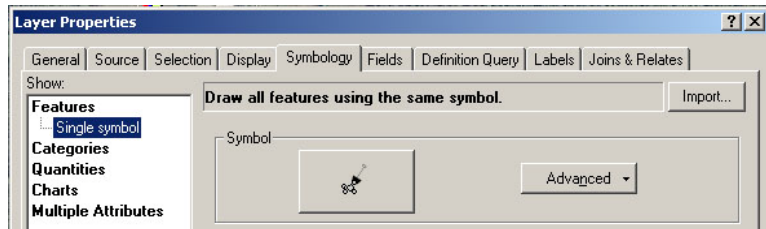
Historic Dredging and Windrowing Data:

SGAT Feature Type	Attribute Information
FIT point data	Dredging, gravel mining, or bar scalping
AND/OR Stream reach – line data	Phase 1 data (Step 5.5) indicating low or high impact rating associated gravel mining and dredging Export Code: I_DREDGE

Use the “Dredging” data layer to display the locations of dredging along the entire river. To do this, set the definition query to IMPACT = ‘Dredging’, ‘Gravel Mining’ or ‘Bar Scalping’ and then display using a single symbol:



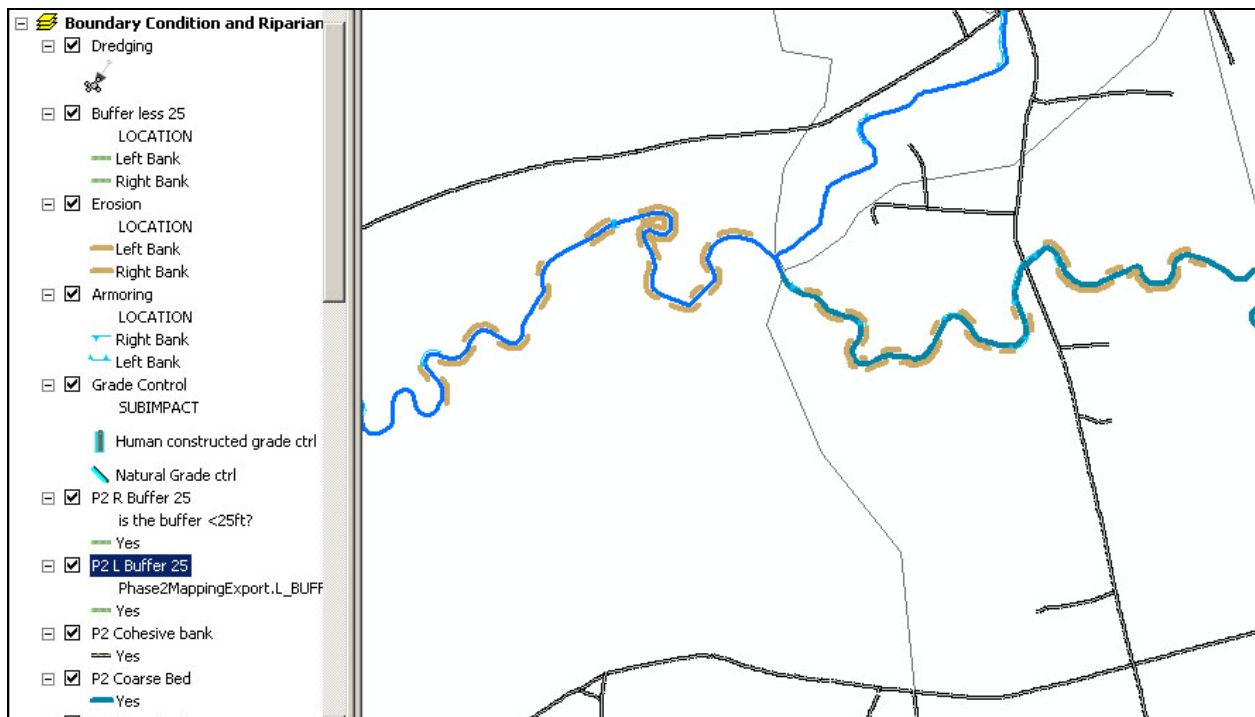
Definition Query



Single symbol in Symbology

Change the default “Dredging” point symbol to the shovel “Dredging” symbol

Sample Boundary Conditions and Riparian Modifiers Map:



Sediment Regime Departure Map

The Sediment Regime Departure Map is actually divided into 2 maps, one depicting reference conditions and one depicting existing conditions. Both maps should have ortho photos as a base and display parcel boundaries, if available.

Phase 1 Sediment Regime Departure -Reference Condition Map

The Sediment Regime Departure Reference Conditions map will show natural grade controls and existing sediment types. This map is created to show what the river would be like without human influence.

To keep the map organized we recommend that you create a new data frame for this map.

