

UA Libraries Data Cooperative Unit's

GIS TUTORIALS

CREATING A BASIC MAP

ESRI

SOFTWARE USED

3

TUTORIAL NUMBER



DIFFICULTY LEVEL



LEVEL OF STOKE

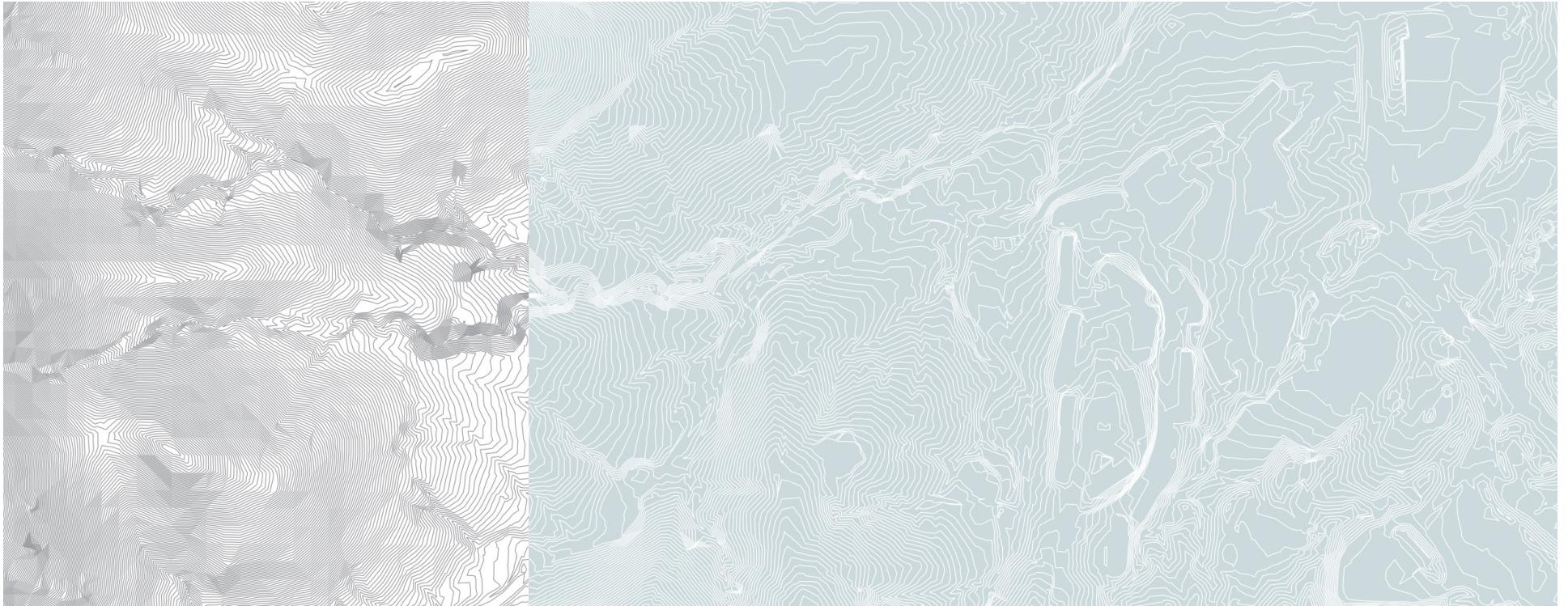


HARDWARE NEEDED:

desktop or laptop computer
running Windows
internet connection

SOFTWARE NEEDED:

ESRI ArcGIS Pro



INTRODUCTION

1

The purpose of this tutorial is to teach you how to open ArcGIS Pro and start a new project. If you are a University of Arizona faculty, staff, or student you are able to access your Esri license, which is needed to use ArcGIS Pro, through Shibboleth using your UA NetID and password.

Upon completion of this tutorial, you should be comfortable:

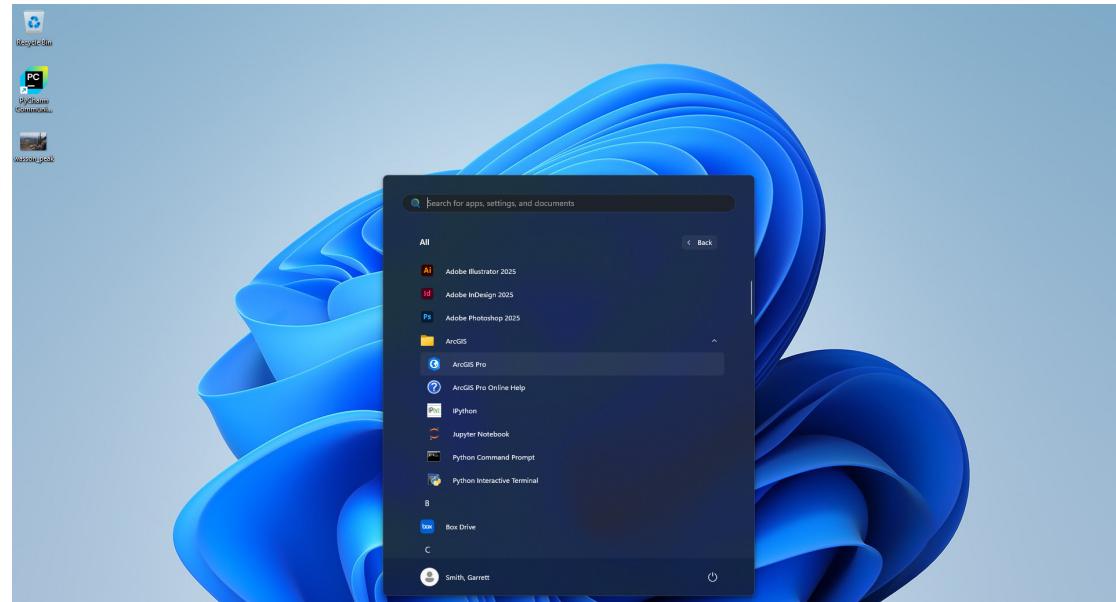
1. Opening Esri's ArcGIS Pro.
2. Starting a new ArcGIS Pro project.
3. Adding and exploring geospatial data in ArcGIS Pro.

