


## MAP LAYOUT IN ARCMAP

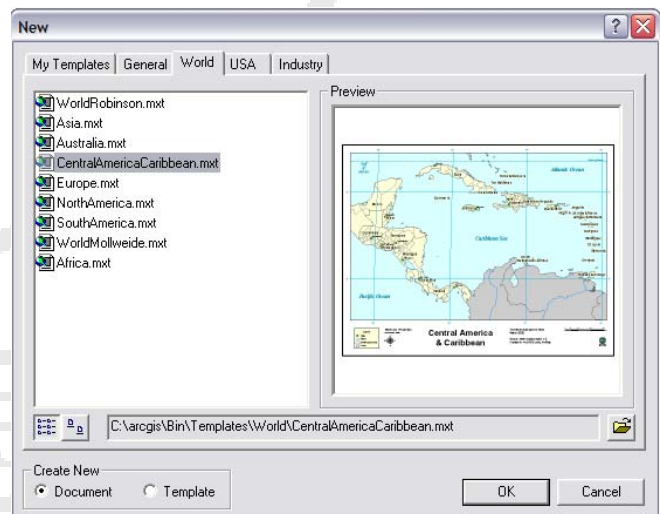
### WORKSHOP #10

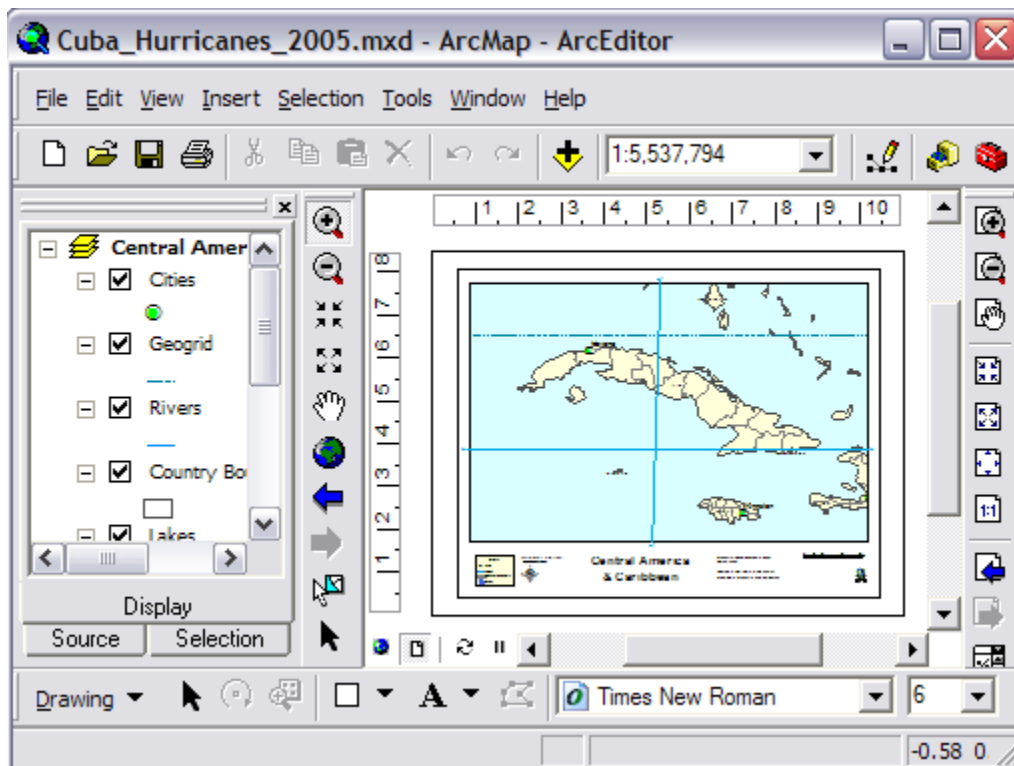
#### *PREPARING FOR THE TUTORIAL*

1. Browse to the **C:\Temp** folder on the computer you are working at.
2. Create a **New Folder** and name it using your **initials** (for example, if your name is Rip Van Winkel, your new folder might be **C:\Temp\RVW**).
3. Open your **web browser** and navigate to <http://www.library.yale.edu/maps>.
4. Look for the “**Download Workshop Materials**” link under **QUICK LINKS**, and follow it.
5. Scroll down until you find the “**Creating Map Layouts in ArcMap**” materials. Download the **Data ZIP file** to the initials folder you created in **C:\Temp**.
6. Browse to the folder containing the downloaded file and extract it to your initials folder.

#### *USING ARCMAP TEMPLATES TO CREATE QUICK MAPS*

1. Start **ArcMap**. When prompted, select “**Start Using ArcMap with: A template.**”
2. In the resulting **Dialog Box**, Select the “**World**” **Tab** at the top.
3. Select the **CentralAmericaCaribbean.mxt** template and click **OK**.
4. Use the **Data Zoom & Pan Tools** , to zoom and center the **Data View** on **Cuba** until you are satisfied with it.
5. On the **Main Menu**, go to **View>Bookmarks>Create...** and create a bookmark called “**Cuba**.”
6. On the **Main Menu**, go to **File>Save As...**, and save your file to the **Layout\_in\_ArcMap** folder as **Cuba\_Hurricanes\_2005.mxd**.



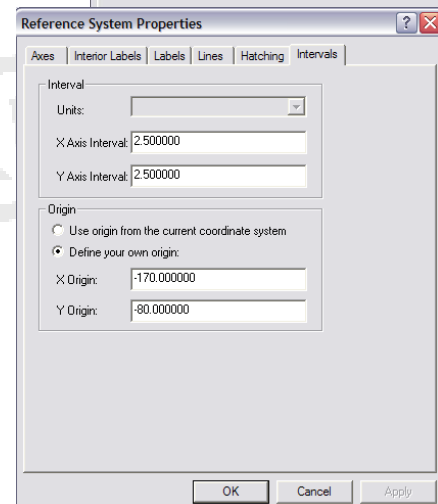
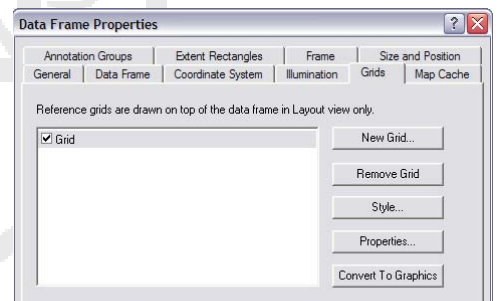


## CHANGING THE GRATICULE INTERVALS

Since you zoomed into Cuba, the intervals of the template graticule have become a little too wide to be truly useful for describing the locations of features in the map. Here you will reduce the interval size to better fit the extent chosen.

