

Introduction to ArcGIS Online Workshop

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The TDL GIS Interest Group

The GIS Interest Group gathers both experts and newcomers to the field of GIS.



Sign up for our listserv to get recent updates: <https://utlists.utexas.edu/sympa/info/tdl-gis>

What is GIS?

Geographic = Related to Earth
Information = Data and their meaning
System = A collection of computer technology, procedures, and structures

A framework for gathering, managing, and analyzing data related to geographical information.

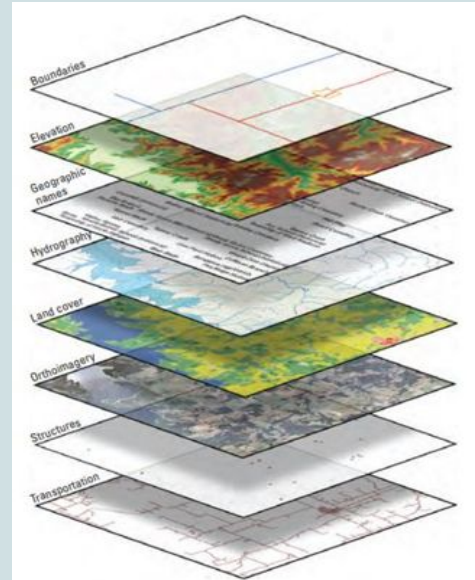


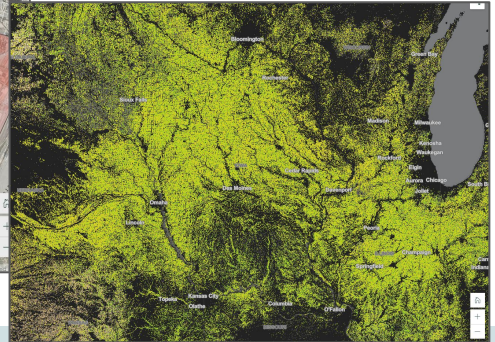
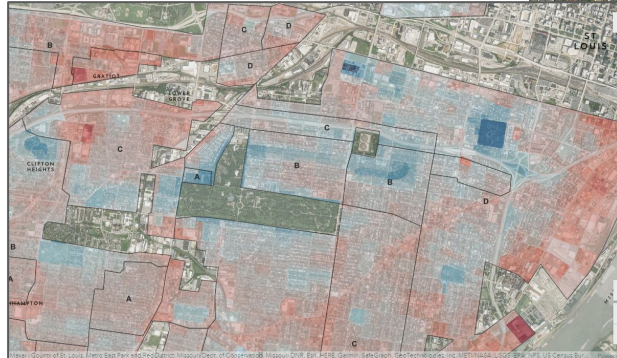
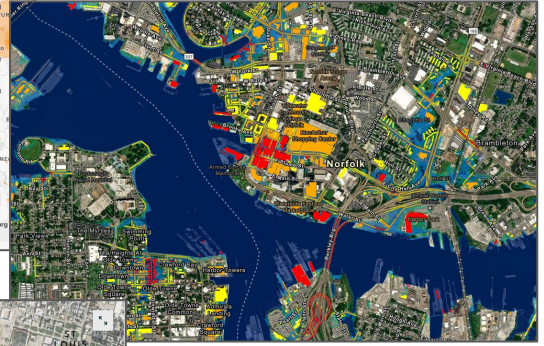
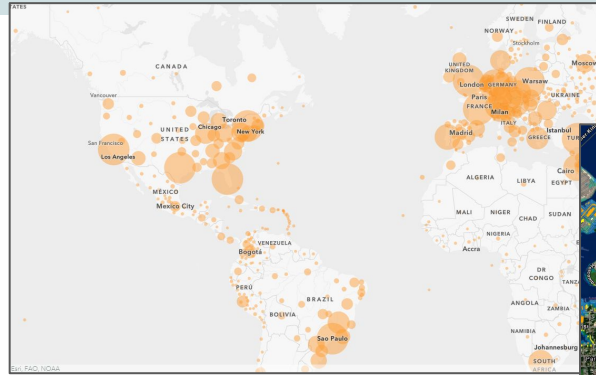
Figure 1. Eight base layers of The National Map.

Source: [USGS.gov](https://www.usgs.gov/)

Credit: Sexton, P.A. Public domain.

Applications & Uses of GIS

- Map spatial locations of features to identify relationships
- Use forecasting to identify trends and assess risk
- Perform analysis to identify and understand problems and solutions



Components of GIS

A GIS is comprised of five components:



Hardware



Software



Data



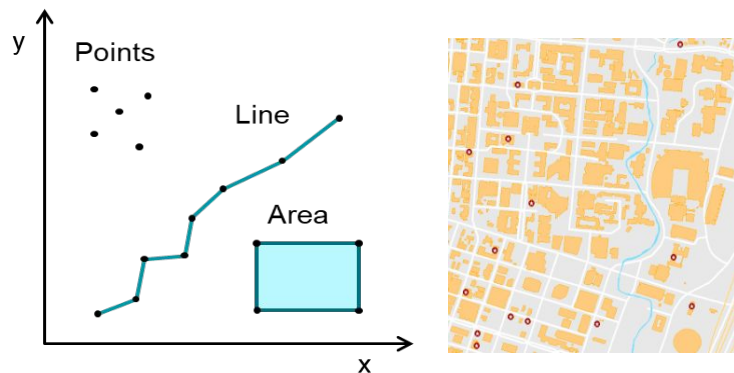
People



Workflows

Geospatial Data

Vector Data

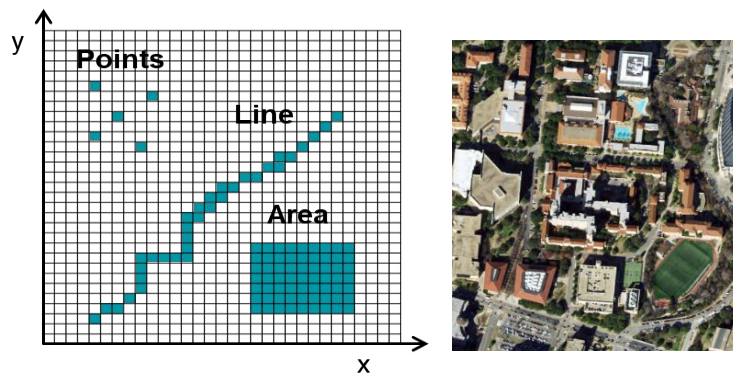


Best for: Discrete objects

Location Modeling: Coordinate pairs define points, lines, & polygons

Attribute Storage: Multiple attributes

Raster Data

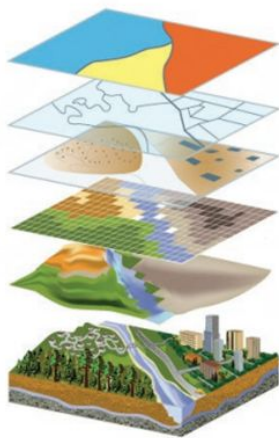


Best for: Continuous data

Location Modeling: Georeferenced grid cells

Attribute Storage: Single attribute

Layers & GIS Data Types

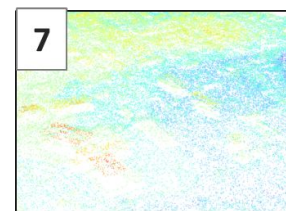
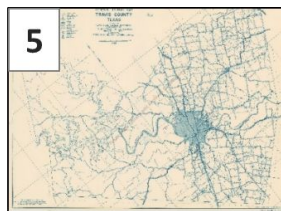
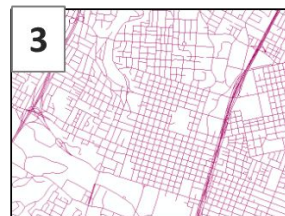
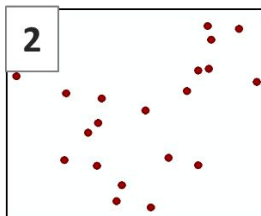


**Vector
Data**

**Raster
Data**

1

1	2	3	4	5	6	7
Season	Name	SQL_Shape	Latitude	Longitude	Wind_M	Pres_mib
2015	PATRICKA	3002/2015-6-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-12-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-18-00	33.3	-84.2	30	3000
2015	PATRICKA	3002/2015-6-00	33.3	-84.2	30	3000
2015	PATRICKA	3002/2015-6-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-12-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-18-00	33.3	-84.2	30	3000
2015	PATRICKA	3002/2015-6-00	33.3	-84.2	30	3000
2015	PATRICKA	3002/2015-6-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-12-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-18-00	33.3	-84.2	30	3000
2015	PATRICKA	3002/2015-6-00	33.3	-84.2	30	3000
2015	PATRICKA	3002/2015-6-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-12-00	33.3	-84.2	30	3000
2015	PATRICKA	3020/2015-18-00	33.3	-84.2	30	3000



1) Spreadsheet with coordinates/addresses 2) Points 3) Lines 4) Polygons

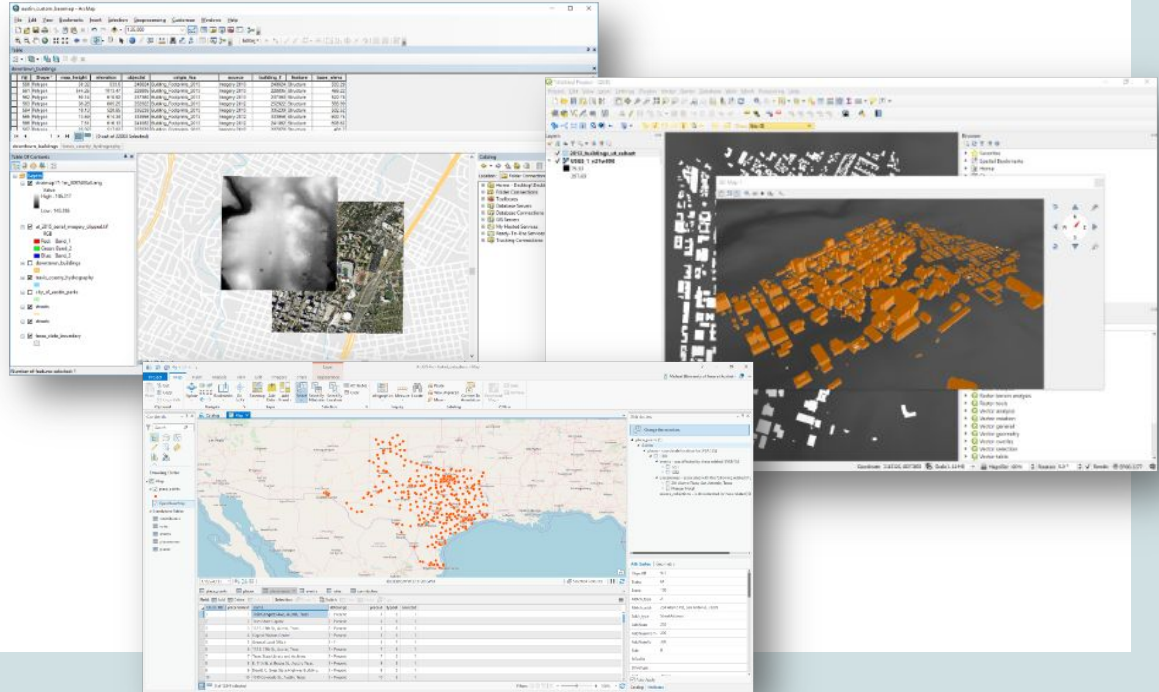
5) Scanned map images 6) Aerial imagery 7) Lidar

