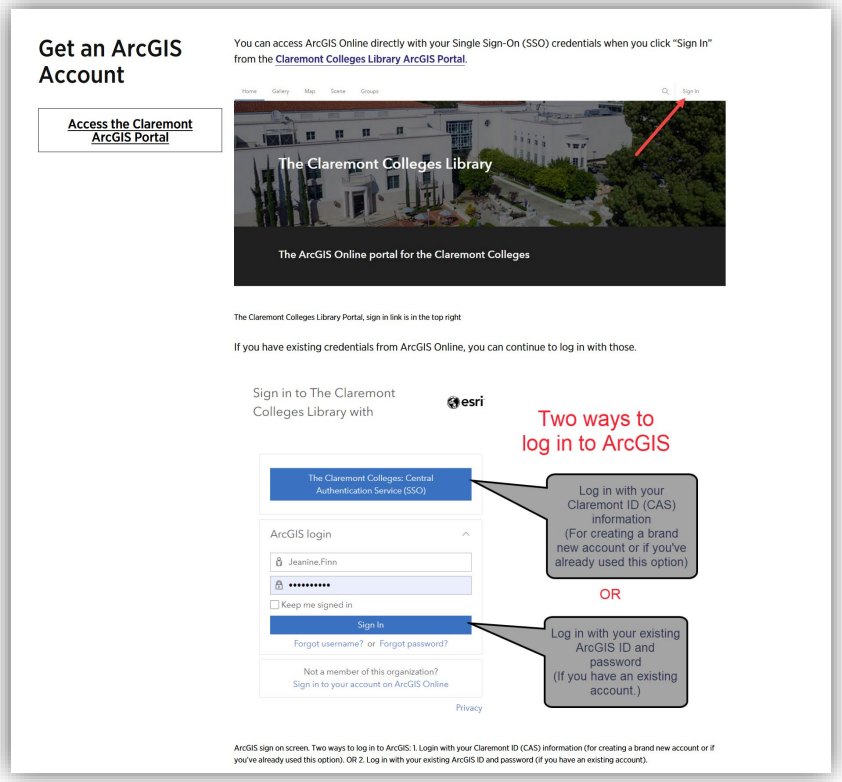
GIS 1:
a very basic introduction

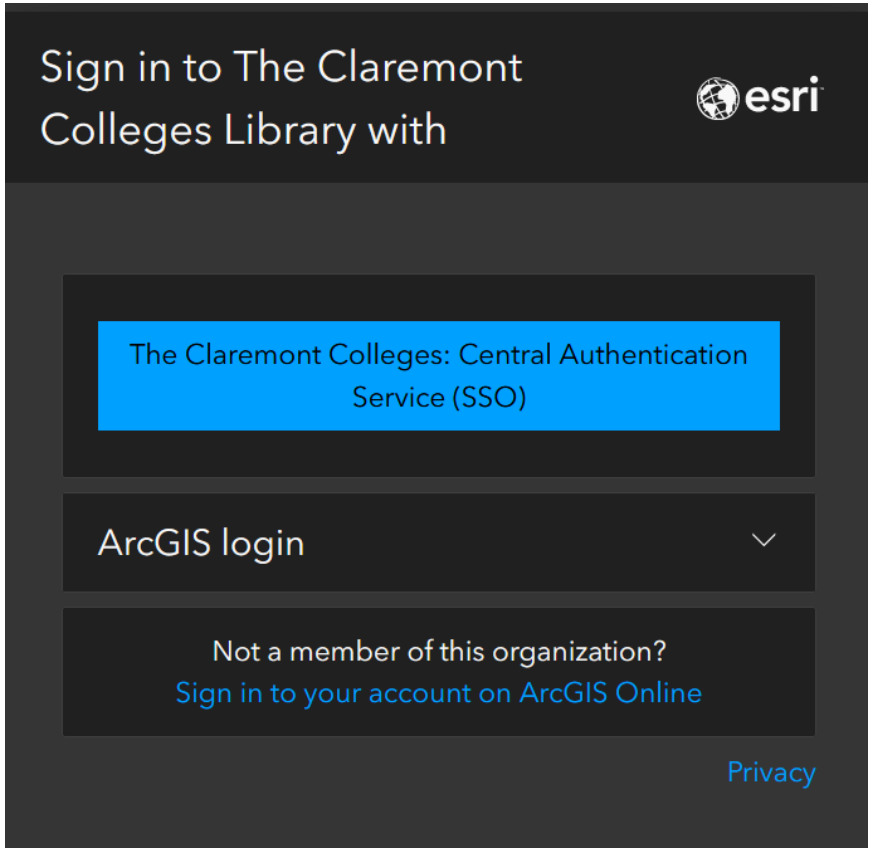
By Vanessa Arias Casillas, Ph.D

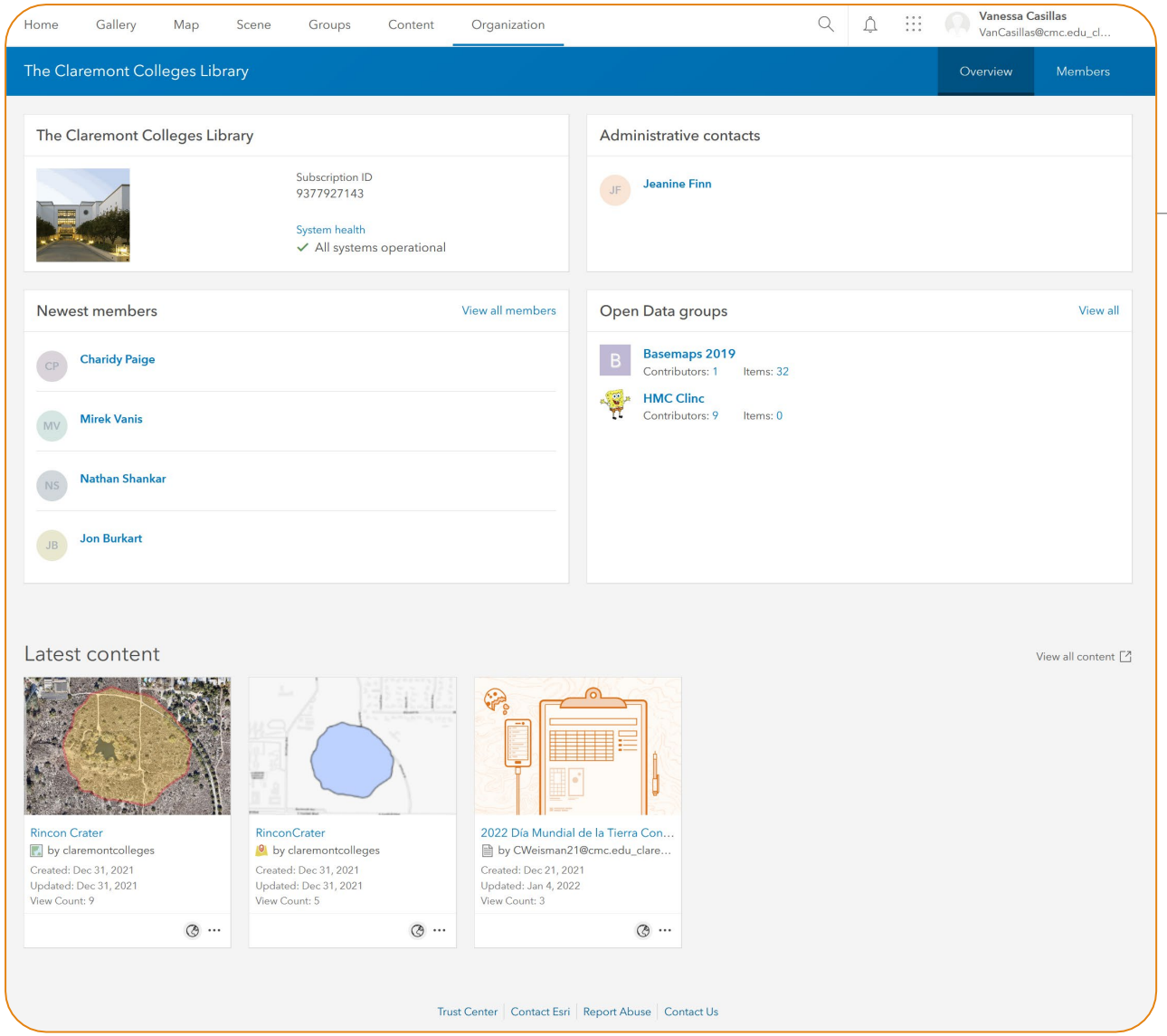
Agenda

- What is GIS?
- Classic ArcGIS online overview
- Base and Layers
- Analysis
- Edits
- Save and Send to New ArcGIS Online
- Print and Share
- Endnotes