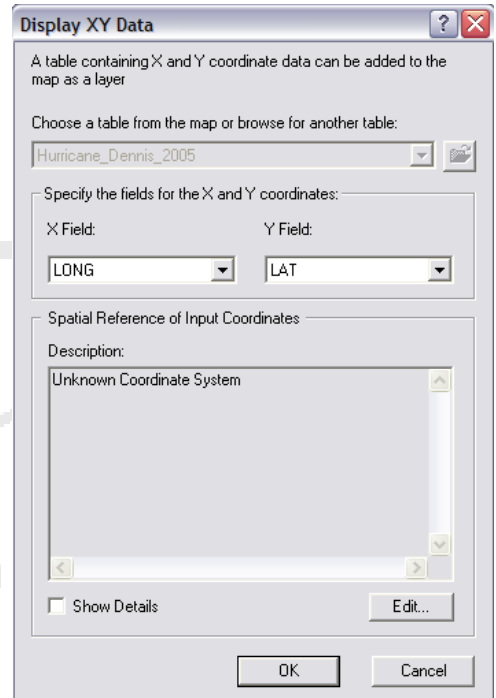
1. In the **Table of Contents**, right-click on the “**Central America & Caribbean**” **Data Frame** and select “**Properties.**” Select the **Grids Tab**.
2. Click on the **Properties Button**. Select the **Intervals Tab**.
3. Replace the **X & Y Axis Interval values** (currently set to 10.000000) with **2.5**, as shown to the right. Click **OK** twice.

The graticule now has an interval that is more useful for describing the position of features in the map layout. To add a graticule to any data frame, open the Data Frame’s Properties, click on the Grids Tab and click New Grid to start the Wizard.



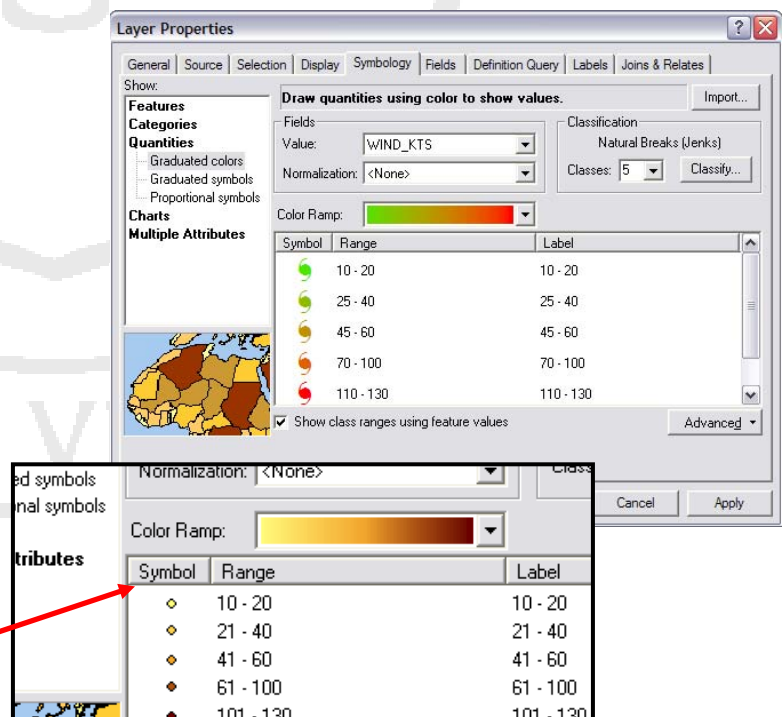
## ADDING YOUR DATA TO A TEMPLATE MAP

1. Use the **Add Data Button** to browse to the **C:\Temp\initials\Layout\_In\_ArcMap\Data\Table** folder and add the **Hurricane\_Dennis\_2005.dbf** table to your **Map Document**.
2. The **Table of Contents** will change to the **Source Tab** and the **Hurricane\_Dennis\_2005** table will be added to the bottom.
3. Right-Click on **Hurricane\_Dennis\_2005** and select “**Display XY Data**.”
4. **ArcMap** has incorrectly chosen **YEAR** as the **Y Field**. Use the **Drop-down** to select **LAT** as the **Y Field**. Click **OK**.
5. Define the Coordinate System as GCS WGS84.
6. A new layer called **Hurricane\_Dennis\_2005 Events** will be added to the top of the **Table of Contents** and the points describing the track of **Hurricane Dennis** will be added to the map layout.

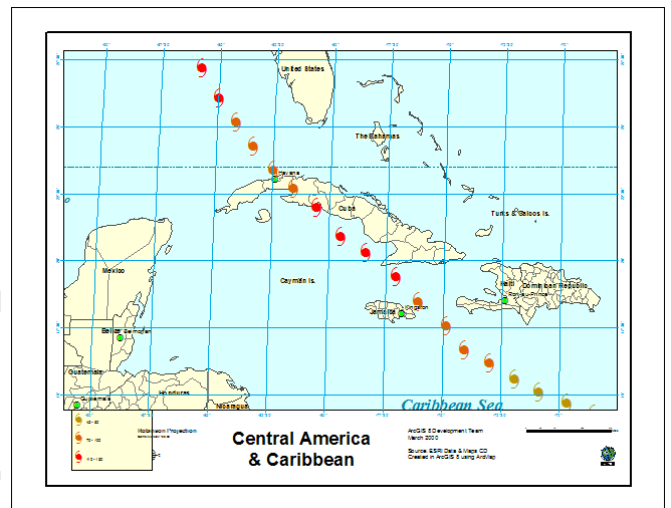


## USING SYMBOLOGY TO SHOW QUANTITY

1. Right-click on **Hurricane\_Dennis\_2005 Events** and open the **Properties** dialog. Select the **Symbology** Tab.
2. Select **Quantities** from the **Show: panel** on the left. Highlight the **Graduated colors** item.
3. Select **WIND\_KTS** as the **Value Field** (no normalization). Make sure there are **5 classes** under the **Classification** settings.
4. Click on the **Symbol field** header (shown below) and select “**Properties for All Symbols**” to open the **Symbol Selector**.




