

Exercise 3 – Sharing a Map



Introduction

In this exercise, we are sharing the map that was created in Exercise 1 and updated in Exercise 2.

Objectives

- Create a Layout
- Add the Main Map Elements to Layout

Required Data

- The training materials can be downloaded from here:
 - T:\FS\NFS\WOEngineering\GMO-GTAC\Program\TUS\Training\ArcGISProCartographicTools

Prerequisites

- ArcGIS Pro installed on local pc.
 - Recommended to have the latest release implemented in the Forest Service.
 - ArcGIS Pro is available in the Software Center.
 - Submit a [GIS Service Request](#) if you have any questions.
- Basic understanding of how to use ArcGIS Pro.
- Completion of Exercise 2.



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Whaley, A.; Martin, L.; 2021. Cartographic Tools using ArcGIS Pro: Exercise 1. GTAC. Salt Lake City, UT: U.S. Department of Agriculture, Forest Service, Geospatial Technology and Applications Center. xx p.



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Part 1: Considerations for Cartography in the FS

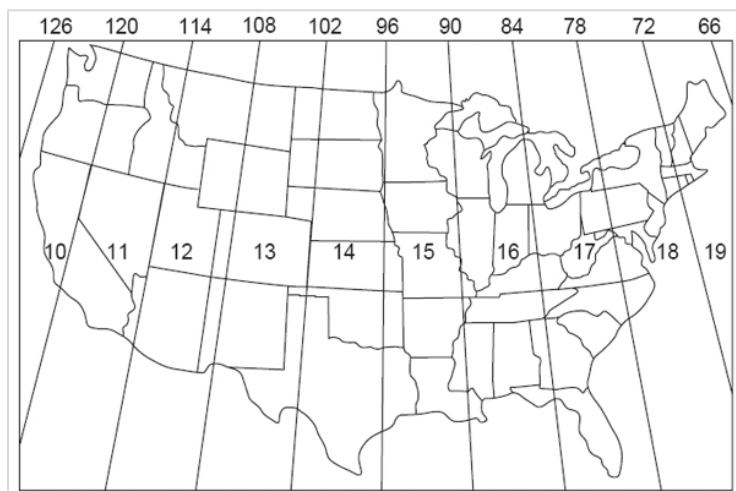
A. Projections

Each [type of projection](#) preserves a different value. Some preserve the area of the polygons (equal area), some preserve distance (equidistant), some preserve direction (equidirectional), and others preserve shape (conic).

Which projection works best for your data? In this exercise, we are working primarily with trails data at a local scale. A transversal or Mercator projection would be appropriate for displaying this data as it will not be skewed too much in either value.

There are a few options for choosing a projection (aka projected coordinate system) depending on the geography of your data. Remember that each projection also has an associated geographic coordinate system. Therefore, the full coordinate system should be written out with the geographic coordinate system followed by the projected coordinate system (ie NAD 83 UTM 17N).

One choice is the [Universal Transverse Mercator \(UTM\) system](#). The Conterminous US ranges from UTM Zone 10N to 19N. If your data falls neatly within a zone, a UTM projection would work for your map.