OPENING ARCGIS PRO

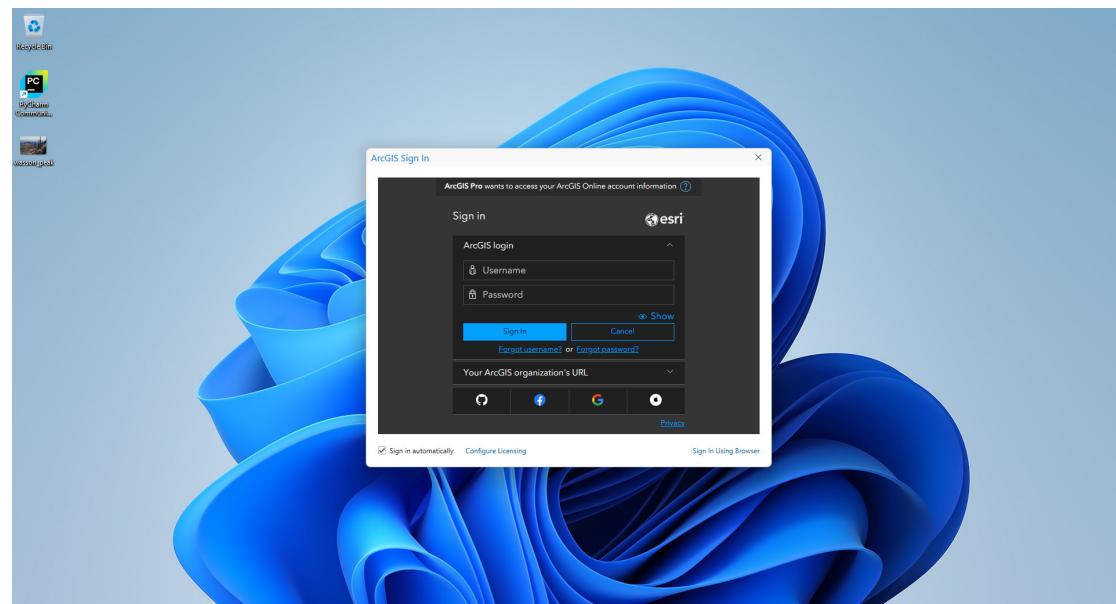
1. Open ArcGIS Pro by clicking on the ArcGIS Pro Icon, which is generally found in an ArcGIS folder created in your Applications folder.
2. In the ArcGIS Sign In window click on “Sign In Using Browser” at the bottom right-hand corner of the window.

HELPFUL HINT:

Your ArcGIS Login is managed by the University of Arizona's site license and not through Esri. This is why you are going to log-in to ArcGIS Pro through the UA GIS account.



1



2

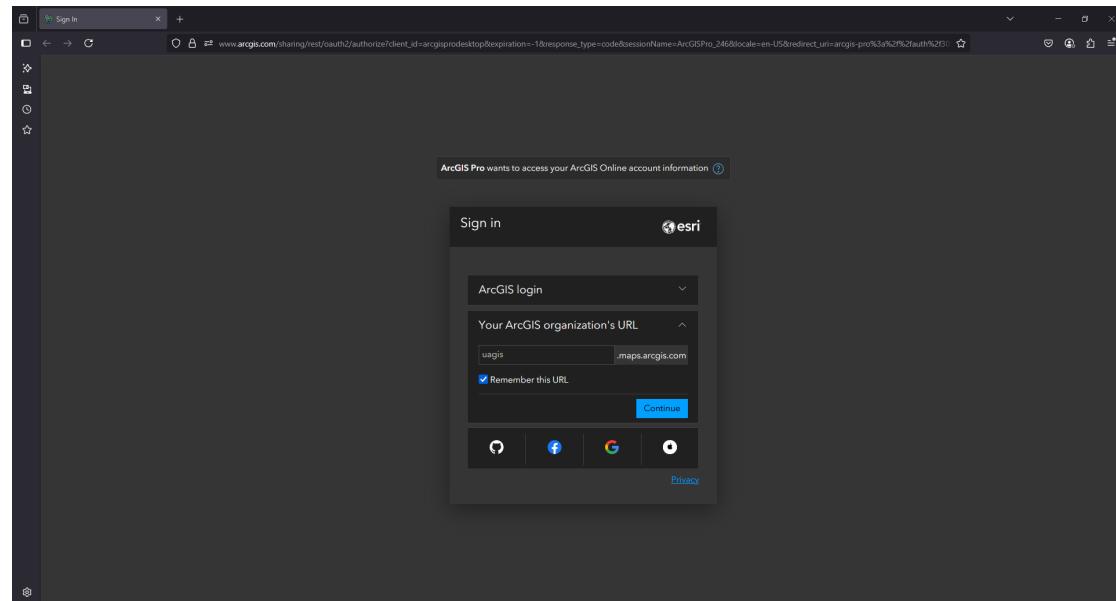
- 3.** ArcGIS Pro should open a web browser on your computer that takes you to the ArcGIS Online sign-in page.

Expand Your ArcGIS organization's URL and type in “**uagis**” for **uagis.maps.arcgis.com**.

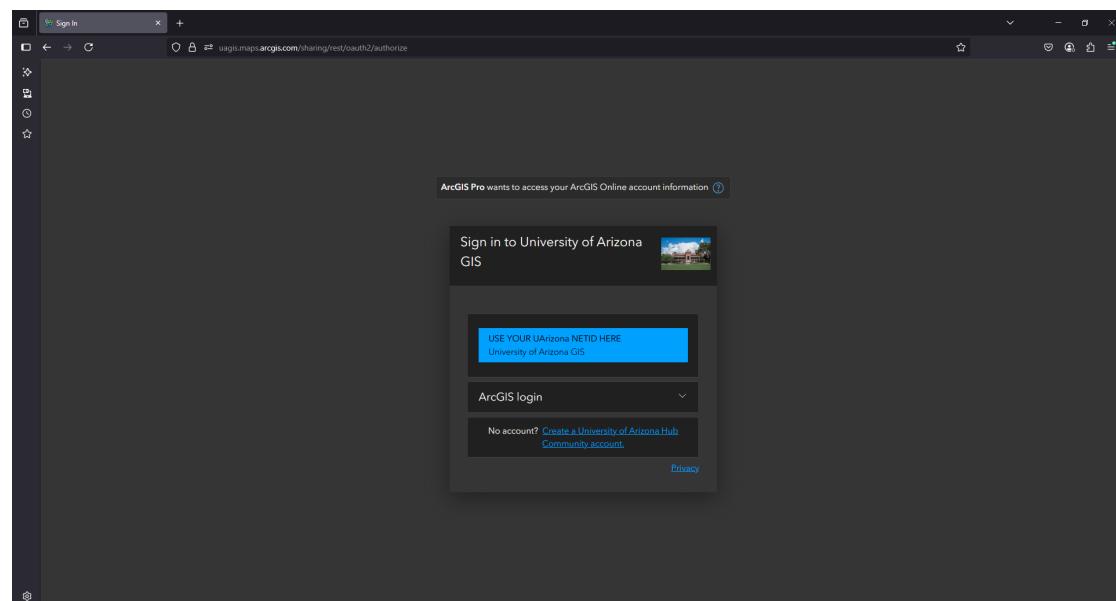
Click the check box next to Remember this URL for future use.

Press the Continue button.

- 4.** Click on the USE YOUR UArizona NETID HERE button and enter your NETID and Password in the following screen.



3



4

ARCGIS TUTORIAL STARTING ARCGIS PRO AND STARTING A NEW PROJECT

- 5.** After entering your NETID and password you will be redirected to another screen.

