

# Basic Mapping: Livelihood Zones In Haiti - 2009

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In this exercise, you will learn how to use the basic analysis GIS tools. We will use data for Haiti that was put together in the days after the 2010 earthquake. Functions to be covered:

- Adding a Map Projection to the Data Frame
- Symbology
- Labeling Features
- Select by Attributes
- Adding a 2<sup>nd</sup> Data Frame to a Map Layout

## Data Sources

We are going to make the map above using ArcMap 10.5.1. The original data sets in this exercise are from:

- **Livelihood Zones** - *Famine Early Warning System Network* (FEWSNet) - <http://www.fews.net/sectors/livelihoods>
- **Shaded Relief** – ESRI Maps and Data - [http://www.arcgis.com/home/group.html?q=tags:ArcMap931\\_Base&t=group&owner=esri&title=ESRI%20Maps%20and%20Data&sortField=title&sortOrder=asc&content=all](http://www.arcgis.com/home/group.html?q=tags:ArcMap931_Base&t=group&owner=esri&title=ESRI%20Maps%20and%20Data&sortField=title&sortOrder=asc&content=all)
- **Roads, cities, rivers** - US AID Data Repository of the Geographic Information Support Team (GIST) - <https://gist.itos.uga.edu/>

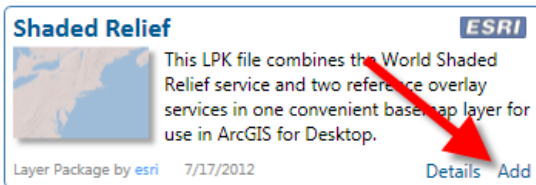
## Mapping Network Drives outside the Data Lab

The data that will be used in this tutorial is located in the S: drive. To use files in the S: drive on a computer outside the Data Lab (Mugar Lab, Eaton Lab, Home) you must first map the network drive in Windows.

1. Check to see if the S drive is already mapped in *This PC*. If it is *not*, follow these directions:
2. **Windows 10** → Open File Explorer, right click on “This PC” and select “Map Network Drive” tab (this includes Eaton and Mugar Labs)
3. In the drop down menu labeled *Drive*: choose **S:**
4. In the *Folder*: drop down menu manually enter (or copy and paste) the following pathway:  
 \\rstore2.uit.tufts.edu\gisprojects\$
5. Check the box *Reconnect at logon*. Click Finish.
6. Look to see that you have an H drive available to save your map file.

## Setting Up your ArcMap Session

1. You can access the data two separate ways:
  - 1) Download and unzip the data that accompanies this tutorial at [GIS.tufts.edu](http://GIS.tufts.edu) to your personal (H or P) drive.
  - 2) **OR** Navigate to S:\Tutorials & Tip Sheets\Tufts\Tutorial Data\Basic Mapping\_Livelihood Zones in Haiti  
**Copy the folder to your** personal storage drive (H: or USB drive).
2. Open the **Basic\_mapping\_exercise\_Haiti.mxd** map session from your H Drive by double-clicking on it.
3. After the map appears, choose **File** → **Add Data** → **Add Data from ArcGIS Online...**
4. In the ArcGIS data pop up window, search for **World Shaded Relief**, then click on it and then click on the **Add** button.