Source: [Esri.com](https://www.esri.com)

GIS Software & Applications

GIS software is designed to be used for all aspects of geospatial data management:

- Storage
- Conversion
- Processing
- Analysis
- Visualization
- Dissemination



GIS Software & Applications



QGIS

- Free, open source
- Extensible with plugins
- Windows, MacOS, & Linux
- Widely used internationally with growing popularity in the U.S.



ArcGIS Pro

- Developed by Esri, expensive to purchase
- Desktop software, Windows only
- Widely used by businesses & local governments
- Integrates with ArcGIS Online



ArcGIS Online

- Developed by Esri
- Cloud-based WebGIS platform
- Facilitates collaboration and sharing of mapping projects

What is ArcGIS Online?

→ ArcGIS Online is the leading cloud GIS platform

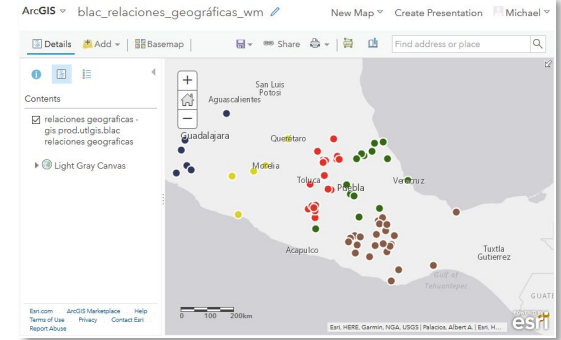
→ Accessed via a web interface at <https://arcgis.com>

→ Excellent integration with Esri's ArcGIS Pro, QGIS can be used to prepare data

◆ No need to install software to use ArcGIS Online though

→ Used for:

- ◆ Storing geospatial data in the cloud
- ◆ Publishing geospatial data services
- ◆ Creating/hosting interactive web maps that are easy to customize and share
- ◆ Developing StoryMaps to tell detailed geospatial stories using a variety of media

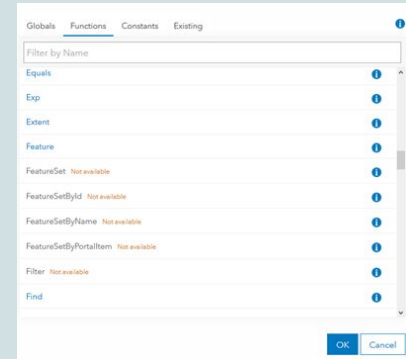
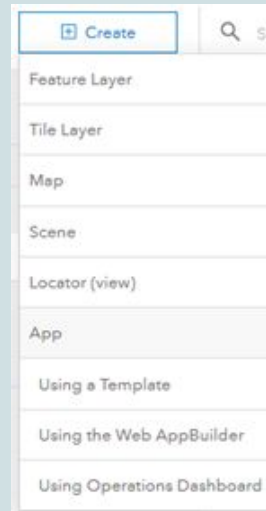
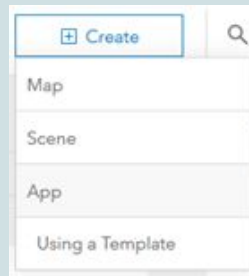
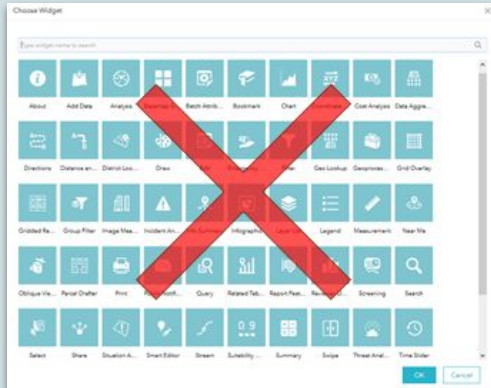


Why is ArcGIS Online so popular?

- Easy to manage/share data and web maps
- Tight integration with GIS software
- No need to manage physical servers
- Reduced risk of data loss
- Easy to scale