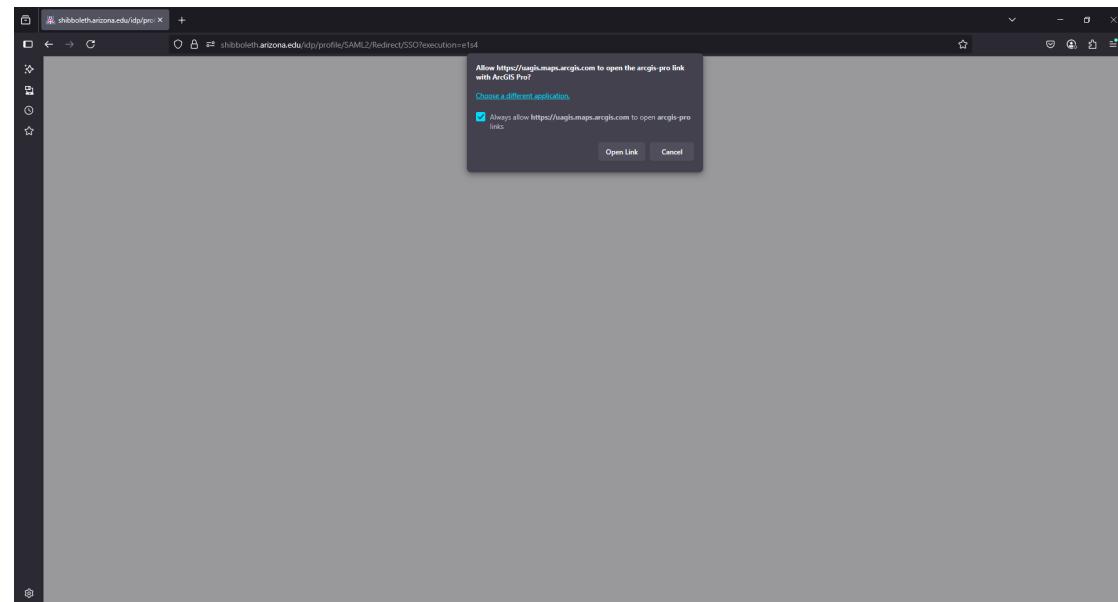
Click on the check box next to Always allow <https://uagis.maps.arcgis.com> to open arcgis-pro links.

Click on the Open Link button.

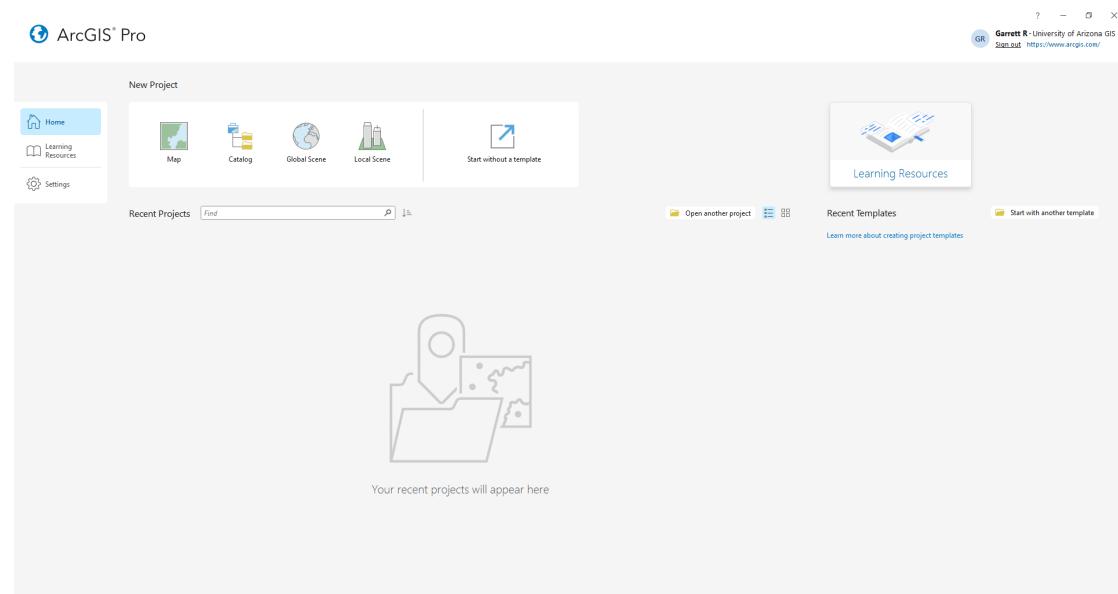
- 6.** If you complete the process correctly, you will be redirected to ArcGIS Pro and should see the ArcGIS Pro startup screen with your username located at the top right-hand corner of the page.

HELPFUL HINT:

If you are using your own personal computer you will generally only need to follow this process to logging into ArcGIS Pro one time as ArcGIS Pro should be linked to your UA ArcGIS Online account.



5



6

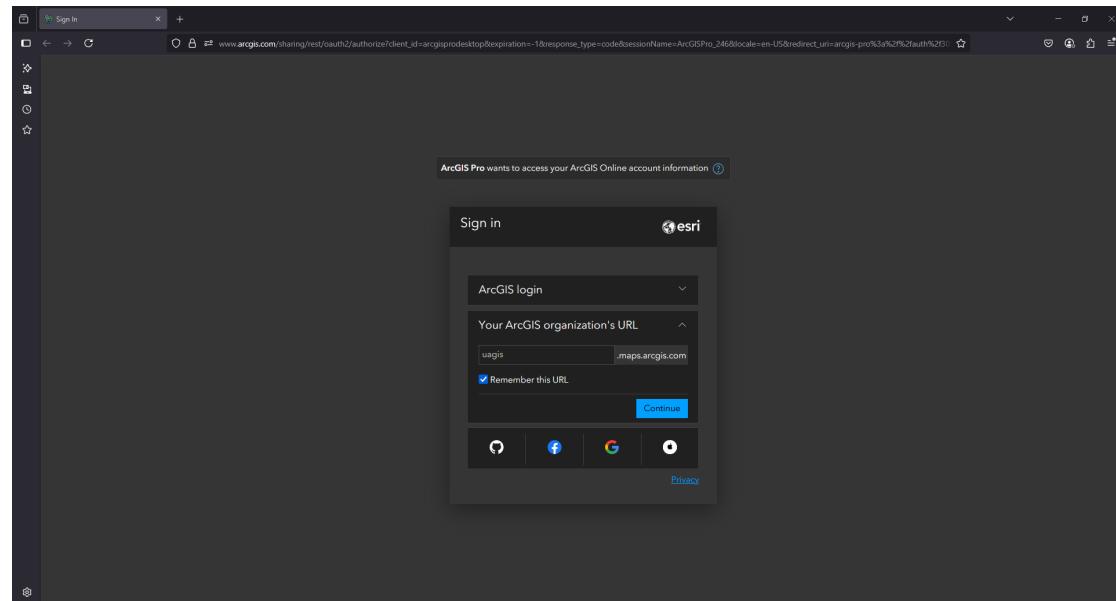
3. ArcGIS Pro should open a web browser on your computer that takes you to the ArcGIS Online sign-in page.

Expand Your ArcGIS organization's URL and type in "uagis" for uagis.maps.arcgis.com.

