

MAKING A SCOPE OF WORK MAP



**CREATING A SHAPEFILE, EDITING, AND
MAKING A MAP FOR A RESOURCE
MANAGEMENT PROJECT**

BNCR GIS Team

Amber Collins, Divyasree Gudugula,
Brady Harrison, Jessica Richards, Colby Spencer

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Plan

Scope of Work Map

- Starting from a Template
- Creating a Shapefile
- Adding and Editing Features
- Adding Attributes
- Exporting a Shapefile
- Finalizing the Layout
- Exporting the Map



Template Scope of Work Project

ArcGIS Pro Projects

Where to Find

\\floridadep\data\DRP\GIS\STANDARDS\Templates\Scope of Work\SOW

Self-contained

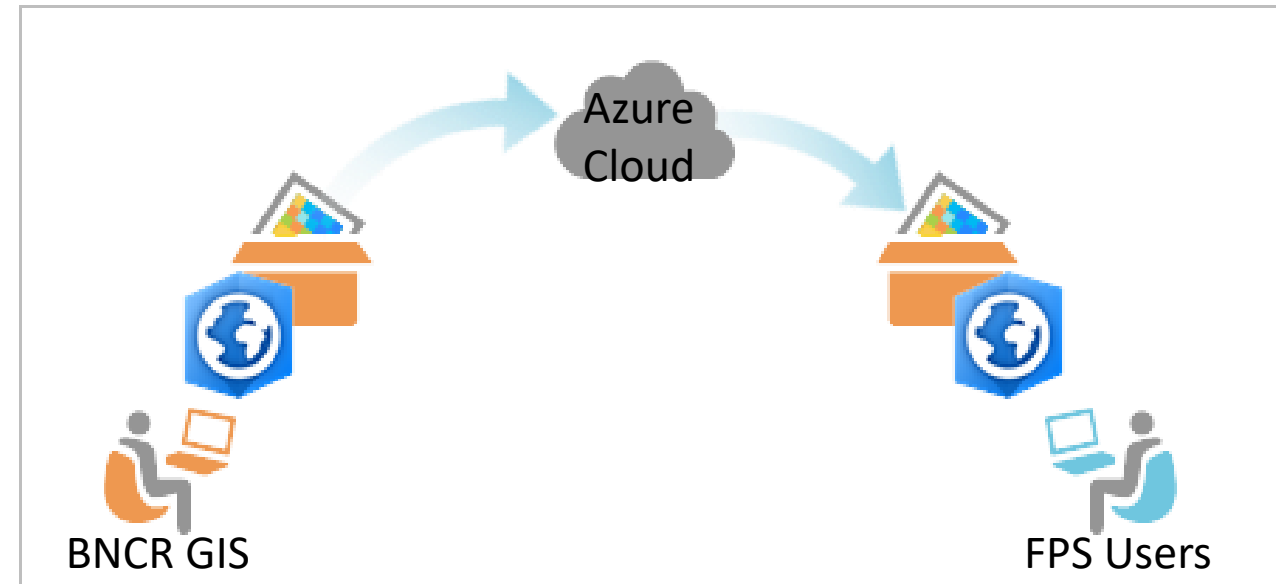
- Base data and design choices already finished

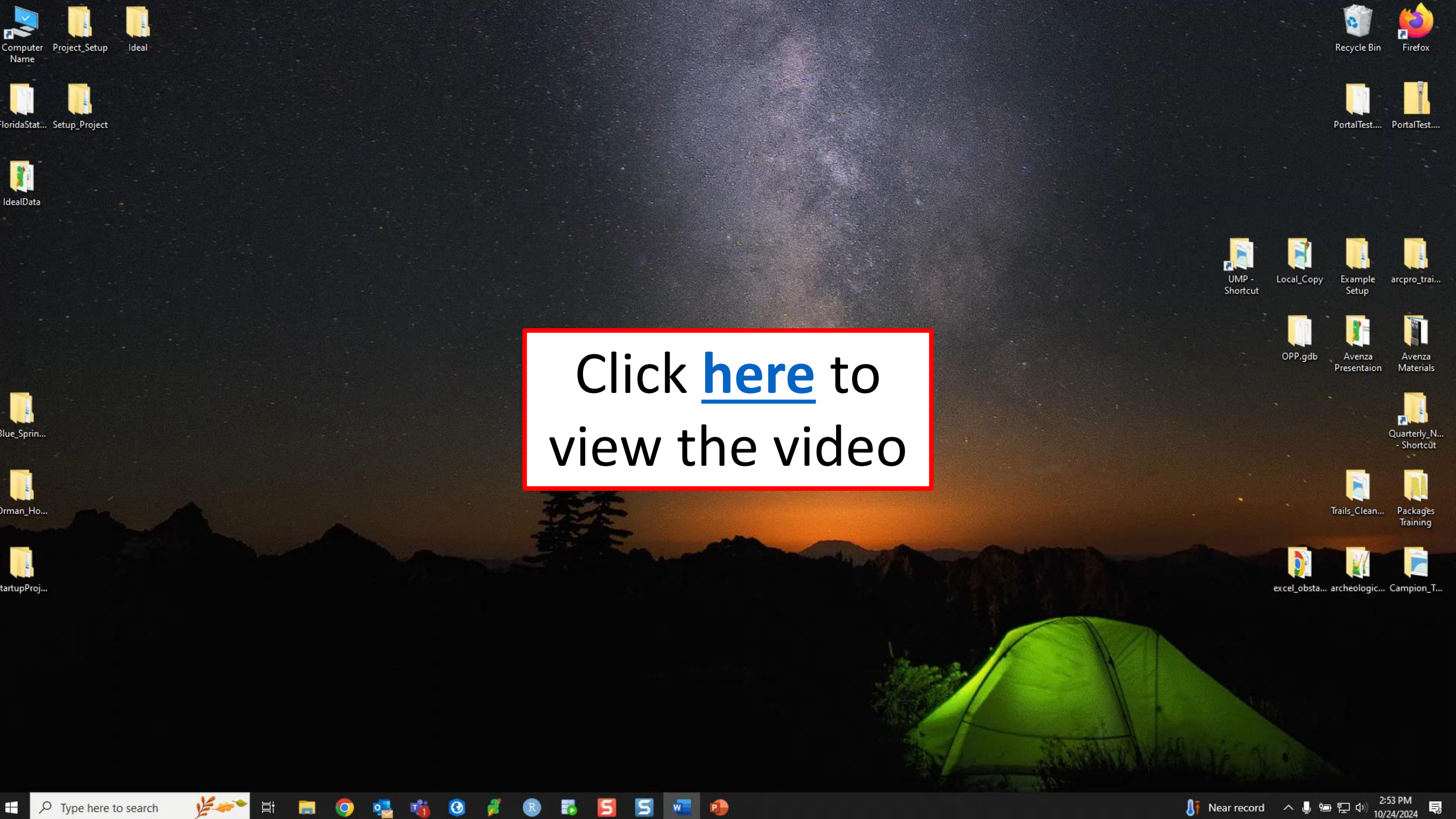
Map and Layers

- Satellite imagery basemap
- Management Zones
- Boundaries
- Natural Communities

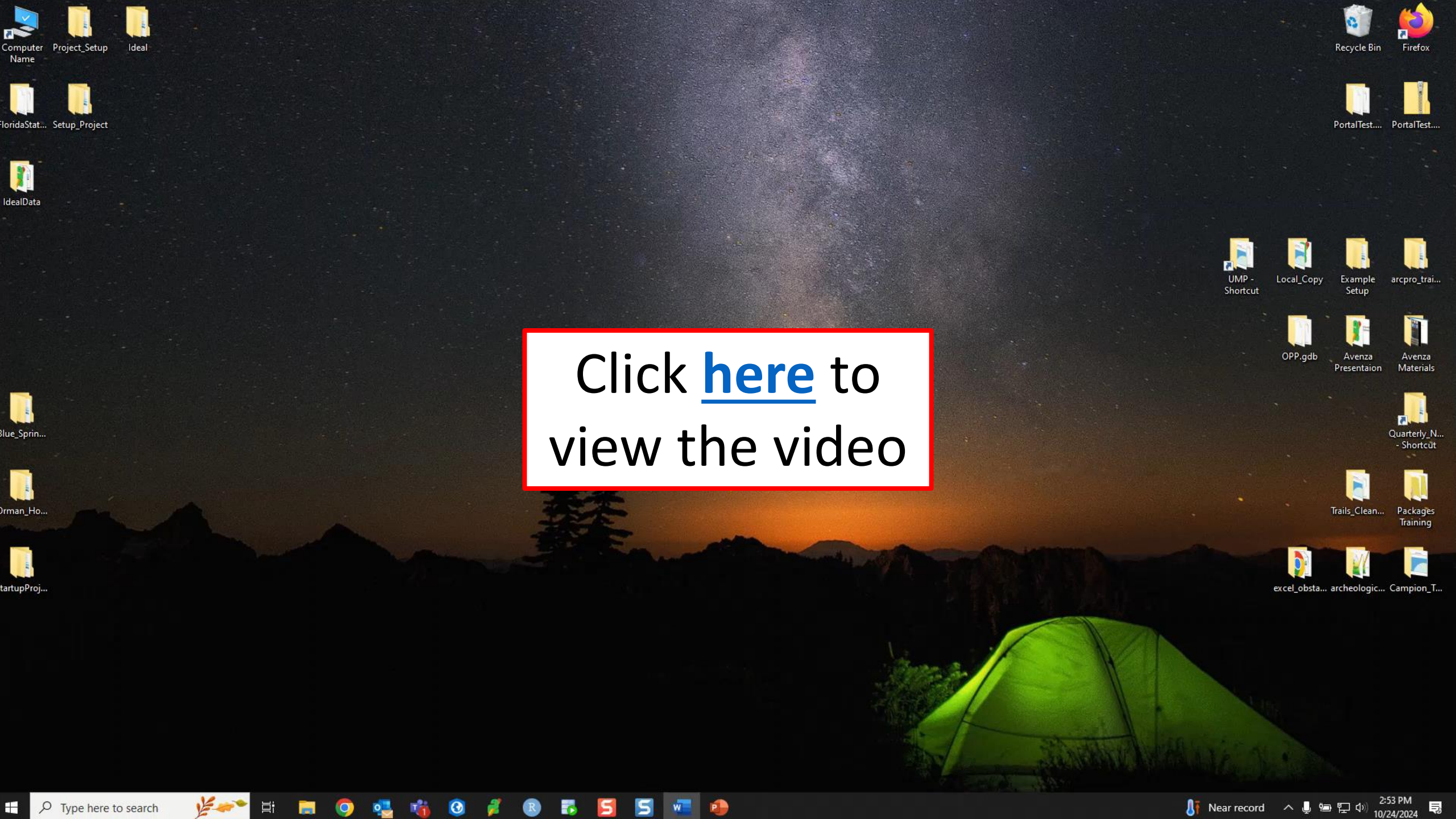
Layouts

- Professional and consistent aesthetic
- Contains key features of a good map





Click [here](#) to
view the video





Save As

Where to Save

Azure Cloud Service

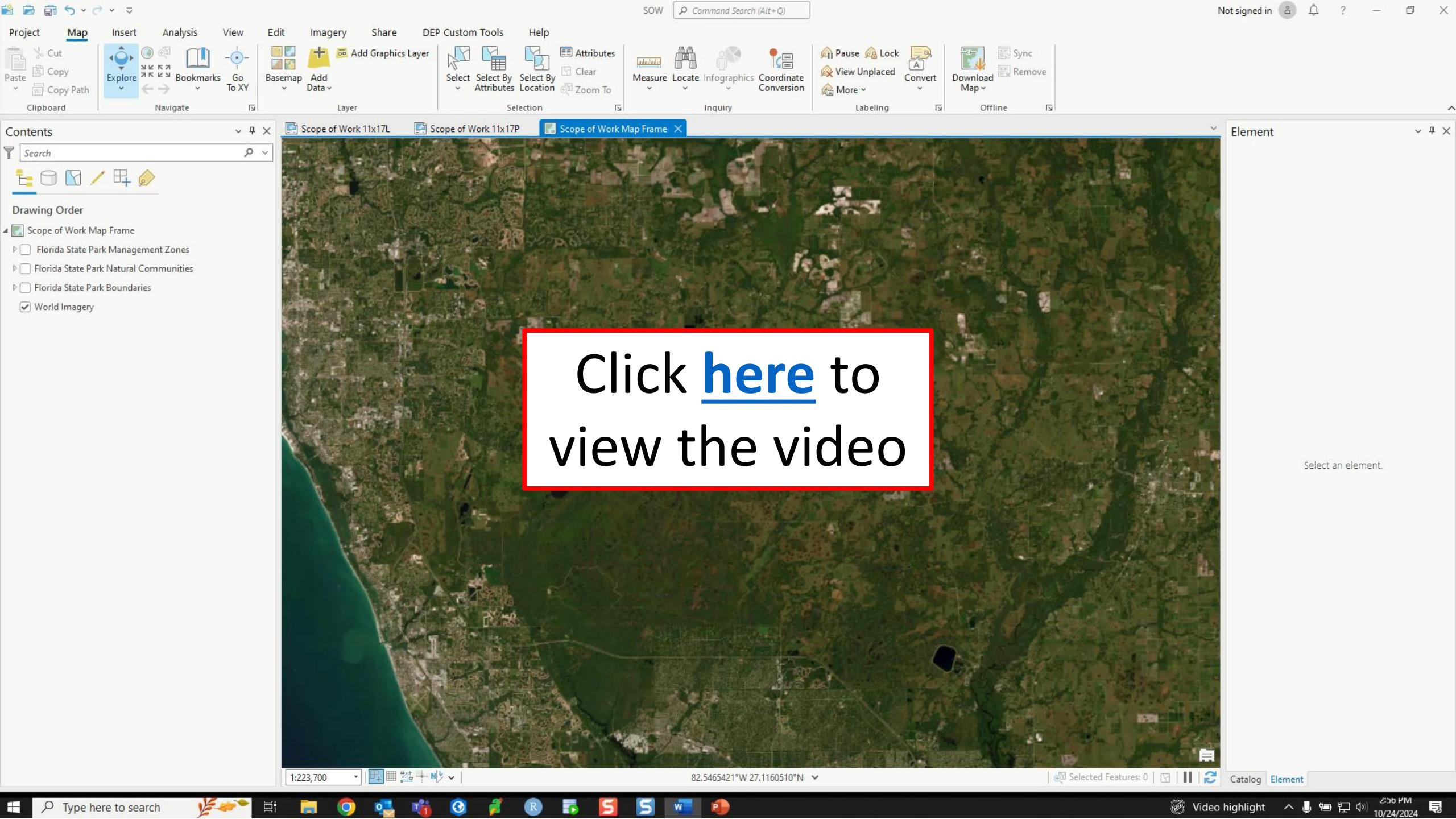
- Basically everything in a shared folder
- Slow to read and write

Computer Disc

- Fast reading and writing
- Cannot be accessed by other people
 - computer breaks, staff turnover, etc -- not recoverable
 - Workspace to complete projects, then move to network

Project vs Project Data

- Geodatabase or shapefile location affects speed
- 'Saving project as' does not change where the data source locations



