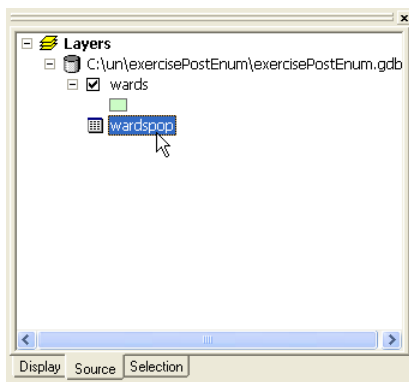


Exercise – Producing Thematic Maps for Dissemination

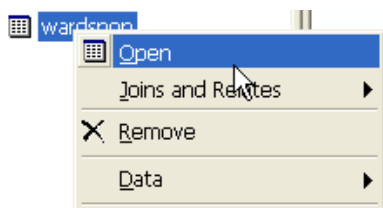
In this exercise you will work with an existing file geodatabase which contains administrative boundaries (named wards) feature class and population tabular data. The population data was created for this exercise and is not reflective of real-world values. The steps take you through one method to interrupt and visualize the census data. The final product will be a map view depicting three years of population data that has been classified using the quantile method.

Step 1: Join the tabular census data to the administrative boundaries (wards) feature class allowing analysis and visualization of census data.

- **Open** the ArcMap document **exercisePopYear.mxd** found in the exercise folder, **c:\un\exerciseDissem**.
- Click the **Source** tab on the **Table of Contents** to view the population table, **wardspop**.



- Right-click the **wardspop** table in the Table of Contents, then click **Open** to view the attributes of the **wardspop** table. Short-cut to open table: hold control-key and double click wardspop name in table of contents. This table consists of numerous census attributes for several years.



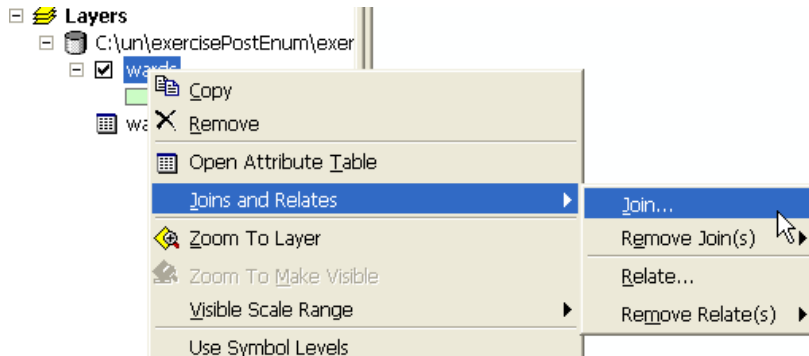
- Compare to the wards feature class attributes. Right-click the **wards feature class**, then click **Open** to view the attributes of the wards feature class. The wards feature class does not contain census population data. To access this data we will join the table to the feature class.
- Close the **wardspop** table. Keep the **wards feature class** table open.

About Joining Tables

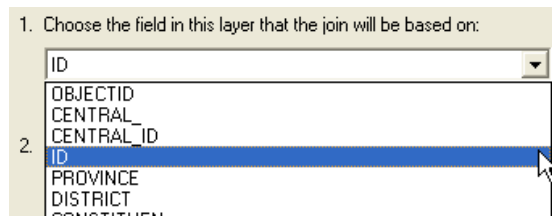
Joining a table of data, such as demographic, to a set of geographic features for visualization and analysis is very common. This requires that the table and the geographic features share a key field, such as ID code. When you join data from different sources it is important that the data types and values of the key fields match exactly. If one field is of numeric type and the other is text, it will not be possible to join on the fields. To work around

this, you can create a new field in one of the tables that matches the data type in the other table, and calculate the values from the non-matching field into the new, matching field. Also, if a key value is misspelled, has variant spellings, or contains a typographic error or extra characters (for example, a trailing space character) the records with unmatched keys will not be joined.