CMC – ArcGIS Online

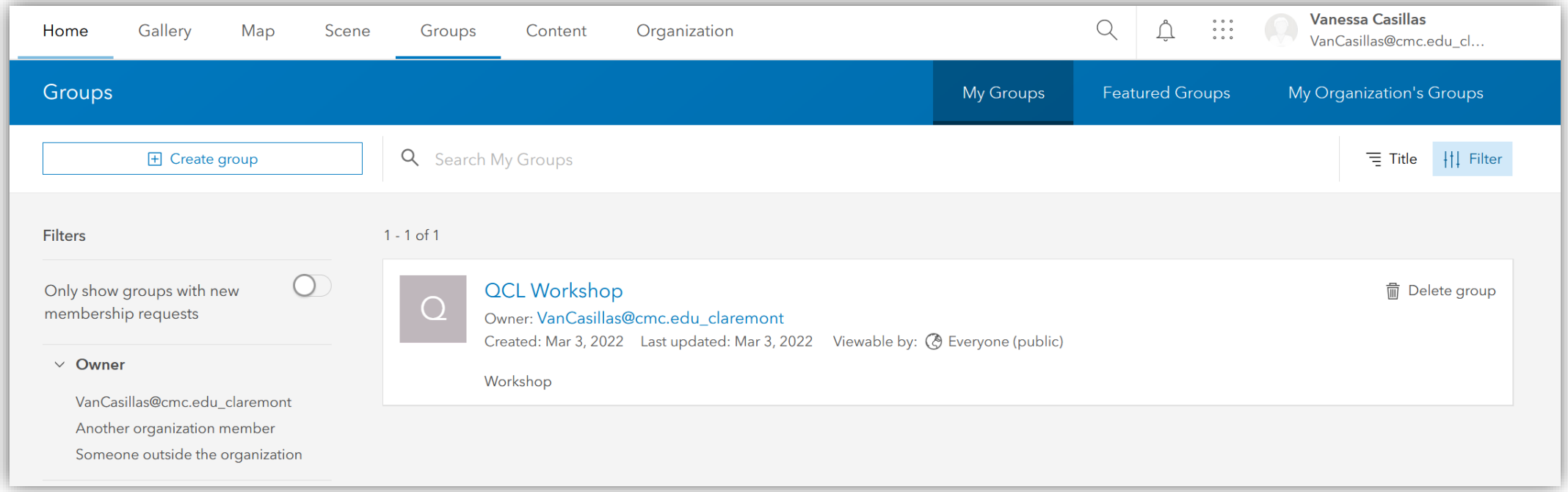


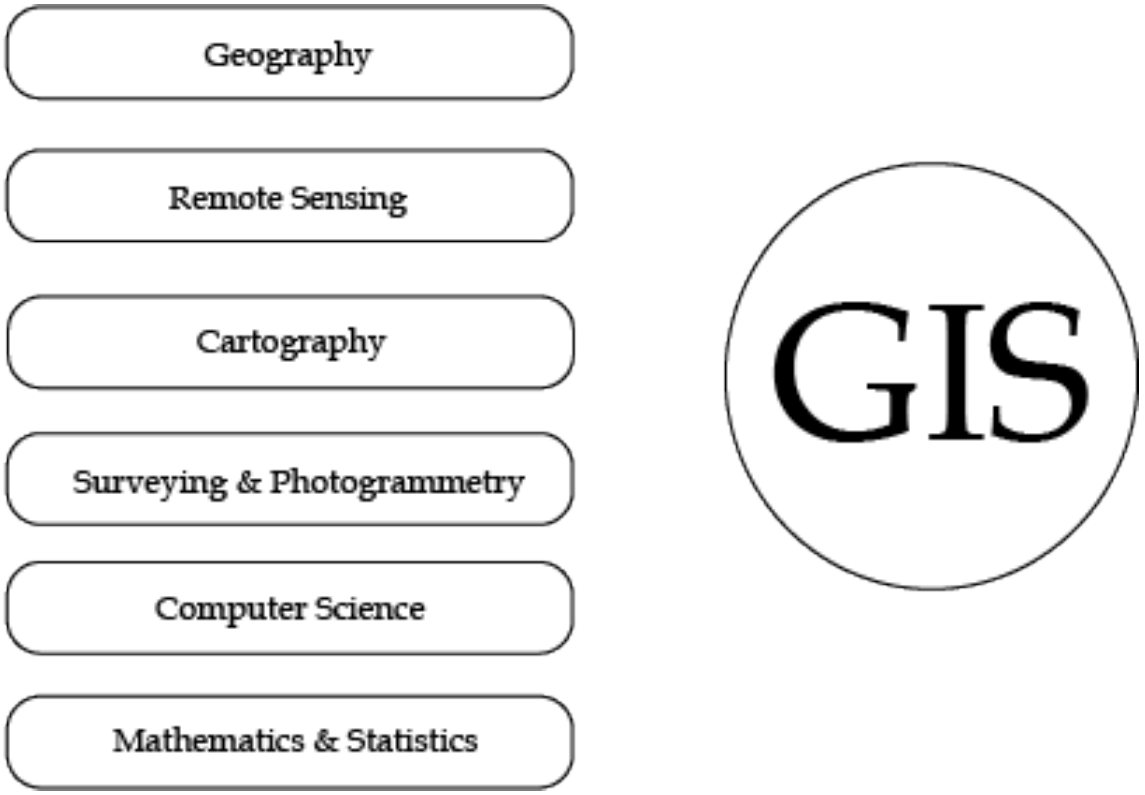



Home
Gallery
Map
Scene
Groups
Content
Organization
Vanessa Casillas
VanCasillas@cmc.edu_cl...
The Claremont Colleges Library
Overview
Members
The Claremont Colleges Library
Subscription ID
9377927143
System health
All systems operational
Administrative contacts
JF
Jeanine Finn
Newest members
View all members
CP
Charidy Paige
MV
Mirek Vanis
NS
Nathan Shankar
JB
Jon Burkart
Open Data groups
View all
B
Basemaps 2019
Contributors: 1
Items: 32
HMC Clinc
Contributors: 9
Items: 0
Latest content
View all content
Rincon Crater
by claremontcolleges
Created: Dec 31, 2021
Updated: Dec 31, 2021
View Count: 9
RinconCrater
by claremontcolleges
Created: Dec 31, 2021
Updated: Dec 31, 2021
View Count: 5
2022 Día Mundial de la Tierra Con...
by CWeisman21@cmc.edu_clare...
Created: Dec 21, 2021
Updated: Jan 4, 2022
View Count: 3
Trust Center
Contact Esri
Report Abuse
Contact Us