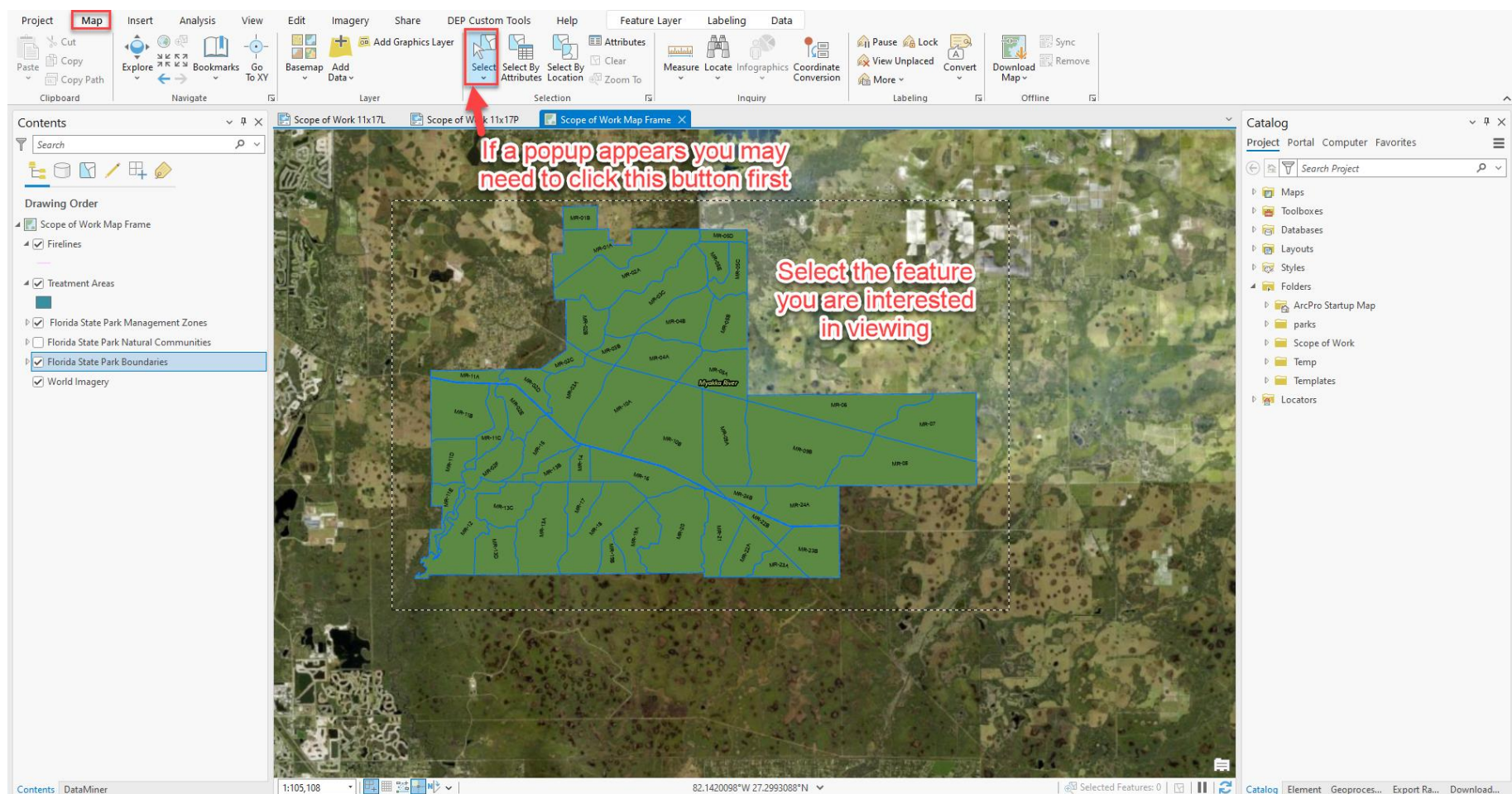
Click [here](#) to
view the video



Zoom To

Make a selection

- May need to enable selection in the map tab by clicking the select button

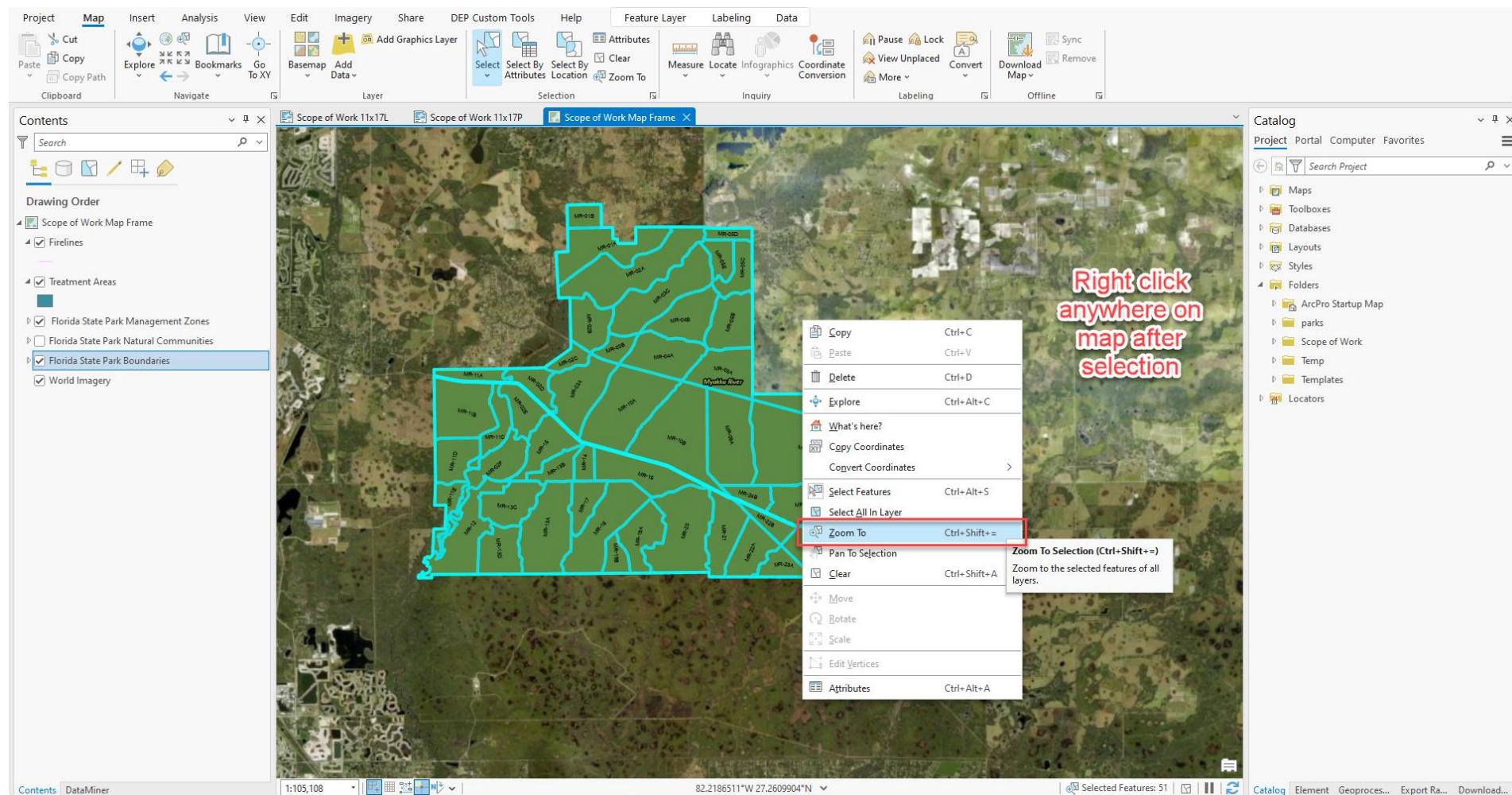




Zoom To

Zoom To

- Changes the map view to closely bound the feature we are interested in

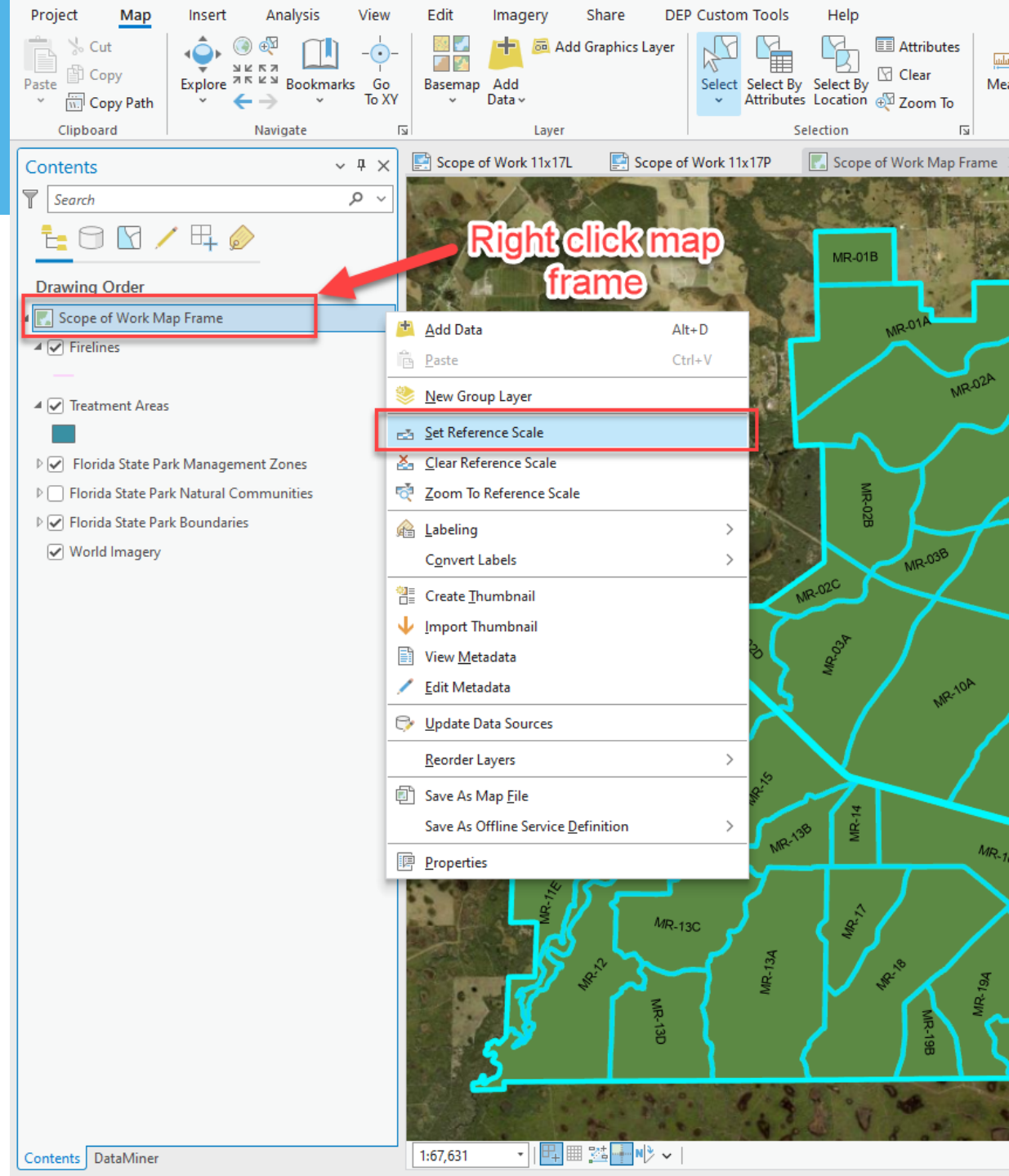


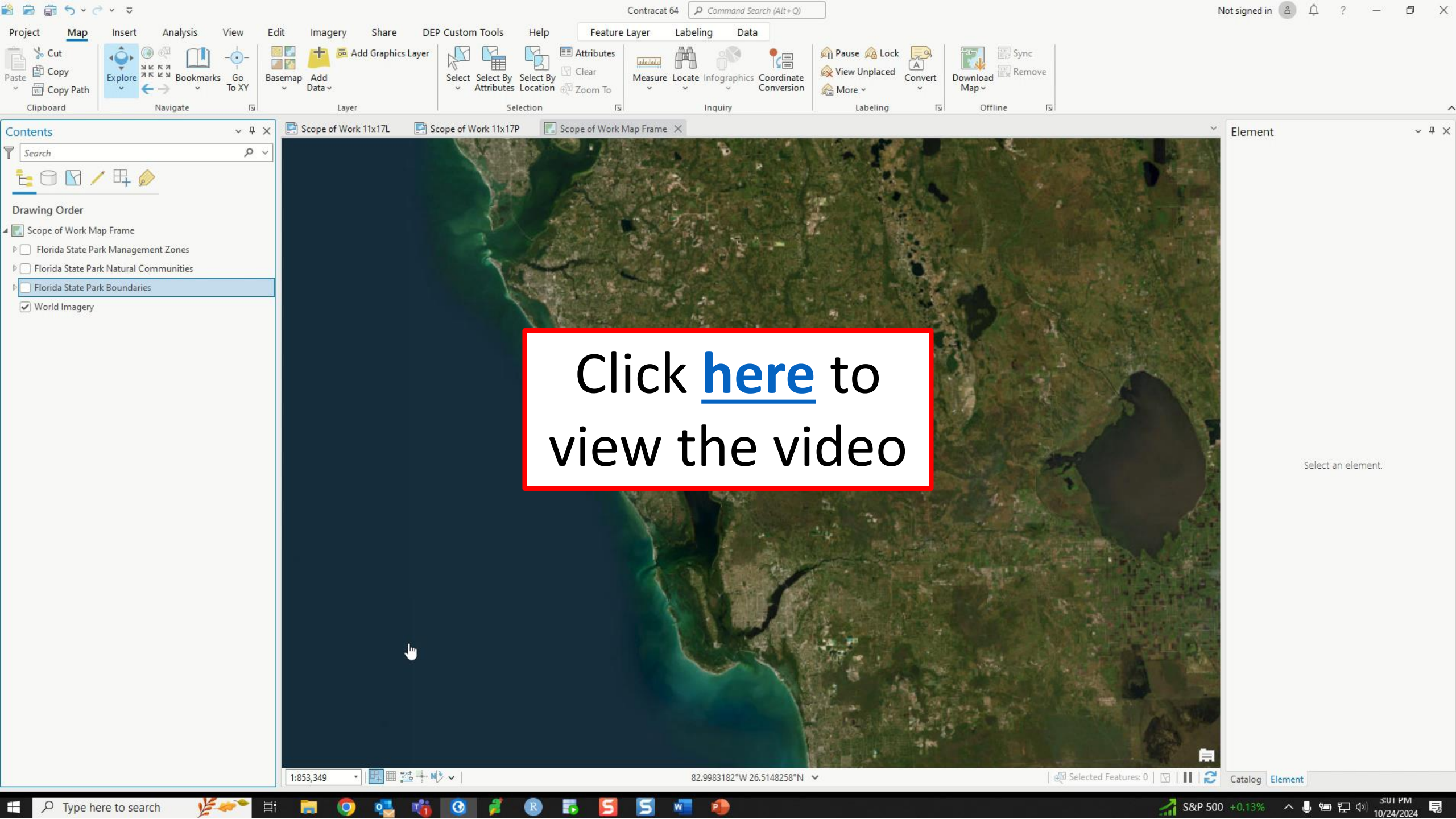


Reference Scale

Reference Scale

- Fixes the size of symbols and text





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view the video



Create Shapefiles

What is it?

