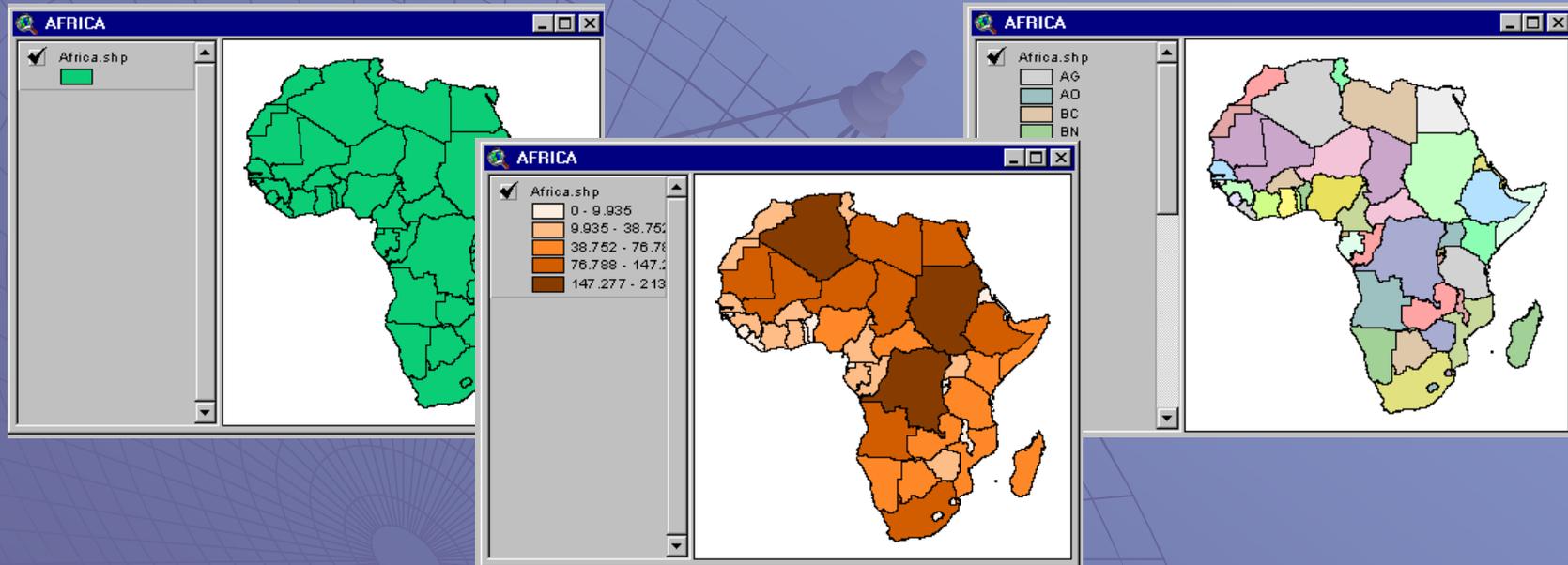




Displaying Themes



Training Center
U.S. Geological Survey
Center for Earth Resources
Observation and Science (EROS)
Sioux Falls, South Dakota, USA

Displaying Themes



FEWS



ArcView Introduction

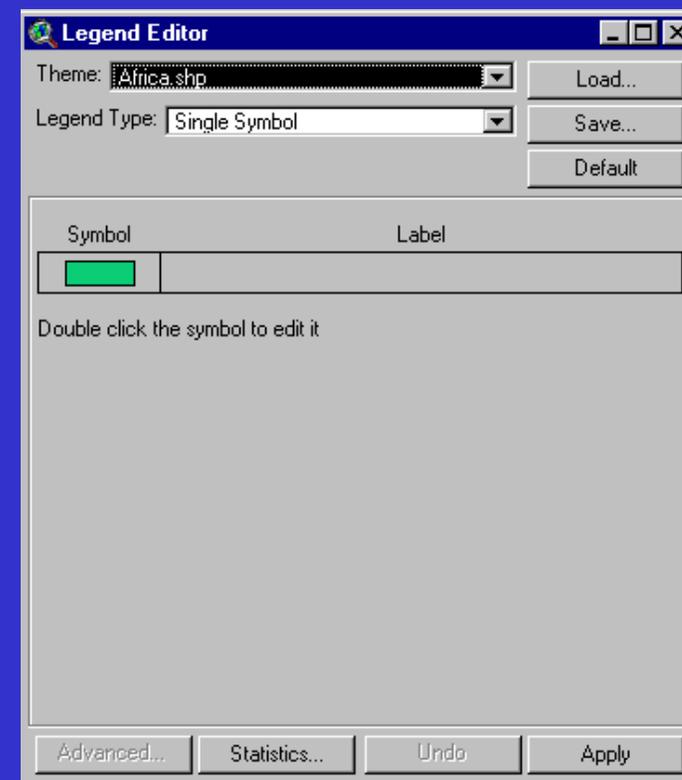
Outline:

- Thematic Mapping with the Legend Editor
- Choosing a Classification Method
- Modifying Legend Elements
- Managing Theme Display and Theme Properties



Thematic Mapping with the Legend Editor:

- Choose a legend Type
- Choose a classification Method
- Add Descriptive Legend Text
- Change Symbology

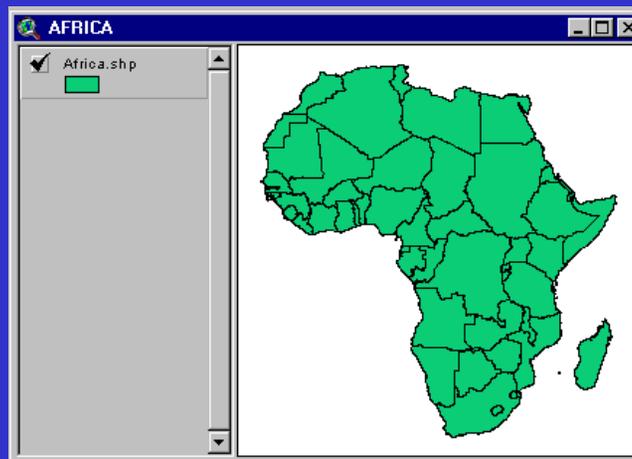


Double-click
the theme to
open the
Legend Editor

or



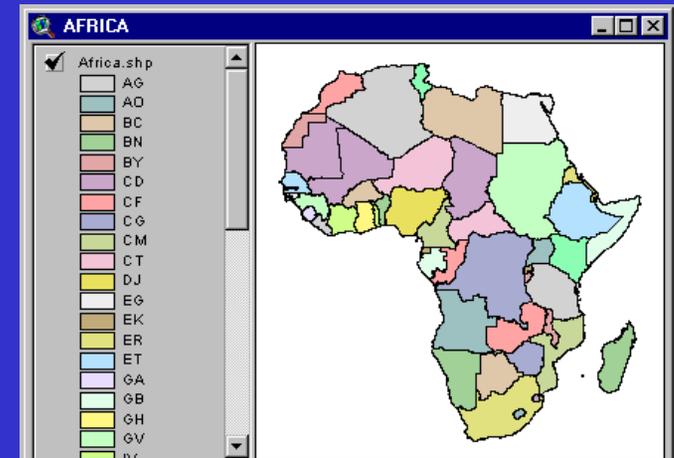
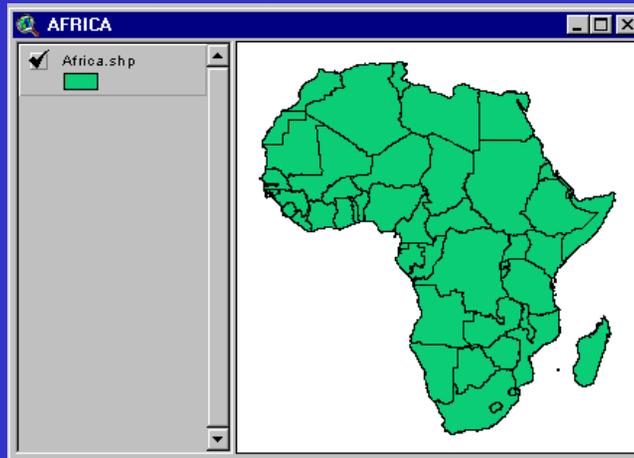
Edit Legend tool



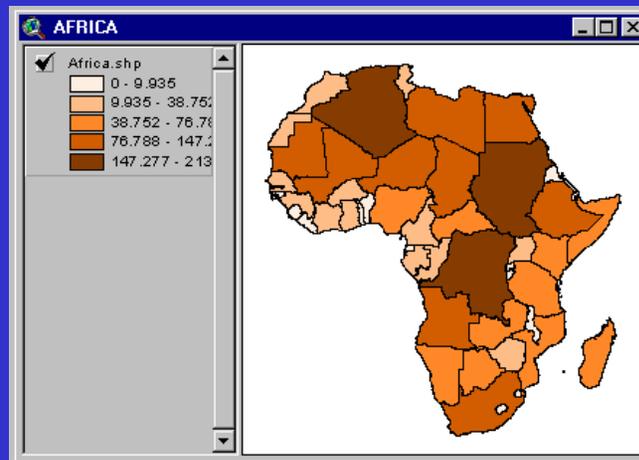
Choosing a Legend Type:

- Single Symbol (default)

- Unique Value



- Graduated Color

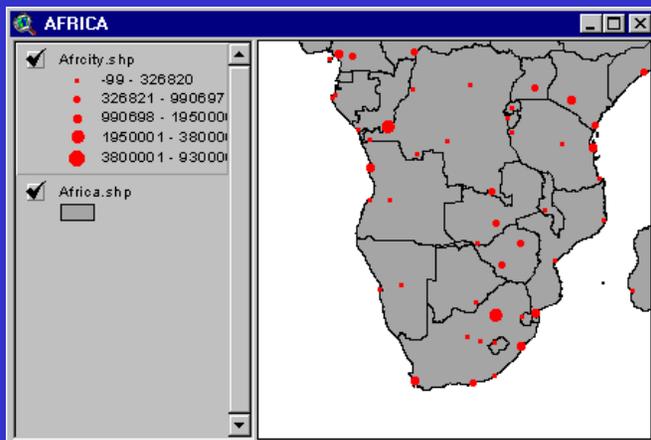


ArcView Provides Six Legend Types:

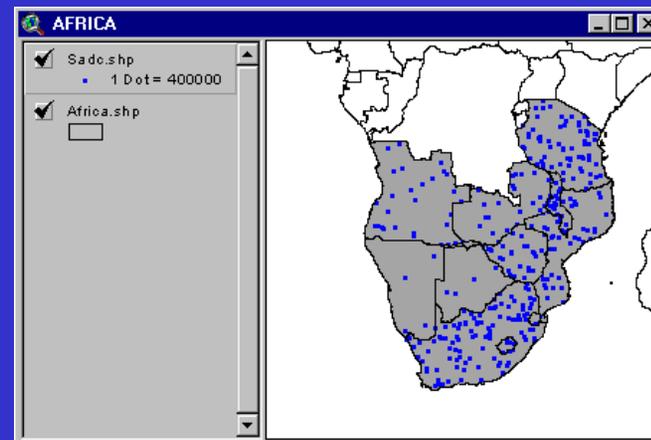
- Single Symbol
- Unique Value
- Graduated Color
- Graduated Symbol
- Dot Density
- Chart Symbol



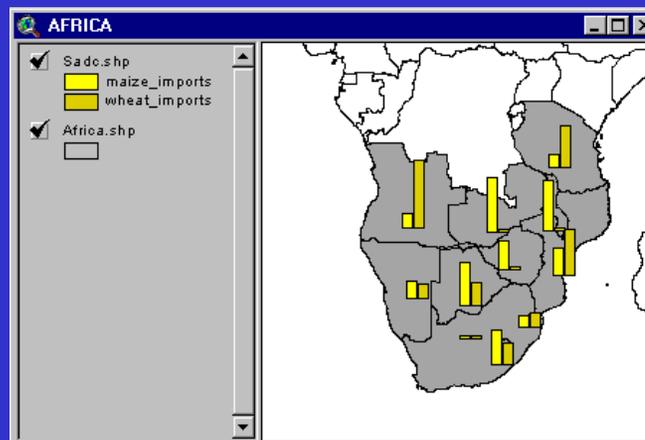
Examples of other Legend Types:



■ Graduated Symbol
(point & line data only)