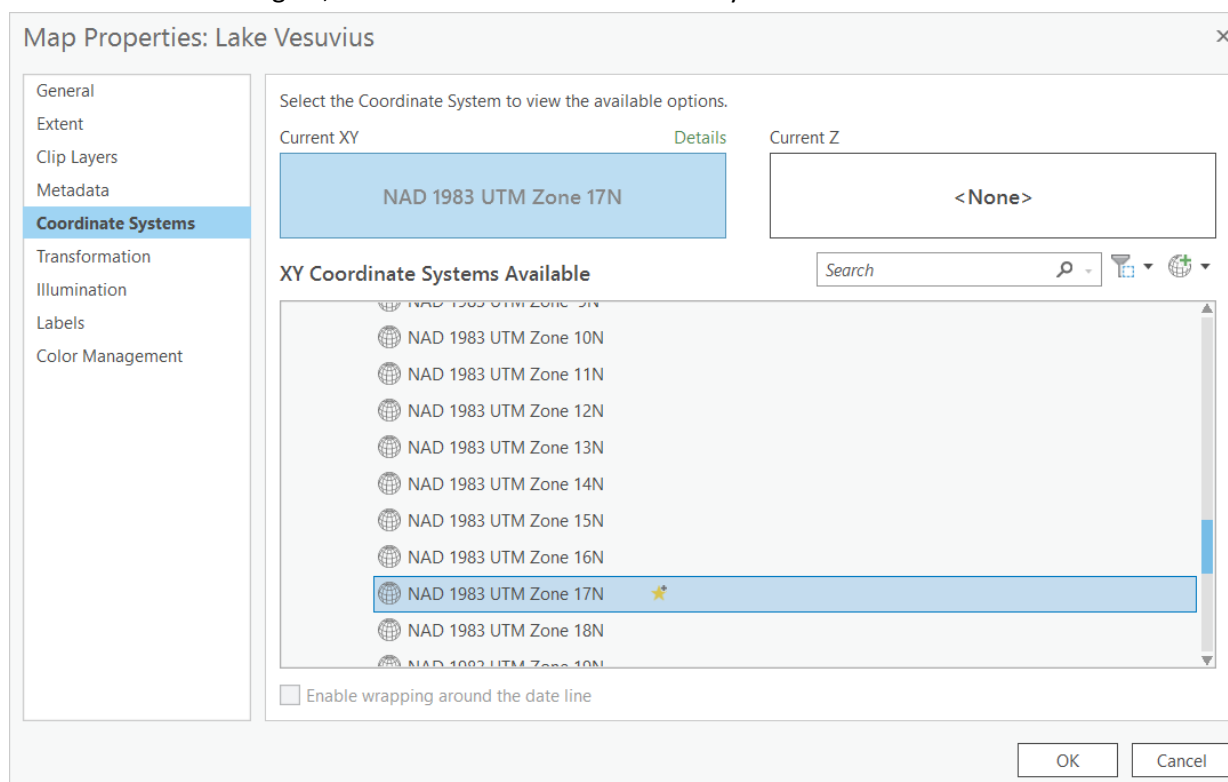


However, some states fall between UTM zones. In this case, the [State Plane system](#) is more appropriate. State Plane projections are state-specific coordinate systems that work well for more localized data because they divide states up into multiple planes. This reduces inaccuracies in the projection.

The goal with the map we are creating is to share a static, printed map. Therefore, a projected coordinate will need to be applied in order for the data to be displayed on the flat, 2-dimensional piece of paper.

In Part 2-D of this exercise, you will be sharing as a web map in addition to a printed map. Web maps will need to be stored in a geographic coordinate system when saved to ArcGIS Online since AGOL cannot process the projection.

1. Check your **coordinate system** of the **Lake Vesuvius** map.
2. **Right-click** on **Lake Vesuvius** from the **Contents** pane, then select **Properties**.
3. **Open** the **Coordinate Systems** tab.
4. The current coordinate system is **WGS 1984 Web Mercator (auxiliary sphere)**. This is the projection we will use to share this map as a web map. However, since we will export a PDF first, change this coordinate system to **NAD 1983 UTM Zone 17N** by navigating to **Projected Coordinate System, UTM, NAD 1983**, then **NAD 1983 UTM Zone 17N**.
5. **Select Okay**.
6. The map will refresh. Does your data look any different? Test by switching back to **WGS 1984 Web Mercator (auxiliary sphere)**.
7. Before moving on, be sure to leave the coordinate system as **NAD 1983 UTM Zone 17N**.



B. 508 Compliance

As a federal agency, the US Forest Service is expected to create map products that are accessible to all persons. The [CDC estimates](#) that “12 million people 40 years and over in the US have vision impairment.” And [according to the American Optometric Association](#), some 8% of males and 0.5% of females have a color vision deficiency. Below are two methods for helping to create more accessible maps.

