

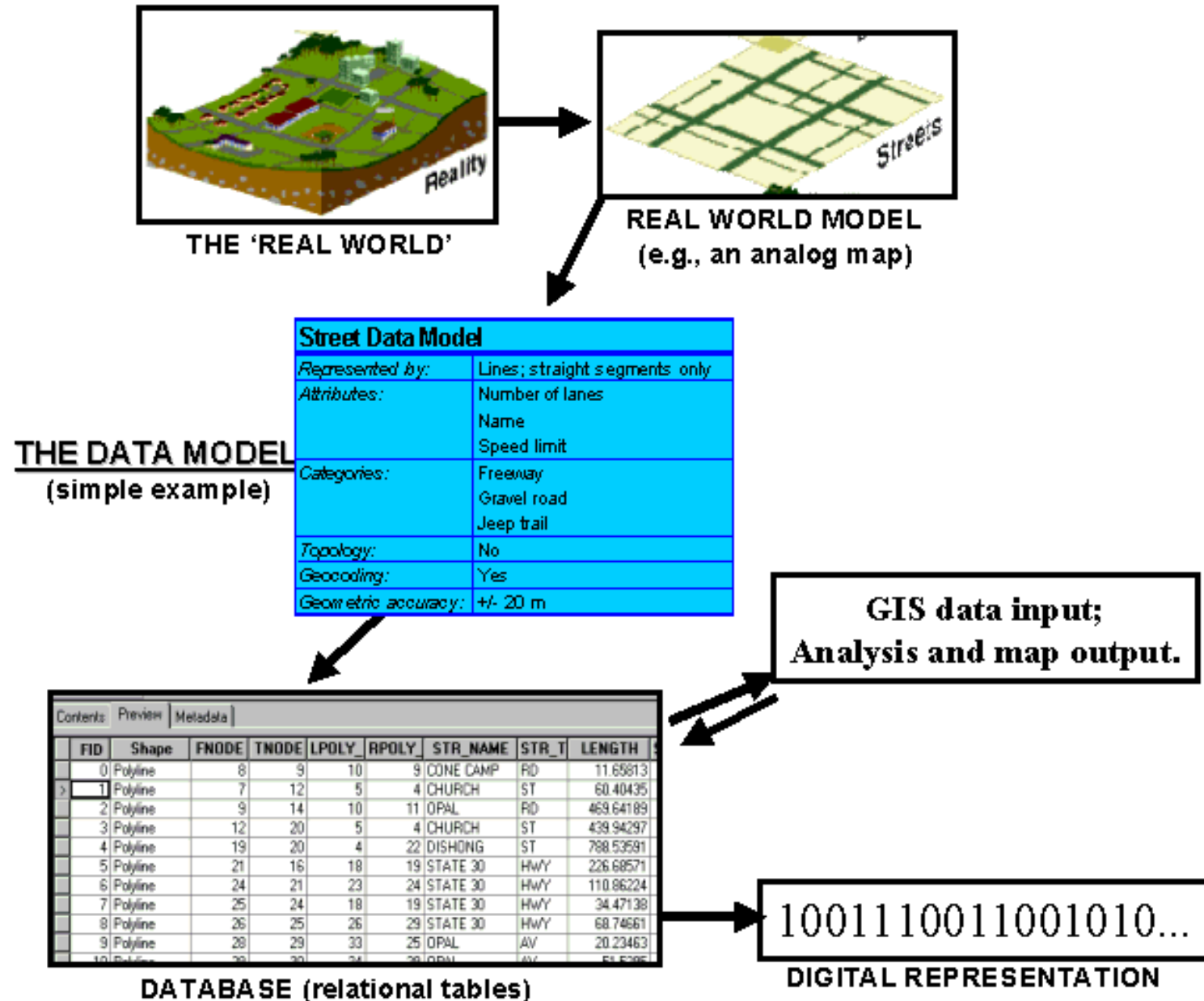


INTRO TO GIS: DATA, DATA STORAGE, COORDINATE SYSTEMS

IGME 384 Week 2

DATA MODELS

- A GIS data model is the way that geographic-scale features or phenomena are represented in a digital manner.
- Digital representations ultimately reduce to binary 1 and 0s.
- Reducing geographic reality to 1 and 0s is problematic and many of the nuances, subtleties, and idiosyncrasies are lost in digital representations
- For example:
 - How does one represent the shifting nature of an eroding shoreline?
- Thus, GIS data models have been developed to address these representational issues in a variety of ways



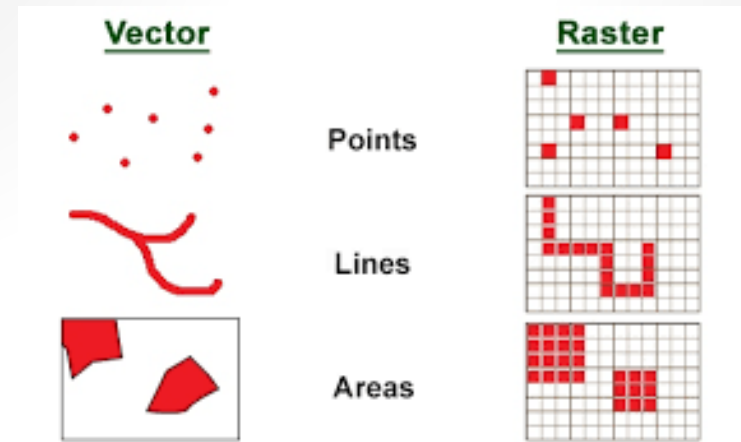
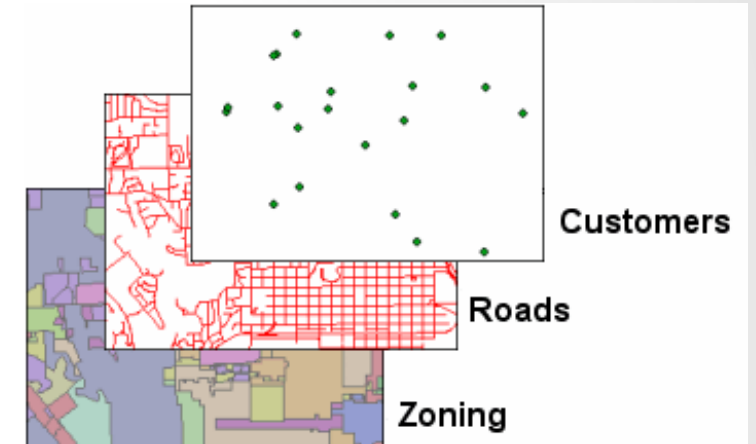
GIS DATA TYPES

- Two Main Types of GIS Data
 - Vector
 - Points
 - Lines
 - Polygons



VECTOR DATA

- Discrete, vertex-based shapes
- Each vertex in a vector shape is referenced to a specific XY cartesian point or geographic coordinate location.
- By using a discrete, vertex-based approach, the vector data model is generally advantageous for representing geographic features that have discrete boundaries or edges or can be reduced to representation as a single XY coordinate pair
- Points, lines and polygons: discrete edges or boundaries

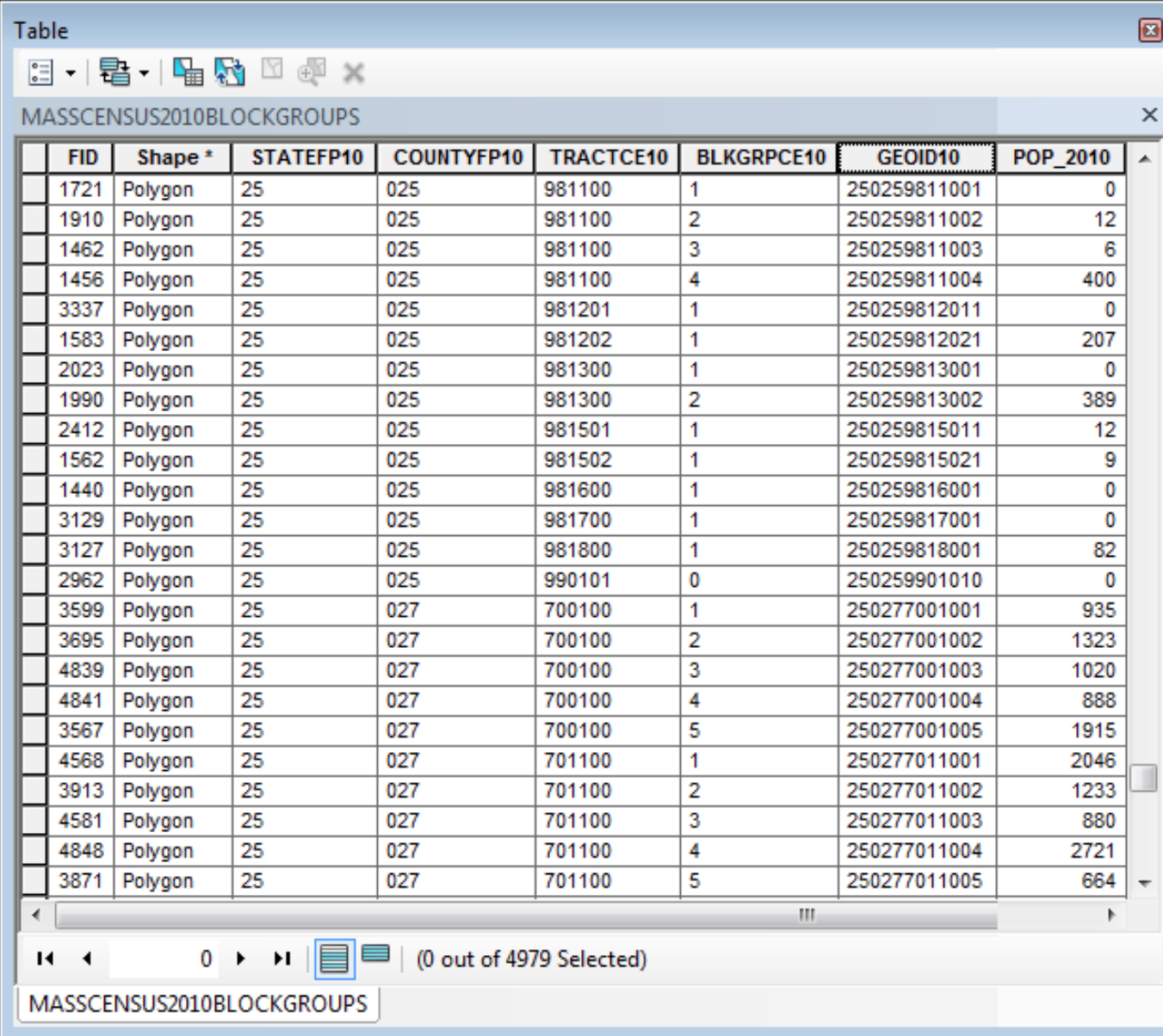


VECTOR DATA

In addition to the spatial location, the record (attribute table) can include a variety of non-spatial attributes (e.g. population count)

The specific data of the point, line, or polygon is typically hidden from ArcMap-user.

But, using text-based data formats (XML, KML, or GeoJSON), the user can view specific vector vertices and coordinates.



Table

MASSCENSUS2010BLOCKGROUPS

FID	Shape *	STATEFP10	COUNTYFP10	TRACTCE10	BLKGRPCE10	GEOID10	POP_2010
1721	Polygon	25	025	981100	1	250259811001	0
1910	Polygon	25	025	981100	2	250259811002	12
1462	Polygon	25	025	981100	3	250259811003	6
1456	Polygon	25	025	981100	4	250259811004	400
3337	Polygon	25	025	981201	1	250259812011	0
1583	Polygon	25	025	981202	1	250259812021	207
2023	Polygon	25	025	981300	1	250259813001	0
1990	Polygon	25	025	981300	2	250259813002	389
2412	Polygon	25	025	981501	1	250259815011	12
1562	Polygon	25	025	981502	1	250259815021	9
1440	Polygon	25	025	981600	1	250259816001	0
3129	Polygon	25	025	981700	1	250259817001	0
3127	Polygon	25	025	981800	1	250259818001	82
2962	Polygon	25	025	990101	0	250259901010	0
3599	Polygon	25	027	700100	1	250277001001	935
3695	Polygon	25	027	700100	2	250277001002	1323
4839	Polygon	25	027	700100	3	250277001003	1020
4841	Polygon	25	027	700100	4	250277001004	888
3567	Polygon	25	027	700100	5	250277001005	1915
4568	Polygon	25	027	701100	1	250277011001	2046
3913	Polygon	25	027	701100	2	250277011002	1233
4581	Polygon	25	027	701100	3	250277011003	880
4848	Polygon	25	027	701100	4	250277011004	2721
3871	Polygon	25	027	701100	5	250277011005	664

0 (0 out of 4979 Selected)

MASSCENSUS2010BLOCKGROUPS

SHAPEFILE(CONTINUED)

The shapefile is the most common geospatial file you'll come across (industry standard but also very outdated).

Each shapefile contains three mandatory files:

SHP (feature geometry)

SHX (shape index position, allows GIS systems to find features quickly)

DBF (attribute data)










Optional:

PRJ (projection system metadata)

XML (associated metadata)

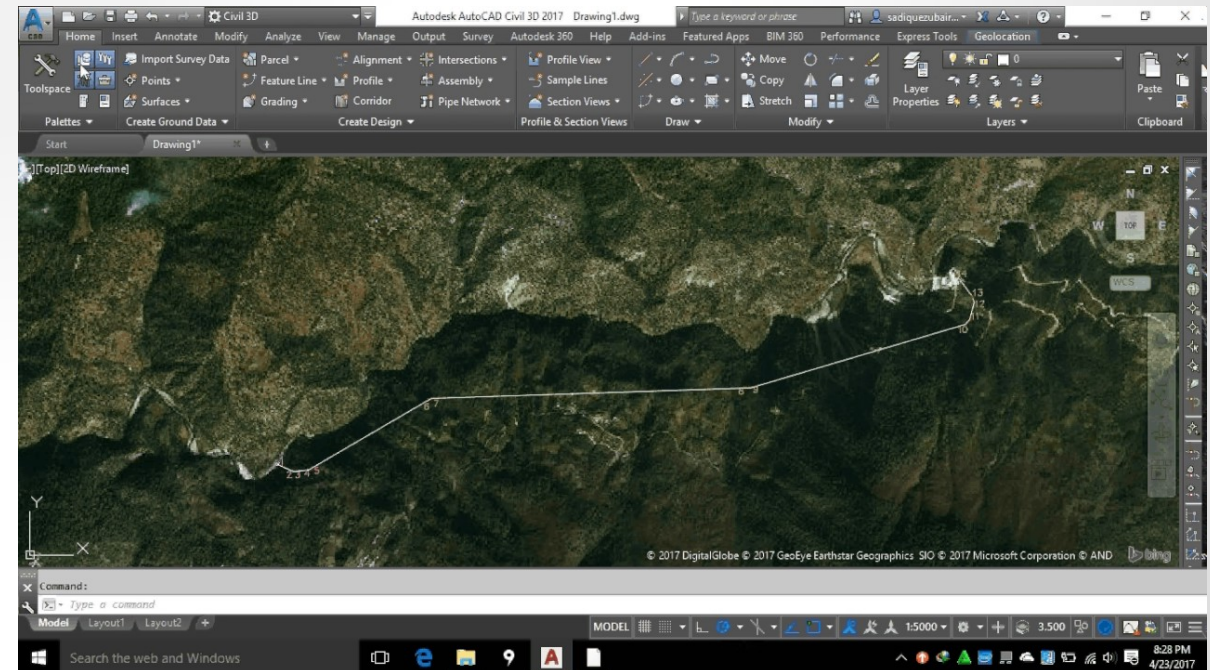
Has a Parody Twitter Account [@shapefile](#)



Name	Type	
 Lines.shp	Shapefile	  Lines.dbf
 Points.shp	Shapefile	  Lines.shp
 Polygons.shp	Shapefile	  Lines.shx

OTHER TYPES OF VECTOR DATA THAT YOU MAY SEE:

- KML stands for Keyhole Markup Language. This GIS format is XML-based and is primarily used for Google Earth. KML was developed by Keyhole Inc which was later acquired by Google.
- KMZ (KML-Zipped) replaced KML as being the default Google Earth geospatial format because it is a compressed version of the file. KML/KMZ became an international standard of the Open Geospatial Consortium in 2008.
- The longitude, latitude components (decimal degrees) are as defined by the World Geodetic System of 1984 (WGS84).



GIS DATA TYPES

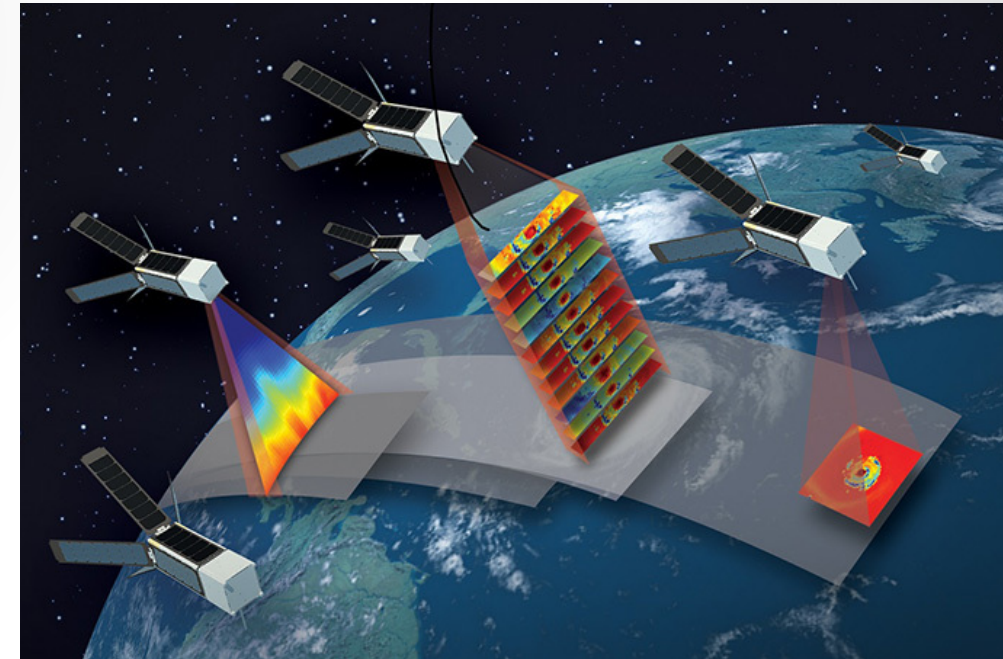
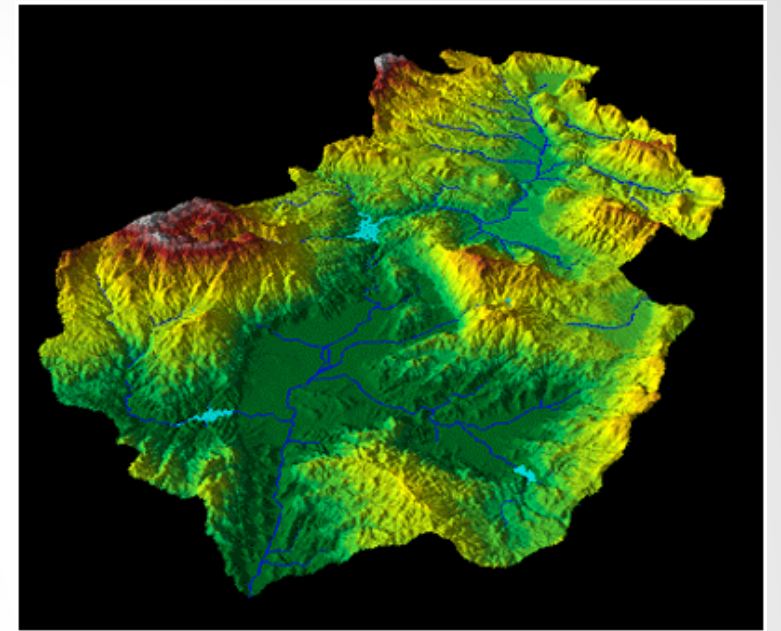
- Two Main Types of GIS Data
 - Vector
 - Points
 - Lines
 - Polygons
 - Raster
 - Aerial Imagery
 - Weather Radar Imagery
 - Elevation Data
 - Lots of other types



Raster data is not the same as OSM or Google Maps tiles
Those are rasterized versions of GIS Projects to display faster, but do not have the same data characteristics as the original

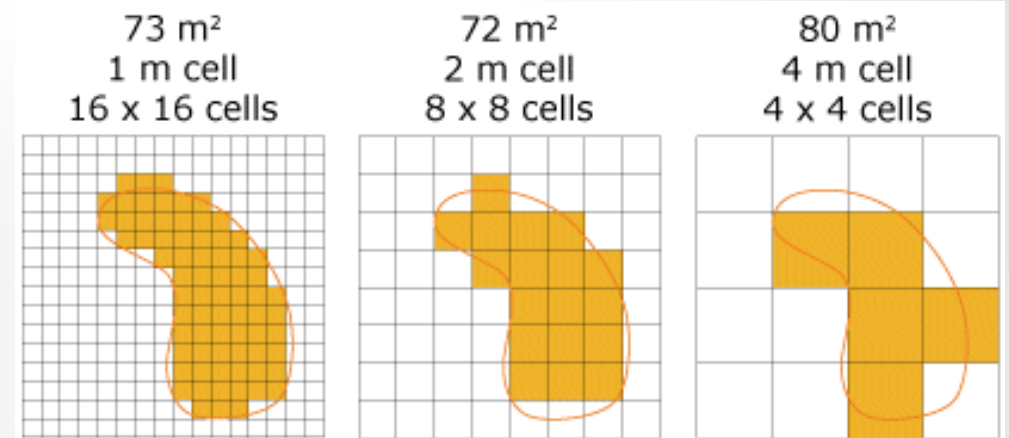
RASTER DATA

- The raster GIS data model represents geographic features and phenomena as a grid of individual cells.
- Used for modeling geographic entities that are continuous in nature and have no discrete boundaries or edges.
- Examples of continuous phenomena include temperature and elevation.
- Raster data is also the format used for imagery ranging from aerial photography to space-based images that can be incorporated into GIS software.