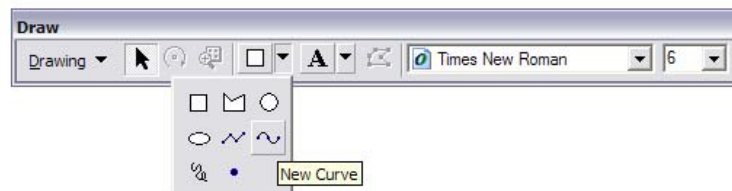
5. Click on the **More Symbols** button and select **Weather**. Scroll to the bottom of the symbol list and select the **Hurricane** symbol. Set the **symbol size** to **20**. Click **OK**.
6. Double-click on the **symbol** for the **10-20** range and change its **color** to **green** and click **OK**. Change the **101-130** range symbol color to **red** the same way.
7. Click on the **Symbol field header** again and select **Ramp Colors**.
8. Check the “**Show class ranges using feature values**” **checkbox**. Click **OK**.



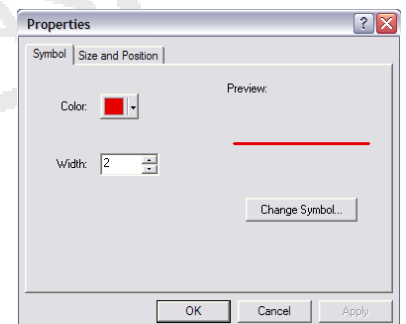
## PLACING GRAPHICS INTO MAP LAYOUT


Now you will use the ArcMap drawing tools to create a curve that follows the track of Hurricane Dennis.

1. Switch to **Data View**. If you draw graphics in data view, they will be “anchor” to the location they are placed. When in **Layout View**, graphics will not scale or shift if you change the extent of the map.
2. Click on the **Fixed Zoom Out** tool  twice.
3. On the **Drawing Toolbar**, click the **drop-down arrow** next to the **New Rectangle** tool and select the **New Curve** tool.




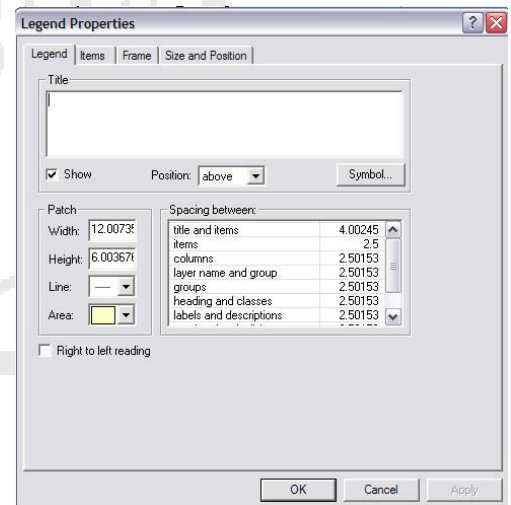
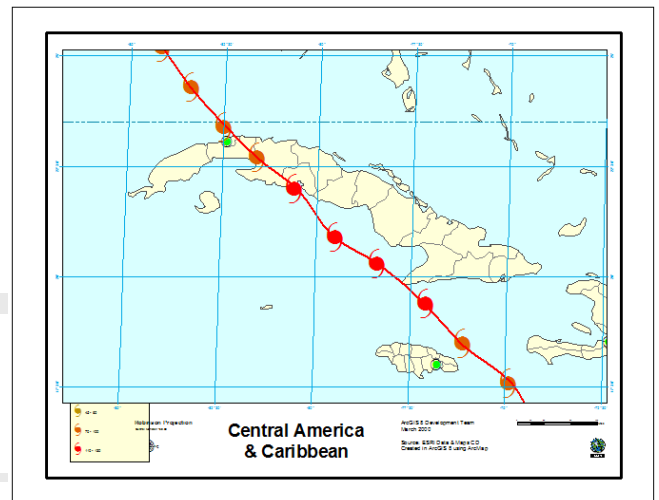
4. Place the first **vertex** on the **lower right hurricane symbol** and place a **vertex** on each point until you reach the upper left limit of the map view (you don't need to place a curve along the entire length of the hurricane track, since you are only mapping its path across Cuba).
5. When you reach the **last point**, double-click to place the last **vertex** and finish the line.
6. Right-click on the line you just created and open the **Properties dialog**. Change the **color** to **red**. Click **OK**.



7. Return to **Layout View**.
8. On the **Main Menu**, go to **View>Bookmarks>Cuba**.
9. Save  your work.

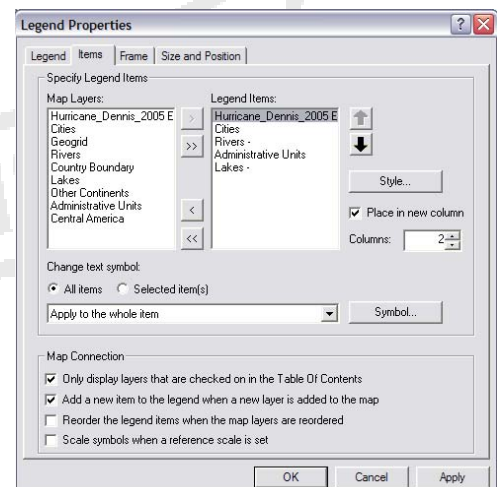
### ADJUSTING THE LEGEND

1. Make sure the **Select Elements tool**  is active.
2. Click on the **Legend** in the **Map Layout** to select it.
3. Right-click on the **Legend** and open the **Properties dialog**.
4. In the **Legend Tab**, uncheck the “**Show**” checkbox.
5. Change the “**Spacing between Columns**” to 10.
6. In the **Items Tab**, highlight the “**Hurricane\_Dennis\_2005 Events**” item and move it to the top of the list using the up arrow.
7. Change the **number of columns** to 2.
8. Uncheck “**Reorder the legend items when the map layers are reordered.**”
9. Click **OK**.




### Final Touches

1. With the **Select Elements tool** active, select and move the **Legend** to the left until you can see the **North Arrow** and **Projection text** which has been hidden by the resized **Legend**.
2. Using the **Select Elements tool**, drag a box across the **text** and **North Arrow** to select them all.



3. Move the **selected elements** to the other side of the **map layout**. Click outside the **map layout** page to deselect the elements, then select them one at a time and place them as shown to the right.

4.  back to the **Legend** and use the **Select Elements** tool to select it. Right-click the **Legend** and select **Order>Bring to Front**.