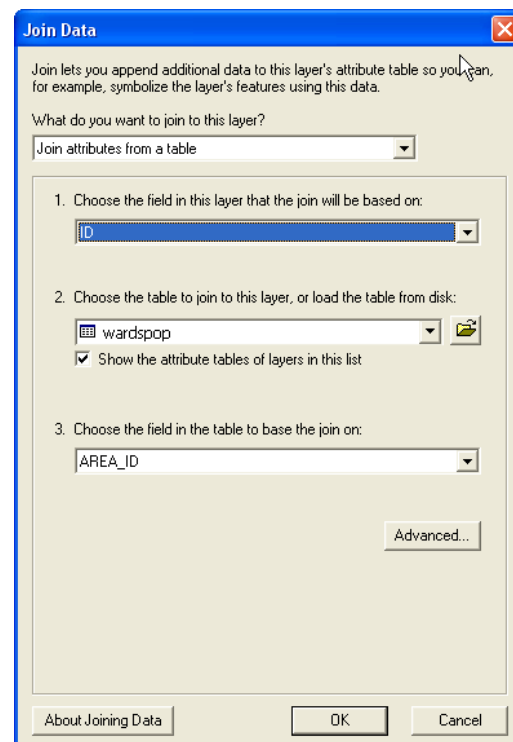
- Right-click **wards** feature class, then click **Joins and Relates**, select **Join**



- Select **Join attributes from a table** for What do you want to join to this layer? (this should be the default).
- Select the **ID** field for the **layer that the join will be based on:**

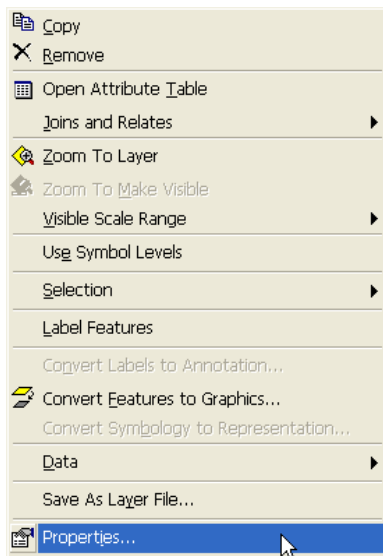


- Choose **wardspop** as the **table to join to this layer**.
- Keep **show the attribute tables of layers in this list** checked
- Choose **Area_ID** for field in the table to base the join on.
- Click **OK**. The dialog will disappear.
- Look again at the **wards attribute table**. You now should see the attributes from the wardspop table starting with **wardspop.**
- Close the table by clicking on the
- Click on the **Display** tab on the Table of Contents.