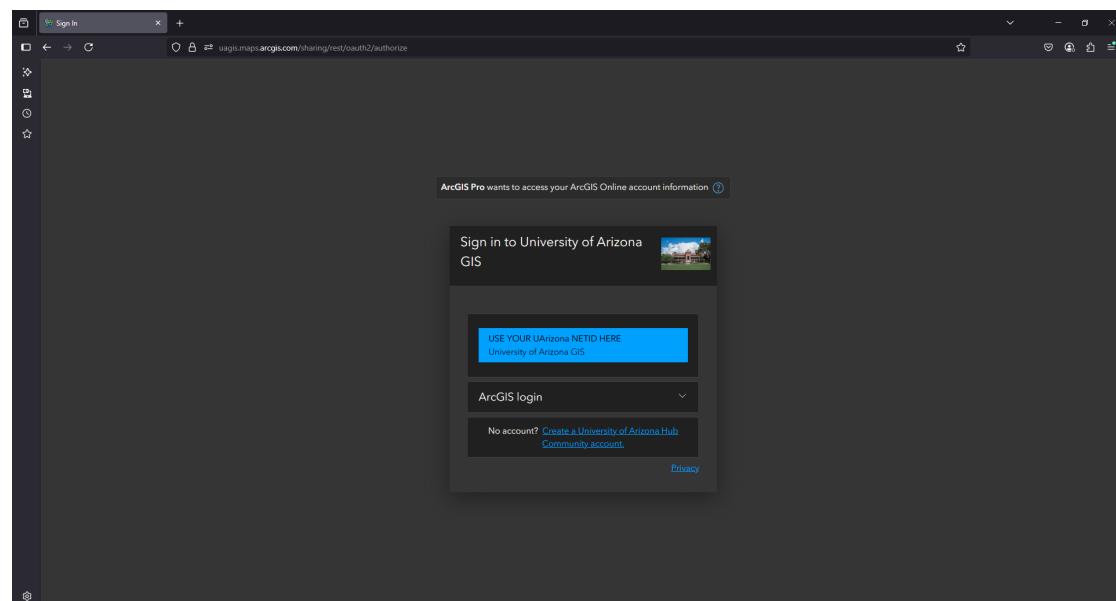
Click the check box next to Remember this URL for future use.

Press the Continue button.

4. Click on the USE YOUR UArizona NETID HERE button and enter your NETID and Password in the following screen.



3



4

- 5.** After entering your NETID and password you will be redirected to another screen.

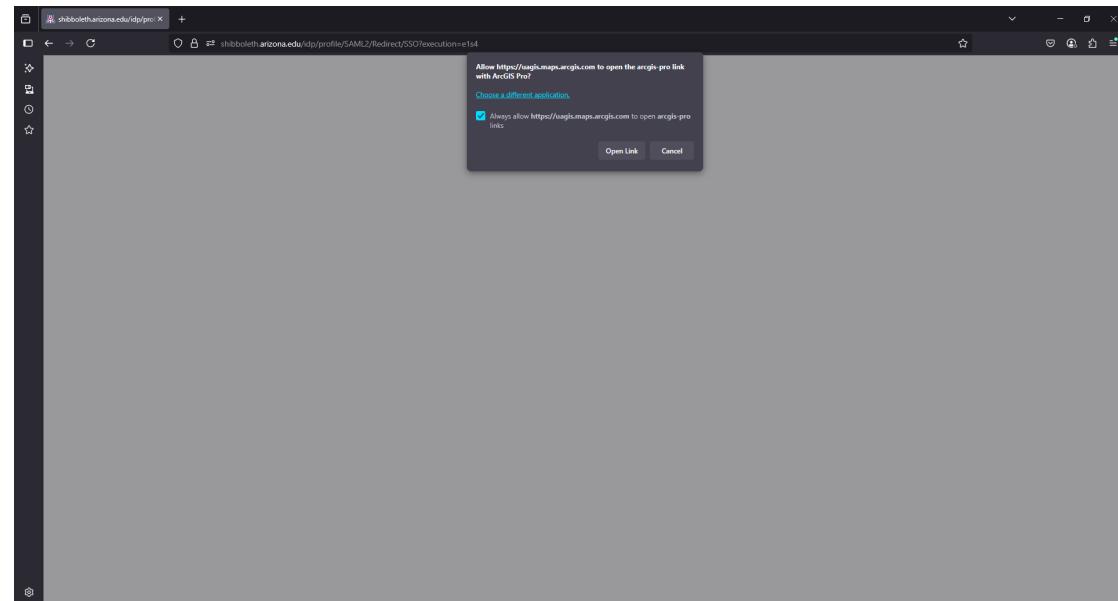
Click on the check box next to Always allow <https://uagis.maps.arcgis.com> to open arcgis-pro links.

Click on the Open Link button.

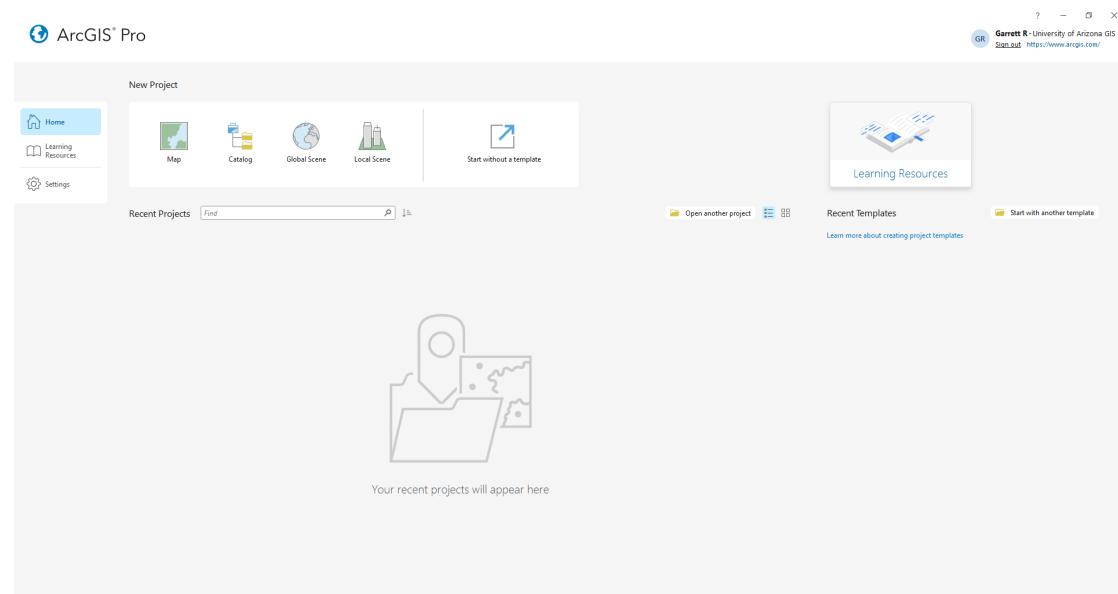
- 6.** If you complete the process correctly, you will be redirected to ArcGIS Pro and should see the ArcGIS Pro startup screen with your username located at the top right-hand corner of the page.

HELPFUL HINT:

If you are using your own personal computer you will generally only need to follow this process to logging into ArcGIS Pro one time as ArcGIS Pro should be linked to your UA ArcGIS Online account.



5



6

STARTING A NEW PROJECT

Before opening ArcGIS Pro, download the data that will be used in this tutorial from the following link:

[GIS IntroData.zip](#)

Please note: All of the data used in this tutorial is available on the UA Library's GeoBlacklight Data Portal:

<https://geodata.lib.arizona.edu/>

1. Within the ArcGIS Pro start screen click on Map under New Project.

In the Create A New Project menu click on the folder icon next to the Location field and navigate to a location on your computer that you would like to save your project to.

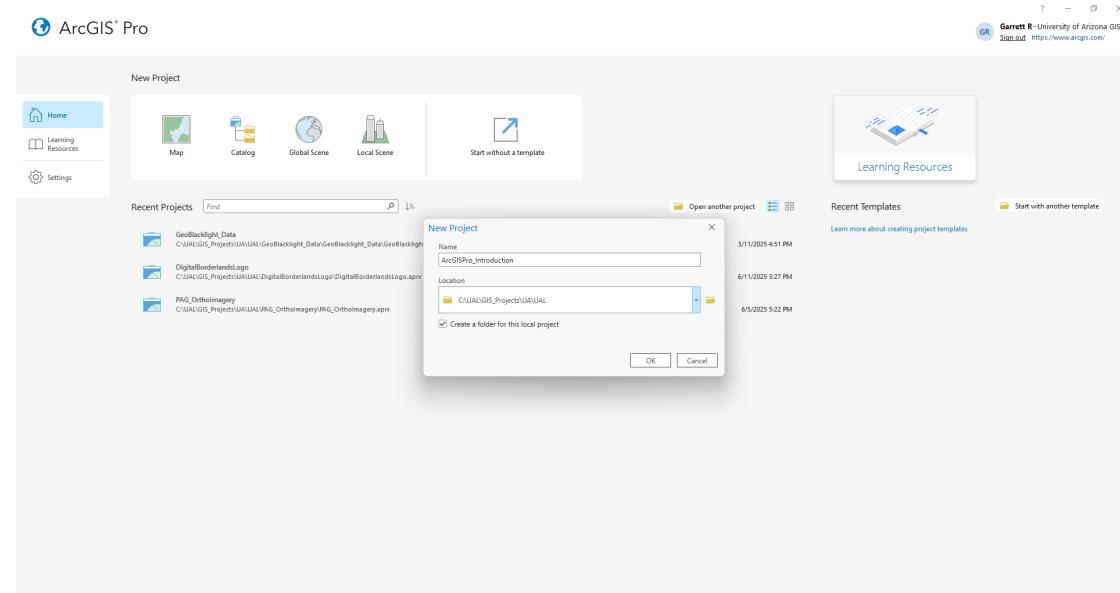
In the Name field enter a name for your project. Please Note: Sometimes Esri does not work well with file names or file paths that contain spaces.

Finally, make sure that there is a check mark next to "Create a new folder for this project".

PROJECT FOLDERS:

A project folder is created by ArcGIS Pro at your defined location and stores all the relevant information that is affiliated with that project including maps, geodatabases, a default toolbox, and connections to data that you will define.

Remember that any folders, projects, and data should not contain spaces because ArcGIS Pro can sometime interpret that space as the end of a file path.



1

COPYING GIS DATA

1. Unzip the GIS_IntroData folder and place it the project's folder that you created in the previous step.

HELPFUL HINT:

Whenever you work on an ArcGIS Pro project that contains data from outside sources a good habit to develop is to have a folder within your project folder that contains all of your raw data, or data that has not been manipulated. That way you will not have to go back and re-download data if any issues with the data should arise.

PROJECT FOLDER COMPONENTS:

When looking at the project folder in File Explorer there are a number of files that ArcGIS Pro automatically creates, these include:

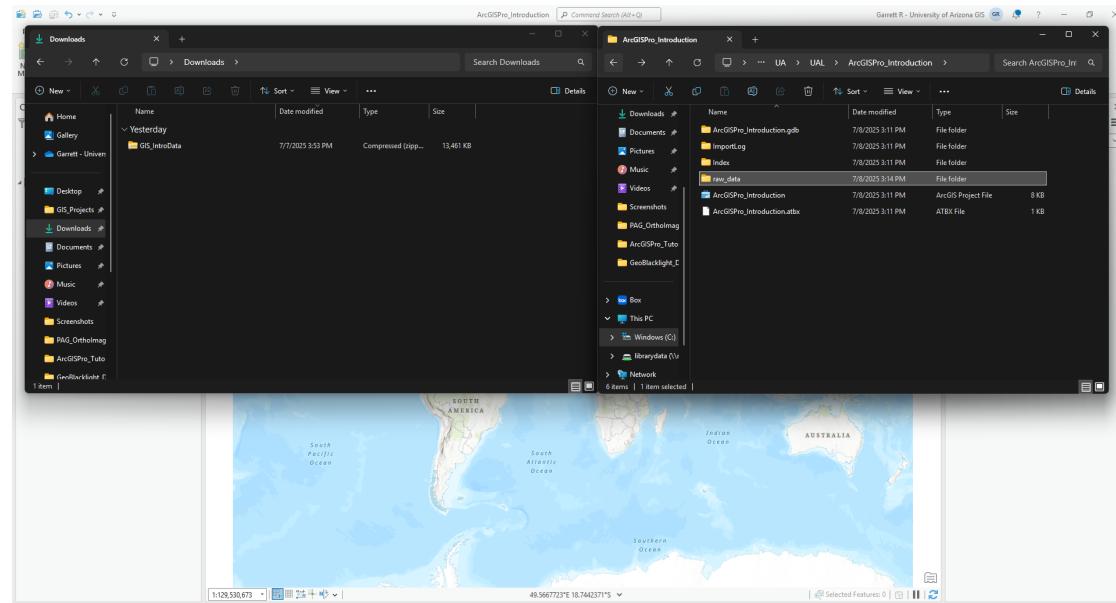
ProjectName's.gdb
Project geodatabase

Index

A dynamic folder that stores everything in the project as the project is being worked on.

ProjectName's.aprx (ArcGIS Project File)
Stores all the components of the project

ProjectName's.atbx (ArcGIS Toolbox)
Project toolbox



1

UNDERSTANDING GIS DATA

1. In the File Explorer window, open the Dame folder located in the GIS_IntroData folder.

GIS DATA STRUCTURE:

When looking at GIS data in the File Explorer window you will notice that there are a number of files present, each of which are or are not required and who have their own purpose:

Dam.cpg (not required)

Codepage for identifying the character set to be used.

Dam.dbf (required)

The dBASE table that stores the attribute information of the features.

Dam.prj (required)

Stores the coordinate system of the file.