5. In the **Table of Contents**, click on the **Hurricane\_Dennis\_2005 Events layer** name, pause and click again to make the name editable. Change the **layer name** to **“Wind Speed”**.

6. Using the same method, change the **WIND\_KTS** field name to **“in Knots”**.

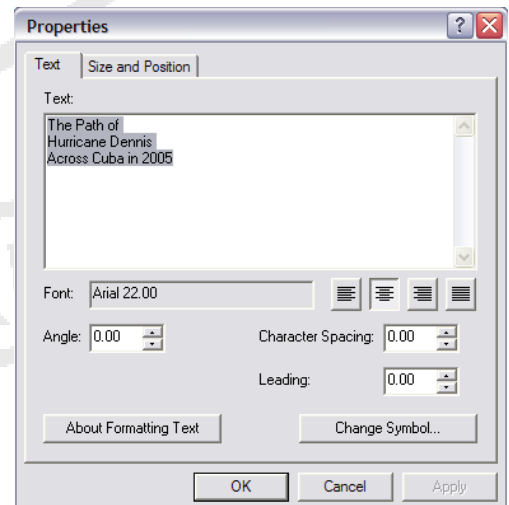
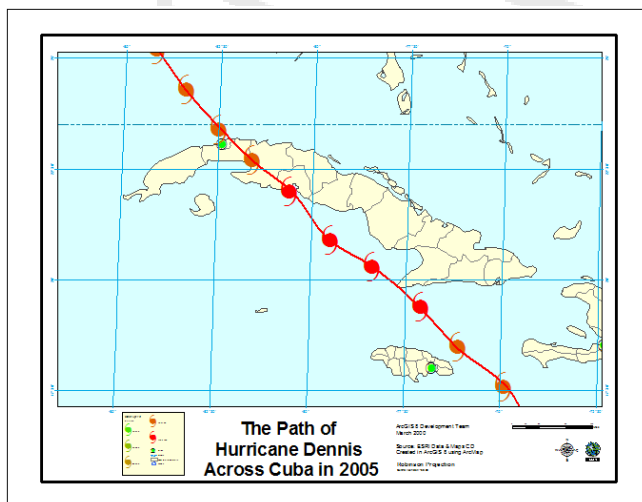
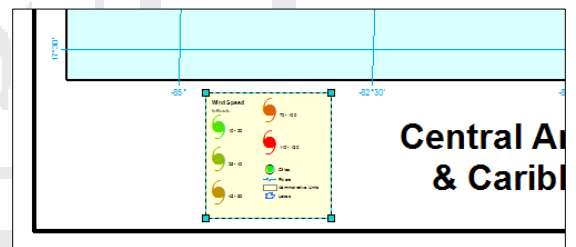
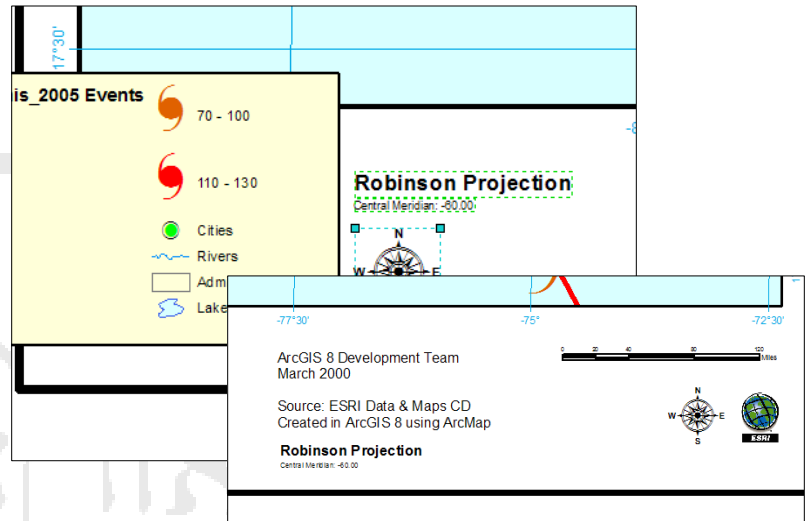
7. Use the **Select Elements** tool to resize and reposition the **Legend** as shown at the right.

8. Double-click on the **“Central America & Caribbean” Title Text**.




9. In the **Title Text Properties dialog**, change the **Map Title** to **“The Path of Hurricane Dennis across Cuba in 2005”**. Be sure to enter line breaks as shown on the right.

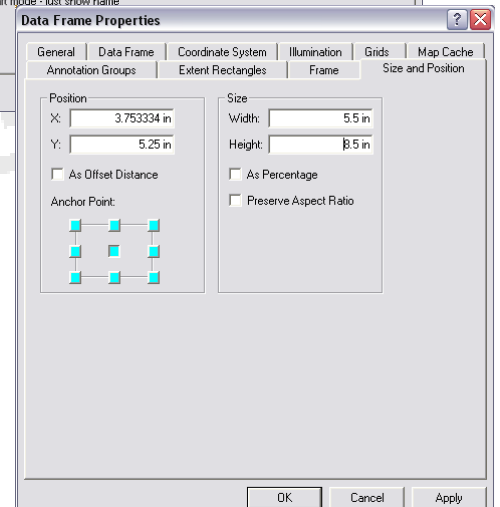
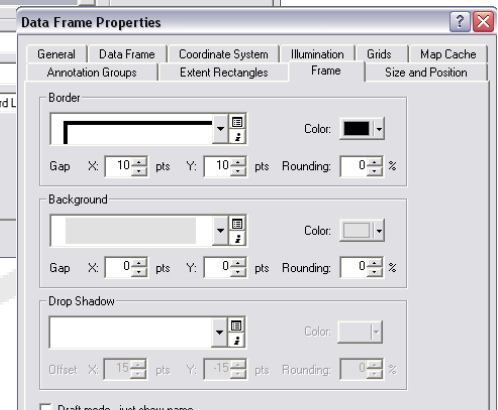
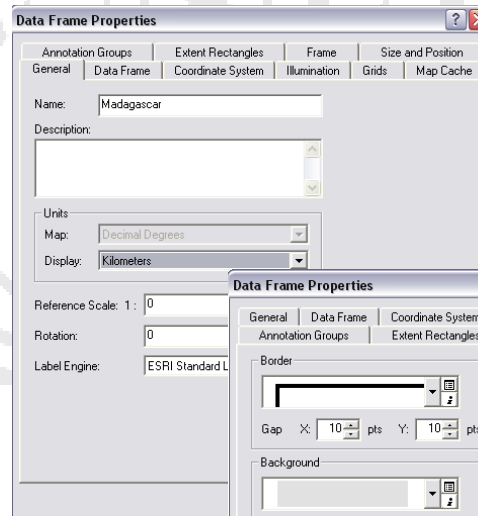
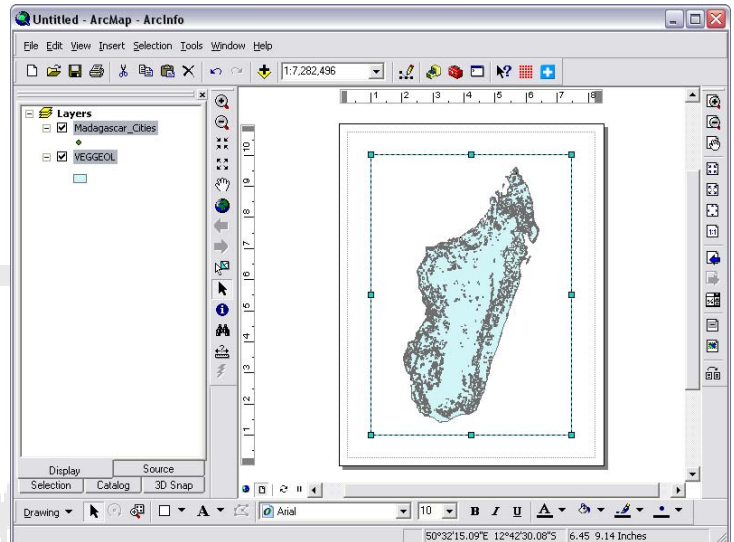
10. **Activate** the **Select elements tool** and position the **Title Text** as shown below.