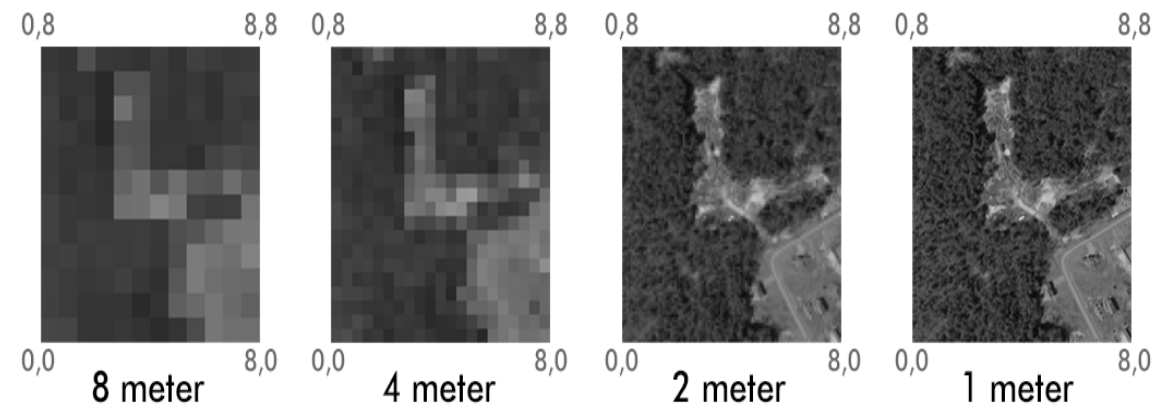


SPATIAL RESOLUTION

- Spatial resolution is of utmost importance in raster data: fineness of detail of a raster dataset
- It is based on the size of each cell within the grid
- For example, the smaller each grid cell, the finer the spatial resolution of the raster dataset.
- This idea is no different than that of
- digital camera picture pixel resolution.



Raster over the same extent, at 4 different resolutions



RASTER FORMAT EXAMPLES

- GeoTIFF (Geographic Tagged Image File Format)
- The GeoTIFF has become an industry image standard file for GIS and satellite remote sensing applications.
- GeoTIFFs may be accompanied by other files:
 - TFW is the world file that is required to give your raster geolocation
 - XML optionally accompany GeoTIFFs and are your metadata
 - AUX out auxiliary files store projections and other information.

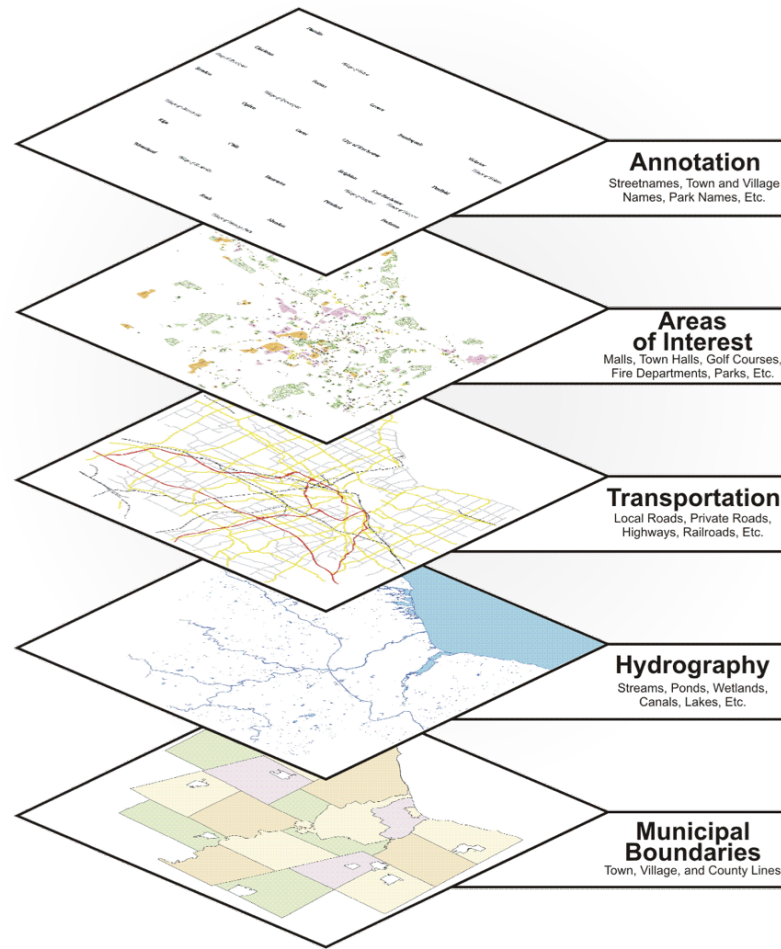


RASTER FORMAT EXAMPLES (CONTINUED)

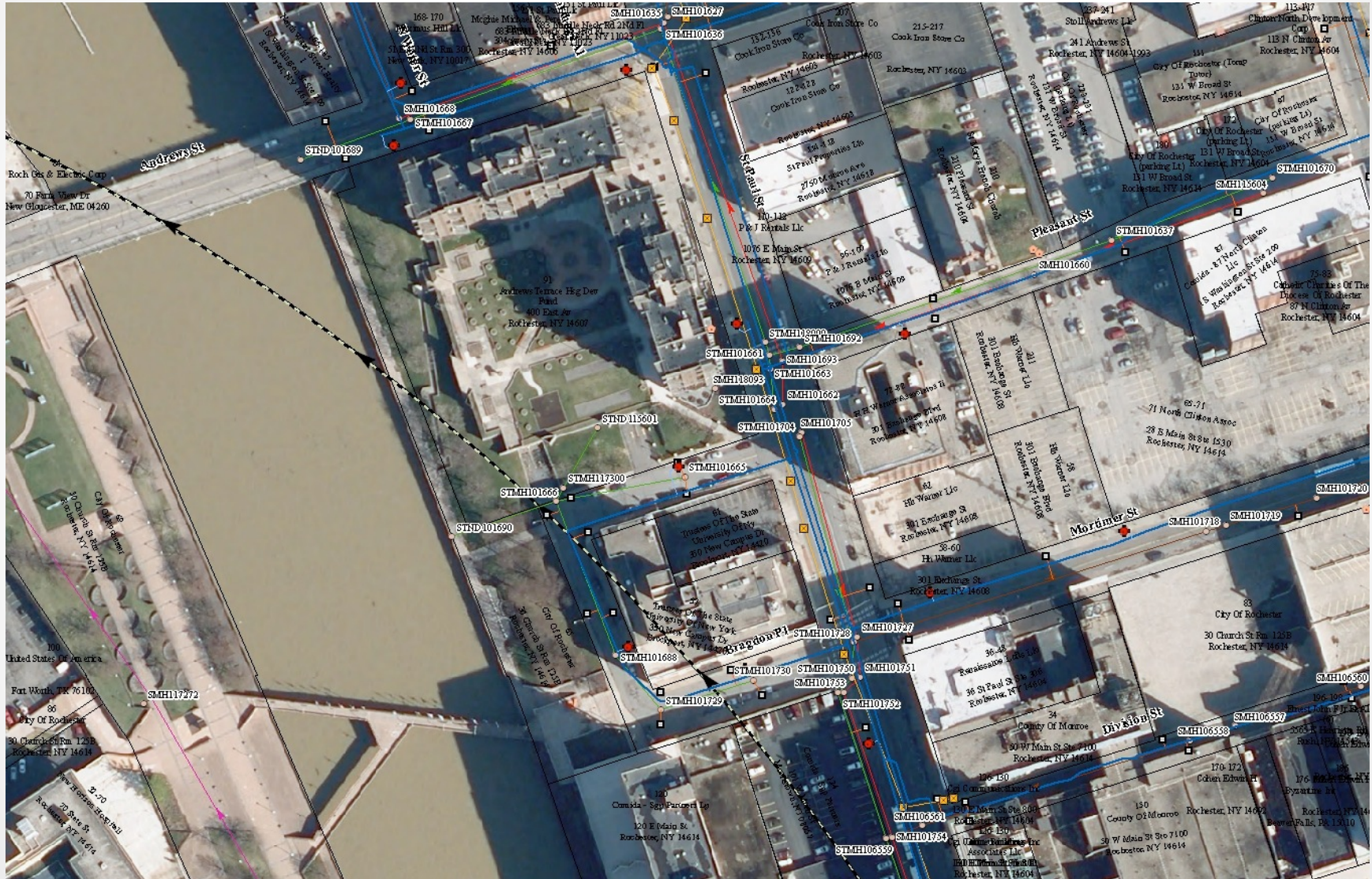
- JPEG 2000 (Joint Photographic Experts Group)
- JPEG 2000 typically have a JP2 file extension.
- The JPEG 2000 GIS formats require a world file which gives your raster geolocation.



GIS MAPS ARE CREATED IN LAYERS OF DATA



GIS DATA TYPES, EXAMPLE



OTHER COMMON GIS DATA FORMATS: COMMA-SEPARATED VALUES (CSV)

- Simple: read by almost any program including the Excel or Google Docs.
- Text file where columns are separated by commas and rows are separated by line breaks.
- When used in mapping, two extra columns are added to hold the x and y, or lat and lon.
- The downside of the CSV is that they are very easy to break. Just one comma in the wrong place and the file becomes unreadable.

New John's Apparel CSV

File

Edit

View

Insert

Format

Data

Tools

Add-ons

Help

Last edit was 2 minutes ago

Comments

Share

fx

First Name

	A	B	C	D	E	F	G	H	I	
1	First Name	Last Name	Email	Company	Address1	Address2	City	Province	Province Code	Co
2	Charles	Brocade	brochuck@hotmail.com		2171 Bay Street		Toronto	Ontario	ON	Ca
3	Tom	Moffatt	tom.moffatt@gmail.com							
4	Katherine	Vasbinder	katherinemvasbinder@jourrapide.		1152 Lauzon Parkway		Amherstburg	Ontario	ON	Ca
5	Adam	McFadden	adamcmcfadden@gmail.com		4278 Eglinton Avenue		Toronto	Ontario	ON	Ca
6	Kevin	Buttler	kevinbuttler@gmail.com		150 Elgin St.		Ottawa	Alberta	AB	Ca
7	Emily	Macausland	emily@Mclausandstationary.com					Ontario	ON	Ca
8	Jean	Lajoie	johns-apparel@gmail.com		123 Rue D'exemple			Ontario	ON	Ca
9	Beatrice	Pendergast	pendergast.b@gmail.com		13 Casey Crescent		Vancouver	British Columbia	BC	Ca
10	Amy	Pond	apond@crackinthewall.com				Ottawa	Ontario	ON	Ca
11	Eliza	Bennet	eliza@eliza.com		89 Dearwood Dr		Toronto	Ontario	ON	Ca
12	Beatrice	Alighieri	beatrice1300@gmail.com		620 Dante's Court		Virgil	Ontario	ON	Ca
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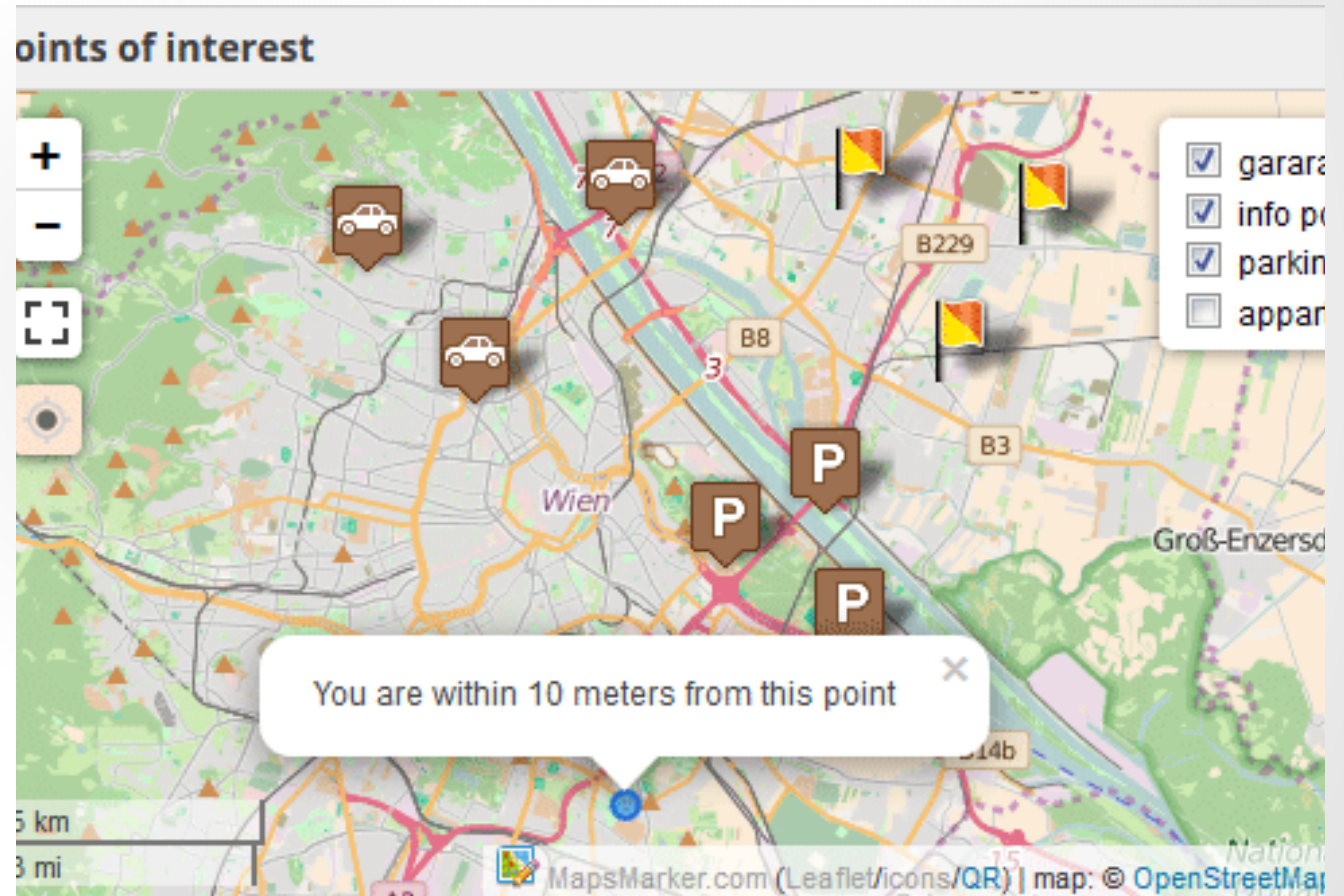
OTHER DATA FORMATS: LAYER DATA

- LYR (Layer)
- Layer files are used for displaying a set of symbology in a map. It doesn't contain the geographic data itself, layer files simply specify how the data will be displayed.
- When you share a vector or raster data set, a layer file ensures the same symbology will be displayed in another map.
- Layer files can represent polygons, polylines, points or raster data sets

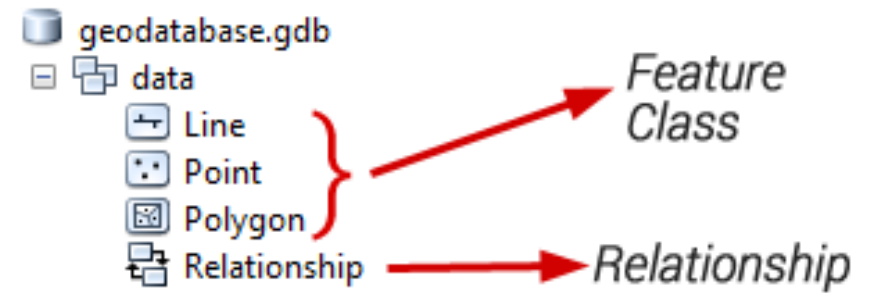


OTHER DATA FORMATS : OPENSTREETMAP (OSM)

- OpenStreetMap is the largest crowdsourcing GIS data project of the planet Earth.
- The GIS format .OSM is OpenStreetMap's XML-based file format
- Effectively a vector format but served in a tile image service



OTHER DATA FORMATS : FILE GEODATABASE



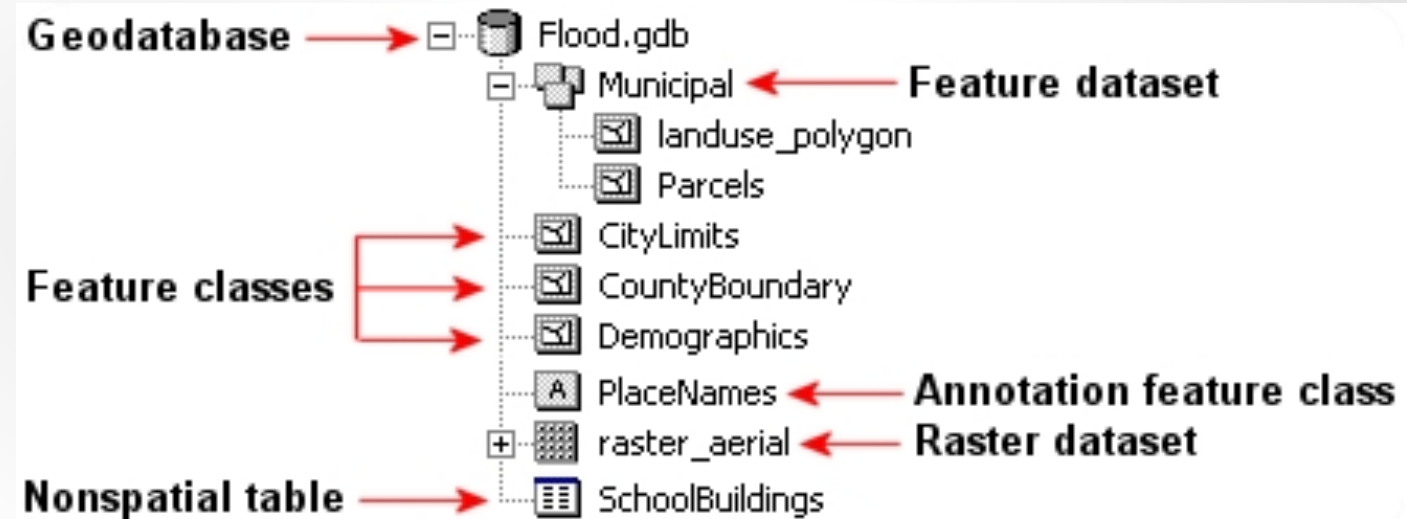
- “A file geodatabase is a collection of files in a folder that can store,
- query, and manage both spatial and nonspatial data.”
- Esri created the file geodatabase to be a container for storing multiple attribute tables, vector and raster data sets.
- File geodatabases offer structural and performance advantages.
 - They have fast performance, versatile relationships, compatible storage for rasters, data compression, customizable configuration
- Within a geodatabase, shapefiles are referred to as feature classes. It can store more complex data such as networks, raster mosaics and feature data sets.