Storage structure for a feature class

Contains spatial data in a series of files with the same name that can be zipped and shared over email

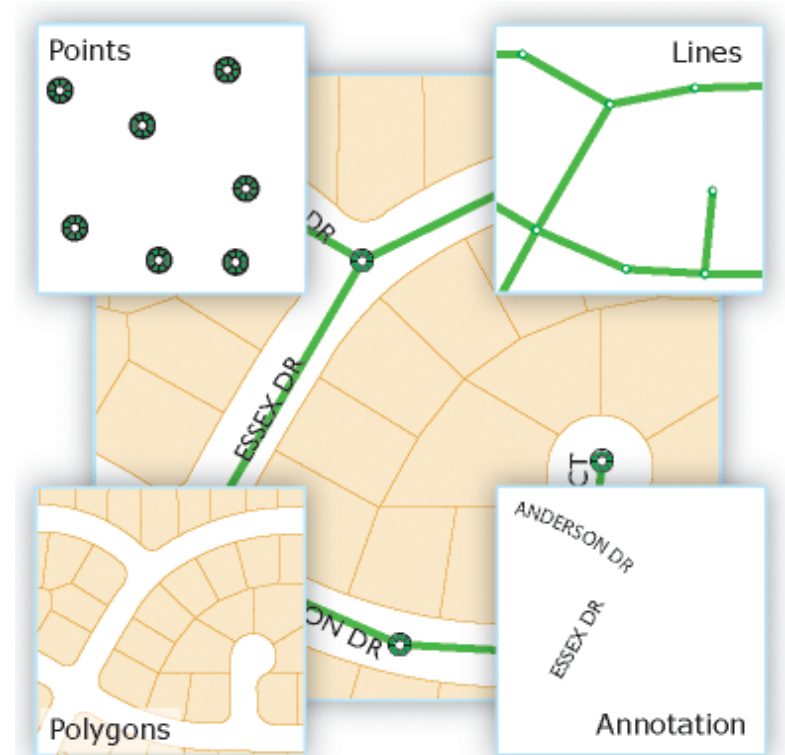
Standalone data

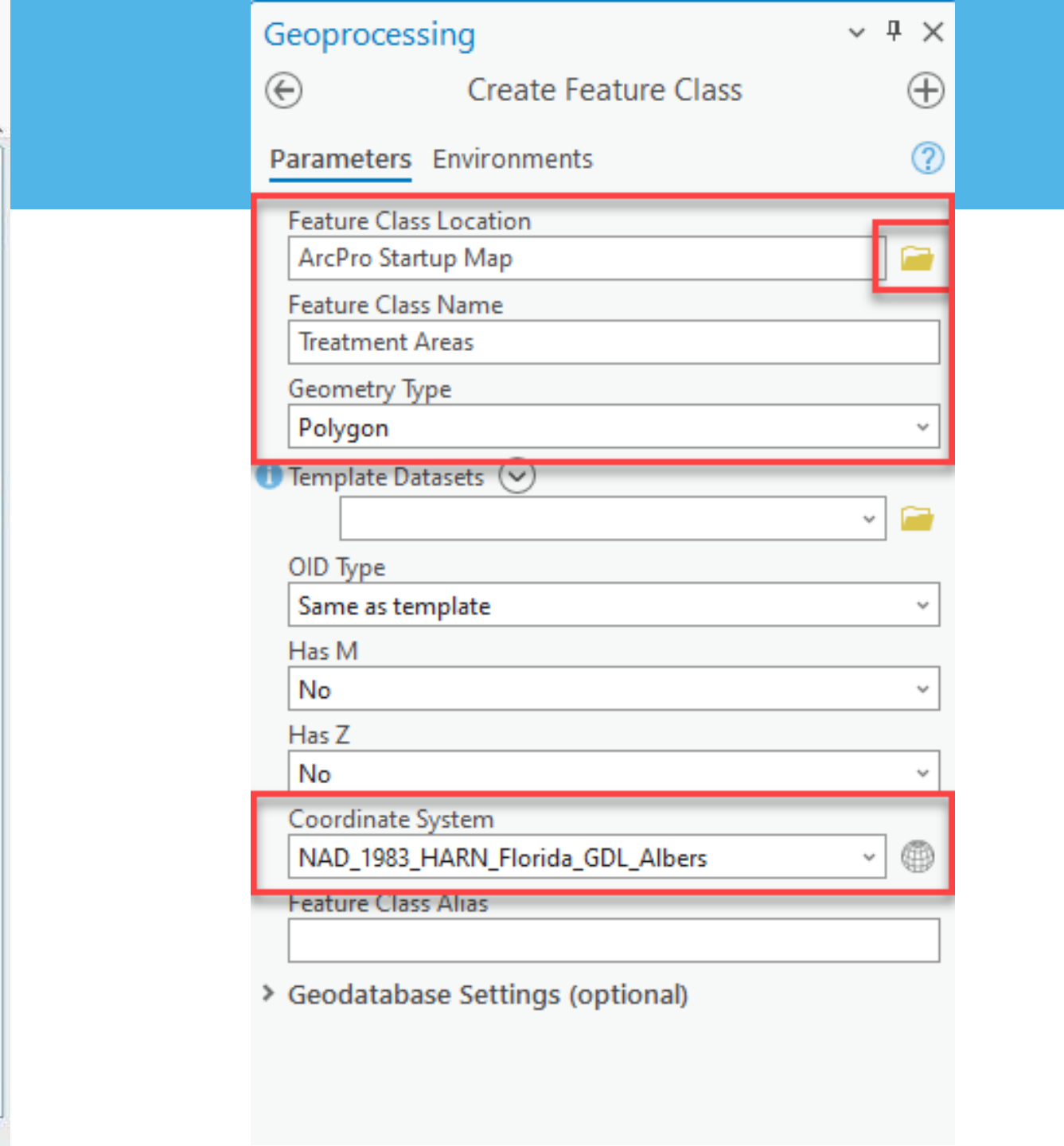
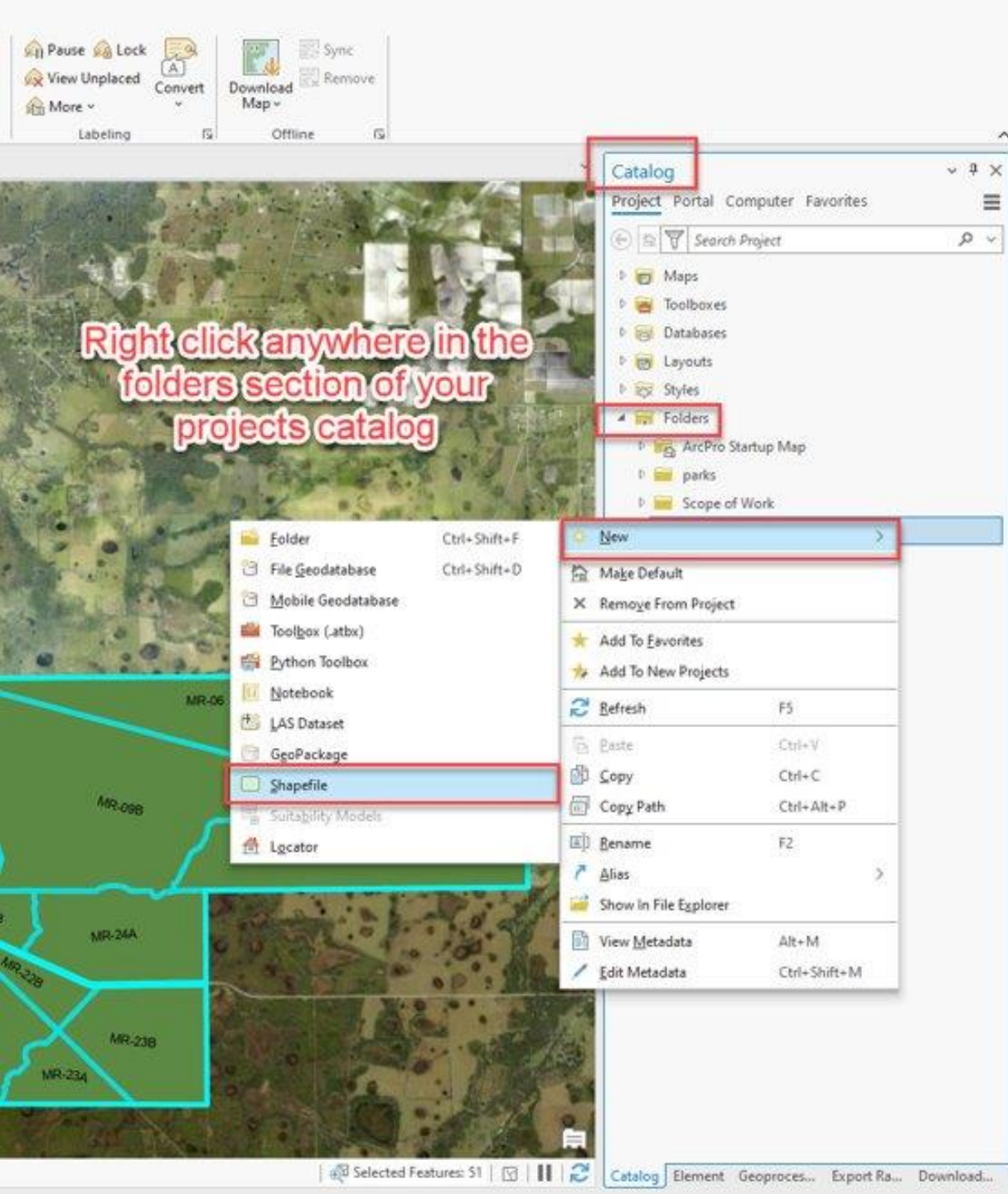
Shapefile vs Geodatabase

- both store feature classes
- geodatabases have additional features
- Learning shapefiles because contractors want them and FPS staff is more familiar

Feature classes

A feature class is a set of spatial data in ArcGIS Pro that has one shape and attribute table







Create Shapefiles

DEP Values

Shapefiles are a container for a feature class

- Feature classes can be stored in shapefiles or geodatabases

Only items in red boxes need to be changed

- Feature class location should be whatever folder you want the shapefile to be stored in
 - Every park has a shapefile folder, storing on disc is faster but less accessible
- Feature class name is self explanatory
- Geometry type is self explanatory
- Coordinate system is NAD_1983_HARN_Florida_GDL_Albers
 - Can select 'Current Map'

Geoprocessing

Create Feature Class

Parameters Environments

Feature Class Location
ArcPro Startup Map

Feature Class Name
Treatment Areas

Geometry Type
Polygon

Template Datasets

OID Type
Same as template

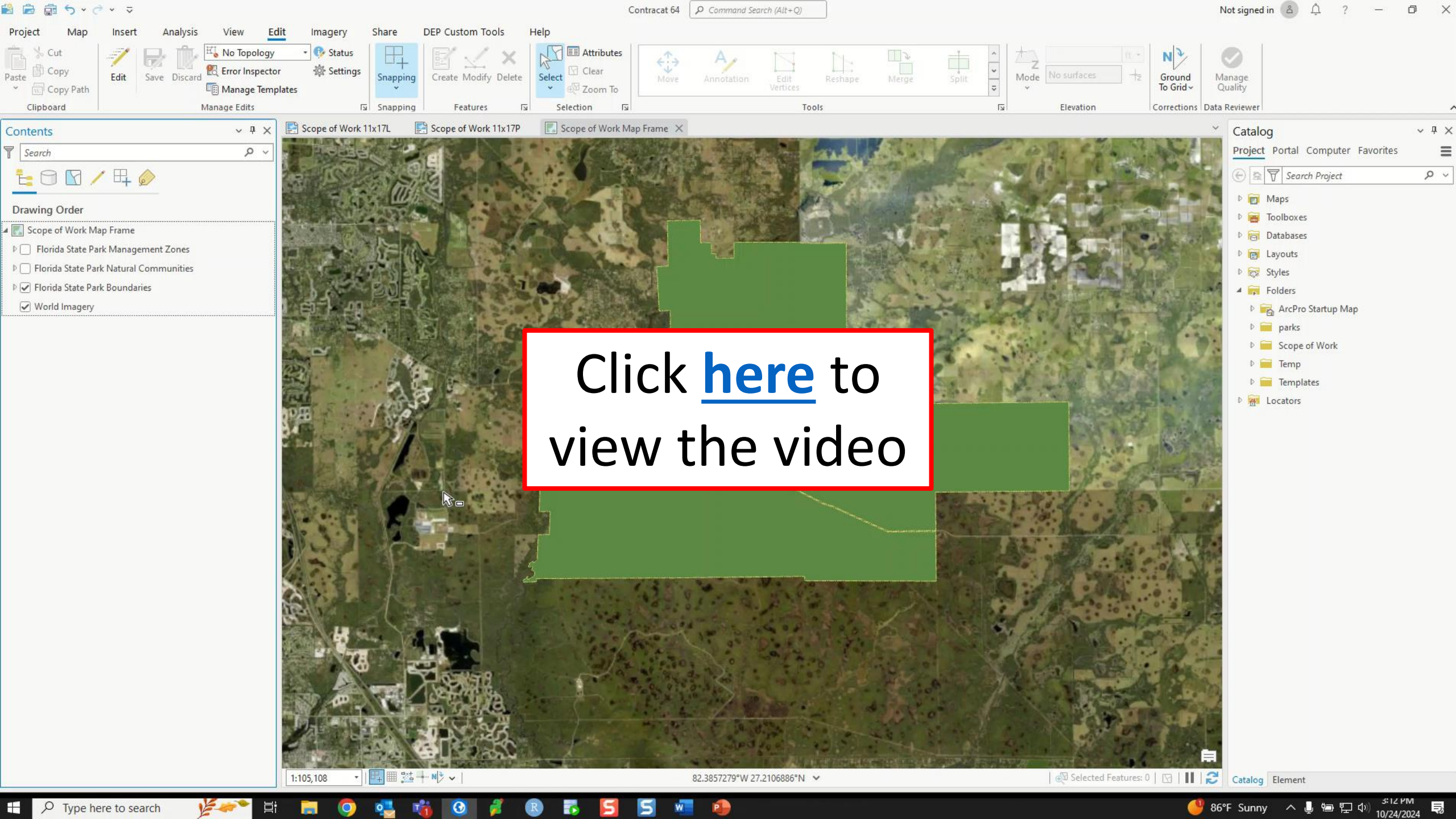
Has M
No

Has Z
No

Coordinate System
NAD_1983_HARN_Florida_GDL_Albers

Feature Class Alias

> Geodatabase Settings (optional)