Home view

Groups – add yourself

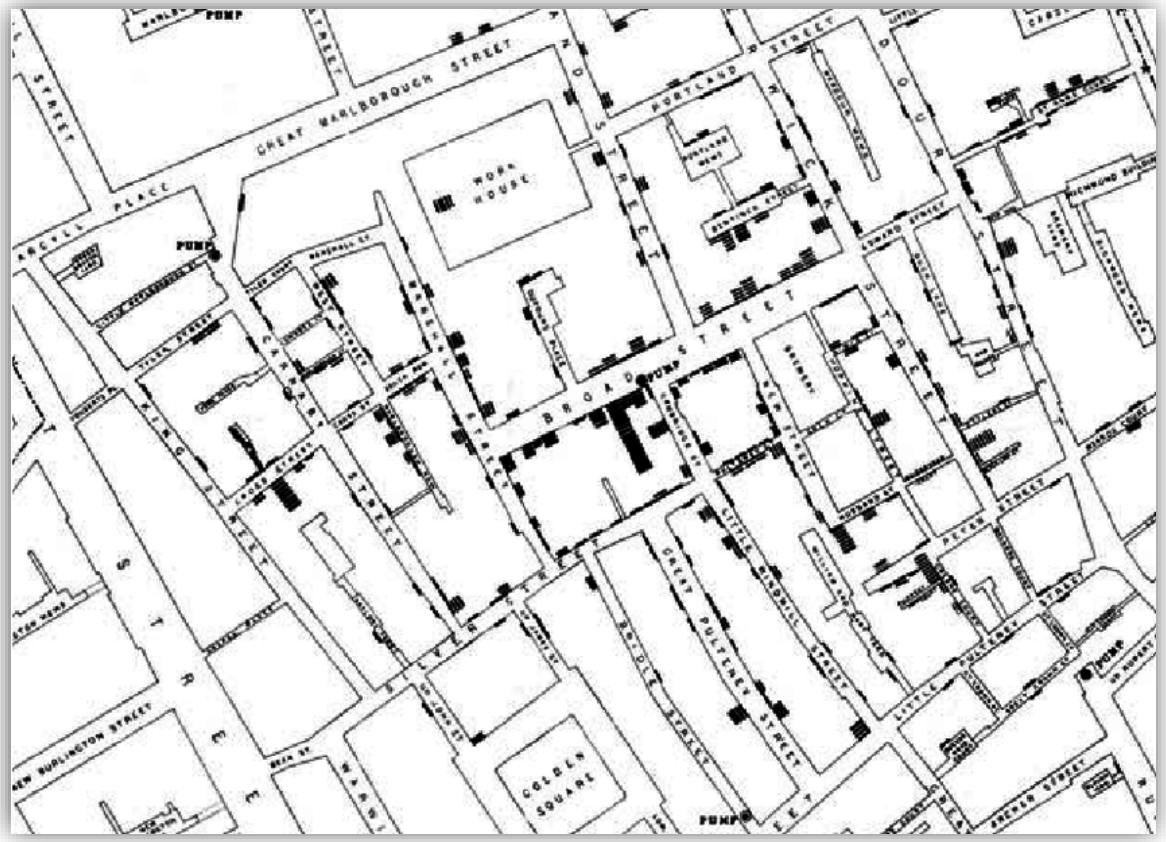




GIS? Quick Overview

GIS: Geographic Information Systems

- computer-based tools used to store, manage, visualize, analyze, and interpret geographic data
  - Five Components: hardware, software, Data, People, and Workflows
  - Two types of Information: attributes and location
  - GIS capability: Spatial analytics, field operations, mapping and visualization, Real-time GIS, 3D GIS, Imagery and remote sensing and data collection and management
  - Types of Files: CSV, Excel, and JSON
  - Presentation of Maps: Static (printed map, PDG and JPG) and Dynamic (web and apps)



Mentions

ESRI: Environmental Science Research Institute (The Science of Where), Redlands

ArcGIS Online, cloud-based

- Create, use, share geospatial content with organization, community and publicly
  - used the software-as-service (SaaS) model
  - Make maps, share maps, apps, collaborate, analyze data, and work with your data