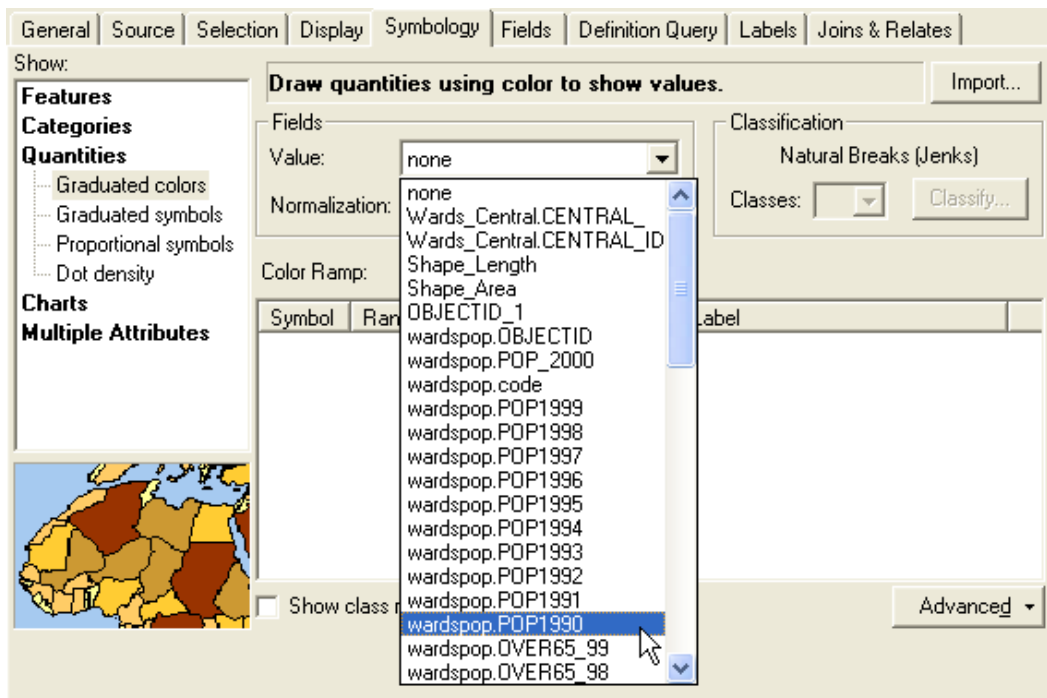


Step 2: Prepare the map document and thematically depict data by three different years, 1990, 1995 and 2000 for visual comparison. To create the map view the data view will consist of three data frames of the data, one for each year.

- Thematically symbolize the map based on population for the year 1990. Right-click wards layer in table of contents, select **Properties** to open the layer properties.



- Click on the **Symbology** tab.
- In the **Show** dialog, select **Quantities – Graduated colors**.
- Click the Value Field drop-down arrow and click **wardspop.POP_1990**.

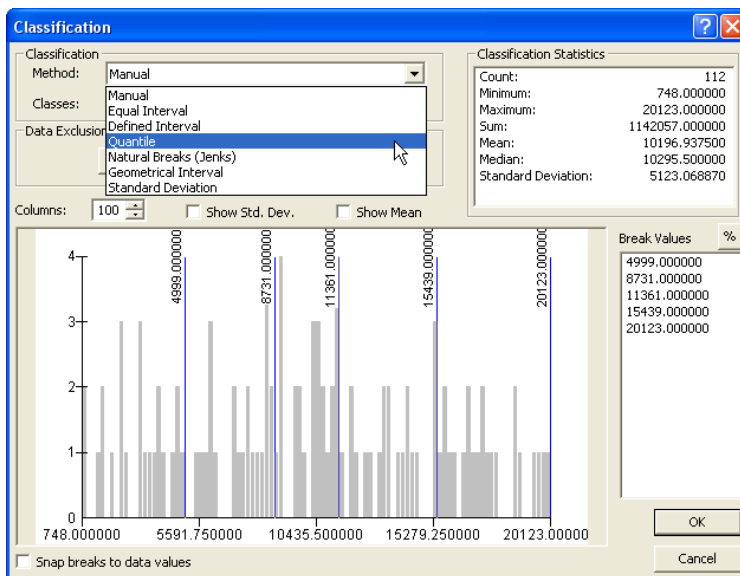


- Normalization: keep as **none**.

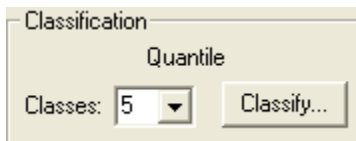
- Select the green to red color ramp.



- Keep the Classification Classes to **5 classes**. The default is Natural Break classification method. This can be modified.
- Click **Classify...** next to Classes: in the Classification window.
- Click the Method drop-down, select **Quantile** method. For quantile method, the range of possible values is divided into unequal-sized intervals so that the number of values is the same in each class. Classes at the extremes and middle have the same number of values. Because the intervals are generally wider at the extremes, this option is useful to highlight changes in the middle values of the distribution. See help section to determine the best classification method for your data.



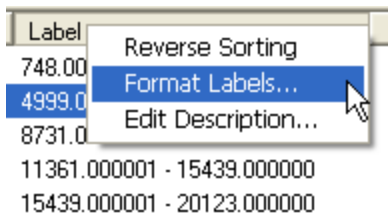
- The Classification window will now indicate **Quantile**



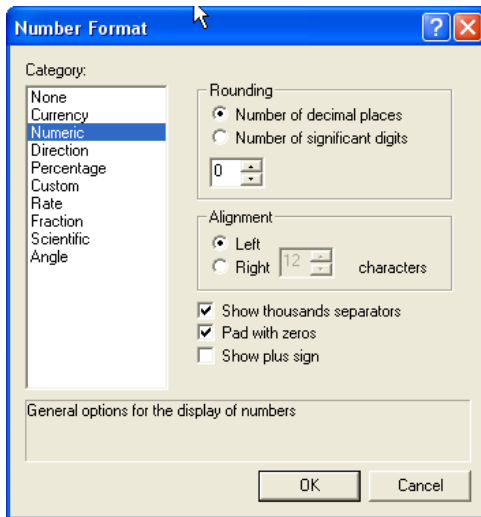
- Click **OK**.
- The labels need improving for readability.