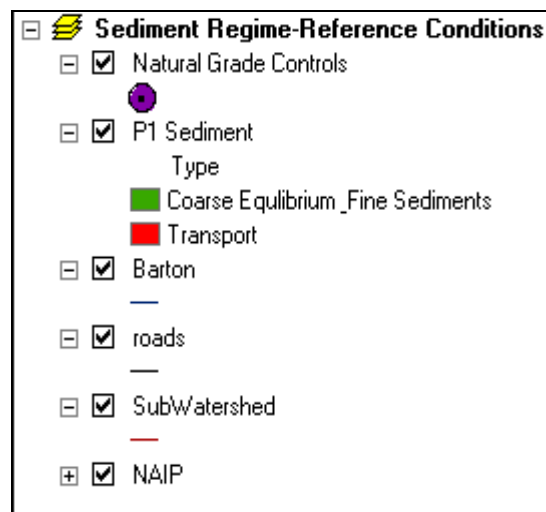
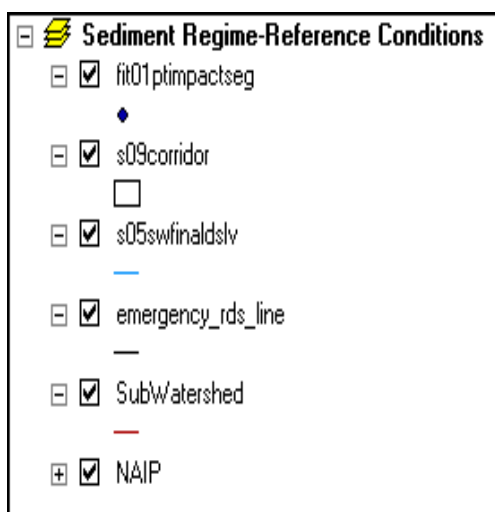
Select “Insert” → “Data Frame” from the upper menu

Rename this data frame “Sediment Regime Reference”

Copy and paste all the data layers need for this map.

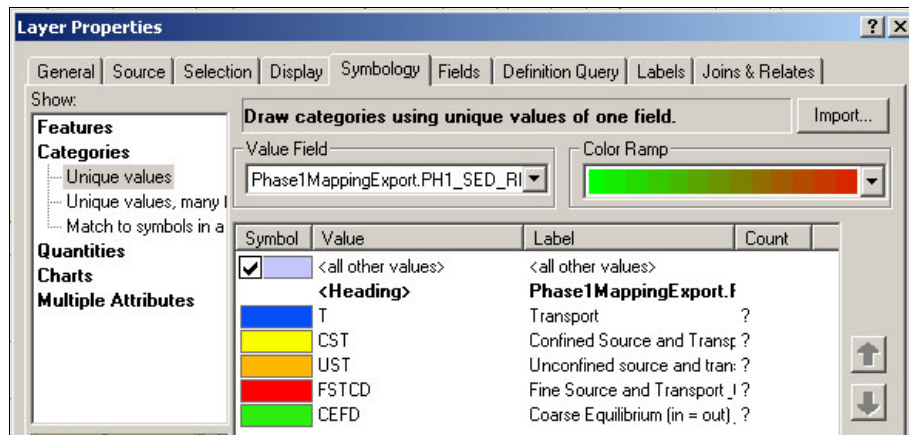
# of copies	Data
1	Fit01ptimpactseg
1	S09corridor
1	Emergency roads line
1	S05swfinaldslv
1	SubWatershed
-	NAIP

Rename the layers in the Sediment Regime Reference Data Frame.



Mapping Sediment Regime Data:

Use the “P1 Sediment” data layer to show the sediment regime of each segment/reach. Symbolize by “Unique Value”. Set the “Value Field” to “Phase1MappingExport.PH1_SED_RE”. Add all relevant values.



Unique Value in Symbology

Change the “P1 Sediment” polygon fill symbols to the blue, yellow, orange, red, and green for “T”, “CST”, “UST”, “FSTCD” and “CEFD” fills.

Change the “<Heading>” “PH1_SED_REG” to “TYPE”

Change the “T” title to “Transport”

Change the “CST” title to “**Confined Source and Transport**”

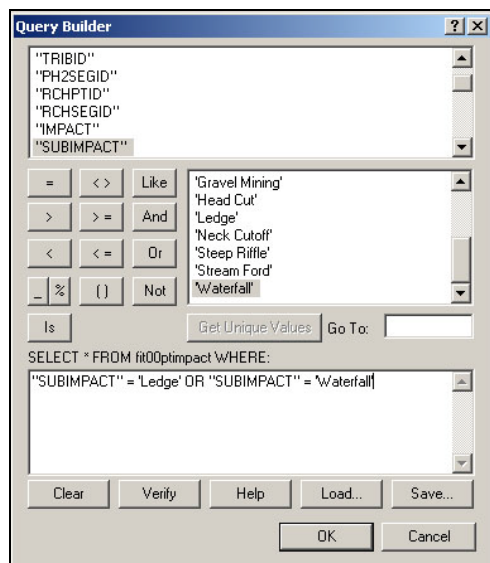
Change the “UST” title to “**Unconfined Source and Transport**”

Change the “FSTCD” title to “**Fine Source and Transport & Coarse Deposition**”

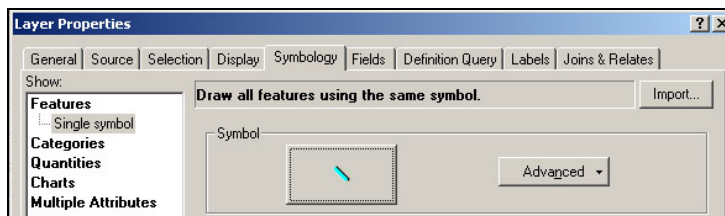
Change the “CEFD” title to “**Coarse Equilibrium (in = out) & Fine Deposition**”

Mapping Grade Control Data:

1) Use the “Natural Grade Ctrls” data layer to display Vertical Constraints along the whole river. To do this, set the definition query to SUBIMPACT = waterfall OR SUBIMPACT = ledge. Then symbolize with a single symbol.



Definition Query



Single Symbol in Symbology

Change the “Natural Grade Ctrls” point symbol to the blue and gray “Natural Grade Control” symbol.

Phase 2 Sediment Regime Departure -Existing condition Map

The Sediment Regime Departure Existing Conditions map will show all grade controls, existing sediment types, and a buffered corridor development layer.

To keep the map organized we recommend that you create a new data frame for this map.