1854 Cholera (kaa·lr·uh) Epidemic – London: Dr. John Snow

- Mapped cholera deaths
- Determined water pump source

Goal

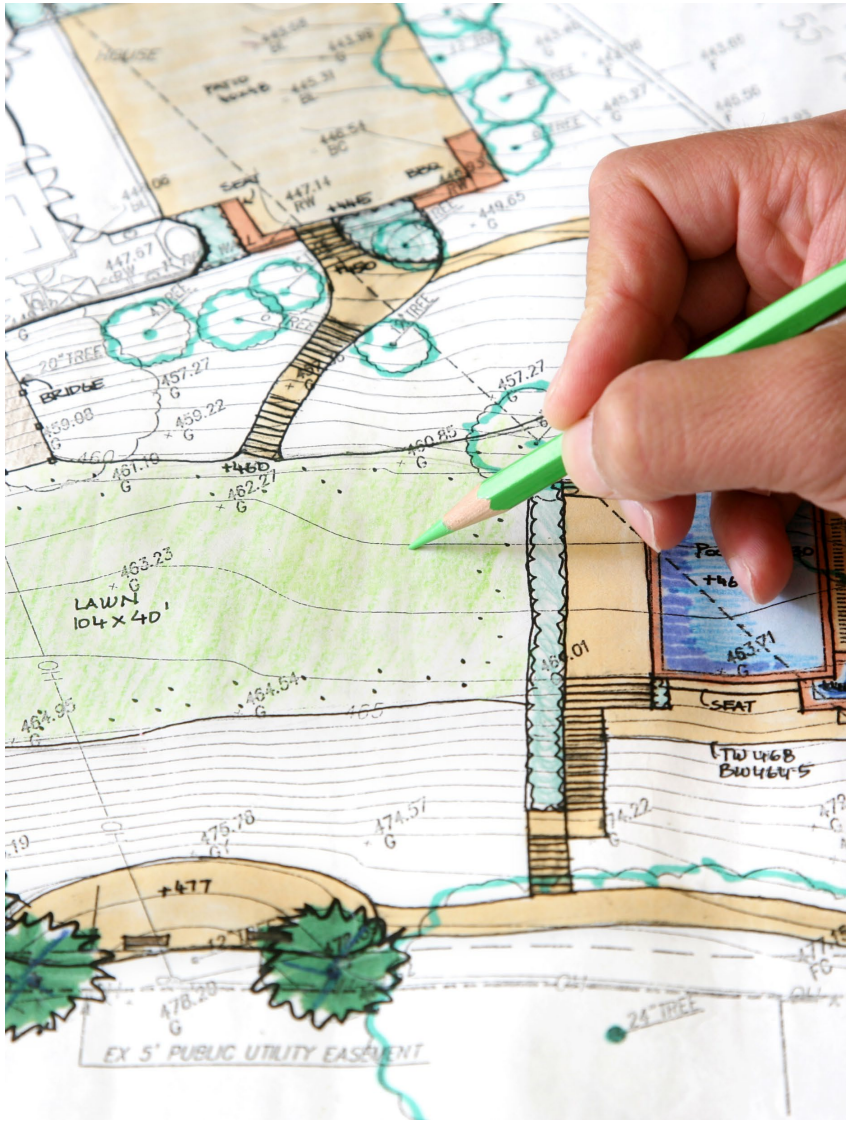
Navigate ArcGIS Online

Make a simple map

Run a simple analysis with the data on your map

Show your map your group or organization

Make a PDF print for presentations and reports



Planning a Map: a simple map

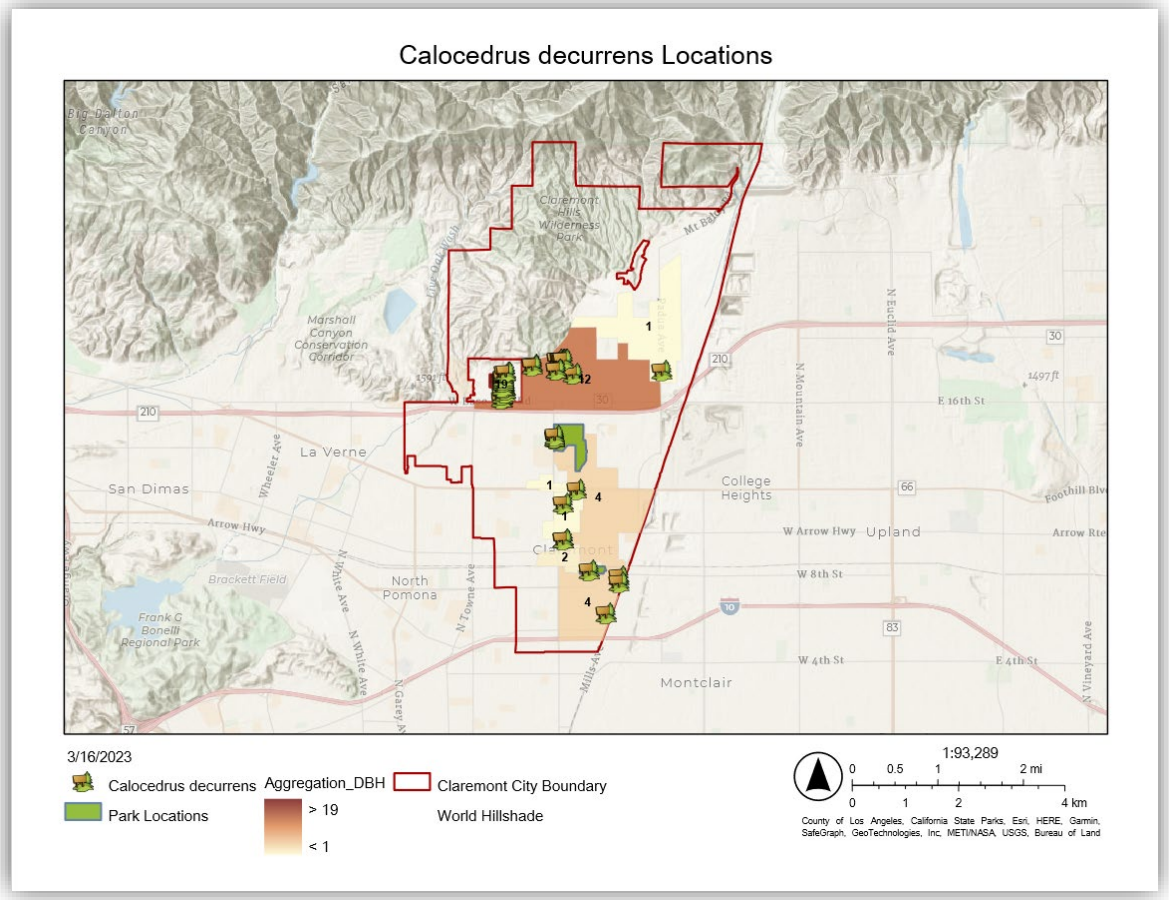
1. Problem – why are we making a map?
    a. You got called that a couple trees might fall over due to the winds. You know that what type of tree it is yet not the exact location.
    b. You decide that while checking on the trees you should update your data for the Diameter at breast height (DBH): is measured on standing trees outside of the bark. Diameter can be calculated by measuring the circumference of the tree, then divide circumference by π (3.1416)

2. Data – what layers do we need?
    a. Claremont Trees
    b. Neighborhood
    c. Parks
    d. Claremont Boundary

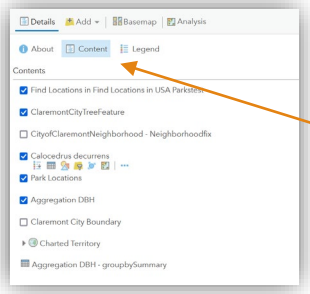
3. Analysis – what layers do we need to adjust or make?
    a. Mean of the DBH and count of Trees in Neighborhoods

4. Edits – who is looking at the map?
    a. Fieldworks
    b. Public

5. Results – does it tell a visual story?
    a. PDF or Share


Calocedrus decurrens Locations
Big Dalton Canyon
Claremont Hills Wilderness Park
Marshall Canyon Conservation Corridor
La Verne
San Dimas
College Heights
Upland
North Pomona
Montclair
Brackett Field
Frank G Bonelli Regional Park
3/16/2023
Calocedrus decurrens
Park Locations
Aggregation_DBH
> 19
< 1
Claremont City Boundary
World Hillshade
1:93,289
0 0.5 1 2 mi
0 1 2 4 km
County of Los Angeles, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land

End Result



Details > Content is where you will find layer on your map and legend

Add is where you will find new layers to add to your map

Base maps are kept separate from all the feature layers

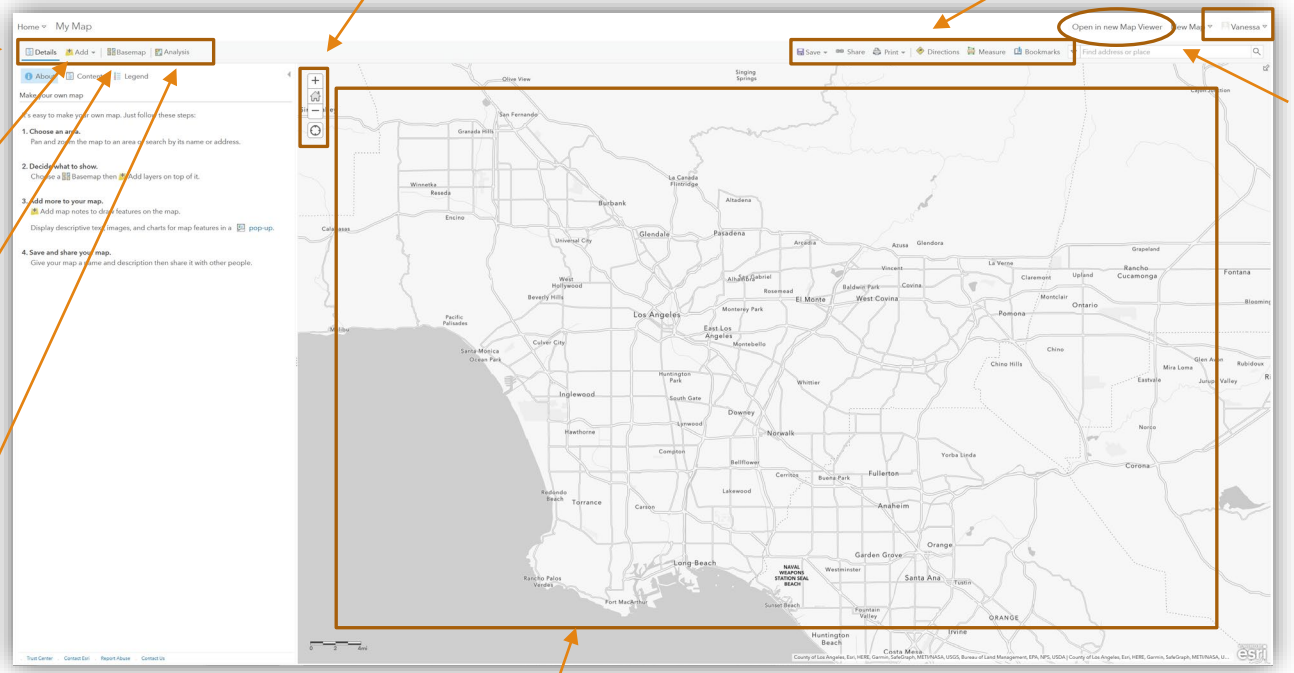
Analysis is where you will find all your tools for analysis

