



Introduction to ArcGIS Pro

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- ▶ Brief tour of ArcGIS Pro Start Page
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 - ✓ Connecting to a folder
 - ✓ Performing a query
 - ✓ Tools
- Creating a map from start to finish


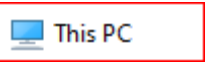


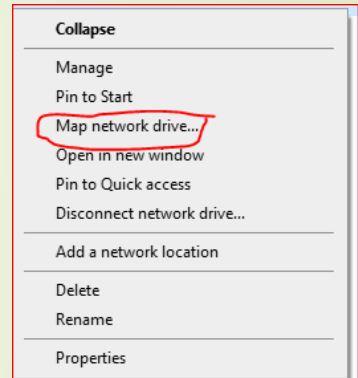
Disclaimer

- ▶ This course is entirely hands-on learning, and it is advised that you use two monitors – one for reading and one for doing the exercises.
- ▶ It is also advised to follow along with the instructor as this is an emersion course, and you will better understand the material when:
 - ❓ We go through the exercises
 - ❓ And afterward, when you use the skills taught in this course.
- ▶ I will try to accommodate your individual needs. If you need help, please feel free to tell the instructor to slow down.



Connecting to the Course 2 Directory

- If you haven't mapped a network drive to the course directory, go to: \\dotb6gishr01\WVDOT_Training\Course2
- To map to a network drive, open a file browser 
- On the left-hand side is the quick access toolbar which lists all the files and folders and mapped drives located on 'This PC'. 
- Search for a button called 'This PC' and right click on it
- Then select 'Map network drive'
- This will bring up an interactive window where you can connect to a drive



Connecting to the Course 2 Directory

- ▶ In this window, follow these steps:
 - ▶ Drive Box:
 - ✓ Select a letter, A through Z, that corresponds to a mapped network location or hard disk drive on the computer.
 - ✓ If it isn't mapped already, choose Q drive.
 - ▶ Folder Box
 - ✓ Identifies the location of the network this file or file share is located at
 - ✓ Every Share has the same format:
 \\server\share
 - ✓ The Server is the physical location on the network where the shared folder is being hosted from
 - ✓ Share refers to shared directory where the geographical data is stored
 - ✓ For us,
 - ✓ The server is : [dotb6gisrh01](#)
 - ✓ The shared directory is: [WVDOT Training\Course2](#)
 - ✓ Copy [\\dotb6gisrh01\WVDOT Training\Course2](#) in the Folder Box.

Connecting to the Course 2 Directory

? For the next two boxes, leave the default as:

- ✓ Check 'Reconnect at sign in' – means the drive will reconnect every time the user logs onto the computer
- ✓ Leave unchecked 'Connect using different credentials' – this means that the drive will use special credentials to access the drive.

- The window should look like this.
- Click finish.



Connecting to the Course 2 Directory

Map Network Drive

What network folder would you like to map?

Specify the drive letter for the connection and the folder that you want to connect to:

Drive: Q:

Folder: \\dotb6gishr01\WV DOT_Training\Course2 Browse...

Example: \\server\share

Reconnect at sign-in

Connect using different credentials

[Connect to a Web site that you can use to store your documents and pictures.](#)

Finish Cancel





Introduction to ArcGIS Pro

Section 1: GIS Recap



GIS Recap

- ▶ Stands for **G**eographical **I**nformation **S**ystems
- ▶ Every feature on earth has a geographical location that is defined by a set of two or more points called coordinates.
- ▶ These are based on lines running North and South (Latitude) and East and West (Longitude) that are part of the coordinates.
- ▶ There is a series of strategically placed disks with known Lat and Long coordinate points and heights called geodetic markers, and highly accurate GPS receivers that continuously transmit Lat, Long, and Height coordinates called Continuously Operating System (CORS) network.
- ▶ These form an interwoven network (grid) called a spatial reference system.
- ▶ There are two types of spatial references that locate data:
 - ❓ Geographic: Which provides the precise coordinate location on earth
 - ❓ Projection: Which provides measurements such as length, area, and scalability



GIS Recap

- There are a set of constraints that specify and define these coordinates called datum. These include:
 - ? Horizontal – measures distances from the equator and prime meridian
 - ? Vertical – measures height
 - ? Geodetic – measures both distance and height as well as time using satellites
- GIS also consists of an Informational component used for:
 - ? Identifying Characteristics such as feature name, feature type, and facts and figures
 - ? Measurements such as distance and beginning and ending points
 - ? Figures and features that:
 - ✓ Aide in decision making
 - ✓ Illustrate a feature or theme
 - ✓ Provide reference for navigation



GIS Recap

- Information is assembled from data or a collection of raw, unorganized facts, figures, symbols, descriptions, etc.
- Data we use are called Geospatial data because they have a geographical component associated with them
- Geospatial data are housed in tables, spreadsheets, or databases. These are made up of:
 - ❑ Fields or columns which are shared attributes (characteristics) of multiple features
 - ❑ Rows which are the individual records of each feature and consist of many fields
- When found in Geospatial Datasets, these are called Attribute Tables



GIS Recap

➤ Geospatial data can be found in the following formats:

? Vector

? Raster

? Triangular Irregular Network (TIN)

➤ Geospatial Data are stored in:

? Shapefiles

? Feature classes

? Various raster formats

➤ Data can reside in folders (stand alone shapefiles and rasters), personal geodatabases, file geodatabases, or in enterprise geodatabases (feature classes and rasters)



GIS Recap

- GIS is an Information System which is used to collect, maintain, organize and distribute geographical data.
- GIS converts the raw materials (geographical and informational components) into a finished product.
- The GIS system consists of:
 - ? The Geographical Information: such as shapefiles and geodatabases containing tables, feature classes, and raster data
 - ? The Infrastructure used to convert the Geographical information into finished products including:
 - ✓ Software used directly and indirectly for creating, maintaining, organizing and sharing the geographical information and the finished product.
 - ✓ Hardware used to house the GIS software, finished products, and raw data.
 - ✓ Network: the organized interconnected system of the software and hardware components.
 - ? The Organization develops the information, shares the finished products, and maintains the network.
 - ? Finished products such as maps and informational products and applications.



GIS Recap

- ▶ WVDOT's GIS network consist of two networks:
 - ❓ Production
 - ✓ <https://gis.transportation.wv.gov/portal>
 - ✓ <https://gis.transportation.wv.gov/server>
 - ✓ DOTB6GISDB01
 - ❓ Staging
 - ✓ <https://gisdev.transportation.wv.gov/portal>
 - ✓ <https://gisdev.transportation.wv.gov/server>
 - ✓ DOTB6GISDBST01
- ▶ These networks are composed of four components:
 - ❓ Enterprise Geodatabase Server
 - ❓ ArcGIS Portal
 - ❓ ArcGIS Server
 - ❓ ArcGIS Datastore



GIS Recap

- For the production network, the database server, DOTB6GISDB01, is composed of two enterprise geodatabases:
 - GTI_PUB_UTM
 - RIL_LRS_PUB
- GTI_PUB_UTM contains the following datasets:
 - ? Boundaries
 - ✓ Counties: West Virginia Counties
 - ✓ Incorporated_Places_20XX: Location of all incorporated municipalities, towns, and cities within WV
 - ✓ WVDOH_Districts: Polygon feature of all WVDOH Districts
 - ? Economic
 - ✓ Parcels_20XX: Statewide parcel layer used for right of way
 - ✓ WVDOT_Parcels: Location of all WVDOT owned parcels
 - ? Hydrology
 - ✓ Major_Rivers_Other_NHD: polygon feature of all major rivers in WV
 - ✓ Rives_Streams_NHD: Polyline feature of all rivers and streams in WV
 - ✓ Lakes_Oter_Waterbodies_NHD: All lakes, ponds and other waterbodies in WV



GIS Recap

? Routes

- ✓ Dominant_Routes: feature class derived from the county mile point showing the primary(dominant route) on centerline feature in WV.
- ✓ Dominant routes is used primarily for displaying routes and eventing tables to the route network.

? Transportation

- ✓ Bridges: Shows all bridges within West Virginia
- ✓ Lane_Info_RH: Shows AADT Traffic Counts, Roadway Surface Type and Lane Width
- ✓ WV_Railroads: WV Railroad Layer
- ✓ WV_DOT_Facilities: Location of WVDOT Facilities
- ✓ WV_Airports: WV Airports
- ✓ WV_Fuel_Sites: Location of all WVDOH Fuel Sites

➔ RIL_LRS_PUB

- ? County_Milepoint: Dataset showing both primary routes (Dominant) and the secondary route(Subordinate) on a centerline
 - ? Use similar to Dominant Routes for mapping routes and eventing route information
- ? LRSE_Bridges: Shows slimmed down version of the bridge feature class in GTI_PUB_UTM
- ? Street_Name_Sams: Has the street names of every route in WV





Introduction to ArcGIS

Section 2: ArcGIS Pro Start Page





Questions

- How many of you use some sort of GIS software currently?
- Show of hands, how many use ArcMap?
- Show of hands, how many use ArcGIS Pro?
- How many of you have created a map in ArcMap before?
- How many of you have created a map in ArcGIS Pro before ?



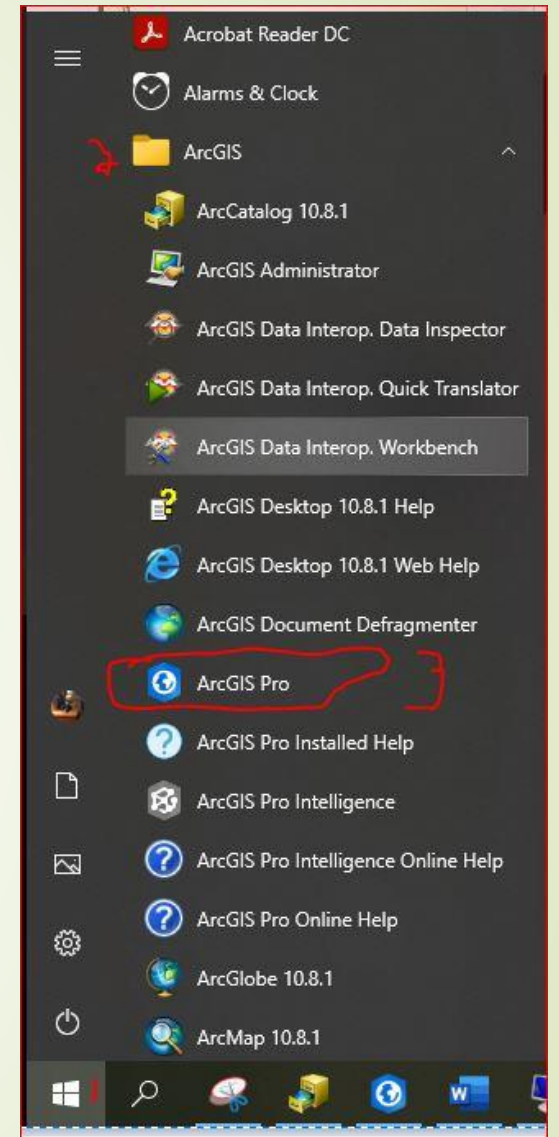
GIS Software

- As we learned earlier, GIS Software refers to a single suite of programs used to create, manipulate, manage, analyze, and share geospatial information.
- It includes:
 - ? ArcGIS Pro
 - ? ArcGIS Desktop
 - ? Quantum GIS
 - ? MicroStation
- The majority of GIS work in WVDOT is done in ArcMap in ArcGIS Desktop and in ArcGIS Pro.
- However, starting in 2026, ESRI will no longer support ArcMap making ArcGIS Pro the only way create, edit, manage and maintain geospatial data

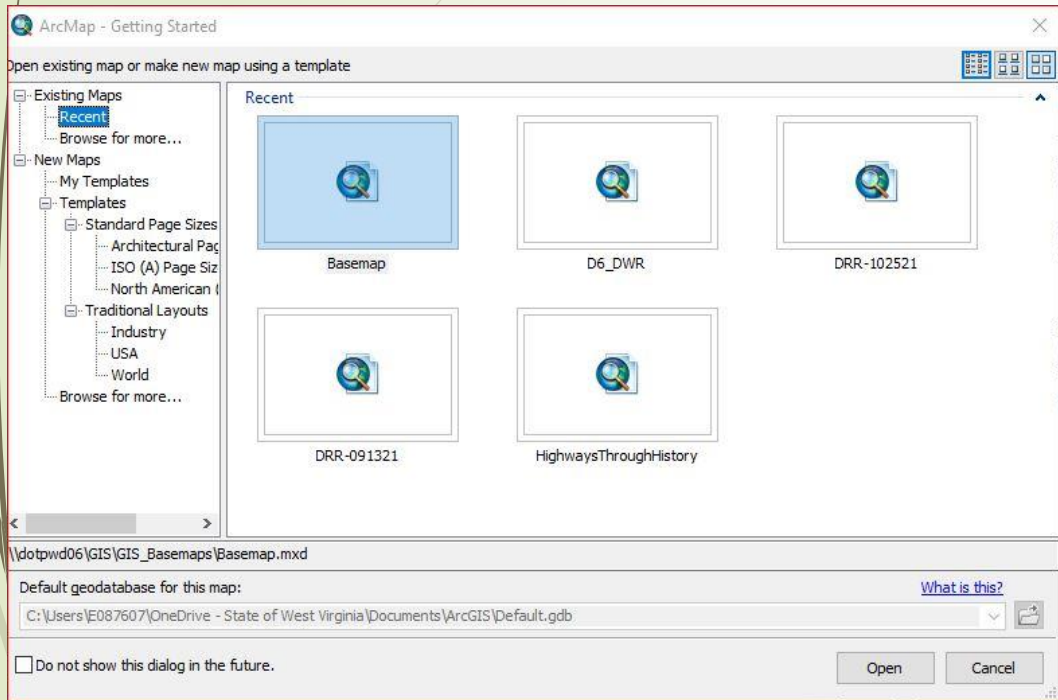


ArcGIS Pro

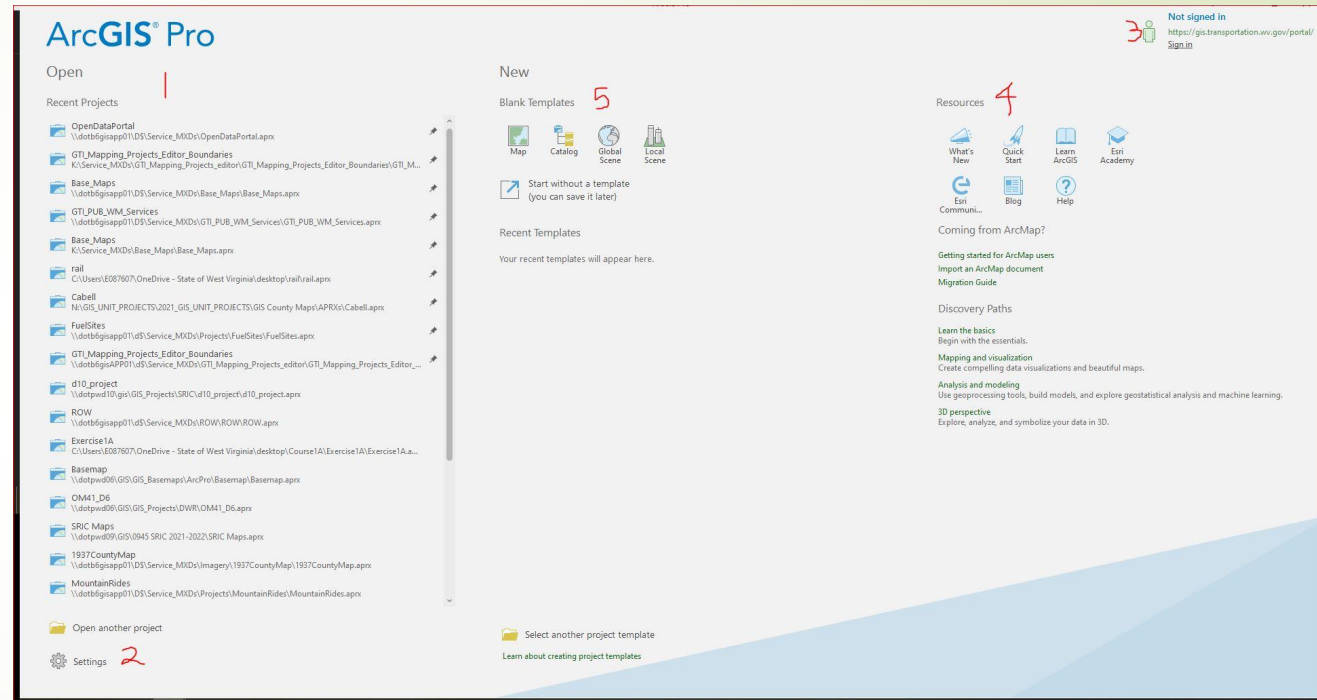
- We will continue to support both in the foreseeable future; however, we will slowly move to ArcGIS Pro exclusively.
- So, let's explore ArcGIS Pro.
- Go to the start folder → ArcGIS → ArcGIS Pro
- The ArcGIS Start Screen will pop up
- If the software has not been used before, a licensing screen pops up.
 - Go to \\dotb6gishr01\WVDOT_Training\materials
 - It includes a document on how to configure ArcGIS Pro. It is a step-by-step tutorial on configuring ArcGIS Pro.