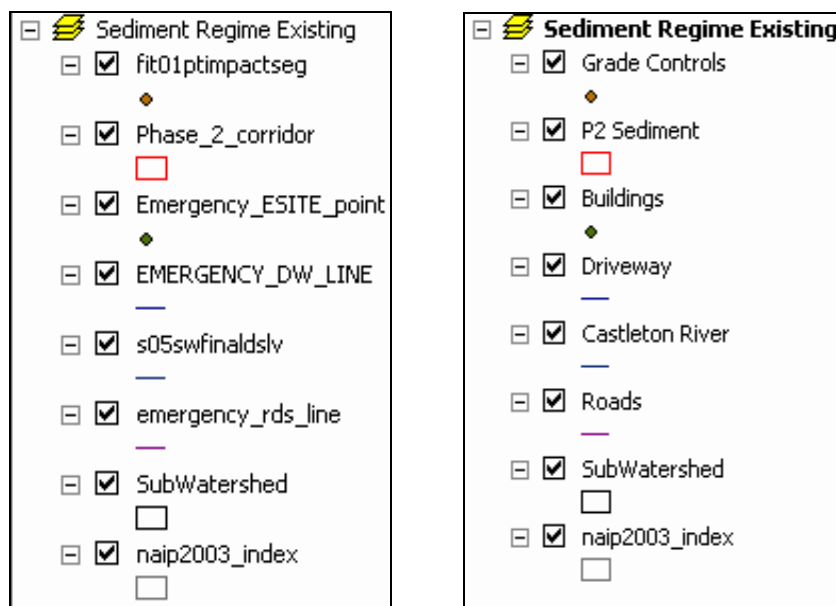
Select “Insert” → “Data Frame” from the upper menu

Rename this data frame “Sediment Regime Existing”

Copy and paste all the data layers need for this map.

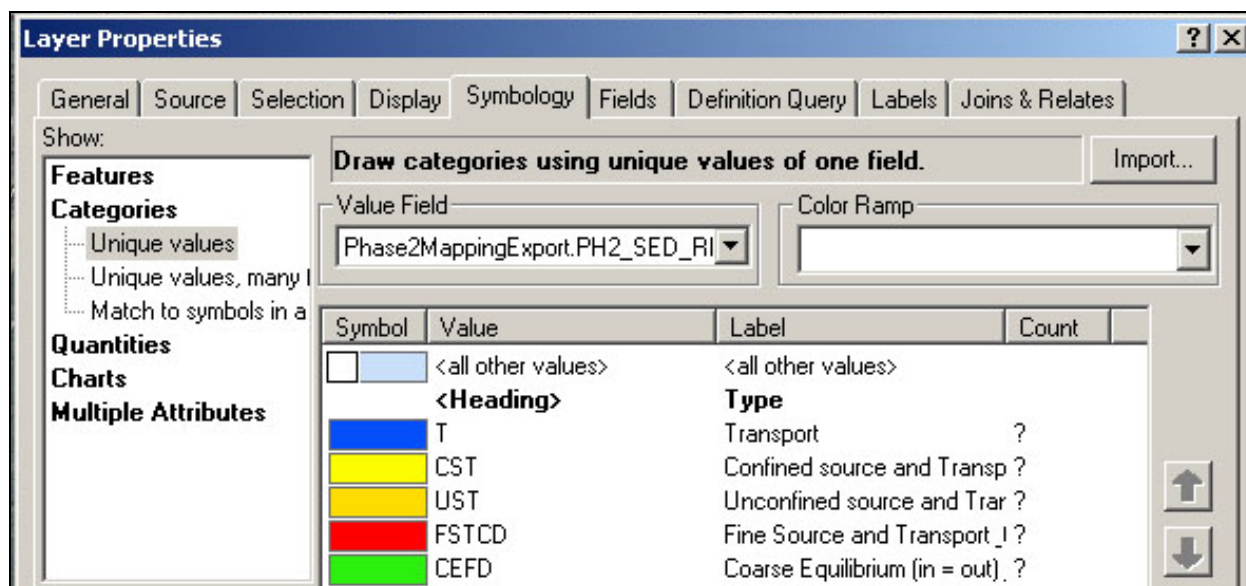
# of copies	Data
1	Fit01ptimpact
1	Phase 2 Corridor
1	S15WR emergency roads line
1	Emergency ESITE Point
1	Emergency DW Line
1	S05swfinaldslv
1	SubWatershed
-	NAIP
-	Parcels

Rename the layers in the Sediment Regime Existing Data Frame.



Mapping Sediment Regime Data:

1) Use the “P2 Sediment” data layer to show the field verified sediment regime types for each segment/reach. Categorize by “Unique Value”. Set the “Value Field” to “Phase2MappingExport.PH2_SED_R”. Add all relevant values.



Unique Value in Symbology

Change the “P2 Sediment” polygon fill symbols to the blue, yellow, orange, red, and green for “T”, “CST”, “UST”, “FSTCD” and “CEFD” fills.