Zoom and Home buttons

Save, Sharing and Bookmarks can be found here*

Username and account settings

You can which back and forth between classic and map viewer

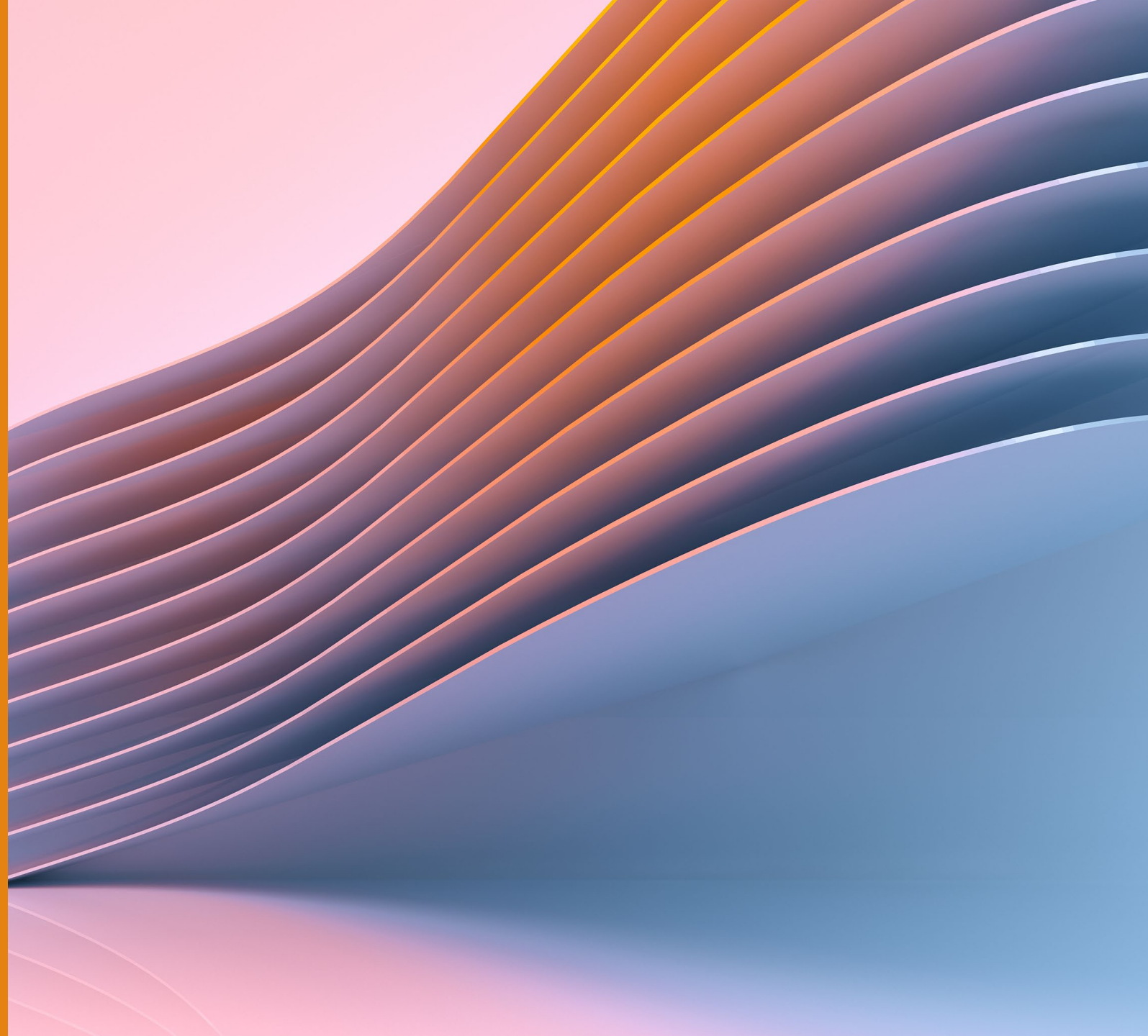


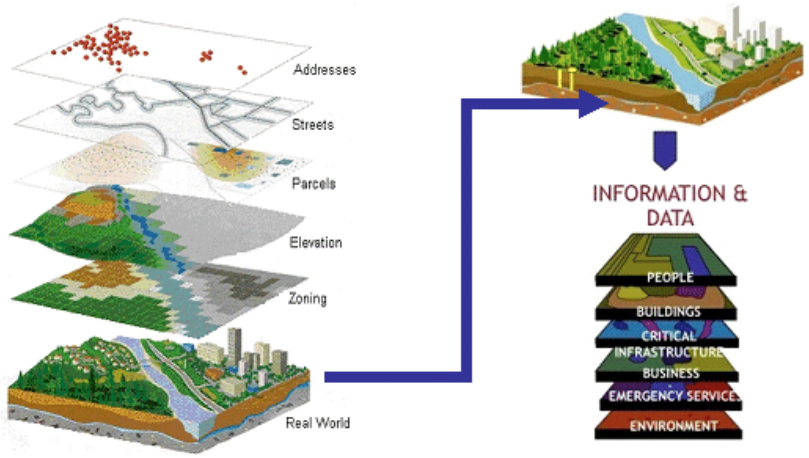
Interactive map, pop ups for tables

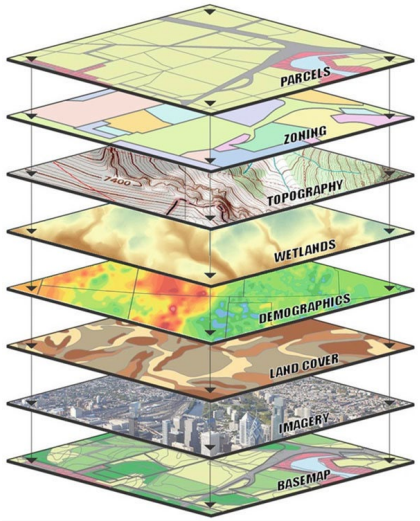
*print in map viewer not classic

Classic ArcGIS

Data Layers





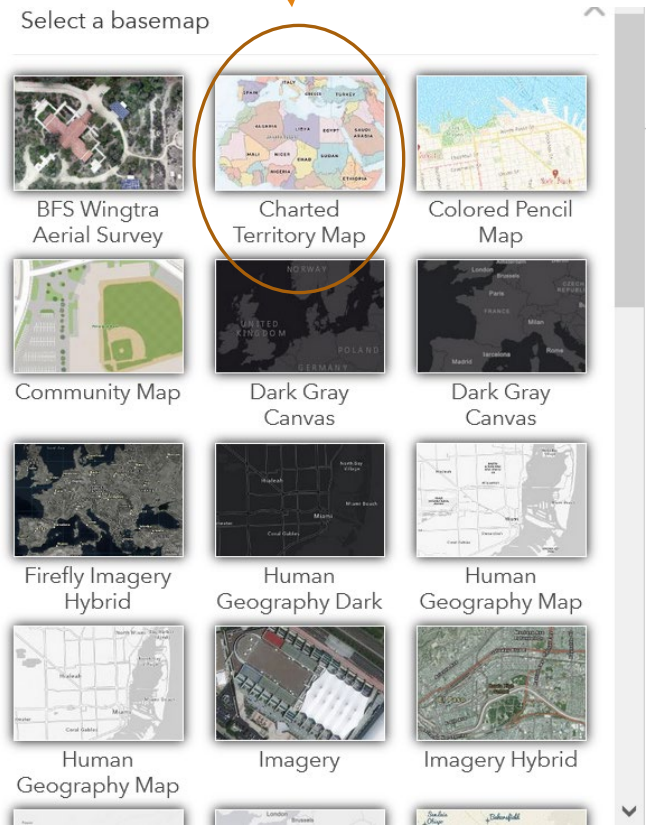


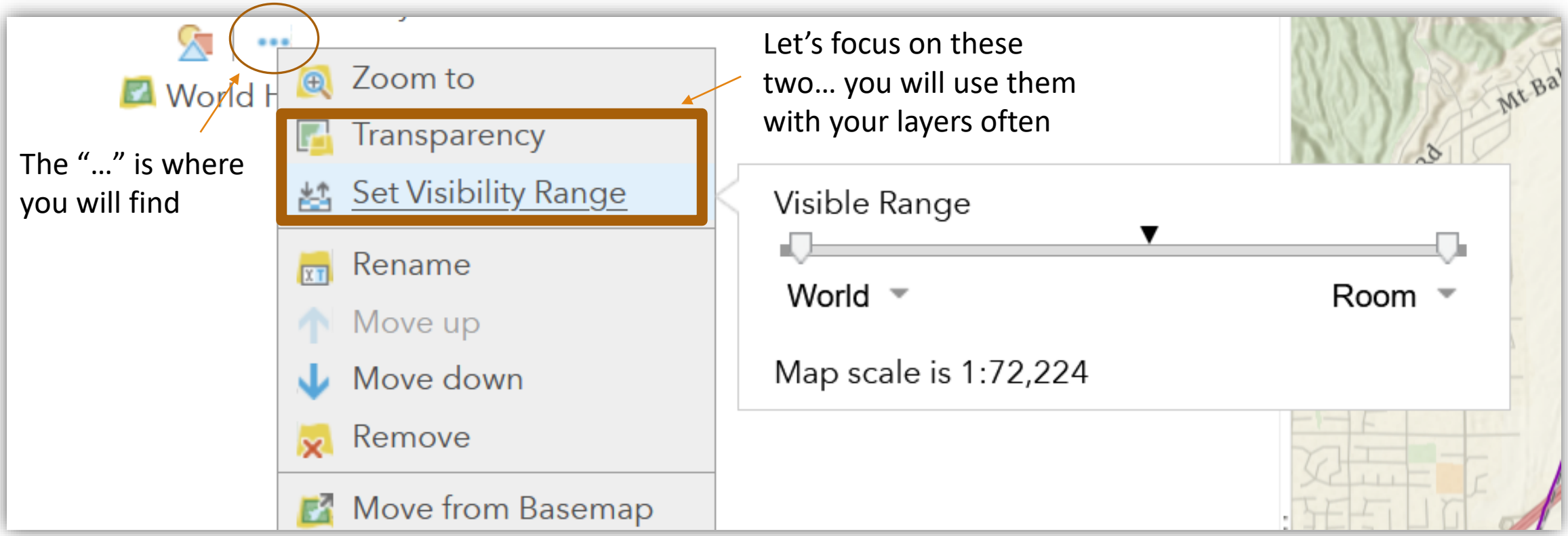
Layers

- Vector data is split into three types: point, line (or arc), and polygon data
- Raster data (also known as grid data) represents the fourth type of feature: surfaces. Raster data is cell-based containing coordinate information and values for each cell.
- Features can be points, lines, or polygons (areas), and may also have tables associated with them. In ArcGIS Online, a feature layer is represented as a single item. However, a feature layer item may contain one or more layers and tables inside it, depending on how it was published.