ArcGIS Online Account Types

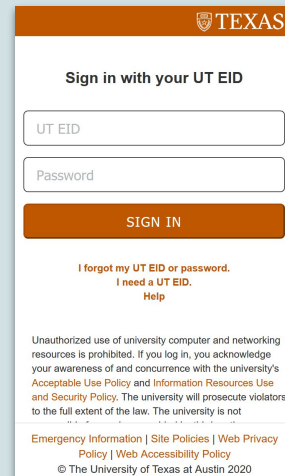
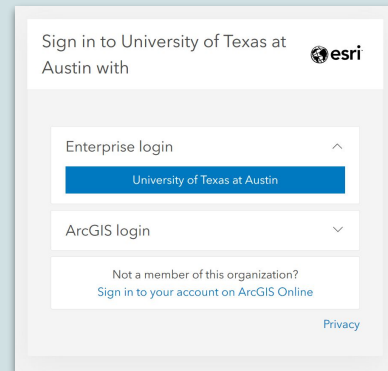
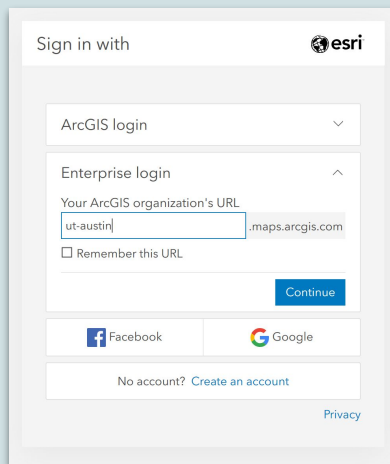
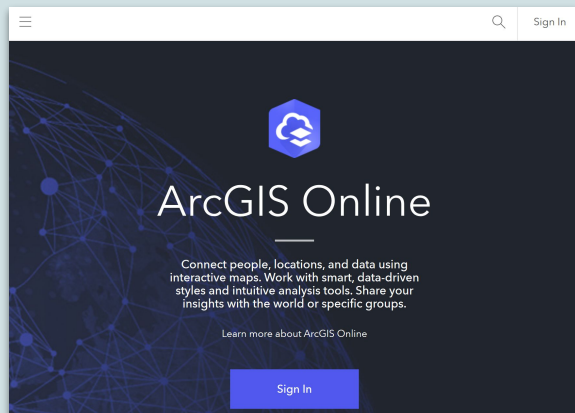
- Anyone can create a free, public ArcGIS Online account but these accounts have limitations (see below)
- Affiliates of institutions with Esri site licenses can create ArcGIS Online accounts linked to their university
 - ◆ These accounts provide extra functionality and credits
 - ◆ Account access is typically lost when leaving an organization



You do not have access to this resource: <https://www.arcgis.com/sharing/rest/content/items/4663432>.

Creating & Signing in to an Institutional AGOL Account with SSO

<https://arcgis.com>



→ If your institution has set up single sign on (SSO) integration for ArcGIS Online, you will be able to sign in to your account using your institutional credentials

Limitations of Institution Linked ArcGIS Online Account

- Accounts assigned a limited number of service credits by default
- Once your institutional affiliation ends, your account will be deactivated and eventually deleted
- Make sure you download or transfer all content you want to keep prior to your affiliation ending
- ArcGIS Online Assistant (<https://ago-assistant.esri.com/>) can be used to transfer certain content from your university linked account to a new free public account
- If you have completed work that needs to be preserved within your organization, contact your administrator to ask about migrating your content to another account

Navigating the User Interface

- **The top navigation bar (shown below) is the key to navigating ArcGIS Online successfully**
 - You may use some buttons only rarely (like Gallery)
 - Other buttons (like Content) will be utilized frequently by nearly all users
 - Explore all of these buttons to get acquainted with the pages they direct to

Home Gallery Map Scene Notebook Groups Content Organization



Michael Shensky
mshensky_example_user

ArcGIS Online Credits

- **ArcGIS Online organization credits**
 - Spent by using AGOL for storage, processing, and proprietary data access
- **User account credits**
 - May be limited by default
 - You may not be able to see your remaining credits
 - Additional credits can be requested

Capability	Example of where used	Credits used
Feature storage, excluding feature attachments, feature collections, and features associated with location tracking	Store a hosted feature layer	2.4 credits per 10 MB stored per month, calculated hourly 📌 Note: Feature layer settings, such as Enable Sync and Keep track of created and updated features , can increase storage size over time.
Imagery storage	Geocoding	Match addresses when publishing spreadsheets (such as CSV or Excel files) as hosted feature layers using ArcGIS World Geocoding Service or a view of this locator 40 credits per 1,000 geocodes
	Service Areas	Analysis tools such as Create Drive-Time Areas 0.5 credits per drive time
	Closest Facility Routes	Analysis tools such as Find Nearest 0.5 credits per closest facilities route
	Multi-Vehicle Routes	Analysis tools such as Plan Routes 1 credit per vehicle route
	ArcGIS GeoEnrichment Service	Analysis tools such as Enrich Layer 10 credits per 1,000 attributes (data variables multiplied by total feature records)
	Simple Routes	Analysis tools such as Directions and Connect Origins to Destinations 0.005 credits per simple route
	Optimized Routes	Directions with Optimize order 0.5 credits per optimized route
	Location-Allocation	Analysis tools such as Choose Best Facilities 0.1 credit per allocated demand point
	Origin Destination Cost Matrix	Generate Origin Destination Cost Matrix in ArcGIS Pro and ArcMap 0.0005 credits per input origin and destination pair
	Spatial Analysis	Analysis tools such as Aggregate Points and Join Features 📌 Note: Join Features does not consume credits if you choose the option to create results as a hosted feature layer view. 1 credit per 1,000 features (queried for Find Existing Locations and Derive New Locations)
Imagery Analysis	Perform imagery analysis using raster analysis tools or raster functions	Credit usage for imagery analysis depends on the number of pixels or features processed, which incorporates the number of bands in multiband imagery and the number of slices in multidimensional data. Custom raster function templates that chain multiple complex functions together may increase credit usage.