11.  your work.



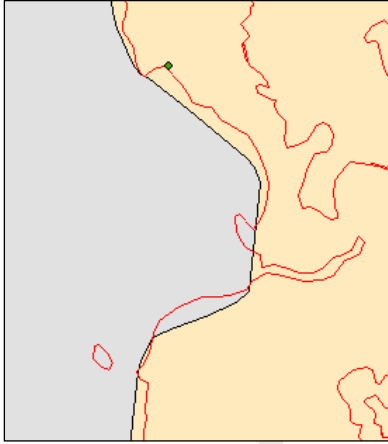
## Map Layout from Scratch

1. Click on the **New Map Document Button**  to create a new empty map document.
2. Click on the **Add Data Button**  and browse to the **C:\Temp\initials\Layout\_In\_ArcMap\Data\Shapefile** folder. Select the **Madagascar\_Cities.shp** and **VEGGEOL.shp** layers and click **Add** to add them to your map layout.
3. Change to **Layout View**, if you are not already.
4. Right-click on the **Data Frame** in the **map layout** and open the **Properties dialog**.
5. In the **General Tab**, rename the **Data Frame** “**Madagascar,**” and change the **Display Units to Kilometers**.
6. In the **Frame Tab**, select the **3.0 point Border** and set both **X & Y Gaps to 10**. Select the **Grey 10% Background**.
7. In the **Size and Position Tab**, set the **Width to 5.5 inches**, and the **Height to 8.5 inches**. Click **OK** to apply the settings and close the **Properties dialog**.
8. Activate the **Select Elements Tool**  right-click in **Madagascar Data Frame** and go to **Align>Align to Margins**.
9. Right-click on the **data frame** again and go to **Align>Align Center**, then **Align>Align Vertical Center**. This will center the **Madagascar Data Frame** on the page.




## Using Dissolve to Create an Outline Layer

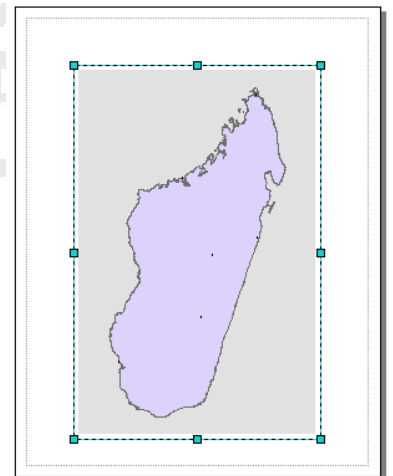
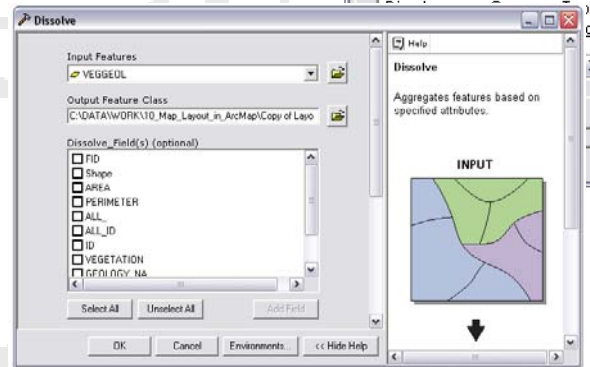
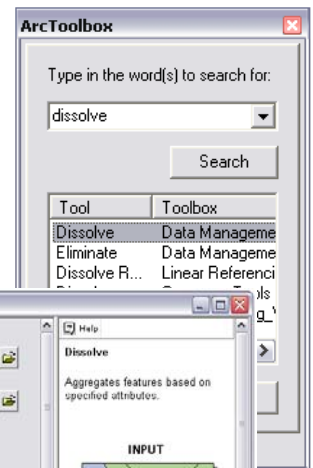
The **VEGGEOL.shp** layer included with this tutorial contains detailed information about the vegetation and geology of Madagascar. You don't need this information since this will simply be an overview map of the country.



However, as in many cases, the detail of the political boundaries in the **VEGGEOL.shp** layer is much greater than in the readily available political boundaries layers (as shown on the left). Rather than using the less detailed political boundary layer for your map, you will create a blank country boundary layer from the **VEGGEOL.shp** layer for your map. To do this, you will use the **Dissolve Tool**.