Dam.shp (required)

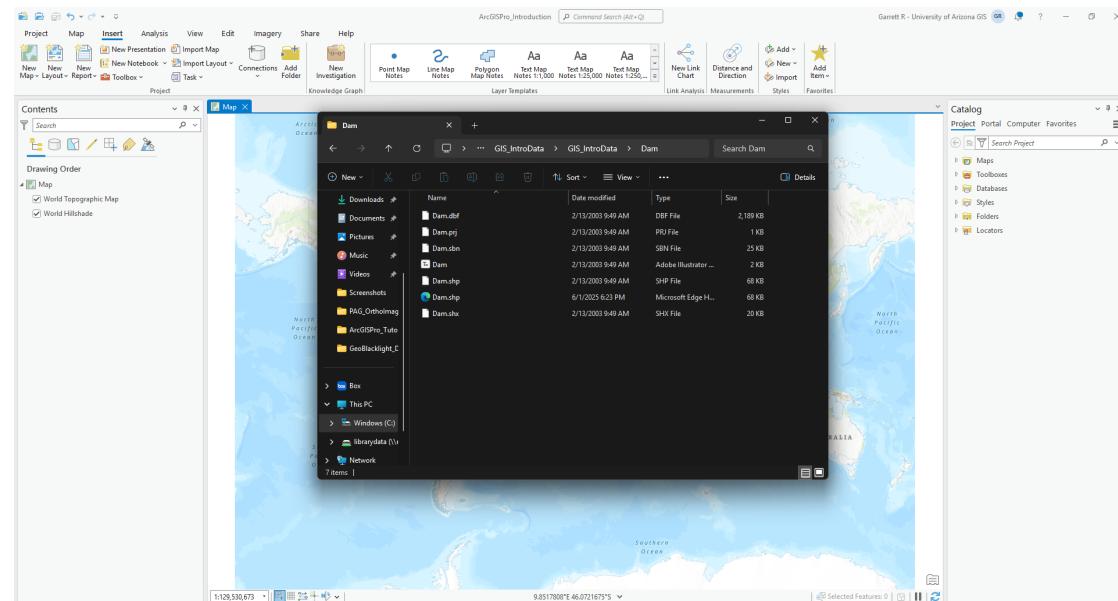
The main file storing the geography.

Dam.shx (required)

The index file that stores the index of the feature geometry.

HELPFUL HINT:

Whenever copying data in the File Explorer window it is important to make sure that each of the required files listed above are located in the same folder. Generally it is a good habit to create folders for individual datasets before copying and/or moving them in the File Explorer window to make sure all the required files are available for the display of the data in the ArcGIS Pro environment.



1

ARCGIS TUTORIAL STARTING ARCGIS PRO AND STARTING A NEW PROJECT

ARCGIS PRO USER INTERFACE

1. Return to your project in ArcGIS Pro.

ARCGIS PRO USER INTERFACE:

The ArcGIS Pro user interface consists of a number of windows, with the default view consisting of the Content, Map, and Catalog panes as well as the ribbon located at the top of the screen containing a number of tabs.

Additional panes will open as you proceed through the course and take advantage of other ArcGIS Pro functionality.

Contents

Lists all the data layers that are present on the map. Just like a layer cake, the data layer that is the top of the Contents pane will be displayed on top of all the data that exists below it.

Map

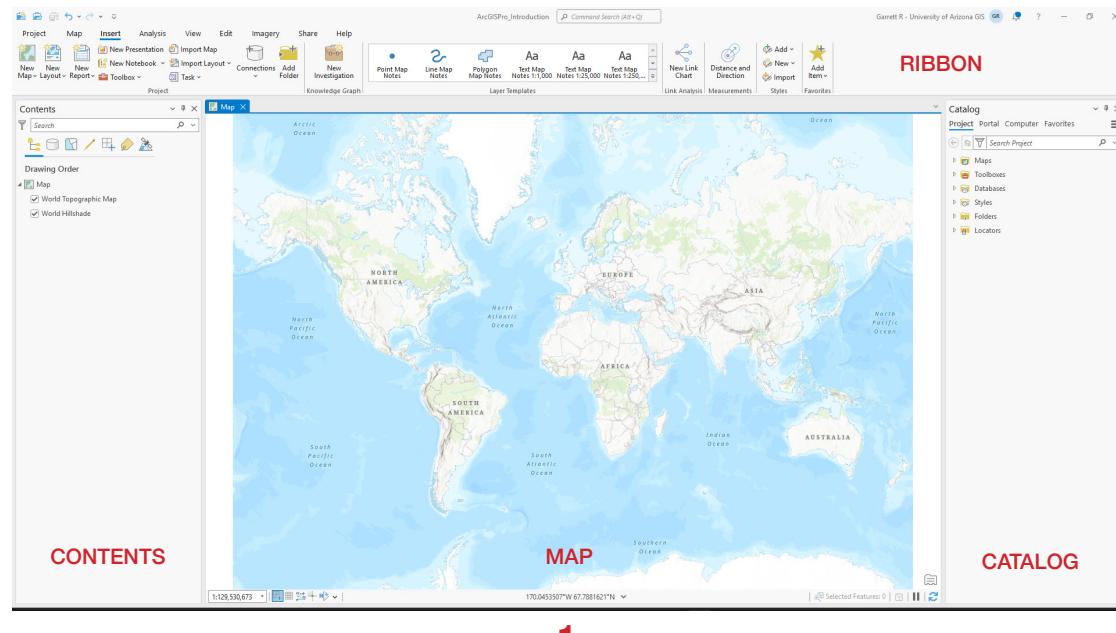
Displays the data from the Contents pane in a geographical context.

Catalog

Lists all the files associated with the project.

Ribbon

Quick access to a number of ArcGIS Pro tools and commands.



1

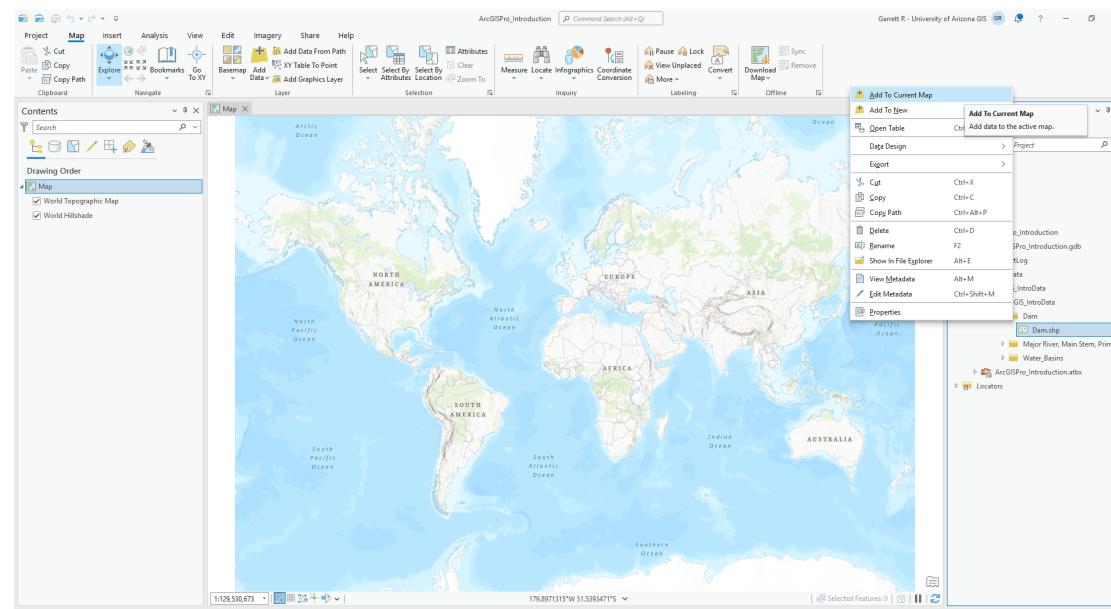
SIMPLE DATA EXPLORATION

1. Add the Dam.shp (shapefile) to the map by either dragging and dropping them on the Map pane or right-clicking on the Dam.shp file and selecting Add To Current Map.
2. In the Contents pane right-click on Map and select Properties.