Change the “<Heading>” “PH2_SED_R” to “TYPE”

Change the “T” title to “Transport”

Change the “CST” title to “Confined Source and Transport”

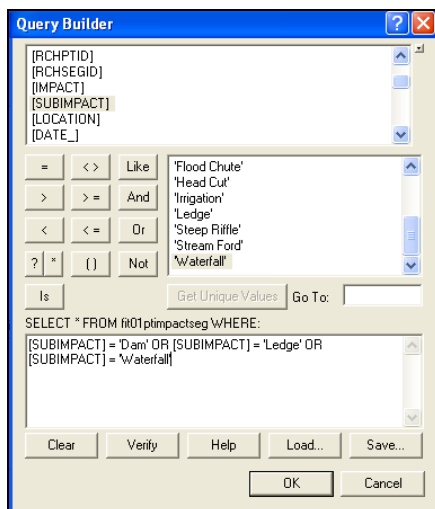
Change the “UST” title to “Unconfined Source and Transport”

Change the “FSTCD” title to “Fine Source and Transport & Coarse Deposition”

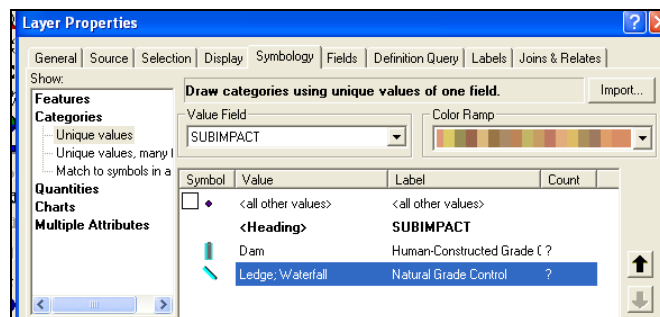
Change the “CEFD” title to “Coarse Equilibrium (in = out) & Fine Deposition”

Mapping Grade Control Data:

To display Vertical Constraints for the river use the “Grade Ctrls” data layer. To do this set the definition query to ‘SUBIMPACT’ = waterfall, or ‘SUBIMPACT’ = ledge OR ‘SUBIMPACT’ = dam OR ‘SUBIMPACT’ = weir. Categorize by “Unique Value”. Set the “Value Field” to “SUBIMPACT” Add all relevant data. Group the grade control by natural and human-constructed:



Definition Query



Unique Value in Symbology


Change the “Grade Ctrls” point symbols to the blue and grey “natural grade control” and “human constructed grade control” symbols.

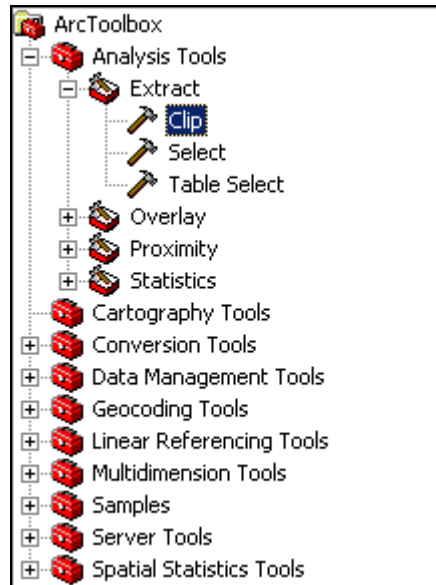
Change the value title “Dam; Weir” to “Human-Constructed Grade Controls” and the value title “Ledge; Waterfall” to “Natural Grade Control”

Delete the “<Heading>” “SUBIMPACT”

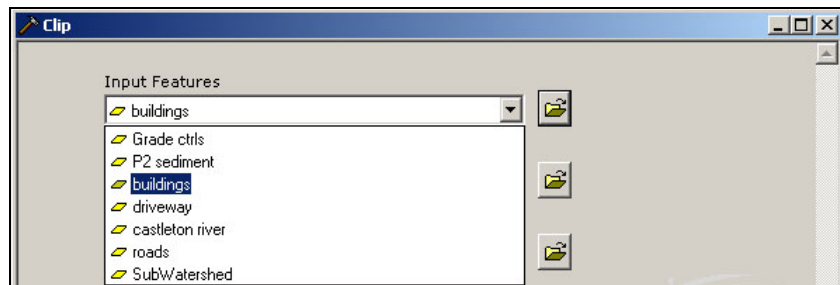
Mapping Lateral Constraints:

To map Lateral Constraints, begin with “Roads”, “Driveway”, and “Buildings” data layers (Note: Only select Buildings data that indicates a building, not a pay phone or hydrant.). We

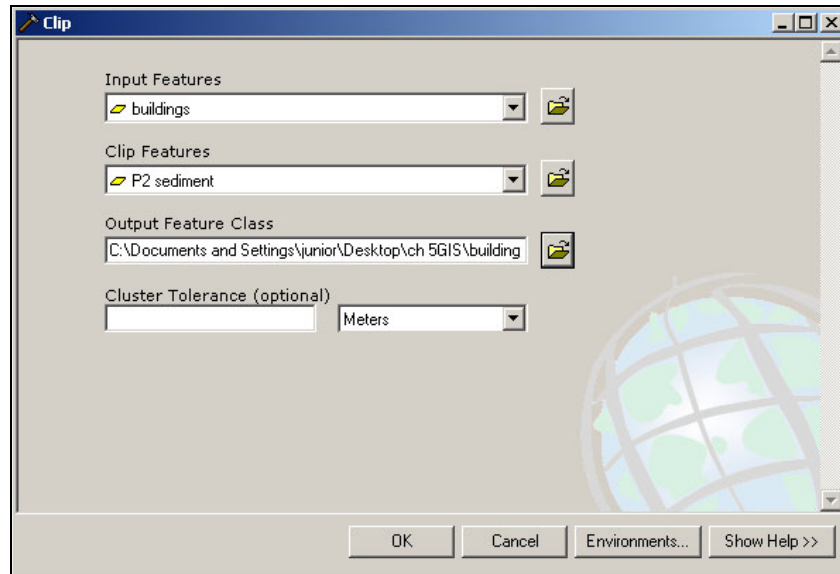
only want to see the features that falls within the river corridor (P2 Sediment). To do this open ArcToolbox by clicking on the red toolbox icon  in the top center of the ArcMap display. Navigate within the tool box to the “Clip” tool.