PARTS OF A GEODATABASE

- Feature Class
- Feature Dataset
- Standard Tables
- Relationship Classes
- Attribute Domains

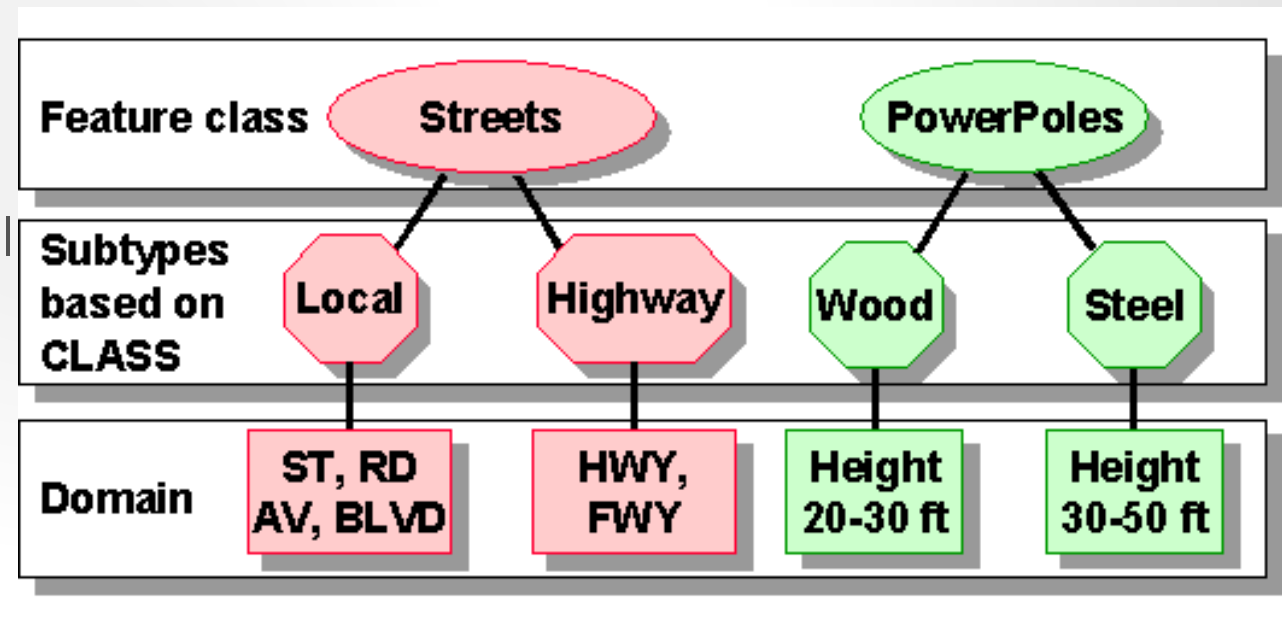
FEATURE CLASS AND FEATURE DATASET

- A feature class is the primary storage unit for spatial data in the file geodatabase.
 - Features within a feature class all share the same spatial representations (e.g. roads are lines)
- Feature datasets contain spatially related features (organization container for feature classes)
- Standard Tables are collections of non-spatial data observations
- organized by rows and columns
 - Each column has a data type (numerical, text)



GEODATABASES (CONTINUED)

- Attribute domains are the idea of a predetermined list of values that can be used for populating records in a feature class or table.
- Example: online shopping list of states/countries can be used for populating records in a feature class or table.
- Benefits: Standardization when creating new feature classes/tables. Helps to reduce inconsistencies (e.g. typos)



MAP PROJECTIONS REVIEW



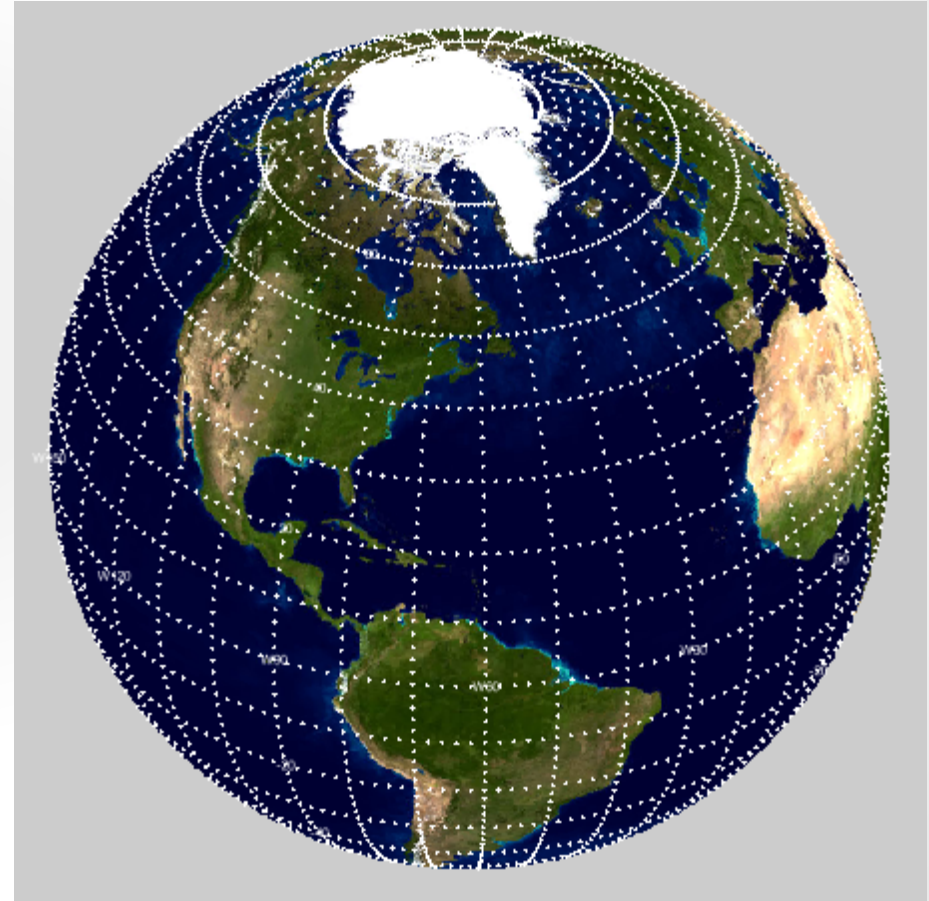
WHAT IS A MAP PROJECTION?

- A method of representing the earth's three-dimensional surface as a flat two-dimensional surface.
- Mathematically convert geographic
- (latitude and longitude) coordinates into planar Cartesian (x,y) coordinates



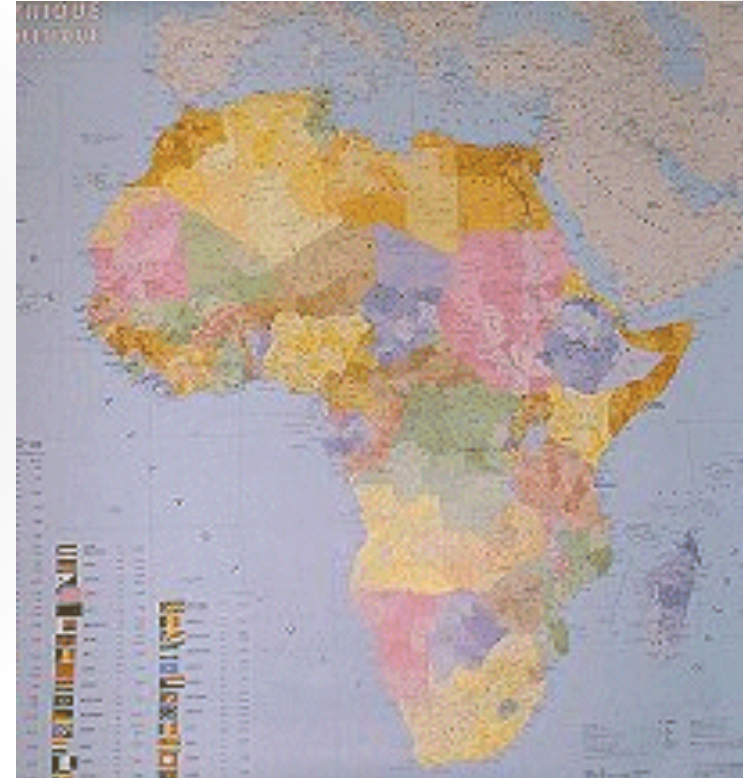
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DECIMAL DEGREE COORDINATES ARE A WAY TO REFER TO LAT/LONG COORDINATES IN NUMERICAL/DECIMAL FORMAT

- 1 Degree is equal to 60 Minutes
- 1 Minute = 60 Seconds
- Using $43^{\circ}4' 31''$ as an example, how is this coordinate the same as 43.0753
- The first step is to convert seconds to minutes, or divide 31 seconds by 60 to get 0.5166 minutes
- The second step is to convert the minutes to degrees, where you first add the minutes from step 1 which were 0.5166 with 4 and divide that combined value of 4.5166 by 60 to get 0.0753degrees

DIFFERENCE BETWEEN GEOGRAPHIC COORDINATE SYSTEMS AND PROJECTED COORDINATE SYSTEMS

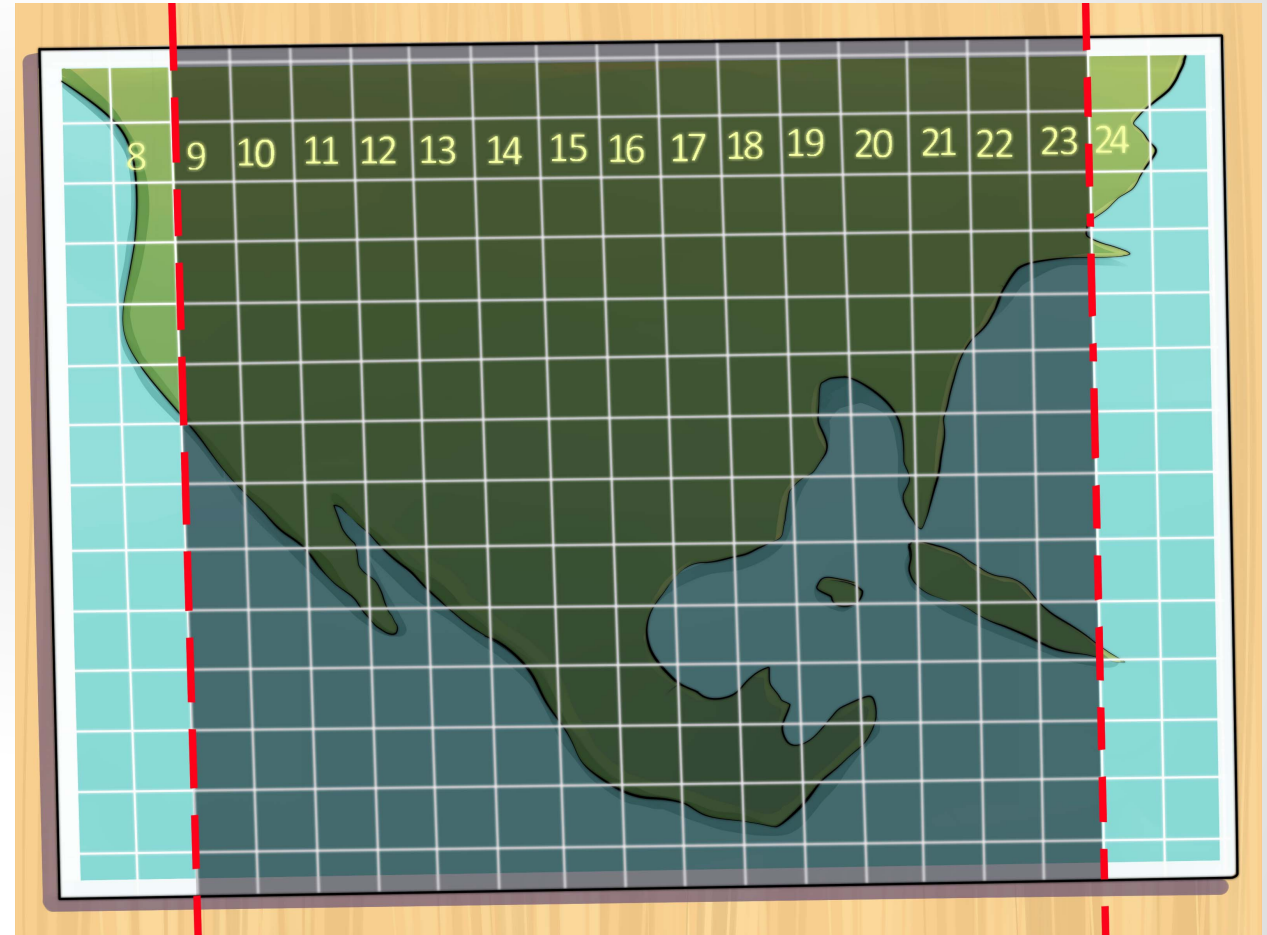
- A global or spherical coordinate system such as latitude-longitude. These are often referred to as geographic coordinate systems (how data are stored in 3D*)
- A projected coordinate system such as universal transverse Mercator (UTM), Albers Equal Area, or Robinson, all of which (along with numerous other map projection models) provide various mechanisms to project maps of the earth's spherical surface onto a two-dimensional Cartesian coordinate plane.
- Projected coordinate systems are referred to as map projections. (how data are displayed in 2D, ArcMap transforms according to equation)

WHAT YOU REALLY NEED TO REMEMBER ABOUT COORDINATE SYSTEMS:

- A horizontal datum (based on a reference ellipsoid and control points) is used to mathematically define the earth's shape and provide a reference for latitude and longitude (or spherical) coordinates;
 - Most common is WGS 84
- A map projection mathematically translates a 3D representation of the earth into a 2D representation which unavoidably creates some distortion.
- Based on this translation created through a map projection, spherical coordinates can be converted to planar (x,y) coordinates;
- A coordinate system can then be derived from an agreed upon origin point based on map projections optimized for a particular region and using standard units of measurement.

THE UNIVERSAL TRANSVERSE MERCATOR (UTM) COORDINATE SYSTEM

- Internationally standard planar coordinate system
 - 2D measurement system that locates distance based on an origin (0,0)
- In the UTM system, the earth is divided up in 60 zones that span 6° of longitude each or $60 \text{ zones} * 6^\circ = 360^\circ$ total covering the entire earth and each UTM zone is divided into a north and south section
- The equator (0° latitude) is used to mark the boundary between the north and south sections of each UTM zone.
- Although the UTM Coordinate system is very useful, it also has drawbacks.
 - Why?



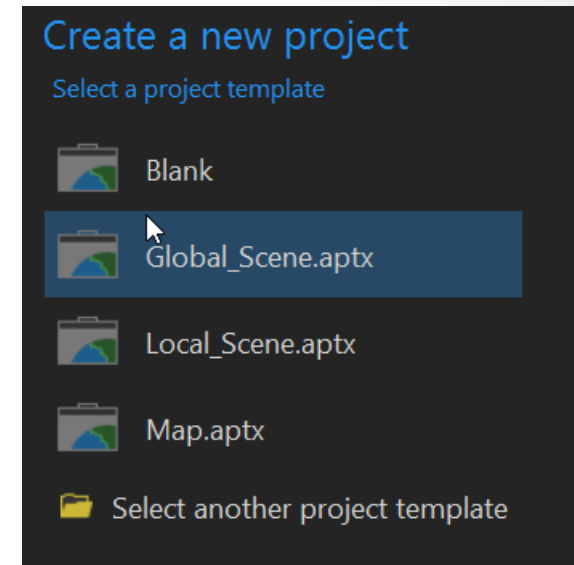
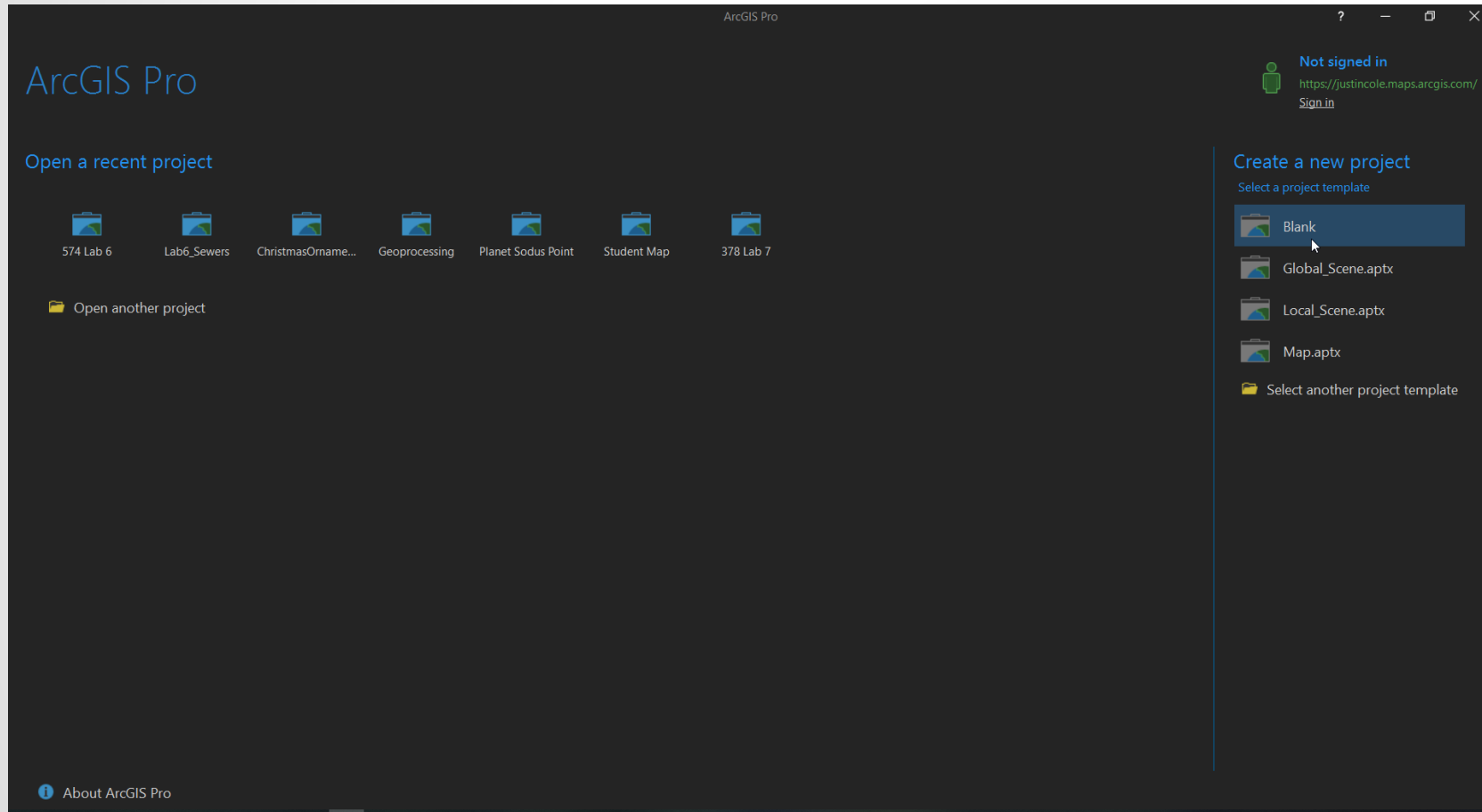
DATUMS

- A horizontal datum (set of reference points), from which we would derive X,Y coordinates, consists of two elements: reference ellipsoid and accurately known control points
- However, it is important to understand the basic ideas of ellipsoids in a mapping context as a spot on the earth's surface can have different coordinate values based on the reference ellipsoid used to measure the coordinates
- Control points are accurately measured locations used as reference points in land surveying and for developing datums.
- In the United States, government organizations like the US Coast and Geodetic Survey physically mark control points with a small metal disk called a benchmark.
- Common datums you will find in GIS datasets include the North American Datum of 1983 (or NAD 83) and the World Geodetic System 1984 datum (WGS84).
WGS 84 is the datum that is used for most Global Positioning System (GPS) receiver coordinates