1. Use a color contrast checker

- i. Let's check the color contrast of two colors on the map. We will check the contrast between the Recreation – Site Point's icons and the background Topographic basemap.
- ii. Open the [Image Color Picker](#) with this link.
- iii. Select "Choose file" to upload the **Exercise3_ColorContrastCheck.png** from the Data folder in the training materials.
- iv. Hover the cursor over the **Recreation – Site Points** icon in the image to select the color. There is a text box on the right side of the web site labeled "HEX." HEX is a universal color-coding system. It should return a **267300** for the symbol's color.
- v. Now, **select** an area of the **lighter basemap**. You should get something like **E9F3DB**. This can vary though depending on where you click on the basemap within the uploaded image.
- vi. **Open** the [Colour Contrast Check](#) using this link.
- vii. The values should already be setup for **Foreground Colour** and **Background Colour**.
- viii. These two colors have a high contrast so they pass the contrast test.
- ix. This means that map viewers with certain vision disabilities will be able to interpret your map's information!

Foreground Colour:	Background Colour:	Results
# 267300	# E9F3DB	This is example text. Some of it bolded. <i>Some of it italicized.</i>
Red: <input type="range"/>	Red: <input type="range"/>	Brightness Difference: (>= 125) <input type="text" value="158.40"/>
Green: <input type="range"/>	Green: <input type="range"/>	Colour Difference: (>= 500) <input type="text" value="542"/>
Blue: <input type="range"/>	Blue: <input type="range"/>	Are colours compliant? <input type="text" value="YES"/>
Hue (°): <input type="range"/>	Hue (°): <input type="range"/>	Contrast Ratio <input type="text" value="5.179"/>
Saturation (%): <input type="range"/>	Saturation (%): <input type="range"/>	WCAG 2 AA Compliant <input type="text" value="YES"/>
Value (%): <input type="range"/>	Value (%): <input type="range"/>	WCAG 2 AA Compliant (18pt+) <input type="text" value="YES"/>
		WCAG 2 AAA Compliant <input type="text" value="NO"/>
		WCAG 2 AAA Compliant (18pt+) <input type="text" value="YES"/>

2. Check the Recreation – Horse Trails layer's color with the background color of the basemap.

- i. **Open** the **Symbology** of the **Recreation – Horse Trails** layer.
- ii. **Change** the color to **Burnt Umber** (Hex **#734C00**).
- iii. **Input** the **Burnt Umber Hex Code** for the **Foreground Colour**.
- iv. **Use** this link to the [Colour Contrast Check](#) to see the results.
- v. Raw Umber passes when paired with the background color!

For more information on making your map red-green color deficient friendly, check out this blog from Esri titled, "[Red...Green...What?](#)"

For more information on how [Section 508 Accessibility](#) is implemented across the US Forest Service, review the link.

Part 2: Publishing Content

You are now ready to publish your map! There are a few options for exporting, we'll walk through three different ways.

A. Sharing as PDF

1. **Open** the **Lake Vesuvius Layout** from **Exercise 2**.
2. From the **Share** tab, select **Layout** on the **Export** group. This opens the **Export** pane.
3. **Change** the **File Type** to **PDF**.
4. **Name** the file and **choose** a location to save the file.
5. **Review** the **settings**.
 - i. **Notice** that Embed Fonts box is checked by default. **Leave** this checked. This includes the font with the .pdf file and can mitigate issues with using different fonts.

For sharing as a Georeferenced PDF for viewing in Avenza Maps, ensure that the "Export georeferenced information" is checked under the PDF settings.