Base Maps

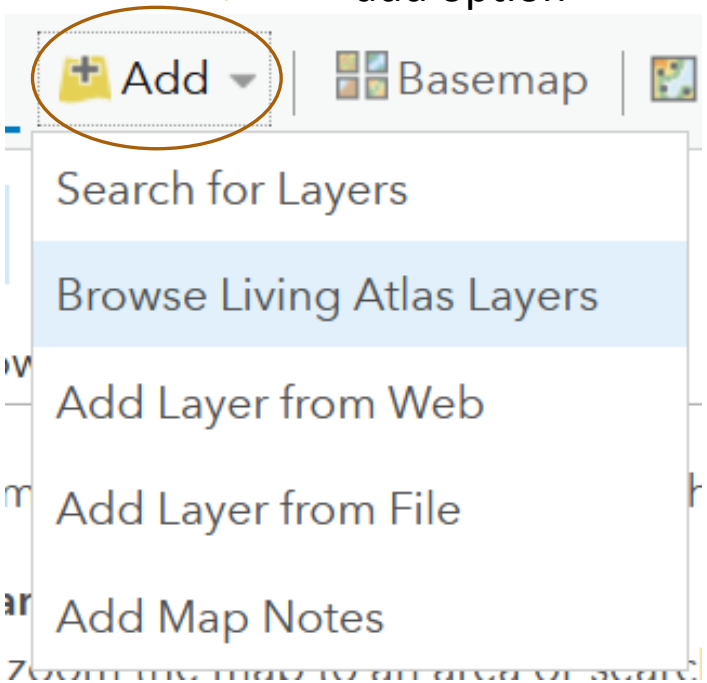
We will be using this Base map

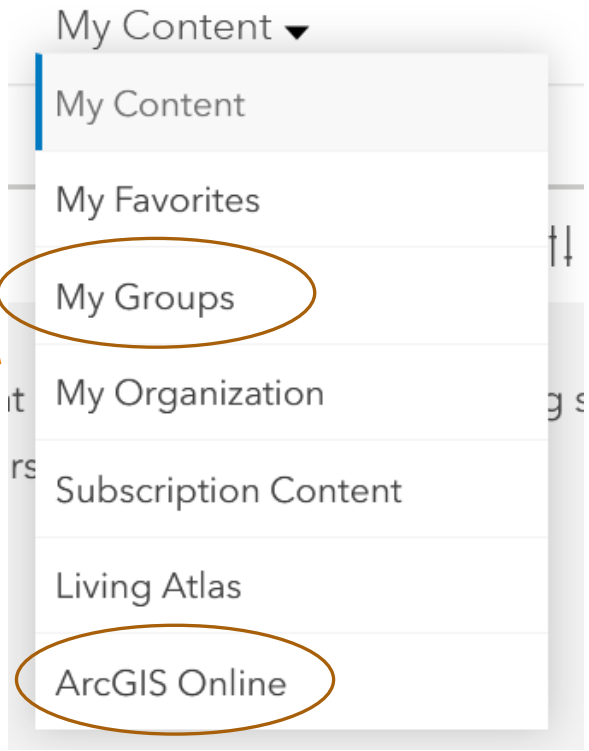




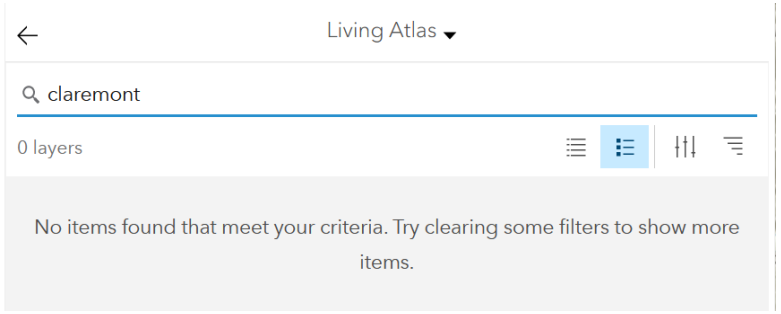
Visibility and Transparency

Top left you will click on add option



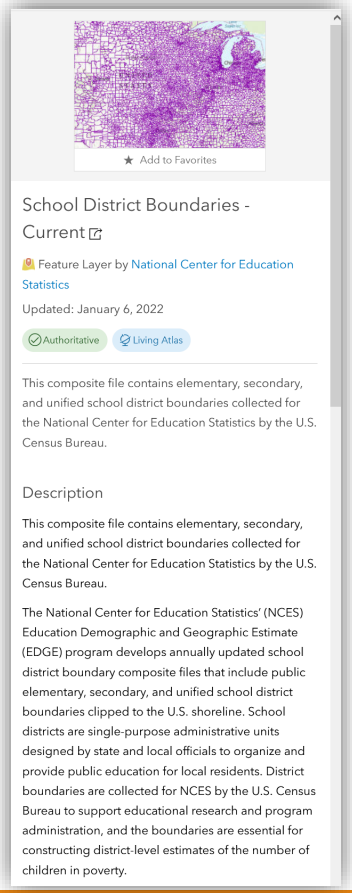


Today's workshop will be using these two



Sometimes when you are searching for key terms you will come across this. First look at the library you are using before you panic that all your layers are gone.

Layer Information – great example



The Census Bureau's School District Boundary Review program (SDRP) (https://www.census.gov/programs-surveys/sdrp.html) obtains the boundaries, names, and grade ranges from state officials, and integrates these updates into Census TIGER. Census TIGER boundaries include legal maritime buffers for coastal areas by default, but the NCES composite file removes these buffers to facilitate broader use and cleaner cartographic representation. The NCES EDGE program collaborates with the U.S. Census Bureau's Education Demographic, Geographic, and Economic Statistics (EDGE) Branch to develop the composite school district files. The inputs for this data layer were developed from Census TIGER/Line and represent the most current boundaries available. For more information about NCES school district boundary data, see https://nces.ed.gov/programs/edge/Geographic/DistrictBoundaries.

Previous collections are available for the following years:

- SY 2019-20 TL 20
- SY 2018-19 TL 19
- SY 2017-18 TL 18
- SY 2015-16 TL 17
- SY 2015-16 TL 16
- SY 2013-14 TL 15
- SY 2013-14 TL 14

Terms of Use

All information contained in this file is in the public domain. Data users are advised to review NCES program documentation and feature class metadata to understand the limitations and appropriate use of these data.