Symbol	Range	Label
	748.000000 - 4999.000000	748.000000 - 4999.000000
	4999.000001 - 8731.000000	4999.000001 - 8731.000000
	8731.000001 - 11361.000000	8731.000001 - 11361.000000
	11361.000001 - 15439.000000	11361.000001 - 15439.000000
	15439.000001 - 20123.000000	15439.000001 - 20123.000000

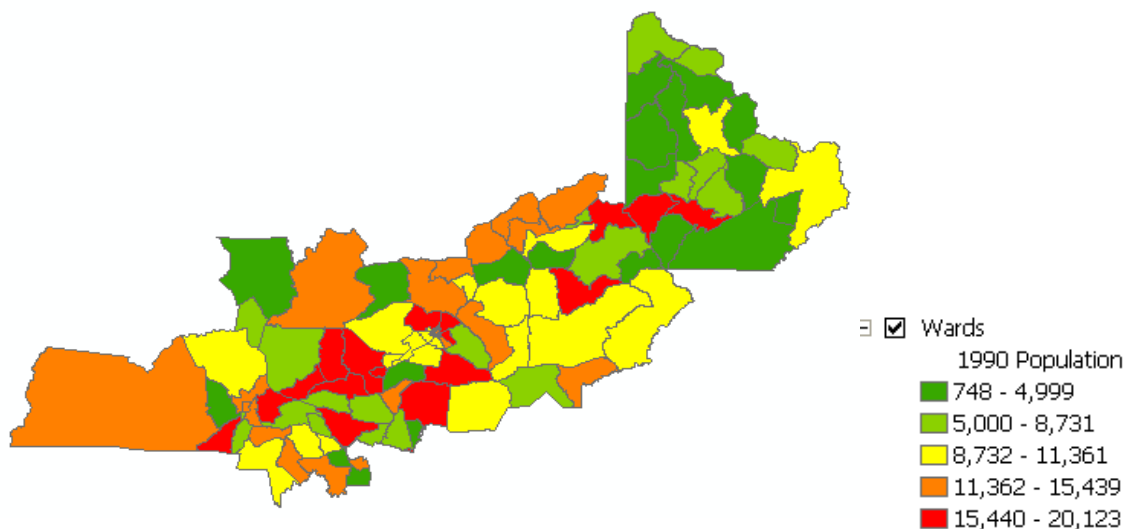
- Click the **Label** bar that is positioned above the labels and select **Format Labels...**




- For **Rounding - Number of decimal places** press arrows until **0** appears.
- Click **Show thousands separators**

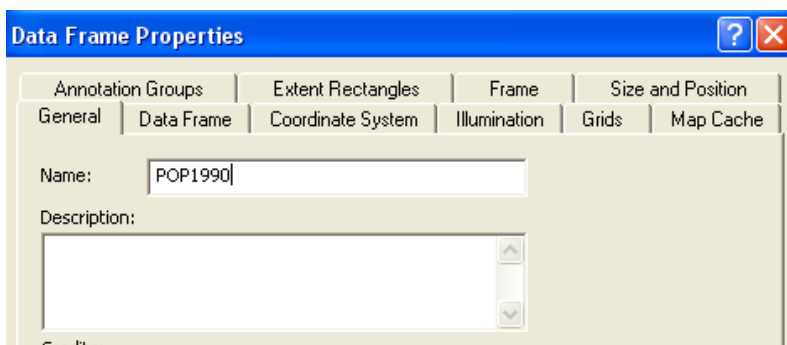


- Select **OK**.
- Select **OK** on the Layer Properties dialog window.
- A thematic map representing the population by ward for 1990 will be displayed.

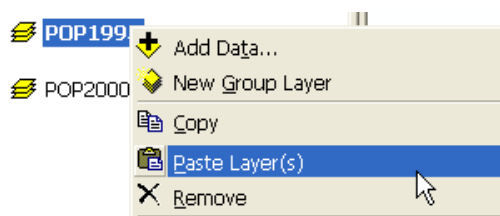


- The legend indicates the color ramp and associated values.
- Click once on **wardspop.POP1990** in the table of contents to improve the description. Change to **1990 Population**.