Click [here](#) to
view the video



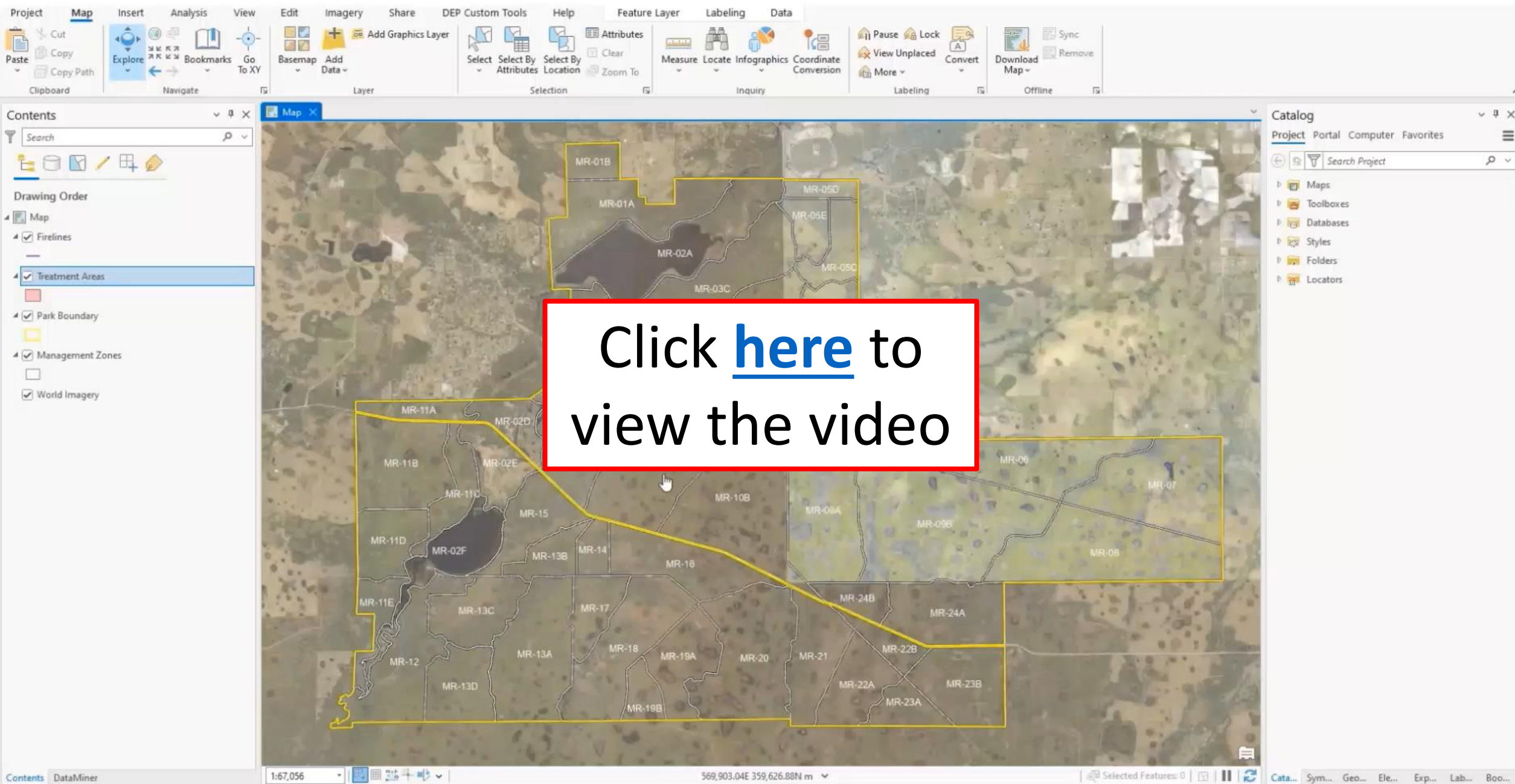
Creating and Editing Data

- Creating Features – Polygons and Lines
- Copy and Paste
- Clip Tool
- Editing Vertices
- Split Tool
- Merge Tool



Creating Features

- Allows you to create irregular shaped polygons or lines
- Freehand draw polygons and lines
- More information can be found here:
<https://pro.arcgis.com/en/pro-app/latest/help/editing/create-polygon-features.htm>





Copy and Paste

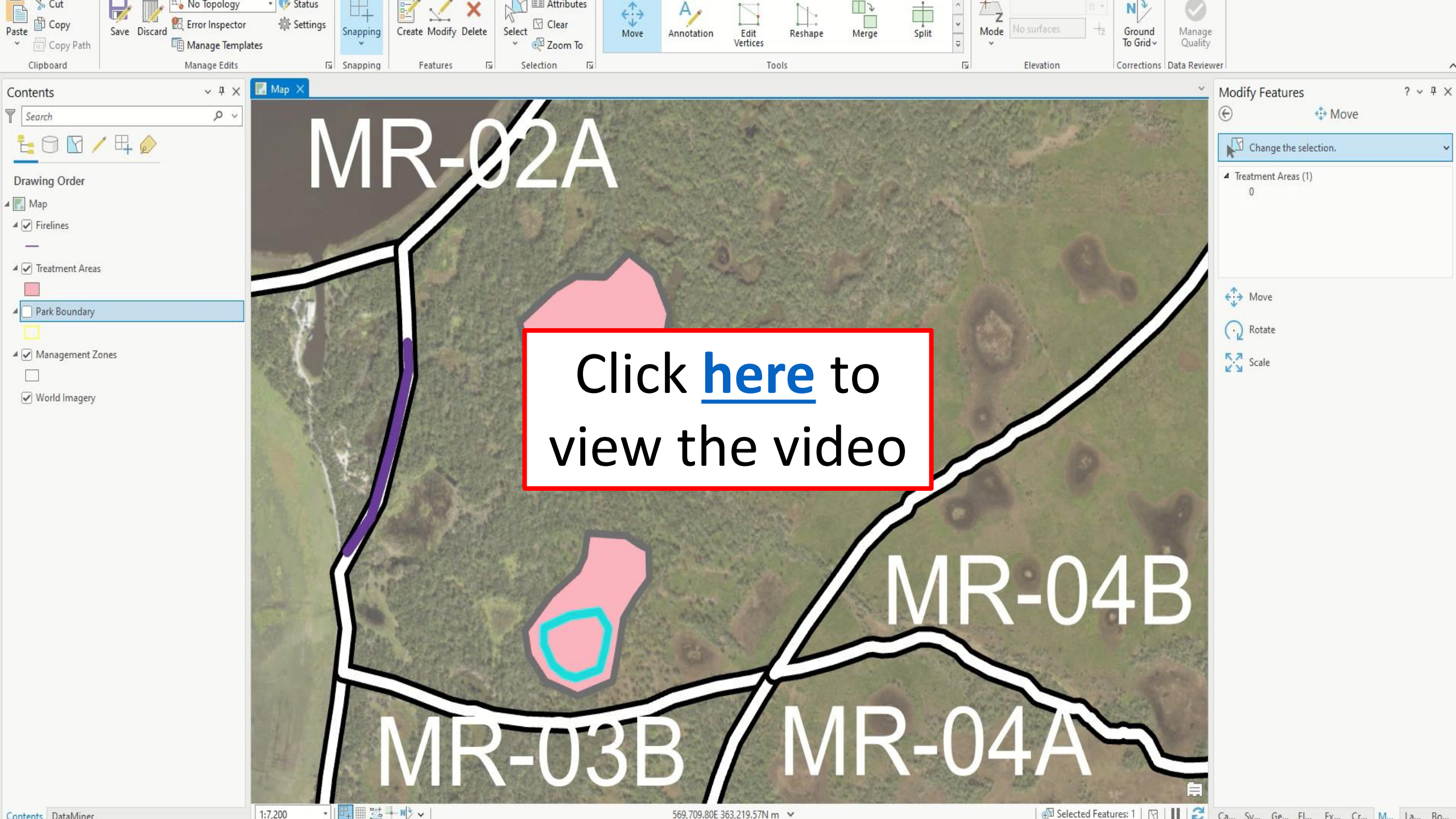
- Allows you to copy polygons, lines, and points from one map/shapefile to another, while maintaining the attributes.
- Key board shortcuts: Copy = CTRL + C, Paste = CTRL + V
- If keyboard shortcuts don't work, you may need to select the down arrow under paste and select 'Special', you'll then need to select the layer you want the new feature (polygon, line, point) to be a part of
- More information can be found here: <https://pro.arcgis.com/en/pro-app/latest/help/editing/copy-and-paste-using-the-clipboard.htm>





Clip Tool

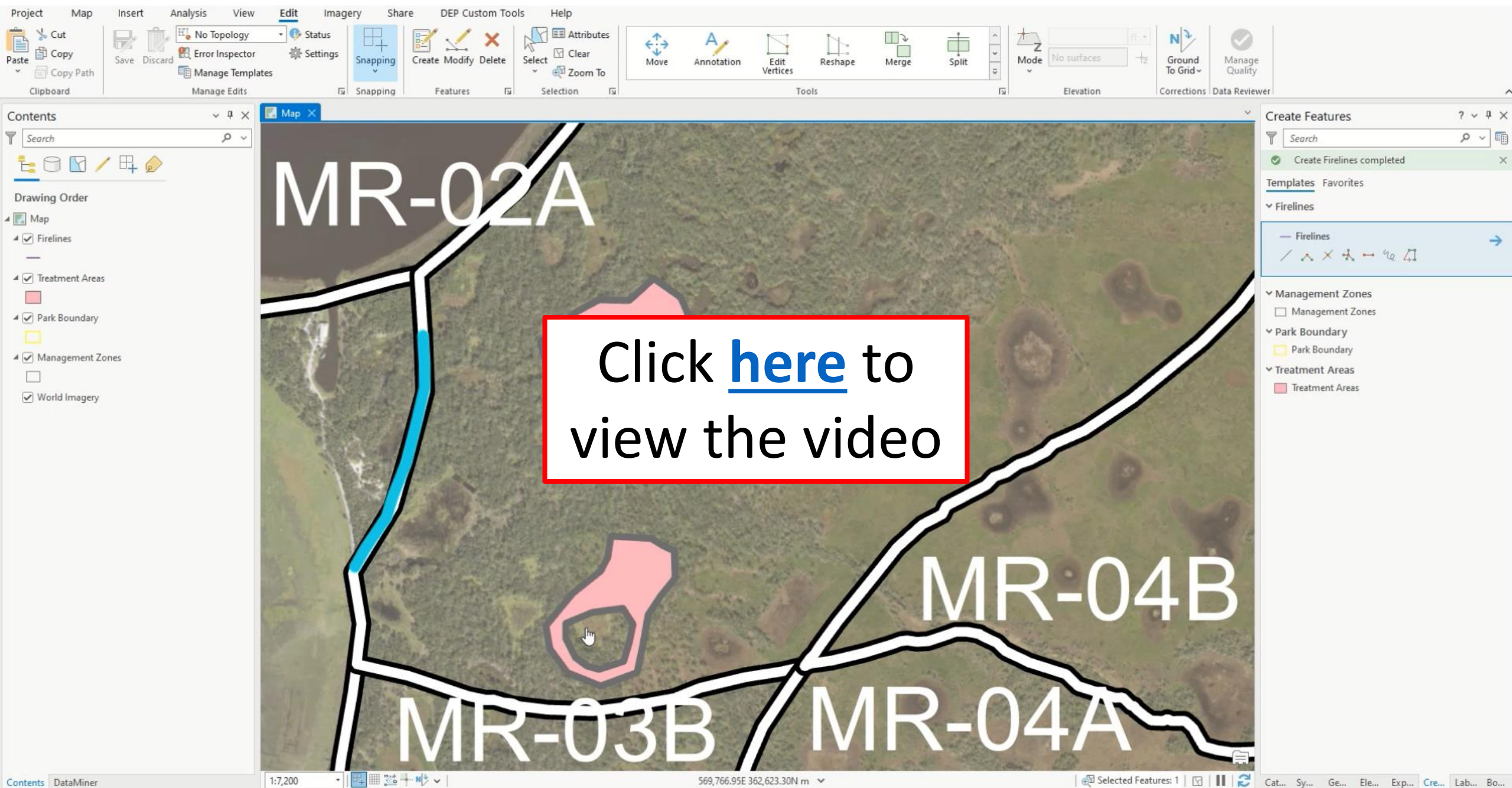
- Clips all visible and editable features where they intersect selected features (polygons or lines)
- Multiple ways to clip – delete or keep features that intersect the clip area or delete all features outside the clip area.
- For this demonstration, we will be focusing on the '**discard**' option in the clip tool
- More information can be found here: <https://pro.arcgis.com/en/pro-app/latest/help/editing/clip-features-using-another-feature.htm>





Editing Vertices

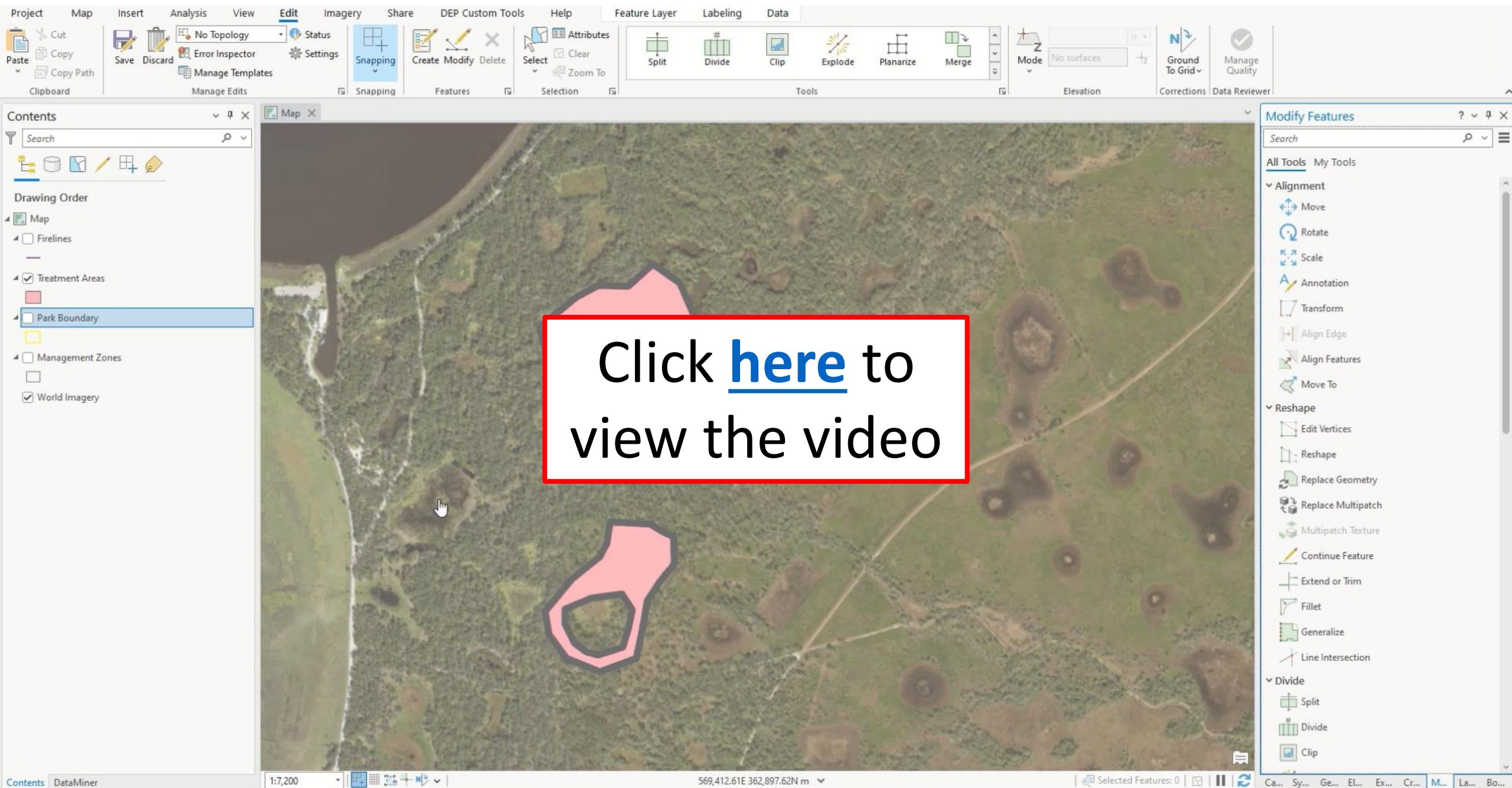
- Moves, adds, trims, and deletes the vertices that form a selected polygon or line.
- Good for quick updates to a polygon or line, without having to redraw the entire feature.
- More information can be found here: <https://pro.arcgis.com/en/pro-app/latest/help/editing/modify-feature-vertices.htm>