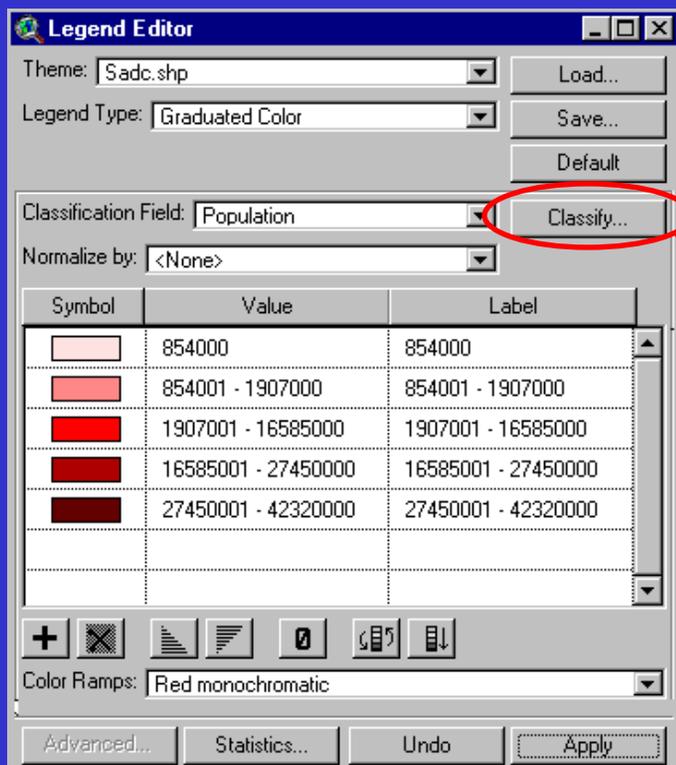
■ Dot Density



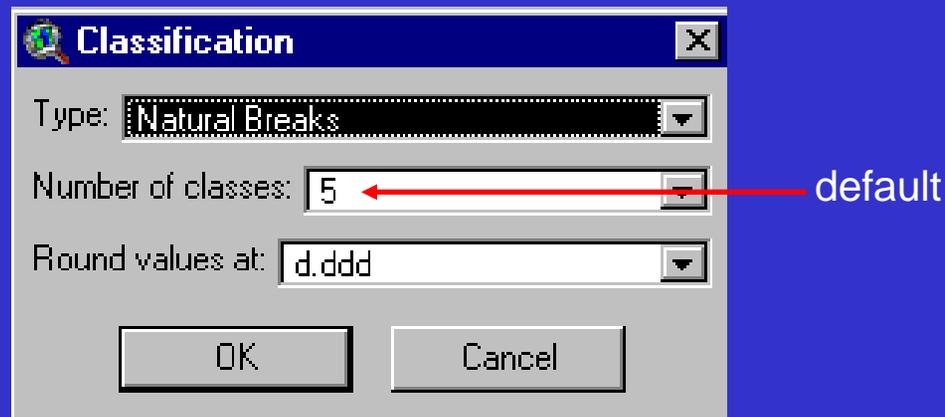
■ Chart Symbol

Choosing a Classification Method:

- Classification places attribute information into groups
- Five Classification Methods

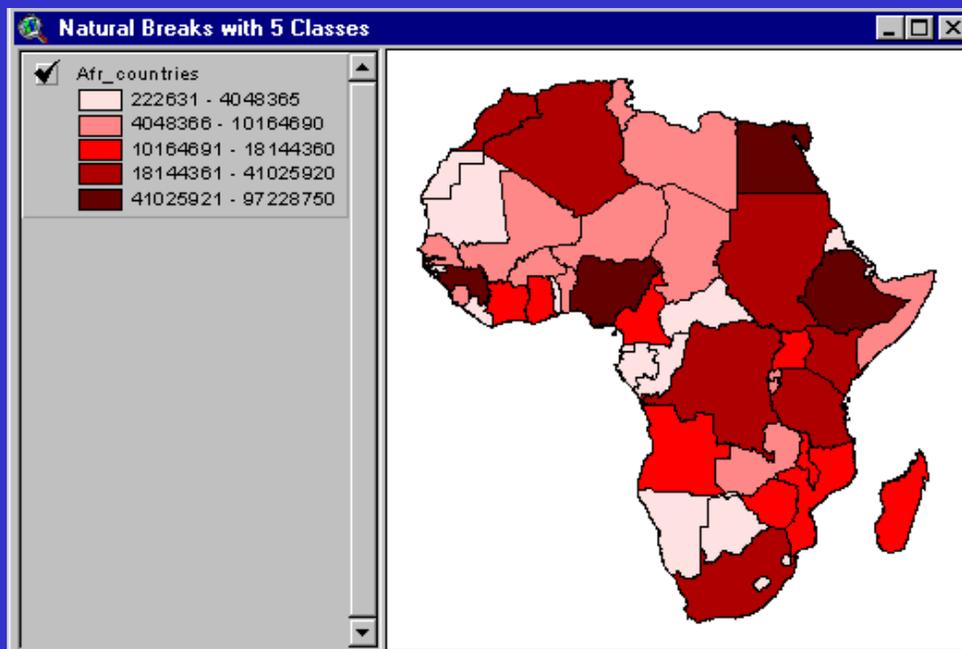


- Natural Breaks (default)
- Quantile
- Equal Interval
- Equal Area
- Standard Deviation



Using Natural Breaks:

- Default Method
- Identifies breakpoints between values
- Shows clusters or concentrations of values



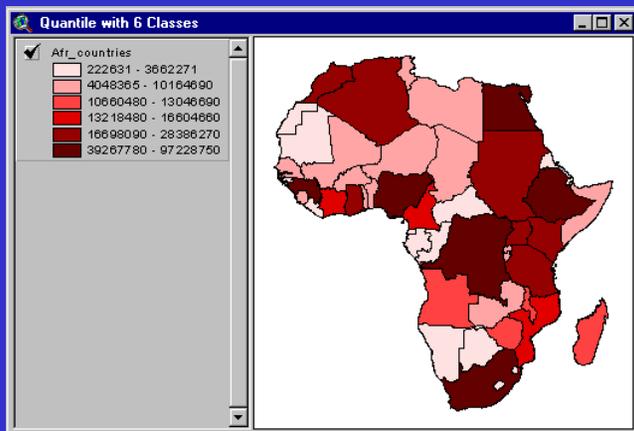
Population (millions)

Nigeria	97.2	} Grouped
Guinea	62.4	
Egypt	56.1	
Ethiopia	53.1	

Using Quantile, Equal Interval, and Equal Area:

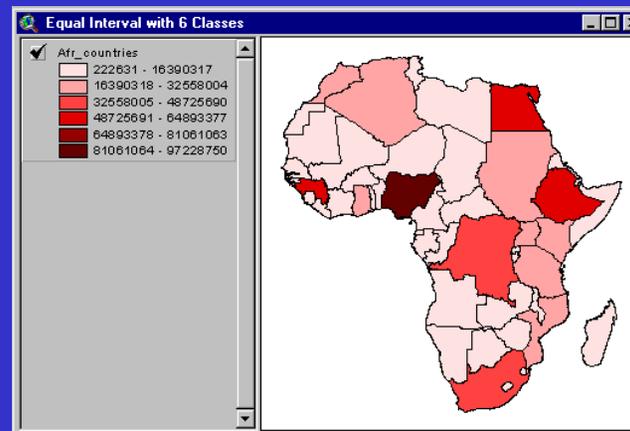
■ Quantile

Each class contains the same number of features



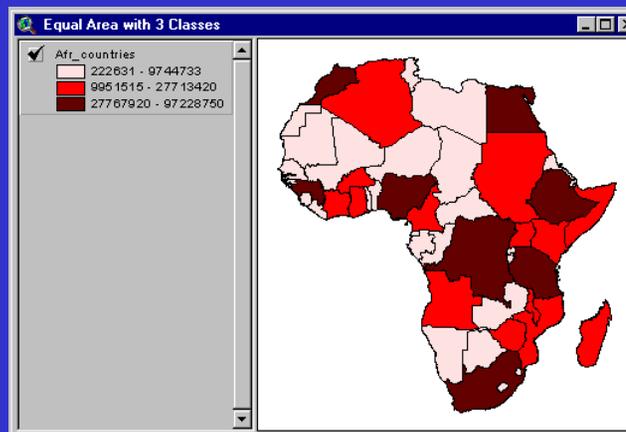
■ Equal Interval

Divides values into equal ranges



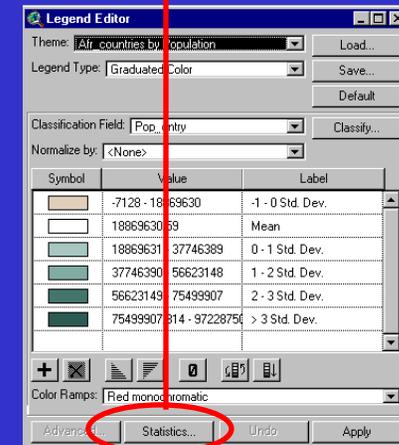
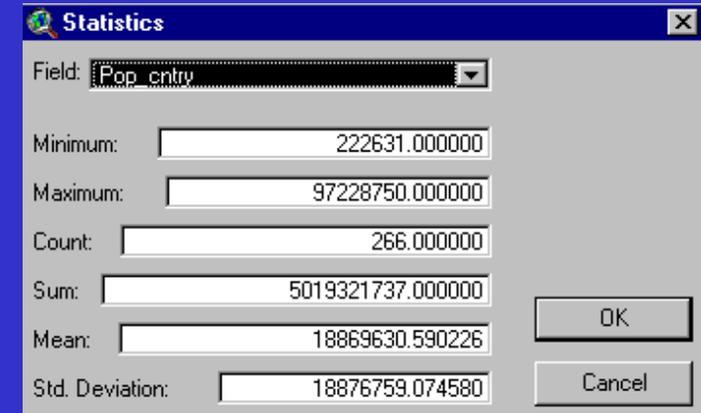
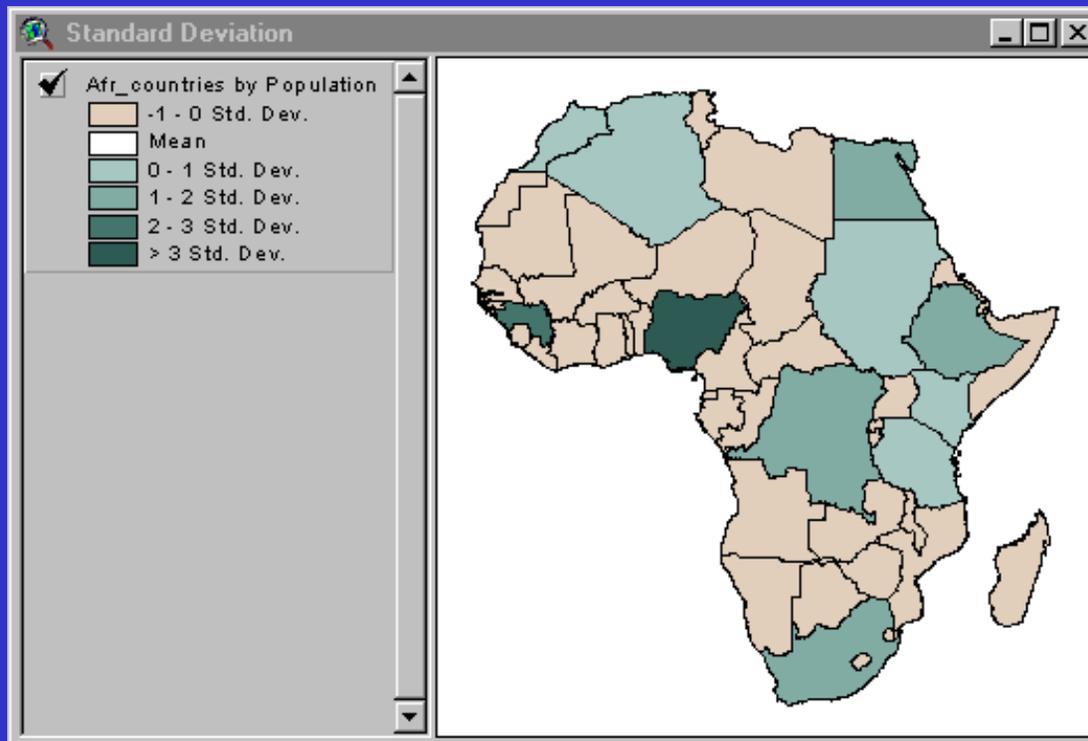
■ Equal Area

Each class contains the same area



Using Standard Deviation and Statistics:

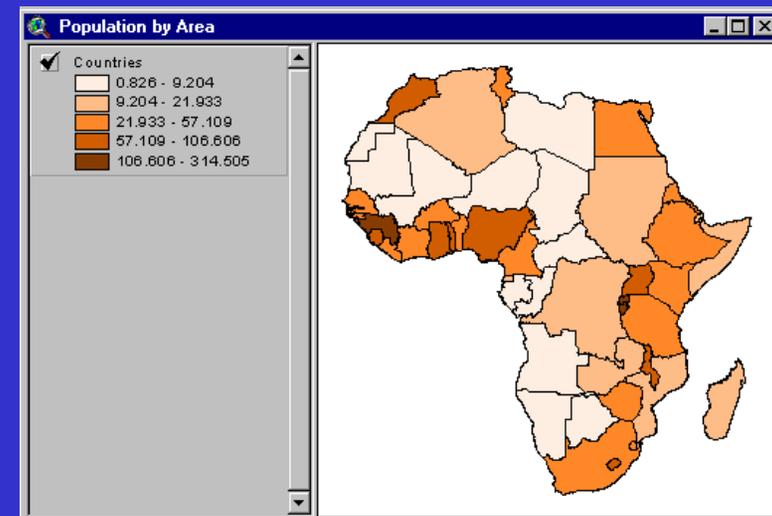
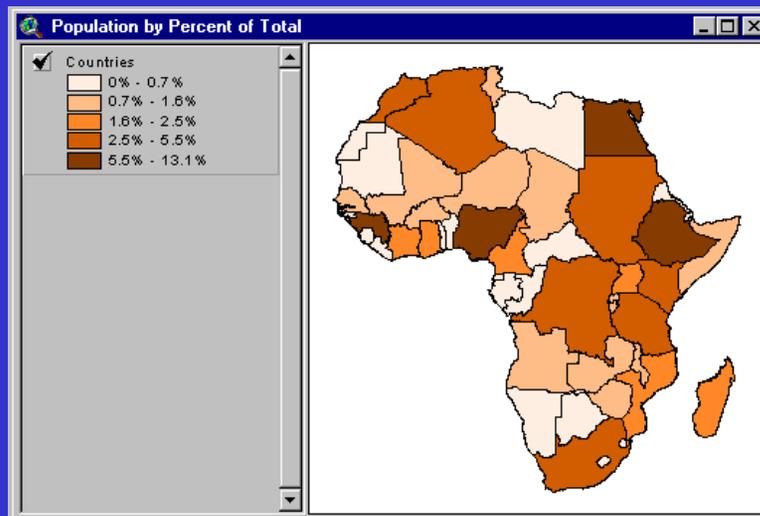
- Shows distribution above and below the mean



Click the statistics button at the bottom of the legend editor to display statistics of the fields whose values you are classifying.