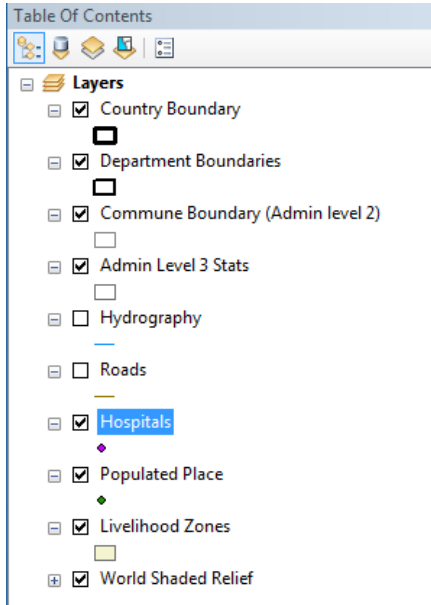


## Basic Map Cleanup

1. Rename your layers as follows:

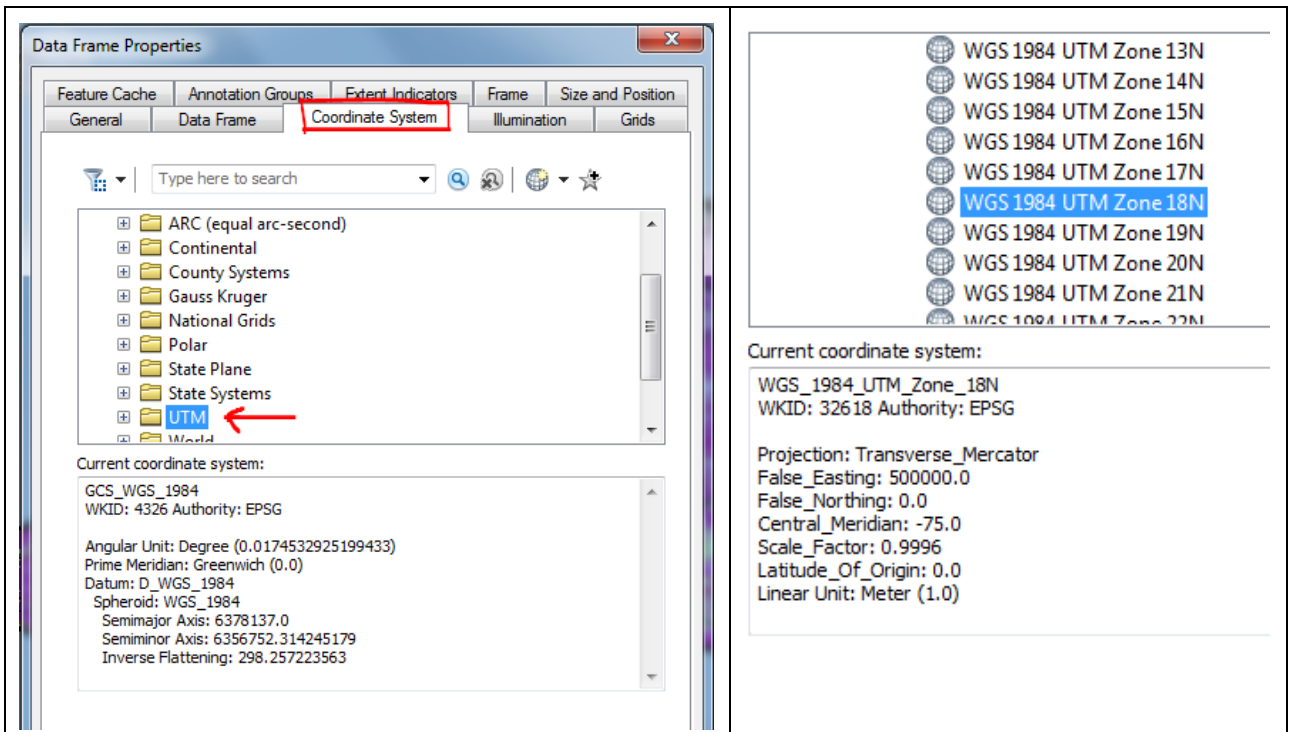
File Name	Rename
hti_pplp_MINUSTAH_GIS	Populated Place
hti_watrcrsl_rvr	Hydrography
hti_rdsl2_minustah	Road
Haiti_Livelihoods_GAUL_Clean	Livelihood Zone
hti_polbnda_adm1_cnigs	Department Boundary
hti_polbnda_adm0_cnigs	Country Boundary

2. Arrange and symbolize your data layers, as follows:



## Apply an Appropriate Map Projection/Coordinate System

1. Right click on **Layers** (the Data Frame in the Table of Contents) and choose **Properties...**
2. Click on the *Coordinate System* Tab. In the top box, scroll down to the *Projected Coordinate Systems* folder and choose **UTM** → **WGS 1984** → **Northern Hemisphere** and scroll to find **WGS 1984 UTM Zone 18N**.