Split Tool

- Splits a visible feature (polygon or line) into two or more features.
- Must intersect the feature at 2 or more locations for tool to work.
- Start your split line outside the feature and end outside of the feature; keeping the line within the boundaries of the feature you wish to split will result in the tool failing to run.
- For lines, seeing the split may be harder; opening your attribute table is a good way to double check if the split actually worked.
- More information can be found here: <https://pro.arcgis.com/en/pro-app/latest/help/editing/split-a-feature.htm>





Merge Tool

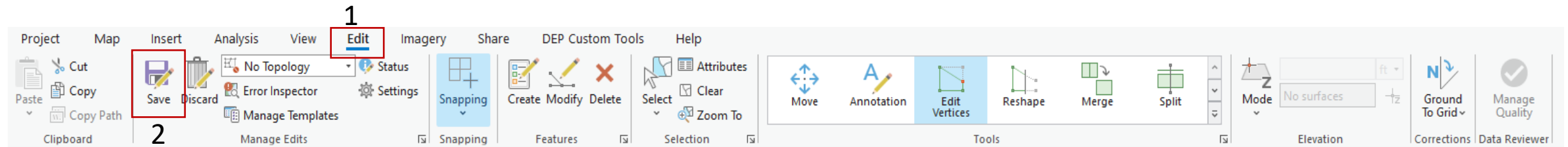
- Combines two or more features on the same layer into an existing feature or combines two or more features into a new feature.
- Features do not have to touch each other to be merged together. This is called a multipart feature.
- More information can be found here: <https://pro.arcgis.com/en/pro-app/latest/help/editing/merge-features-into-one-feature.htm>





SAVE YOUR EDITS

- Remember to save your edits frequently!





Your shapefile has features-points, lines & polygons...what's next? Add Fields!

Adding fields is as important as adding features.

- Add “types” to your features
- Add feature calculations like
 - Acres
 - Length-miles or feet
 - Latitude, Longitude
- Add a name-unique ID, MZs
- Add a description
- Add other class or subtypes

Right click on the layer name to bring up this dialog box

OBJECTID *	Shape *	UNIT_ID	SITE_NAME	USE	NAME	NUMBER *	FUNCTION	SQ_FT	FOUNDATION	DATE CONST	COST	ROOF MATER
1	Polygon	S00002	Alfred B. Maclay Gardens	Visitor Center	Garden Welcome Center	BL002022	Public	1785.255	Slab on Grade	01/1962	0	Asphalt/Fiberglass
2	Polygon	S00002	Alfred B. Maclay Gardens	Storage - Equipment	Golf Cart Storage	<Null>	Support	107.0197	Slab on Grade	<Null>	0	Plastic
3	Polygon	S00002	Alfred B. Maclay Gardens	Gazebo	Lakeside Pavilion	BL002030	Public	781.9206	Slab on Grade	01/1962	2016	Asphalt/Fiberglass
4	Polygon	S00002	Alfred B. Maclay Gardens	Storage - Chemical/Flamm	Fuel Storage	<Null>	Support	7.907047	Pilings	<Null>	0	None
5	Polygon	S00002	Alfred B. Maclay Gardens	Barn	12X24 Shelter	N0020001	Support	303.6462	Slab on Grade	<Null>	0	Metal



Let's start adding fields!

1:19,456 82.2737379°W 27.2290056°N

FireLines Fields: FireLines X Adding Fields in "Field View"

Current Layer FireLines

Visible	Read Only	Field Name	Alias	Data Type
☒	☐	Shape	Shape	Geometry
☒	☐	Id	Id	Long
☒	☐	Miles	Miles	Double
☒	☐	Feet	Feet	Double
☒	☐	Treatment	Treatment	Text
☒	☐	Ten_Charc	This is the field Alias and you can use 255 Characters#1!	Long

82.2736457°W 27.2216232°N

"Table View" after adding a new field

Select By Attributes Zoom To Switch Clear Delete Copy

Feet	Treatment	This is the field Alias and you can use 255 Characters#1!
6641.01	Mowing - 1	0
8982.07	Mowing - 2	0

Filters: 3/3

What are your field names and types

- The maximum number of characters allowed for a **field name** in a shapefile is **10**. No spaces and no funky stuff
- A **field alias** is an alternative name for a field providing a more user-friendly description of the content. Unlike true names, aliases do not have to adhere to the limitations of the database and can contain up to **255** characters, including spaces, numbers, and special characters. By specifying an alias, you can give names to fields that are more descriptive than their actual field name.

Tip-Right click on any field header to bring up field view for adding fields!



In a shapefile, you can add different types of fields. Selecting the correct field type matters!

Shapefile Field Types-yellow highlight is most common

Double

The double data type is a double-precision 64-bit floating point number that can store numbers with up to 15 digits. Double fields can support fractional numbers between $-2.2E308$ and $1.8E308$. Select your decimal place.

Text

The text data type is any characters, words or text description. Shapefile character limit is 254.

Date

The date data type has additional selections for how to store and read the date field. Wow there's some interesting date formats

Float

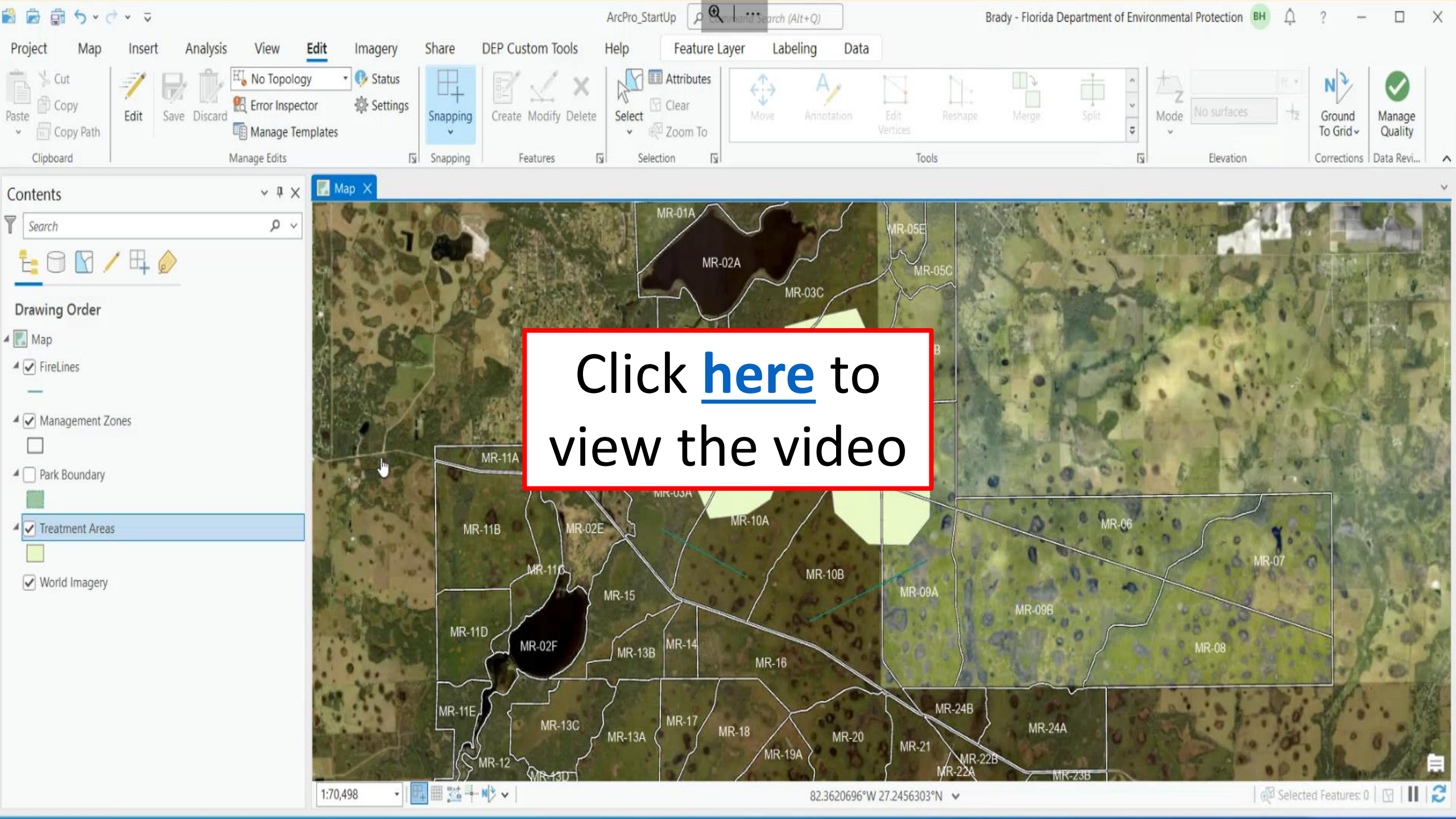
The float data type is a single-precision 32-bit floating point number that can precisely store numbers that contain up to six digits only

Long

The long data type is a 32-bit signed integer that can store whole number values within the range of -2.14 billion to 2.14 billion

Short

The short data type is a 16-bit signed integer that can only store whole number values within the range of -32,768 to 32,767





I've got my fields, let's add some additional info

Three main ways to enter data into a field.

1. Simply click in the cell and start typing
2. Use "Calculate Geometry" for X/Y, Area or Length
3. Use "Calculate Field" to build more complex statements or math formulas

Tip-If you have selected records, it only calculates on those selected records or features!

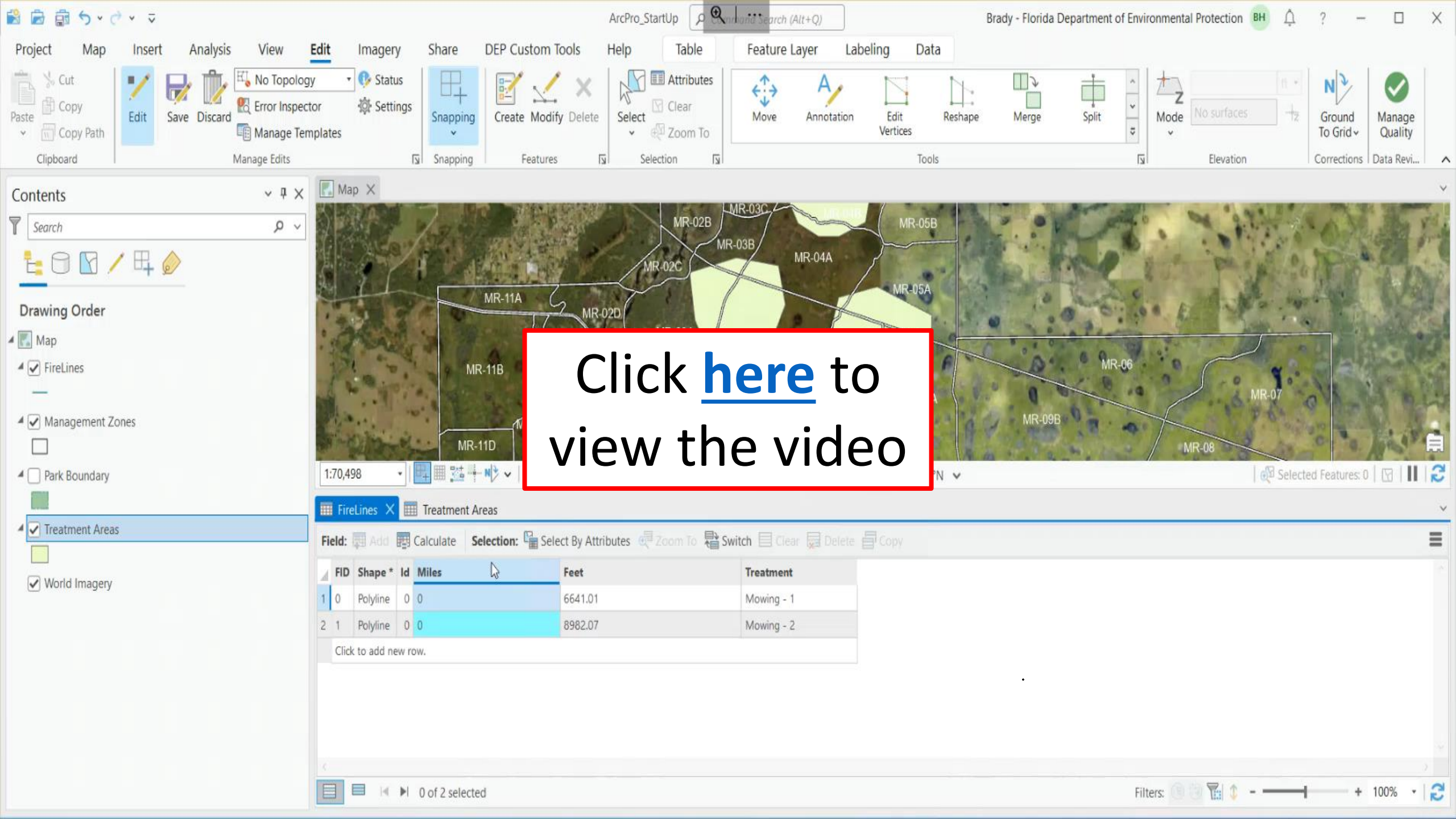
The screenshot displays the FireLines software interface. At the top, a scale bar indicates 1:19,456. Below it, a toolbar contains icons for adding, calculating, and selecting data. The main window shows a table with columns: FID, Shape, Id, Miles, and Feet. The first row has FID 0, Shape Polyline, Id 0, Miles 1.25776631346, and Feet 6641.01. The second row has FID 2, Shape Polyline, Id 0, Miles 1.7, and Feet 8982.07. A context menu is open over the table, showing options like Sort Ascending, Sort Descending, Custom Sort, Fields, Hide Field, Freeze/Unfreeze Field, Calculate Field, Calculate Geometry (highlighted), Explore Statistics, Visualize Statistics, Summarize, and Delete. Below the table, a 'Calculate Field' dialog box is open, showing the 'Expression' tab with the formula `!Miles! * !Feet! = !Treatment!`. A 'Code Block' tab is also visible, showing the same formula. The background shows a map with a green line representing a fireline.

FID	Shape	Id	Miles	Feet
0	Polyline	0	1.25776631346	6641.01
2	Polyline	0	1.7	8982.07

Click to add new row.