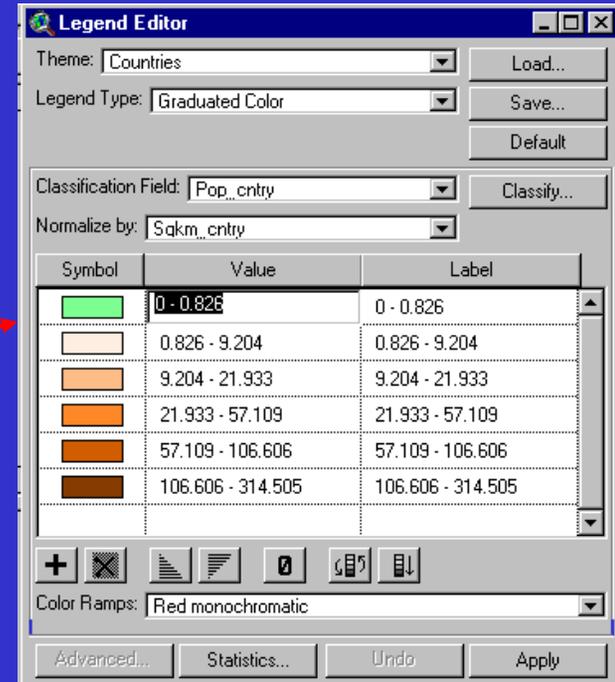
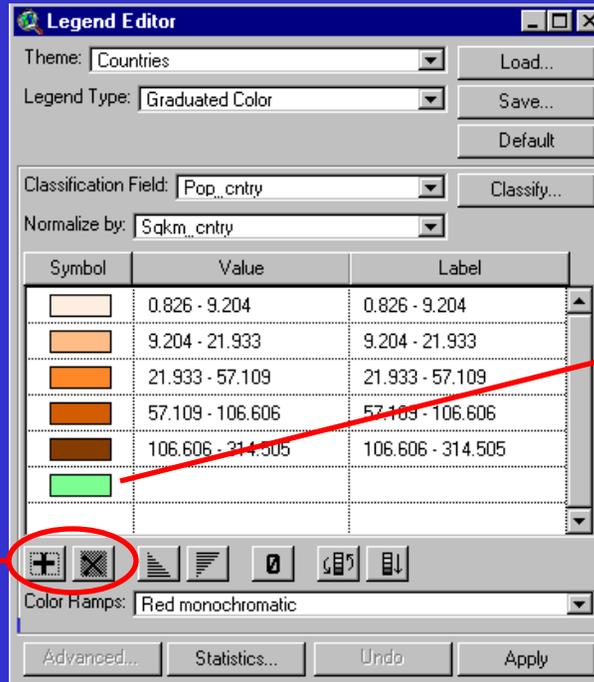
Normalizing Data:

- Expresses data as a percentage
- Shows the ratio of one attribute to another
- Two ways to normalize
 - By percent of total
 - By the values of another attribute



Manipulating Classes:

Adding / Deleting
Classes



Click and drag the new class to reposition it in the legend editor. Assign a value to the class by clicking and typing in the “value” box.

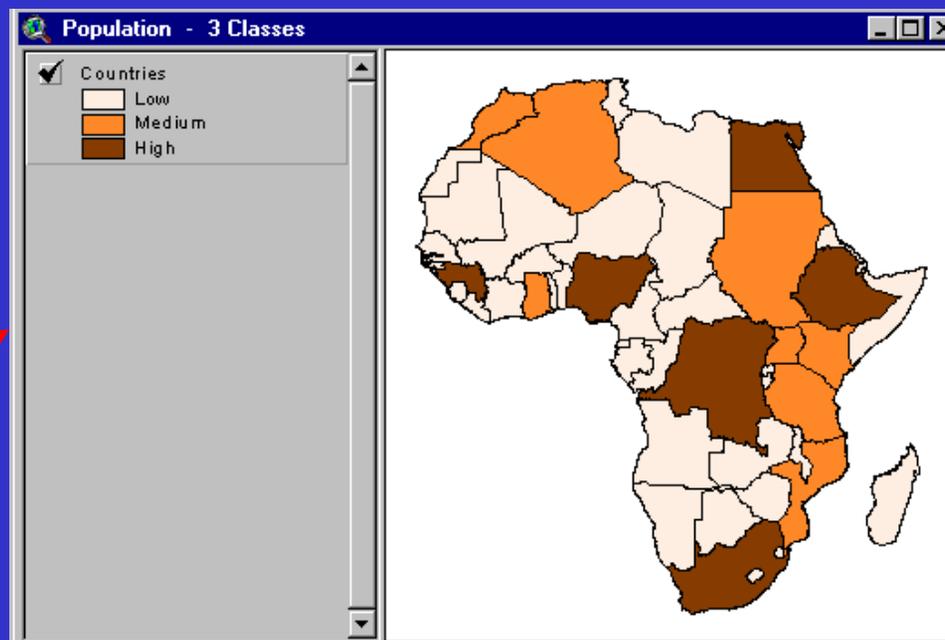
Manipulating Classes: cont'd.

Editing Values / Labels

Classification Field:

Normalize by:

Symbol	Value	Label
	222631 - 18144360	222631 - 18144360
	18144361 - 41025920	18144361 - 41025920
	41025921 - 97228750	41025921 - 97228750



Classification Field:

Normalize by:

Symbol	Value	Label
	0 - 15000000	Low
	15000001 - 40000000	Medium
	40000001 - 98000000	High

Modifying Legend Elements:



- Sort values and labels



- Flip Symbols



- Ramp Colors



- Undo Changes (up to 5)

Legend Editor

Theme: Countries

Legend Type: Graduated Color

Classification Field: Pop_cntry

Normalize by: <None>

Symbol	Value	Label
[Lightest Orange]	222631 - 3149545	222631 - 3149545
[Light Orange]	3149546 - 6308708	3149546 - 6308708
[Medium-Light Orange]	6308709 - 11527260	6308709 - 11527260
[Medium Orange]	11527261 - 18144360	11527261 - 18144360
[Dark Orange]	18144361 - 41025920	18144361 - 41025920
[Darkest Orange]	41025921 - 97228750	41025921 - 97228750

Color Ramps: Orange monochromatic

Buttons: Advanced..., Statistics..., Undo, Apply

Legend Editor

Theme: Countries

Legend Type: Graduated Color

Classification Field: Pop_cntry

Normalize by: <None>

Symbol	Value	Label
[Dark Red]	41025921 - 97228750	41025921 - 97228750
[Red]	18144361 - 41025920	18144361 - 41025920
[Light Red]	11527261 - 18144360	11527261 - 18144360
[Very Light Red]	6308709 - 11527260	6308709 - 11527260
[Lightest Red]	3149546 - 6308708	3149546 - 6308708
[Darkest Gray]	222631 - 3149545	222631 - 3149545

Color Ramps: Grays to Reds dichromatic

Buttons: Advanced..., Statistics..., Undo, Apply

Legend Editor

Theme: Countries

Legend Type: Graduated Color

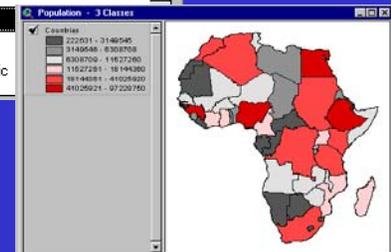
Classification Field: Pop_cntry

Normalize by: <None>

Symbol	Value	Label
[Darkest Gray]	222631 - 3149545	222631 - 3149545
[Dark Gray]	3149546 - 6308708	3149546 - 6308708
[Medium-Dark Gray]	6308709 - 11527260	6308709 - 11527260
[Medium Gray]	11527261 - 18144360	11527261 - 18144360
[Light Gray]	18144361 - 41025920	18144361 - 41025920
[Darkest Red]	41025921 - 97228750	41025921 - 97228750

Color Ramps: Grays to Reds dichromatic

Buttons: Advanced..., Statistics..., Undo, Apply

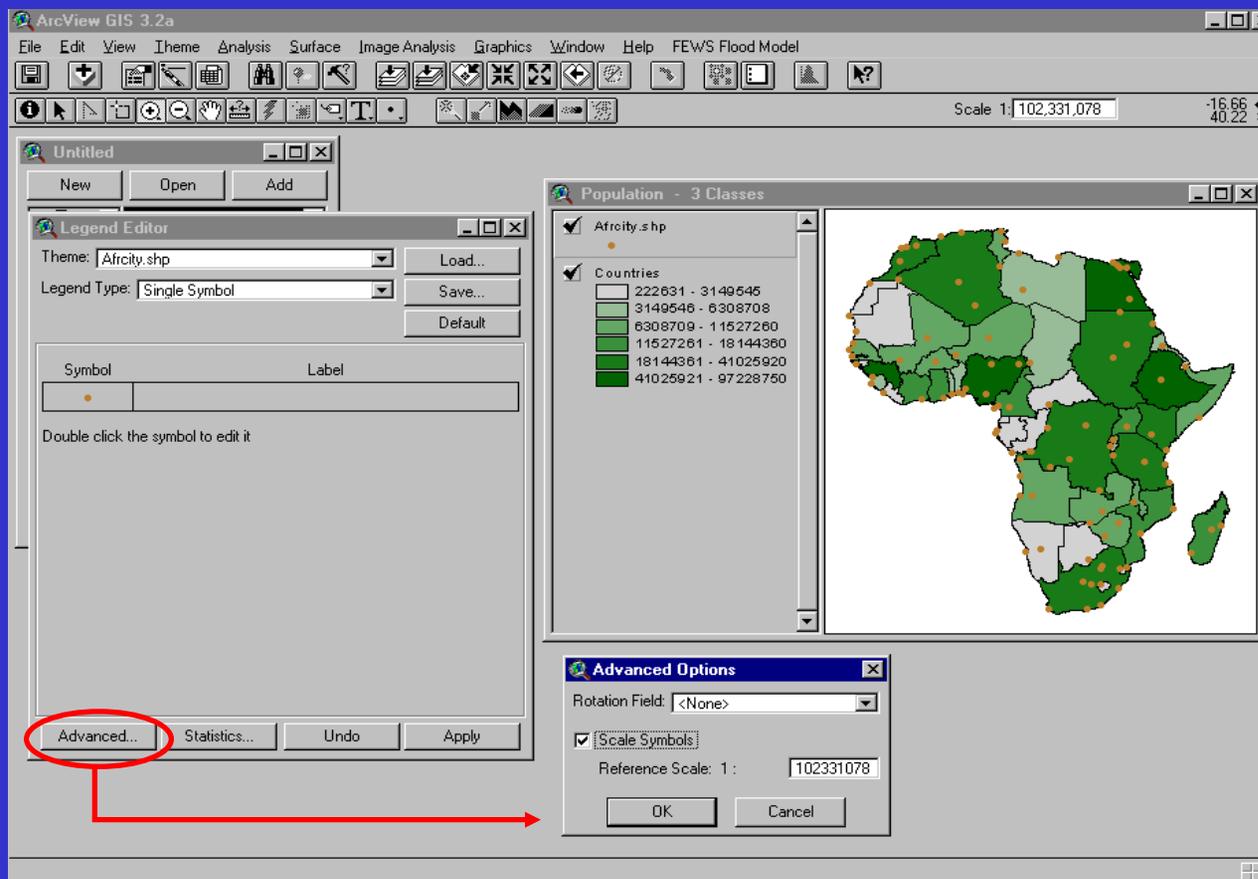


Symbol	Value	Label
[Dark Red]	222631 - 3149545	222631 - 3149545
[Red]	3149546 - 6308708	3149546 - 6308708
[Light Red]	6308709 - 11527260	6308709 - 11527260
[Very Light Red]	11527261 - 18144360	11527261 - 18144360
[Lightest Red]	18144361 - 41025920	18144361 - 41025920
[Darkest Gray]	41025921 - 97228750	41025921 - 97228750

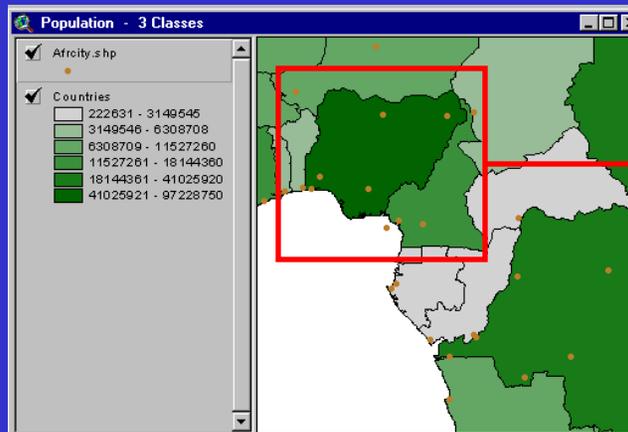
Scaling Symbols:

...it may be useful for line and point symbols to appear larger as you zoom in. The ArcView default is no scaling for symbols.