ArcMap



ArcGIS Pro



Differences between Pro and Desktop

- ▶ For those who have used ArcMap before, ArcGIS Pro is fundamentally different when it comes to layout.
- ▶ There are several major differences between ArcGIS Pro and ArcGIS Desktop.
 - ▶ Pro combines all the components of ArcGIS Desktop (ArcMap, ArcCatalog, ArcScene, ArcGlobe) into a single piece of software.
 - ▶ In Pro, maps, scenes, catalogs, etc. are housed in Projects instead of a document like in ArcMap.
 - ▶ ArcGIS Pro Projects can contain multiple maps, scenes, etc. whereas an ArcMap Document can contain only one of each.
 - ▶ Toolbars in ArcMap have been replaced by tool ribbons
 - ▶ Editing of data and features are done automatically in Pro, whereas in ArcMap it is done in an editing session.

<https://www.cloudpointgeo.com/blog/2018/2/15/top-5-differences-between-arcmap-and-arccgis-pro>



Introduction to ArcGIS Pro

➤ Let's compare the start page for both.

? In ArcMap, the start page:

- ✓ Is known as the Getting Started Screen.
- ✓ Has basic functionality. Using it, you can:
 - Open map documents
 - Create new map documents using several standard templates
 - Change the default geodatabase for the map

? In ArcGIS Pro, the start page is the central hub used to:

- ✓ Access
 - Existing map projects
 - Map templates
 - Help resources
 - ArcGIS Portals



Introduction to ArcGIS Pro

✓ Create new projects such as:

- Maps
- Catalogs
- Scenes
- Blank projects

✓ Configure settings for the ArcGIS Pro software and map

➤ For our needs, we will focus on configuring settings, accessing help documents, and creating new projects

<https://www.esri.com/about/newsroom/arcuser/why-you-should-move-to-arcgis-pro/#:~:text=ArcGIS%20Pro%20features%20innovations%20that,in%20any%20other%20desktop%20GIS.&text=ArcGIS%20Pro%20uses%20a%20project,scenes%20and%20editing%20in%203D>



ArcGIS Pro Start Page

The screenshot displays the ArcGIS Pro Start Page interface. At the top left is the ArcGIS Pro logo. In the top right corner, there is a user profile icon with the text "Not signed in" and a link to "https://gis.transportation.wv.gov/portal/Sign in".

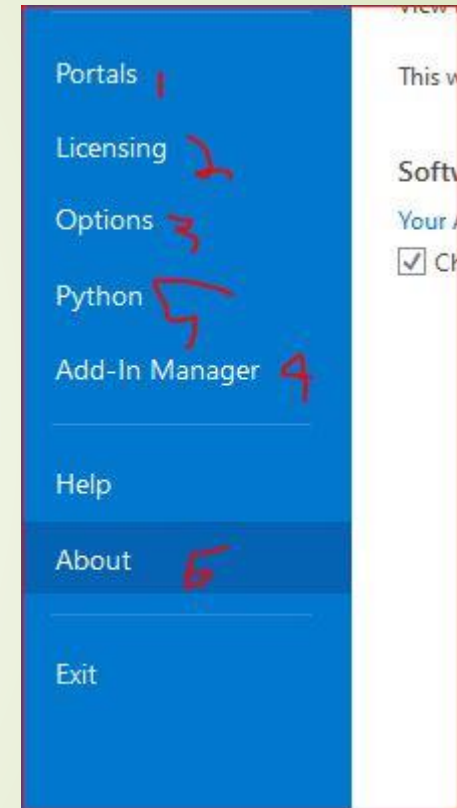
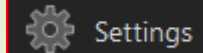
The interface is divided into several main sections:

- Open:** A list of recent projects with a scroll bar on the right. At the bottom of this section is an "Open another project" button.
- Settings:** A gear icon with a red handwritten number "2" next to it.
- New:** A section for creating new projects. It includes "Blank Templates" with a red handwritten number "5" and icons for "Map", "Catalog", "Global Scene", and "Local Scene". Below these is a button "Start without a template (you can save it later)". At the bottom of this section is a button "Select another project template" and a link "Learn about creating project templates".
- Recent Templates:** A section with the text "Your recent templates will appear here."
- Resources:** A section with a red handwritten number "4" and icons for "What's New", "Quick Start", "Learn ArcGIS", "Esri Academy", "Esri Communi...", "Blog", and "Help".
- Coming from ArcMap?:** A section with a link "Getting started for ArcMap users" and "Import an ArcMap document Migration Guide".
- Discovery Paths:** A section with three sub-sections: "Learn the basics" (Begin with the essentials.), "Mapping and visualization" (Create compelling data visualizations and beautiful maps.), and "Analysis and modeling" (Use geoprocessing tools, build models, and explore geostatistical analysis and machine learning.).

At the bottom right of the interface, there are two circular logos: the State of West Virginia logo and the GP SDMT logo.

Settings

- Click on settings.
- Here the user can:
 - ? Configure projects and ArcGIS Pro application settings and options
 - ? Add and connect to Existing ArcGIS Portal and ArcGIS Online sites
 - ? Configure and view ArcGIS Licensing options and check out the license.
 - ? Add, configure, manage and remove ESRI Service Extensions
 - ? Add, configure, update, and view Python scripting packages
 - ? Add in external widgets and programs
 - ? Update ArcGIS Pro

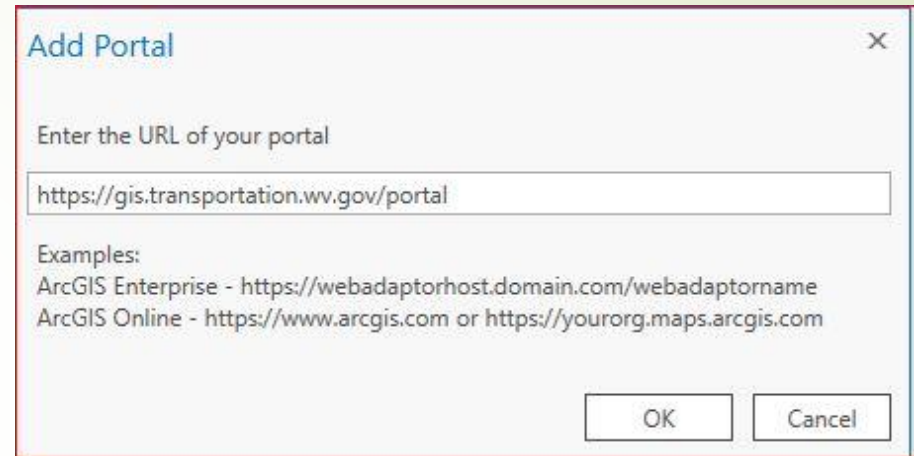


Adding Portals

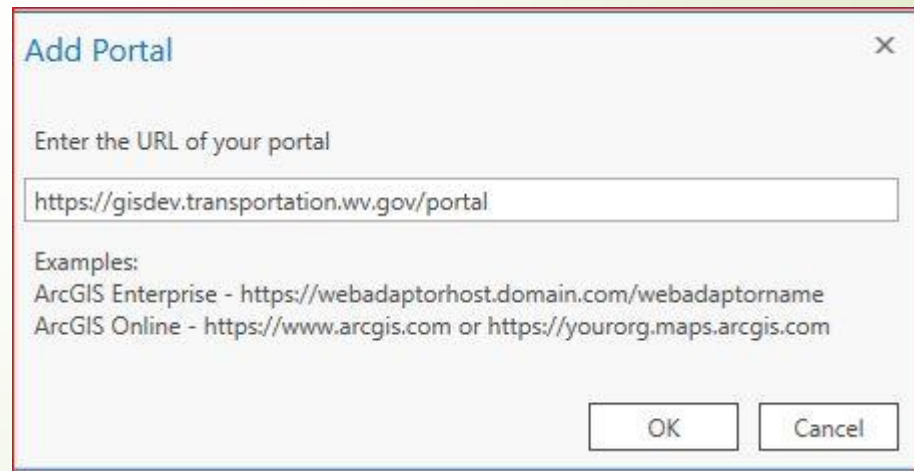
- On the Settings page, click on the Portal tab in the settings menu.
- As described on the previous slide, this is where the user can add and connect to the existing ArcGIS Portal and ArcGIS Online sites.
- This is important to configure when you start because with Portal and ArcGIS Online one can:
 - ? Access pre-produced mapping products and services
 - ? Participate in certain mapping and data management activities that are part of a job including editing:
 - ? Certain feature datasets that have been branch versioned
 - ? Web applications for verification and editing
 - ? Publish and share interactive maps with other users
- Additionally, the portal screen is where the user switches between the portals.
- ArcGIS Online is added by default.

Connecting ArcGIS Portal

- Click on add portal.
- As you remember, we have a staging and production network in WVDOT, each with their own ArcGIS Portal.
- Add the production portal. Its web address is: <https://gis.transportation.wv.gov/portal>
- Click Ok
- Repeat the above 3 steps this time for the staging portal. Its web address is:
<https://gisdev.transportation.wv.gov/portal>
- The final screen should look like this:



The screenshot shows a dialog box titled "Add Portal" with a close button (X) in the top right corner. Below the title, there is a label "Enter the URL of your portal" and a text input field containing the URL "https://gis.transportation.wv.gov/portal". Below the input field, there are "Examples:" listed: "ArcGIS Enterprise - https://webadaptorhost.domain.com/webadaptorname" and "ArcGIS Online - https://www.arcgis.com or https://yourorg.maps.arcgis.com". At the bottom right, there are two buttons: "OK" and "Cancel".



The screenshot shows a dialog box titled "Add Portal" with a close button (X) in the top right corner. Below the title, there is a label "Enter the URL of your portal" and a text input field containing the URL "https://gisdev.transportation.wv.gov/portal". Below the input field, there are "Examples:" listed: "ArcGIS Enterprise - https://webadaptorhost.domain.com/webadaptorname" and "ArcGIS Online - https://www.arcgis.com or https://yourorg.maps.arcgis.com". At the bottom right, there are two buttons: "OK" and "Cancel".

Connecting ArcGIS Portal

Portals

	https://gis.transportation.wv.gov/portal/ Available : Not signed in		...
	https://gisdev.transportation.wv.gov/portal/ Available : Not signed in		...
	https://www.arcgis.com/ Available : Not signed in		...

Sign in using browser

[Learn more about managing portal connections](#)



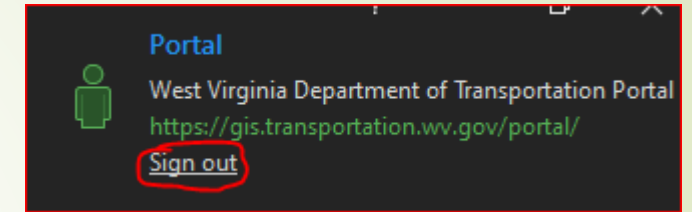
Connecting ArcGIS Portal

- Now, set the default portals.
 - By default, it is set to ArcGIS Online.
 - The two that are most frequently use are:
 - WV DOT Production Portal
 - ArcGIS Online
- Right click on <https://gis.transportation.wv.gov/portal> and select 'Set As Active Portal'.
- Return out of the portal screen and go back to the ArcGIS Pro home screen.
- The portal screen in the top right corner of the home screen should change to reflect the new portal.



Connecting ArcGIS Portal


- Click on the 'Sign in'.
- There are two ways to access the Portal.
 - Username: EXECUTIVE\A, B, E number
 - Password: Password used to log onto your computer
- Or
 - Username: A, B, E number@EXECUTIVE
 - Password: Password used to log onto your computer
- Using one of these methods, log into portal to access it.
- Please refer to the next slide to see how to sign in.



Sign Ins

ArcGIS Sign In

ArcGIS Pro wants to access your WVDOT Staging Portal account information

Sign in to WVDOT Staging Portal with 


ArcGIS login

[Forgot password?](#)

Sign in automatically [Sign In Using Browser](#)

ArcGIS Sign In

ArcGIS Pro wants to access your WVDOT Staging Portal account information

Sign in to WVDOT Staging Portal with 

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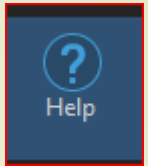


Resources

- Directly after the portal 'sign in' page is the Resources page.
- Resources is beneficial to the ArcGIS Pro user after this course because it provides:
 - ? ArcGIS Pro help resources
 - ? Free ESRI training course opportunities through Learn ArcGIS and ESRI Academy
 - ? Access to other ArcGIS professionals through ESRI Community and Blog
 - ? Learning paths to further cultivate your skills with ArcGIS Pro
 - ? Access to what's new and coming down the path
- ? We're going to focus on Help, Learn ArcGIS, ESRI Academy, ESRI Community, and the Learn the Basics Discovery Path



Resources



Resources

- What's New
- Quick Start
- Learn ArcGIS
- Esri Academy
- Esri Communi...
- Blog
- Help

Coming from ArcMap?

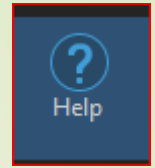
- [Getting started for ArcMap users](#)
- [Import an ArcMap document](#)
- [Migration Guide](#)

Discovery Paths

- [Learn the basics](#)
Begin with the essentials.
- [Mapping and visualization](#)
Create compelling data visualizations and beautiful maps.
- [Analysis and modeling](#)
Use geoprocessing tools, build models, and explore geostatistical analysis and machine learning.
- [3D perspective](#)
Explore, analyze, and symbolize your data in 3D.



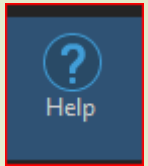
ESRI Help



- Click on the help button, this brings you to the ESRI ArcGIS Pro's Knowledge Base.
<https://pro.arcgis.com/en/pro-app/latest/get-started/get-started.htm>
- It consists of:
 - ? Information and walk throughs on utilizing different tools
 - ? Descriptions and walk arounds for errors encountered
 - ? Access to different ESRI resources such as:
 - ✓ Features
 - ✓ Courses
 - ✓ Blog
 - ✓ News
 - ✓ New software features
 - ? Access to downloadable software and extensions
- Any time inside ArcGIS Pro, ESRI Help can also be accessed by hitting the F1 key.



ESRI Help



https://pro.arcgis.com/en/pro-app/latest/help/main/welcome-to-the-arcgis-pro-app-help.htm

esri Products Industries Support & Services News About

ArcGIS Pro Overview Extensions Features Resources Free Trial Contact Sales Pricing

Home Get Started Help Tool Reference Python SDK

Search ArcGIS Pro help

Help

- Projects
- Maps and scenes
- Data
- Analysis and geoprocessing
- Metadata
- Layouts
- Reports
- Production
- Workflows
- Share your work

ArcGIS Pro help

ArcGIS Pro 2.9 | [Other versions](#) | [Help archive](#)

ArcGIS Pro is the essential application for creating and working with spatial data on your desktop. It provides tools to visualize, analyze, compile, and share your data.

Build projects

ArcGIS Pro organizes the resources you use into [projects](#). A project contains maps, layouts, layers, tables, tasks, tools, and connections to servers, databases, folders, and styles. Projects can also incorporate content from your [organization's portal](#) or [ArcGIS Online](#).

- Build your own project or start by opening a [project template](#) created by Esri or others in the community.
- Add content to your project by browsing, [searching your project](#), or [searching your active portal](#).
- Be sure to [save your project](#) so it's ready the next time you start ArcGIS Pro.
- When you want to share your project, you can [create project templates](#) for others to use as a starting point or [package the project and its data](#).
- Configure ArcGIS Pro to your needs by setting [project and application options](#) and [customizing the ribbon](#).