ArcGIS Online Roles & Privileges

- **Institutional ArcGIS Online accounts are assigned to a particular role**
- **Each role has defined privileges which control access to certain types of AGOL functionality like:**
 - Notebooks
 - Geocoding
 - Creating “shared update” groups
- **You may have to request that your AGOL administrator grant you additional privileges that you need**











Member roles

Manage roles

Create, edit, and manage member roles in your organization. You can create a role based on an existing role or role template by enabling or disabling associated privileges as needed. [Learn more about roles](#)

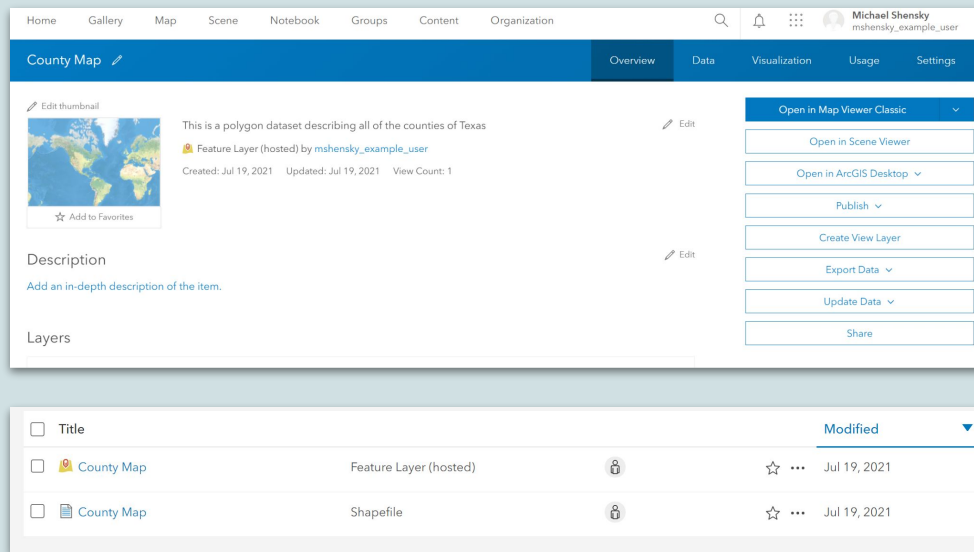
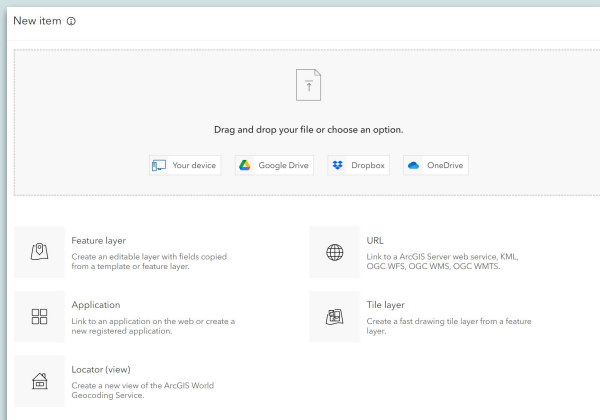
Create role

Q Search roles

Administrator	  7	Default	
Data Editor	  0	Default	
Editor	  0	Custom	...
Facilitator	  0	Default	
Geocoder	  45	Custom	...

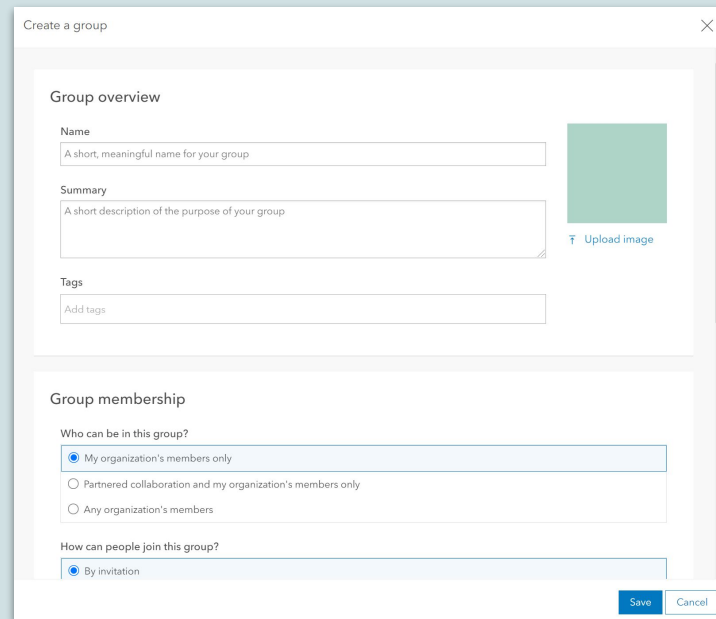
Creating and Uploading Content

- **Maps, web apps, StoryMaps, and datasets can be created from scratch in ArcGIS Online**
- **Datasets are most often created in ArcGIS Online by uploading existing data you have on your file system**



Sharing Content with Groups

- Groups can be very useful for controlled sharing of data with others in your organization
- Groups are easy to create but settings can be a little complicated so learning how to read ArcGIS Online documentation can be important for choosing the correct group configuration for your situation