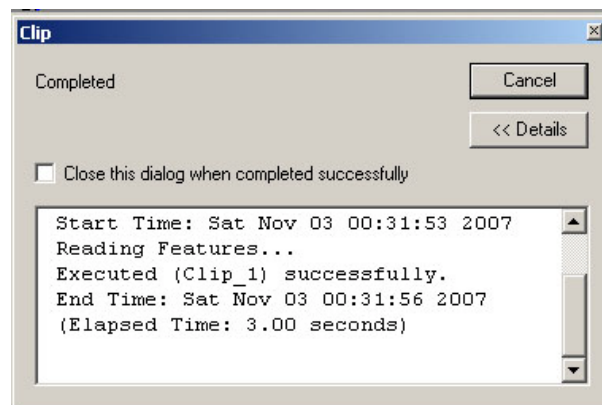
Double click on the “Clip” tool to open the “Clip” window. You must clip each of the above mentioned, one at a time. First select the “Buildings” data layer from “Input Features” drop down menu.



Now select the polygon filed “P2 sediment” that you will “Clip Features” to. Select where you would like the file saved (Output Feature Class) and what you would like to name it (the default name will work). When you have selected all these options, click “OK”

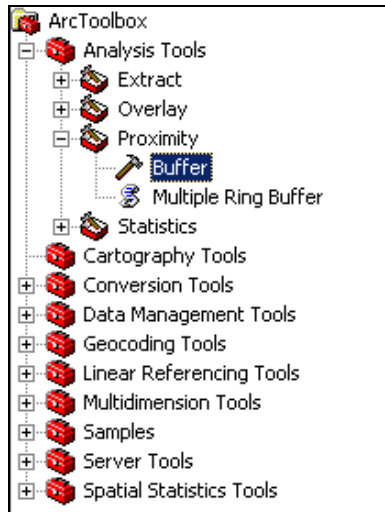


This will trigger a dialog showing the status of the clipping.

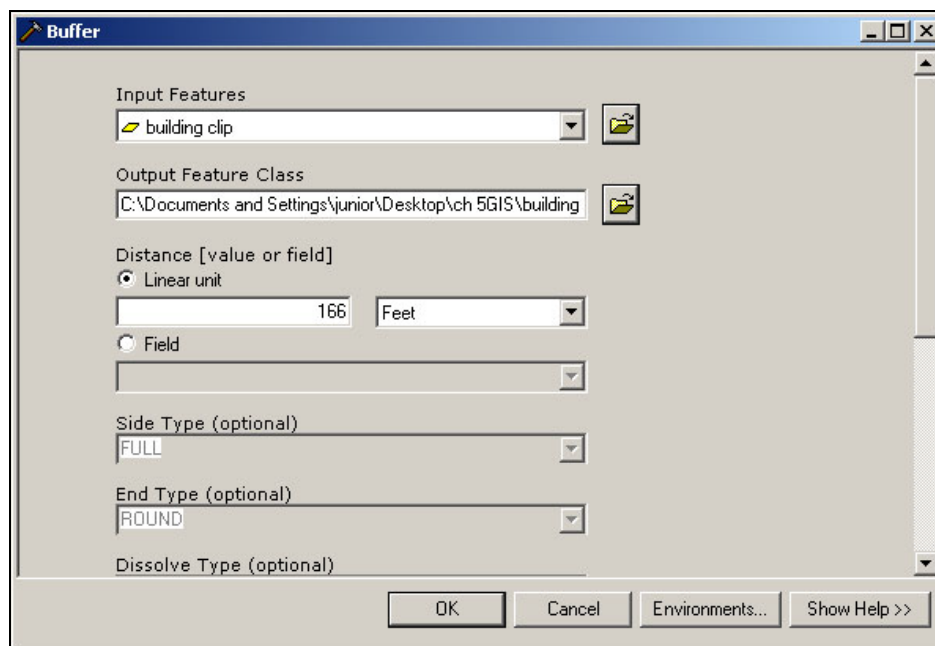


Repeat the above steps for the clipping of the “Roads” and “driveway” data layers. If the shapefiles you created have not automatically been added you will need to add all 3 of the newly created shapefiles.

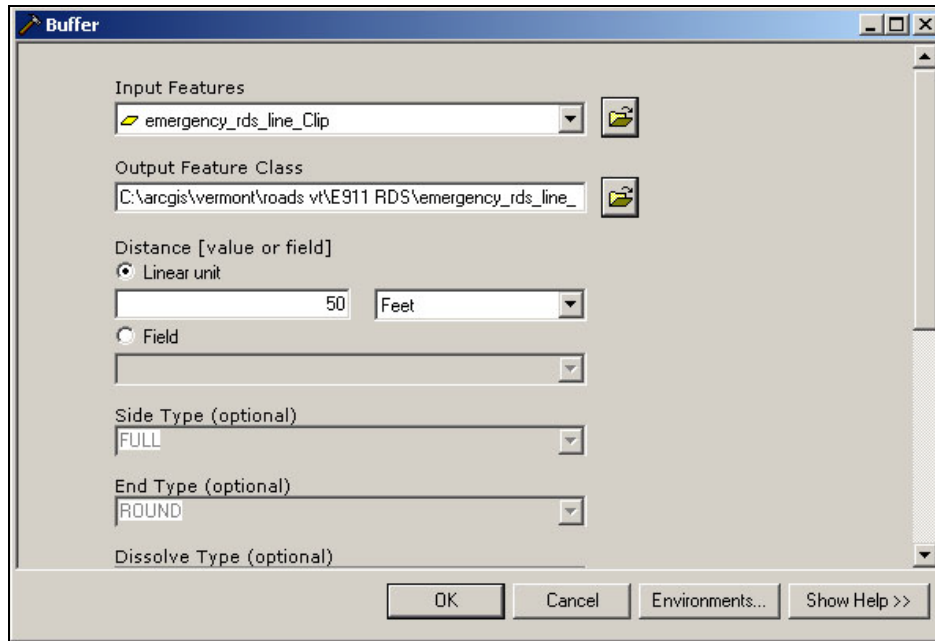
Now we are going to create a buffer around these newly added shape files. To do this, navigate to the “buffer” tool within the ArcToolbox.