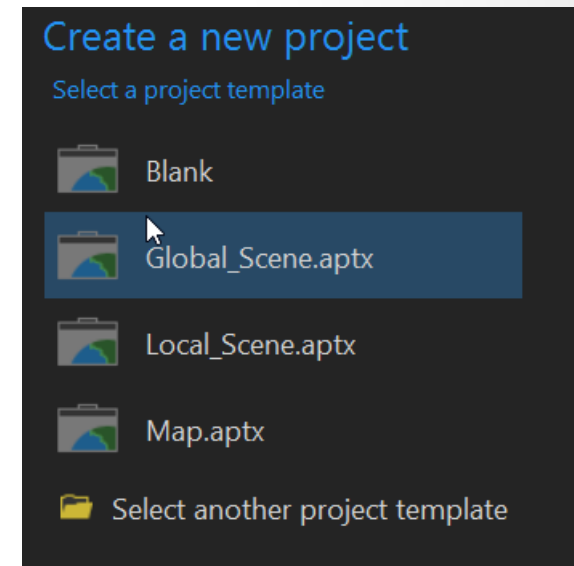
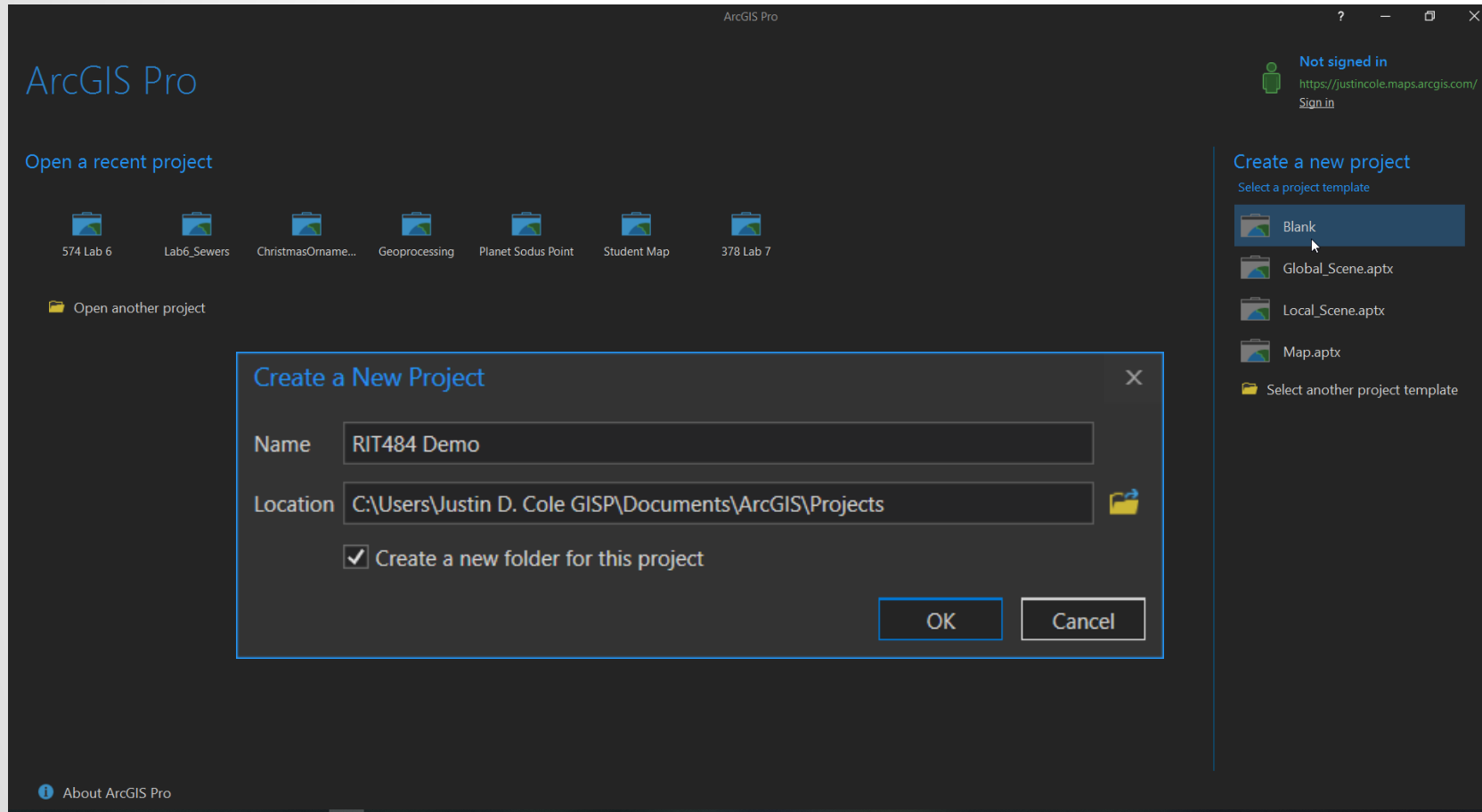


ARCGIS PRO

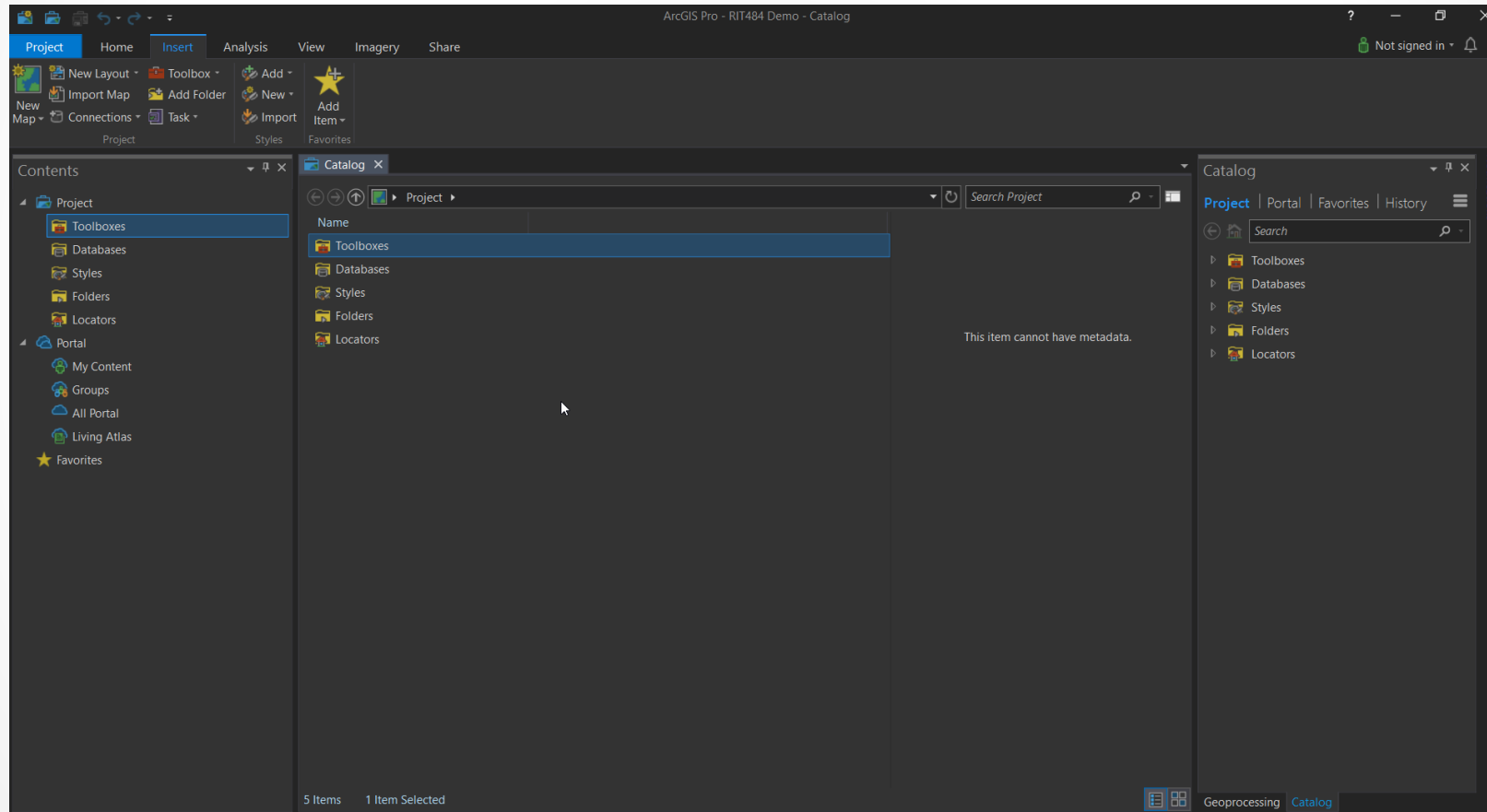
ARCGIS PRO STARTS WITH THE PROJECT



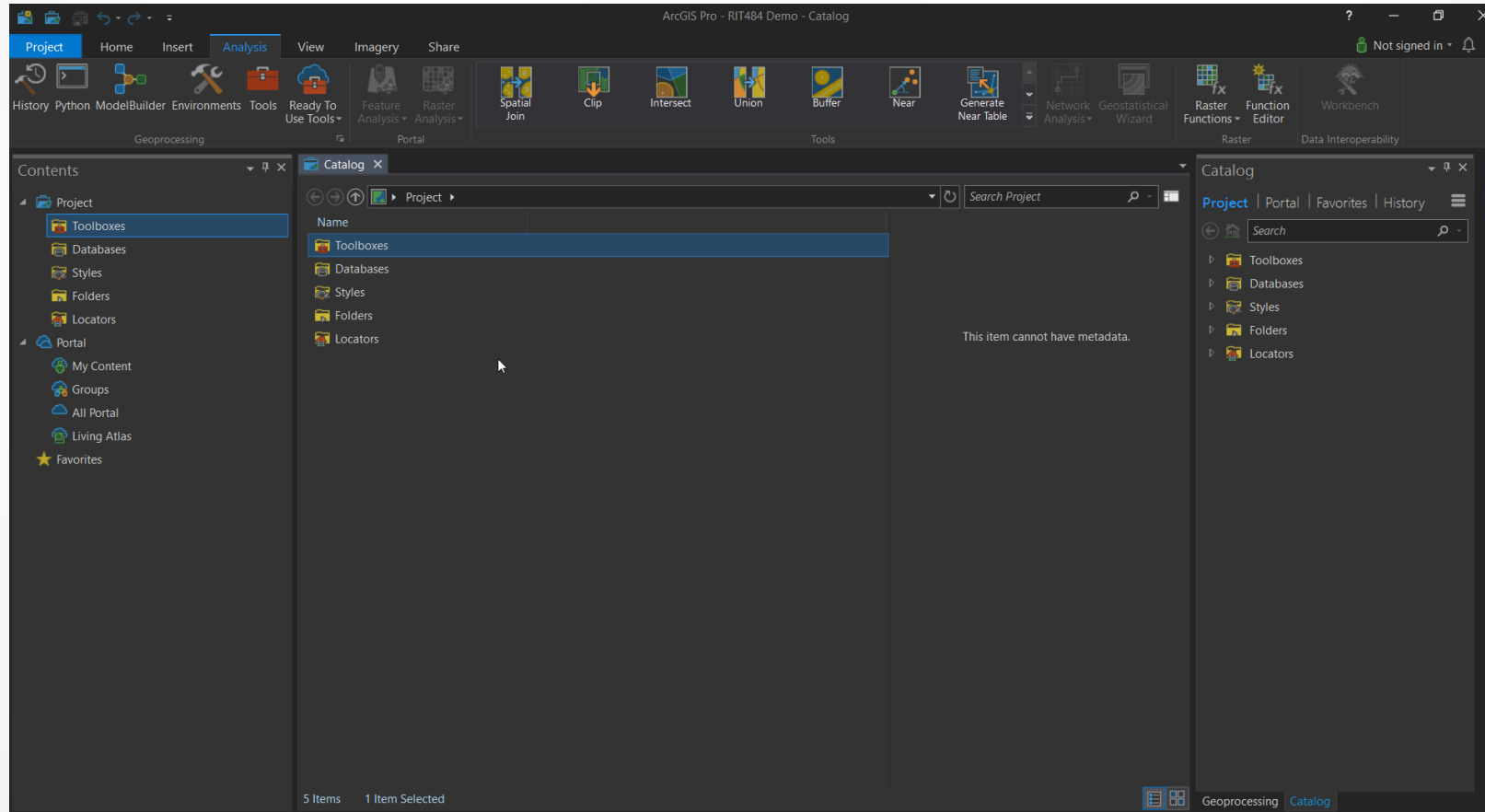
ARCGIS PRO STARTS WITH THE PROJECT



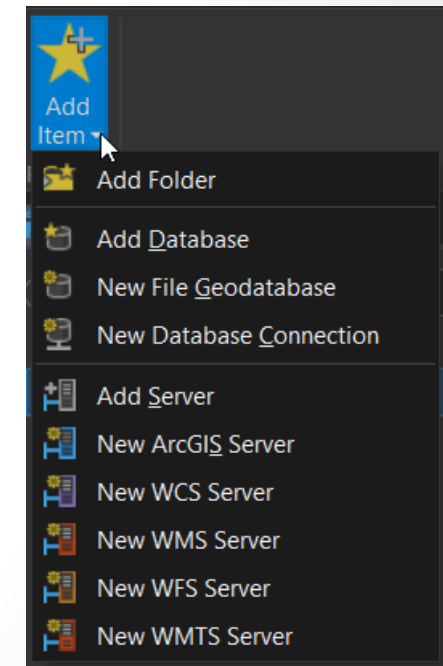
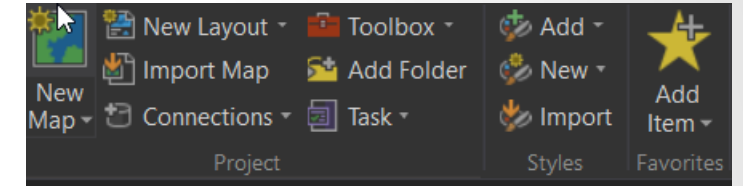
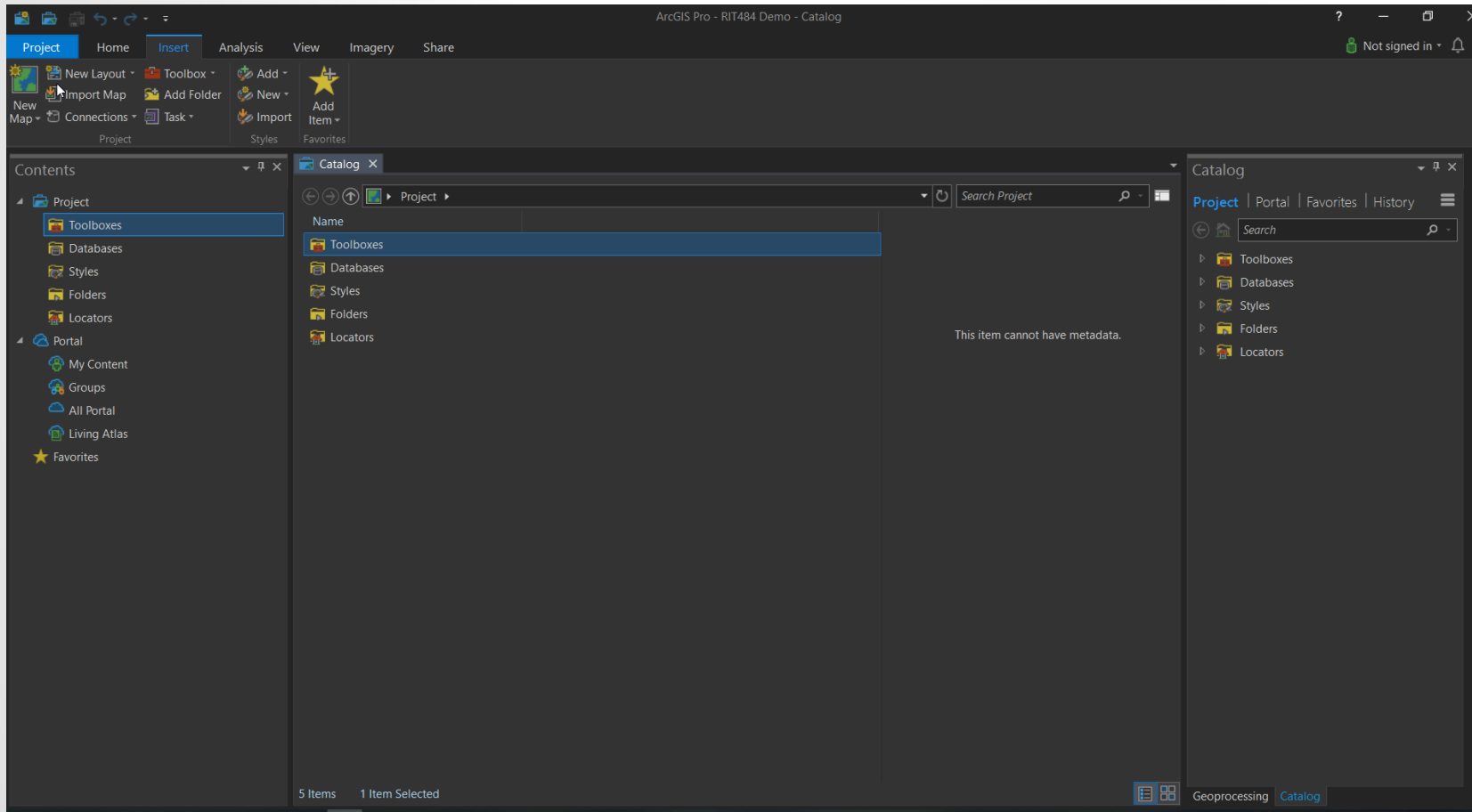
WHEN YOU START THE PROJECT YOU WILL SEE THE CATALOG PANE