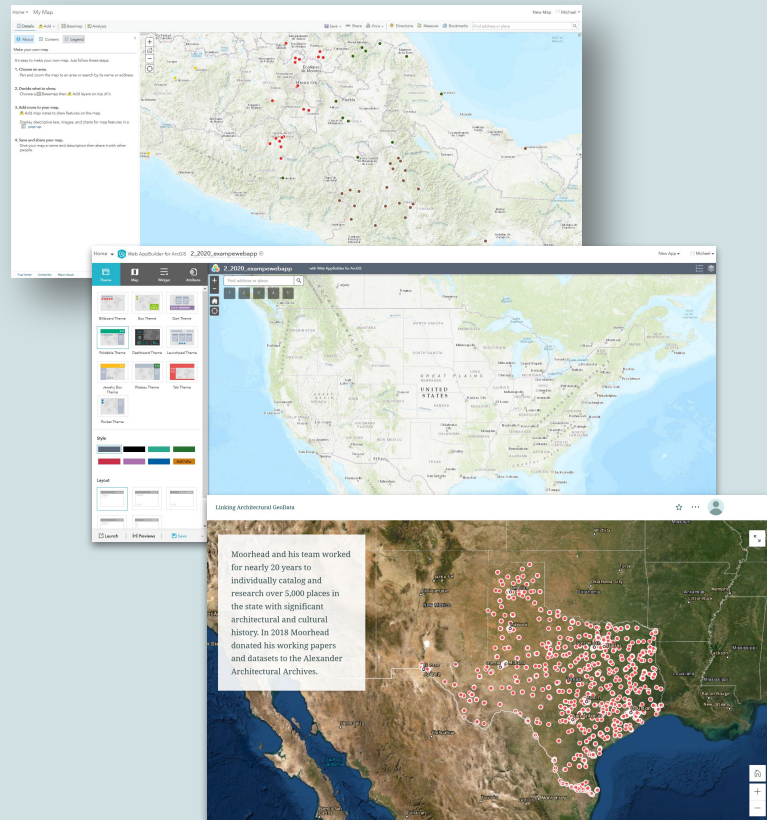
The screenshot shows the 'Create a group' dialog box with the following sections:

- Group overview**
 - Name:** A text input field with placeholder text 'A short, meaningful name for your group'.
 - Summary:** A text input field with placeholder text 'A short description of the purpose of your group'.
 - Tags:** A text input field with placeholder text 'Add tags'.
 - Image:** A green square placeholder image with a link to 'Upload image'.
- Group membership**
 - Who can be in this group?** A dropdown menu with three options:
 - ☒ My organization's members only
 - ☐ Partnered collaboration and my organization's members only
 - ☐ Any organization's members
 - How can people join this group?** A dropdown menu with one visible option:
 - ☒ By invitation

At the bottom right, there are 'Save' and 'Cancel' buttons.

ArcGIS Online: Map Types

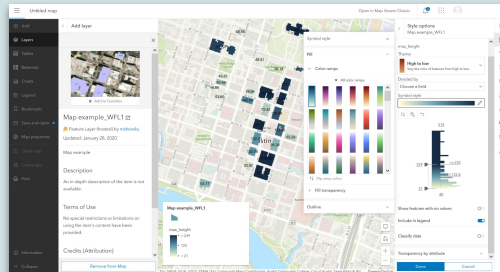
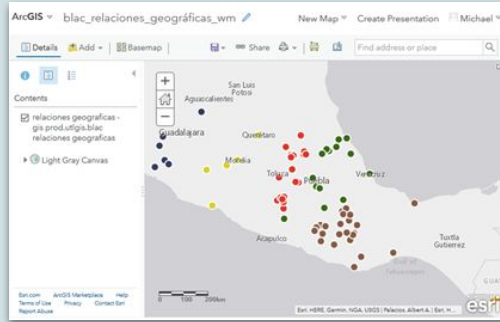
- Separate site and interface but all controlled by a single ArcGIS Online account
- **ArcGIS Online Web Maps** for very simple interactive web maps with multiple layers and information pop ups
- **ArcGIS Online Web Mapping Applications** for interactive maps with complex functionality (integrated widgets)
- **ArcGIS StoryMaps** for in-depth multimedia driven stories about a particular topic that feature one or more interactive maps along with text, photos, videos, infographics, etc.



AGOL Hosted Layers

- Hosted layers are created by **publishing** data to AGOL
- Publishing data as a layer is different than just uploading a copy of the data to AGOL
- Hosted layers can be added to web maps and shared with others via groups
- Hosted feature layers can be used to allow collaborative editing of a dataset
- Types of layers include...
 - ◆ Feature layers: for vector data with accessible attribute information
 - ◆ Scene layers: for 3D data
 - ◆ Tile: for tiled image and vector data that loads fast
 - ◆ Imagery: for raster data with accessible attribute information

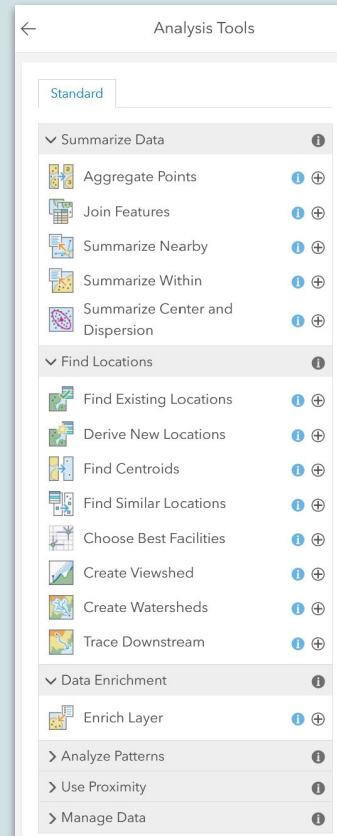
Web Maps



- A web map is a simple interactive map that is easy to create and work in
- Web maps allow you to add data to a map, customize the symbology, and carry out basic analysis
- Web maps can be used to share data or facilitate data editing
- Web maps can be turned into web apps or included in Story Maps
- Esri currently provides a choice between the older Map Viewer Classic and the new Map Viewer