Calculate Field dialog box:

Input Table: FireLines
Field Name (Existing or New): Miles
Expression Type: Python
Expression: `!Miles! * !Feet! = !Treatment!`



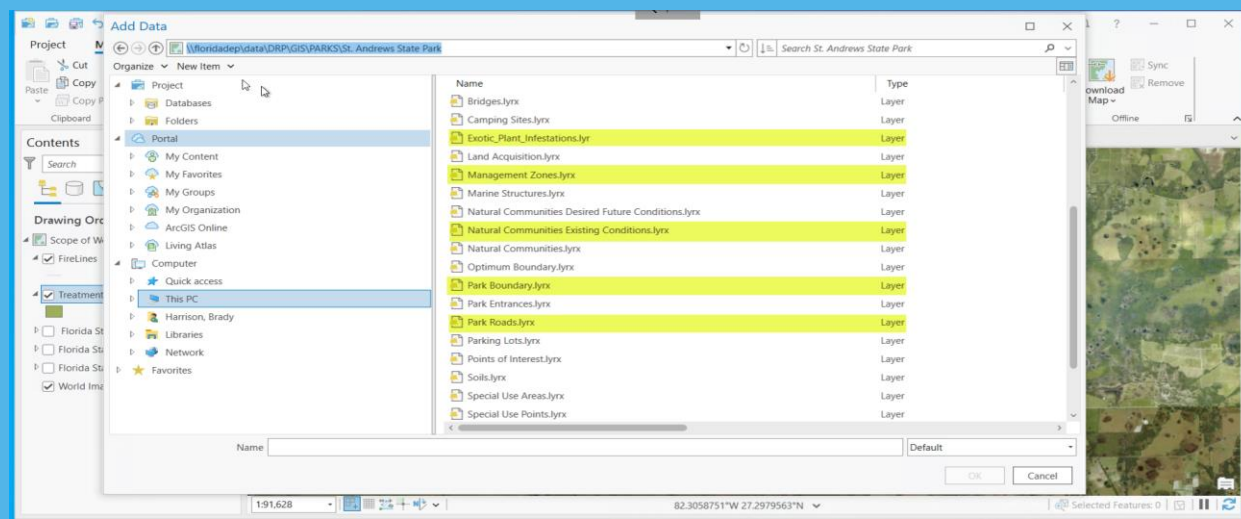
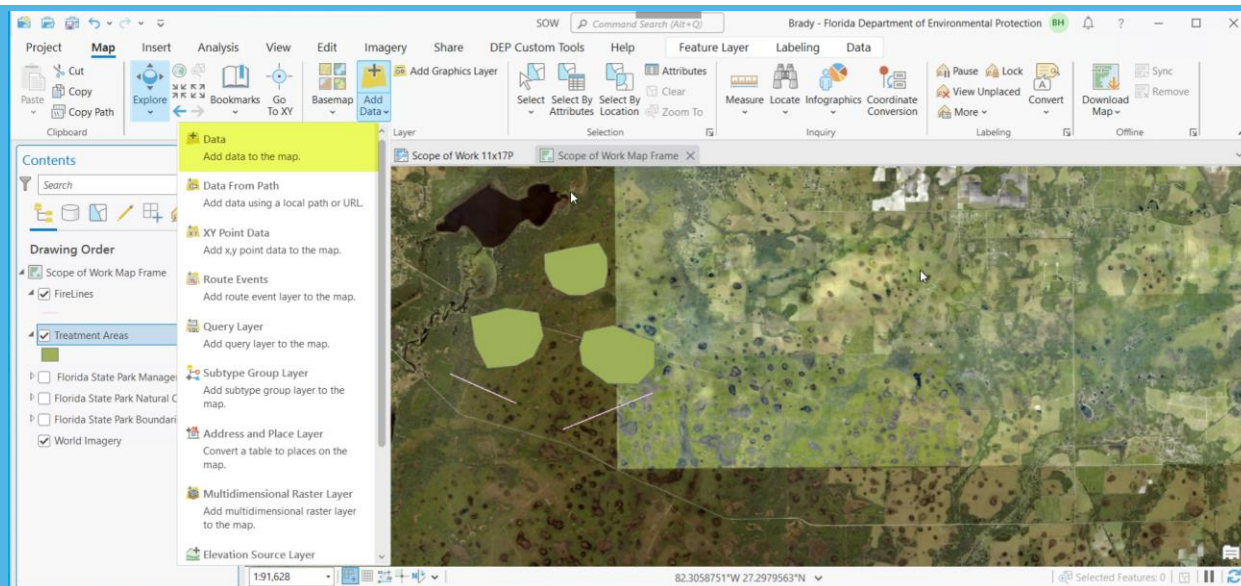


We've created data from scratch, but I want to modify or use something already available in GIS

It's easy and a very effective way to jump start a shapefile.

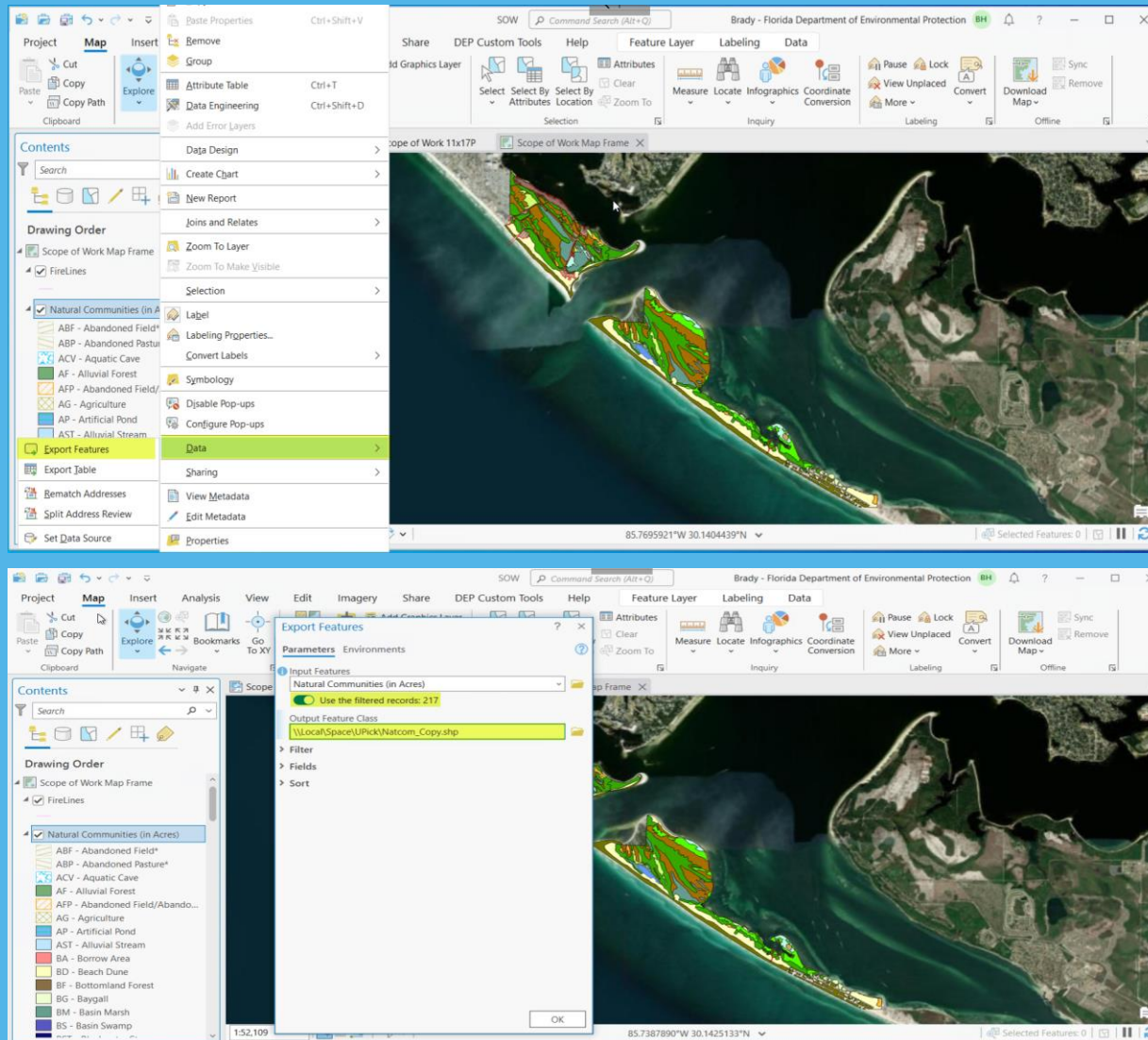
- The central GIS park directories have everything that is available for any park.
- <\\floridadep\data\drp\gis\parks>
- Everyone in DRP has access to the directory to load or copy data.
- We recommend mapping this network location both in file explorer and ArcPro.

TIP-You can even open central GIS ArcPro projects like the natural communities map or base map. Look in the projects folder.





The data you want to copy is loaded into ArcPro. Let's make a local copy you can edit, store or send.



Almost everything in ArcPro has a “right click”.

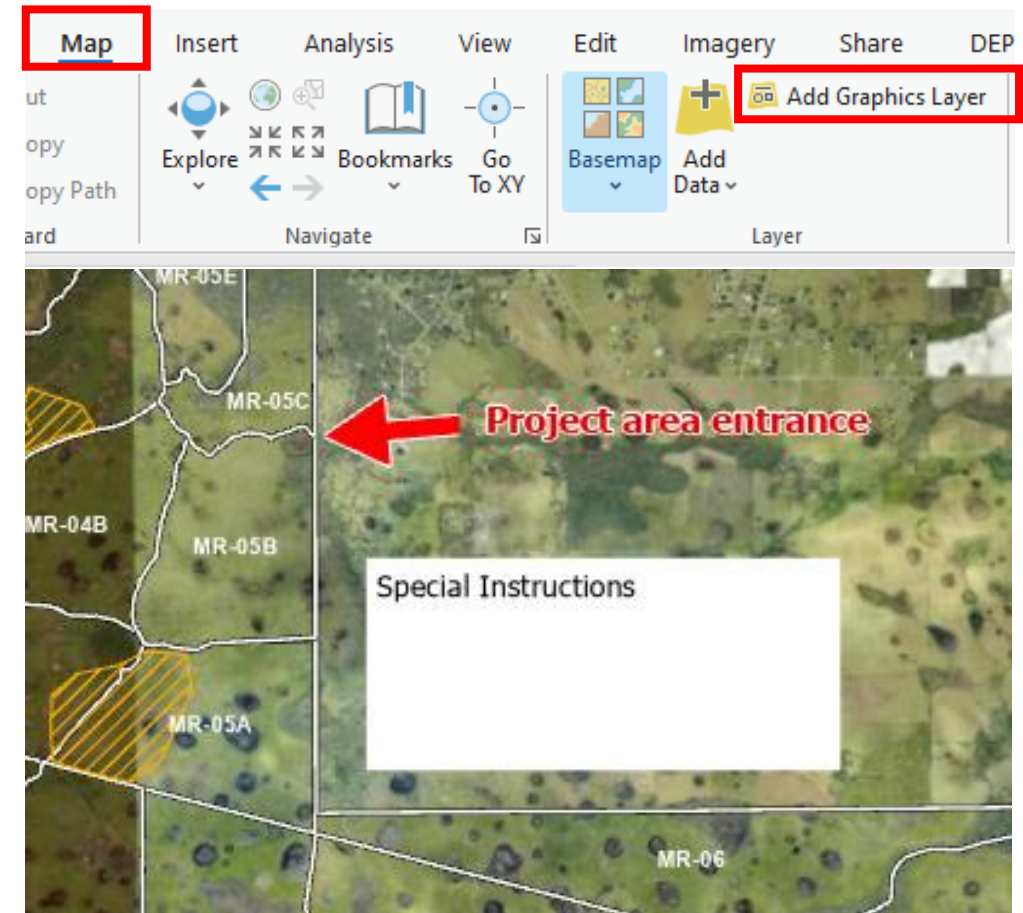
- The data you just added appears in the “Table of Contents” pane.
- Use a single click to “select” or to highlight the layer.
- Right click the selected layer to bring up a dialog list.
- Scroll down the list to “Data”.
- Once in “Data”, select “Export Features” to create a shapefile or select “Export Table” to export a csv.
- In the export dialog box select the name, location and add “.shp” to create a shapefile.

Tip-you must add .csv or .shp to the name to determine file type.



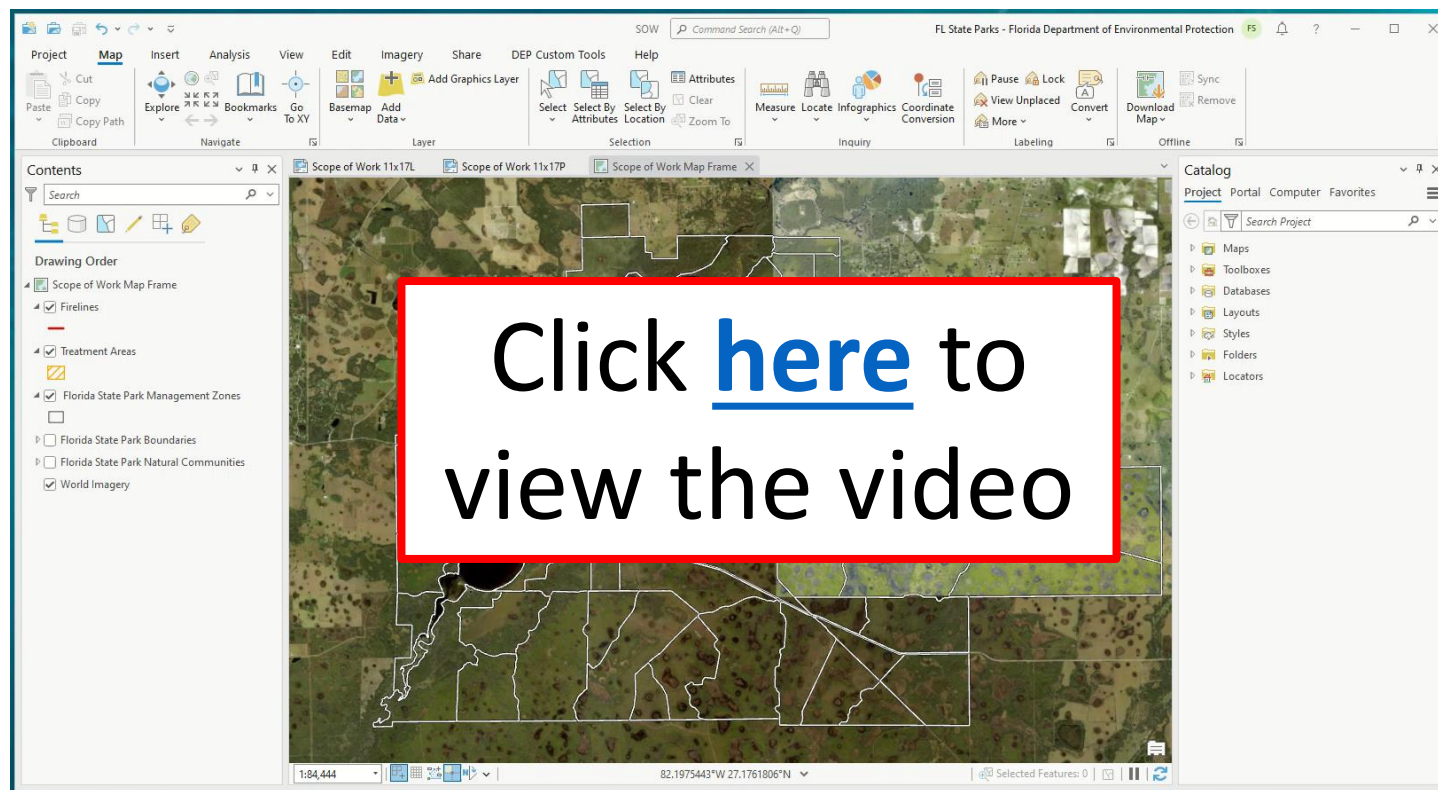
CREATING A GRAPHICS LAYER

- Graphics layers are a great way to add custom text/shapes on your map
- Drawing graphics in the map is better than adding graphics in the layout
 - If you change your extent in the layout your graphics will stay where you placed them on the map
- You can turn graphics layers on and off in the Contents Pane just like shapefiles
- Save them as a layer file to use in other maps