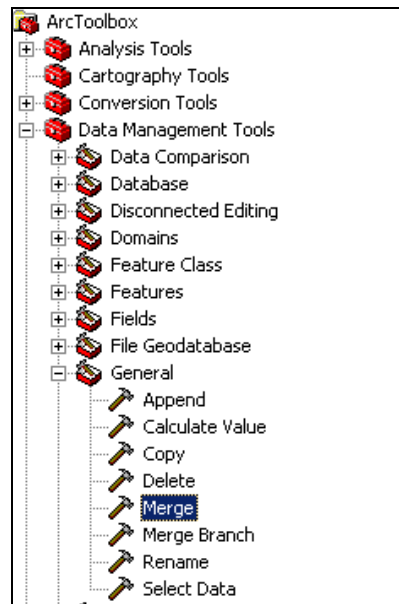
Like clipping, the Buffer tool must be run separately for each layer. Double click on the “Buffer” tool to open the “Buffer” window. Select the newly created building shape file, “Building clip”, from the “Input Features” drop down menu. Select where you would like this saved and what you would like to name it. Set the “Distance [value or field]” to “166” and choose “Feet” from the units drop down menu. Click the “OK” button.



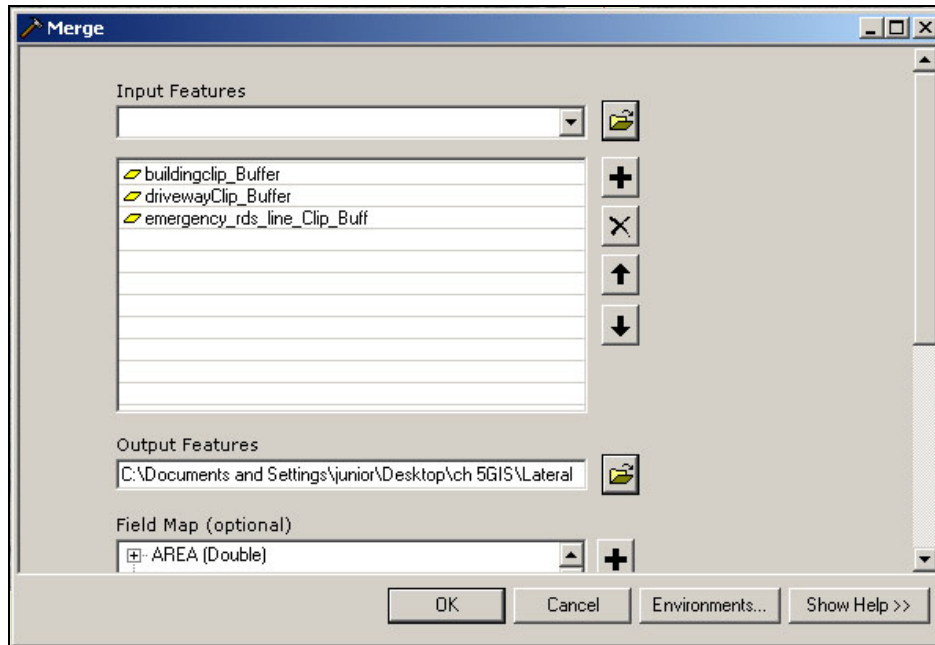
Repeat these steps to buffer the clipped “Roads” and clipped “driveways”, but for these, you must use a “Linear unit” of “50” “Feet”.



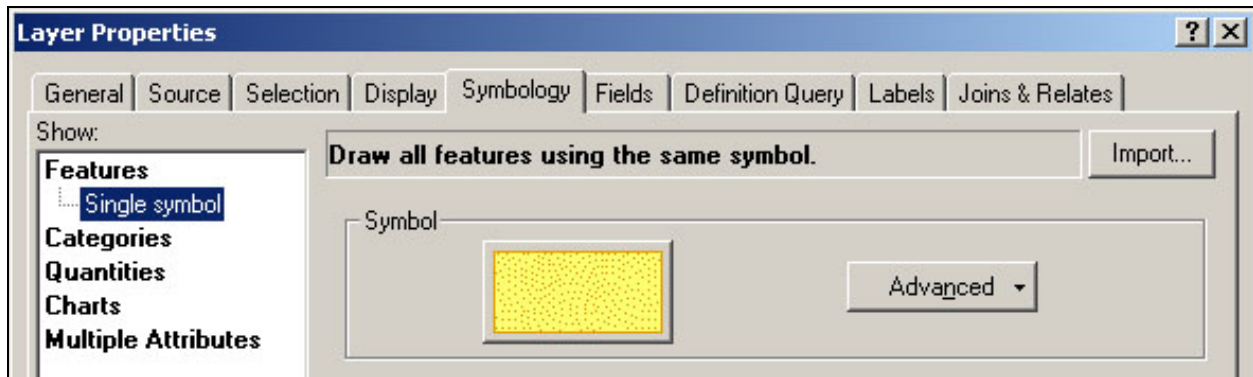
It is helpful to merge all of the buffered data into one data layer and call it Lateral Constraints. To do this, navigate to the merge tool within ArcToolbox:



Double click on the “Merge” tool, to open the “Merge” window. Use the “Input Features” drop down menu to select the 3 buffered data layers. Once you have selected (highlighted) one click on the Plus button to add it to the list. Once all three are on the list, choose the location where you would like this file saved. Rename the File “Lateral Constraints”.