Credits (Attribution)

NCES EDGE

Owner

National Center for Education Statistics

Managed by:
OpenDataMgr_NCES

View count: 994,240

Created: March 16, 2020

Shared with: Everyone (public)

Title

Updated

Description

Terms of Use

Credits (Attribution)

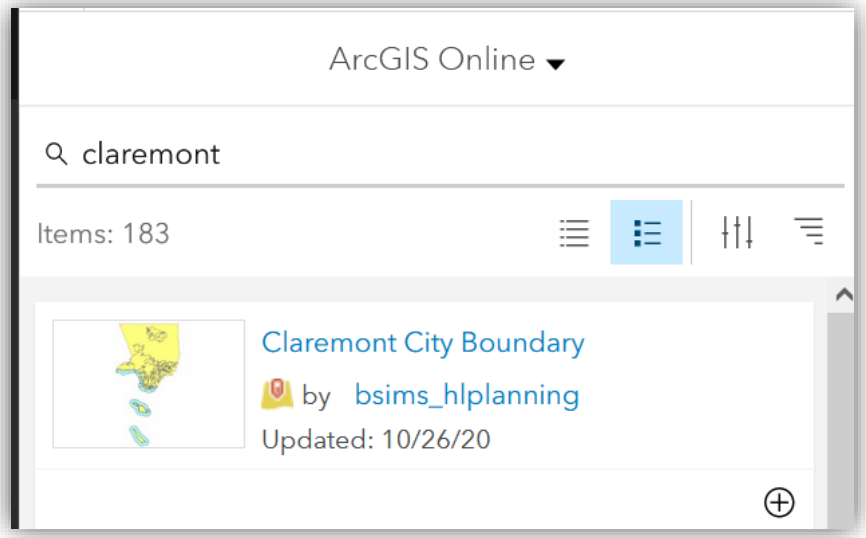
Owner

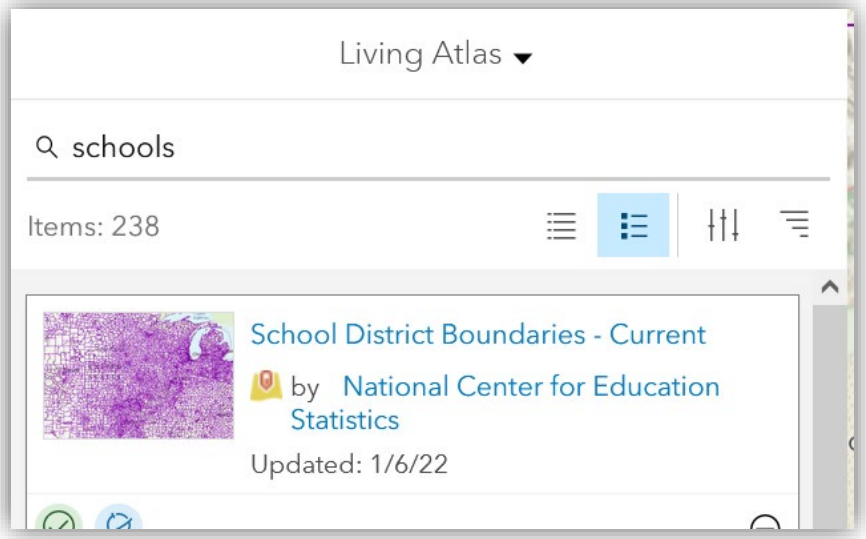
Managed by

View Count

Created

Shared with





Libraries

Living Atlas – maintained by Esri

ArcGIS Online – Same layer as Living Atlas plus peer-to-peer layers

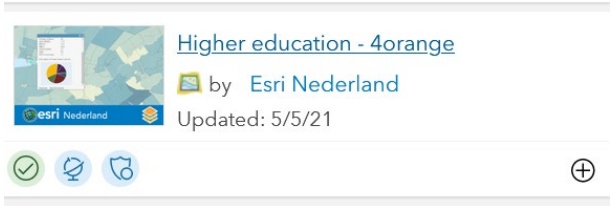
All fun and games till you run out of Credits!!!

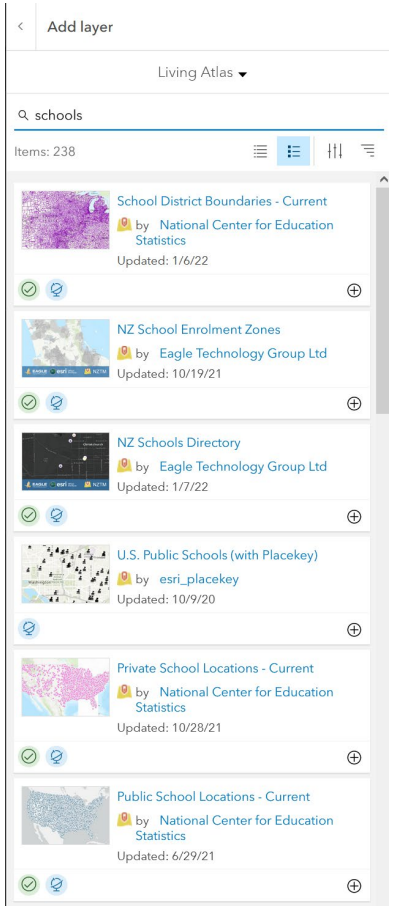
Credits vs. Free

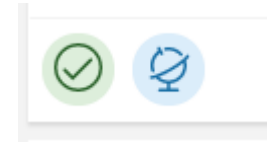
- Story time! (every GIS specialist has one) The time I blew all my credits on converting all addresses from regular mail to address to geocodes