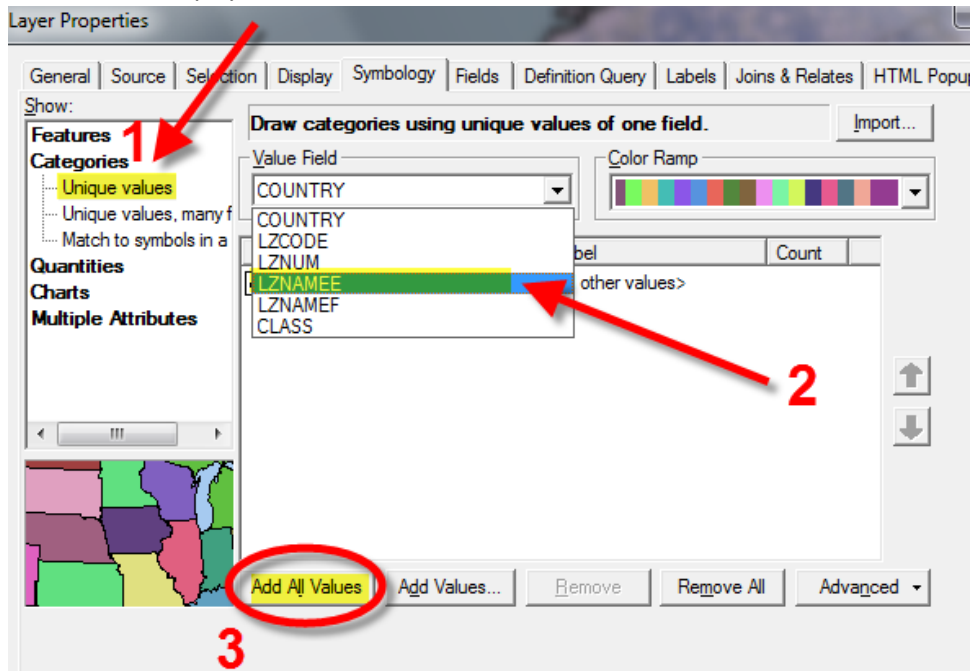


3. Click **OK** and **Save** your map.

## Working with the Livelihood Zone data layer

1. Turn off all the layers *except* **Shaded Relief** and **Livelihood Zone**.

2. Read about this **livelihood zone** data product here: *Famine Early Warning System Network (FEWSNet)* - <https://www.fews.net/sectors/livelihoods>
3. Open the **Livelihood Zone attribute table** to examine its fields (columns) and values. Remember which field (column) has the English zone description!
4. Close the table.
5. Go to the *Symbology* properties for the **Livelihood Zone** layer (double click the layer name or right-click on it and choose *Properties*).
6. Follow the 3 steps you see here:



We've now used Symbology to show the *English Livelihood Zones* we saw in the *attribute table*.

7. Make the **colors** and the **order** of the categories similar to what you see here (these are the typical livelihood zones colors determined by FEWSNet):