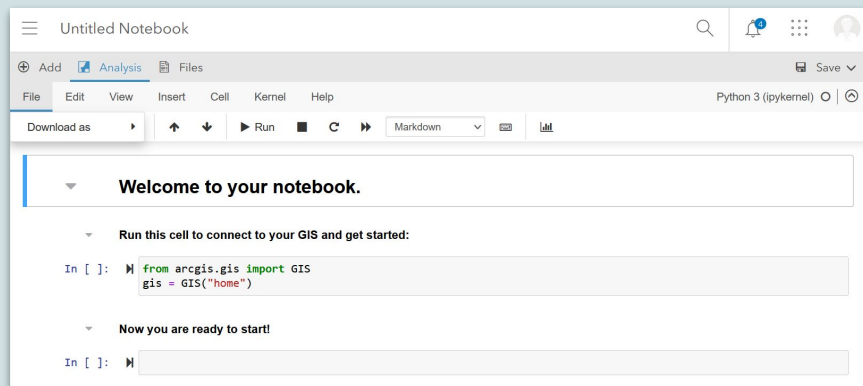
Analysis in ArcGIS Online

- ArcGIS Online allows for many geospatial data processing and analysis like:
 - Adding, deleting, and editing data
 - Joining tables
 - Data enrichment
 - Spatial interpolation
 - Buffering
- If you need more advanced tools, you will need to utilize ArcGIS Pro



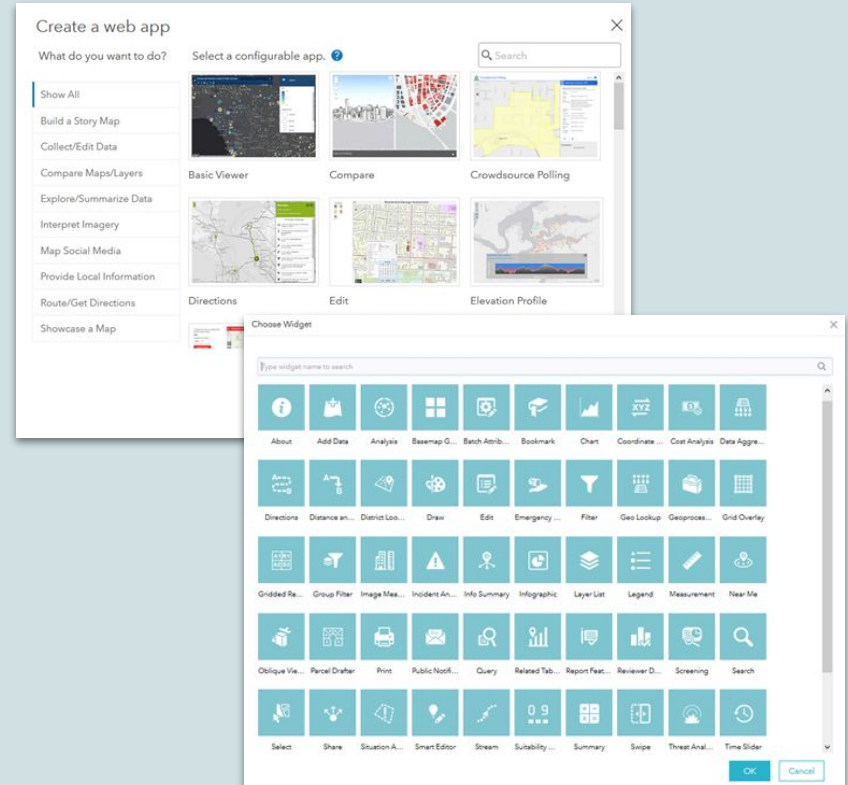
ArcGIS Online Notebooks

- Notebooks provide a Jupyter interface for working with Python code in AGOL
- Simple notebooks do not use credits, but more powerful ones do
- Notebooks functionality may be available to you by default, you may need to request it from your organization's AGOL administrator



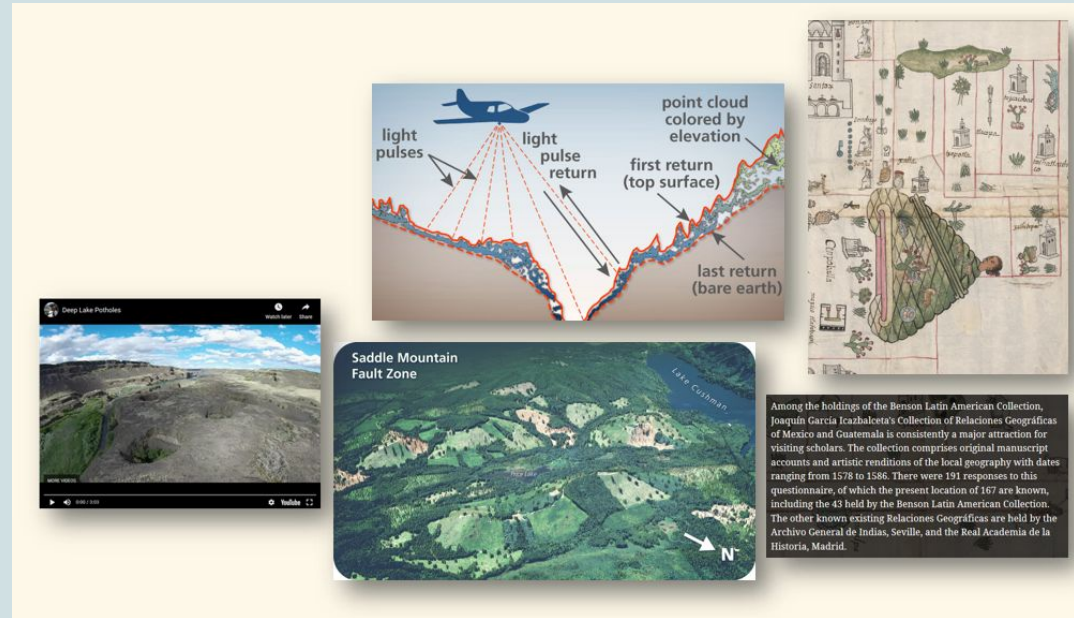
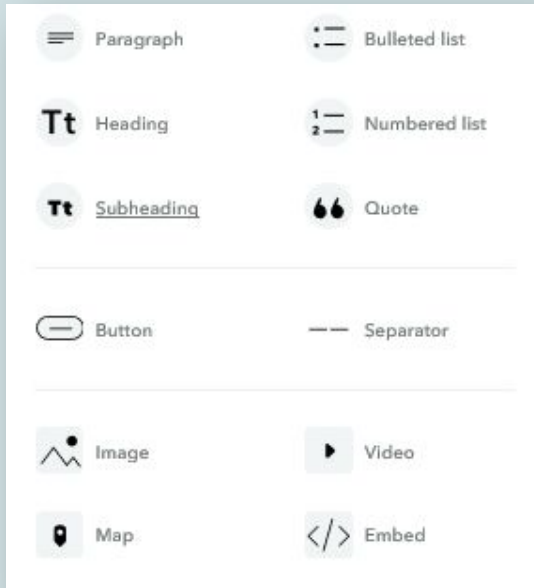
Web Apps