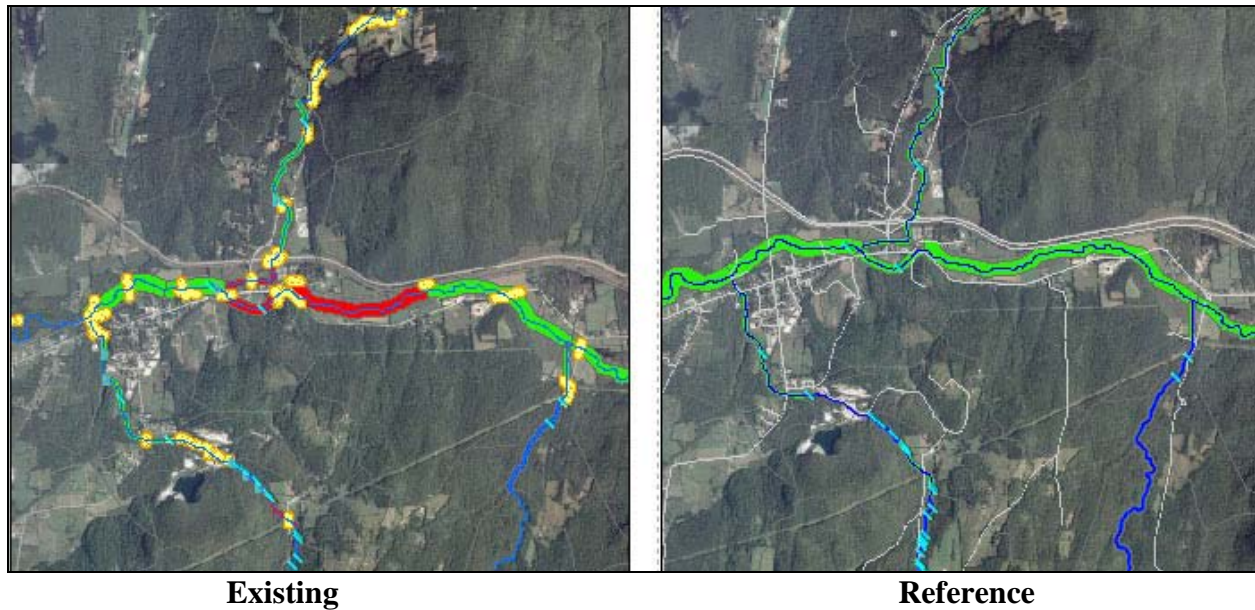
When you have done this, click “OK”
Add the “Lateral constraints” shapefile to the map.



Single Symbol in Symbology

Change the “Lateral Constraints” polygon fill to the yellow “Lateral Const” fill.

Sample Sediment Regime Departure Map:



Stream Sensitivity Map

The stream sensitivity map will show sensitivity rating, aggradation and degradation history.

To keep the map organized we recommend that you create a new data frame for this map.

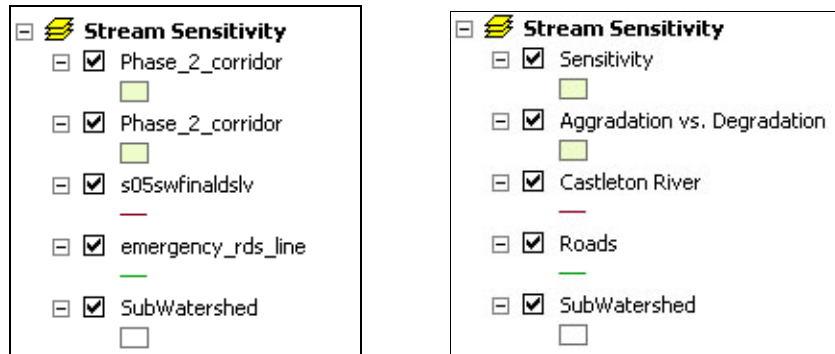
Select “Insert” → “Data Frame” from the upper menu

Rename this data frame “Stream Sensitivity”

Copy and paste all the data layers need for this map.

# of copies	Data
2	Phase_2_Corridor
1	Emergency roads line
1	S05swfinaldslv
1	SubWatershed

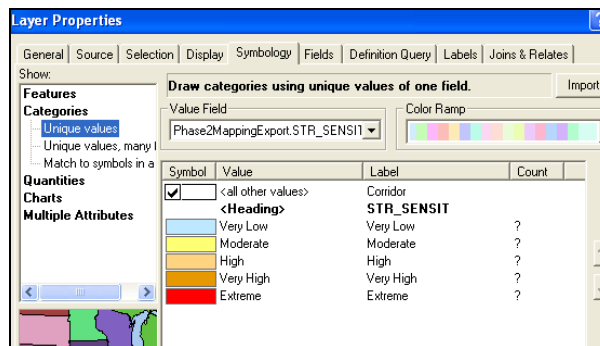
Rename the layers in the Stream Sensitivity Data Frame.