Click the advanced tab from the legend editor to select or unselect symbol scaling

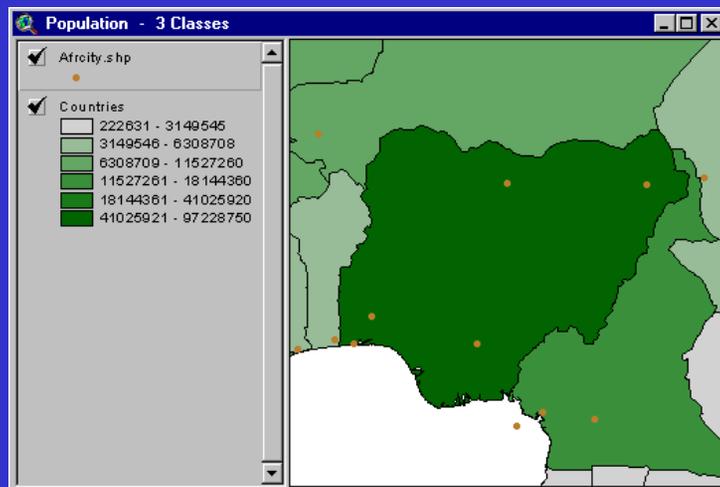


Scaling Symbols: cont'd

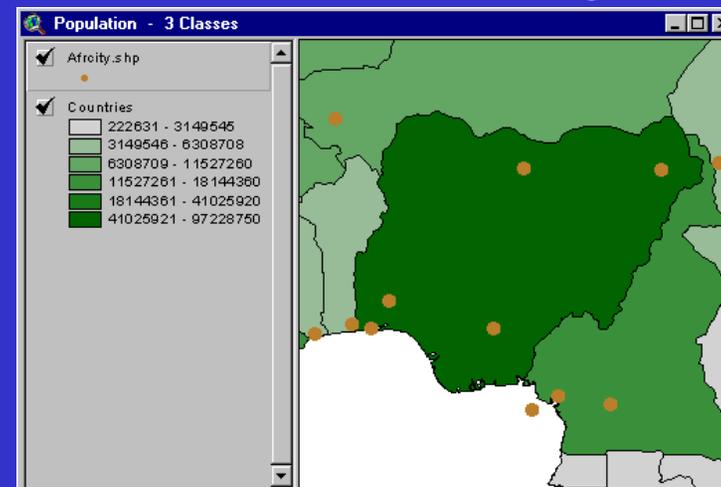


Zoom Area

Zoom in without scaling

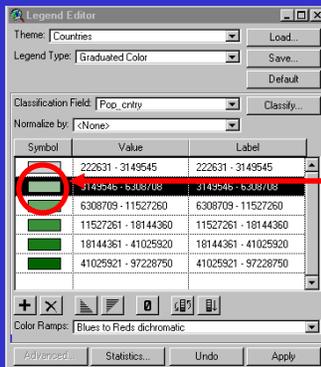


Zoom in with scaling



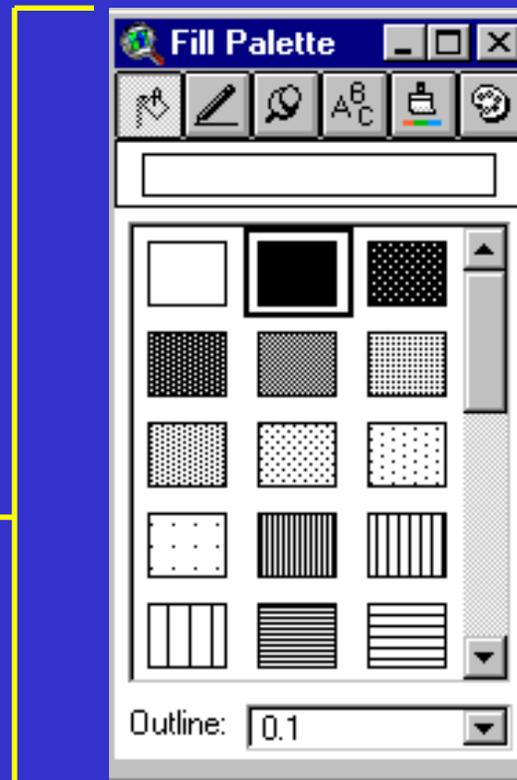
Changing Symbols with the Symbol Window:

...the symbol window is comprised of a number of different palettes for changing the symbols used to display a theme



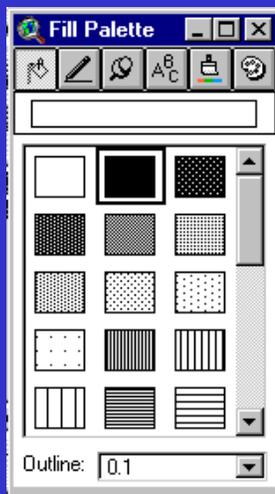
Double-clicking a symbol in the legend editor opens the symbol window

Symbol Window

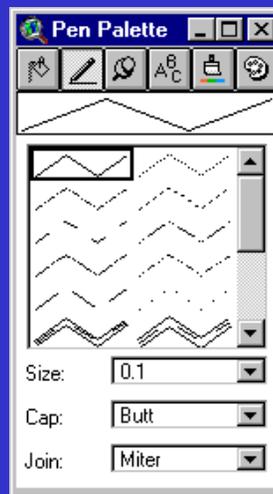


Palettes

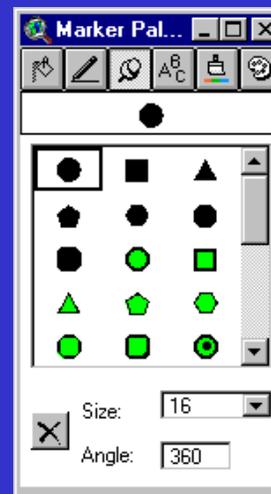
Fill Palette



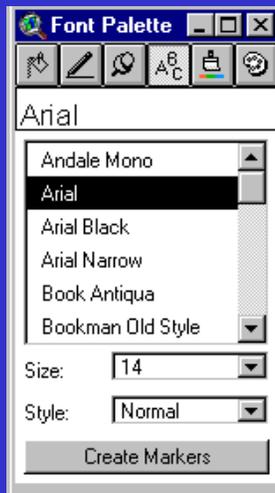
Pen Palette



Marker Palette



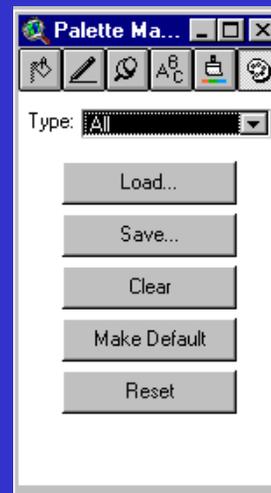
Font Palette



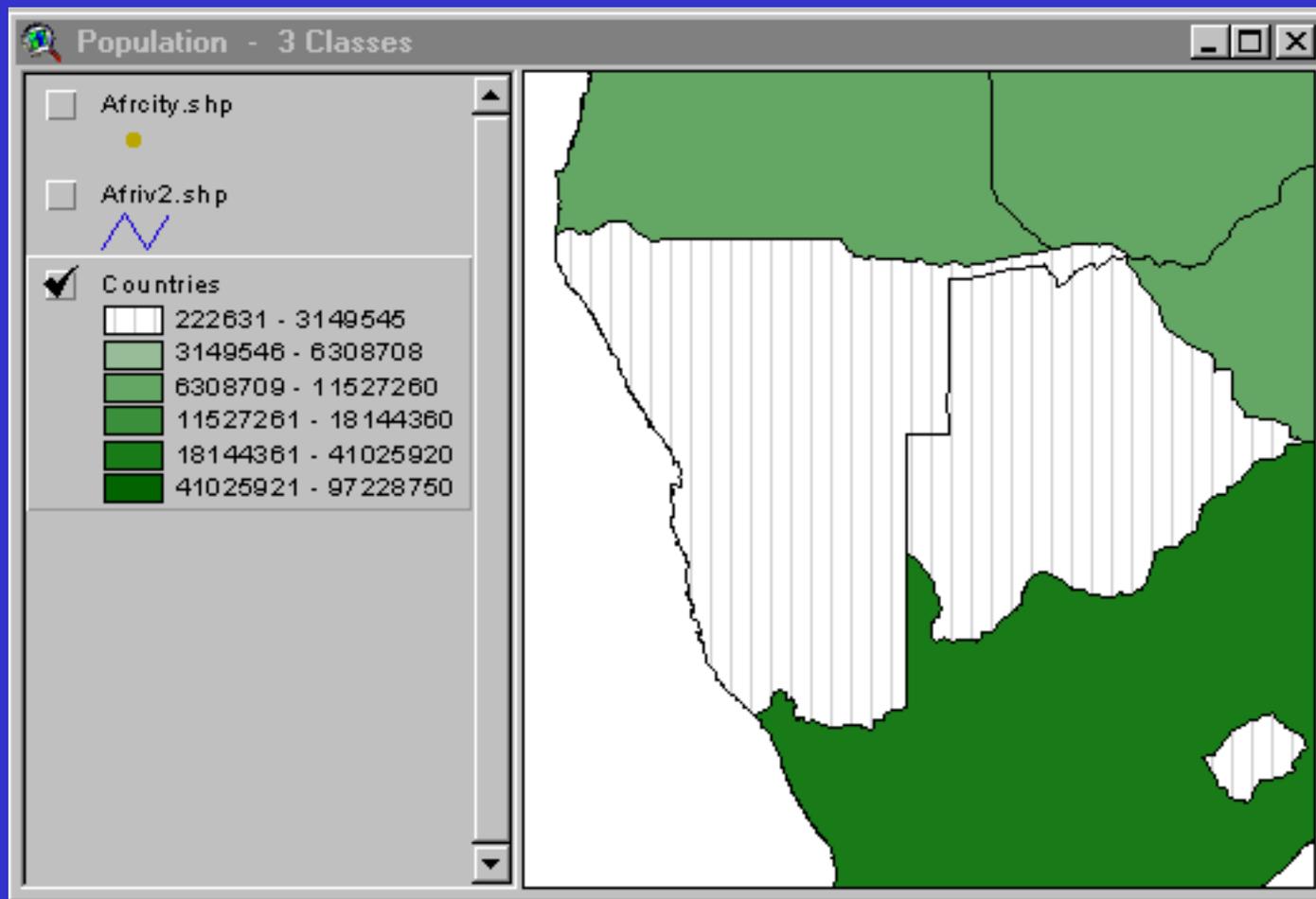
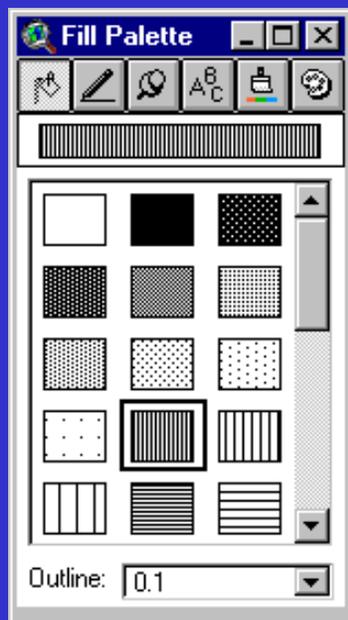
Color Palette



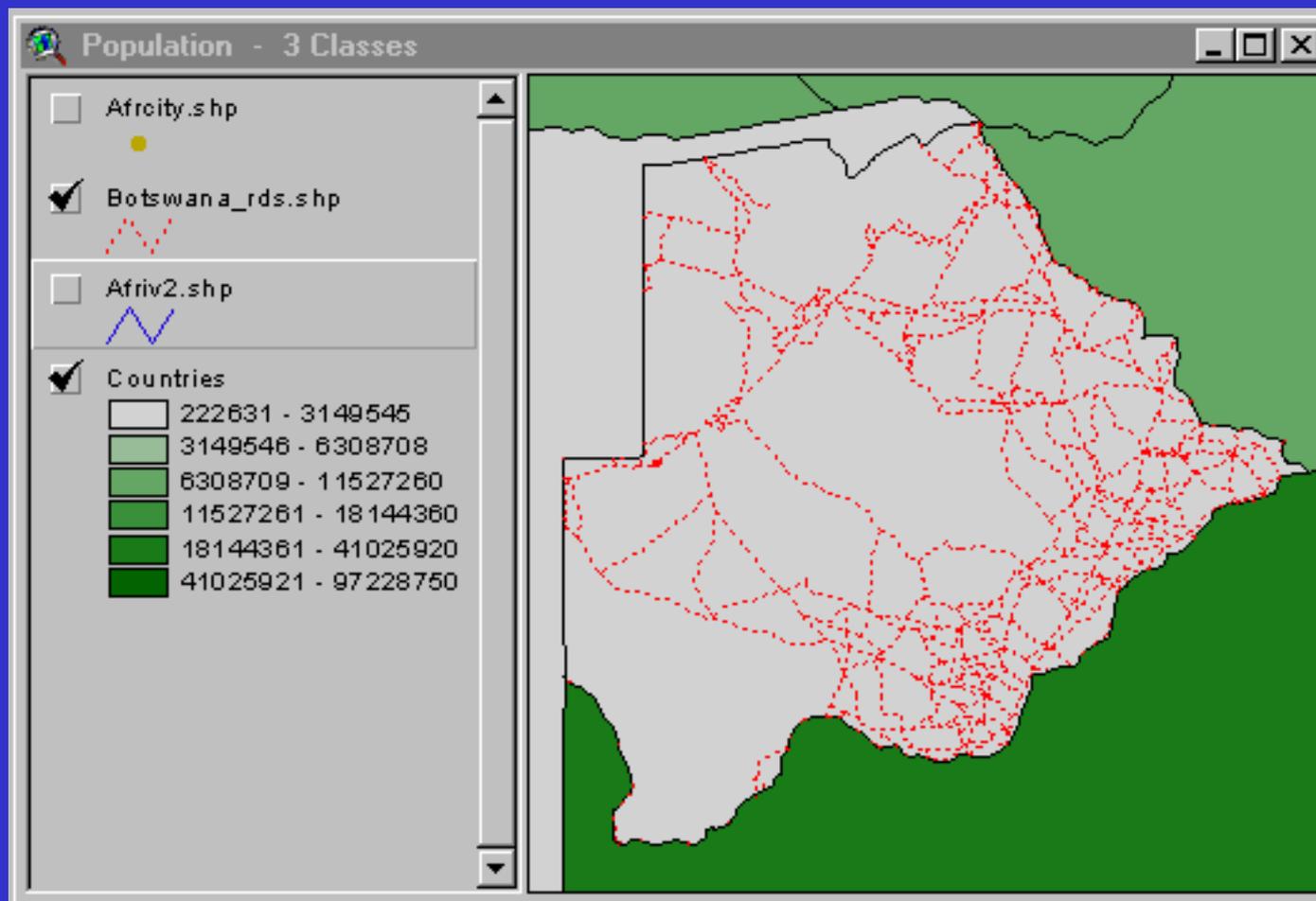
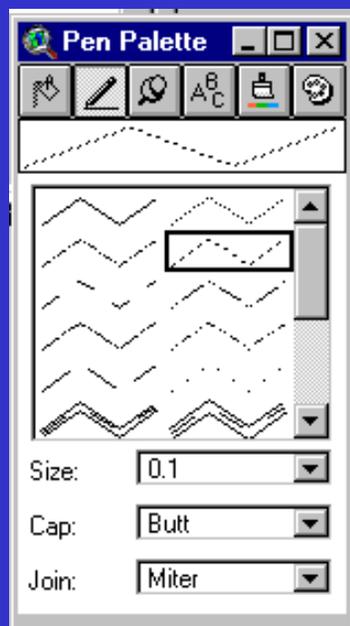
Palette Manager