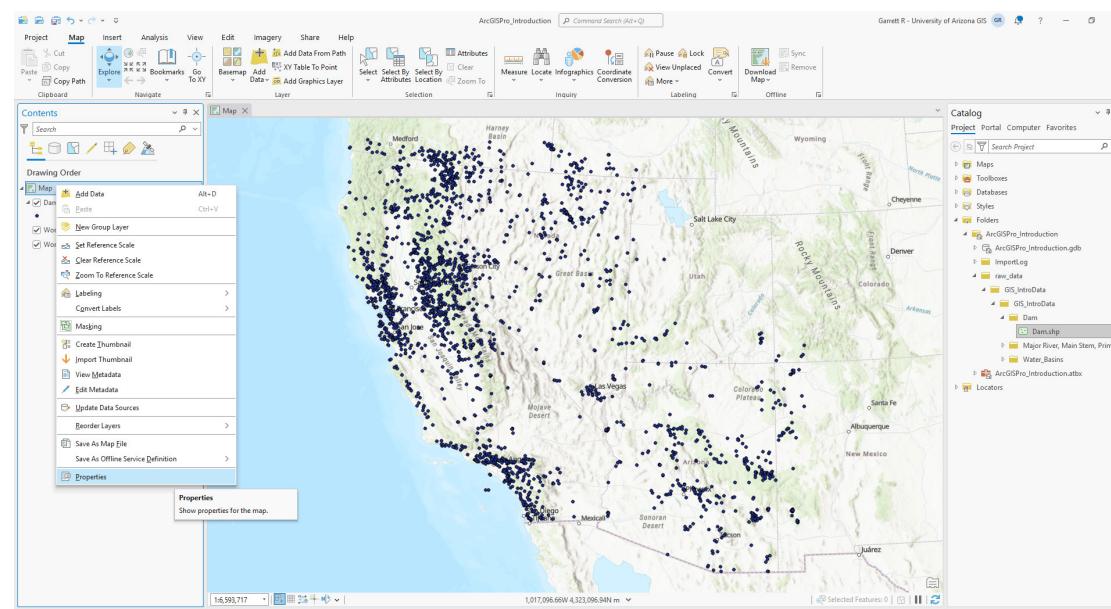
SHAPEFILES:

Shapefiles, also known as vector data, is a file storage format that stores the geographic location, shape, and attributes (table) of geographic features of the same geometry type. Notice, in the Catalog pane, that you can only see the .shp files and not the other files that underlie the data that is found in the same folders if you were to open them in the Windows File Explorer as you did previously. Shapefiles are represented as points, lines, and polygons.

Points are used to represent the location of something on the Earth's surface through the use of the location's latitude and longitude. Lines consist of nodes (points) and arcs (connect nodes to one another) and can be measured using length. Finally, polygons also consist of nodes and points but are closed and can be measured using area.



1



2

ARCGIS TUTORIAL STARTING ARCGIS PRO AND STARTING A NEW PROJECT

3. In the Map Properties window select Coordinate Systems and notice that the Current XY is set to NAD 1983 UTM Zone 12N. If you expand Layers and NAD 1983 UTM Zone 12N you will notice that the coordinate system for the map has been inherited from the Dam feature layer. Click OK to exit the Map Properties window..

4. Add the CO4.shp and Water_Basins.shp files to your map.

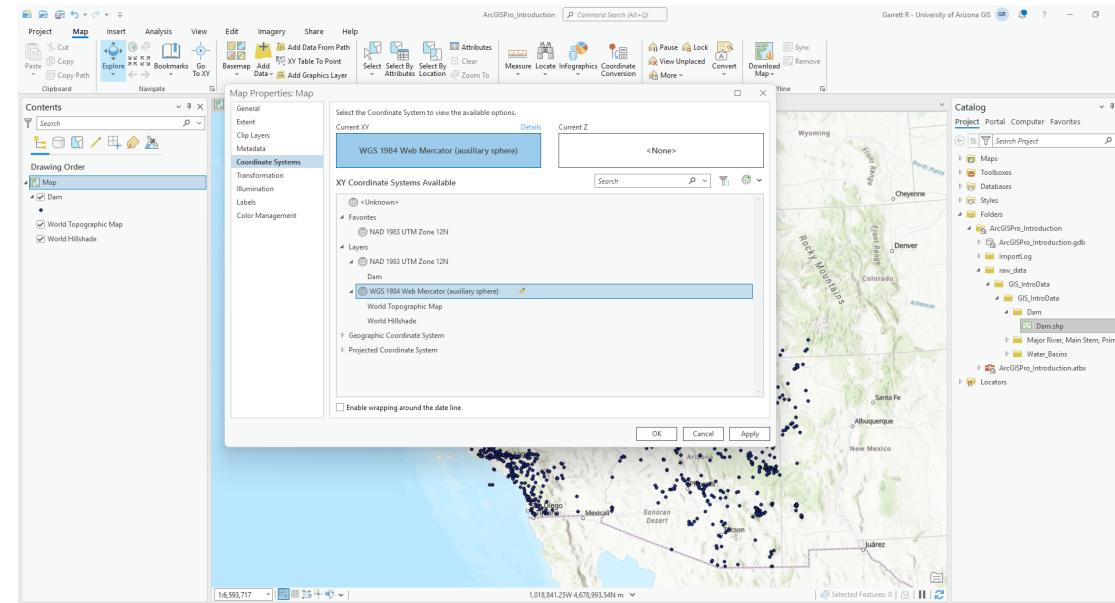
PROJECTED COORDINATE SYSTEMS:

Geospatial data contains numerical information that allows it to be positioned on the Earth's surface when brought into a GIS software program. This numerical information is also known as the coordinate system and provides the reference that places the feature on the surface of the Earth, allows the data to align with other data, and that allows for accurate spatial analysis and map creation.