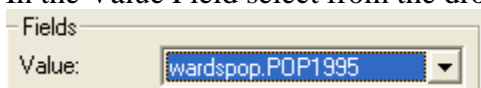
- Click **Save** button  on the Standard toolbar to save the map document. Save often.
- On the map view you want to compare the data layers side by side. To do so, you will add data frames to the table of contents. When a map has more than one data frame, one of them is the active data frame. The active data frame is the one you are currently working with. When you add a new layer to a map, it is added to the active data frame. You can always tell which data frame is active because it is highlighted on the map and its name is shown in **bold** text in the table of contents.
- Click the **Insert** menu and click **Data Frame**. Repeat one more time for a total of 3 data frames.
- To keep the data frames organized, rename each by activating the data frame Properties. Right-click data frame **Layers**, click **Properties**, select **General** tab, and type in the new data frame name **POP1990**.



- Repeat for the other two data frames. Rename **New Data Frame** to **POP1995**. Rename **New Data Frame 2** to **POP2000**.
- Right-click the **POP1995** data frame in the table of contents.
- Click **Activate**. The data view is empty.
- To copy data from one data frame to another, right-click **wards** feature class in the **POP1990** data frame, click **Copy**, right-click **POP1995** data frame, click **Paste Layer(s)**.

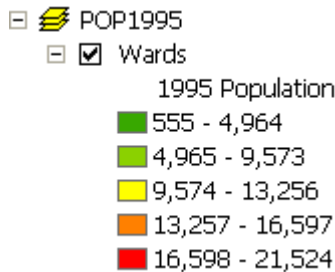


- The symbology is classified and in a consistent color scheme for this map. The data variable for the data frame POP1995 needs to be adjusted.
- Activate the layer properties, click on the **symbology** tab.
- In the Value Field select from the drop-down list, **wardspop.POP1995**.

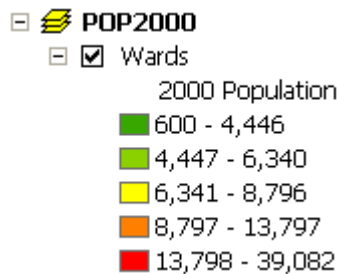


- Click the **Label** bar that is positioned above the labels and select **Format Labels....**
- For **Rounding - Number of decimal places** press arrows until **0** appears.

- Click **OK**.
- Click once on **wardspop.POP1995** in the table of contents to improve the description. Change to **1995 Population**.
- The POP1995 data frame label will appear as follows.

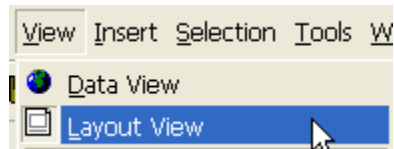


- Repeat the same steps for the third data frame.
- Right-click **wards** feature class in the **POP1990** data frame, click **Copy**, right-click **POP2000** data frame, click **Paste Layer(s)**.
- Activate the layer properties, click on the **symbolology** tab.
- In the Value Field select from the drop-down list, **wardspop.POP_2000**.
- Click the **Label** bar that is positioned above the labels and select **Format Labels....**
- For **Rounding - Number of decimal places** press arrows until **0** appears.
- Click once on **wardspop.POP2000** in the table of contents to improve the description. Change to **2000 Population**.
- The POP2000 data frame labelling will appear as follows.