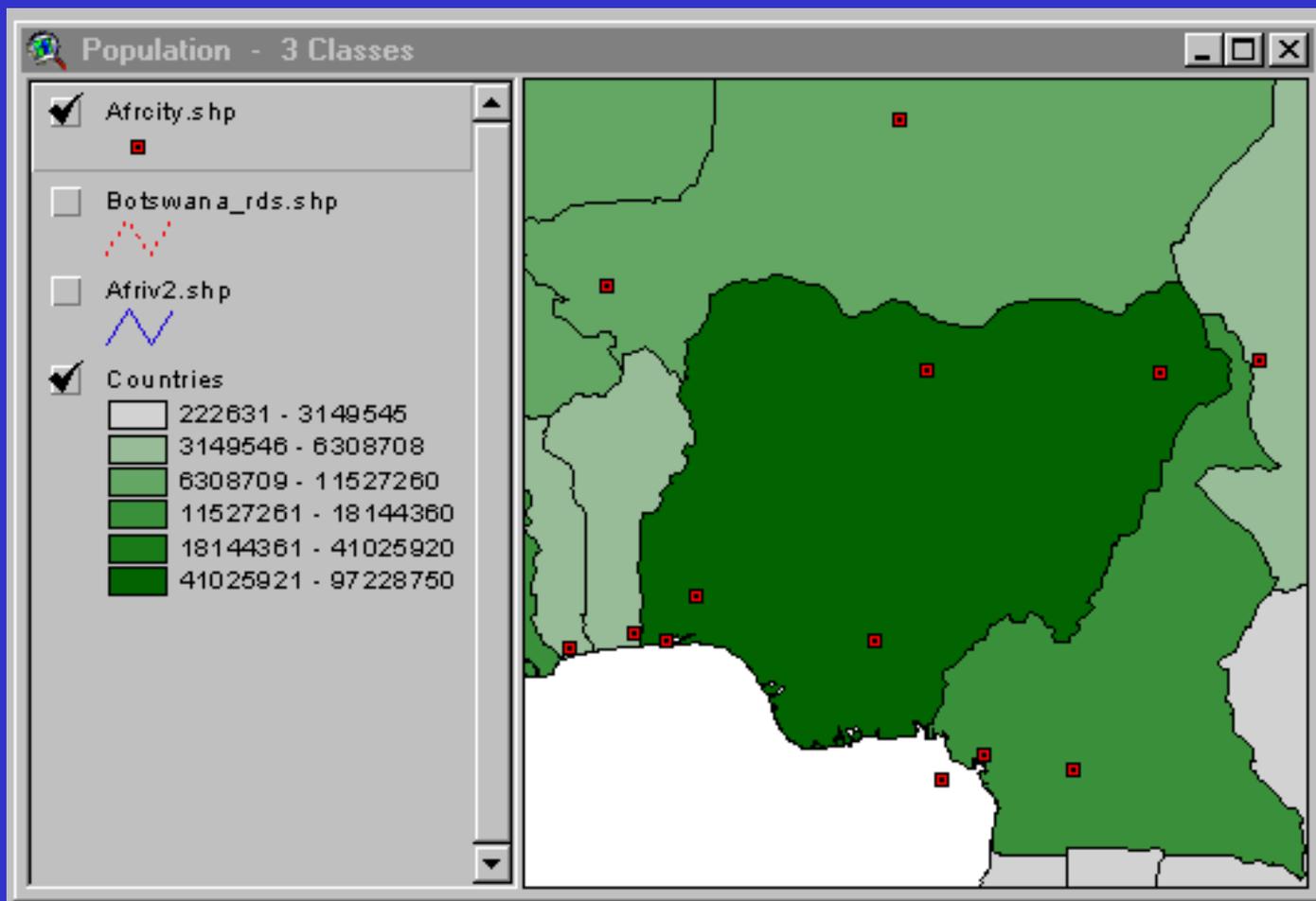
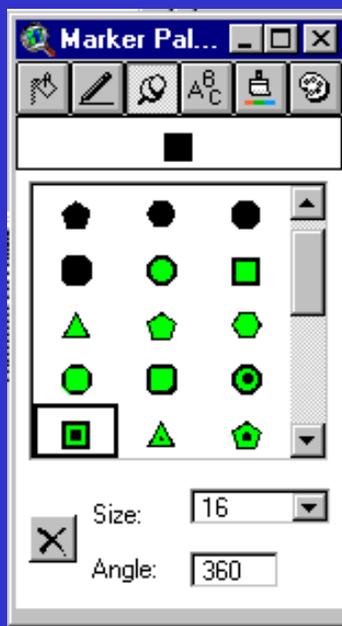
Fill Palette:



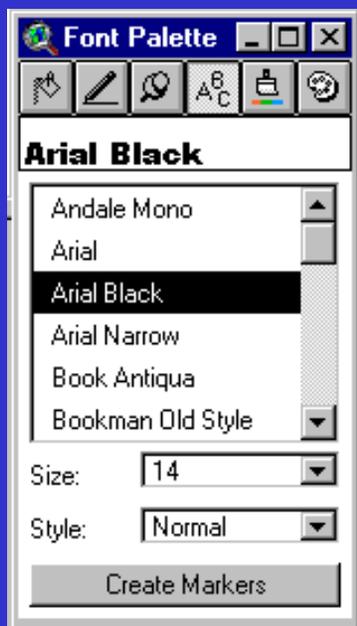
Pen Palette:



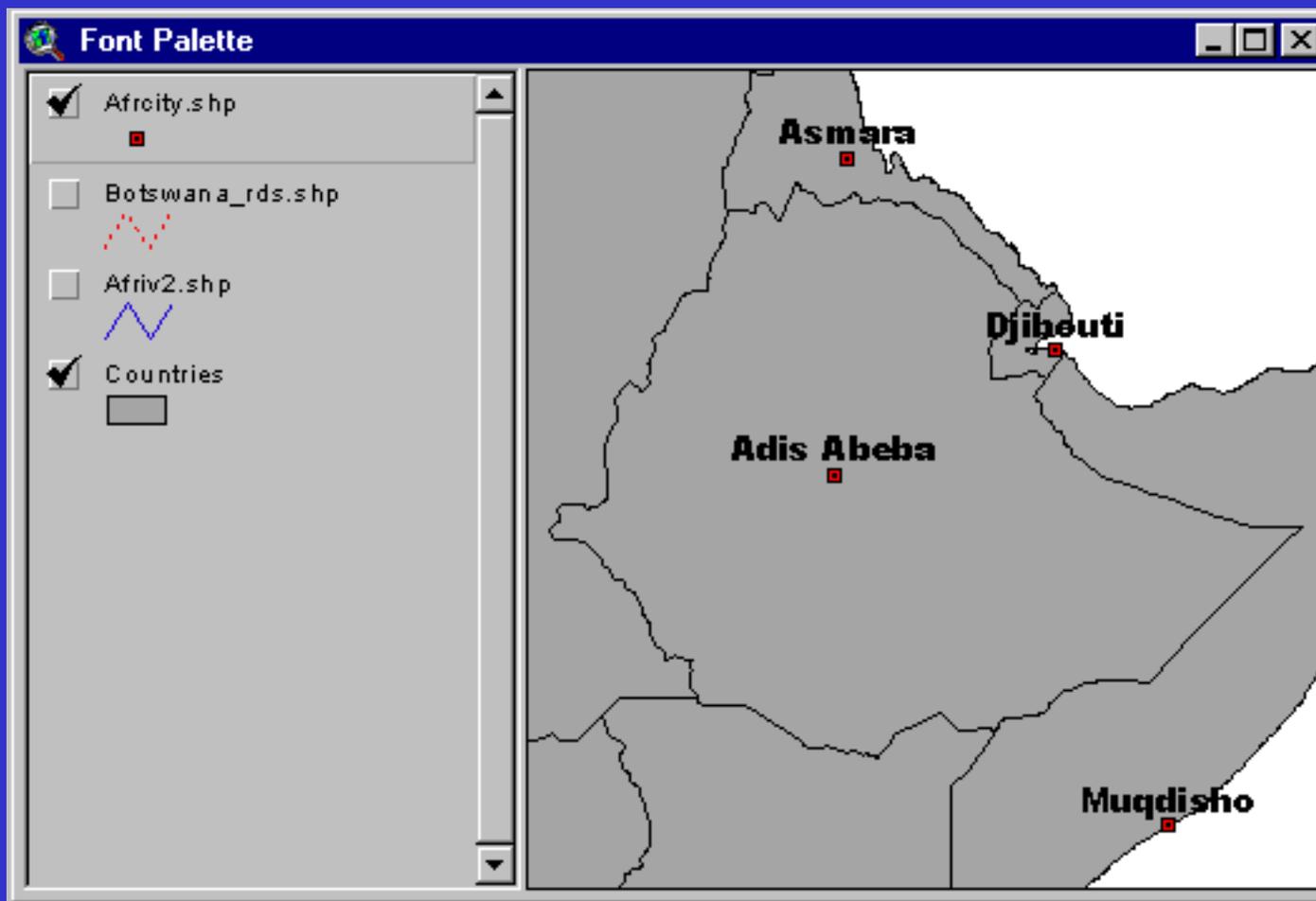
Marker Palette:



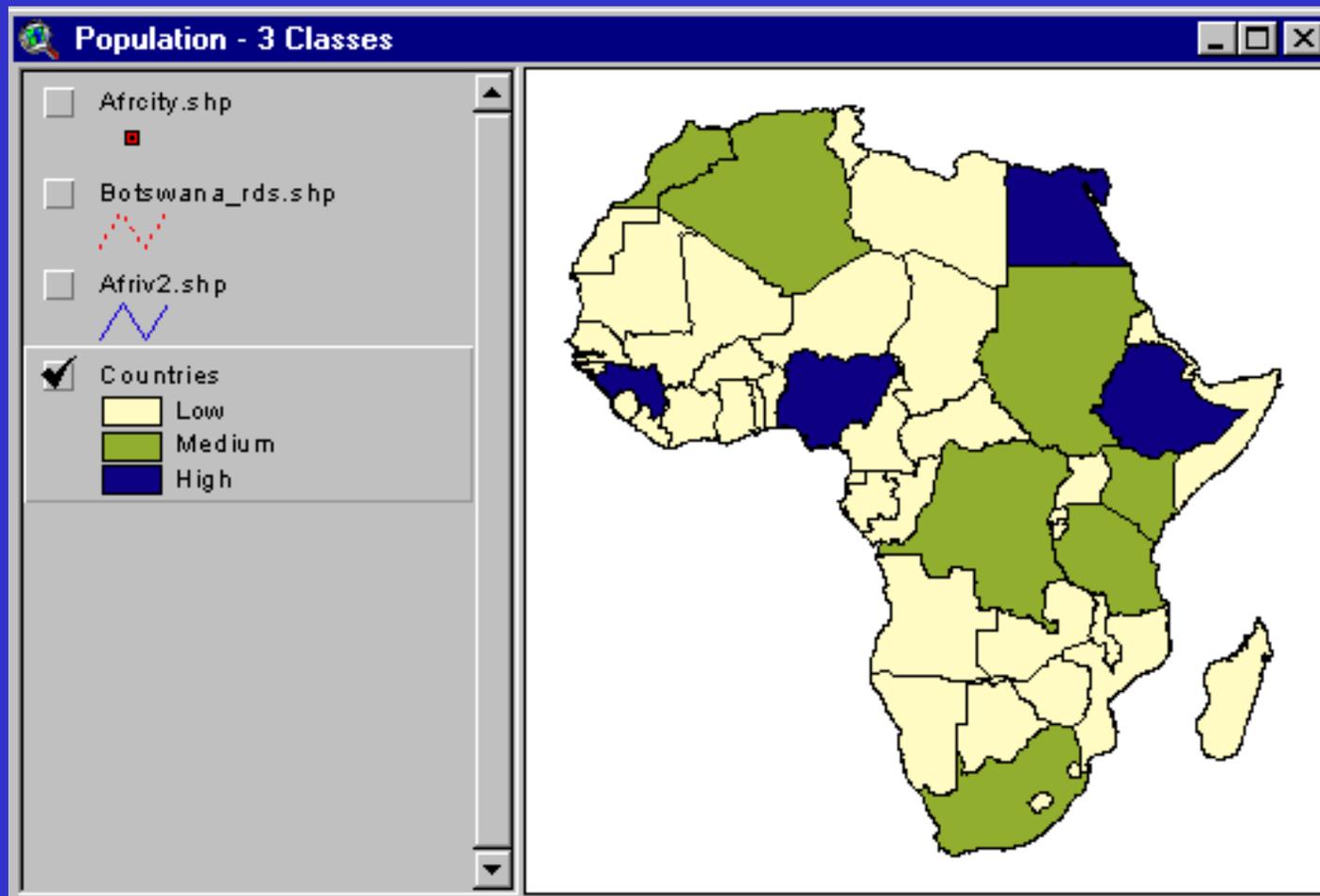
Font Palette:



The font palette can also be used to create new marker symbols



Color Palette:



Saving and Loading Legends:

Legend Editor

Theme: Countries Load...