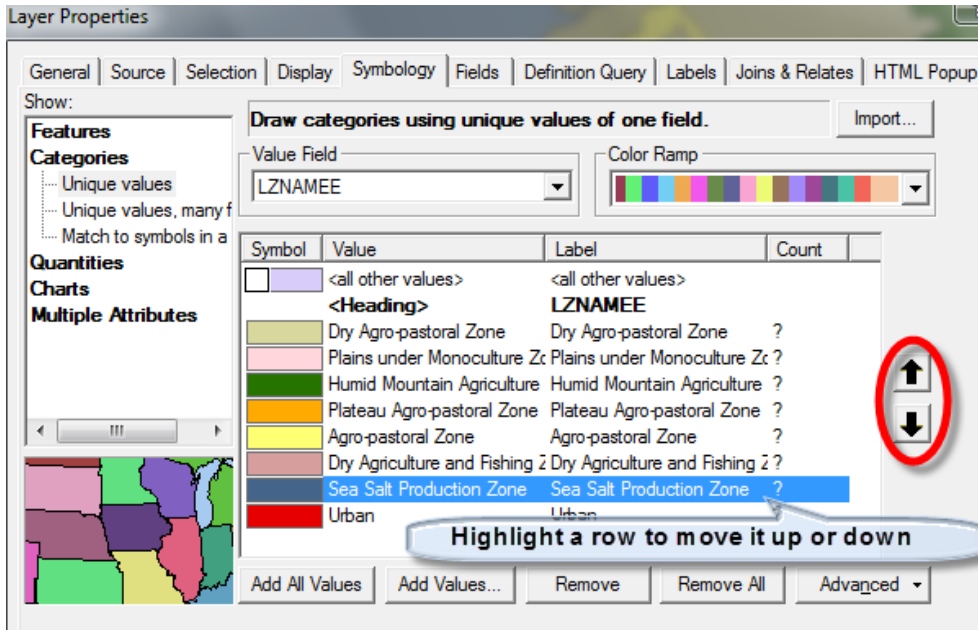
**Livelihood Zone**

- 1 Dry Agro-pastoral Zone
- 2 Plains under Monoculture Zone
- 3 Humid Mountain Agriculture Zone
- 4 Plateau Agro-pastoral Zone
- 5 Agro-pastoral Zone
- 6 Dry Agriculture and Fishing Zone
- 7 Sea Salt Production Zone
- 8 Urban

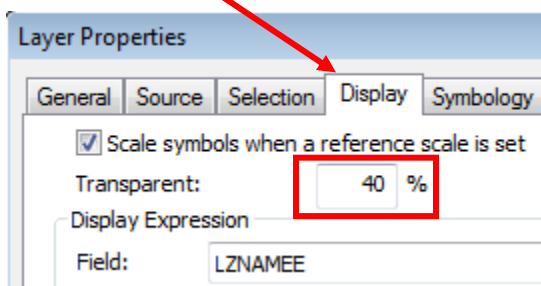
**Note:** Use the arrows on the side to move the categories up and down. Manually change the colors by double clicking the symbol and selecting the proper color.

8. Still in the Symbology dialog box, uncheck **All Other Values** (this would show any values not in the display list in a single color).

9. Your symbology should now look like this:



10. Still in *Layer Properties*, click on the *Display* tab and set the transparency to 40%. Press OK.



11. Save your mapfile.

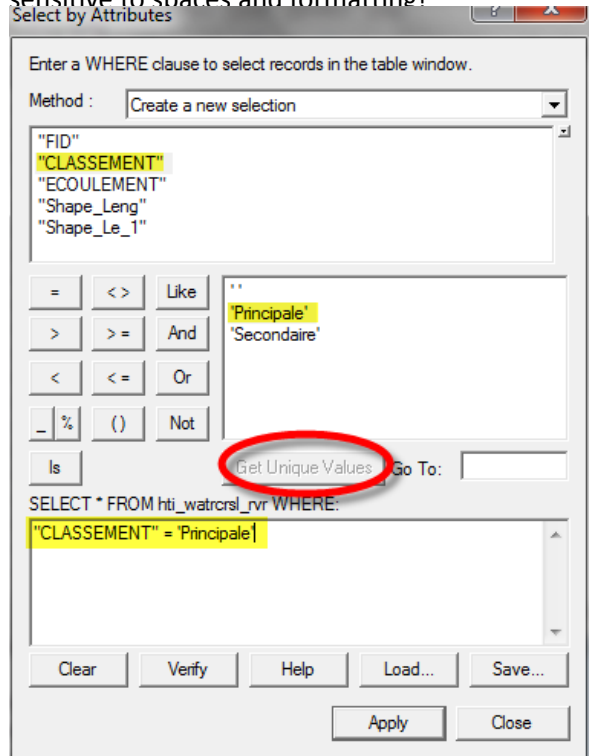
## Selecting and Drawing Major Rivers

1. Turn on **Hydrography**.
2. Open the **Hydrography attribute table**. What *field* indicates the class of stream/river? If we want to draw only the major rivers, which class should we select within that field?
3. With the attribute table still open, click on the **Select by Attribute** icon.

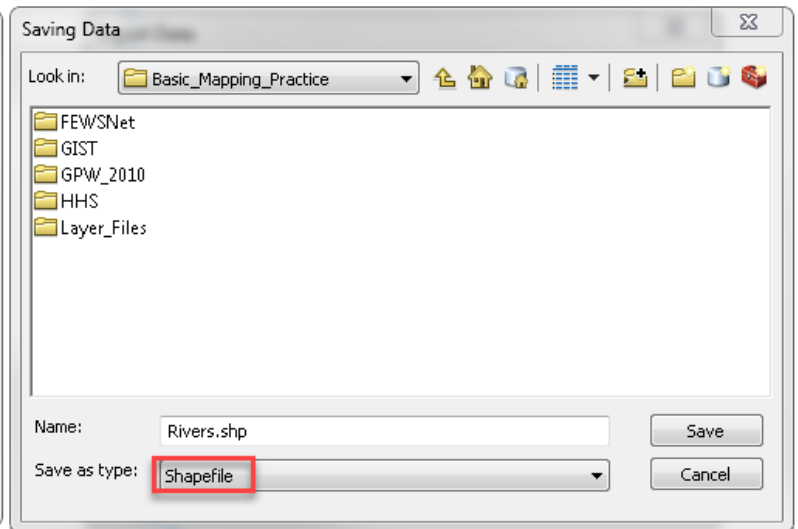
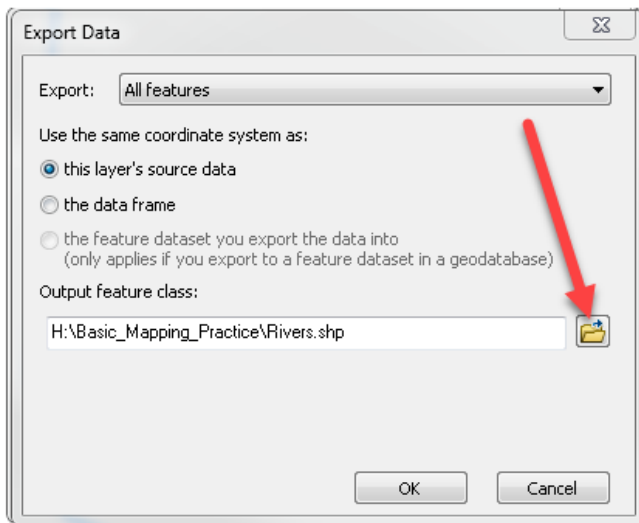
FID	Shape *	CLASSEMENT	ECOULEMENT	Shape_Leng	Shape_Le_1
0	Polyline	Secondaire	Temporaire	925.679296	0.00849
1	Polyline	Secondaire	Temporaire	348.35625	0.003149
2	Polyline	Secondaire	Temporaire	769.040236	0.007019

4. Fill out the dialog box as follows. Double click "CLASSEMENT" then click "=", then click "Get Unique Values" (this shows all the values listed in that field). Double click on "Principale" to add it to the query in the bottom box and click on **Apply** when finished.