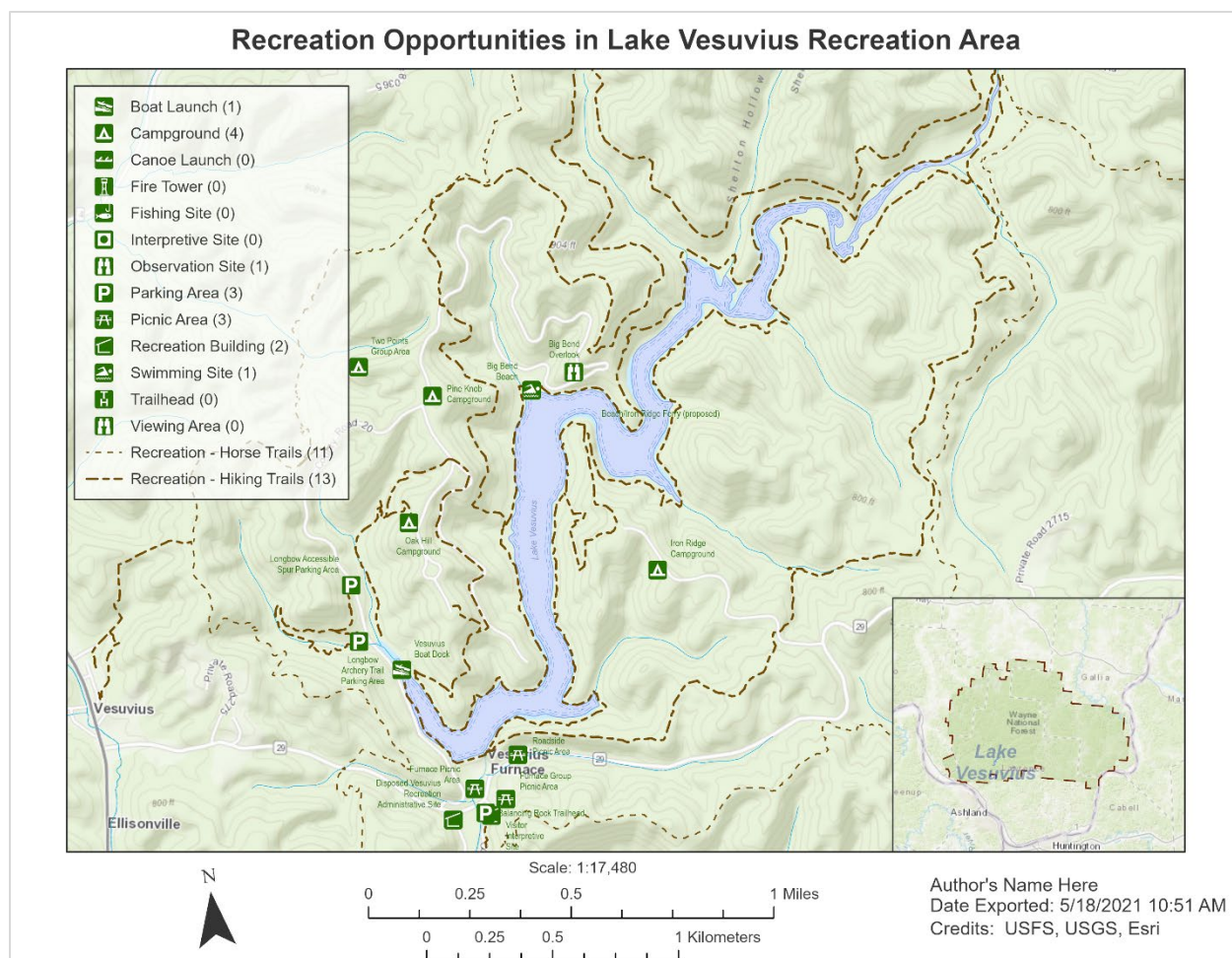
6. **Select Export**.
7. Your PDF should look like the image below the next section.

B. Sharing as Image

Sharing as Image file instead of PDF is helpful for including maps in Word Documents, StoryMaps, and other applications that require a .png or .jpeg file type.

1. The **Export** pane will still be open from the previous section.
2. **Scroll** up.
3. **Change** the **File Type** to **PNG**.
4. **Name** the file and **choose** a location to save the file.
5. **Accept** the default values.
6. **Select Export**.
7. Your PNG should look like the image below.

You can also share this map as a Web Map to ArcGIS Online. Learn more at [Share a Web Map](#).



Congratulations! You have successfully completed this exercise and training. You now have a foundation for using cartographic tools in ArcGIS Pro.