Legend Type: Graduated Color Save...

Classification Field: Pop_cntry Classify...

Normalize by: <None>

Symbol	Value	Label
	222631 - 18144360	Low
	18144361 - 41025920	Medium
	41025921 - 97228750	High

Color Ramps: Red monochromatic

Advanced... Statistics... Undo Apply

Save Legend

File Name: population.avl

Directories: e:\fevs\training\data\continent

OK Cancel

Load Legend

File Name: population.avl

Directories: e:\fevs\training\data\continent

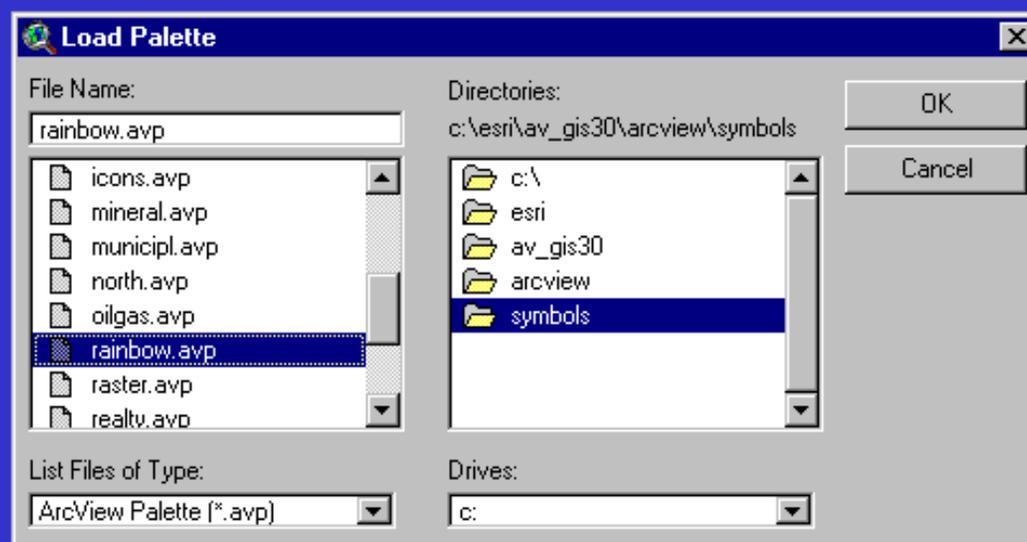
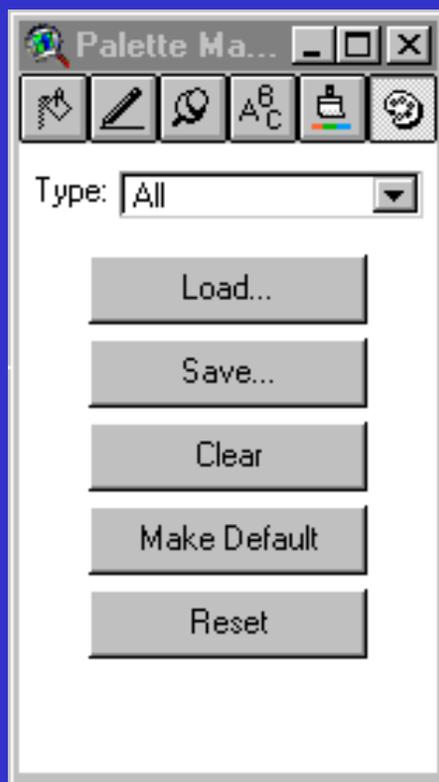
OK Cancel

List Files of Type: Legend (*.avl)

Drives: e:

Palette Manager:

The palette manager can be used to load, save, clear, create a default palette or reload the system palette. ArcView comes with several additional palettes (.avp's) that are specific to various applications.



For a list of palette files with descriptions, search the “ArcView Palette Files” help topic.

Results of loading the “rainbow.avp” file:



Additional palettes include a variety of marker types, fill patterns, color tables, and line symbols.

Section 3a Procedures

- Use the Legend Editor for Thematic Mapping
- Examine Various Legend Types
- Explore Different Classification Methods
- Display Theme Statistics
- Normalize Data Using Percent Total
- Normalize Data Using Values of Another Attribute
- Add / Delete Classes in the Legend Editor
- Edit Values and Labels in the Legend Editor

Section 3a Procedures

- Modify Legend Elements (Sort, Flip Symbols, Ramp)
- Turn Scaling of Symbols On / Off
- Zoom in to Examine the Effect of Scaling
- Change Symbols using Different Palettes
- Save and Load a Legend
- Load Additional Palettes with the Palette Manager

Managing Theme Display and Theme Properties:

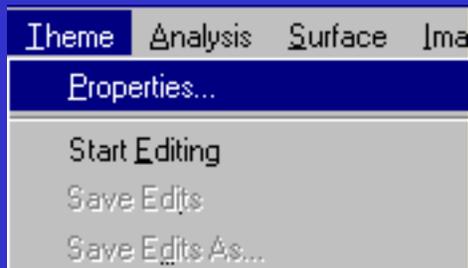
...theme properties control how themes display

The theme properties dialog box allows the user to:

- display a subset of a theme
- label theme features with values from an attribute field
- set the scale at which a theme displays
- create hot links to theme features

Once theme properties are set, they can be locked and only those with a password can make changes to the them.

Theme Properties:

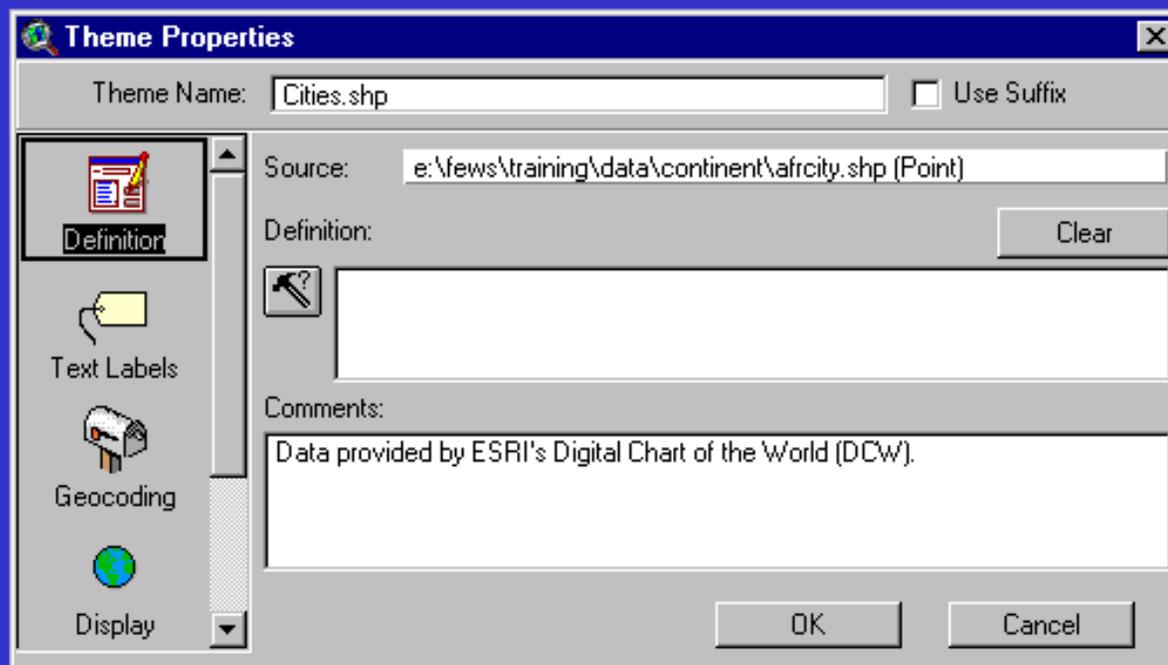


or



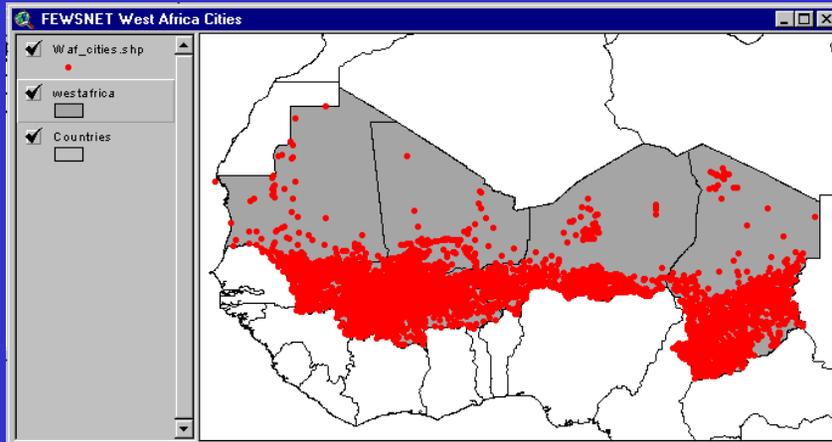
from the button bar

The definition page of the properties dialog defines the theme name, the data path, contains an editable comments section, and allows for the building of queries which define a theme subset.

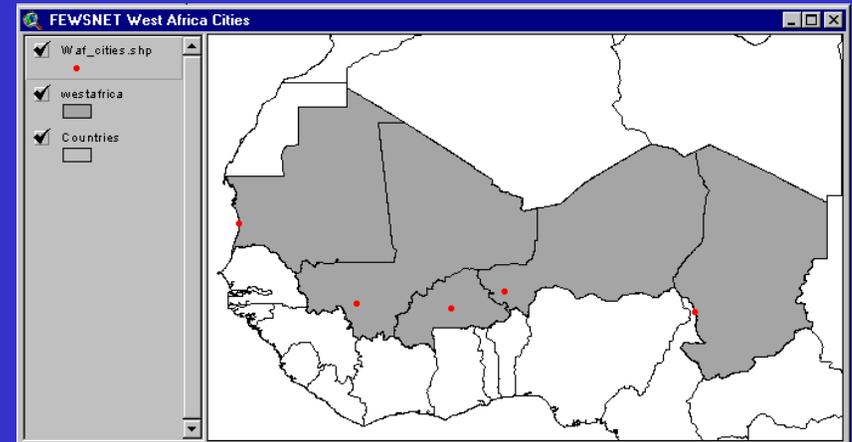


Define a Theme Subset:

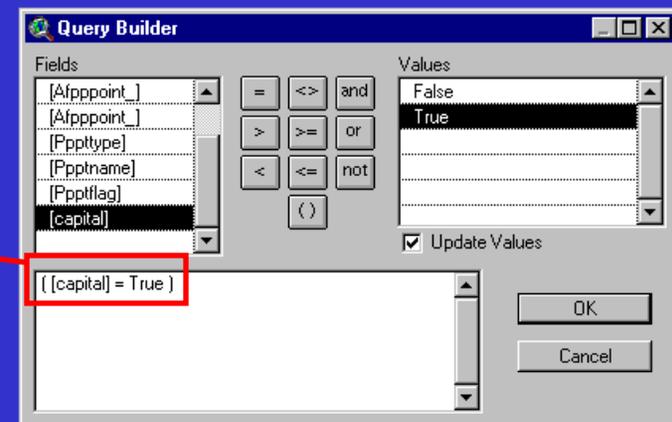
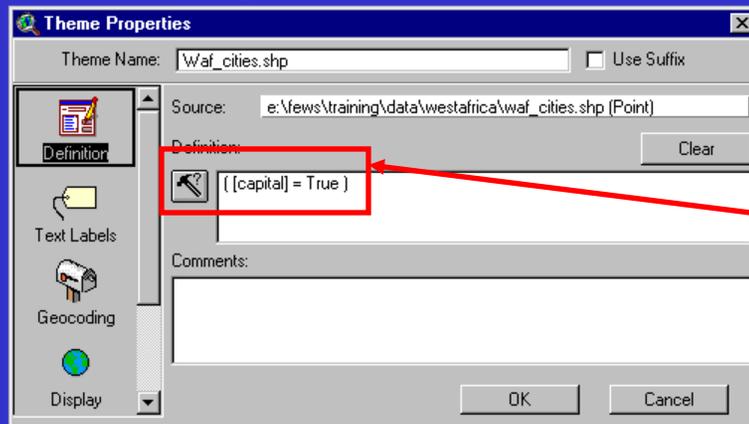
- All Theme Features – Cities