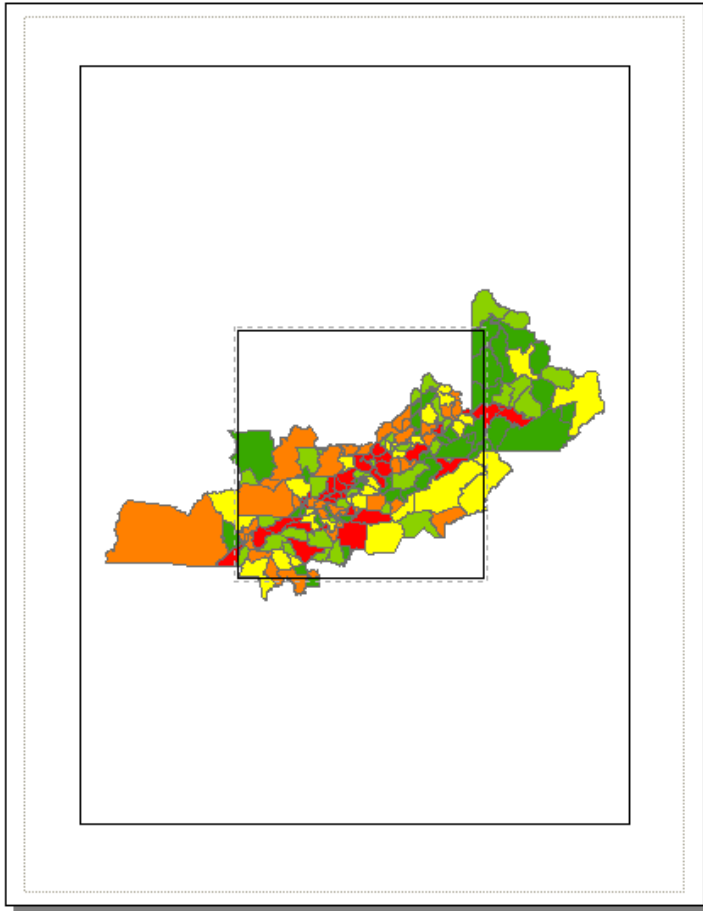
Step 3: Create the map view to depict the population differences between the three years: 1990, 1995 and 2000.


- Select View from the Main menu, click on **Layout View** to switch to the map layout.

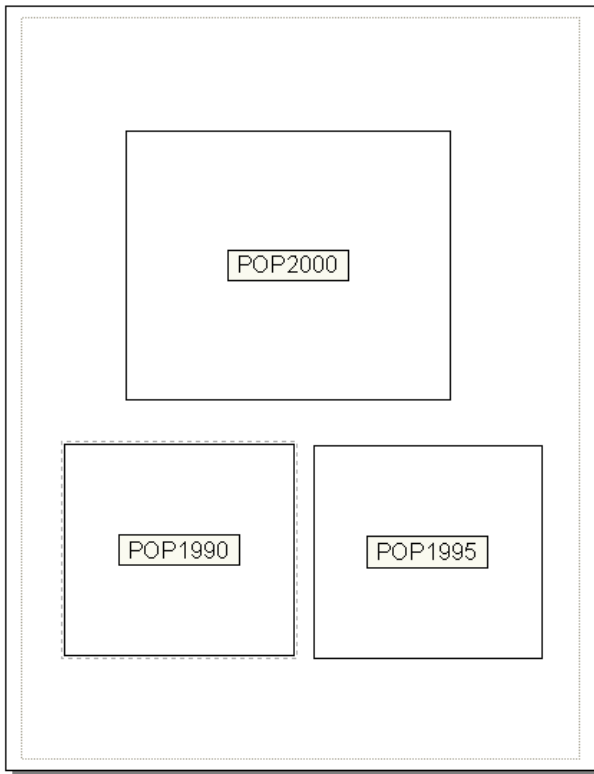


- A map layout is the arrangement of map elements and their overall design on a printed page or a digital map display. Example map elements include a title, legend, north arrow, scale bar, and one or more geographic data frames. In ArcMap, the layout view presents the virtual page upon which geographic data and map elements, such as titles, legends, and scale

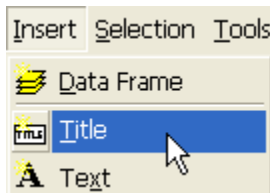
bars, are placed and arranged for printing. You can work with the individual map elements and map layers in the layout view. Use the Insert menu to add map elements or the Draw toolbar along the bottom to add map graphics. Once they are placed on your map layout, you can edit their appearance, right-click to change their properties, and select each element to reposition it or scale its size as needed. Below is the initial map layout.