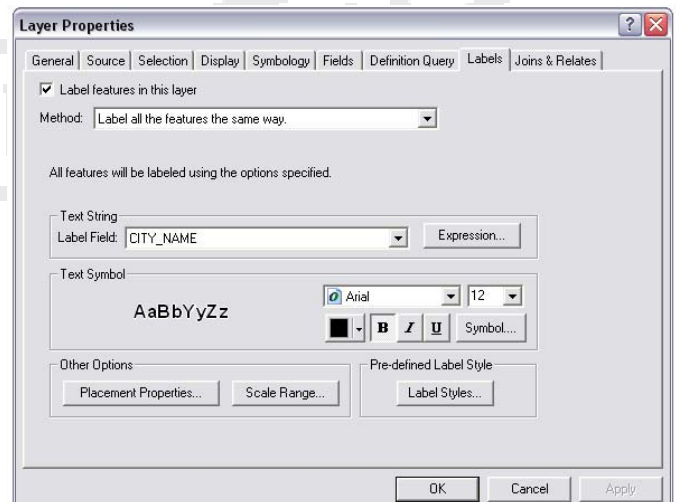
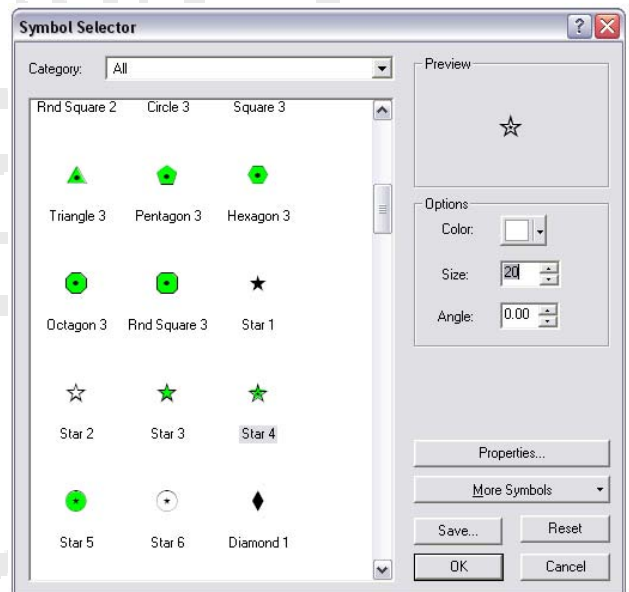
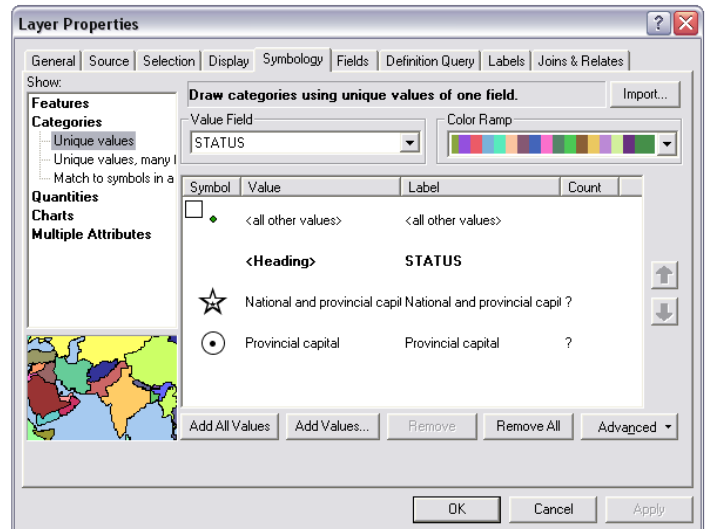
1. Launch **ArcToolbox**  and select the **Search Tab**. Search the **ArcToolbox** using the search term “**dissolve.**”
2. In the results panel, double-click on the **Dissolve Tool** from the **Data Management Toolbox** to open its dialog.
3. If it is visible, click on the **Show Help>>** button to make the **Contextual Help** panel visible. Examine the overview of what the **Dissolve tool** does.
4. Select the **VEGGEOL** layer as the **Input Features** layer. Browse to the **C:\Temp\initials\Layout\_In\_ArcMap\Data\Shapefile** folder and save your **Output Feature Class** as **Madagascar\_Boundary.shp**.
5. Scroll to the bottom of the **Dissolve\_Field(s)** panel and check the **DUMMY** field. This is a field that has the same value for every record in the layer.
6. Leave all **other settings** as their **default value** and click **OK** to run the **Dissolve Tool**.
7. A new **Madagascar\_Boundary** layer will be added to your **Table of Contents** and **map layout**. The new layer should only have the outline of the country, without the vegetation & geologic features of the previous layer. You can right-click on the **VEGGEOL** layer and **Remove** it.





## Applying Symbology & Labels to the City Features

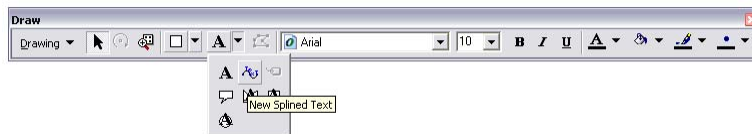
1. Right-click on the **Madagascar\_Cities** layer and open the **Properties** dialog.
2. In the **General Tab**, change the **Layer Name** to “**Cities.**”
3. In the **Symbology Tab**, click on the **Categories** item in the “**Show:**” panel on the left. **Unique values** should be the highlighted selection for this section.
4. Change the **Value Field** to **STATUS** and click the “**Add All Values**” button.
5. Uncheck the **<all other values>** item.
6. Double-click on the point symbol next to the “**National and Provincial Capital**” item to open the **Symbol Selector** dialog. Scroll down the list to **Star 4**, select it, change its **color** to **white** and change its **size** to **26**. Click **OK**.
7. Double-click on the point symbol next to the “**Provincial Capital**” item to open the **Symbol Selector** dialog. Scroll down the list to **Circle 3**, select it, change its **color** to **white** and change its **size** to **20**. Click **OK**. Click **Apply** to Apply the Symbology to the map layout.
8. In the **Labels Tab**, check the “**Label features in this layer**” checkbox.
9. Make sure that **CITY\_NAME** is selected as the **Label Field**.
10. Click on the **Symbol Button** in the **Text Symbol Settings** to open the **Symbol Selector**. Click on the **Properties Button** (*be patient, sometimes it takes a while for these windows to open*).
11. In the **General Tab**, change the **Font Size** to **12** and change the **Style** to “**Bold.**”.
12. In the **Formatted Text Tab**, increase the **Character Spacing** to **10**.