- Subset of features - capitals

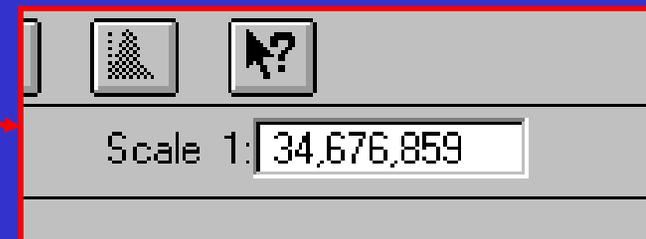
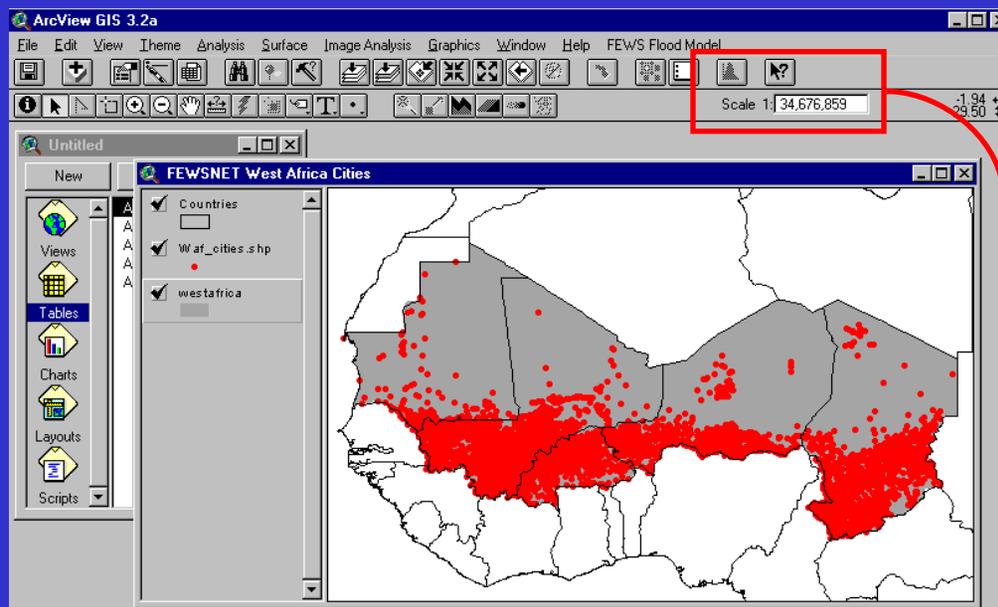


- Build an expression to define a subset



Understanding Scale:

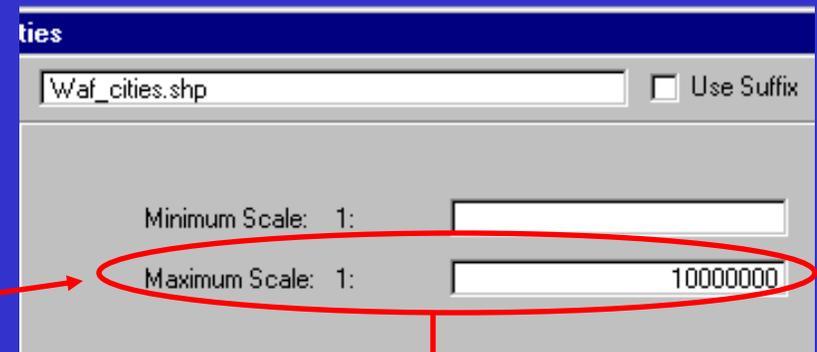
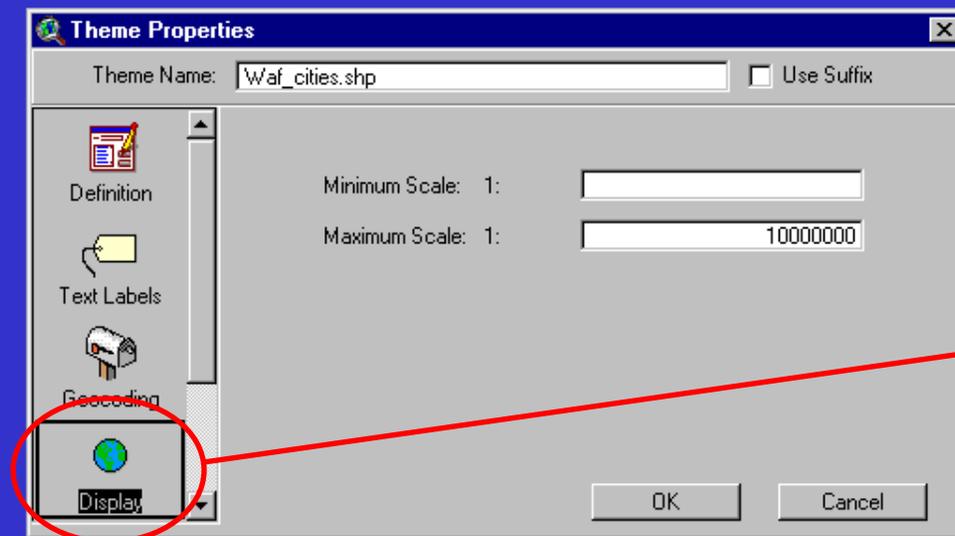
...scale refers to how the dimensions of the view relate to the dimensions of the earth...in the example below, one unit of measure on the view is equal to 34,676,859 of the same units on the earth's surface



Scale thresholds allow the user to define at what scale themes will display.

Setting a Scale Threshold:

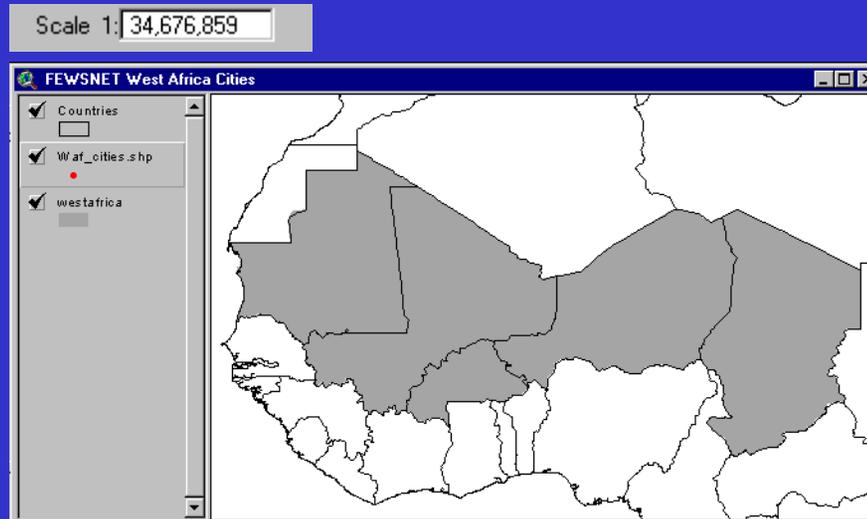
...by adjusting the scale denominator to 10,000,000, the cities shapefile will not display until the view is zoomed to a scale less than the denominator value (i.e. $< 1:10,000,000$)



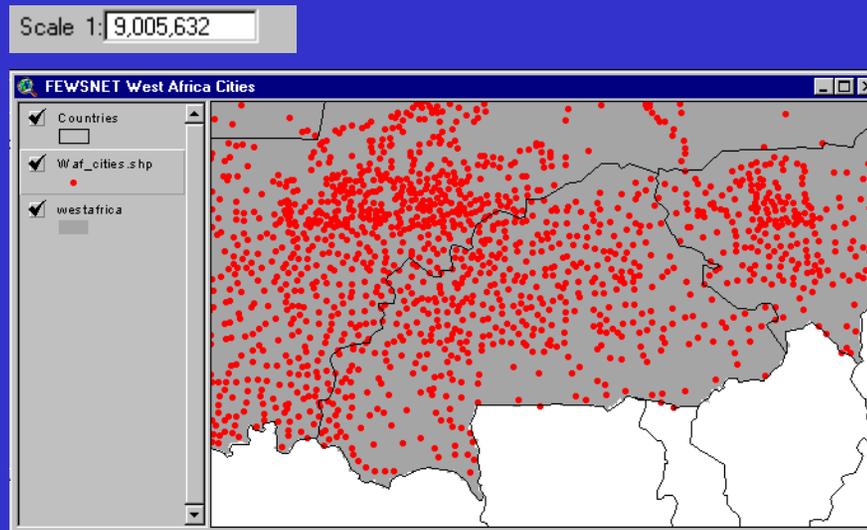
**Scale denominator
threshold set to
10,000,000**

Results of Thresholding:

Scale Denominator =
34,676,859

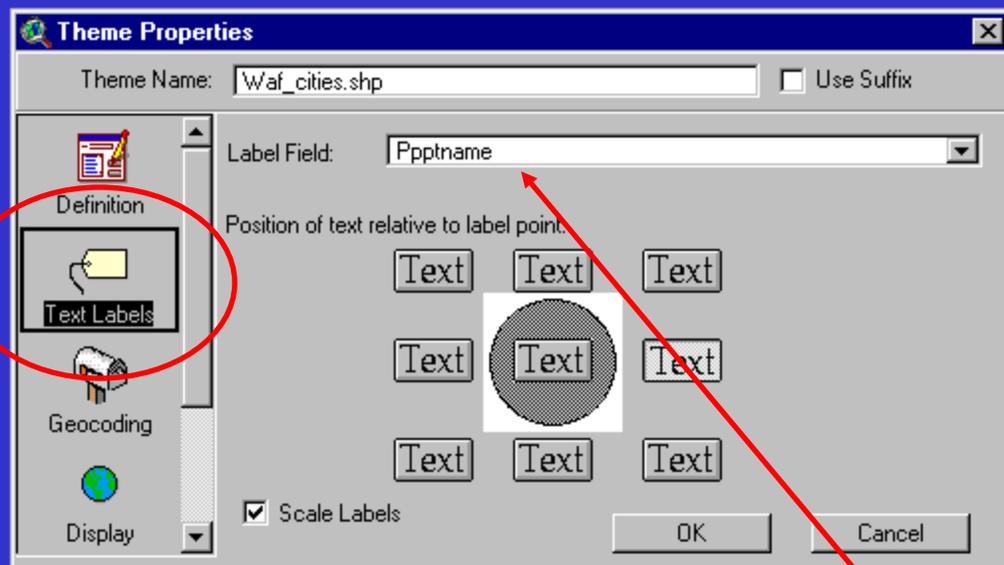


Scale Denominator =
9,005,632



Labeling Theme Features:

- Select a field for labeling features

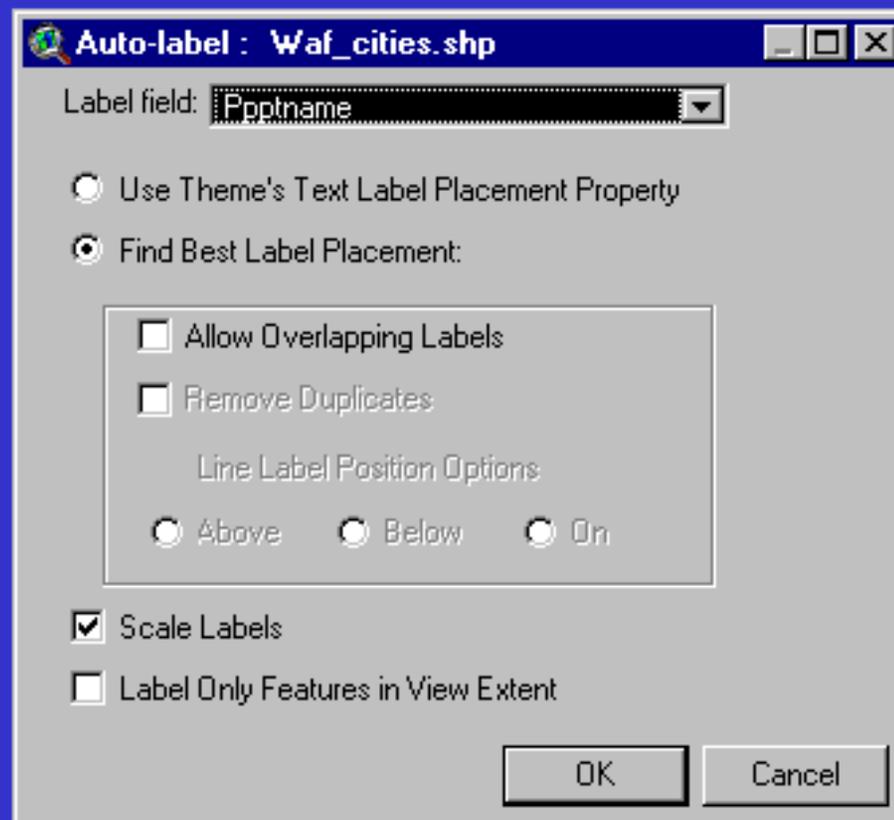
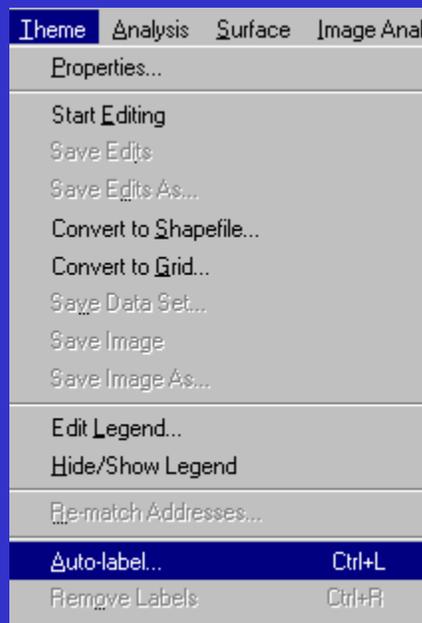