In this topic

- [Build projects](#)
- [Map and visualize your data](#)
- [Perform analysis and geoprocessing](#)
- [Manage and edit your data](#)
- [Use tasks to streamline your work](#)
- [Share your work](#)
- [Access learning resources](#)

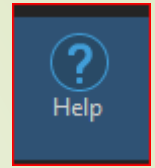
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ESRI Help Topic Tutorial



- To search by a topic go to Search ArcGIS Pro Help box. We will type in “how to create a geodatabase”
- Select the first entry
- This is a typical help article.
- It consists of:
 - ❓ An overview of the topic
 - ❓ Hyperlinks to related help topics
 - ❓ If a tool is involved, an overview of the tool includes:
 - ✓ A description and use of the tool
 - ✓ An overview of each field corresponding to the tool
 - ✓ Sample python scripts
- Explore this Help Topic screen. Once you are done, close out of it and return to ArcGIS Pro Start Screen.



ESRI Help Topic Tutorial



Help / Data / Geodatabases

Create geodatabases

ArcGIS Pro 2.9 | [Other versions](#) | [Help archive](#)

There are three primary ways you can create geodatabases:

- Use a [geodatabase XML workspace document](#) to copy an existing geodatabase schema and subsequently load datasets into the copied geodatabase.
- [Copy the schema and contents](#) of an existing geodatabase.
- Design and create an empty geodatabase and subsequently define the schema and load datasets into it. For a summary of how to create each type of geodatabase and links to instructions, see the sections below.

For information about designing a geodatabase, see the [Data design](#) and [Define data properties](#) sections of this help system. For information about loading datasets, see the [Add datasets to a geodatabase](#) section of this help system.

File geodatabase

You can create a file geodatabase directly in a folder in the **Catalog** pane or run a geoprocessing tool or script. See [Create a file geodatabase](#) for instructions.

Mobile geodatabase

You can create a mobile geodatabase directly in a folder in the **Catalog** pane or run a geoprocessing tool or script. See [Create a mobile geodatabase](#) for instructions.

In this topic

- [File geodatabase](#)
- [Mobile geodatabase](#)
- [Enterprise geodatabase](#)

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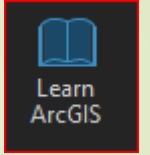
[Cookies Settings](#)

Help / Data / Geodatabases

- ▼ The geodatabase
 - What is a geodatabase?
 - The architecture of a geodatabase
 - Fundamentals of the geodatabase
 - Table basics
 - Feature class basics
 - Types of geodatabases
 - Client and geodatabase compatibility
 - Create geodatabases**
 - › Copy geodatabase schema
 - › Define data properties
 - › Add datasets to a geodatabase
 - › Data design
 - › Data management and transactions
 - › Versioned data
 - › Manage distributed data



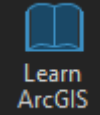
Learn ArcGIS – ArcGIS Lesson Gallery



- Click on the Learn ArcGIS button, this brings you to the ArcGIS Lesson Gallery.
<https://learn.arcgis.com/en/gallery/?rsource=https%3A%2F%2Flinks.esri.com%2Farcgis-learn-pro-lesson-gallery#?p=arcgispro>
- The Gallery is a collection of self-paced courses developed by ESRI for all its software packages.
- These packages:
 - ? Get users accustomed to new software (our case)
 - ? Teach users new skills or techniques
 - ? Teach users how to perform different types of analysis
 - ? Are informal
- Courses are found on a variety of skill levels from beginner to expert.
- Now search for Getting Started with ArcGIS Pro, something we'll use later.
 - Minimize this this screen and return to ArcGIS Pro.



Learn ArcGIS – ArcGIS Lesson Gallery



Learn ArcGIS Choose an Experience ▾ Discover a Capability ▾ Explore a Product ▾ Lesson Gallery Sign In English ▾


Lesson Gallery

Enter a product name or keyword like 'Get started'

Filter

- All Capabilities ▾
- ArcGIS Pro ▾
- All Topics ▾
- All Types ▾
- All Regions ▾
- New User ▾
- [Clear Filters](#)

Filters [ArcGIS Pro X](#) [New User X](#) [Clear Filters](#)




COURSE & CURRICULUM

Health information systems modernization

Health professionals can follow the exercises here to develop expertise in innovative technology; connect maps, apps, data and people; and make more informed health decisions.

🕒 40 hr




LESSON

Convert a list of historic places into a map in ArcGIS Pro

Use geocoding to map some of the oldest continuously inhabited cities in Africa.

🕒 45 min

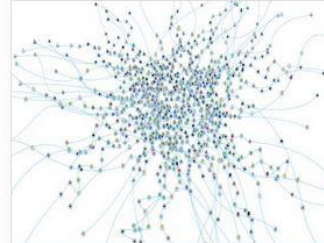


COURSE & CURRICULUM

Official Statistics Modernization GIS Curriculum

Covering every stage of the census process, these tutorials teach you how to plan your work, conduct field data collection, monitor your operations, and disseminate your authoritative data, all using ArcGIS.

🕒 40 hr

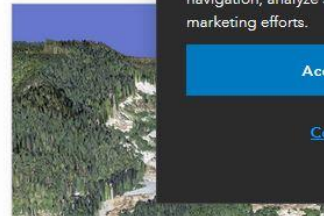





PATH

Working with spatiotemporal data in ArcGIS Pro Intelligence

Using, analyzing, and visualizing activity in both space and time.

🕒 1 hr 4 min



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9:09 AM



ESRI Academy



- Click on the Esri Academy button. This brings you to the ESRI training site:

<https://www.esri.com/training/catalog/search/>

- This is ESRI's formal training site where the user can:
 - ❓ Explore and take both free and paid courses from ESRI
 - ❓ View, create, and access learning plans
 - ❓ Track progress and achievement
 - ❓ Take online courses to get certified in ESRI
- In 'Search Courses', type in "Introduction to ArcGIS Pro" and select Free.
- This gives additional courses that will supplement this course.
- Minimize this screen and return to ArcGIS Pro.



ESRI Academy



The screenshot displays the Esri Academy website interface. At the top, there is a navigation bar with the Esri logo and links for Products, Solutions, Support & Services, Stories, and About. A search bar and "Sign In" link are also present. Below this is a secondary navigation bar with "Esri Academy" and links for About, Catalog (which is highlighted), Certification, My Academy, and Help. A third navigation bar offers options like Course Catalog, Courses by Schedule, Courses by Location, New and Retired Training, and Learning Plans.

The main content area features a large blue banner with the text "Explore Our Courses". Below the banner is a search bar labeled "Search Courses" with a search icon and a share icon. Underneath the search bar is a "Browse by Topic" section with nine topic-based icons: Getting Started, ArcGIS Products, Data Management, Mapping, Spatial Analysis & Data Science, Field Operations, Scripting & Development, Imagery & Remote Sensing, and 3D Visualization & Analytics.

Below the topics, there are filters for FORMATS (set to "Viewing All"), PRODUCTS (set to "ArcGIS Pro"), and checkboxes for "Maintenance" and "Free". There are also SORT (set to "Popularity") and VIEW (grid and list icons) options.

The results section shows "Viewing: 264 Results" with a "Clear Search" link. Three course cards are visible:

- MOOC: Spatial Data Science: The New Frontier in Analytics**
Course opens Oct 5, 2022
6 Weeks
Free
15836 ratings
- WEB COURSE: GIS Basics**
2 Hours, 35 Minutes
Free
2505 ratings
- WEB COURSE: Getting Started with ArcGIS Pro**
5 Hours, 30 Minutes
Free
19322 ratings

Each course card includes a heart icon for favorites and a plus icon for more options. A partial sidebar on the right shows the text "By clic storing naviga marks".



ESRI Community



- Click on the Esri Community button. This brings you to the ESRI Community.

https://community.esri.com/t5/arcgis-pro/ct-p/arcgis-pro?rmedium=links_esri_com_e_i&rsource=https%3A%2F%2Flinks.esri.com%2Fgeonet-arcgispro

- This is a hosted site from ESRI for the user community and ESRI employees to:
 - ❓ Post questions about a problem they are having
 - ❓ Provide assistance and solutions to other users
- Covers all ESRI Software products and solutions
- Minimize this scree.



ESRI Community



Community

All Communities ArcGIS Ideas Community Basics Sign In

ArcGIS Pro Questions 271 36.2M 10.3K

ArcGIS Pro Blog 274 1.5M 65

ArcGIS Pro Documents 245 653.4K 42

ArcGIS Pro Videos 236 27.8K 22

ArcGIS Pro Ideas 328 8.7M 4.1K

Latest Activity

Sort/Filter: Created

Create A Post

POST **Trying to use the append tool**
I am trying to append an existing layer with the result of a GEOcoder. I am getting this error code when trying to r...
by **Zelong** • New Contributor II
in **ArcGIS Pro Questions** • Last Updated 26m ago

POST **labelling and scaling - some points display, others don't**
New to GIS! Learning pretty much on my own. Inherited Cleaning Map with all attributes, symbology, etc. already set ...
by **BarbaraDabney** • New Contributor
in **ArcGIS Pro Questions** • Last Updated 44m ago

POST **Trying to fix different projection error w/ "Esri 2020 Land Cover" layer**
In ArcGIS Pro where I am using the standard, out-of-the-box "World Imagery" basemap, I am using the "Esri 2020 Land C...
by **JohnSasso** • New Contributor II

Top Collaborators

USER	COUNT
DanPatterson MVP	17
Robert_LeClair esri	6
JayantaPoddar MVP	6
jcarlson MVP	
AdrianWelsh MVP	
MervynLatter	

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Learn The Basics

Learn the basics
Begin with the essentials.

- Click on the Learn the Basics button. This brings you to the ESRI Community.

https://learn.arcgis.com/en/paths/try-arcgis-pro/?rmedium=links_esri_com_j_r&source=https%3A%2F%2Flinks.esri.com%2Flearn-try-arcgis-pro

- Learn the Basics provides a prescribed curriculum for learning ArcGIS Pro to supplement this course.
- Courses in the Lesson Gallery include [Get started with ArcGIS Pro](#) which is good segway into the next section utilizing ArcGIS Project.
- Minimize this screen and return to ArcGIS Pro.



Learn the Basics

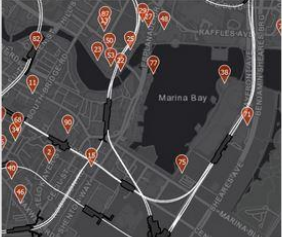
Learn the basics
Begin with the essentials.

Learn ArcGIS Choose an Experience Discover a Capability Explore a Product Lesson Gallery Sign In English

Lesson Gallery / Path

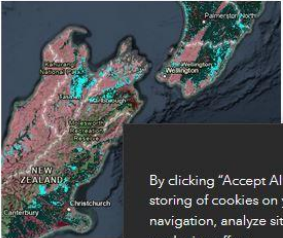
Try ArcGIS Pro

Get started with the essentials of ArcGIS Pro.

- 


Get started with ArcGIS Pro

Create a map to help tourists in Singapore find places of interest.

30 min
Lesson
- 

Explore data in ArcGIS Pro

Explore data with pop-ups, tables, statistics, and charts.

45 min
Lesson
- 

Symbolize map layers

Use symbology methods and effects to draw a city transportation network.

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3:10 PM





Introduction to ArcGIS Pro

Section 3: Utilizing ArcGIS Pro



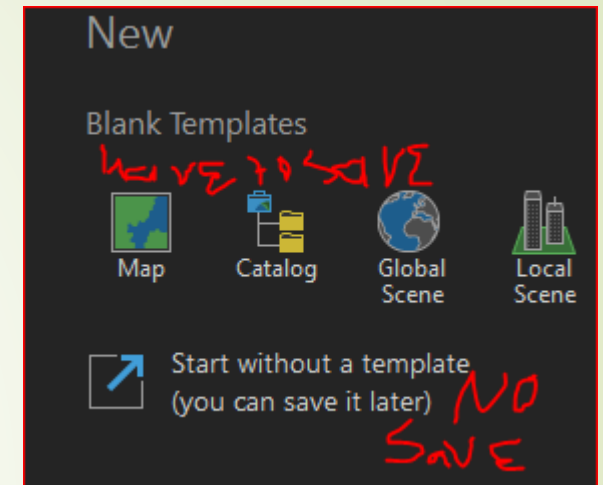


Section 3: Utilizing ArcGIS Pro

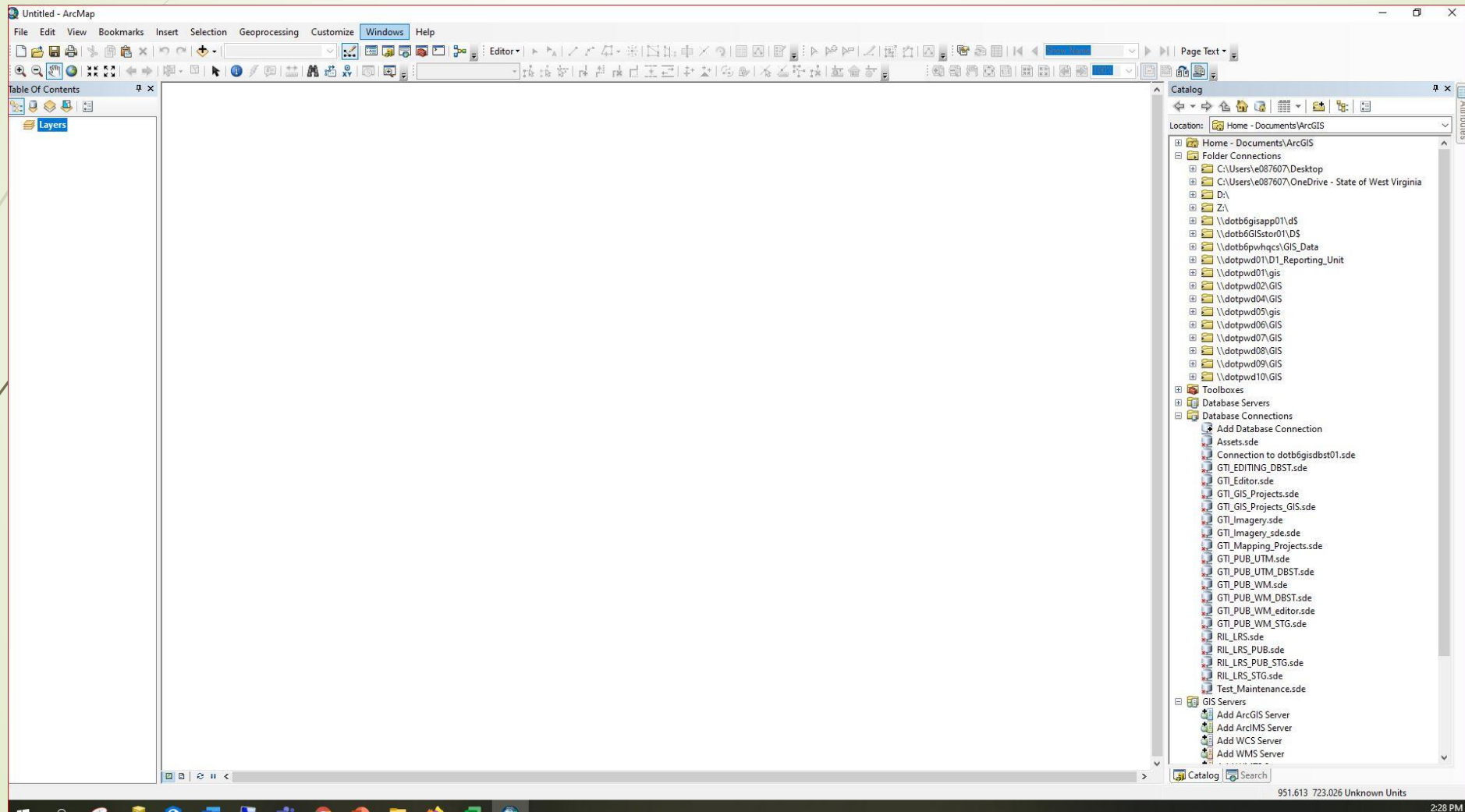
- ▶ This section introduces the following elements of ArcGIS Pro. In the next section 4, we will cover how to use these elements in making a map.
 - ▶ Creating a new map document
 - ▶ Tool Ribbon and its tabs
 - ▶ Share Tab and the Sharing Ribbon
 - ▶ Save as Tab and Saving a Project
 - ▶ Project Tab
 - ▶ Map Tab
 - ▶ The Selection Group in the Map Tab
 - ▶ Insert Tab and the Insert Tool Ribbon
 - ▶ The New Map Tab on the Insert Tool Ribbon
 - ▶ Map Panes
 - ▶ Analysis Tab and Analysis Tool Ribbon
 - ▶ The View Tab and View Tool Ribbon
 - ▶ Edit Tab and Edit Tool Ribbon