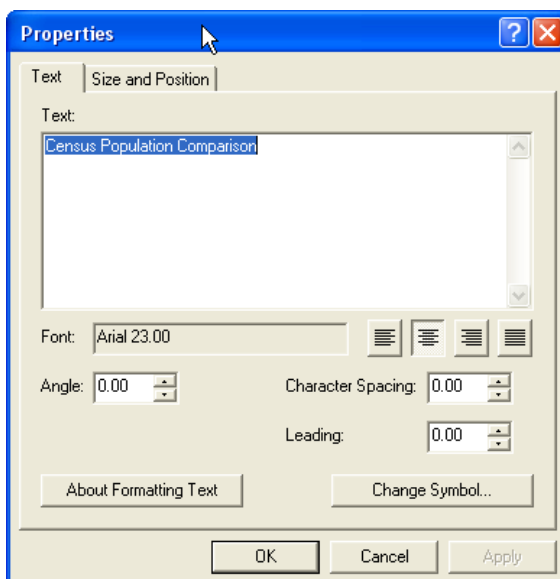
- The three data frames are drawn on top of each other. To rearrange the data frames, click **toggle the draft mode**  to turn off the map features allowing for quicker manipulation of map elements and data frames.
- Click once to activate a data frame and rearrange as depicted below.



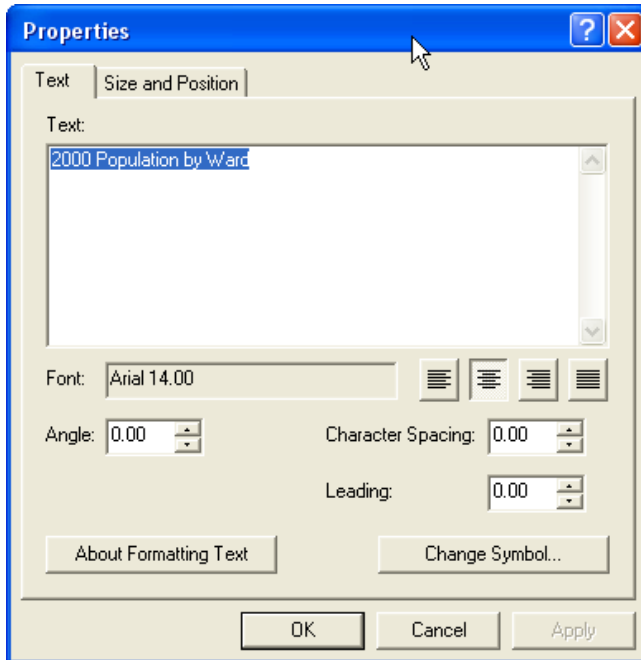
- Click **Insert** on the main menu bar and select **Title** to add a title to the map.



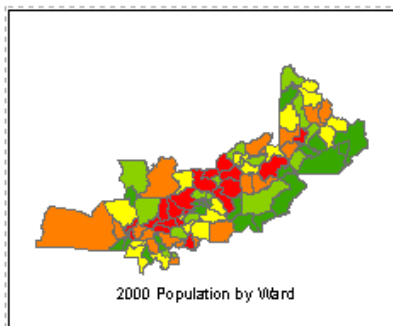
- Double click the title box and enter **Census Population Comparison**. Keep other values the same.



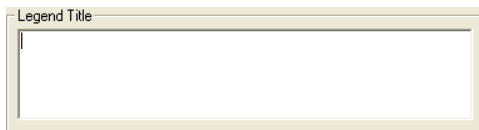
- Click **Insert**, select **Text** to insert text for map labels.
- Double click text box and enter **2000 Population by Ward** as title.
- Click **Change Symbol...** button and increase font size to 14.
- Click **OK**.
- Click **OK**.



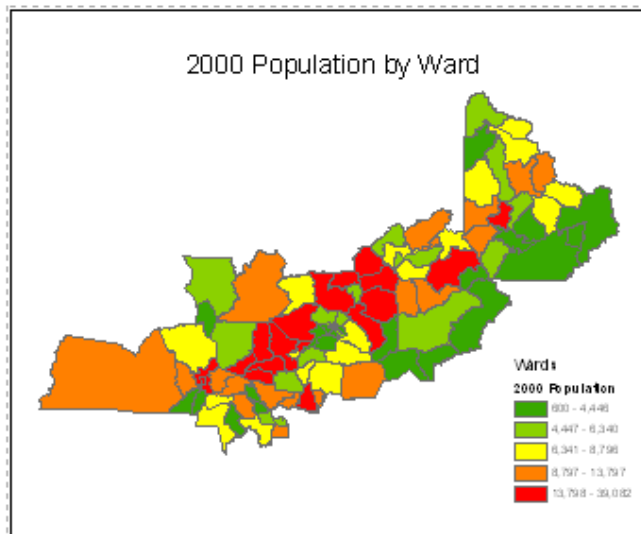
- Copy map label. Click on **2000 Population by Ward** map label to activate. Right-click, select **Copy**. Click in map view in a different location, right-click and select **Paste**.
- Double-click the new text box. Change the text to **1990 Population by Ward**.
- Repeat above two bullets to create a text label for the **1995 Population by Ward** map.
- Place the labels below each map, as below.