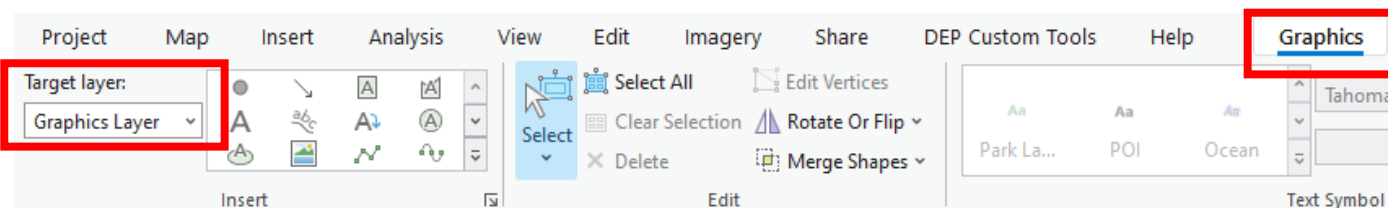




CREATING A GRAPHICS LAYER



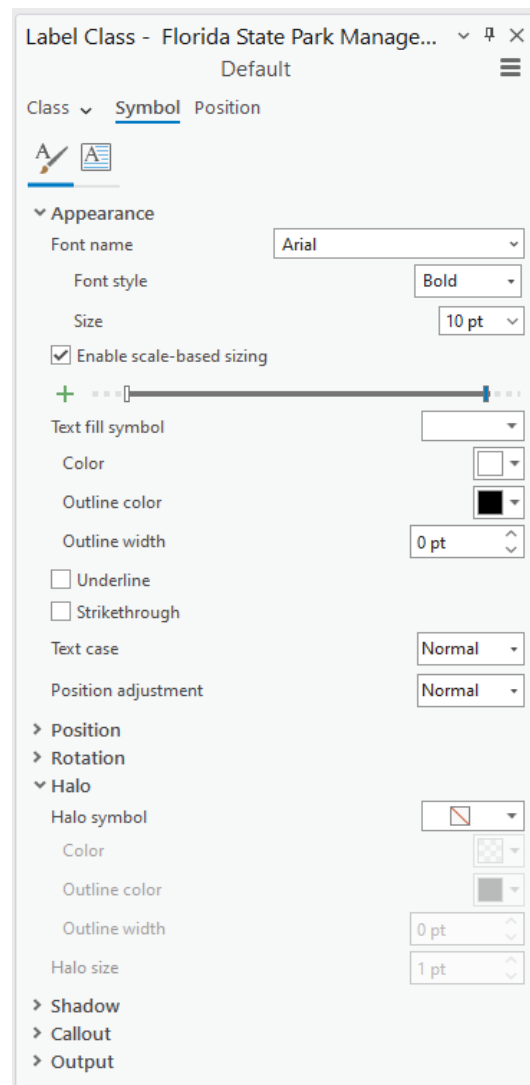
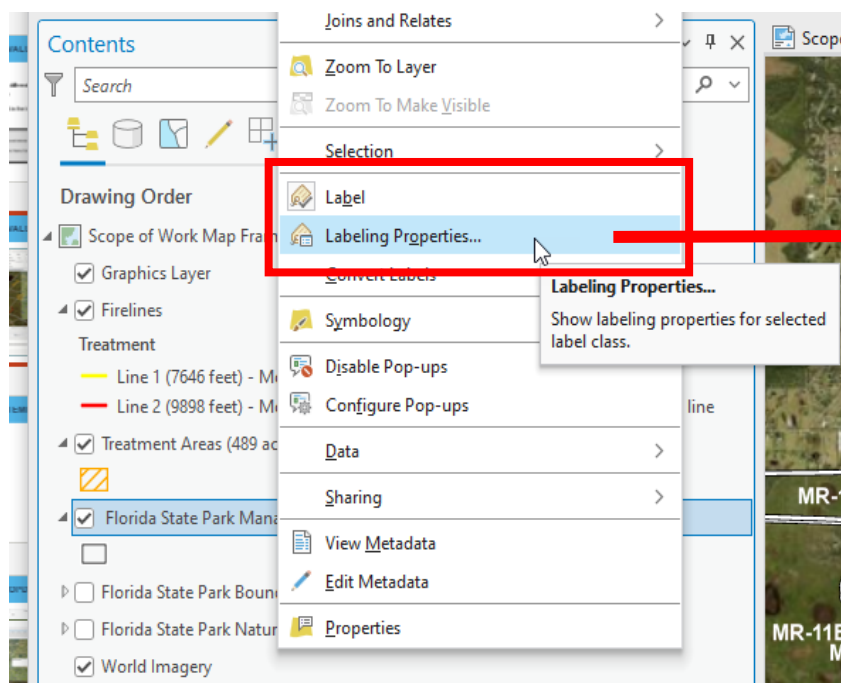
If you create more than one graphics layer in your map, make sure to select the Target layer before adding graphics to the wrong layer.





LABELING

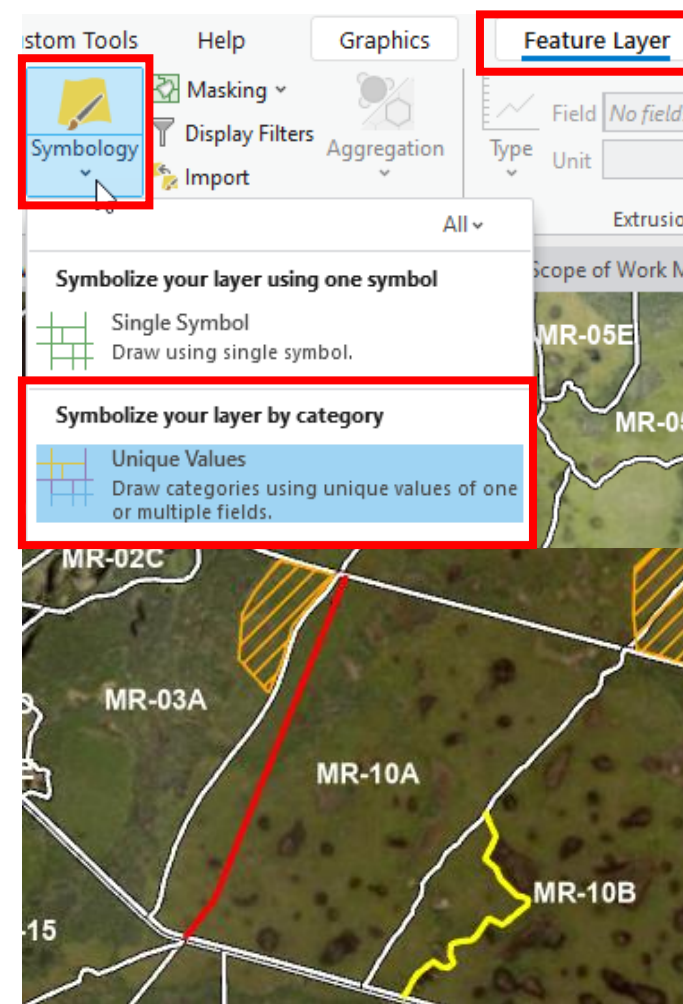
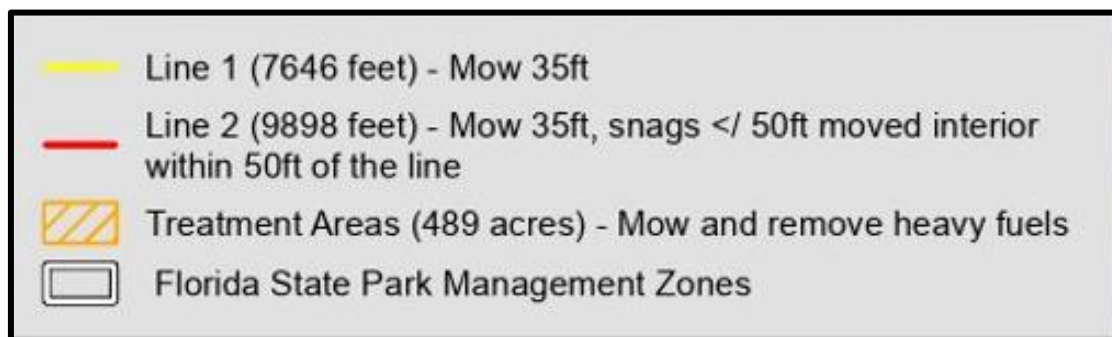
- To use automatic labeling for layers, you can right click the layer in the Contents Pane and click Label to turn them on.
- Right click and go to Labeling Properties to customize labels even further.





ADDING UNIQUE VALUES FOR SYMBOLOGY

- Use Unique Values for symbology to differentiate features by attributes in the shapefile
- Less custom labeling and more detail in the legend
- Quick and clear delineation between similar features





ADDING UNIQUE VALUE SYMBOLOGY

The screenshot shows the ArcGIS Pro interface with the 'Feature Layer' tab selected. A red box highlights the text 'Click [here](#) to view the video' in the center of the map area. The interface includes a top menu bar, a left sidebar with 'Contents' and 'Drawing Order' panels, and a right sidebar with a 'Catalog' panel. The map area displays a satellite view of a landscape with a red line indicating a feature. Below the map, a table shows the attributes of the selected features.

FID	Shape	Id	Miles	Feet	Treatment
1	1	Polyline	1	1.45	7646 Mow 35ft
2	0	Polyline	2	1.87	9898 Mow 35ft, snags </ 50ft moved interior within 50ft of the line