Creating a New Map Document

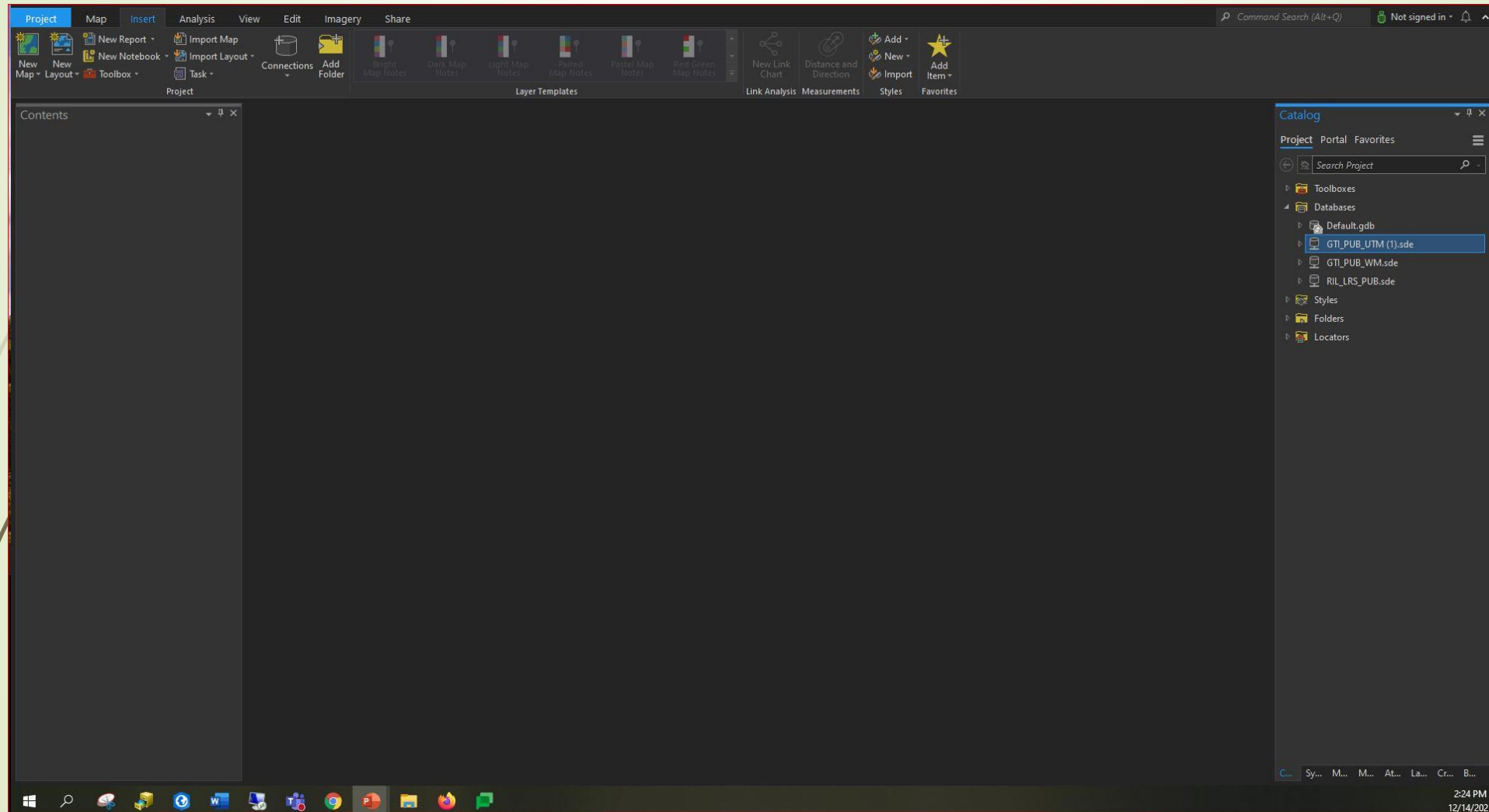
- Go to the new map screen. Here one can create:
 - ? Map
 - ? Catalog
 - ? Global or Local Scene
- With these three you must save the project as well
- Click on Start without a template to access the ArcGIS Pro project
 - This will create a blank project without a template.
- Compare the blank ArcGIS Pro project to an ArcMap document. Do you notice any differences?
- <https://pro.arcgis.com/en/pro-app/latest/help/projects/what-is-a-project.htm>



ArcMap Document



ArcGIS Pro Project



Toolbar vs Ribbon

- The most noticeable difference is how to access different tools.
- In ArcMap, every tool was housed in neatly grouped like tools called toolbars.
- With toolbars the user could:
 - ? Customize these toolbars to have access to the tools he or she used the most.
 - ? Turn on and off toolbars as needed.
 - ? Access almost every tool with one or two clicks.
- The primary layout in ArcMap consisted of:
 - ? Menu bar – File, Edit, View, etc.
 - ? Standard toolbar with the most commonly accessed tools such as save, add, undo, redo, add toolbars, etc.
 - ? The Tools Toolbar which were all navigational tools.



Toolbar vs Ribbon

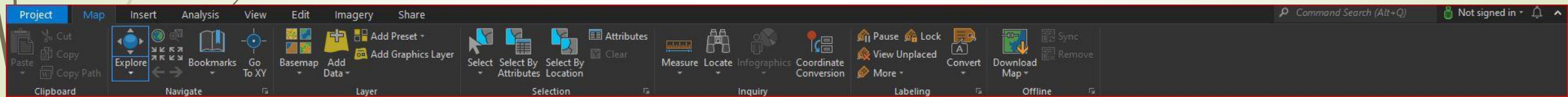
- The Tool Ribbon replaces the toolbar. It is a horizontal ribbon at the top of the application window.
- The Tool Ribbon is the primary interface for working in ArcGIS Pro.
- Hundreds of essential GIS commands and tools (buttons) are located in contextual tabs that are organized in the tool ribbon and are associated with whatever view you have active.
- The ribbon consists of 8 to 12 different tabs that correspond with the different menu bar options.
- Each tab consists of multiple toolbars with the most frequently used tools from each toolbar.
- Also consists of a quick access toolbar above the tool ribbon which has the most frequently accessed tools including:
 - Creating New Projects
 - Opening, Saving Projects
 - Any other customizable features



Toolbar vs Tool Ribbon

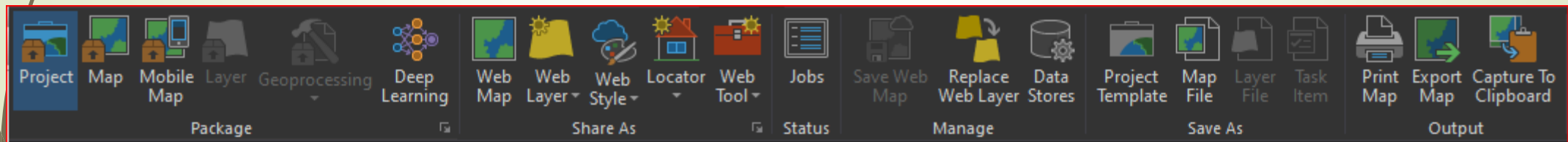
- Default tabs on a tool ribbon are:
 - Project
 - Map
 - Insert
 - Analysis
 - View
 - Edit
 - Imagery
 - Share
- Additional tabs that are added to the tool ribbon can be:
 - Appearance
 - Labeling
 - Data

Tool Ribbon





Sharing Ribbon

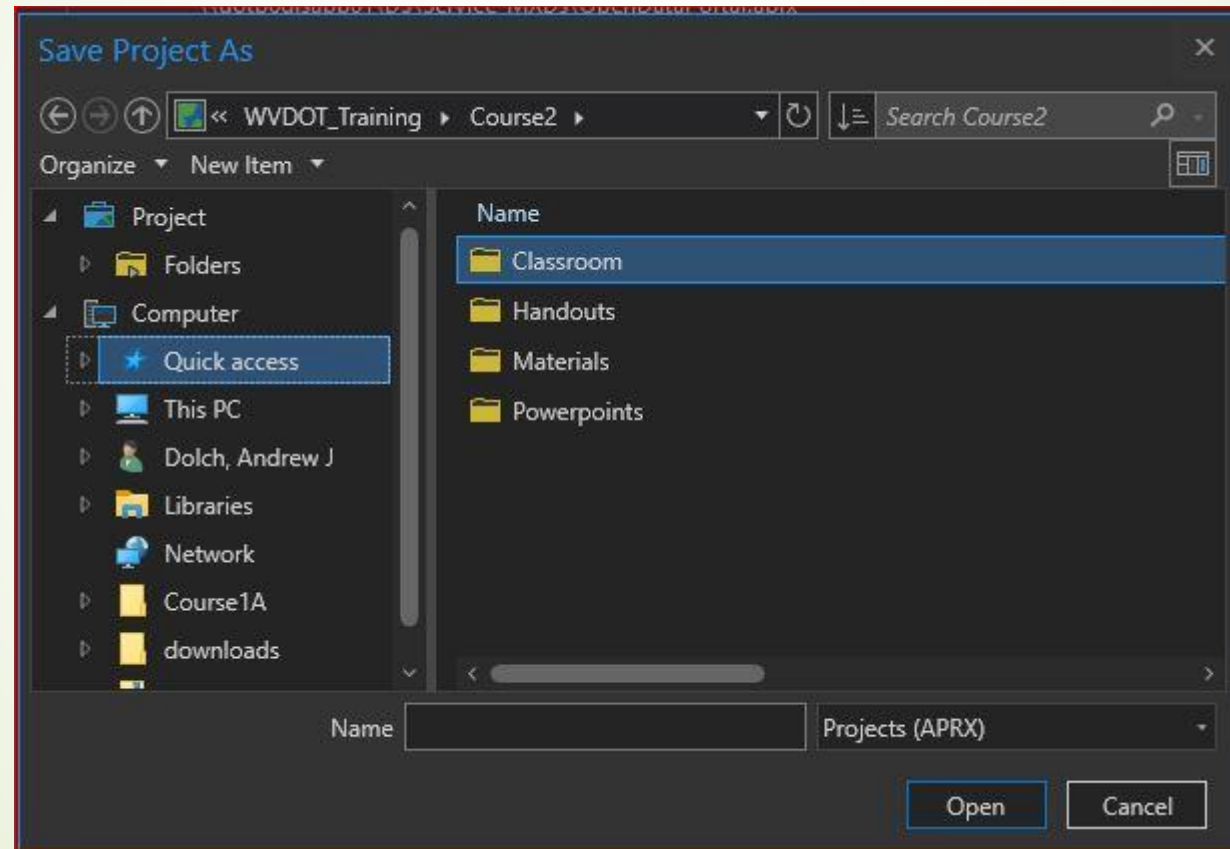
- ▶ Click on the Share tab to bring up the Sharing Ribbon.
- ▶ The Sharing Ribbon is a tool ribbon for sharing information.
- ▶ In addition to publishing information products, it can also:
 - ▶ Overwrite existing web services
 - ▶ View existing results
 - ▶ View datastores
 - ▶ Create project templates, map files, and layers
 - ▶ Print and export static maps
- ▶ We will come back to this later on in this course.



Saving a Project

- ▶ One of the holdover toolbars from ArcMap is Saving a Project.
- ▶ The Saving a Project tool bar is accessed by selecting the Save As tab in the Sharing Ribbon.
- ▶ This tool bar consists of the most frequently used commands in ArcGIS Pro including:

- ▶ Creating a new document
- ▶ Open an existing document
- ▶ Saving changes
- ▶ Undo and Redo actions
- ▶ Click on save.
- ▶ The following screen should pop up. Navigate to the classroom folder under Course 2.

- ▶ It should look something like this.

Saving a Project



Saving a Project



- Save it as Intro_yourinitials
IE: Intro_AJD
- There are several unwritten rules for saving material being worked on:
 - ? Save often, usually for me, is after an hour of work.
 - ? When saving and creating a map document or project, name it something that is:
 - ? Easy to remember
 - ? Descriptive of what it is being used for, for example with the intro_yourinitials.
 - ? When saving documents or projects with the same name, always add something to differentiate. This could include such terms as _old, _production, etc.
 - ? Always keep similar projects/documents together.
 - ? Make sure not to save ArcGIS Work to any folders that frequently get modified such as temp, downloads, etc.
 - ? Also, you may want to try to store it to a personal drive. It can reduce the risk of having features lost.

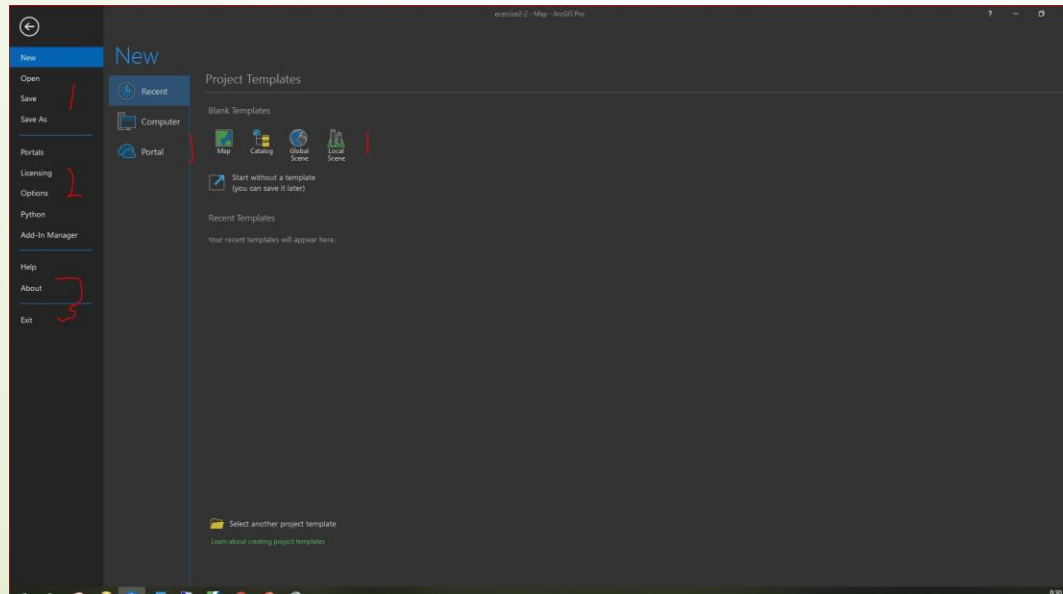
Project Tab

- The Project Tab on the Tool Ribbon is a combination of the Start Screen of ArcGIS Pro and the Options tab.
- With it the user can:
 - Create and save a new project
 - Open and save an existing project
 - Access ArcGIS Pro Project templates stored on:
 - Local Computer
 - ArcGIS Portal
 - And elsewhere
 - Add, connect to, and customize ArcGIS Portal connections
 - Add, configure, remove, and view ArcGIS Pro Licenses and ESRI Extensions
 - Rename your ArcGIS Pro Workstation Alias
 - Check in and out licenses



Project Tab

- Configure Project and Application settings and options
- Add, view, and update Python packages
- Add-in widgets or other non-Esri tools
- Access the Help Menu
- View Current Version of ArcGIS Pro and Update ArcGIS Pro

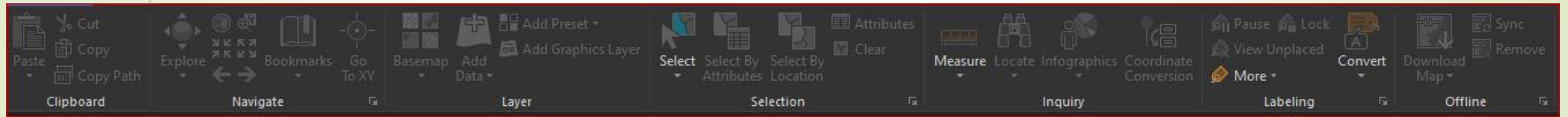


Map Tab

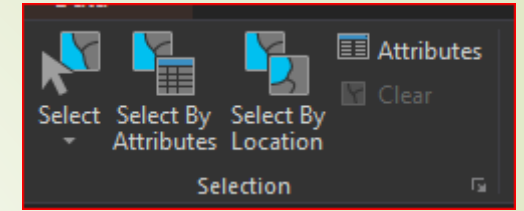
- Click on the Map Tab of the Tool Ribbon. This will bring up the Map tab ribbon.
- The Map tab is a combination of the Standard and Layout toolbar in ArcMap as well as the edit map menu.
- Here one can:
 - Cut, Copy, Paste, and copy the path of features, feature classes, etc. in Map Project (Clipboard)
 - Navigate, Zoom In and Out, zoom to full extent, navigate to other views, and create bookmarks (Navigate)
 - Add and remove data, presets, and add graphics layer(Layer)
 - Change the basemap (Layer)
 - Select by attributes, location, and by drawing type. View attributes and clear selection (Selection)
 - Measure distance, locate features by XY coordinates, etc. (Inquiry)
 - Pause, lock, view unplaced labels, convert labels, etc. (Labeling)
 - Download Maps, Sync, and remove offline (Offline)
- We will go into Navigation and Layer in the 'Creating a Map Section'.