THE RIBBONS AT TOP GIVE YOU ACCESS TO TOOLS DEPENDING ON WHAT YOU ARE DOING

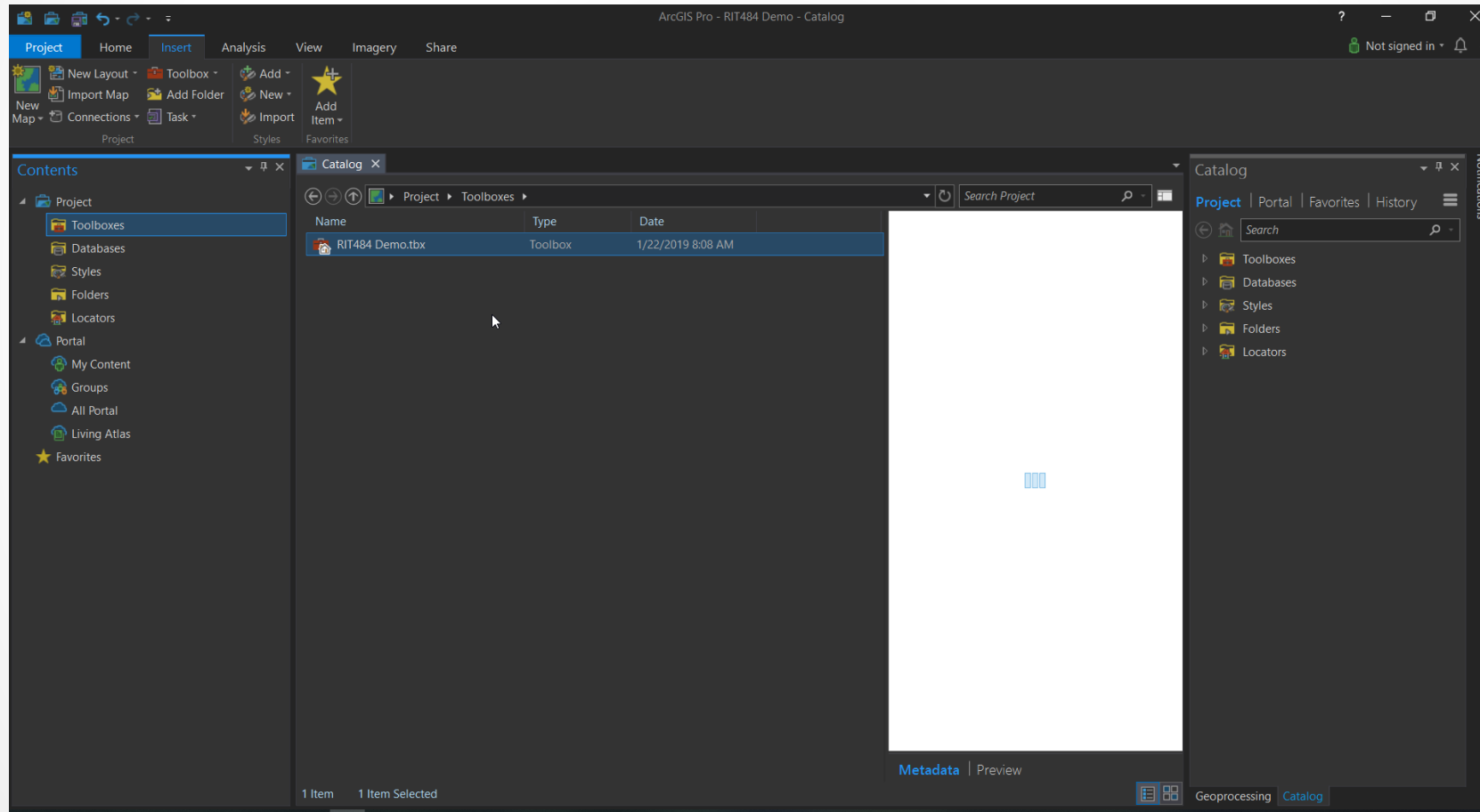


INSTEAD OF JUST SETTING LOCATIONS TO FOLDERS YOU
HAVE THE ABILITY TO ADD OTHER LOCATIONS AS WELL.
SUCH AS DATABASES

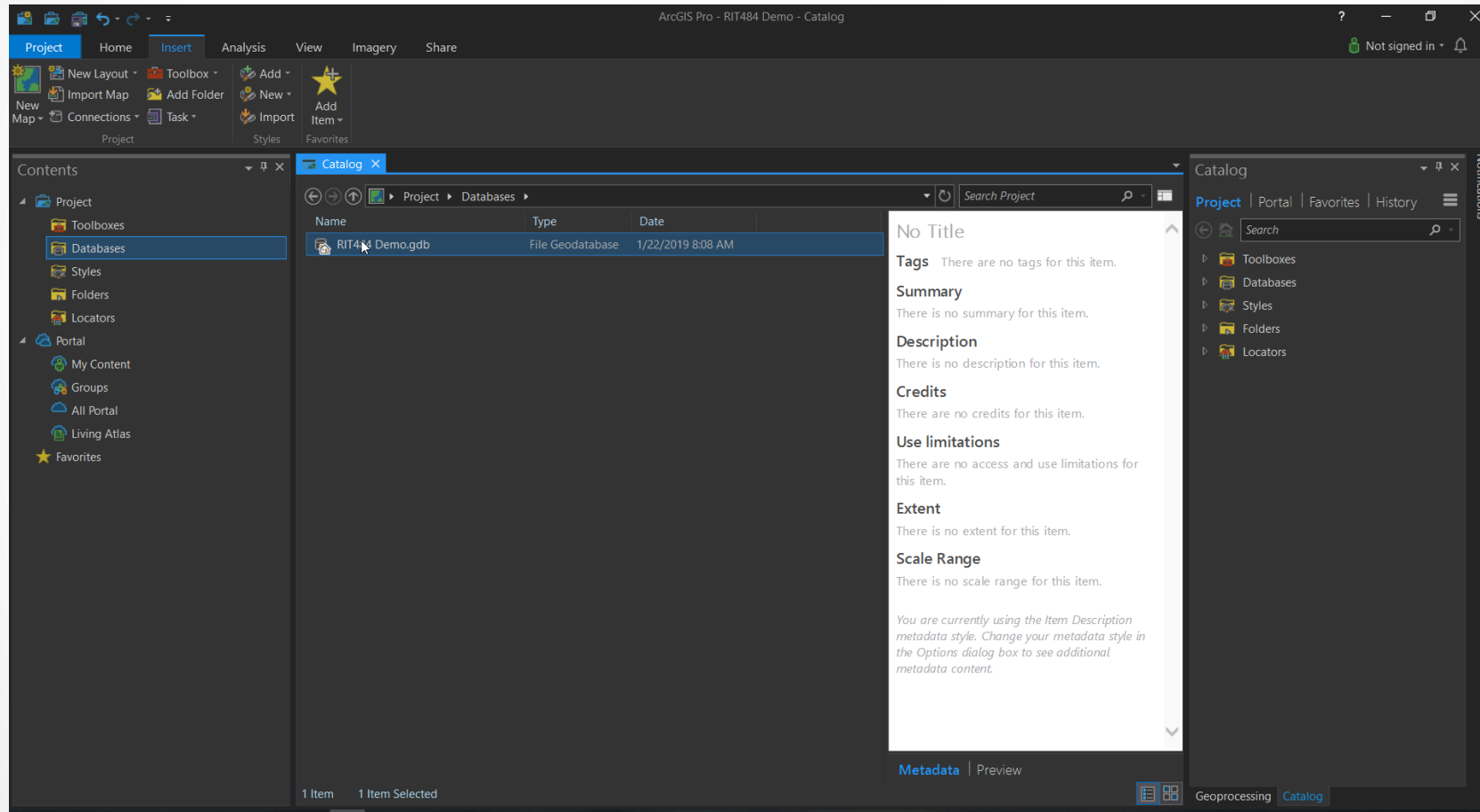


Favorites are a way to share
these between projects

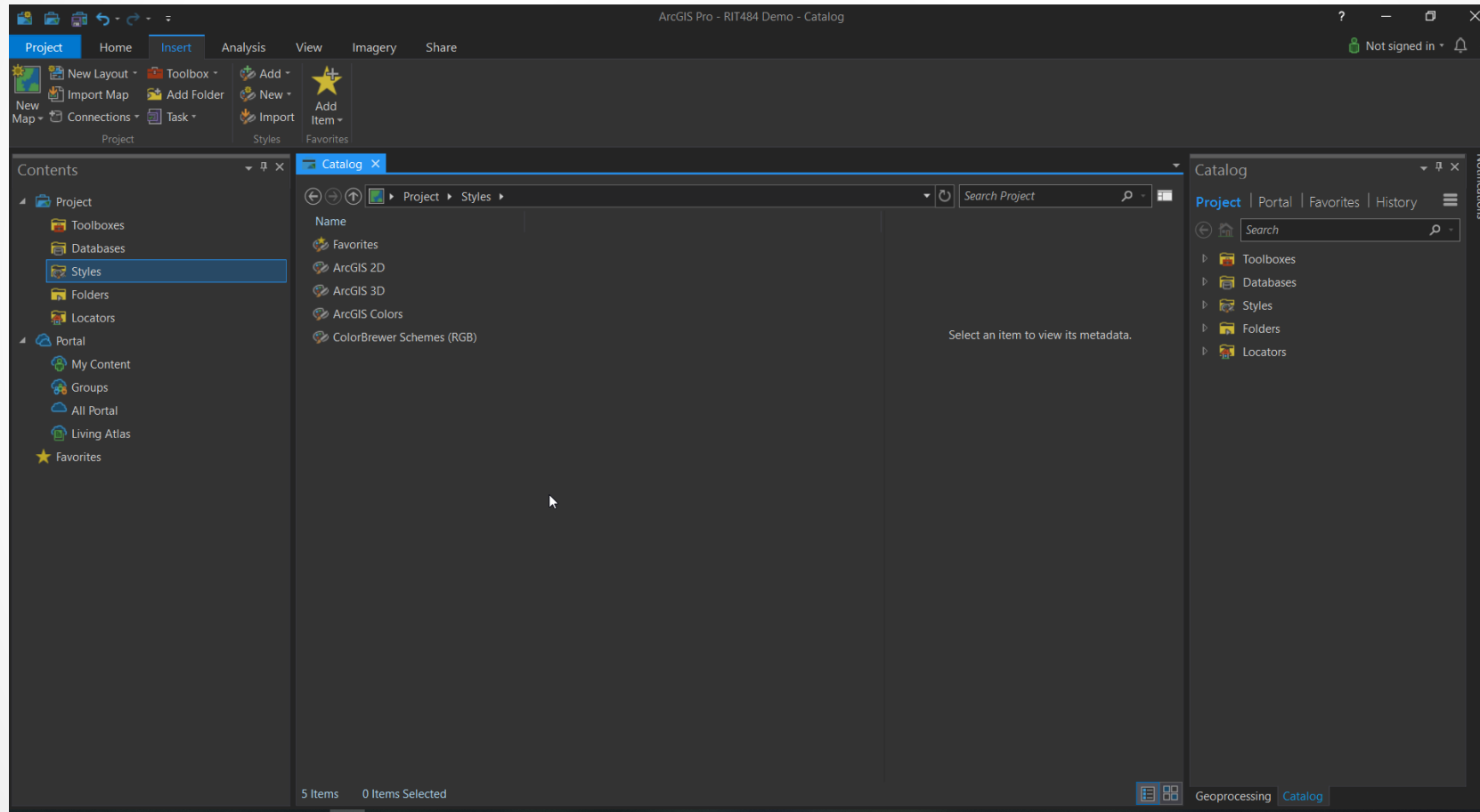
WHEN A PROJECT IS MADE SO ARE CUSTOM AREAS FOR TOOLS



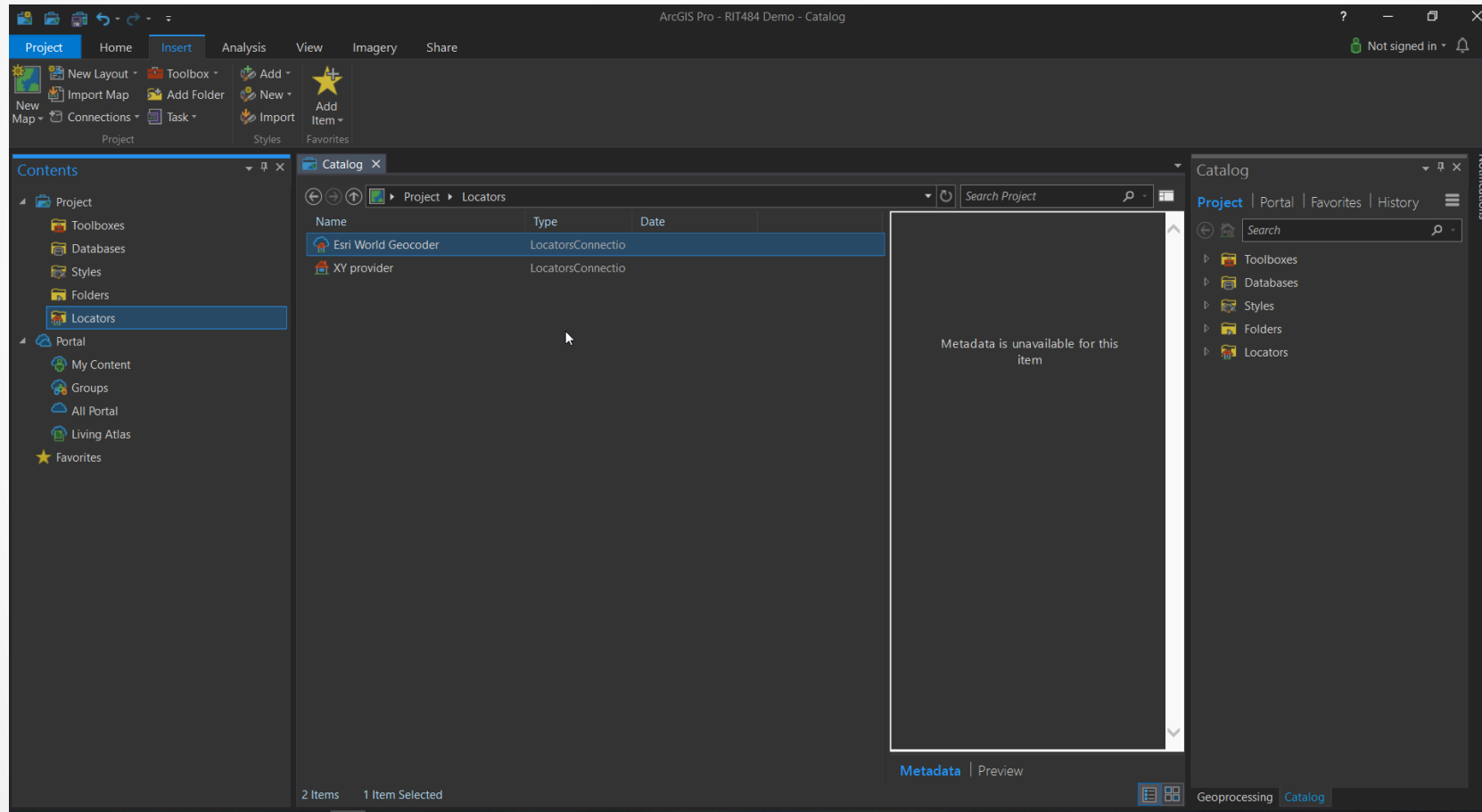
WHEN A PROJECT IS MADE SO ARE CUSTOM AREAS A DEDICATED GEODATABASE



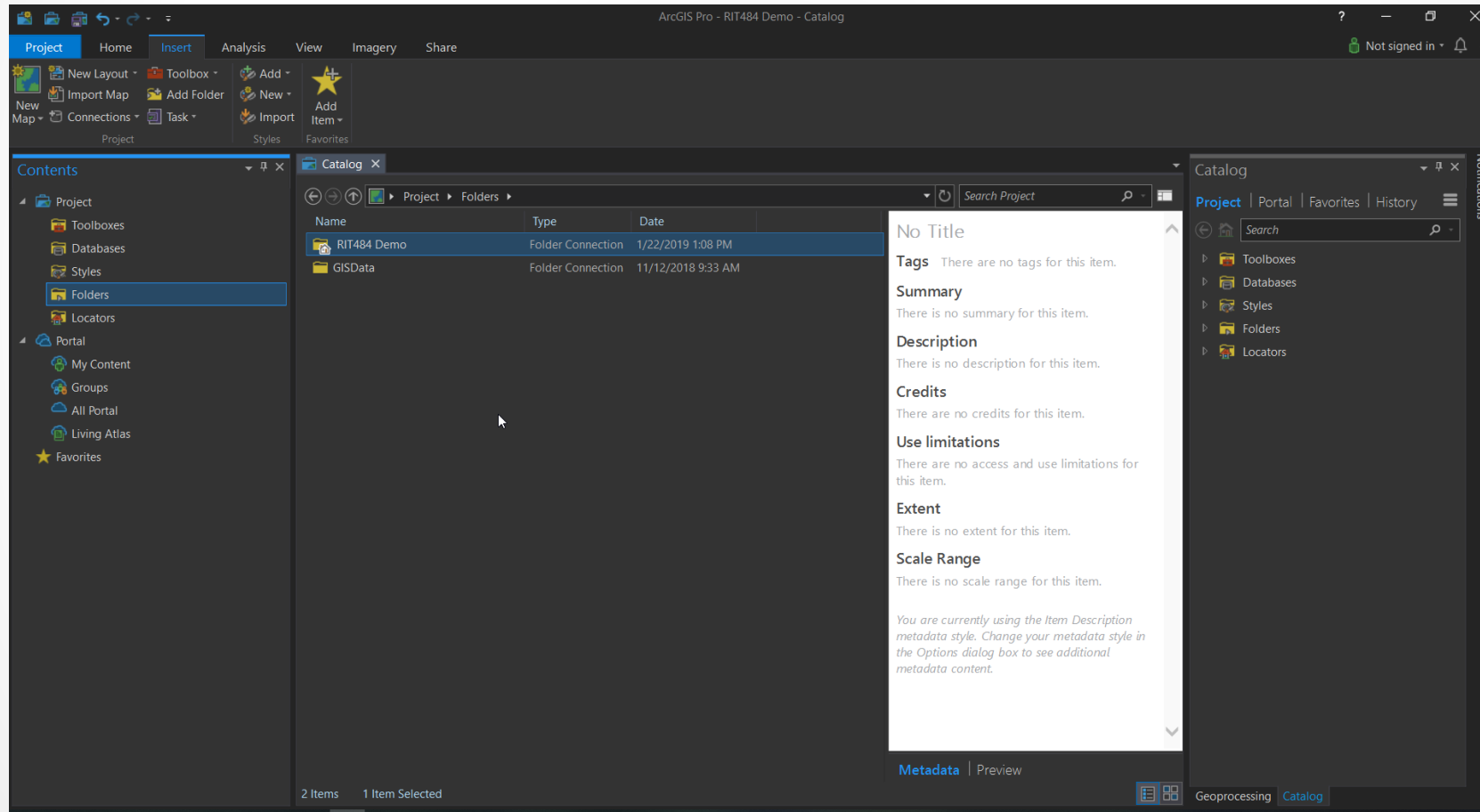
WHEN A PROJECT IS MADE SO ARE CUSTOM AREAS FOR STYLES