- Label features interactively



Area	Perimeter	Alppoint_	Alppoint_	Fppttype	Fpptname	Fpptflag	capital
0.000	0.000	2420	2420	1	NOUAKCHOTT	1	True
0.000	0.000	5130	5130	2	NIAMEY	1	True
0.000	0.000	6513	6513	2	BAMAKO	1	True
0.000	0.000	6920	6920	2	OUAGADOUGOU	1	True
0.000	0.000	7280	7280	2	NDJAMENA	2	True

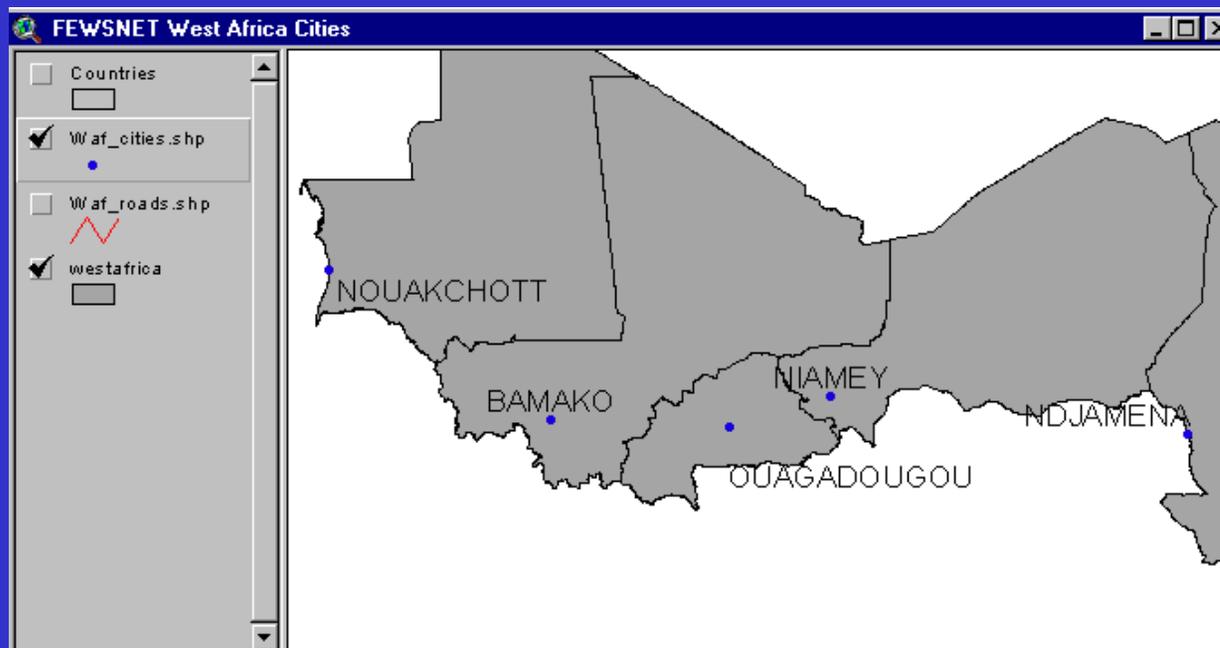
Auto-labeling:



Auto-label allows you to label all features at once using criteria for placement, scaling, etc.

Auto-labeling: cont'd.

- Auto-labeled using best placement and overlapping options

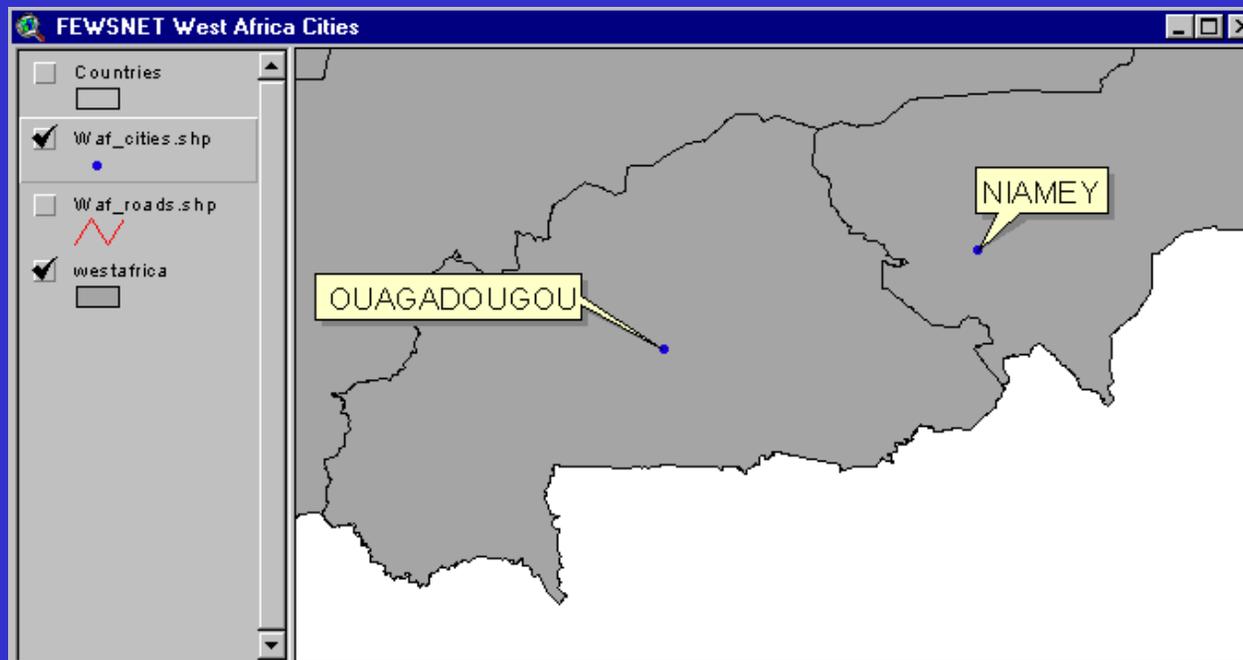


Labels exist as graphics in the view and can be manipulated using selection tools on the tool bar. To remove auto-labels select “remove labels” from the theme menu.

Interactive Labeling:

...the interactive labeling tools dropdown box offers a variety of options for labeling features individually

Select a labeling tool



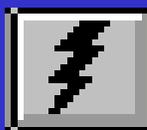
Place the cursor over the feature you want to label and drag to the desired label location

Hot Linking Theme Features:

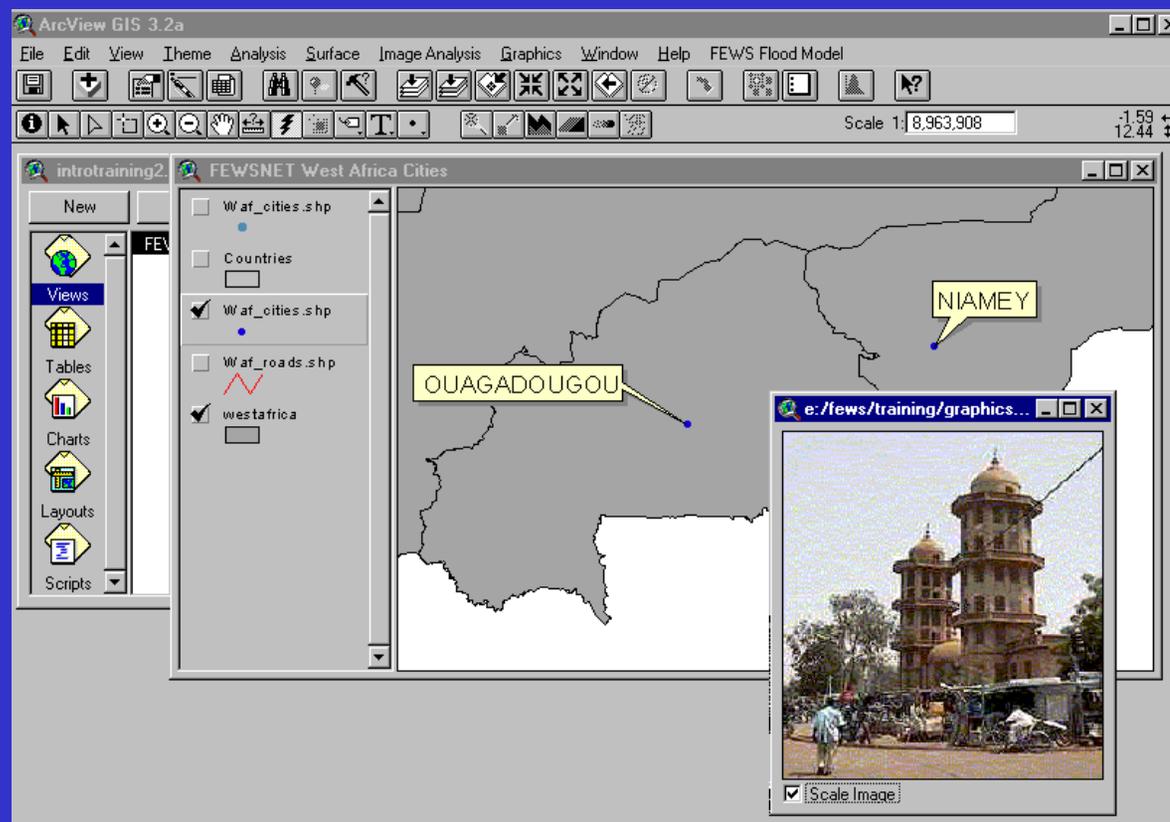
...hot links allow you to click on a feature and display additional data linked to that feature.

Including:

- Images
- Text Files
- Documents (AV docs)
- Project
- Scripts

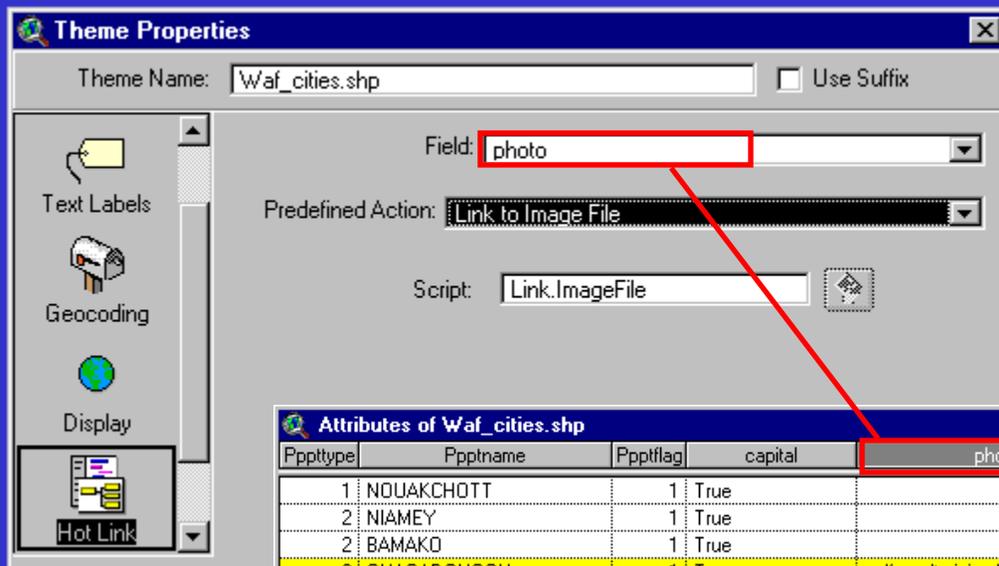


Hot Link Tool

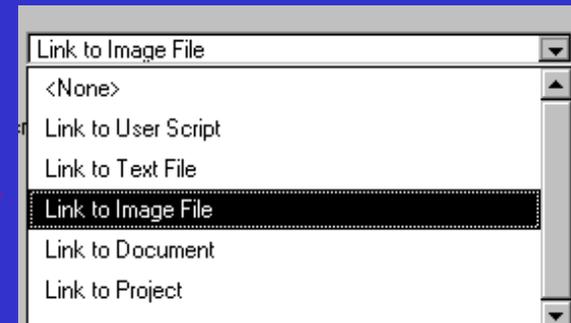


Creating Hot Links:

- Select a field and an action



Ppptype	Ppptname	Ppptflag	capital	photo
1	NOUAKCHOTT	1	True	
2	NIAMEY	1	True	
2	BAMAKO	1	True	
2	OUAGADOUGOU	1	True	e:/fews/training/graphics/mosque
2	NDJAMENA	2	True	



Some supported image formats

- Bitmap
- GIF
- TIFF
- TIFF/LZW (compressed)
- Sun Rasterfiles

Section 3b Procedures

- Examine the Theme Properties Dialog
- Define a Theme Subset using the Query Builder
- Set a Scale Threshold for a Theme
- Examine the Results of Applying a Scale Threshold
- Select a Field for Labeling Features
- Use Auto-Label to Label Theme Features
- Create a Hot Link to a Theme Feature