Map Tab

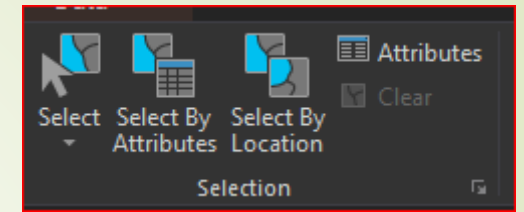


Selection Group



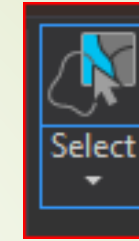
- Let's take a brief tour of the Selection group in the Map tab.
- It is an important tool suite used to:
 - ? Filter out features within a feature class that meet specific criteria or set of criterion including:
 - ✓ Specific characteristics of the feature such as sign system, measurements, etc. (Select by Attributes)
 - ✓ Features that meet the characteristics of a specific location such as intersecting, falls within, is near, etc. (Select by Location)
 - ✓ Features that are selected from a shape drawn by a user (Select)
 - ? View the attributes of the selected features in an attribute table
 - ? Clear a selected feature

Selection Group



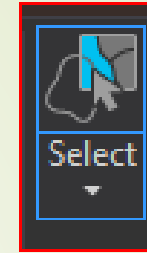
- Used in combination with additional tools to:
 - ? Create new feature classes or shapefiles
 - ? Display the features that only meet specific criteria in a map (for example, we can use query to filter out selected route types)
 - ? Perform analysis or update records on only specific features within a feature class (for example, road surface type)
- Used in combination with each other (IE. Select by Attributes with Select by Location) to create a master combination

Selection Tool



- The Selection Tool is the simplest of the three selection tools in the Selection Group.
- Here the user selects all features regardless of what feature class they belong to in a geometrically shaped area defined (drawn) by the user.
- This includes:
 - 2 Dimensional
 - Rectangle shaped boxes
 - Defined polygons
 - Circles
 - Lasso or freeform selection
 - Line
 - 3 Dimensional
 - Cube
 - Sphere
 - Cylinder

Selection Tool



➤ Pros

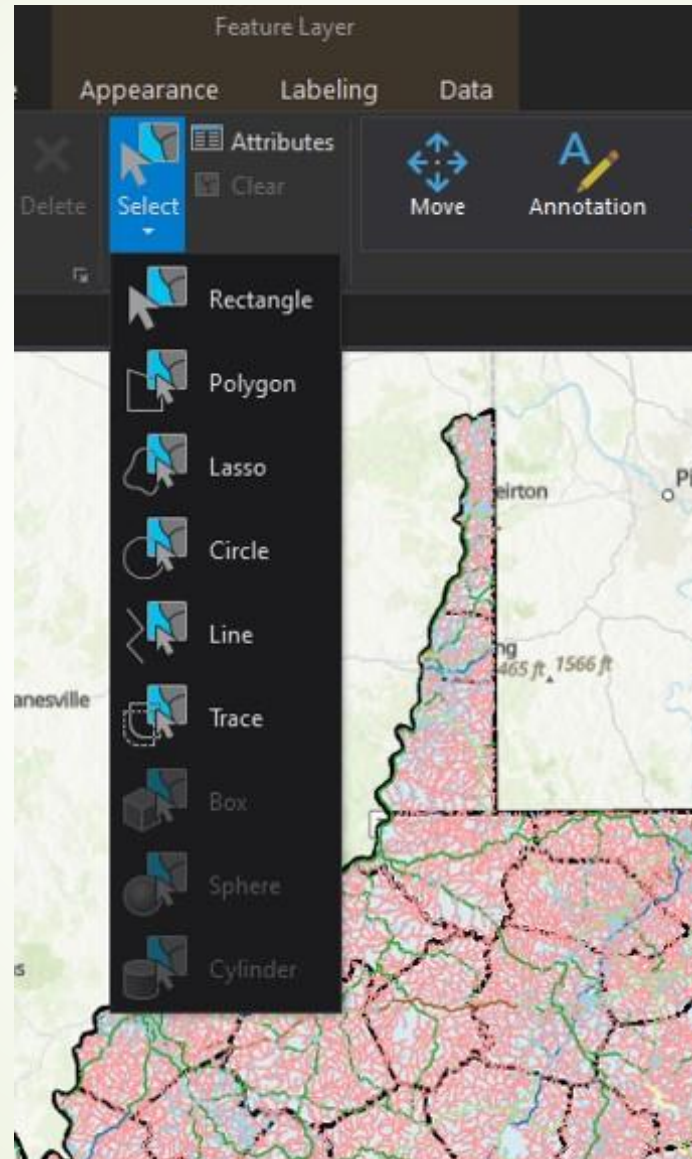
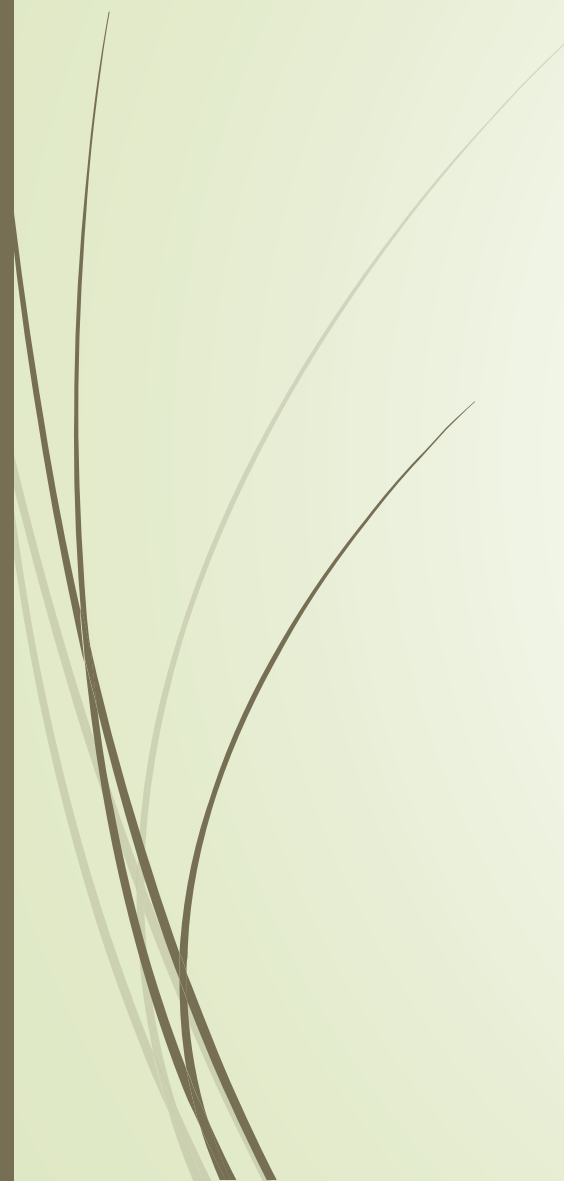
- ❓ Simplest to use as it uses dragging and drawing
- ❓ Does not require the user to set up any parameters before using it, such as defining field and attribute, geographical area, etc.
- ❓ Selects all attributes that other selection tools miss

➤ Cons

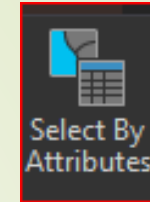
- ❓ Does not discriminate on which feature class the feature itself lies in. Selects the feature selected across every feature class.
- ❓ Cannot define geographical area of interest. Frequently gets records from outside the area of interest.

➤ <https://pro.arcgis.com/en/pro-app/latest/help/mapping/navigation/select-features-using-attributes.htm>





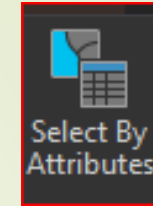
Select by Attributes



- ▶ It is the most frequently used of the three selection tools.
- ▶ It is used for filtering out features whose attributes (characteristics) meet a single characteristic or specific set of predefined characteristics (IE County = "20").
- ▶ Based on SQL queries
- ▶ Uses Boolean logic like:
 - ❓ And/or when combining queries:
 - ✓ And means "All". The criteria must be met (IE County = "20" and Sign_System = 1 meaning that I am only concerned with routes in County 20 and have a sign system of 1)
 - ✓ Or means "Either". Either of the criteria may be met (County = "20" or Sign_System = 1 meaning that I am looking for routes in County 20 or routes that have a sign system of 1)
 - ❓ Must have quotes ("") around any text feature being queried

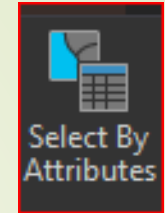


Select by Attributes



- ▶ Includes Operators such as:
 - ▶ Equal/Not Equal to a specific characteristic
 - ▶ Begins with/Ends With/Includes the Values/Contains the Text: The feature must begin or end with or contain a specific character, value, or a string of specific characters or values
 - ▶ Does Not Begin With/Ends With/Includes the Values/Contains the Text: The feature does not begin or end with or contains a specific character, value, or a string of characters or values
 - ▶ Greater than/Greater than or Equal to: The value is more than or at least the specified value
 - ▶ Less than/Less than or Equal to: The value is less than or at most the specified value
 - ▶ Is Null/Is Not Null: The feature has/does not have a value assigned to it

Select by Attributes



? Can use statements

✓ If

✓ Elif (else if)

✓ Else

➔ Pros:

? Provides exact results for the user

? Easy to follow widget in setting up the query

➔ Cons:

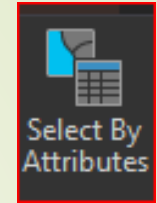
? Runs as an all or nothing. You cannot have any errors in writing the query.

? Error checking can be quite cumbersome especially in large queries.

? Cannot set up distance parameters.



Select by Attributes



- Setting a selection by 'Select by Attributes' consists of a four step process.
 - ? Click on Select by Attributes.
 - ? Select Import Rows: This parameter determines the attribute table from the feature class that you are interested in.
 - ? Make Selection: Determines whether this query:
 - ✓ Is part of a New Query (new)
 - ✓ Needs to be Added to or Removed from an existing query (add/remove)
 - ✓ Is part of a subset (select subset)
 - ✓ Has criteria that is the opposite of the query you already created (Switch)
 - ✓ Clears the query (Clear)
 - ? Expression: The actual code for looking up and filtering the requested features.





Select By Attributes

1 → Input Rows
GTI_PUB_UTM.DBO.Counties

2 → Selection type
New selection

Expression

There is no expression defined.

+ New expression

Invert Where Clause

Apply OK

Expression

Load Save Remove

SQL

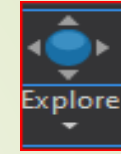
Where OBJECTID is equal

+ Add Clause

Invert Where Clause



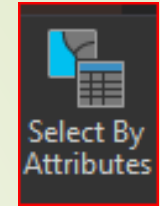
Navigating to the Area of Interest



- On the bottom of the attribute table, there is a button that allows the user to toggle between the full view and selection view. Click on it.
- This will bring up the selection table. As you can see, it is blank. That's ok. It is supposed to be blank as we do not have anything selected yet.
- This also gives us an opportunity to view the different columns (fields) and sort through the tables to find one that might fit our needs. Is there any one that stands out?
- Good. Now that we've located a field to use, go ahead and click on the 'select by attributes' on this field.

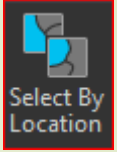


Select by Location



- It is the final way to query data.
- It involves querying data in a specific dataset(s) by predefined polygonal geographic area.
- There are several commands to query data by geographical area:
 - ? Intersecting a feature
 - ? Within a distance of
 - ? Is contained in that feature or completely contains these features
 - ? Within or completely within
 - ? Are Identical To
 - ? Touches
 - ? Share Line Segment
 - ? Have Center in

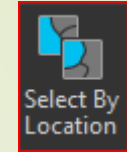
Select by Location



- Usually done after a select by attributes query performed on the geographical area
- Input feature(s) and selecting feature must have a spatial relationship to work.
- Pros
 - Can set up a search distance around the area of interest
- Cons
 - Does not always get every feature defined
 - Can be cumbersome to setup
- This completes the information on the “Selection Group”.





Select by Location



Select By Location ? x



Input Features ▼

GTI_PUB_UTM.DBO.All_Routes ▼ 

▼ 

Relationship

Intersect ▼

* Selecting Features ▼  

Search Distance

Meters ▼

Selection type


New selection ▼

Invert spatial relationship

Apply OK



Attribute Table Recap

 Attributes

- An Attribute Table is a table storing the records (locations) and the characteristics (fields/columns) associated with a geospatial feature.
- For queries, this is where the user can view and access the results of the query. This is done with a toggle button on the bottom of the table.
- In addition to viewing results, the user can:
 - Add Fields
 - Calculate Records
 - Select by Attribute
 - Zoom to selected features
 - Switch Selections
 - Clear Selections
 - Delete Rows
 - Copy rows/Switch views
- We will cover this in further detail in the map making section.



Attribute Table: A table that shows the data in a layer.

Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy

OBJECTID*	AREA	PERIMETER	DEP_24K_	DEP_24K_JD	NAME	STATE	FIPS	POP1986	POP2000	POP_CHNG	POPCH_PCT	MALES	FEMALES	AMER_JND	ASIAN	BLACK	HAWN_PL	HISPANIC	MULT_RACE	OTHER	WHITE	HOUSEHOLDS	AVG_HH_SZ	HSE_UNITS	OWNER_OCC	RENTER_OCC	VACANT
1	0	69539.619328	2	1	Ohio	54	54069	58000	47427	-10573	-18.23	22177	25250	42	369	1691	14	238	430	61	44820	19733	2.197	22166	13539	6194	2433
2	0	125167.039523	3	1	Marshall	54	54051	39200	35519	-3681	-9.39	17288	18231	38	90	153	9	228	239	41	34949	14207	2.3856	15814	11019	3188	1607
3	0	179373.536795	4	1	Preston	54	54077	30400	29334	-1066	-3.51	14535	14799	32	43	86	5	168	159	14	28995	11544	2.5088	13444	9585	1959	1900
4	0	145624.281267	5	1	Morgan	54	54065	10100	14943	4843	47.95	7343	7600	26	18	89	2	124	85	34	14689	6145	2.385	8076	5119	1026	1931
5	0	164158.984954	6	1	Monongalia	54	54061	77700	81866	4166	5.36	41291	40575	162	2009	2763	34	826	1134	264	75500	33446	2.2676	36695	20391	13055	3249
6	0	168803.794814	7	1	Wetzel	54	54103	21700	17693	-4007	-18.47	8586	9107	17	57	15	4	74	93	5	17502	7164	2.432	8313	5625	1539	1149
7	0	201828.504379	8	1	Mineral	54	54057	27700	27078	-622	-2.25	13250	13828	31	54	690	2	158	207	57	26037	10784	2.4743	12094	8416	2368	1310
8	0	155904.398879	9	1	Berkeley	54	54003	51500	75905	24405	47.39	37784	38121	186	350	3558	17	1156	974	428	70392	29569	2.5009	32913	21927	7642	3344
9	0	143224.17944	10	1	Marion	54	54049	64100	56598	-7502	-11.7	26900	29698	114	231	1823	5	394	528	74	53823	23652	2.3172	26660	17685	5967	3008
10	0	157357.23942	11	1	Tyler	54	54095	11000	9592	-1408	-12.8	4686	4906	5	8	2	1	41	43	3	9530	3836	2.4767	4780	3209	627	944
11	0	187873.321722	12	1	Hampshire	54	54027	16200	20203	4003	24.71	10087	10116	48	33	167	4	112	119	25	19807	7955	2.496	11185	6448	1507	3230
12	0	129207.489785	13	1	Jefferson	54	54037	33800	42190	8390	24.82	20873	21317	120	252	2571	17	734	576	254	38400	16165	2.5686	17623	12253	3912	1458
13	0	108822.691374	14	1	Pleasants	54	54073	8100	7514	-586	-7.23	3760	3754	35	15	36	0	28	37	5	7386	2887	2.53	3214	2321	566	327
14	0	164997.91697	15	1	Harrison	54	54033	75200	68652	-6548	-8.71	32861	35791	102	408	1105	19	660	591	145	66282	27867	2.462	31112	20841	7026	3245
15	0	95671.833627	16	1	Taylor	54	54091	16300	16089	-211	-1.29	7869	8220	31	27	134	6	95	102	10	15779	6320	2.48	7125	5033	1287	805
16	0	148711.29541	17	1	Doddridge	54	54017	7700	7403	-297	-3.86	3736	3667	23	11	20	0	42	61	10	7278	2845	2.565	3661	2309	536	816
17	0	150089.77306	18	1	Wood	54	54107	92000	87986	-4014	-4.36	42246	45740	188	448	887	35	514	677	124	85627	36275	2.3556	39785	26609	9666	3510
18	0	190866.47067	19	1	Ritchie	54	54085	11200	10343	-857	-7.65	5070	5273	28	13	14	0	49	71	11	10206	4184	2.4467	5513	3418	766	1329
19	0	205207.603298	20	1	Grant	54	54023	9700	11299	1599	16.48	5585	5714	29	16	76	2	62	51	15	11110	4591	2.4533	6105	3712	879	1514
20	0	146810.022398	21	1	Barbour	54	54001	16500	15557	-943	-5.72	7646	7911	111	40	77	3	73	160	19	15147	6123	2.4625	7348	4815	1308	1225
21	0	162556.831726	22	1	Tucker	54	54093	8600	7321	-1279	-14.87	3570	3751	14	1	5	9	18	48	7	7237	3052	2.35	4634	2520	532	1582
22	0	207396.438169	23	1	Hardy	54	54031	10000	12669	2669	26.69	6255	6414	20	18	244	0	84	85	29	12273	5204	2.4333	7115	4190	1014	1911
23	0	133536.114018	24	1	Wirt	54	54105	4600	5873	1273	27.67	2939	2934	12	6	17	0	18	44	6	5788	2284	2.56	3266	1898	386	982
24	0	168255.380867	25	1	Lewis	54	54041	18700	16919	-1781	-9.52	8206	8713	34	49	22	0	85	119	14	16681	6946	2.404	7944	5072	1874	998
25	0	324281.73498	26	1	Randolph	54	54083	28300	28262	-38	-0.13	14222	14040	46	106	302	4	191	150	45	27609	11072	2.4186	13478	8381	2691	2406
26	0	148989.496649	27	1	Upshur	54	54097	24700	23404	-1296	-5.25	11354	12050	39	72	144	3	137	135	30	22981	8972	2.43	10751	6883	2089	1779
27	0	157414.412621	28	1	Gilmer	54	54021	8500	7160	-1340	-15.76	3600	3560	14	41	65	1	50	63	7	6969	2768	2.365	3621	2004	764	853
28	0	178691.609587	29	1	Jackson	54	54035	26300	28000	1700	6.46	13623	14377	58	64	23	4	81	173	29	27649	11061	2.5083	12245	8803	2258	1184
29	0	164688.558169	30	1	Calhoun	54	54013	8200	7582	-618	-7.54	3786	3796	23	8	8	1	42	33	10	7499	3071	2.46	3848	2422	649	777
30	0	181232.373499	31	1	Mason	54	54053	25900	25957	57	0.22	12724	13233	47	71	130	2	121	146	28	25533	10587	2.415	12056	8573	2014	1469
31	0	197019.787819	32	1	Pendleton	54	54071	7900	8196	296	3.75	4125	4071	22	15	174	3	73	63	23	7896	3350	2.4	5102	2660	690	1752
32	0	171703.11633	33	1	Roane	54	54087	15500	15446	-54	-0.35	7645	7801	32	35	34	0	104	93	29	15223	6161	2.4925	7360	4905	1256	1199
33	0	172607.315752	34	1	Braxton	54	54007	14600	14702	102	0.7	7444	7258	51	16	101	7	65	104	12	14411	5771	2.4533	7374	4511	1260	1603
34	0	269650.535179	35	1	Pocahontas	54	54075	9500	9131	-369	-3.88	4703	4428	6	13	71	0	39	53	5	8983	3835	2.3133	7594	3079	756	3759
35	0	167601.512884	36	1	Webster	54	54101	11900	9719	-2181	-18.33	4783	4936	7	6	1	1	36	64	1	9639	4010	2.3933	5273	3167	843	1263

0 of 55 selected

Filters: 100%

Attribute Table Tools: Add, Calculate, Select By Attribute, Zoom To, Switch, Clear, Delete, and Copy.

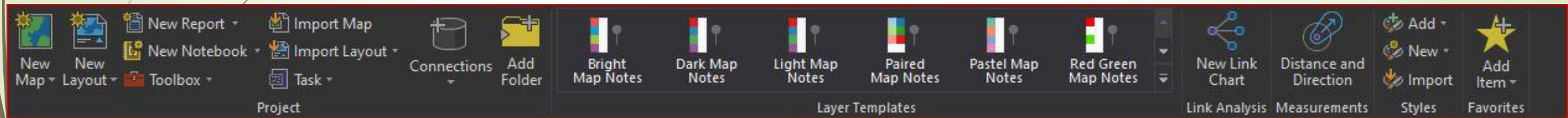


Insert Tab

- Return to the Tool Ribbon and click on the Insert Tab. This brings up the Insert Tool Ribbon.
- The Insert Tool Ribbon does not have any comparable toolbars in ArcMap.
- It is used for:
 - ? Creating any of the projects that reside in ArcGIS including: Maps, Scenes, Stereo Map, Basemap, Map Layout, Reports, Jupiter Notebooks, Tools
 - ? Creating Import Maps, Layouts, and Tasks (Project)
 - ? Creating connections to databases: Big Data, ArcGIS Server Services, Cloud and Cloud Stores, data reviewer, workflow manager, geolocator and folders
 - ? Importing Layer templates and notes (Layer Analysis)
 - ? Adding favorite items including databases, servers, toolbox, etc.
- Let's take a more in-depth look at the Insert Tool Ribbon.

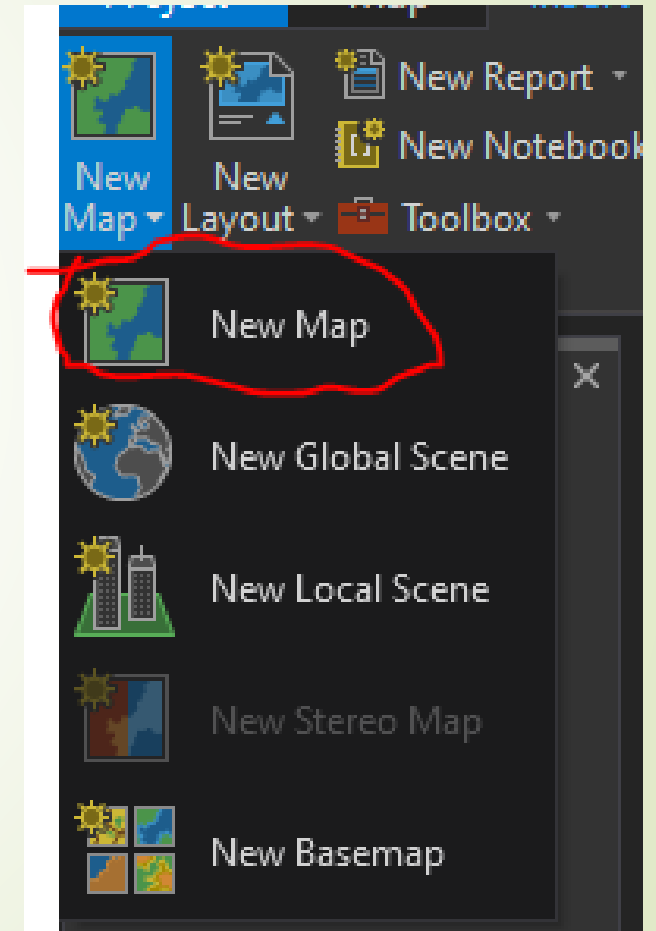
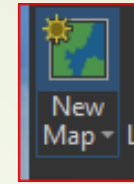


Insert Tool Ribbon

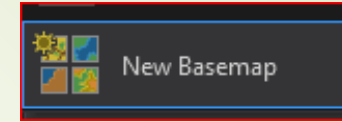


Adding New Map

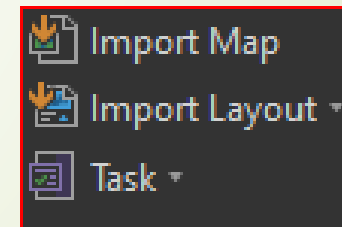
- The first step of any project is defining what the project is going to be about and what will be contained in the document.
- While the first part is up to the cartographer making the map, the second part is handled by the New Map tool.
- The New Map tool is accessed by clicking on the New Map Tab on the Insert Tool Ribbon.
- It is used for:
 - ? Adding any map (regular or stereo) or scene (global or local)
 - ? Creating a new customizable basemap that can be used locally or user-wide
- Click on New Map Tab and select New Map

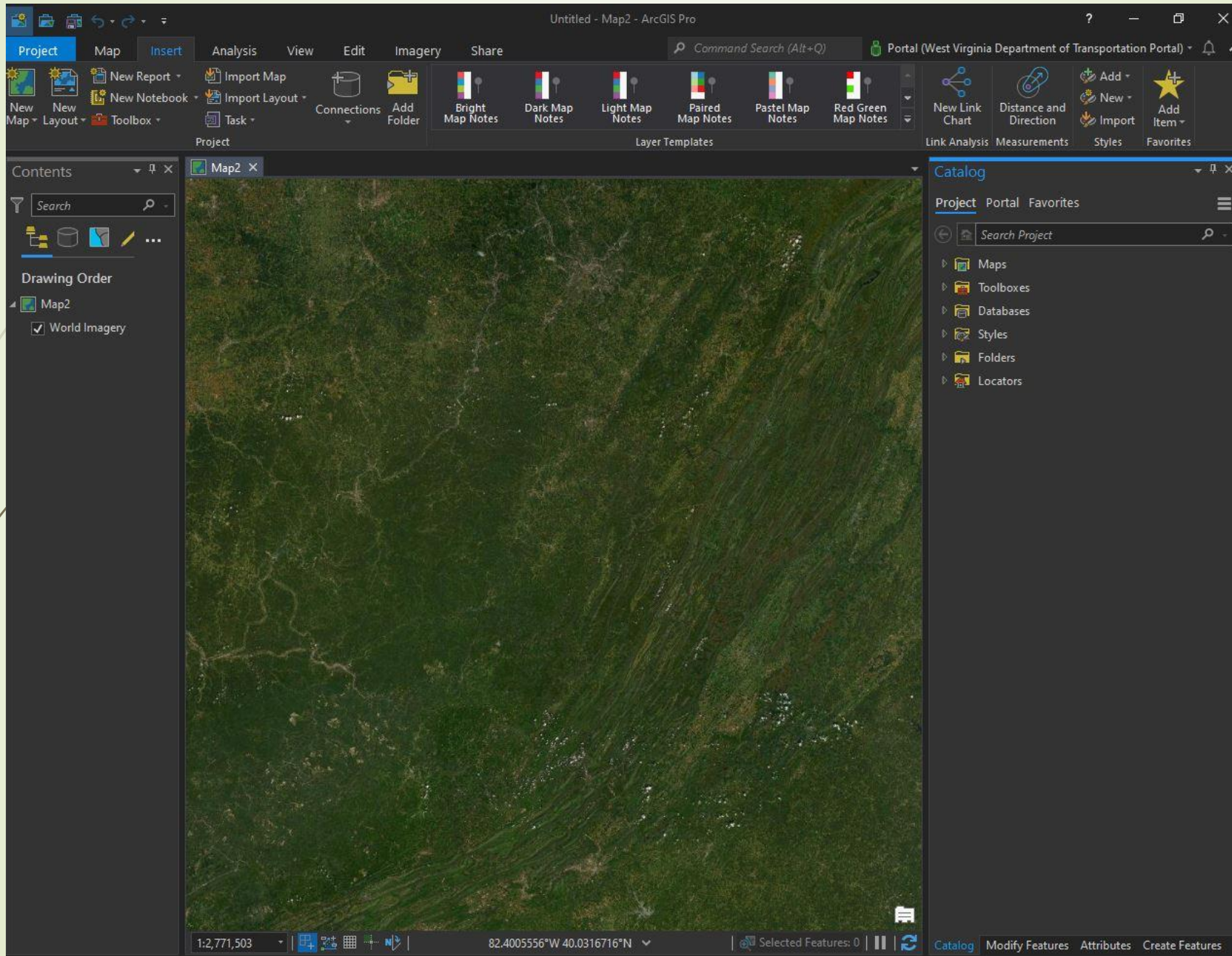


Adding New Map



- Let's also add in a new basemap using the drop down menu.
- This highlights one of the major differences between ArcGIS Pro and ArcMap. ArcGIS Pro can hold multiple maps, scenes, etc. in different formats whereas ArcMap in ArcGIS Desktop can hold only one item in the same format.
- In addition, one can also import already existing maps, layouts, and designs through the Import Feature tool on the Insert Tool Ribbon.
- This includes:
 - ? ArcGIS Desktop products such as map documents (MXD), Globes and scenes
 - ? Map Packages/Map Files
 - ? Pre-defined layouts and layout templates
 - ? Report Files
 - ? Used mostly for moving ArcMap documents into Pro



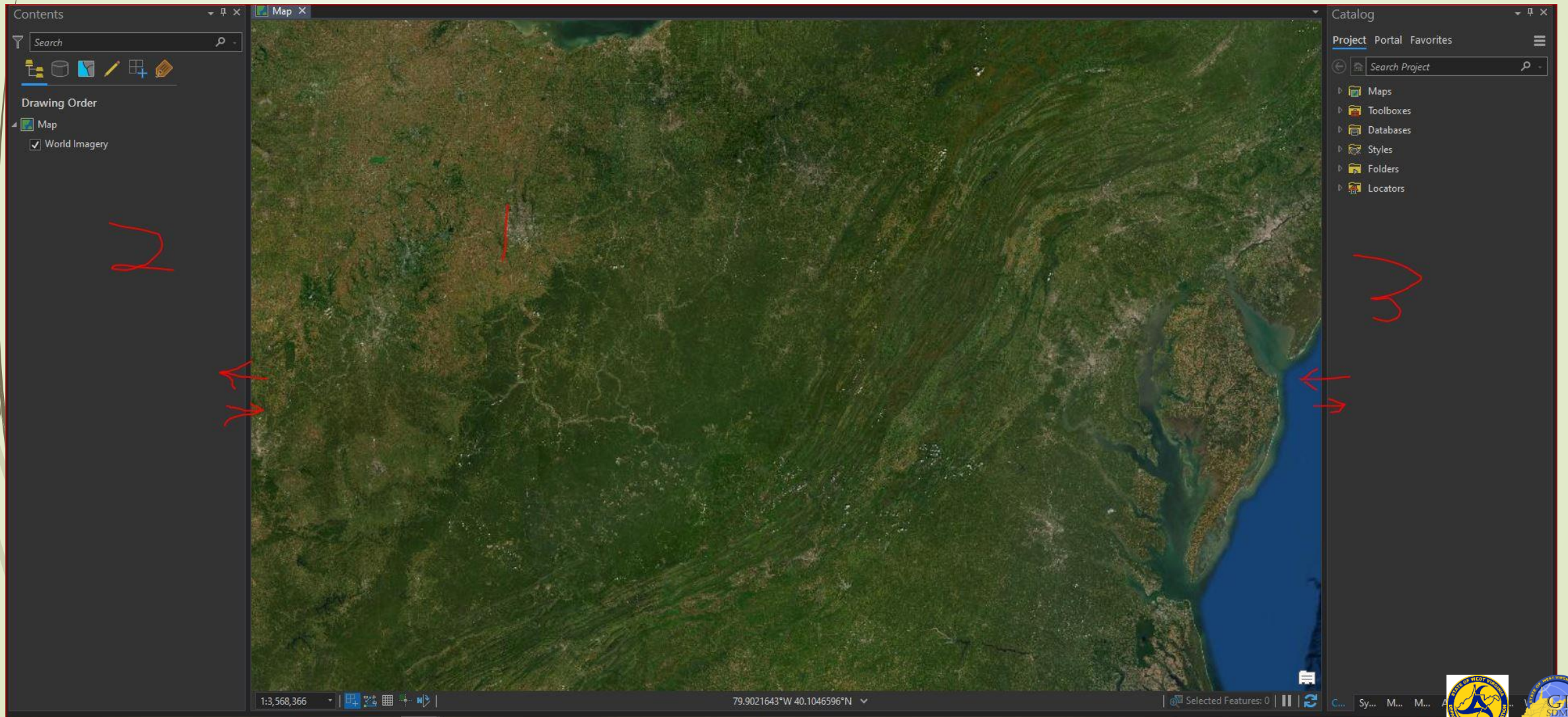


Introduction to Contents View

- When a new map is created, two additional panes become active:
 - ? Workspace
 - ? Contents
- Along with the catalog pane, which we'll learn about later, these three panes make up the core components in producing a map or scene.
- Other key components in producing a map or scene are:
 - ? Creating, managing, editing and viewing geospatial data
 - ? Performing spatial and non-spatial analysis
 - ? Sharing features with others
- Let's take a quick look at each of these panes and how they are used..