Mapping the Sensitivity Rating Data:

SGAT Feature Type	Attribute Information
Stream segment corridor - polygon	Phase 2 (step 7.7) – indicating the stream sensitivity * note: the corridor must be segmented if the Phase 2 reach was segmented prior to attributing Phase 2 data to it. Export Code: STR_SENSIT
Stream segment corridor – polygon	Phase 2 (Step 7.1 and 7.2) – separately indicating if the channel adjustments of degradation or aggradation are major adjustments (fair or poor conditions – scores of 1-5 are poor, 6 – 10 are fair) and the adjustment is current (i.e., the “historic” box is <u>not</u> checked). Export Code: VERT_DEG ; VERT_AGG

Use the “Sensitivity” data layer to display the Phase 2 sensitivity rating assigned to each segment/reach. Categorize by “Unique Value”. Set the “Value Field” to “Phase2MappingExport.STR_SENSIT”. Add all relevant values.



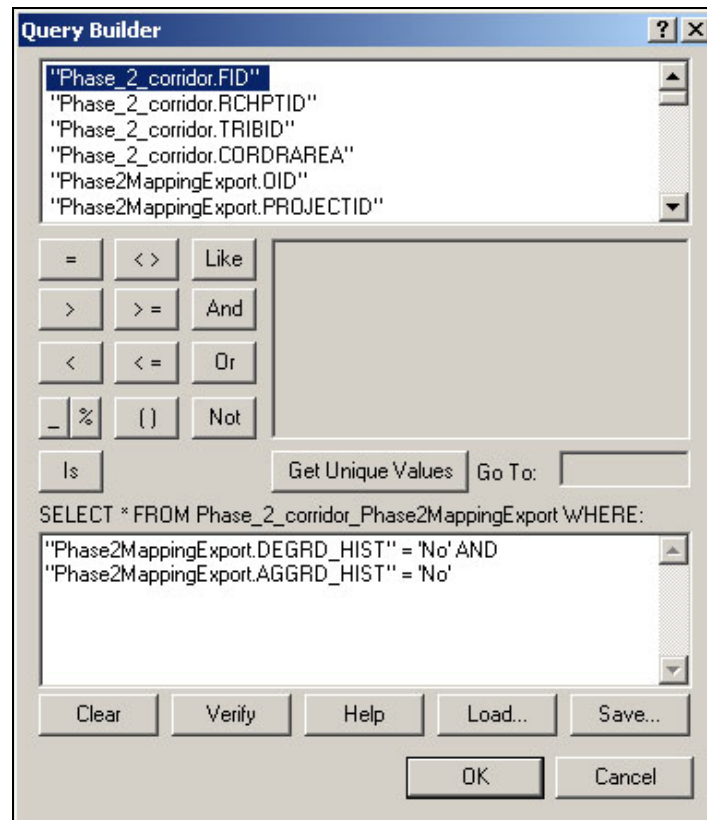
Unique Value in Symbology

Change the “Sensitivity” polygon symbols to the blue, yellow, peach, orange and red shaded fills symbols for “Very Low”, “Low”, “Moderate”, “High”, “Very High”, and “Extreme”, respectively.

Change the “<Heading>” “STR_SENSIT” to “LEVEL”

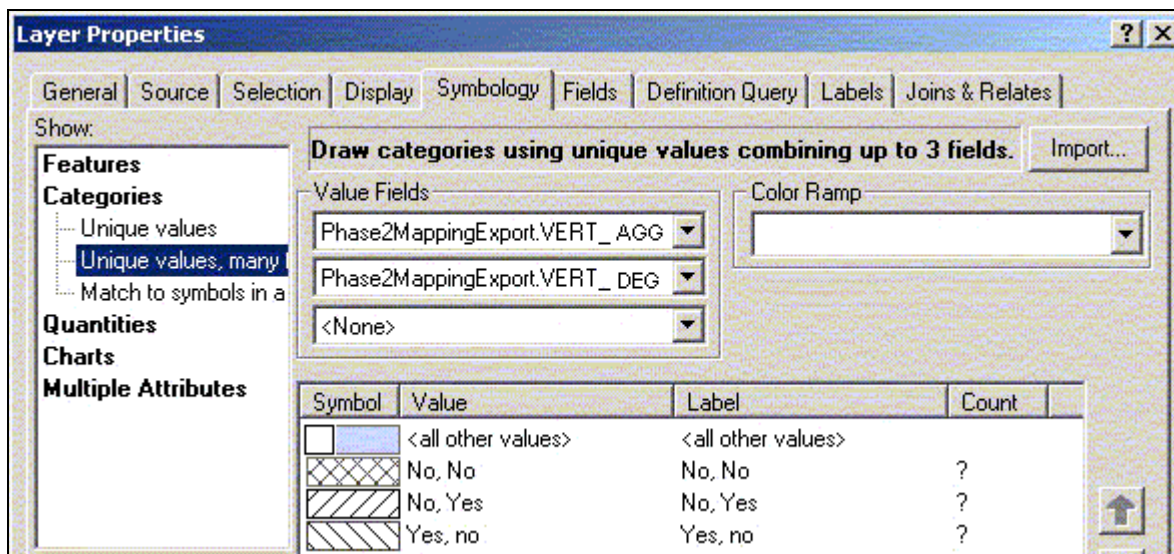
Mapping the Current Vertical and Lateral Adjustments Data:

Use the “Aggradation vs. Degradation” data layer to display vertical adjustments. To do this first develop a definition query that identifies if a reach/segment has not had historic adjustment. Use DEGRD_HIST = ‘No’ and AGGRD_HIST = ‘No’:



Definition Query

Categorize by “Unique Value”. Set on field to “Value Field”, one to “Phase2MappingExport.VERT_DEG” and another as “Phase2MappingExport.VERT_AGG”. Add all relevant values.



Unique Value, many fields in Symbology

Change the “Aggradation vs. Degradation” polygon symbols to the various fill patterns for “No, Yes”, “Yes, No”, and “Yes, Yes”.

Change the “<Heading>” “CNST_CNTRL” to “RANGE”

Sample Stream Sensitivity Map:

