

ENVS321 Cartography Lab 1 - Creating a Project and Visualizing Layers

Before you begin working with ArcGIS Pro, create a folder on your computer desktop called ENVS321, add a subfolder called Lab1. Import the downloaded Lab 1 data files in your Lab 1 folder (see Canvas Assignment page).

Once you have created your folder, follow the steps of each goal outlined below. Your final submission will consist of a map displaying several layers. It should include all cartographic elements (e.g. north arrow, legend, etc.). See an example on the last page of this document.

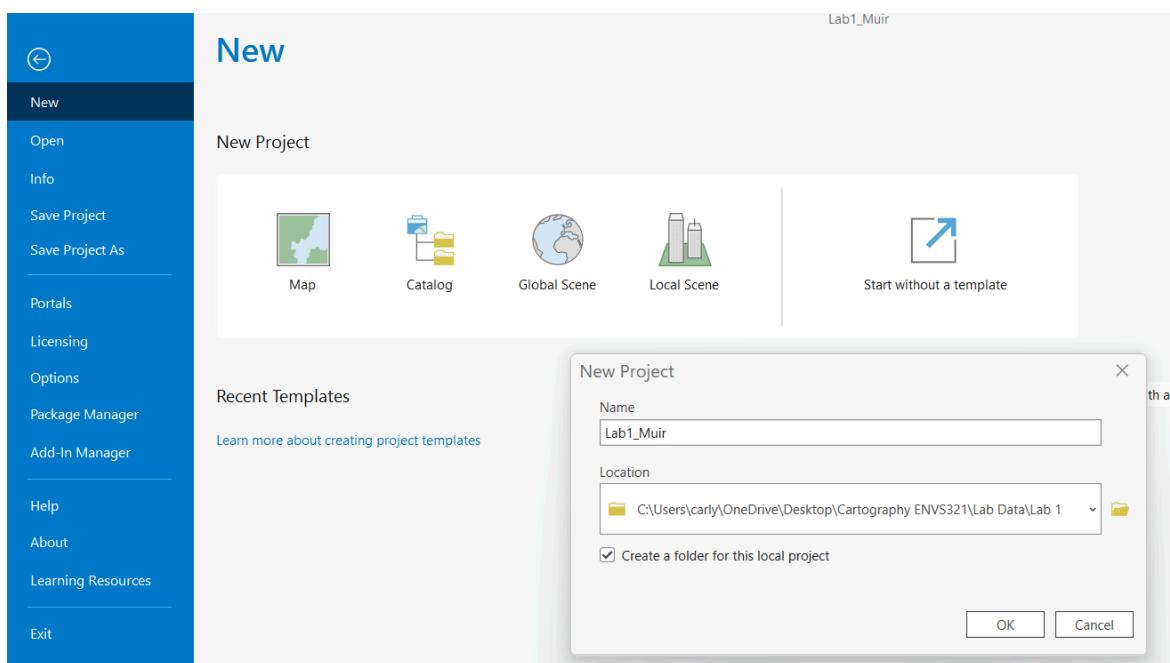
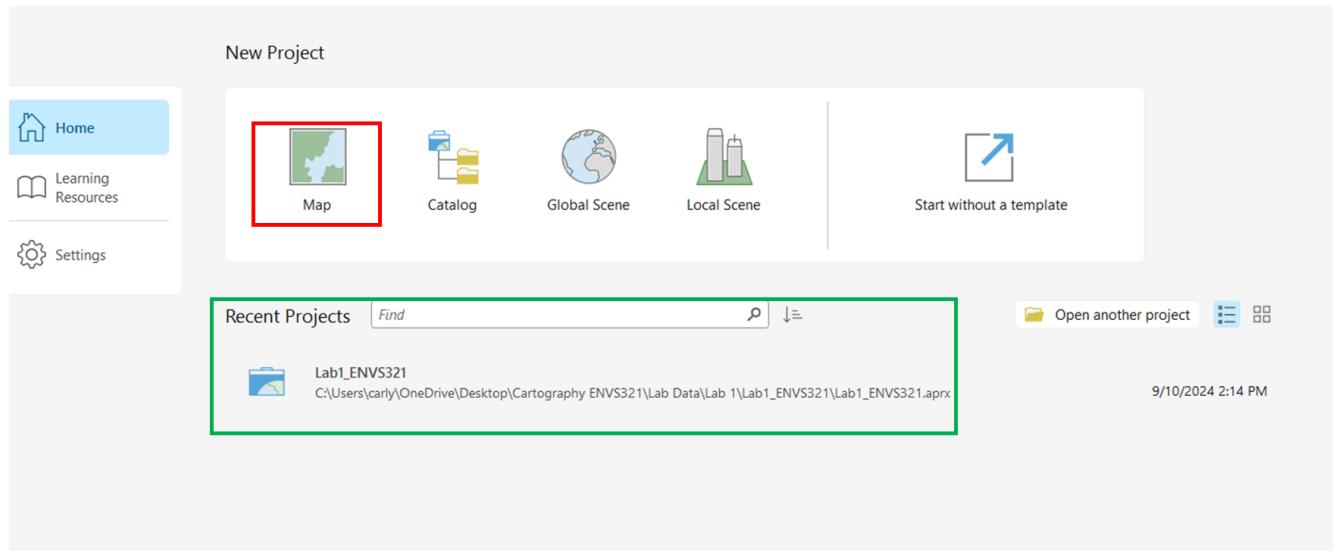
Goal 1: In this task, you will create a new project and file geodatabase (GDB) called "Lab1_(lastname)" in ArcGIS Pro. A file geodatabase is used to store, organize, and manage spatial and non-spatial data in ArcGIS. When you start a new project, a default GDB will be created, and will store the files associated with the project.

Step 1: Open ArcGIS Pro 3.3

1. **Action:** Launch ArcGIS Pro by clicking on the application icon on your desktop or start menu.

Step 2: Create a New Project

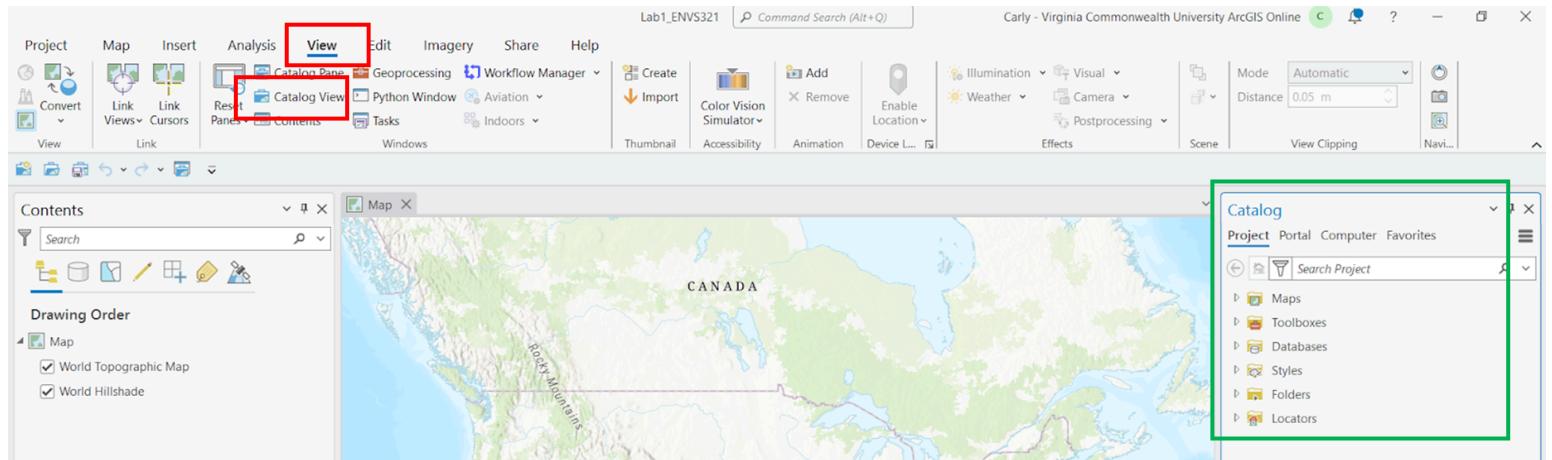
1. **Action:** If you are starting fresh, click the Map option under "New Project". Where the project asks for a Name, type ENVS321_LASTNAME (your last name). For the location, navigate to your ENVS321 folder and the Lab1 subfolder, copy the address as text and paste it into the Location space, then click "OK".
 - **Why:** Projects in ArcGIS Pro are used to organize your work. Each project contains maps, layouts, data, and tools. Saving your project in a defined location helps you keep your work organized. THIS IS VERY IMPORTANT!!



Use the Name and Location options to identify and set a location of your project.

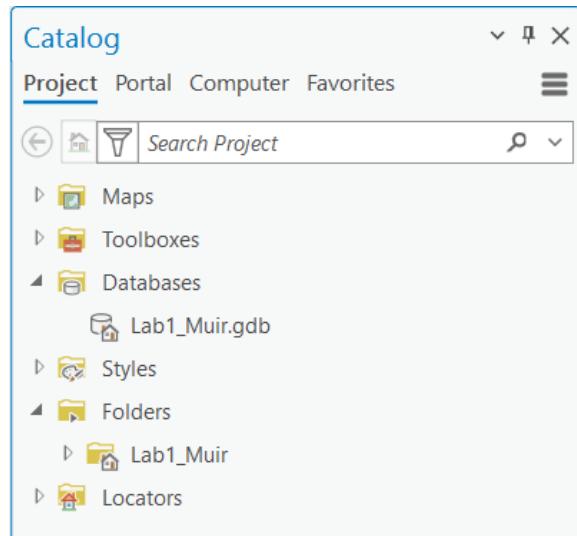
Step 3: Open the Catalog Pane

1. **Action:** If the **Catalog** pane is not visible, go to the "View" tab on the ribbon and click on **Catalog Pane** to open it.
 - o **Why:** The Catalog Pane is used to manage and access files, databases, and other resources. You will use it to create and access your file geodatabase.



Step 4: Navigate to the Folder Where Your default Geodatabase is located (where you saved the project, ENVS321>Lab1)

1. **Action:** In the **Catalog** pane, click on **Folders** and navigate to the folder in which you want to store your new geodatabase (Desktop>ENVS321>Labs). If the folder isn't listed, right-click **Folders** and select **Add Folder Connection** to browse for the desired folder.
 - **Why:** You must choose a location where the geodatabase will be saved. The folder structure helps in organizing your data efficiently.



*Hint, for easy access to the catalog, use the thumb tack icon in the upper right corner to pin the catalog pane.

If you need to create a new file geodatabase, follow these steps, but for now we will use the geodatabase that was created for this project.

- **Action:** In the **Catalog** pane, right-click on the folder where you want to store the geodatabase, then select **New > File Geodatabase**.
 - **Why:** This step creates the container (geodatabase) that will store spatial and non-spatial datasets like feature classes, raster datasets, and tables.
- **Action:** After selecting **File Geodatabase**, a new geodatabase will appear in the folder. Rename it to "lab 1" by right-clicking on the new geodatabase and selecting **Rename**.
 - **Why:** Naming the geodatabase "lab 1" helps you keep track of the purpose of the data it contains. It ensures your data remains organized and easy to identify.

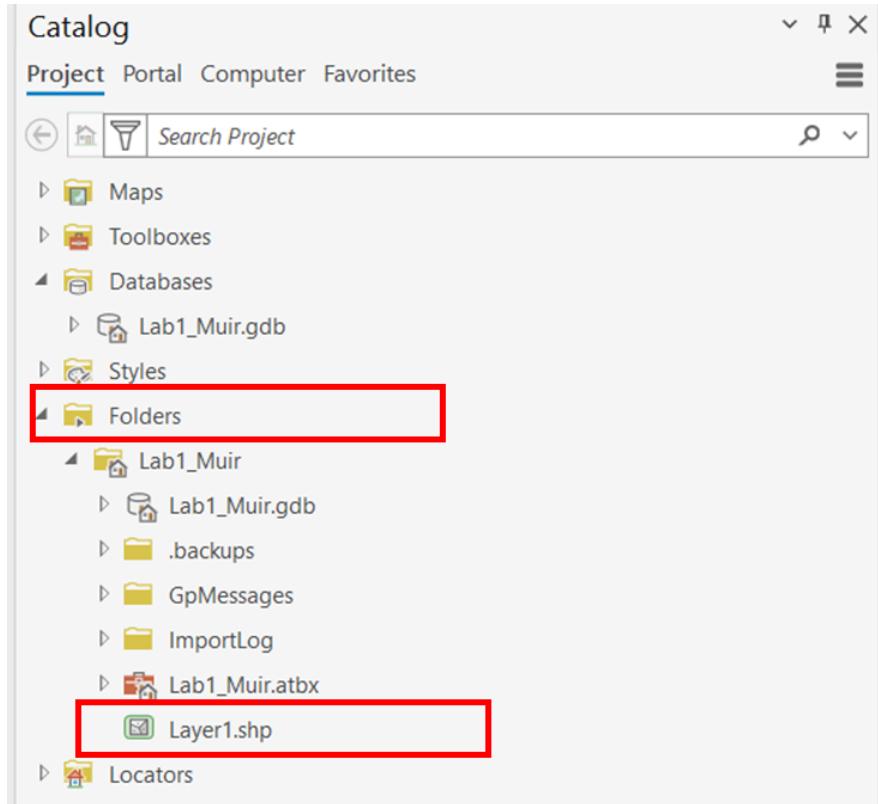
Step 5: Verify the File Geodatabase is Correct

1. **Action:** Once you've located the geodatabase, double-click it in the **Catalog** pane to verify that it is now an empty container ready to store data for your project.
 - **Why:** Verifying the geodatabase ensures it has been successfully created and is ready for use in your project.

Goal 2: In this task, you will import three shapefiles named **Roads**, **Solid Waste Permits**, and **Wildlife Management Areas** into your project in ArcGIS Pro 3.3. Shapefiles are a common format for vector data, and importing them into your project will allow you to visualize, analyze, and manipulate the spatial information.

Step 1: Connect to the Folder with the Shapefiles

1. **Action:** In the **Catalog** pane, click on **Folders**. If the folder containing the shapefiles is already listed, proceed to the next step.



If not, right-click on **Folders** and select **Add Folder Connection**. Browse to the folder where your project and shapefiles (Roads, Solid Waste Permits, Wildlife Management Areas) are saved and click **OK**.

- **Why:** Folder connections allow you to access your shapefiles within ArcGIS Pro. This ensures that you can navigate to the location of your data easily.

Step 2: View the Shapefiles

1. **Action:** Once the folder is connected, expand it in the **Catalog** pane to view the contents. You should see **Roads**, **Solid Waste Permits**, and **Wildlife Management Areas** listed as shapefiles (.shp extension).
 - **Why:** Verifying that the shapefiles are visible in the folder confirms that you are ready to import them into your project and for visualization.

Step 3: Add Shapefiles to the Map

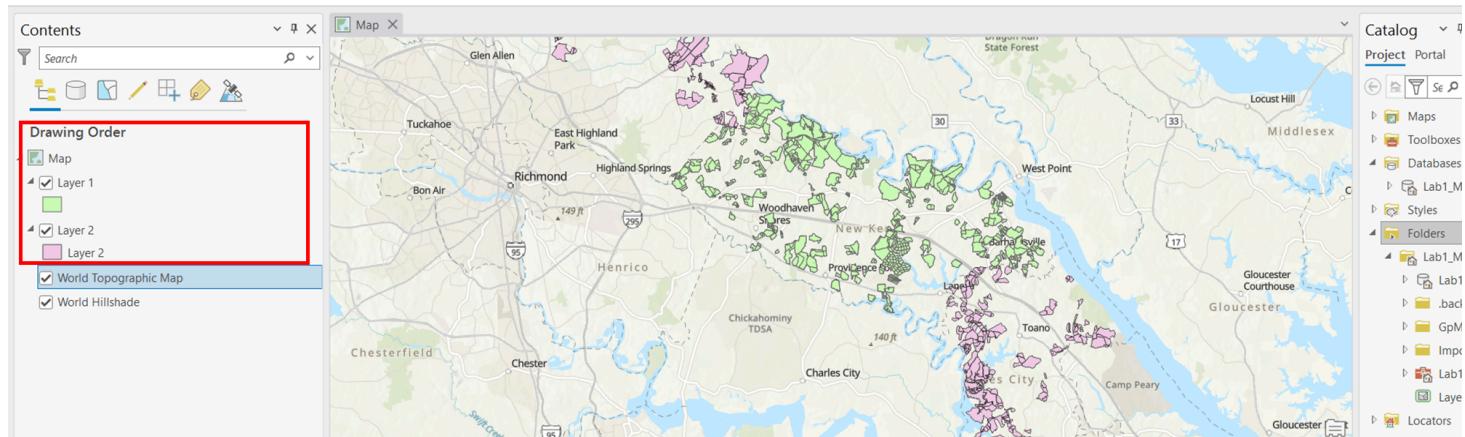
1. **Action:** Select all three shapefiles by holding down the **Ctrl** key and clicking on **Roads**, **Solid Waste Permits**, and **Wildlife Management Areas** in the **Catalog** pane. Right-click the selected files and choose **Add to Current Map**. Similarly, you can drag them to the Contents Pane.

- **Why:** This action imports the shapefiles into your map, enabling you to visualize and interact with the spatial data.

Step 4: Verify Shapefiles are Displayed on the Map

1. **Action:** After adding the shapefiles, look at the **Contents** pane to ensure that **Roads**, **Solid Waste Permits**, and **Wildlife Management Areas** are listed as layers. You should also see the layers displayed on the map.
 - **Why:** This confirms that the shapefiles have been successfully added to the map. Each shapefile is now a visible layer that can be manipulated and analyzed.

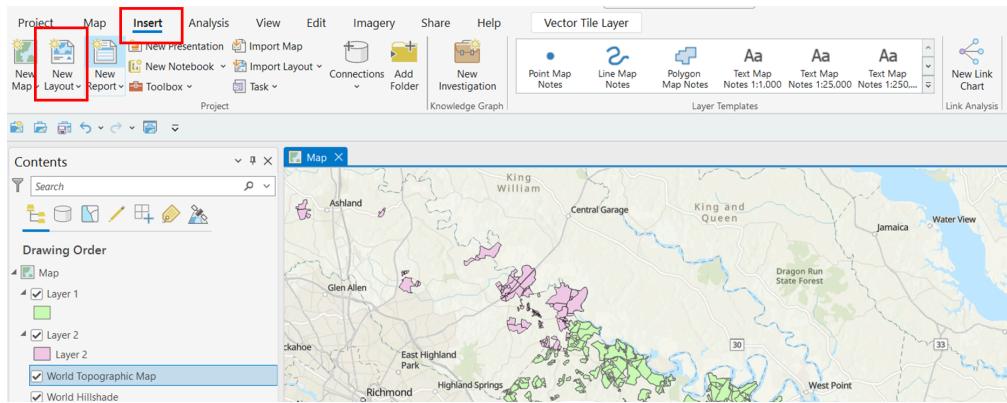
*Hint, if your layers are showing up in the Contents Pane but you do not see them on your map, make sure they are in the correct drawing order (listed above the basemap layers (e.g. world topographic map)



Goal 3: In this task, you will create a layout in which you can insert a **north arrow**, **legend**, **scale bar**, and **title** into your map, customize their properties, and then export the final map as a PDF.

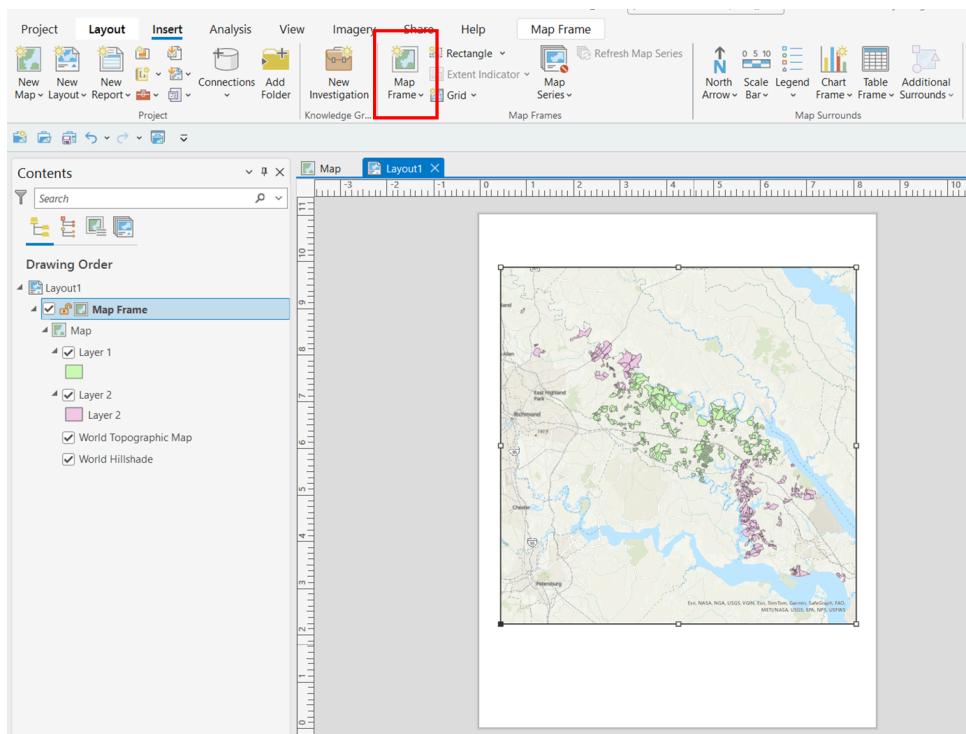
Step 1: Switch to Layout View

1. **Action:** In the **Insert** tab on the ribbon, click **New Layout**. Choose an appropriate layout size (e.g., **Letter** for 8.5" x 11") from the list.
 - **Why:** Layout view is where you arrange map elements like the north arrow, legend, scale, and title for presentation. You need a layout to organize and format these elements for printing or exporting.



Step 2: Insert the Map into the Layout

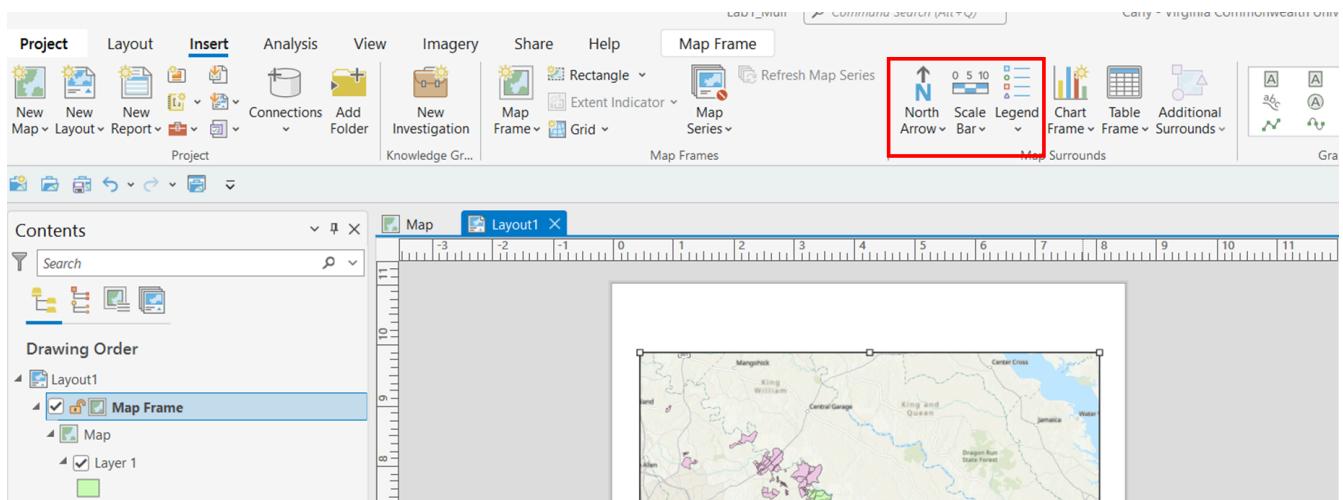
- Action:** In the **Insert** tab, click **Map Frame** and choose the map you've been working on (it should appear in the dropdown). Click and drag on the layout to place your map.
 - Why:** The map frame places your map within the layout. If you are working with multiple maps simultaneously, you will have the option of which one you want to add to the layout. When you create your layout, you can leave space at the bottom of the page to place the cartographic elements and space at the top to place the map title



Inserting Map Elements

Step 3: Insert a North Arrow

1. **Action:** In the **Insert** tab, click **North Arrow** and choose a style from the dropdown menu. Click on the layout where you want to place the north arrow. You can change the size of the north arrow by dragging the corner of the object box containing the arrow.
 - **Why:** A north arrow shows the map's orientation, providing geographic context. It's essential for map readers to understand direction.



Step 4: Insert a Scale Bar

1. **Action:** In the **Insert** tab, click **Scale Bar** and choose a style. Click on the layout to place the scale bar beneath the map. Adjust the size of the scale bar and ensure that the distance value is set to a logical value (e.g. 10 miles, not something "random" like 7 miles). You will edit the size, font and units in the next step.
 - **Why:** A scale bar provides a visual reference for distance, allowing viewers to understand the map's scale.

Step 5: Insert a Legend

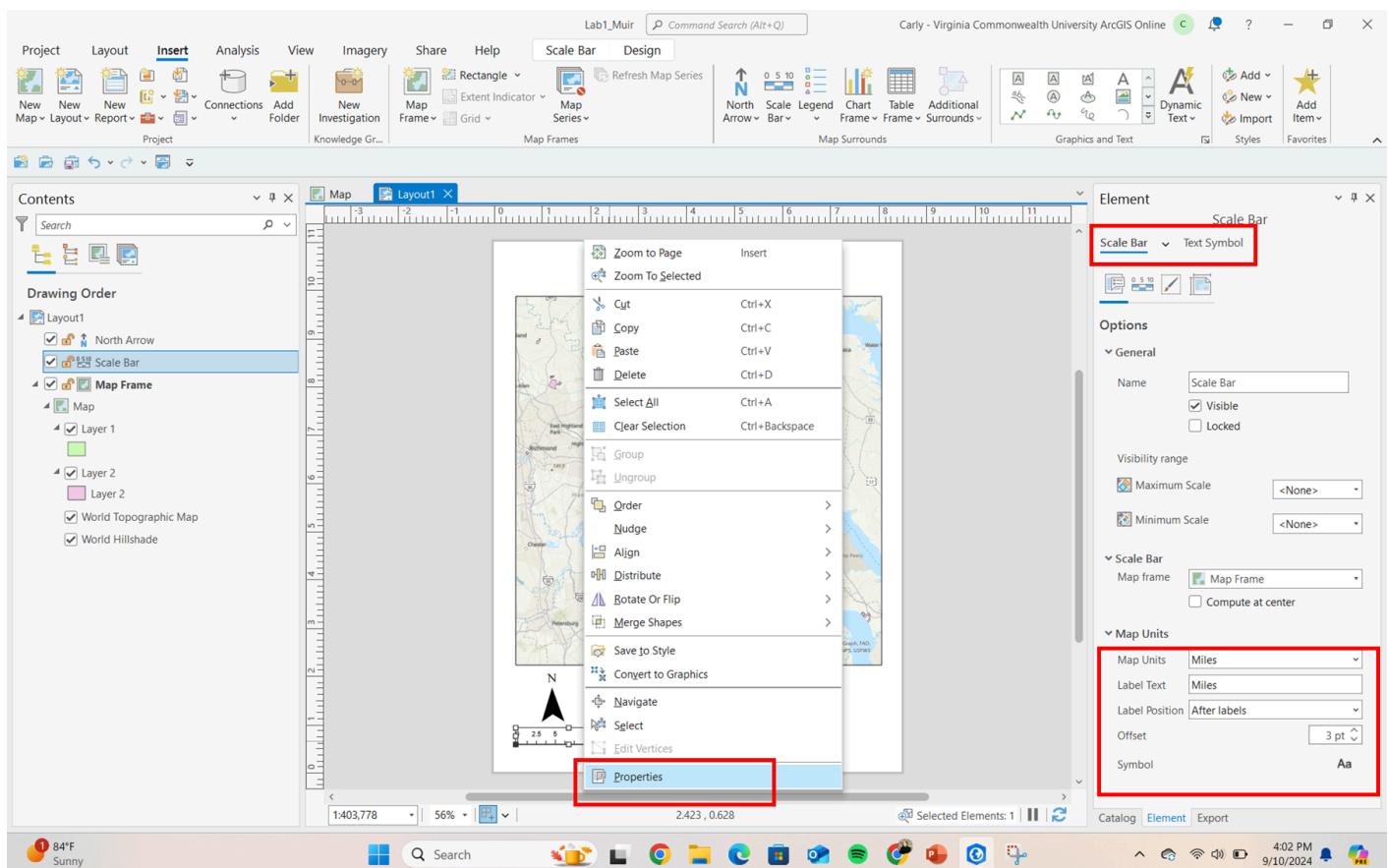
1. **Action:** In the **Insert** tab, click **Legend**. Click on the layout near the edge of the map frame to place the legend. You will edit the size, font and text in the next step.
 - **Why:** The legend explains the symbols and colors used on the map, helping readers interpret the data. It automatically pulls in the layers from your map.

Step 6: Insert a Title

- Action:** In the **Insert** tab, click the rectangle option in the **Dynamic Text** and then click above the map on the layout to place the text box. Type your desired title (e.g., "Lab 1 Map"). You will edit the size, font and text in the next step.
 - Why:** The title provides context and identifies what the map is about, which is critical for communication.

Step 7: Make Necessary Edits to Cartographic Elements

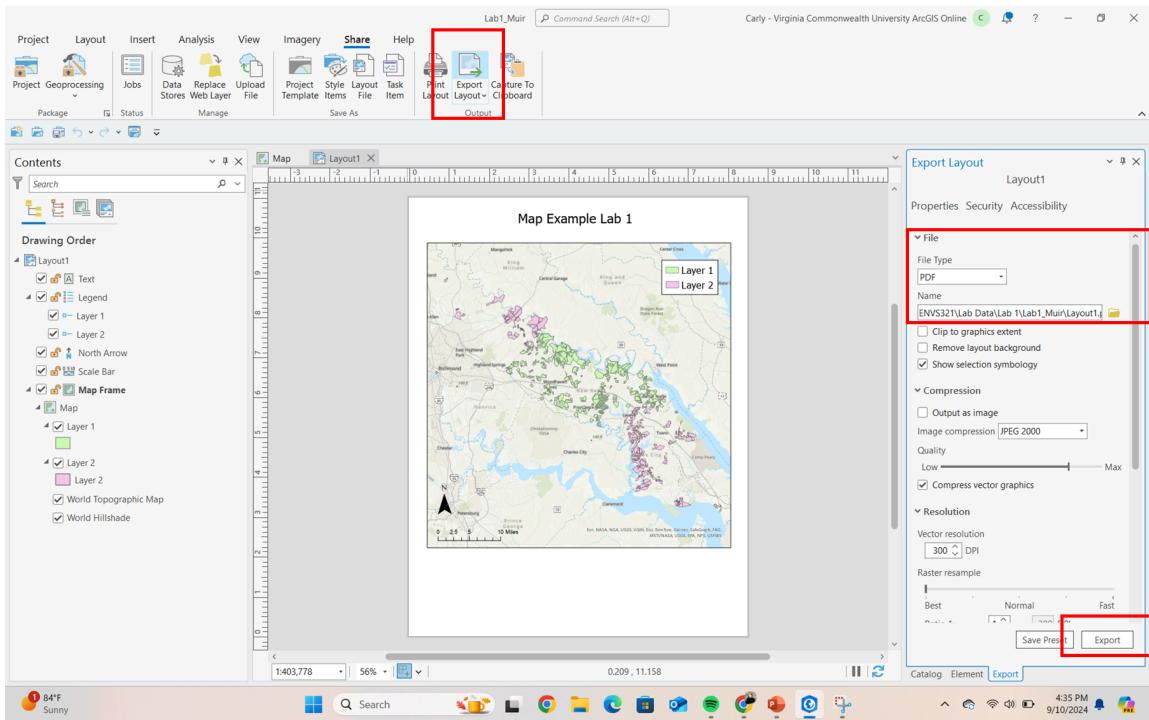
- Action:** To make edits to the cartographic elements you can right click each one and select properties. For example, in the legend properties, you can set the units (e.g. kilometers, miles, meters). You can change the font size and text of the title. You can also change the layout of the legend.



Exporting the Map as a PDF

Step 8: Export the Map

- Action:** Once satisfied with the layout, go to the **Share** tab on the ribbon and click **Export Layout**.



2. **Action:** In the **Export Layout** dialog box, select **PDF** as the file type.
3. **Action:** Choose the export location, adjust the resolution (300 DPI is standard for print), and check the box for **Embed Fonts** if you want to maintain font consistency.
4. **Action:** Click **Export** to generate the PDF.

Submit your map as a PDF file in Canvas under Assignments: Lab 1

Your final map should look similar to the example below

Notice the placement of the map elements

- Title is centered at the top, large text
- Legend is prominently displayed but not obstructive to the map
- North arrow and scale do not obstruct the map and are placed in a logical location

Map Example Lab 1