Components for creating a Map or Scene

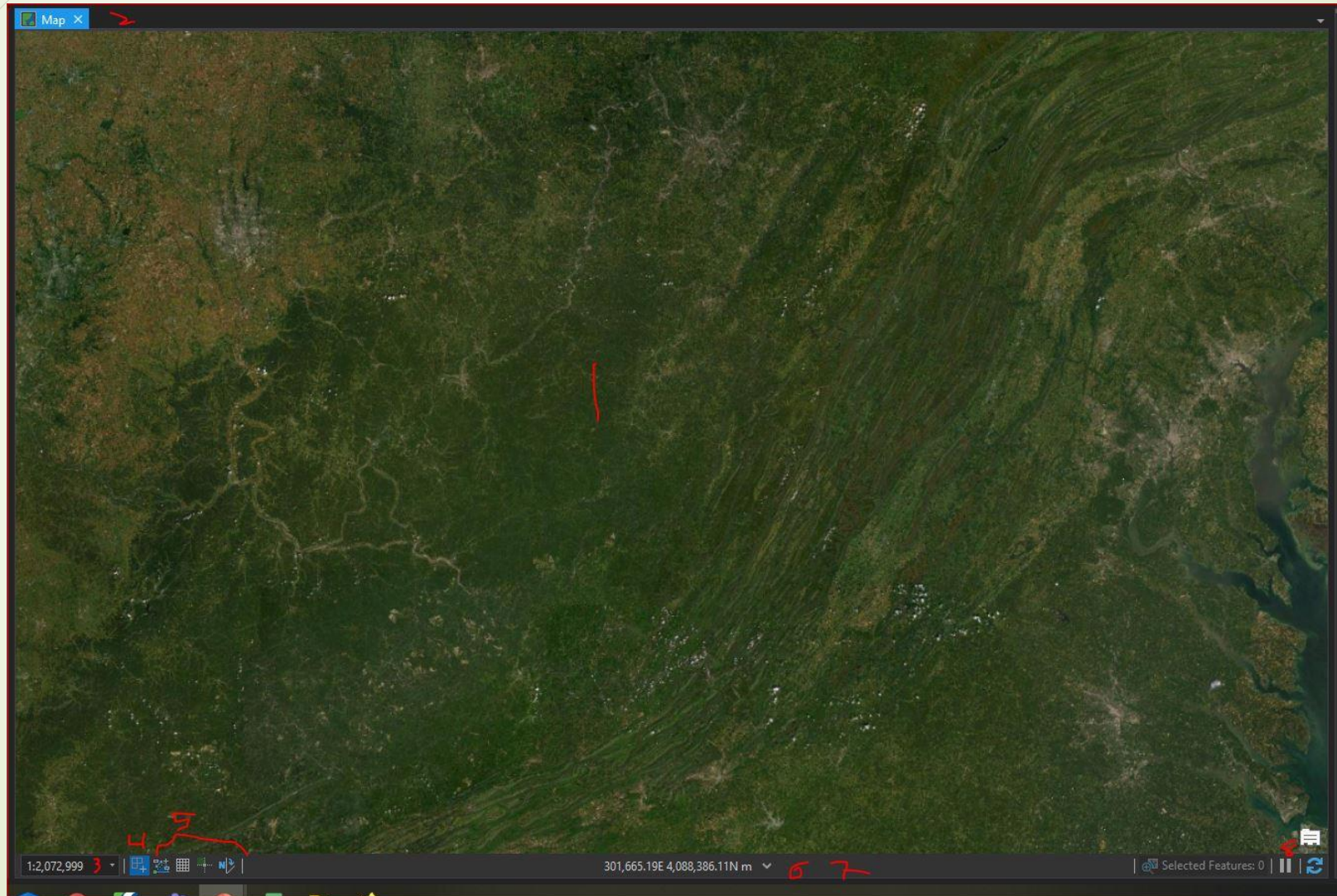


Workspace Pane

- ▶ Central screen of the ArcGIS Pro Project
- ▶ Used to:
 1. Display the features in the Contents pane
 2. Show and toggle between the different maps, scenes, layouts, etc.
 3. Change the scale (zooming in and out)
 4. Configure Snapping tools which allows features to snap together in the edit tab
 5. Toggle on and off grids, grid corrections, exploration constraints and inferences
 6. Set the Mapping units to:
 - ✓ Meters
 - ✓ Feet
 - ✓ Decimal Degrees
 7. Set projection to:
 - ✓ US Grid
 - ✓ UTM
 8. Pause and refresh the view



Workspace Pane



Contents Pane

- Similar function as the table of contents pane in ArcMap
- Manages, configures and organizes the geospatial and non-geospatial features being used in the map, scene, etc. Including:
 - ❓ Setting the drawing (display order within the map, scene, etc.)
 - ❓ Accessing and configuring properties within the feature such as:
 - ✓ Attribute table
 - ✓ Symbology
 - ✓ Annotation/Labels
 - ✓ General Properties of the feature
 - ✓ Groupings
 - ✓ Popups
 - ✓ Metadata
 - ✓ Domains and fields



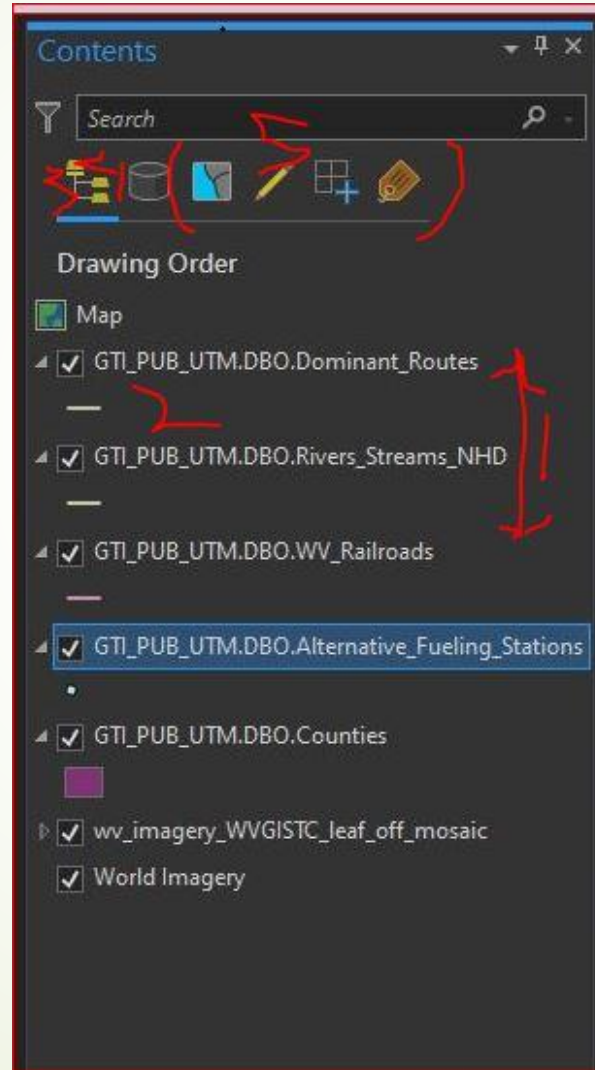
Contents Pane

- ? Adding reports and charts
- ? Joining and relating features to tables, other features, etc.
- ? Copying features
- ? Changing feature's name
- ? Changing the feature's data source
- ? Toggling on and off on features including:
 - ? Select
 - ? Edit
 - ? Snapping
 - ? Labeling

<https://pro.arcgis.com/en/pro-app/2.7/help/mapping/map-authoring/contents-pane.htm>



Contents Pane



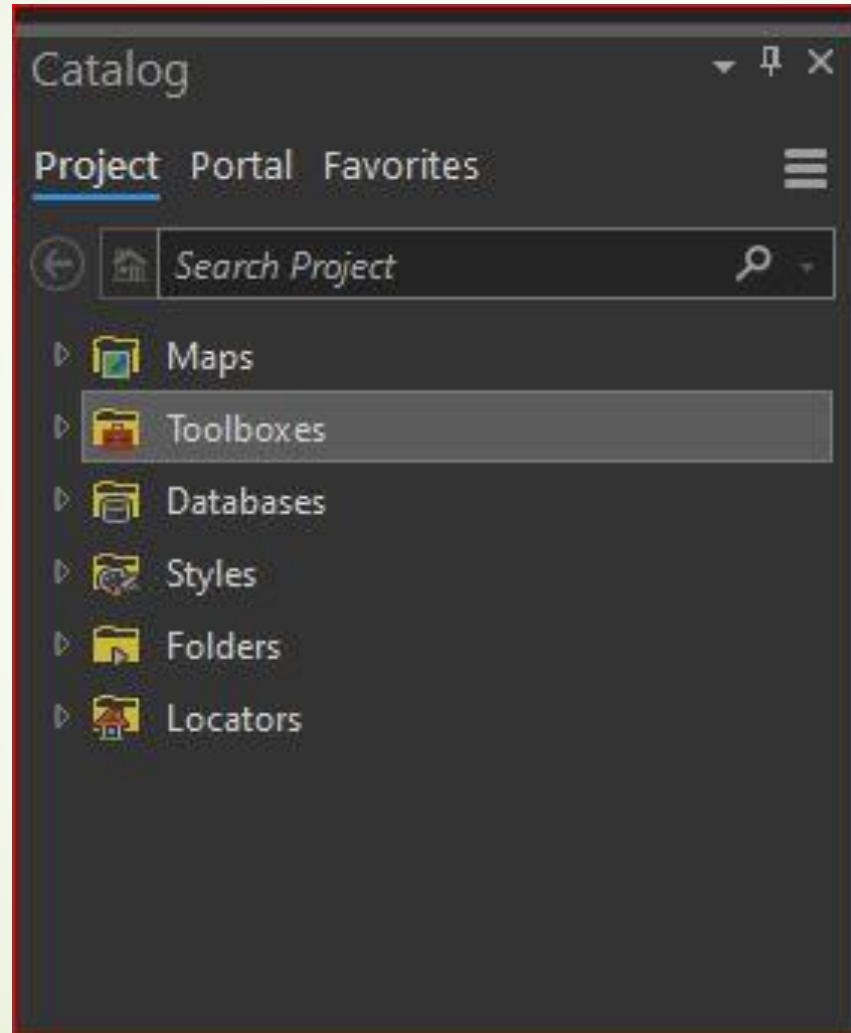
Catalog Pane or View

- Similar function as the Table of Contents pane in ArcMap and ArcCatalog
- Provides access to all tools, information, and maps needed for the project including:
 - ? Maps
 - ? Custom Toolboxes and Tools
 - ? Geodatabases (Enterprise, Mobile, File)
 - ? Shared Directories
 - ? Geolocator or Geocaching Tools
- Found on
 - ? Within the Project
 - ? Local Computers
 - ? Shared Directories
 - ? Enterprise Geodatabase
 - ? Internal and External ArcGIS Enterprise Sites

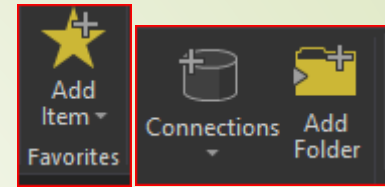
➤ <https://pro.arcgis.com/en/pro-app/latest/help/projects/the-project-pane.htm>



Catalog Pane



Connecting to Folder



- The logical next step for creating a map or scene is adding the geospatial content that the map is trying to represent.
- In ArcGIS Pro, this consists of a two-step process.
 - ❓ First step: connecting to the container housing the geospatial data such as:
 - ✓ Shared Directory or Folder
 - ✓ Local Directory
 - ✓ Enterprise Geodatabase
 - ✓ Hosted ArcGIS or Imagery Service
 - ❓ Second step: adding the geospatial data to the map or scene
- The first step can be done in one of two ways.
 - ❓ Using Connections/Add Folder/Add Items on the Insert Tool Ribbon
 - ❓ Using the Catalog pane
- We'll explore these two steps later in the map creation section.

Analysis Tool Ribbon

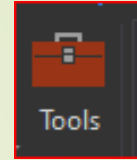
- Return to the Tool Ribbon and click on the Analysis Tab. This will bring up the Analysis Ribbon.
- This corresponds to the geoprocessing menu bar and back part of the standard toolbar in ArcMap.
- The Analysis Tool Ribbon is used for:
 - ? Creating ArcGIS Python scripts, models, etc. (Geoprocessing)
 - ? Accessing and viewing ready to use Tools, toolboxes, history (Geoprocessing)
 - ? Accessing predefined built-in tools that buffer, summarize data, overlay features, determine proximity, analyze patterns, analyze terrain, etc. (Tools)
 - ? Performing additional analysis through the ArcGIS Portal including analyzing patterns, analyzing terrain, creating features through deep learning, creating buffers, managing and summarizing data, creating hydrology features, etc. (Portal Tools)
 - ? Performing customized analysis such as sustainability, visibility, 3D, network, etc. (workflows)
- Let's look at the tools.



Analysis Tool Ribbon



Tools

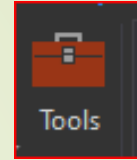


- Also called Geoprocessing Tools.
- Tools are a set of commands or instructions used to create, extract, define manipulate, and analyze geospatial features in GIS Software.
- They are stored in toolboxes or groups of different tools that have like functionality and uses.
- Each Tool consists of the following:
 - ? Inputs: The feature(s) being used in performing the procedures
 - ? Parameters: Set of controlling factors used in running a tool
 - ? Environments: Set of additional controlling factors that define where and how the tool will be run
 - ? Outputs: The results created when the tool is run

<https://pro.arcgis.com/en/pro-app/latest/help/analysis/geoprocessing/basics/geoprocessing-vocabulary.htm>

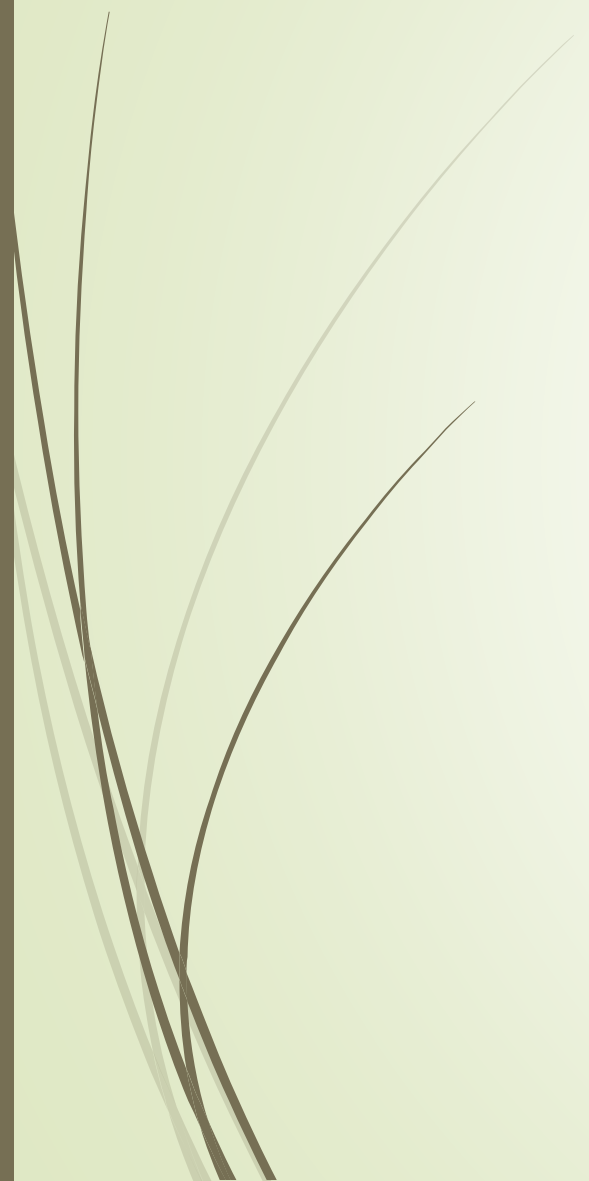


Tools



- The more commonly used tools in GIS are:
 - Append Management
 - Make Route Events Layer
 - Calculate Field
 - Spatial Join
- Click on the Tools tab. This is a collection where the user can access and view all preloaded tools and toolboxes within ArcGIS Pro.
- On the favorites screen, type in Make Route Event Layer and select the top result.
- This will bring up the tool screen. Does it look different than ArcMap?
- One of the main differences between tools in ArcMap and those in ArcGIS Pro is that Pro does not have the tool pop up but instead it will appear on the docked tab on the side (if that is where you have it docked).