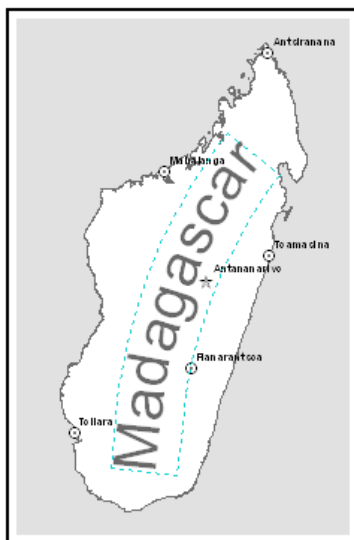
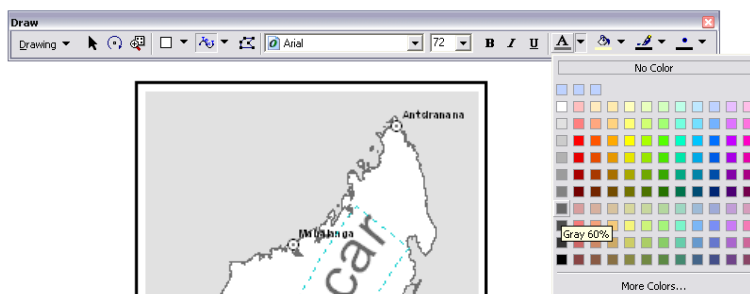
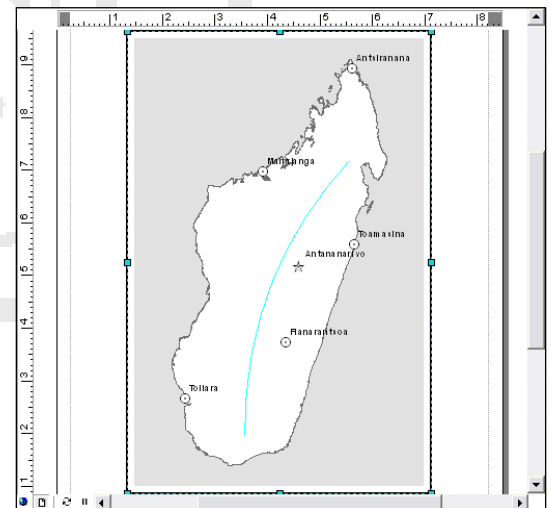
13. In the **Mask Tab**, check the **Halo Checkbox**, set its size to **.5**. The default **color** should be **white**. If not, click on the **Symbol Button** to change the **halo color** to **white**.
14. Click **OK** three times to apply all settings and close the **Properties dialog**.

### Applying Symbology to the Country Boundary and Labeling Using Graphics

1. Click once on the **Color Patch** next to the **Madagascar\_Boundary** layer to open the **Symbol Selector**. Change the **Fill Color** to **White** and click **OK** to apply the change.
2. On the **Drawing Toolbar**, click the **drop-down arrow** for the **Text tool** and select the **New Spline Text tool**.




3. Place **three vertices** within the outline of **Madagascar**, with the **center vertex** offset from the two ends to create a curve (as shown on the right). Double-click to place the **third vertex** and finish the **new spline**.
4. You will be presented with (a very small) **text box** to enter the country name "**Madagascar**" into. Press the **Enter key** to finish your text entry and snap the text to the spline.
5. The text you just added should be highlighted by a blue dashed box. On the **Drawing Toolbar**, change the **Text Size to 72** and the **Text Color to Grey**.

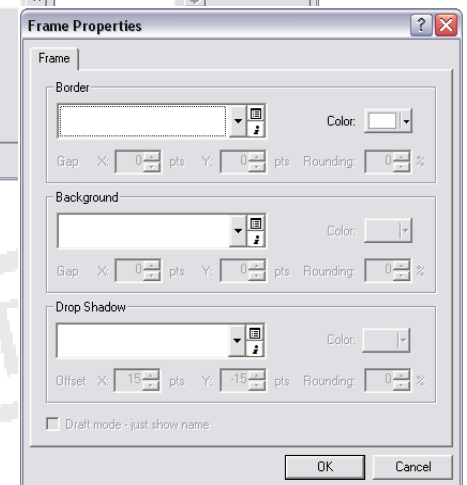
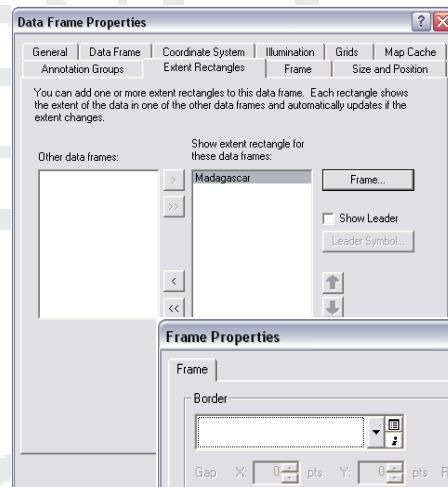
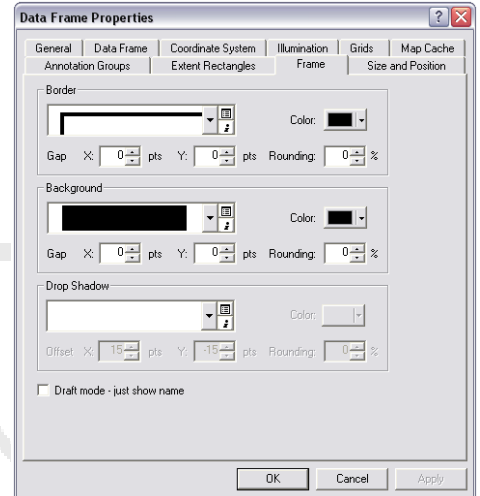


6. Activate the **Select Elements tool** and use it to reposition the **spline text** within the boundary of **Madagascar**.