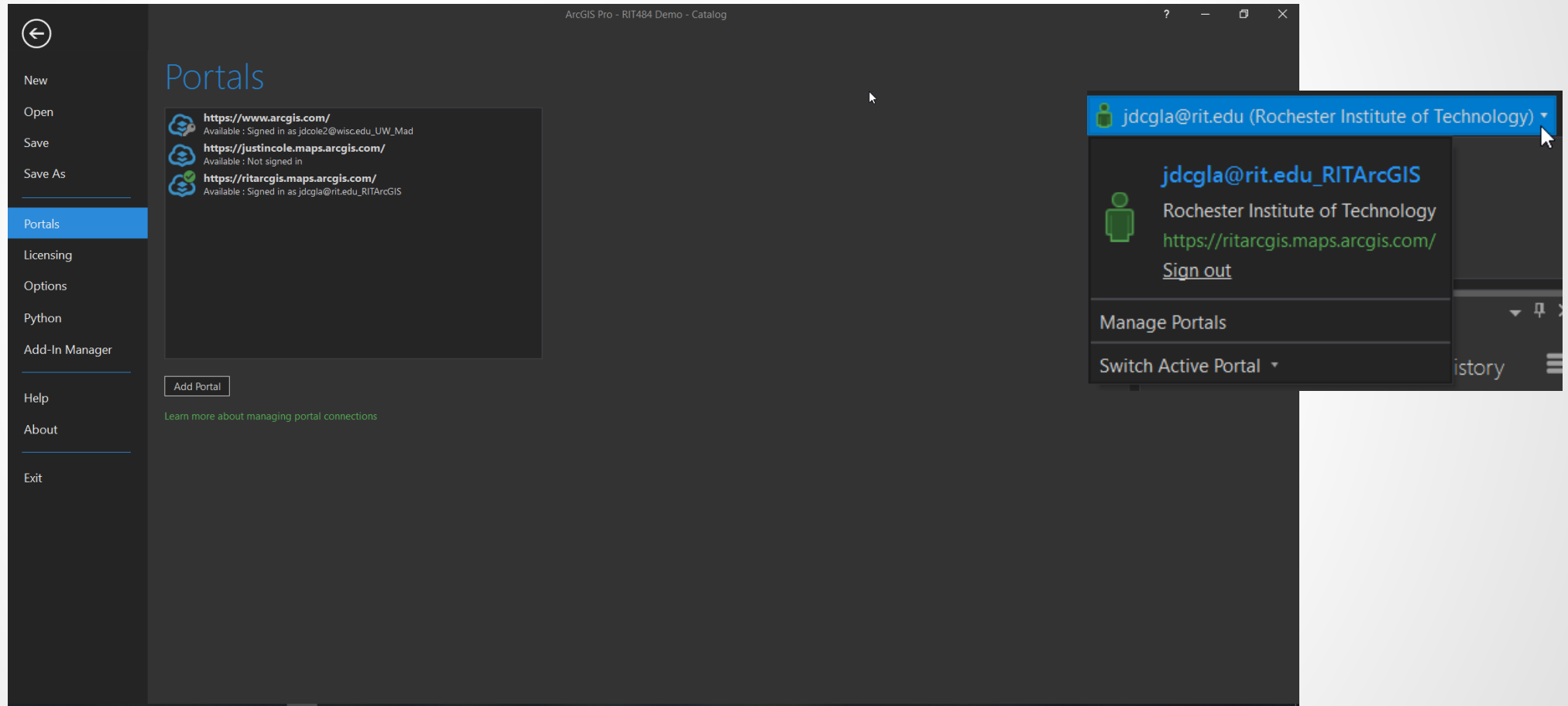
WHEN A PROJECT IS MADE SO ARE CUSTOM AREAS FOR ADDRESS LOCATORS



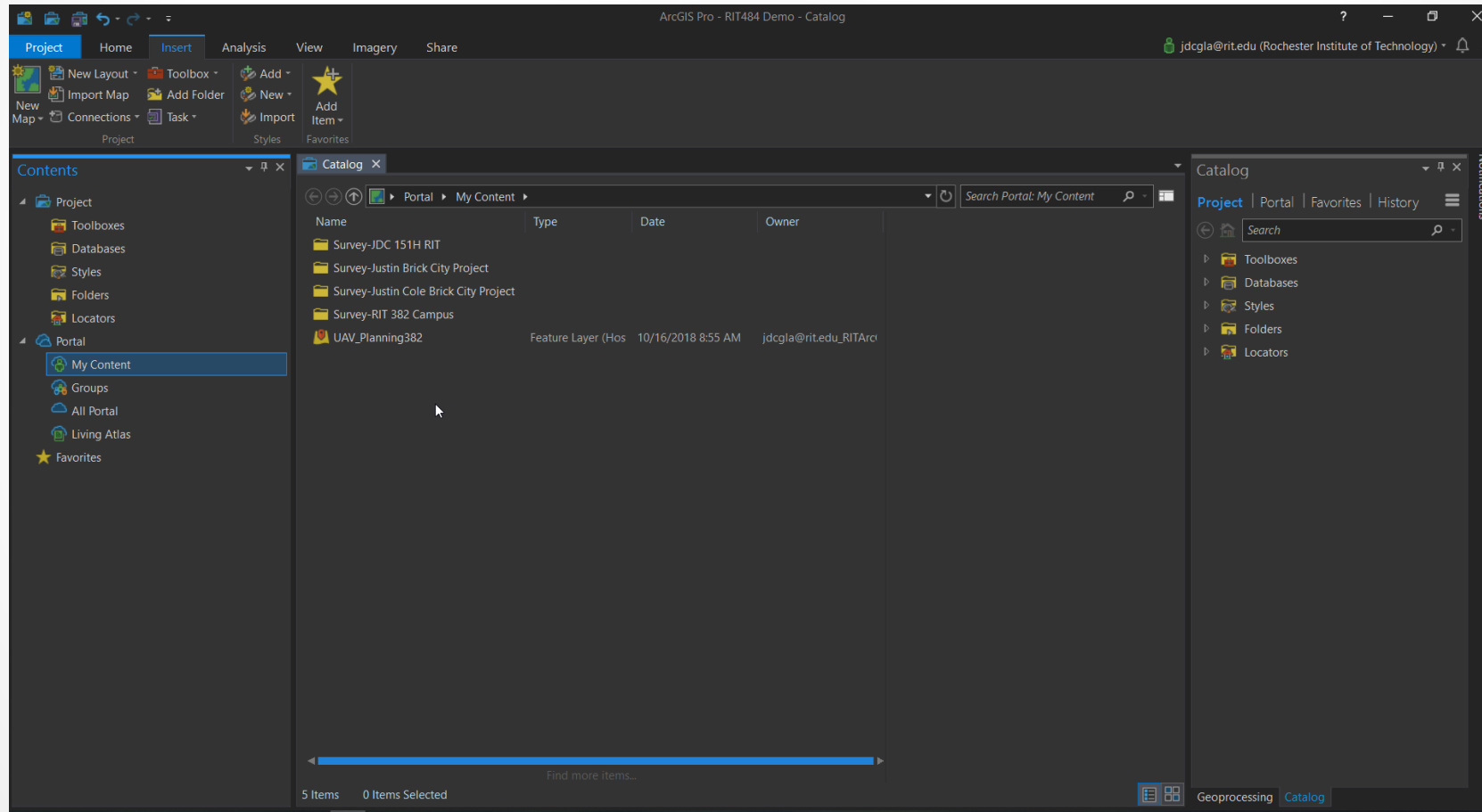
WHEN A PROJECT IS MADE SO ARE CUSTOM AREAS FOR FOLDERS



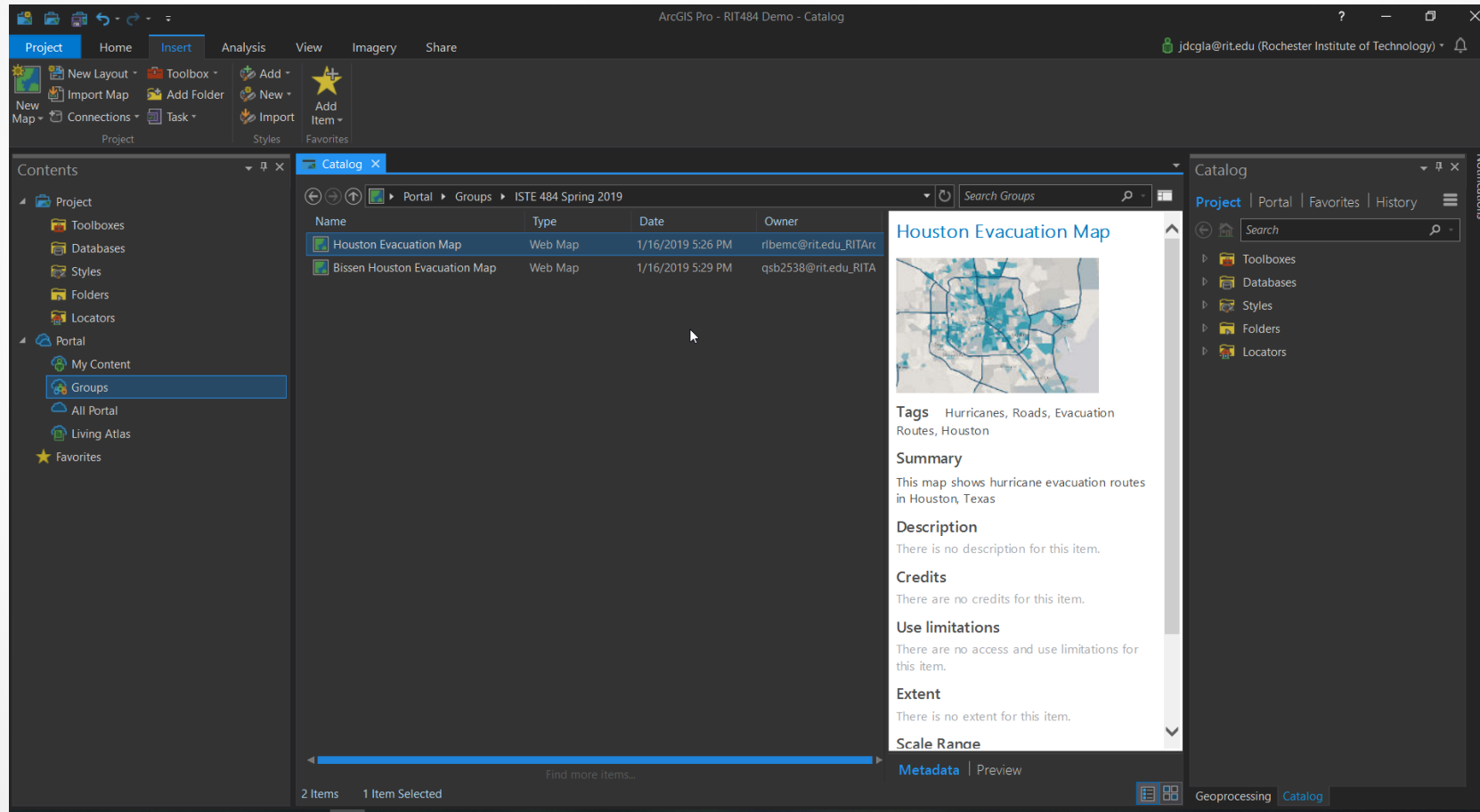
IT IS FULLY INTEGRATED WITH ARCGIS ONLINE AND CAN MANAGE MULTIPLE ACCOUNTS



IT IS FULLY INTEGRATED WITH ARCGIS ONLINE AND CAN MANAGE MULTIPLE ACCOUNTS



ALL OF YOUR ARCGIS PROJECTS ARE ACCESSIBLE (AS WELL AS ANY GROUP PROJECTS)



ALL OF ARCGIS ONLINE'S PUBLIC AND LIVING ATLAS ARE ALSO AVAILABLE

The screenshot shows the ArcGIS Pro interface with the Catalog pane open. The search results for 'transportation' are displayed in a table. The 'World Transportation' item is selected, and its details are shown in the right pane. The details include a map thumbnail, tags, a summary, and a description.

Name	Type	Date	Owner
World Transportation	Tile Layer	11/29/2018 11:07 PM	esri
USA Transportation Terminals	Layer Package	2/5/2018 1:20 PM	esri_dm
Imagery with Labels and Transportation	Web Map	8/3/2018 1:33 PM	esri
2016 ACS Transportation to Work - T	Feature Layer (Hosted)	11/7/2018 12:06 PM	lisa_berry
2016 ACS Transportation to Work - C	Feature Layer (Hosted)	11/7/2018 12:06 PM	lisa_berry
WSDOT - Regional Transportation Planning	Map Image Layer	2/8/2018 5:28 PM	OnlineMapSupport_W
The National Map - Transportation	Web Map	5/10/2012 1:29 PM	LDT_CM
Transportation Improvement Program	Web Map	9/19/2018 3:44 PM	saferin
Australia Public Transportation Spine	Map Image Layer	12/3/2016 8:48 PM	esri
National Highway Network	Map Image Layer	6/26/2018 11:49 AM	Federal_User_Comm
Transportation Improvement Program	Web Map	12/28/2018 4:23 PM	saferin
Intermodal Freight Facilities	Feature Layer (Hosted)	6/26/2018 11:49 AM	Federal_User_Comm
Predominant Means of Transportation	Web Map	2/6/2018 2:15 PM	lisa_berry
Predominant Means of Transportation	Web Map	2/2/2018 1:11 PM	lisa_berry
TRANSPORTATION_austin_metro_train	Feature Layer (Hosted)	1/18/2018 11:02 AM	CTM.Publisher
Hennepin County Transportation Map	Web Map	12/13/2018 1:24 PM	hennepin.county.map
North America Transportation Terminals	Layer Package	4/10/2018 4:08 PM	esri_dm
Transportation Alternatives Program	Web Map	1/8/2019 10:11 AM	IowaDOT_PPM
Regional Transportation Plan Lines	Feature Layer	8/24/2018 11:46 AM	opendata@arc
World Transportation (for Export)	Tile Layer	11/29/2018 11:08 PM	esri
MATPB Transportation Improvement	Web Map	7/3/2018 3:14 PM	DanS_MPO
Regional Transportation Plan Points	Feature Layer	8/24/2018 11:46 AM	opendata@arc
Bicycle Transportation	Web Map	11/29/2017 5:41 AM	ConsejoRegional

World Transportation

Tags world, transportation, street, road, streets, roads, railroads, airports, street names, road names, street labels, road labels, name, label, labels, highways, highway names, highway labels, names, reference, basemap, esri_basemap, general availability

Summary

This reference map provides a transportation and street name labels reference overlay that is particularly useful on top of imagery.

Description

This map presents transportation data, including highways, roads, railroads, and airports for the world.

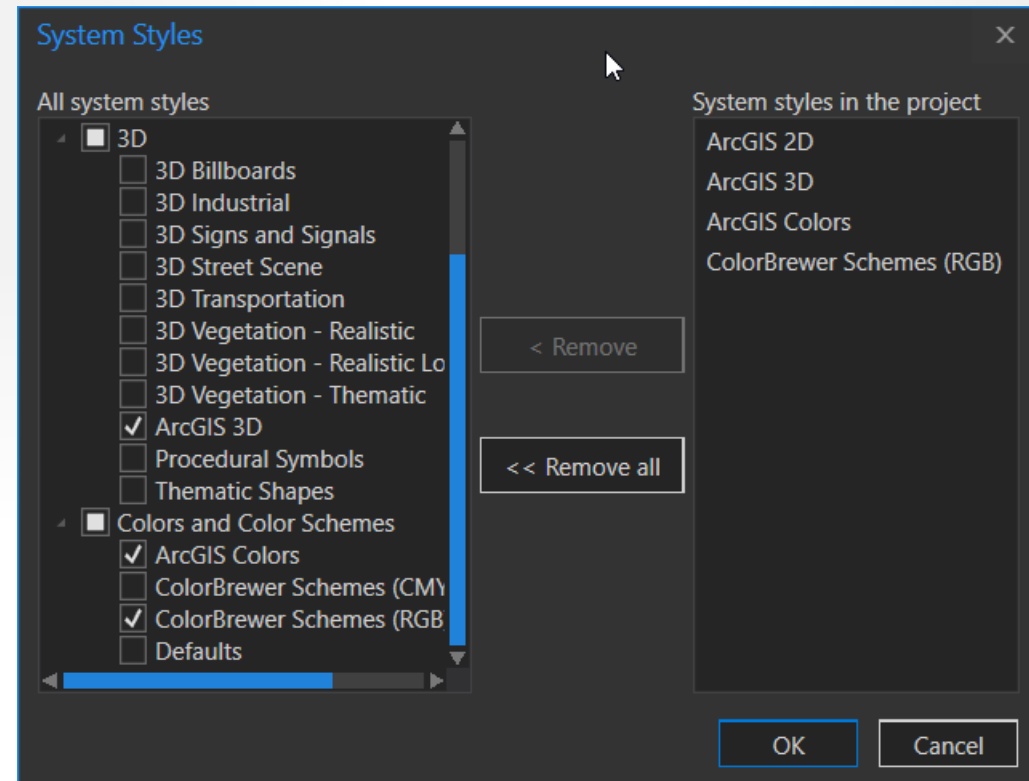
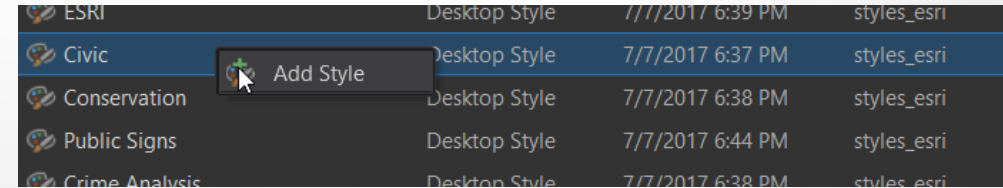
The map was developed by Esri using Esri highway data; Garmin basemap layers; HERE street data for North America, Europe.

The close-up shows the 'Add To New' context menu for the 'World Transportation' item. The menu options are:

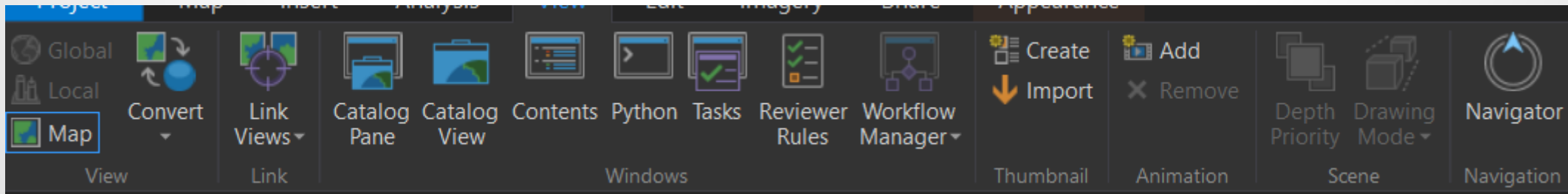
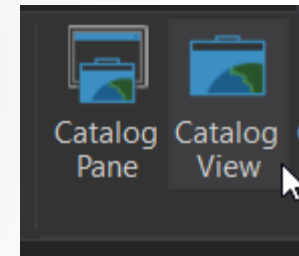
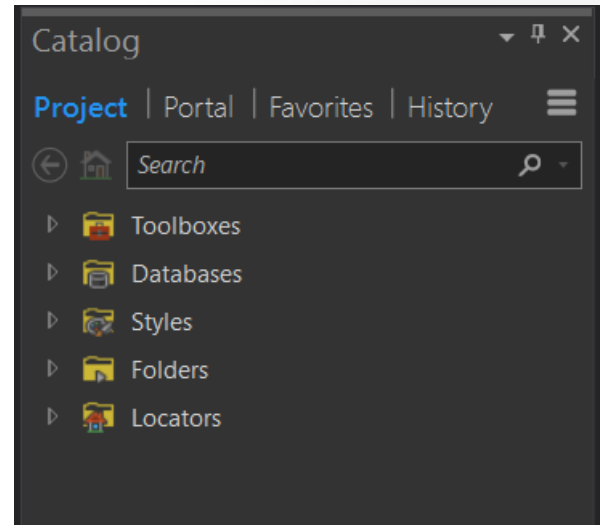
- Map
- Global Scene
- Local Scene

A DOWNSIDE IS NOT EVERY STYLE IS IN ARCGIS PRO, BUT THEY ARE JUST A FEW CLICKS AWAY

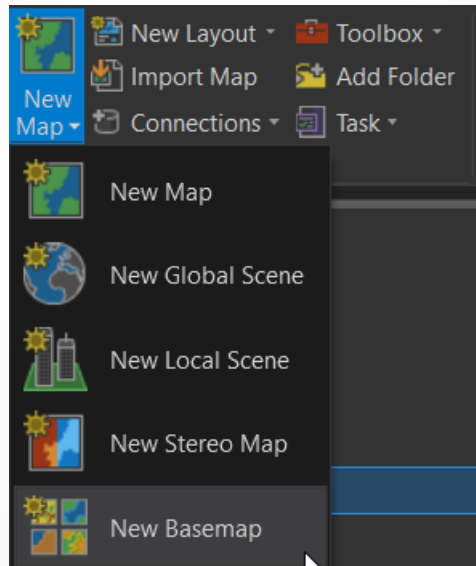
- Because of the Project Based Nature Of ArcGIS Pro Styles were not included
- You can search all of ArcGIS Online (Portal) for Styles to find them
- When you find the style you want you can right click and add style
- You can Also add and remove other styles into your project through the style group



CATALOG IS ALSO AVAILABLE AS A SIDE PANEL IN OTHER WINDOWS SUCH AS MAPS OR SCENES



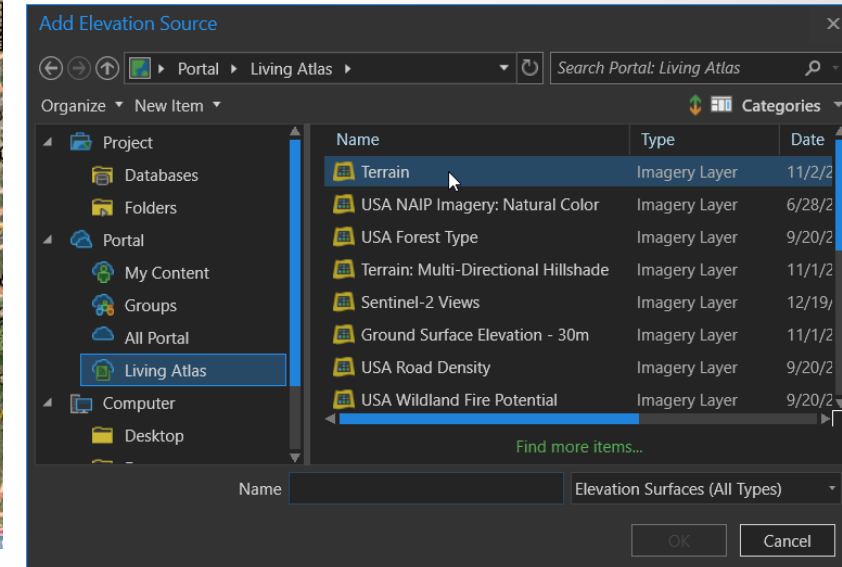
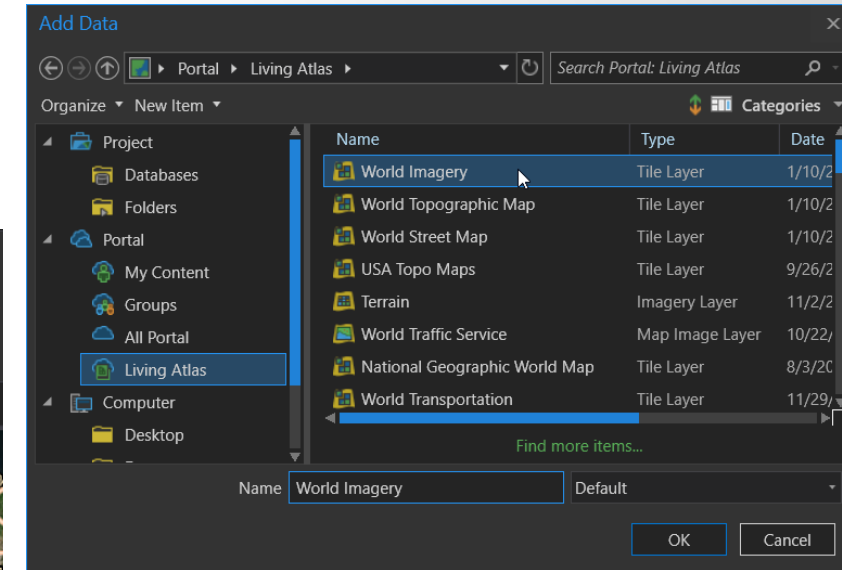
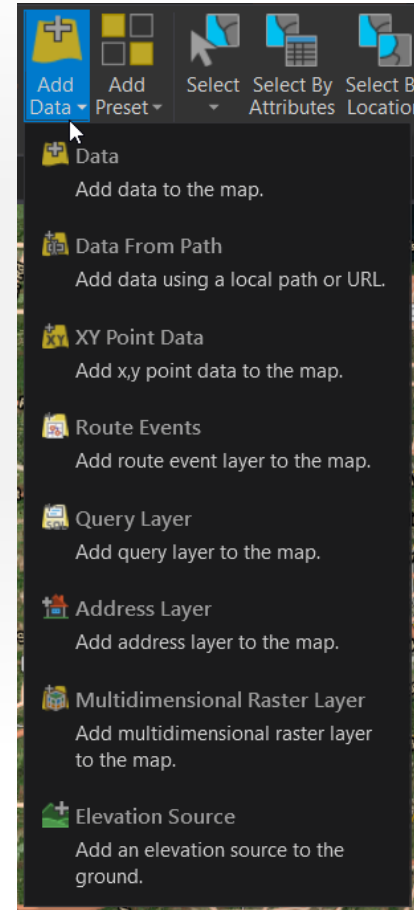
MAPS ARE CREATED USING THE INSERT RIBBON (YOU CAN ALSO CREATE BASEMAPS, SCENES, AND LAYOUTS)