- Web maps can be turned into web apps which have expanded functionality and customization
- There are web app templates designed for common types of interactive maps
- You can customize web app theme colors, tool positioning, credit statement, and more
- There are a wide variety of widgets that you can add to your map to make it more useful



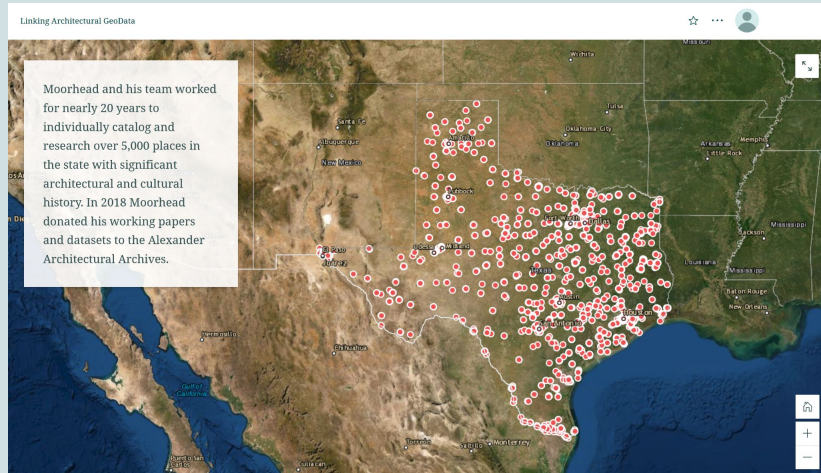
Story Maps

Story maps are a special type of web app that are designed to incorporate the following types of elements



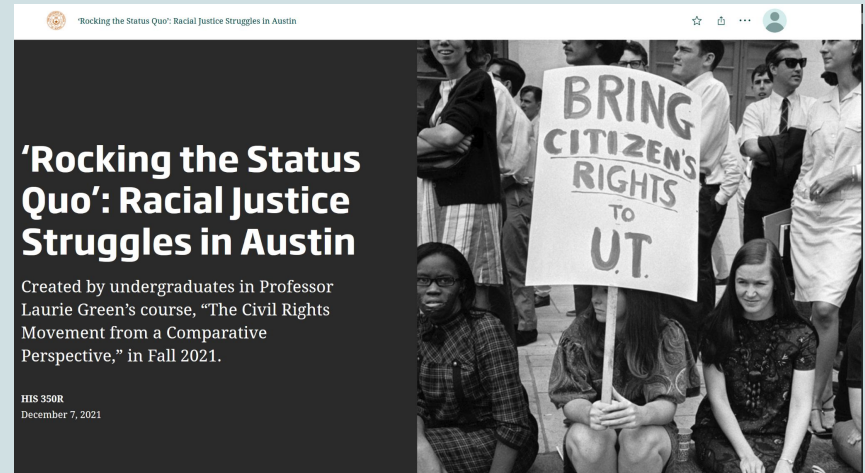
Story maps can actually contain multiple web maps along with other types of multiple media that are easy to structure in a scrolling web app to tell a particular “story”

Story Map Example



Linking Architectural GeoData

<https://storymaps.arcgis.com/stories/69f8676ec02949048d127d0279dcb1e>



Rocking the Status Quo: Racial Justice Struggles in Austin

<https://storymaps.arcgis.com/stories/ff1e660665584c6ba2d15916a93c165e>

Demo

Learning Objectives:

Learn how to do basic navigation of ArcGIS Online and StoryMaps

- Create a simple web map in AGOL

- Create a simple StoryMap

ArcGIS Online Demo

- Navigating-
- Search for/add layer
- Configure pop-ups
- Symbology
- Filter
- Simple analysis

StoryMaps Demo

- Start new story
- Add title
- Add narrative
- Add media
- Add Express map
- Design
 - Navigation/Credits
- Publish/Share

QUESTIONS?

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ArcGIS Online training resources

- <https://doc.arcgis.com/en/arcgis-online/get-started/get-started.htm>
- <https://www.linkedin.com/learning/search?keywords=arcgis+online>

TDL GIS Interest Group

- Next TDL GISIG meeting
 - June 24th at 2pm
- <https://www.tdl.org/members/groups/tdl-gis-interest-group/>