7. Save  your work.

## Adding an Overview Inset with an Extent Box for Orientation

1. On the **Main Menu**, go to **Insert>Data Frame**. A new empty data frame will be added to your **map layout**.
2. Right-Click on the **New Data Frame** layer name and select **Add Data**. Browse to the **C:\Temp\initials\Layout\_In\_ArcMap\Data\Shapefile** folder and select the **Continent.shp**. Click **Add** to add this layer to the **new data layer**.
3. In the **Table of Contents**, right-click on the **New Data Frame** and open the **Properties dialog**.
4. In the **General Tab**, change the **Layer Name** to “**Inset.**”
5. In the **Frame Tab**, Change the **Border** to **3.0 points** and give the data frame a **black background**.
6. In the **Size and Position Tab**, change the **Width & Height** to **2 inches**.
7. In the **Extent Rectangles Tab**, select the **Madagascar** data frame name and add it to the “**Show extent rectangle...**” list.
8. Also in the **Extent Rectangles Tab**, click on the **Frame Button** and change the border to **2 point**, then change the color to **white**. Click **OK** twice to apply the changes and exit the **Data Frame Properties** dialog.
9. Use the **Select Elements tool** to move the **Inset Data Frame** to the upper left part of the map layout.
10. Use the **Data Zoom Tool**  to zoom (in the **Inset Data Frame**) into the **African Continent**, taking care to ensure that Madagascar and the Extent Rectangle are visible.
11. Click once on the **color patch** for the **Continent layer** to open the **Symbol Selector**. Change the **Fill Color** to a **light grey** and the **Outline**



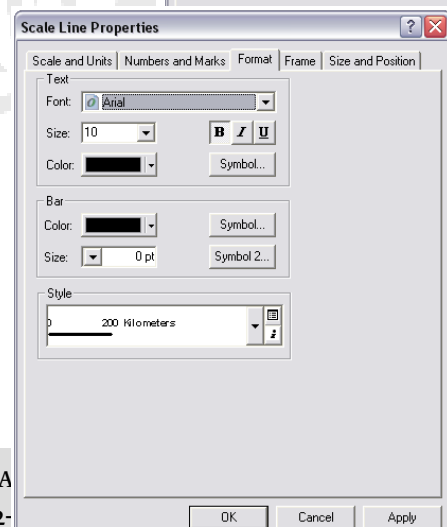
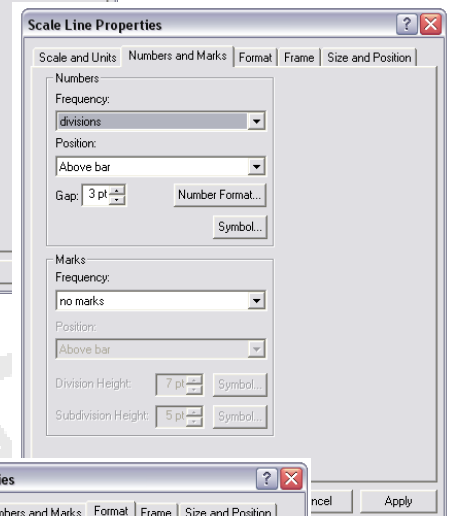
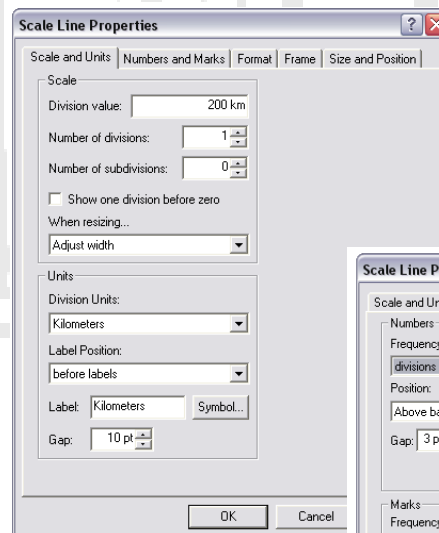
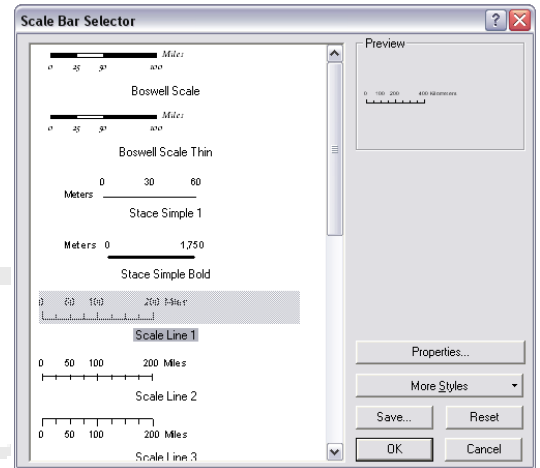
## Color to “No Color.”

12. Save  your work.

## Inserting Map Elements

## Customizing a Scale Bar


1. Right-click on the **Madagascar Data Frame** name in the **Table of Contents** and select **Activate** to change from editing the **Inset Data Frame** to the **Main Data Frame**.
2. In the **Main Menu**, go to **Insert>Scale Bar** to open the **Scale Bar Selector**.
3. Select **Scale Line 1** and click on the **Properties Button**.
4. In the **Scale and Units Tab**, change the **Number of Divisions to 1**. Change the **Number of Subdivisions to 0**.
5. Under the item “**When resizing...**” use the drop-down to change to **Adjust Width**. The “**Division value:**” item will become active. Make sure it has a value of **200 km**.
6. Change the **Label Position** to “**before labels.**”
7. Increase the **Units Label Gap** to **10 pt**.
8. Click on the **Numbers and Marks Tab**, and change the **Numbers Frequency** to **divisions**.
9. Change the **Marks Frequency** to “**no marks.**”
10. Click on the **Format Tab** and change the **Font Weight** to **Bold**.
11. Click on the **Bar Symbol Button** and change the **Width** to **2.00**, then click **OK** twice to apply the settings and insert the **scale bar** into the map layout.
12. Use the **Select Elements Tool** to Move the inserted **Scale Bar** to the lower right of the Map Layout.



## Inserting a North Arrow

1. In the **Main Menu**, go to **Insert>North Arrow**.
2. Select a **North Arrow** from the **North Arrow Selector** and click **OK** to insert it into your map layout.
3. Use the **Select Elements Tool** to move the **North Arrow** above the **Scale Bar**.
4. Adjust the size of the **Scale Bar** using the **blue Resize Handles**, if needed.

## Inserting & Rotating Descriptive Text

1. In the **Main Menu**, go to **Insert>Text**. A **textbox** will be inserted.
2. Insert the text: “**Cartographer: YOUR NAME / Yale University**” into the text box and press the **enter key**.
3. On the **Drawing Toolbar**, change the **text size** to **14**.
4. On the **Drawing Toolbar**, click the **Drawing Button** and select **>Rotate or Flip>Rotate Left**.
5. Use the **Select Elements Tool** to reposition the text at the left margin of the map layout.
6. Save  your work.