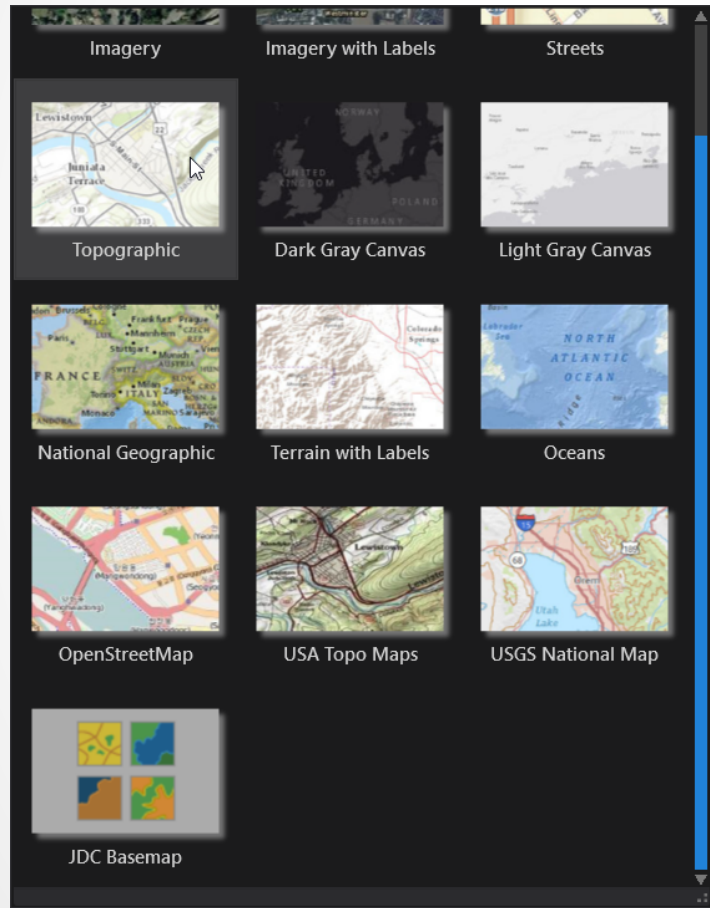
- All of these live within the project so you can have as many as you need
- There is also an Import Map command which will bring in your ArcMap MXDs and convert them to ArcGIS Pro
- We will create a new Basemap first

CREATING A BASEMAP

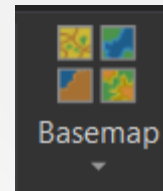
- Creating a basemap gives you the flexibility to have one multiple maps use the same reference map but you can customize it
- These work the same way as the basemaps within ArcMap
- You can add layers from the Living Atlas
- You can also add elevation sources to all for 3D data analysis and display



CREATING A MAP



- When you Insert a New Map it will open the world with one of the default basemaps
- Click on the basemap button to find your custom base map
- Then You can start to create your map
- We are going to use the census data from ArcGIS Online to look at the symbology options



ADD IN THE HOUSING DEMOGRAPHICS IN THE 2010 CENSUS LAYER (TIP SEARCH FOR 2010 CENSUS)

The screenshot displays the ArcGIS Pro interface with the 'Add Data' dialog box open. The dialog box shows a search result for 'census' and lists several layers. The 'Housing Demographics in the 2010 Census' layer is selected. A pop-up window is also visible, showing details for a specific block group (360550131.031) and its associated census data.

Add Data Dialog Box:

Name	Type	Date
USA Households by Census Block	Layer Package	2/5/20
USA Census Block Group Boundaries	Layer Package	4/11/2
USA Census Tract Boundaries	Layer Package	2/5/20
USA Census Populated Places Areas	Layer Package	2/5/20
Housing Demographics in the 2010 Census	Feature Layer (Hosted)	12/5/2
Household Demographics in the 2010 Census	Feature Layer (Hosted)	12/5/2
Race Demographics in the 2010 Census	Feature Layer (Hosted)	12/5/2
Age and Gender Demographics in the 2010 Census	Feature Layer (Hosted)	12/5/2

Pop-up Window:

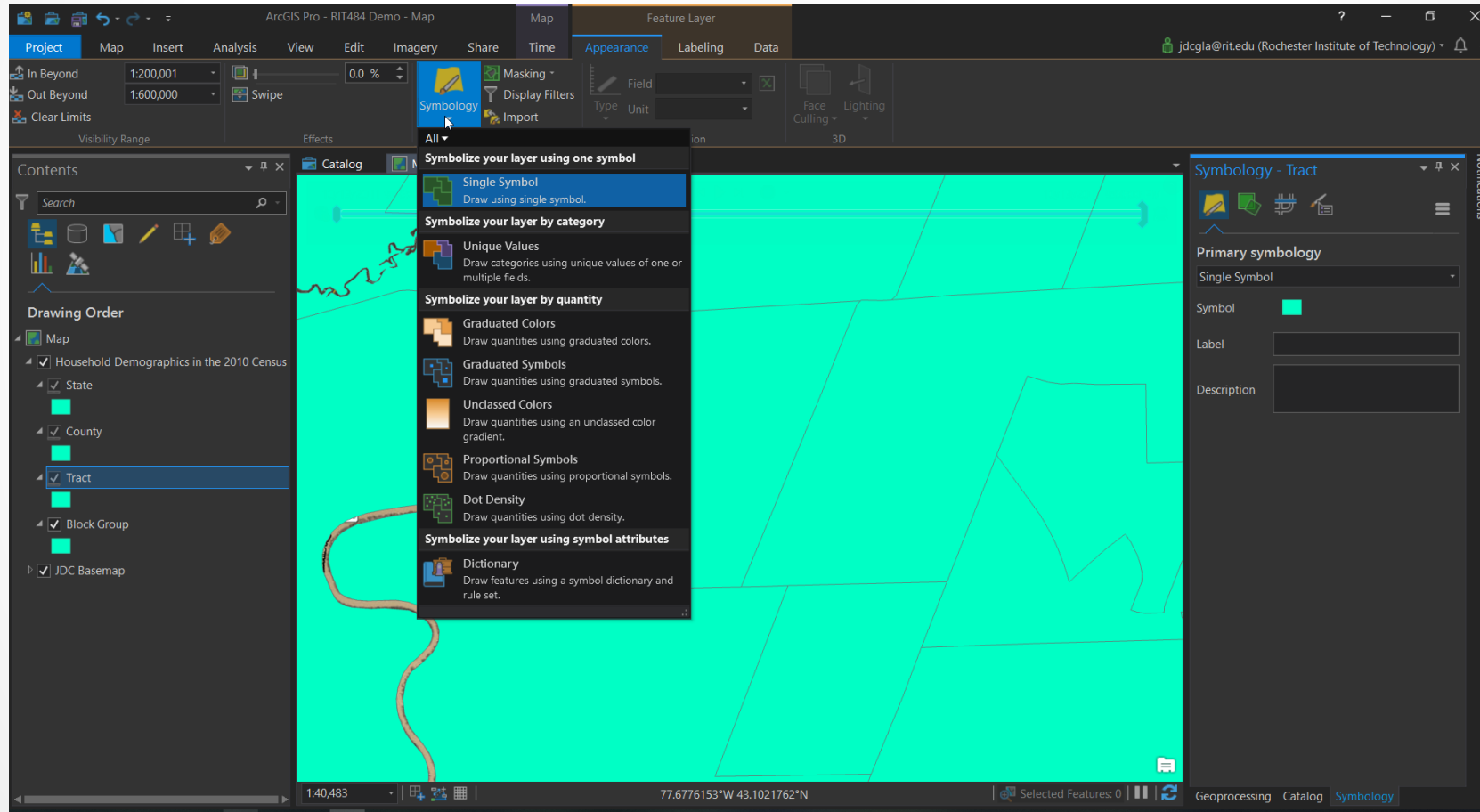
Block Group (1)
360550131.031

Block Group - 360550131.031
(U.S. Census)

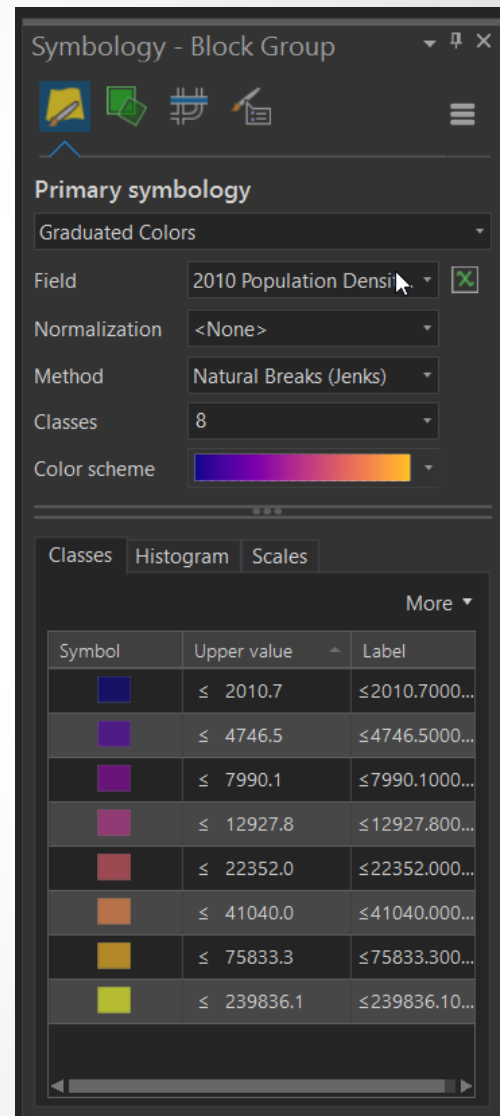
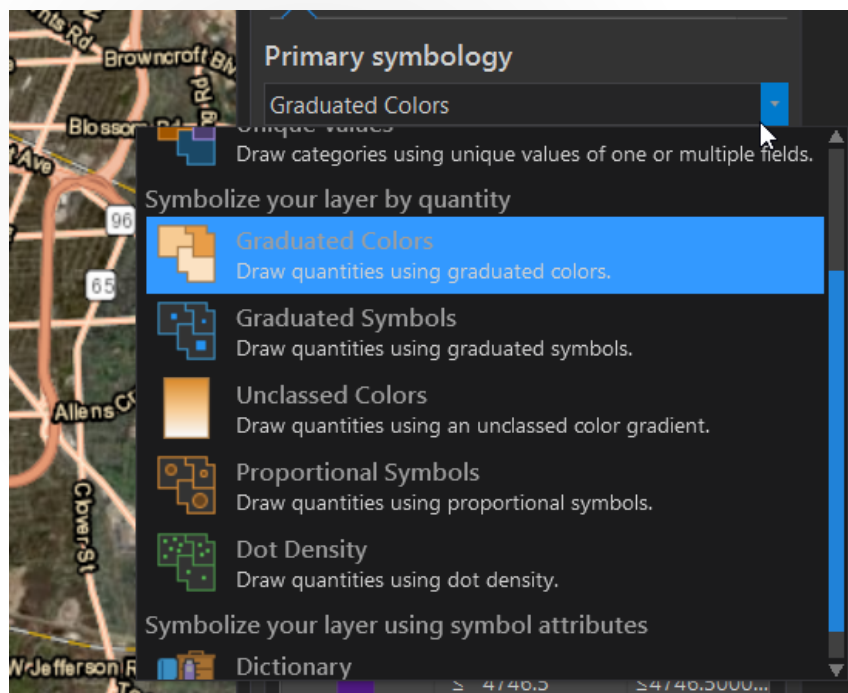
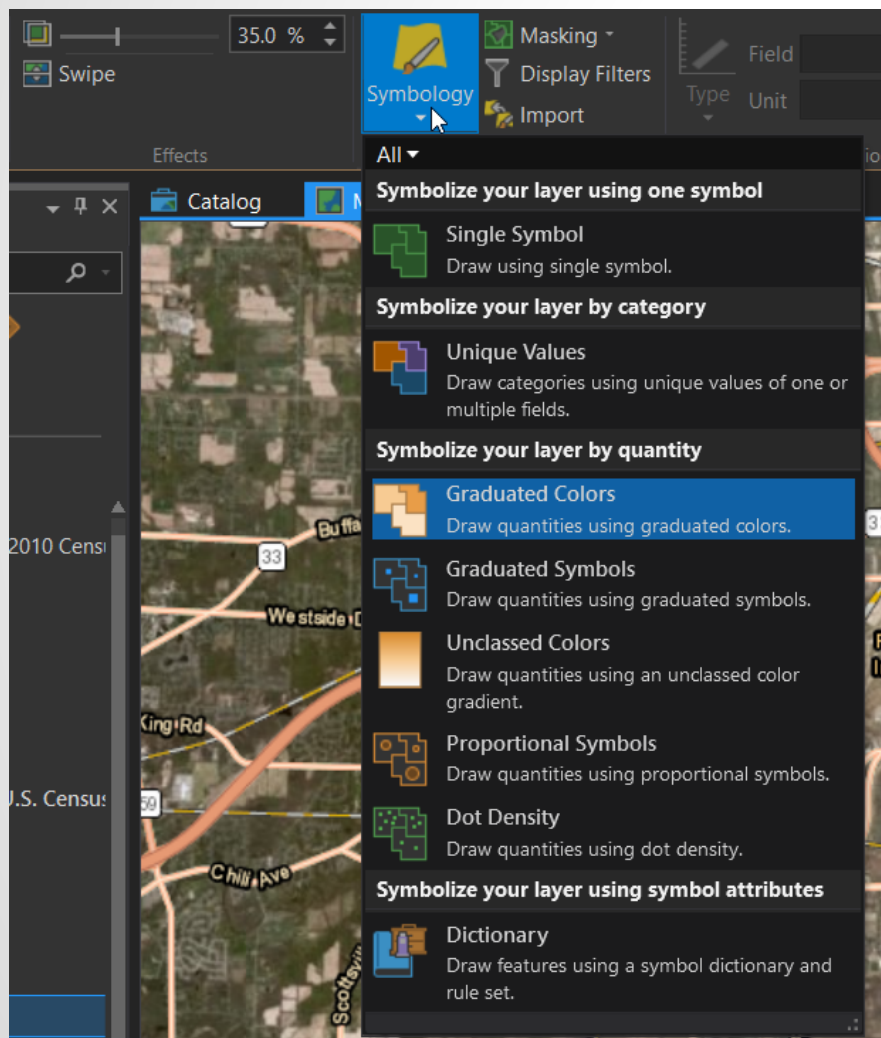
2010 Institutionalized Population in Juvenile Facilities (U.S. Census)	0
2010 Institutionalized Population in Nursing Facilities (U.S. Census)	0
2010 Institutionalized Population in Other Institutional (U.S. Census)	0

77.6767176°W 43.0812394°N

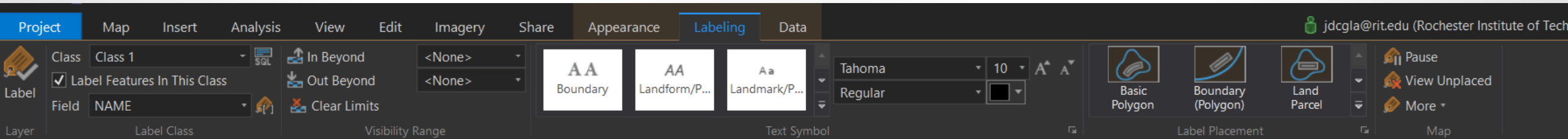
ALL SYMBOLOGY IS WITHIN THE APPEARANCE RIBBON WHEN YOU CLICK ON A LAYER



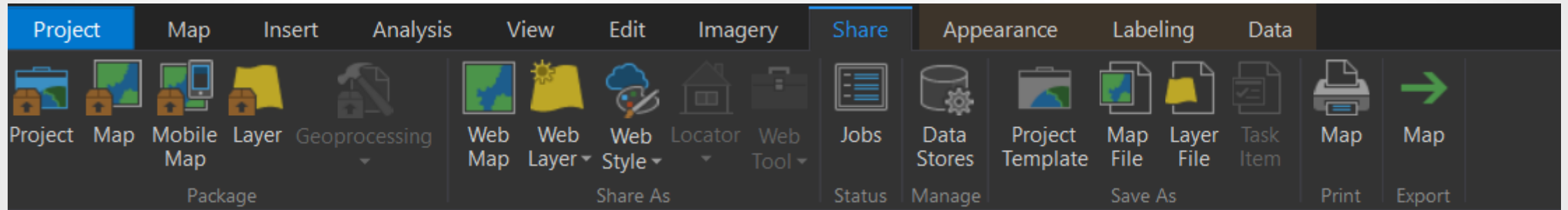
SYMBOLOLOGY



LABELING IS DONE THROUGH THE LABEL RIBBON



SHARING YOUR MAP COMES FROM THE SHARE RIBBON

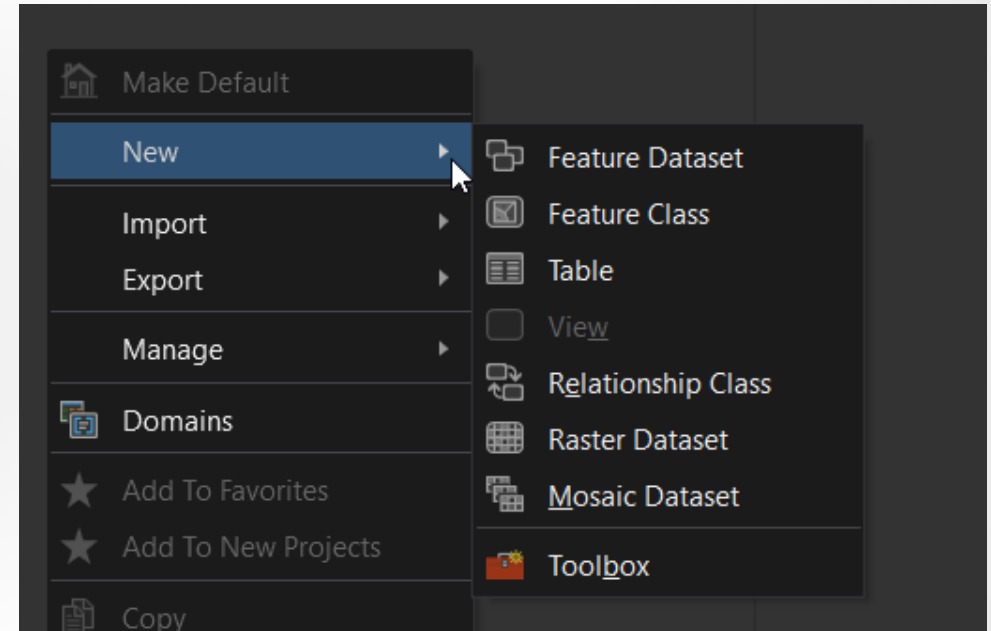


CREATING A FEATURE CLASS

Open the Catalog View or Pane

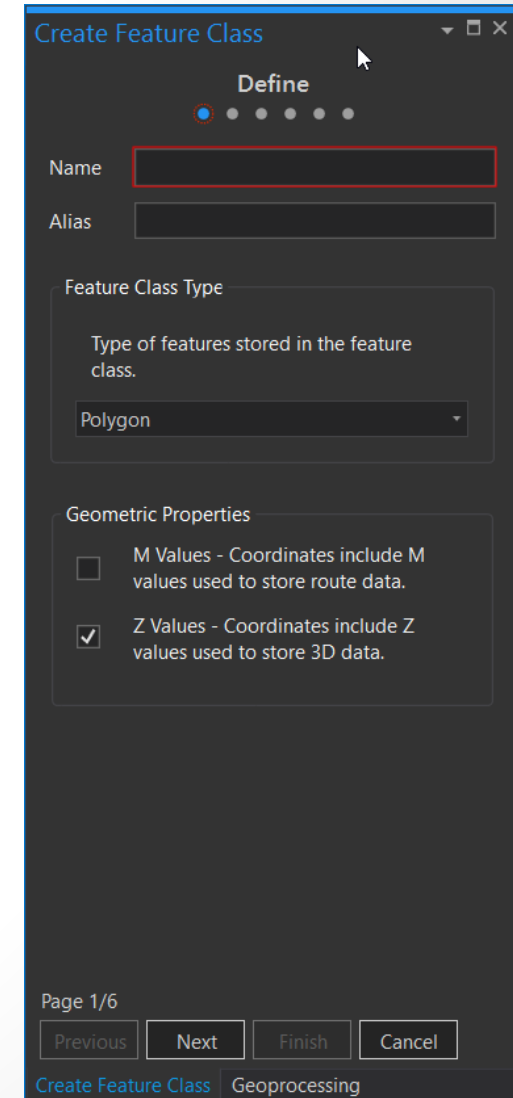
Find your Geodatabase and Open It

Inside the File Geodatabase (or Feature Dataset) right click or file new, then Feature Class



CREATING A FEATURE CLASS

- Inside the File Geodatabase (or Feature Dataset) right click or file new, then Feature Class
- Enter a Name and Alias
 - Alias can have spaces and actual name, name is how to save the data in your geodatabase
- Pick you feature type
 - Point, Line, or Polygon



The screenshot shows the 'Create Feature Class' dialog box in ArcGIS, specifically the 'Define' step. The dialog has a title bar 'Create Feature Class' and a 'Define' tab. Below the title bar, there are five dots indicating the progress, with the first dot being filled. The 'Name' field is highlighted with a red border. The 'Alias' field is also visible. Under 'Feature Class Type', there is a dropdown menu showing 'Polygon'. Under 'Geometric Properties', there are two checkboxes: 'M Values - Coordinates include M values used to store route data.' (unchecked) and 'Z Values - Coordinates include Z values used to store 3D data.' (checked). At the bottom, there are buttons for 'Previous', 'Next', 'Finish', and 'Cancel'. The bottom status bar shows 'Page 1/6', 'Create Feature Class', and 'Geoprocessing'.