- Add a legend, click the 2000 population map to activate the map the blue line will appear to indicate the data frame is active.
- Click **Insert**, select **Legend** the Legend Wizard will appear.
- Click **Next** on the first dialog window keeping the default values.
- Delete the word **Legend** on the next dialog window under **Legend Title**.



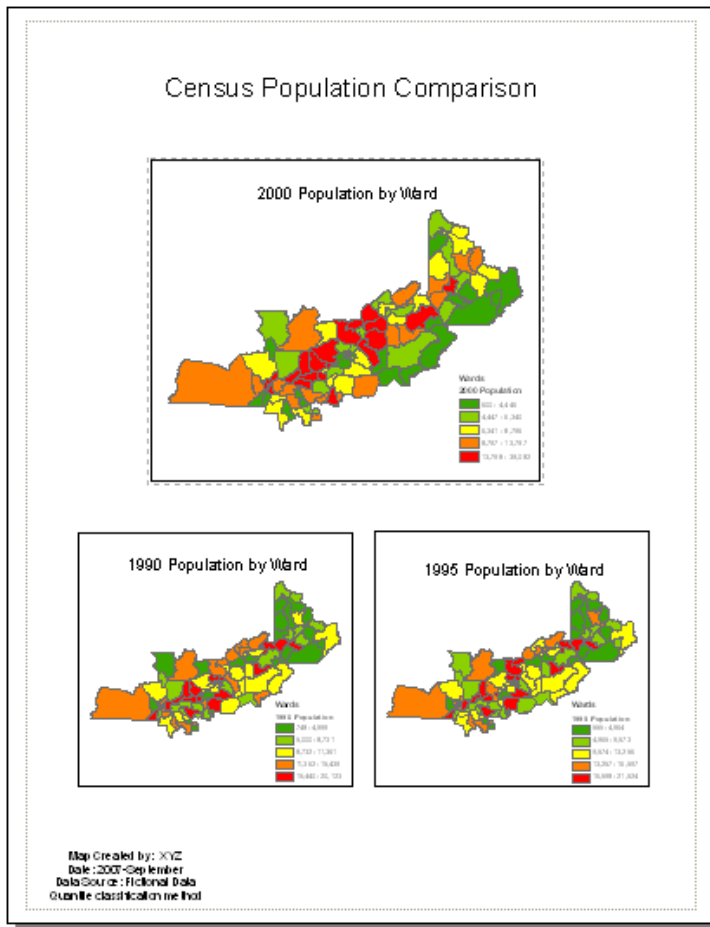
- Click **Next**, **Next**, **Next** and **Finish**.
- Move and resize the legend to fit inside the frame for the 2000 map.



- Add a legend for the remaining two map.
- Create an additional text box to annotate map with author, date created and additional information. For example,

Map Created by: XYZ
 Date: 2007-September
 Data Source: Fictional Data
 Quantile classification method

- The final map looks like:



- The map view is ready to be exported to one of many options available. Click **File**, select **Export Map**, choose **PDF**. Change the output directory to save the PDF file to **c:\un\exercise\ exerciseDissem**.

EMF (*.emf)
 EPS (*.eps)
 AI (*.ai)
 PDF (*.pdf)
 SVG (*.svg)
 BMP (*.bmp)
JPEG (*.jpg)
 PNG (*.png)
 TIFF (*.tif)
 GIF (*.gif)

- If you have access to Adobe Reader, open the PDF file.

Thanks to



and

for data and materials for this exercise.

Data note: The GIMS, Ltd. data was modified to fit the scenario of this exercise. The population data is not accurate. The attributes and values were created for this exercise.