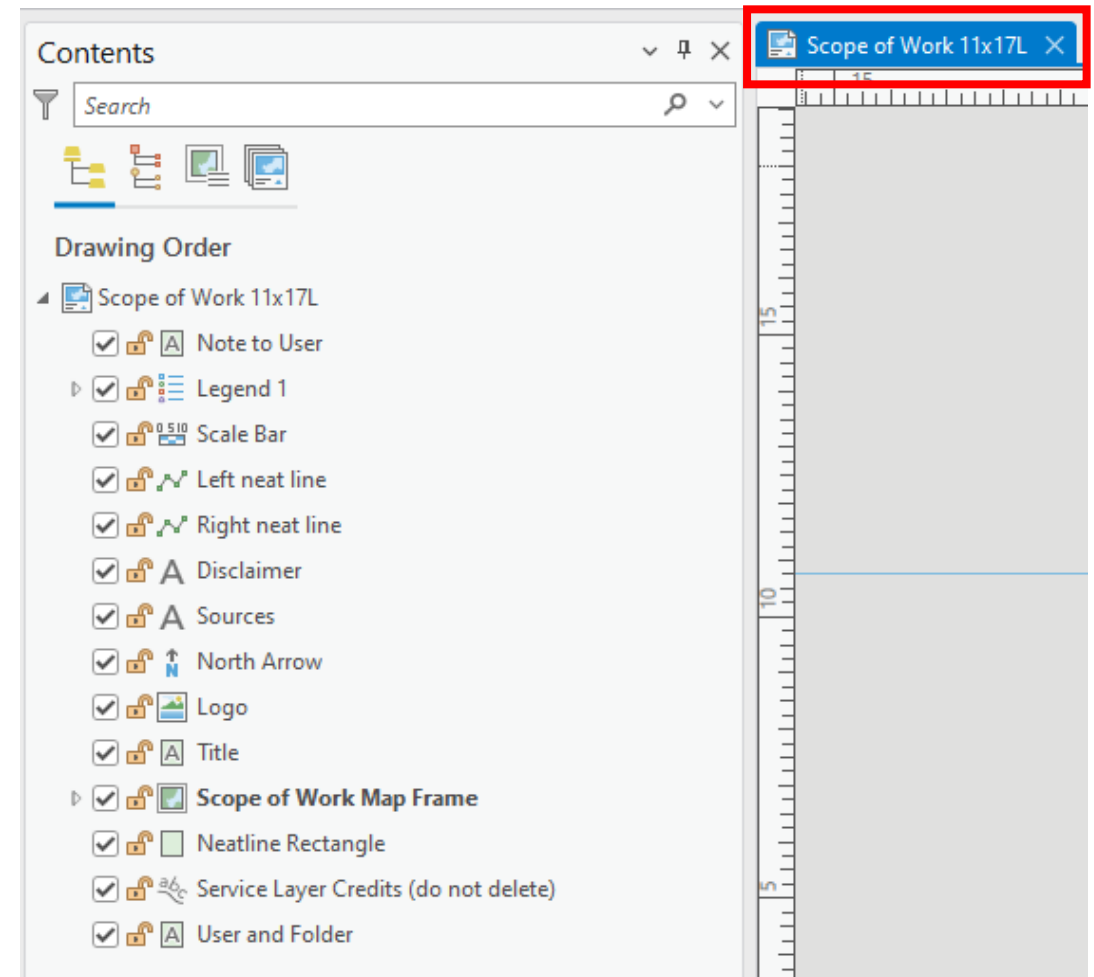




ADJUSTING THE TEMPLATE LAYOUT

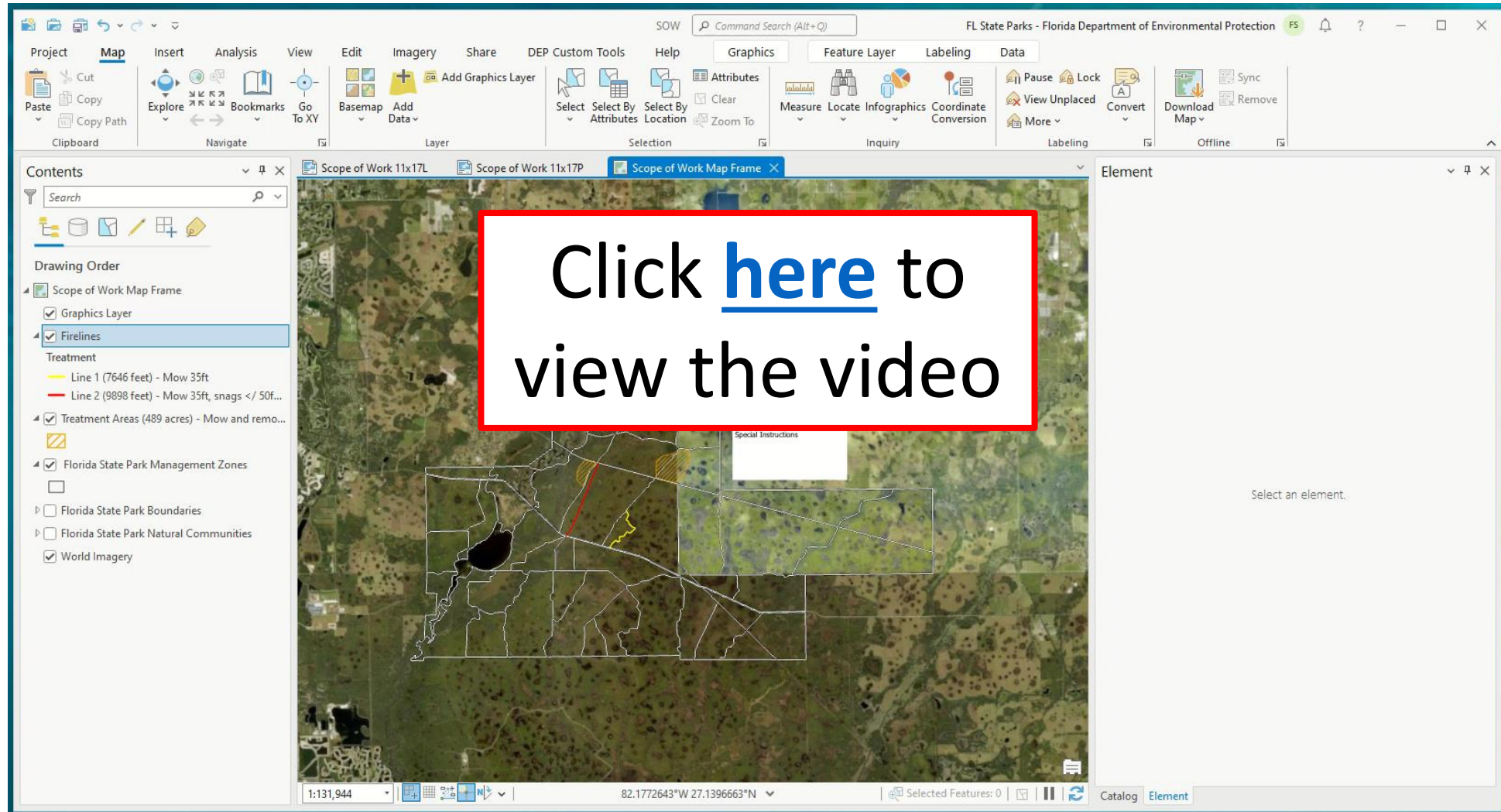
The SOW map template should have everything you need to make a good map but it will need some tweaking for your specific project.

- Change the map title
- Adjust the scale bar (if needed)
- Check layers on/off in the legend
- Activate the map frame to zoom in/out and set your map extent



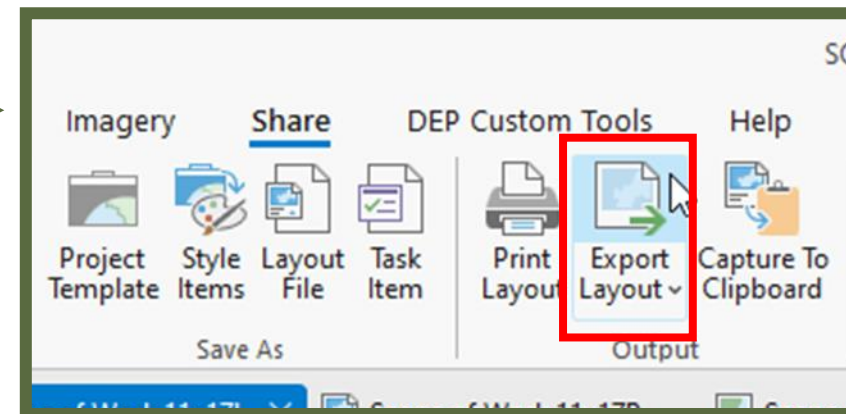
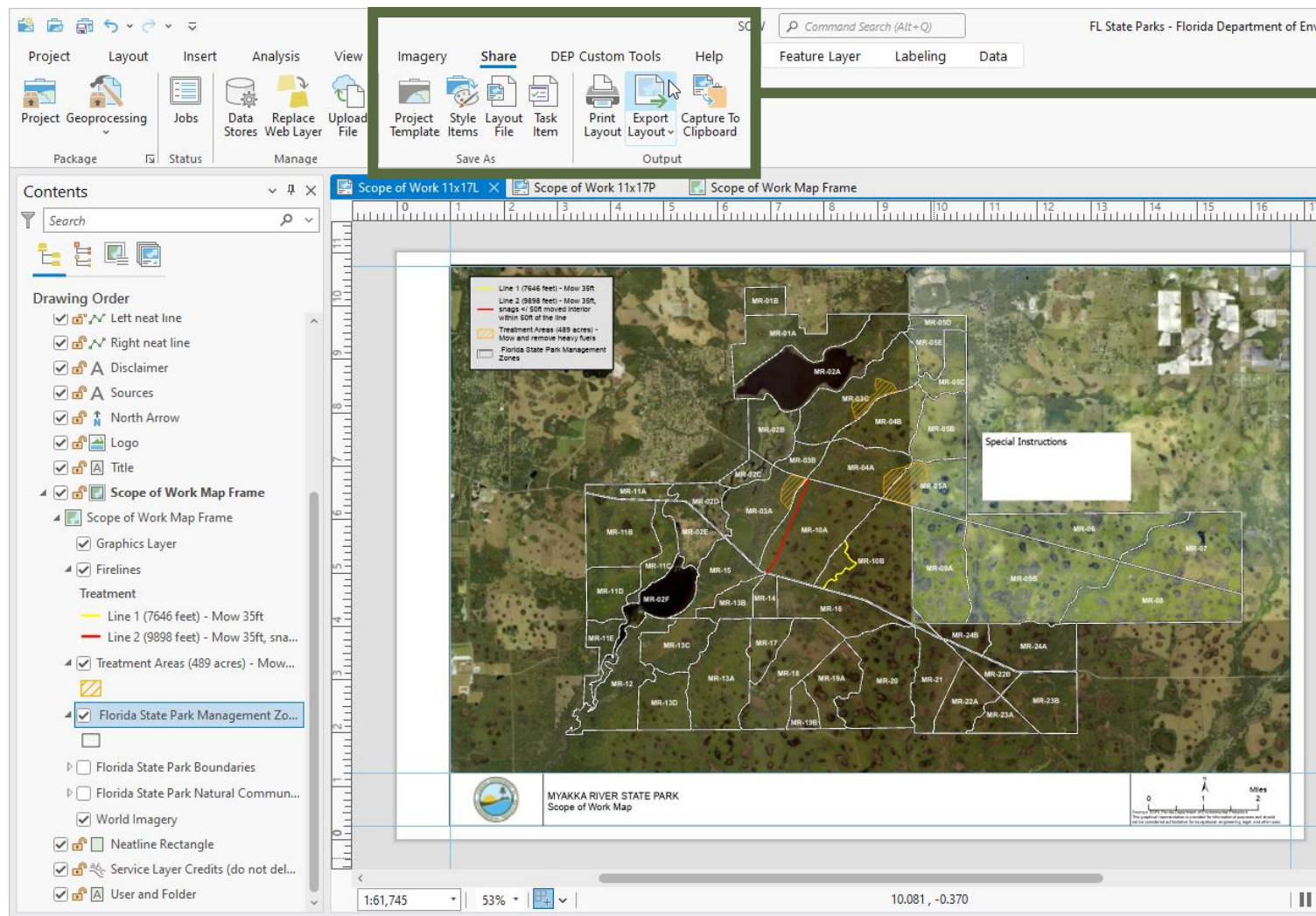


ADJUSTING THE TEMPLATE LAYOUT





EXPORTING A GEOPDF MAP



From the Layout view, go to the Share tab and Export Layout.

Most of the default settings will be good enough as is.



EXPORTING A GEOPDF MAP

Export Layout Scope of Work 11x17L

Properties Security Accessibility

▼ File

File Type
PDF

Name
C:\Users\Richards_JeL\Desktop\Scope of Work 11x17L.pdf

☐ Clip to graphics extent
☐ Remove layout background

▼ Compression

☐ Output as image
Image compression Adaptive
Quality
Low ————— Max
☐ Compress vector graphics

▼ Resolution

Vector resolution
300 DPI

Export Layout

Computer This PC Desktop

Organize New Item

Project
Folders
Computer
Quick access
This PC
Richards, Jessica L
Libraries
Network
Favorites

Name
This container is empty.

Name Scope of Work 11x17L.pdf PDF

OK Cancel

For Name, click the folder to the right to navigate to where you want to save your map and add the name of the file in the bottom box.



EXPORTING A GEOPDF MAP

A screenshot of the Geopdf export settings dialog box. The "Raster resample" section shows a slider between "Best" and "Fast", with "Normal" selected and highlighted by a red box. Below this, the "Ratio 1:" is set to 3 and "DPI" is 100. The "Fonts" section has "Embed fonts" checked. The "Convert character marker symbols to polygon" checkbox is checked and highlighted by a red box. The "PDF Settings" section has "Export georeference information" checked and highlighted by a red box. The "Layers and attributes" dropdown is set to "PDF Layers Only". The "Simulate overprint" checkbox is unchecked. The "Color Management" section has "Embed color profile" unchecked. At the bottom are "Save Preset" and "Export" buttons.

Raster resample

Best Normal Fast

Ratio 1: 3 100 DPI

▼ Fonts

☒ Embed fonts

☒ Convert character marker symbols to polygon

▼ PDF Settings

☒ Export georeference information

Layers and attributes PDF Layers Only ▼

☐ Simulate overprint

▼ Color Management

☐ Embed color profile

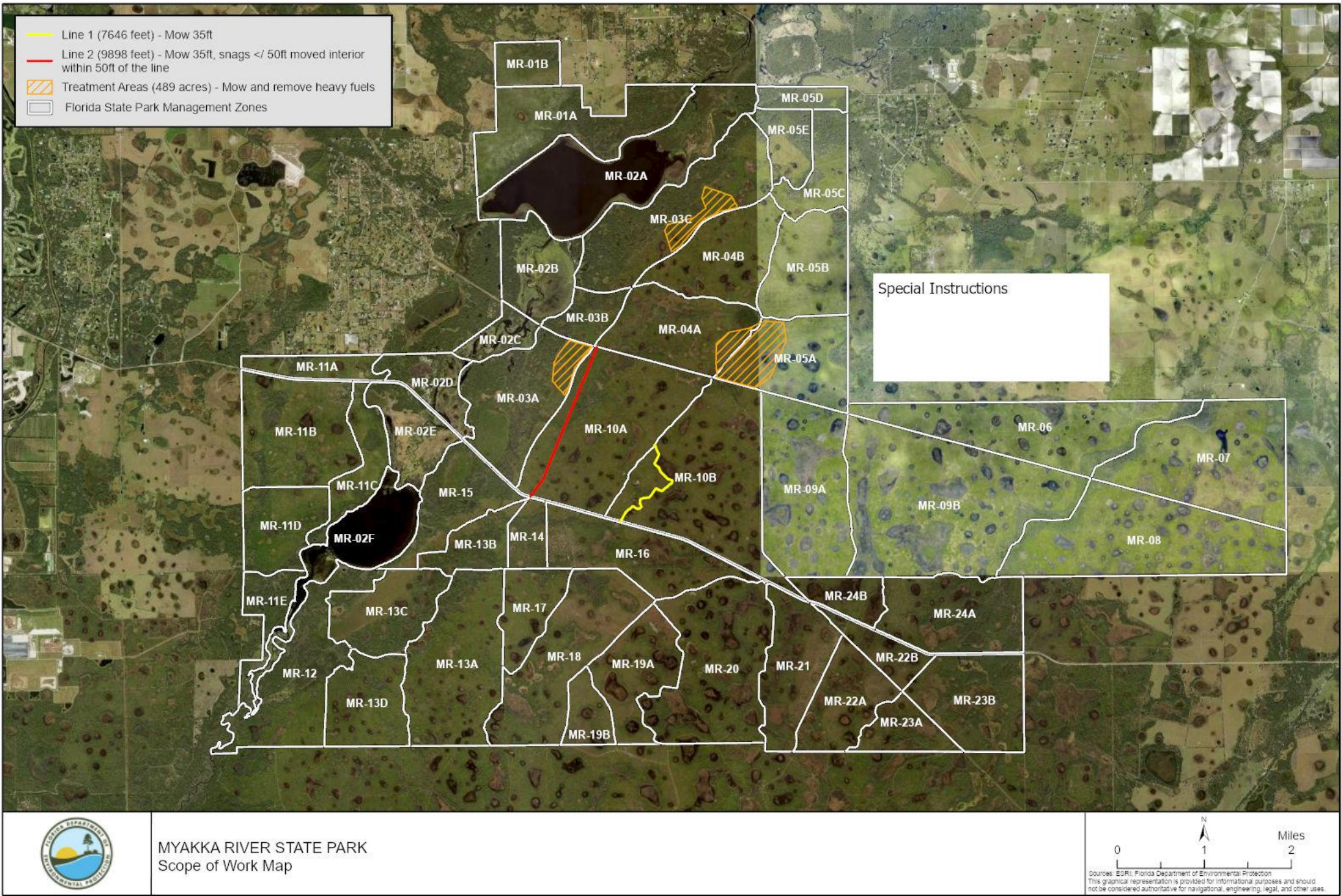
Save Preset Export

- Raster resample should be Normal
- Check the box to Convert character marker symbols to polygon to make sure things like the north arrow look correct on the pdf map.
- Check the box to Export georeference information to make the pdf a GeoPDF that can be used in Avenza.

SOW Map

Essentials:

- Title
- Subtitle
- Scale Bar
- Legend
- North Arrow
- Labels
- Acreage/Length





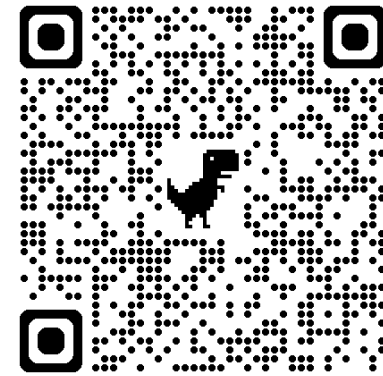
ADDITIONAL RESOURCES



- **Layout Templates for ArcPro:** <\\floridadep\data\DRP\GIS\STANDARDS\TEMPLATES>
- **Park Data:** <\\floridadep\data\DRP\GIS\PARKS>
- [Florida Department of Environmental Protection Open Data Portal](#)
- [Map Direct](#)
- [Map Direct Tutorials](#)
- [Map Direct Guide](#)
- [GeoPDFs for Any Park](#)
- [FDEP Avenza Guide](#)
- [ESRI ArcGIS Trainings](#)
- [DEP Help Guide](#)
- [OTIS GIS SharePoint Training Links](#)
- [OTIS GIS Support Site](#)



QR CODE FOR THE
PRESENTATION



QUESTIONS?



THANK YOU

GIS Team

Bureau of Natural and Cultural Resources
Florida Department of Environmental Protection

Brady Harrison
Amber Collins
Colby Spencer
Divyasree Gudugula
Jessica Richards