**Note:** Always use the ‘buttons’ to add values to the Query Box. Don’t try to type the query because it is very sensitive to spaces and formatting!



5. Close the attribute table. Now only the “Principal” Rivers should be selected.
6. Right-click on **Hydrography**, and go to *Data* → *Export Data*. Click on the Folder icon to choose where you want to save this new shapefile. Navigate to your H Drive → Basic\_Mapping\_Exercise folder. Name the new shapefile **Rivers** and make sure to change the save as type to a **shapefile**. Press ok and then Ok again. Press yes when asked if you want to import the new layer.



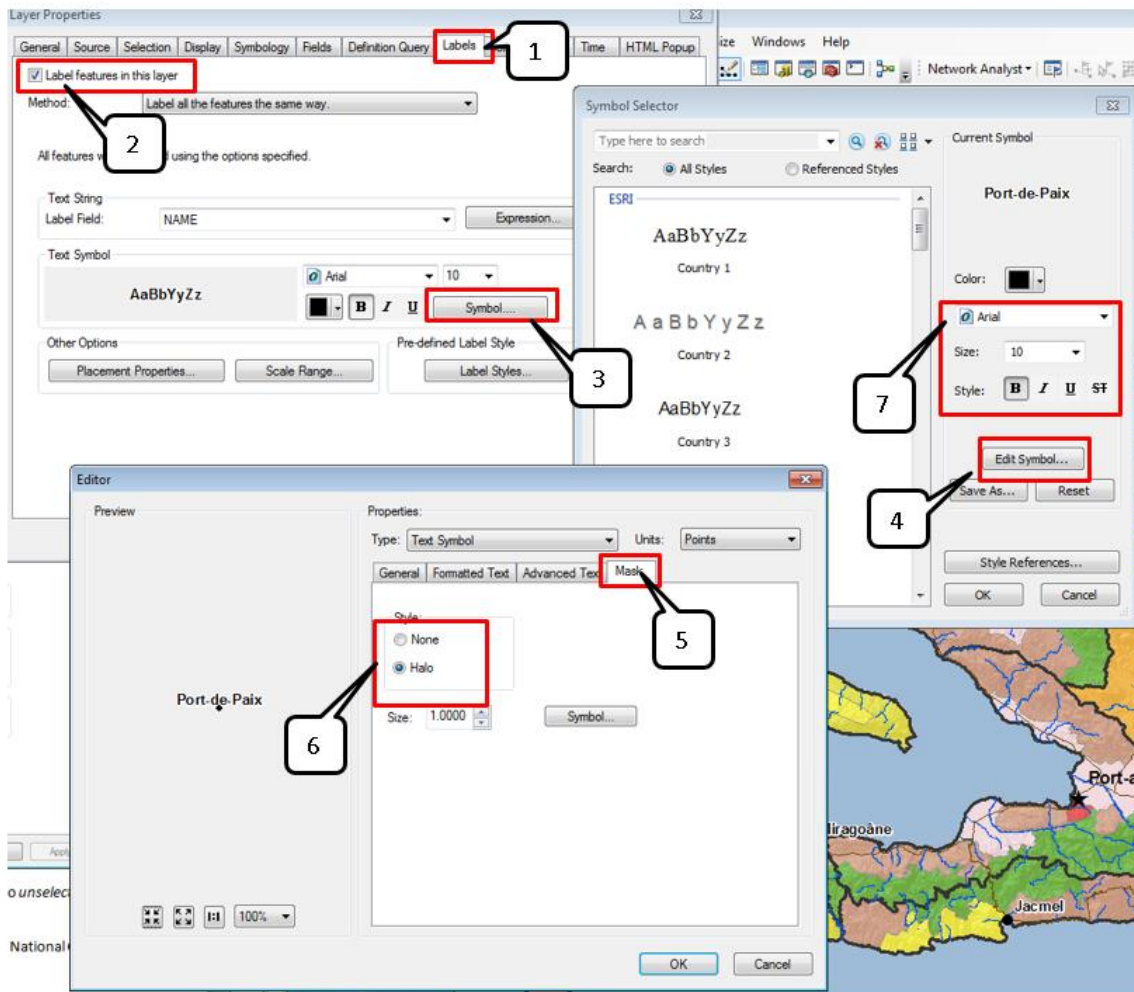
7. Color the **Rivers** layer blue.
8. Use the *Clear Selected features* icon to unselect the principal rivers in the **Hydrography** layer.
9. Turn off **Hydrography**.

## Selecting and Drawing Major Roads

1. Select and draw only **major roads** (principal roads) using what you learned in the *Hydrography* section above.
2. When you save the new shapefile using Data → Export Data, name the new layer **Major Roads**. Add the new shapefile to your map and clear and turn off the **Road** layer.

## Display Department Capitals and the National Capital

1. Turn on **Populated Places** and look at its *attribute table*. Use this table information to select and draw only the department capitals using the *select by attribute* tool.
2. Once the capitals are selected, right click on the Populated Places layer and select **Data → Export Data**. Navigate to your H drive and name the new shapefile **Department\_Capitals**. Make sure to save it as a **shapefile**.
3. Click yes when asked if you want to add the new layer to the map and then change the symbol to a black dot and make it an appropriate size.
4. Turn on the labels and set the label properties of the **Department Capital** names as follows:
  - Calibri, Size 10, Bold.
  - Halo – Size 1 – This will put a white border around the text so it is easier to read.
  - Make sure you click on *Label Features in this Layer*:

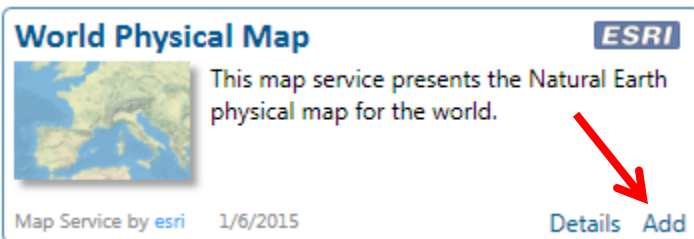


5. Use the same steps to create a new shapefile for the **National Capital** from the **Populated Places** layer. Remember to *unselect* the department capitals before starting your new query.
6. Turn on and set the label properties for the **National Capital**. Use 12pt, bold font with a size 1 Halo, Calibri.
7. Change the symbol of the **National Capital** to an appropriately sized black star.
8. Clear the selection and turn off the **Populated Place** layer.
9. Turn on the **Department Boundaries**.

## Creating a Locator Map

You need to show where Haiti is relative to the rest of North America.

1. Click on **Insert** (on the menu bar) to insert a new *data frame*.
2. Rename what is now called *New Data Frame* to **Locator Map**.
3. From **File** → **ArcGIS Online**., search for **World Physical** and add it:

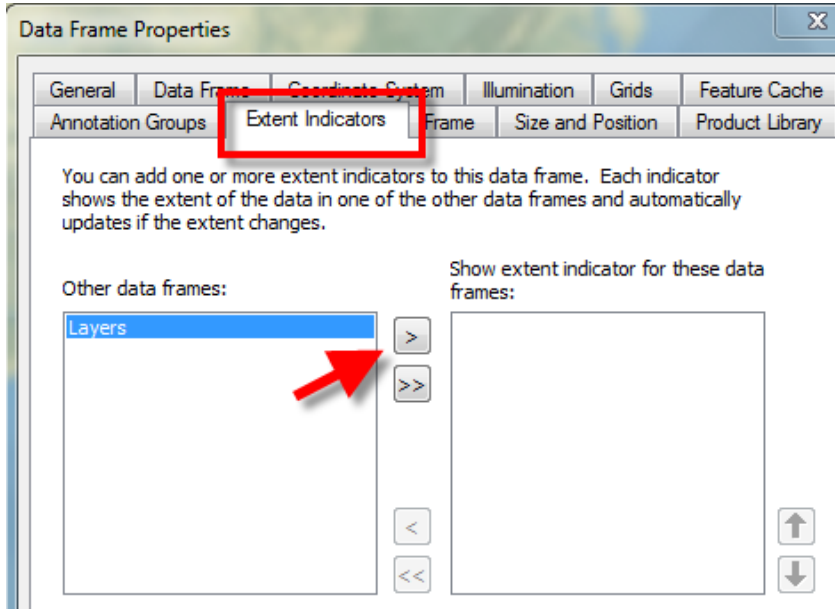


4. Zoom in to show an area something like this:



5. Right-click on **Locator Map** to get the *Data Frame Properties*.
6. Click on the **Extent Indicators** tab and move the *Layers* data frame over to the right side. Press OK.

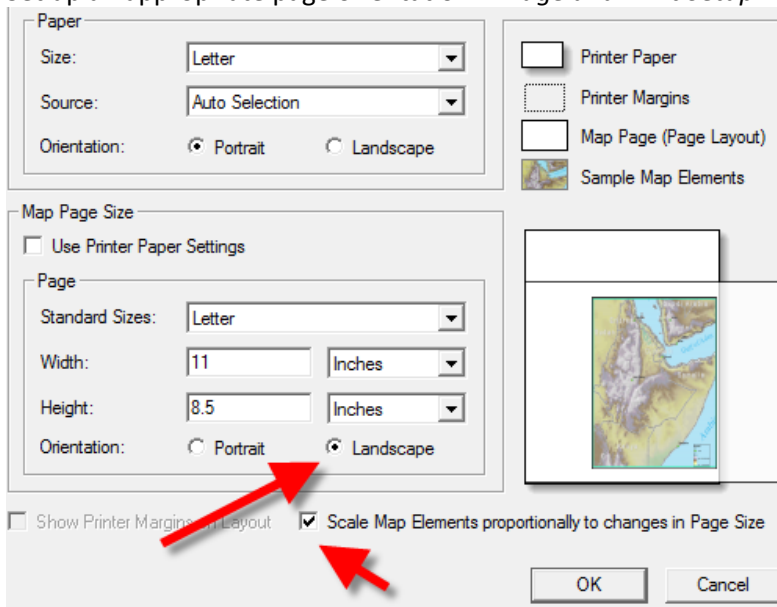




## Creating your Layout

Remember that the original tutorial for Learning ArcGIS Basics (India) has instructions on how to make a good map layout. We will make the map of Haiti that is on page 1 of this tutorial.

1. When you are ready to begin your layout, go to **View → Layout View**.
2. Set up an appropriate page orientation in *Page and Print Setup*.



3. Size and position your different data frames.
4. Your map should include the following elements
  - Descriptive Title – Include Location and Date
  - North arrow
  - Scale Bar – Kilometers for international data
  - Legend – Properly formatted with all necessary layers listed above. No ‘data speak’.
  - Cartographer Information (name, date, class)

- Information about the data sources (listed at the beginning of the tutorial)
- Labels for the Department and National Capitals and oceans
  - **For Oceans, use the Draw toolbar to insert a text box** for the Atlantic Ocean, Caribbean Sea, and Gulf of Gonave. Double click on the text to format it and press symbology.
  - **Ocean labels should be blue and italic.**
- Inset Map

5. **Important note about creating a scale bar!**

You have two data frames in the layout, at two different scales. When you choose **Insert → Scale**, the scale that is inserted is for the *active data frame*. The active data frame will be in **bold** in the *Table of Contents*. To switch data frames, right click on the data frame heading you want to work in and press **Activate**.

6. **Insert → Text** for the Atlantic Ocean, Caribbean Sea, and Gulf of Gonave. Double click on the text to format it and press symbology.