Create Feature Class

Define

Name

Alias

Feature Class Type

Type of features stored in the feature class.

Polygon

Geometric Properties

☐ M Values - Coordinates include M values used to store route data.

☒ Z Values - Coordinates include Z values used to store 3D data.

Page 1/6

Previous Next Finish Cancel

Create Feature Class Geoprocessing

CREATING A FEATURE CLASS

- Define your attributes or fields you will collect
- For the example in class you will create a type text field
- Once we get this part click next and then define the projection

Create Feature Class

Fields

Import Delete

Field Name	Data Type
OBJECTID	OBJECTID
SHAPE	SHAPE
Type	Text

Click here to add a new field

Field Properties

Alias	
Allow Null Values	Yes
Default	
Length	255

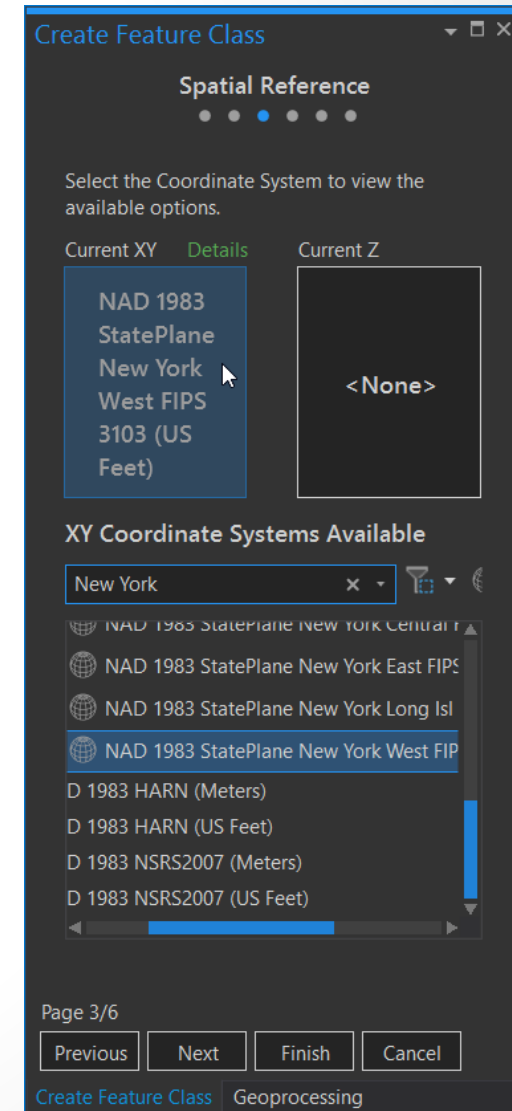
Page 2/6

Previous Next Finish Cancel

Create Feature Class > Geoprocessing

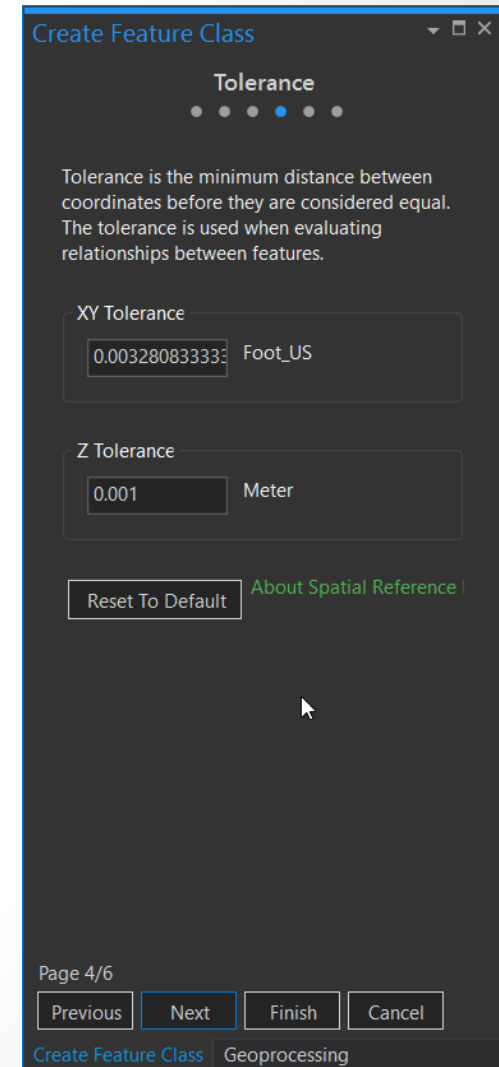
CREATING A FEATURE CLASS

- Define your attributes
- For the example in class you will create a type text field
- Once we get this part click next and then define the projection
- We will use State Plane NAD 1983 New York West (US Feet)
- Click Next Through the different screens



CREATING A FEATURE CLASS

- Define your attributes
- For the example in class you will create a type text field
- Once we get this part click next and then define the projection
- We will use State Plane NAD 1983 New York West (US Feet)
- Click Next Through the different screens



The screenshot shows the 'Create Feature Class' dialog box, specifically the 'Tolerance' screen. The title bar reads 'Create Feature Class'. Below the title bar, there are five dots indicating the progress of the wizard, with the fourth dot (representing 'Tolerance') being active. The main text explains: 'Tolerance is the minimum distance between coordinates before they are considered equal. The tolerance is used when evaluating relationships between features.'

There are two input sections:

- XY Tolerance:** A text box containing '0.003280833333' and a unit dropdown menu set to 'Foot_US'.
- Z Tolerance:** A text box containing '0.001' and a unit dropdown menu set to 'Meter'.

At the bottom of the main area, there is a 'Reset To Default' button and a link 'About Spatial Reference |'.

The footer of the dialog box shows 'Page 4/6' and four buttons: 'Previous', 'Next' (which is highlighted with a blue border), 'Finish', and 'Cancel'. At the very bottom, there is a status bar with the text 'Create Feature Class | Geoprocessing'.

CREATING A FEATURE CLASS

- Define your attributes
- For the example in class you will create a type text field
- Once we get this part click next and then define the projection
- We will use State Plane NAD 1983 New York West (US Feet)
- Click Next Through the different screens

The screenshot shows the 'Create Feature Class' dialog box with the 'Resolution' tab selected. The dialog has a title bar with a dropdown arrow, a maximize button, and a close button. Below the title bar is a progress indicator with five dots, the fourth of which is highlighted in blue. The main content area contains explanatory text about coordinate grids and resolution, a checkbox for accepting default settings, and input fields for XY and Z resolution and domain extent. At the bottom, there is a link for 'About Spatial Reference Properties', a page indicator 'Page 5/6', and four buttons: 'Previous', 'Next' (highlighted with a dashed border), 'Finish', and 'Cancel'. The footer shows the current step 'Create Feature Class' and the overall process 'Geoprocessing'.

Create Feature Class

Resolution

All coordinates stored in a feature class are snapped to an underlying coordinate grid. Resolution is the cell size of this grid. Decreasing the resolution may reduce the data storage needs but may reduce the coordinate accuracy.

The coordinate range or domain extent defines the minimum and maximum coordinate values which can be stored.

☒ Accept default resolution and domain extent

XY Resolution

0.00032808333: Foot_US

Z Resolution

0.0001 Meter

Min -100000 Max 90071982547

[About Spatial Reference Properties](#)

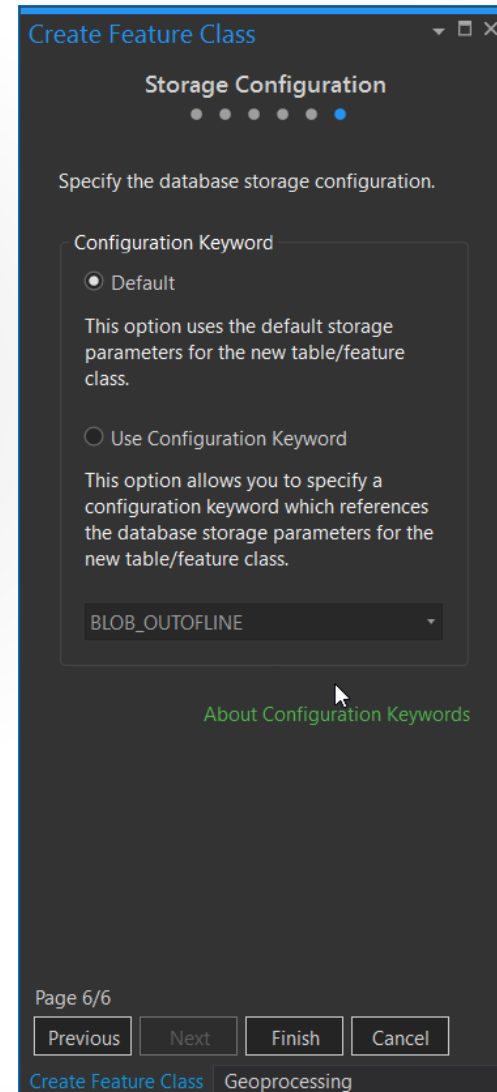
Page 5/6

Previous Next Finish Cancel

Create Feature Class Geoprocessing

CREATING A FEATURE CLASS

- Define your attributes
- For the example in class you will create a type text field
- Once we get this part click next and then define the projection
- We will use State Plane NAD 1983 New York West (US Feet)
- Click Next Through the different screens



The screenshot shows the 'Create Feature Class' dialog box with the 'Storage Configuration' step selected. The dialog has a title bar with 'Create Feature Class' and standard window controls. Below the title bar, there's a progress indicator with five dots, the fourth of which is blue. The main heading is 'Storage Configuration'. Below this, it says 'Specify the database storage configuration.' The 'Configuration Keyword' section has two radio buttons: 'Default' (selected) and 'Use Configuration Keyword'. The 'Default' option has a description: 'This option uses the default storage parameters for the new table/feature class.' The 'Use Configuration Keyword' option has a description: 'This option allows you to specify a configuration keyword which references the database storage parameters for the new table/feature class.' Below these descriptions is a dropdown menu currently showing 'BLOB_OUTOFLINE'. At the bottom of the dialog, there's a link 'About Configuration Keywords' and a page indicator 'Page 6/6'. At the very bottom, there are four buttons: 'Previous', 'Next', 'Finish', and 'Cancel'. The 'Next' button is highlighted. The bottom status bar shows 'Create Feature Class' and 'Geoprocessing'.

Create Feature Class

Storage Configuration

Specify the database storage configuration.

Configuration Keyword

☒ Default

This option uses the default storage parameters for the new table/feature class.

☐ Use Configuration Keyword

This option allows you to specify a configuration keyword which references the database storage parameters for the new table/feature class.

BLOB_OUTOFLINE

[About Configuration Keywords](#)

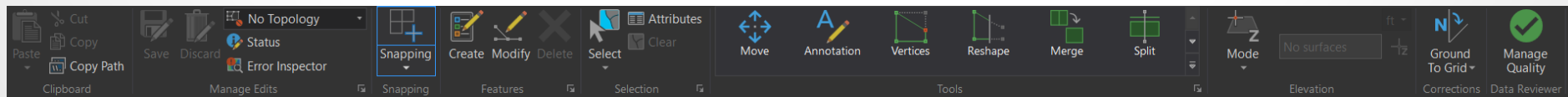
Page 6/6

Previous Next Finish Cancel

Create Feature Class Geoprocessing

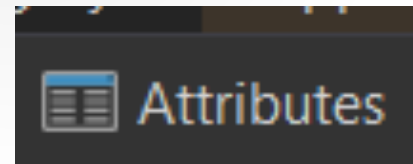
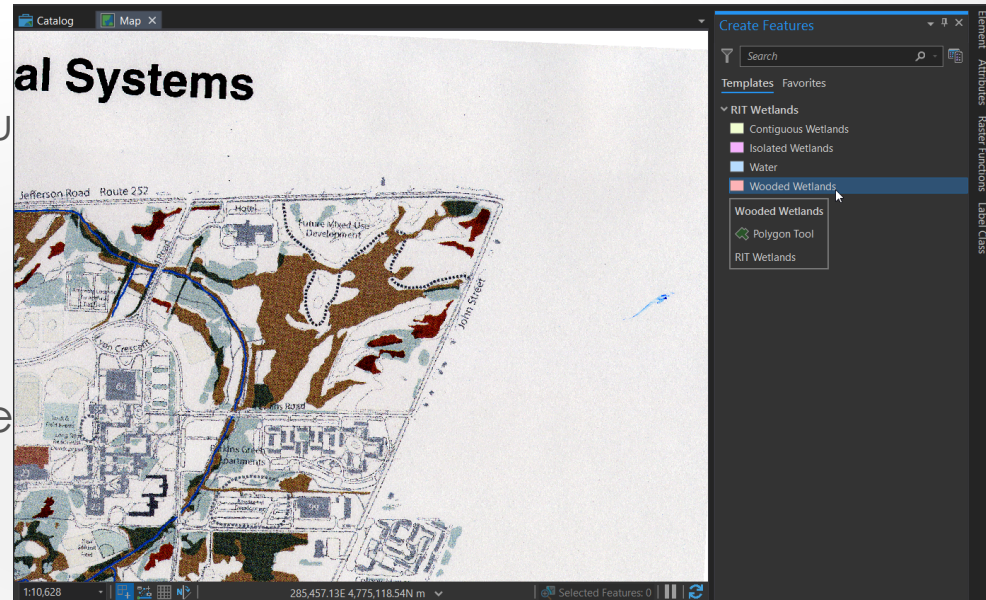
EDITING OR DIGITIZING

- To create data you will need to use the Edit Ribbon
- This can be found like any other toolbar or in the main menu as the pencil with some dots and lines
- To edit you need layers to edit (the vector data you are working on)
- The editor will activate when you specify the start editing command
- Anything you do in an edit session will be temporary until you save your edits



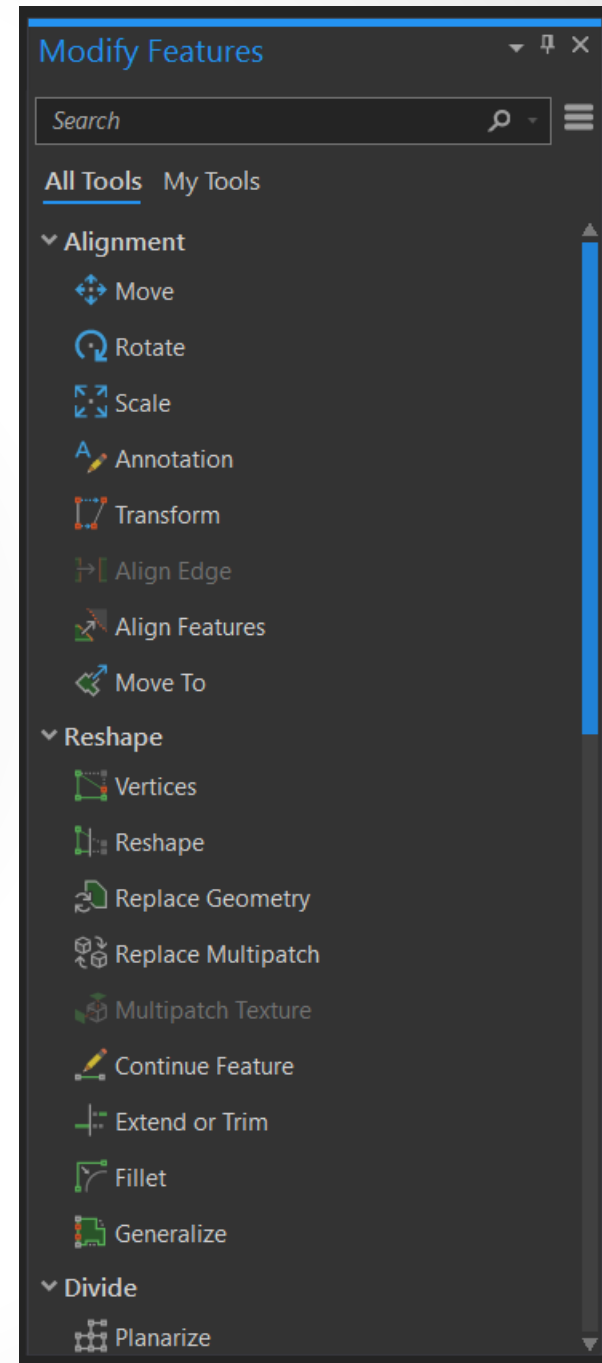
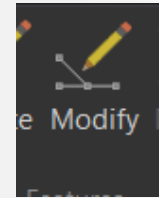
EDITING

- If you have your symbology set before you start editing it will add it to your feature template
- To add a new feature, click on the one you want to add and then draw it on the map
- To finish a line feature you can either double click or hit f2
- Once you have a feature you can click on the attribute button and type in the attributes into the table



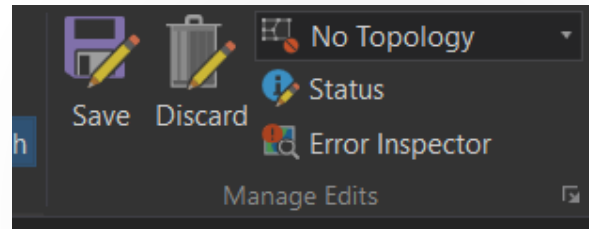
EDITING

- To edit an existing feature, you can use the modify tool
- Just single click to edit the attributes or double click to edit the geometry
- Once you are done you will start to see your features appear on your map document



SAVE EDITS

- Make Sure to Save Your Edits



ASSIGNMENTS

- Readings
 - <https://learn.arcgis.com/en/arcgis-book/chapter4/>
 - <https://www.esri.com/about/newsroom/arcnews/opening-data-to-the-people/>
 - <https://www.esri.com/about/newsroom/arcnews/gis-for-refugees-by-refugees/>
- Lab 2 - Due February 1st
- *If you want more practice with ArcGIS Pro - <https://learn.arcgis.com/en/projects/get-started-with-arcgis-pro/>*