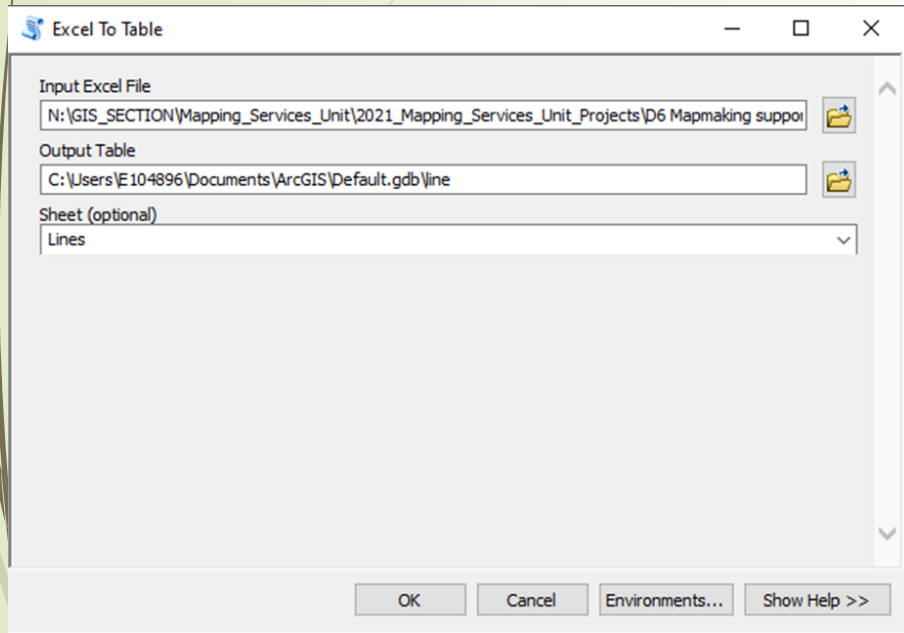
Geoprocessing

Make Route

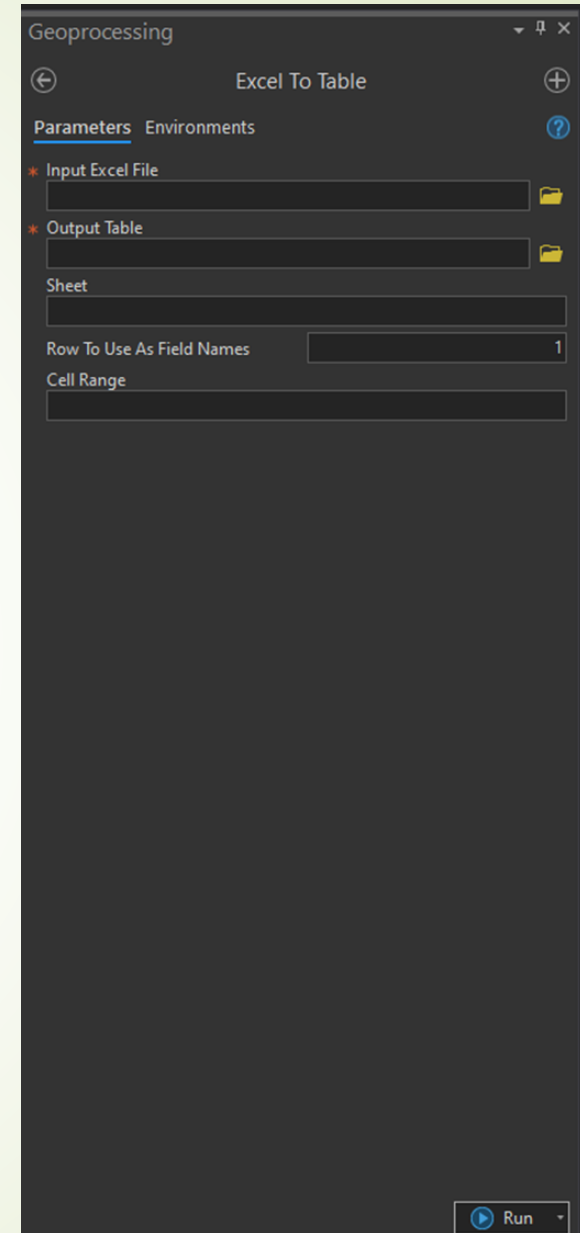
- Make Route Event Layer** (Linear Referencing Tools)
Creates a temporary feature layer using routes and route events ✓
- Make Route Analysis Layer** (Network Analyst Tools)
Makes a route network analysis layer and sets its analysis properties. A route analysis layer is useful for determining the best route bet...
- Make Vehicle Routing Problem Analysis Layer** (Network Analyst Tools)
Creates a vehicle routing problem (VRP) network analysis layer and sets its analysis properties. A VRP analysis layer is useful for opti...
- Create Routes** (Linear Referencing Tools)
Creates routes from existing lines. The input line features that share a common identifier are merged to create a single route.
- Map To KML** (Conversion Tools)
Converts a map to a KML file containing geometries and symbology. The output file is compressed using ZIP compression...
- Create Raster Dataset** (Data Management Tools)
Creates an empty raster dataset.
- Create Random Raster** (Data Management Tools)
Creates a raster dataset of random values with a distribution you define.
- Create Normal Raster** (Spatial Analyst Tools)
Creates a raster of random values with a normal (Gaussian) distribution within the extent and cell size of the analysis window.



Tools



VS



View Tool Ribbon

- Return to the Tool Ribbon and click on the View tab. This will bring up the View Tool Ribbon.
- The View Tool Ribbon is a combination of the geoprocessing, customize, and windows menu bars and the standard toolbar in ArcMap.
- It is used for customizing the ArcGIS Pro workspace by:
 - ? Turning on and off different panes within ArcGIS Pro (Windows)
 - ? Converting between the different project types and views(View)
 - ? Linking views and cursors (Link)
 - ? Creating and importing thumbnails for metadata (Thumbnail)
 - ? Creating map animation (Animation)
 - ? Customizing scenes (Scene)
 - ? Setting up location referencing of the device (Device Location)
 - ? Clipping (View Clipping)
 - ? Setting up navigation and camera (Navigation)
- ? Let's look at the Windows tab.

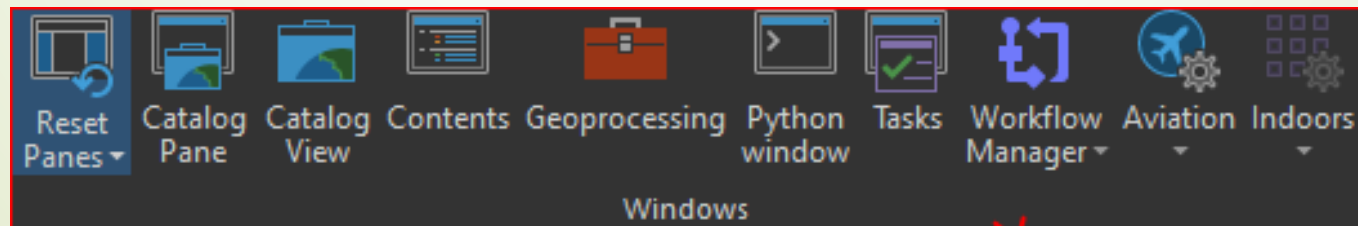


View Tool Ribbon



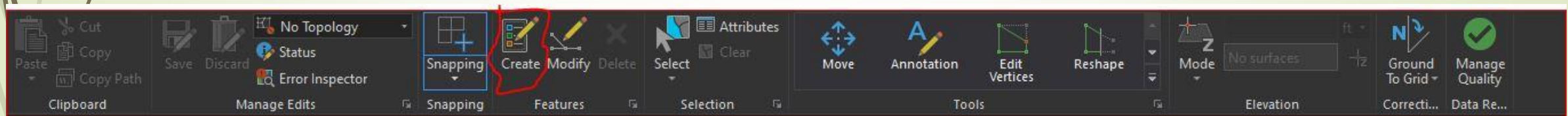
Windows Tab

- Most frequently used of all the tabs on the View Tool Ribbon
- Primarily used for:
 - Resetting and Recovering different windows such as the Catalog and Content pane if they are accidentally turned off
 - Adding additional panes such as the Python Window to test a python script
 - Viewing geoprocessing results or the results of when a tool runs
 - Diagnosing any issues in the results or that prevent it from running
 - Accessing and configuring different extensions such as Workflow Manager, Aviation Manager, etc.

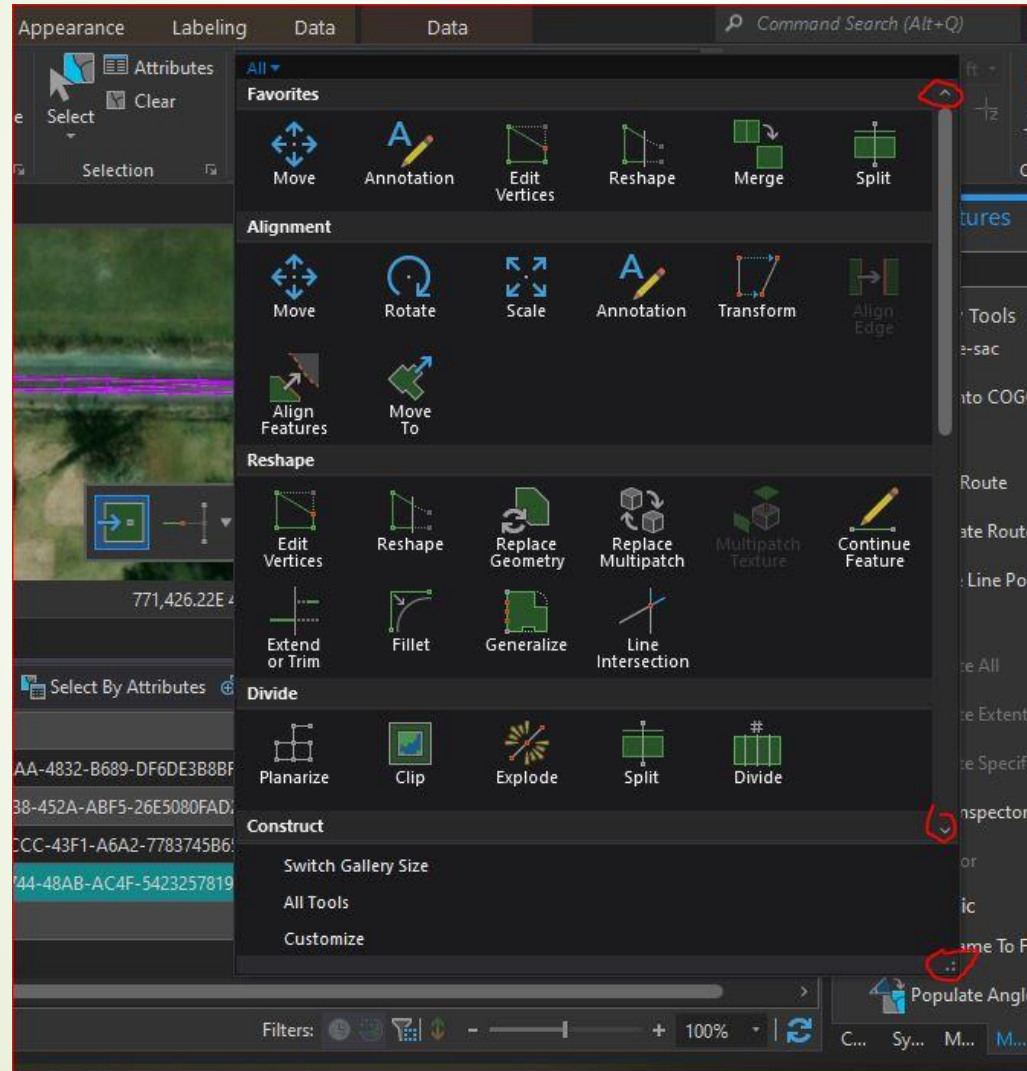


Edit Tool Ribbon

- Return to the top Tool Ribbon and select the Edit tab. This will bring up the Edit Tool Ribbon.
- The Edit Tool Ribbon is a combination of all the general editing and data review toolbars.
- It is used primarily for creating, editing, modifying, and deleting features and their corresponding attributes.
- This ribbon will be explored further in a later course.

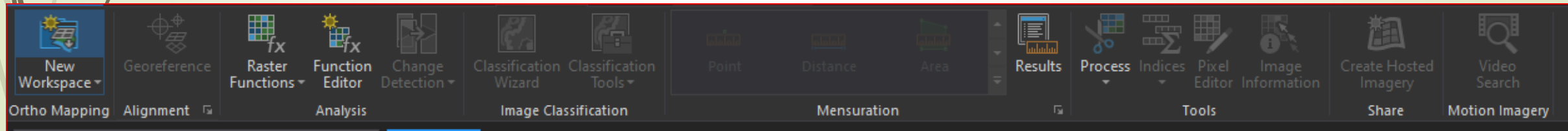


Editing Tool Ribbon



Imagery Tool Ribbon

- Return to the top Tool Ribbon and select the Imagery Tab. This will bring up the Imagery Tool Ribbon.
- The Imagery Tool Ribbon is a combination of the Imagery Classification and Spatial Analyst in ArcMap.
- It is used primarily for the creation, classification, analysis, editing, and sharing of Ortho Imagery and Raster Data.
- Not frequently used within ArcGIS Pro in WVDOT.



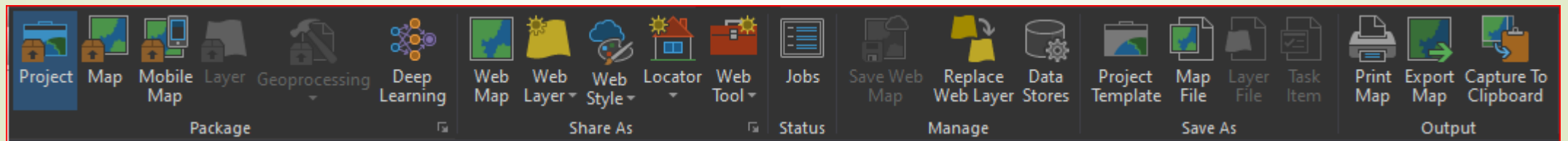
Sharing Ribbon

- Return to the top Tool Ribbon and select the Sharing tab. This will bring up the Sharing Ribbon.
- The Sharing Ribbon is a combination of the File Menu Bar and the Publisher Toolbar in ArcMAP.
- It focuses primarily on creating and publishing shared information products to internal users and to ArcGIS Enterprise including:
 - Map Packages
 - Layer packages
 - Web services including:
 - Web Maps/Features /Hosted Feature Layers/Tiles/Map Images
 - Styles
 - Geolocators
 - Web tools



Sharing Ribbon

- In addition to publishing information products, one can also:
 - Overwrite existing web services
 - View existing results
 - View datastores
 - Create project templates, map files, and layers
 - Print and export static maps
- We will come back to parts of this later on in this course.



Exercise: Review of First Lesson

- Remember the item I had you keep open ([Getting Started with ArcGIS Pro](#)), we're finally going to use it by doing the exercise.
- Additionally, we're going to also do the [Explore Data](#) and [Symbolize Map Layers](#) exercises.
- All of these can be found at:
- https://learn.arcgis.com/en/paths/try-arcgis-pro/?rmedium=links_esri_com_j_r&source=https%3A%2F%2Flinks.esri.com%2Flearn-try-arcgis-pro
- These three sections will help you get ready for the next and final section of this course, *Creating a Map*.





Any Questions? Thanks