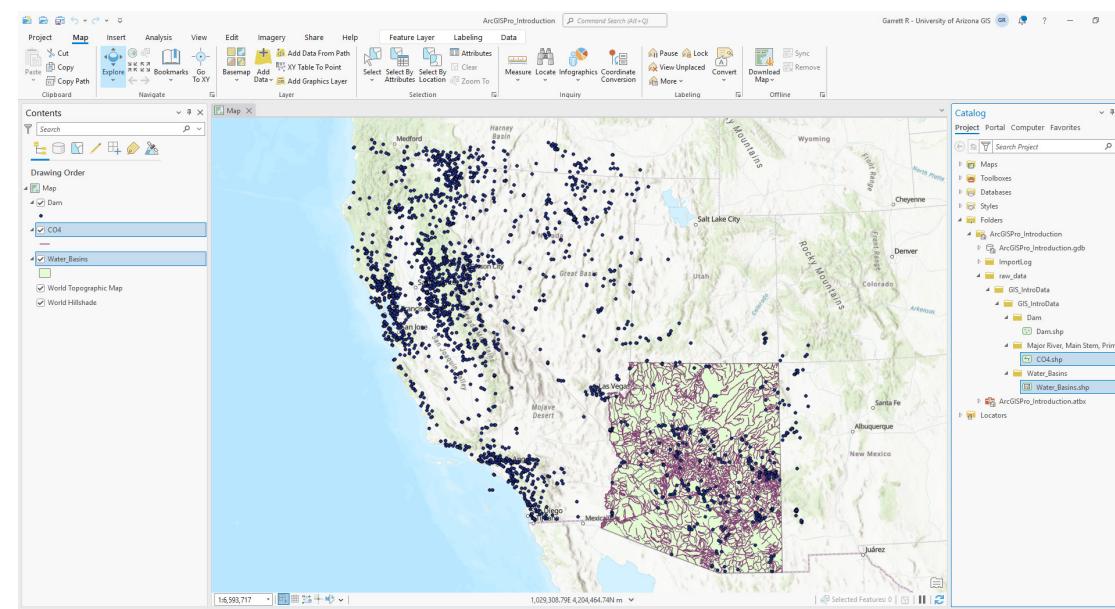
Projected coordinate systems are comprised of a geographic coordinate system and a map projection that contains the mathematical calculations that converts angular coordinates to planar (flat) coordinates.

HELPFUL HINT:

ArcGIS Pro is able to reproject data on the fly so that any data that is added to the map will inherit the coordinate system that is defined from the map. It is always a good idea when you start any project to set the map's coordinate system so that all data will inherit that coordinate system for the project.



3



4

ARCGIS TUTORIAL STARTING ARCGIS PRO AND STARTING A NEW PROJECT

5. Right-click on the Dam feature layer and select Attribute Table.

6. The attribute table contains all the attributes (characteristics) of the individual feature and is displayed as a table of rows (features) and columns (attributes) contained within the shapefile.

ATTRIBUTE TABLES:

Attribute tables consist of the following characteristics:

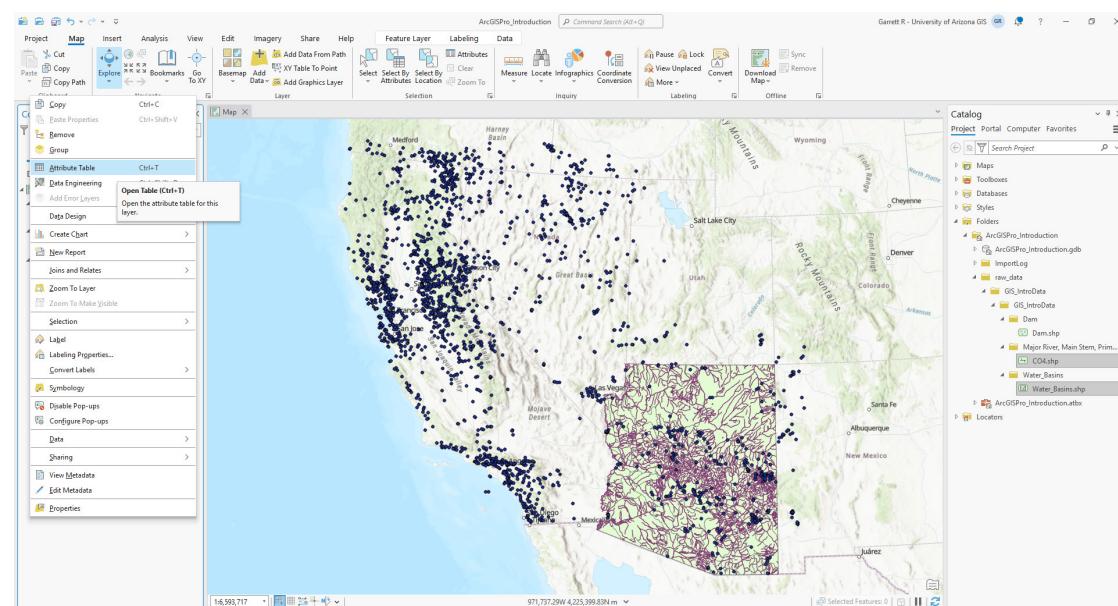
Tables that contains rows

All rows in the table have the same fields

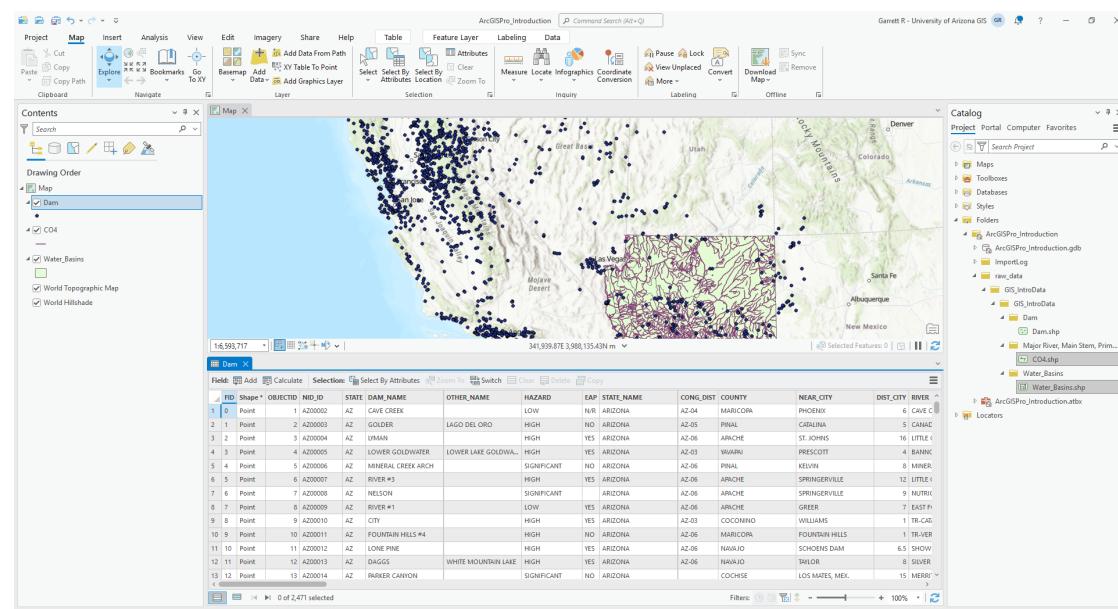
Each column has a data type (integer, decimal, number, character, date)

HELPFUL HINT:

Whenever loading new data into a GIS project it is good practice to (1) place the data on the Map to ensure that it is contained within your study area and to (2) open the attribute table after loading the data into the Contents pane to make sure that there are attributes listed that will ensure that you are able to complete your GIS analysis.



5



6

END