Addresses vs. Geocodes

- latitude versus longitude

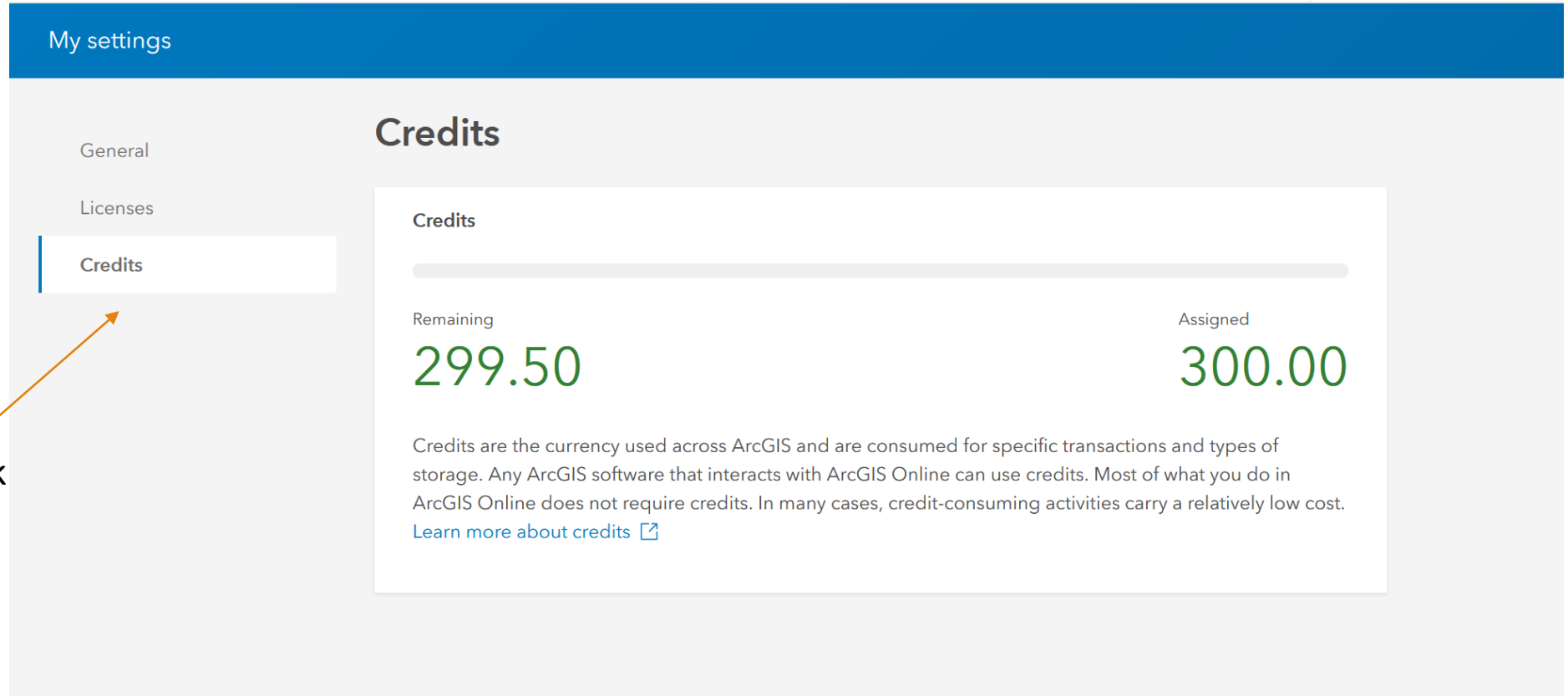


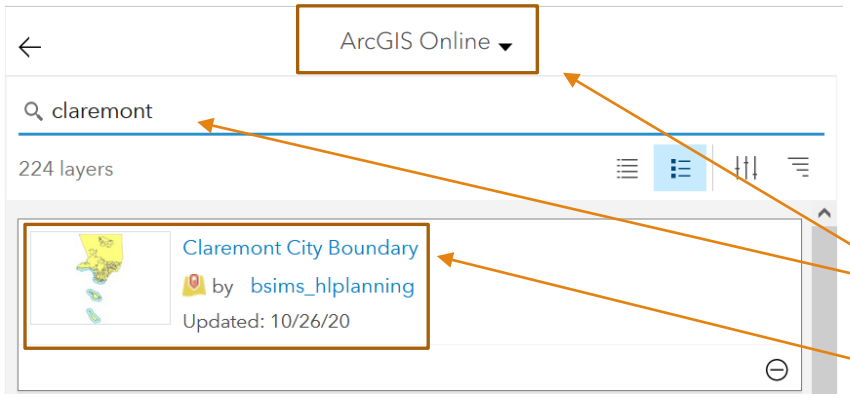


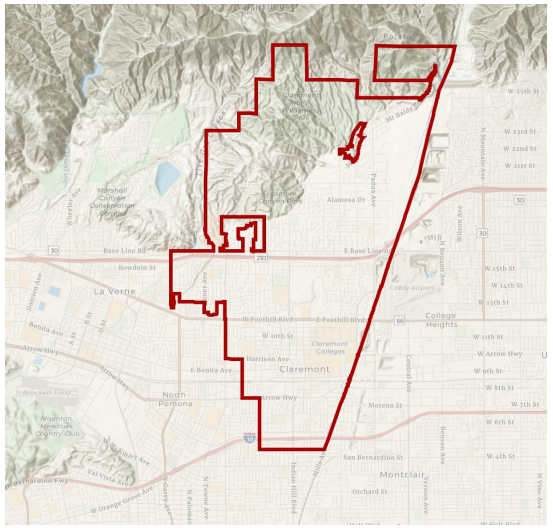


Credits Talk

Go to setting in your account profile and click on credits.

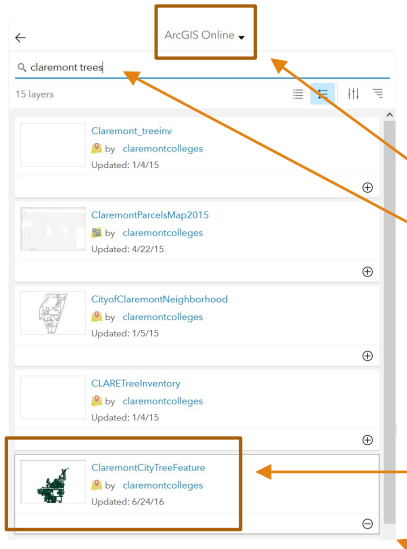


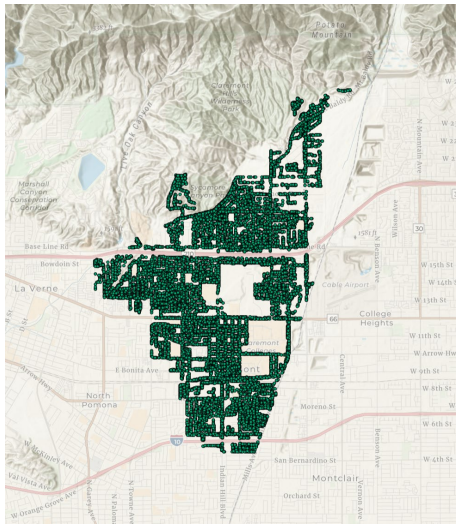




Claremont Boundary Layer

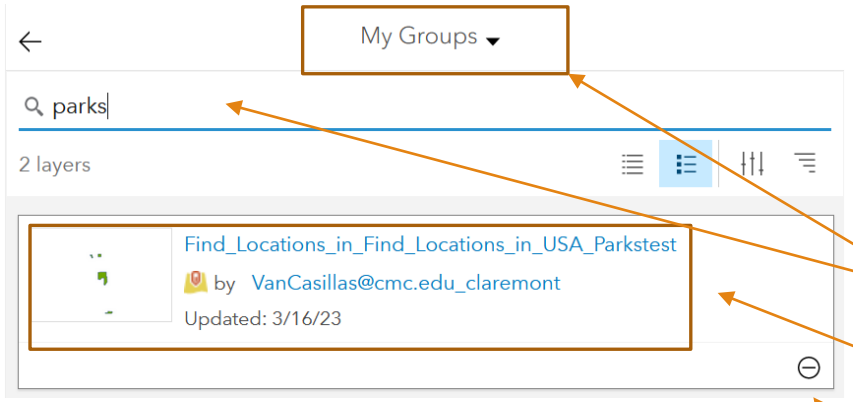
1. Go to ArcGIS Online Library and search for “Claremont”
2. Click the layer named “Claremont City Boundary” by bsims_hlplanning
3. Click the plus sign (+) to add it to your map content
4. You should see a minus sign (-) to indicated that you have added it to your map.
5. Results of this layer

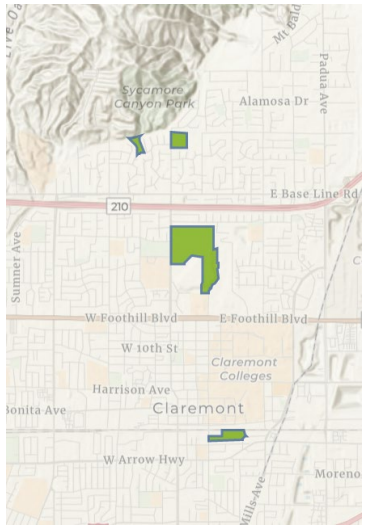




Claremont Trees

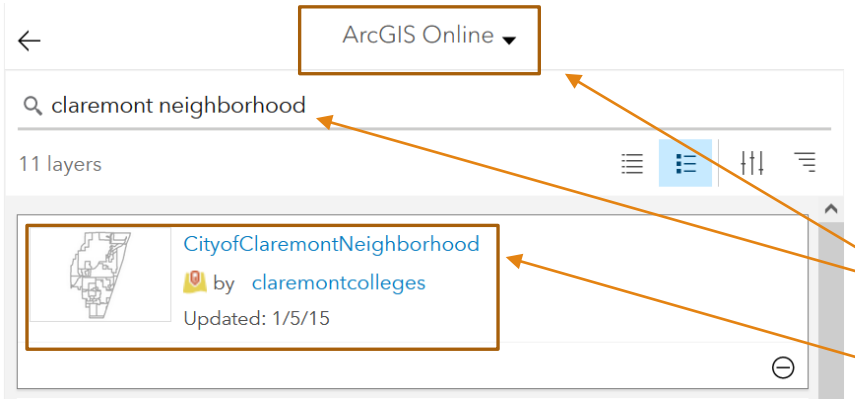
1. Go to ArcGIS Online Library and search for “Claremont trees”
2. Click the layer named “ClaremontCityTreeFeature” by claremontcolleges
3. Click the plus sign (+) to add it to your map content
4. You should see a minus sign (-) to indicated that you have added it to your map.
5. Results of this layer

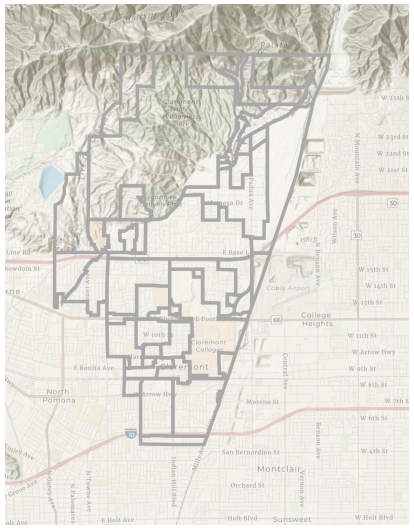




Parks Data Layer

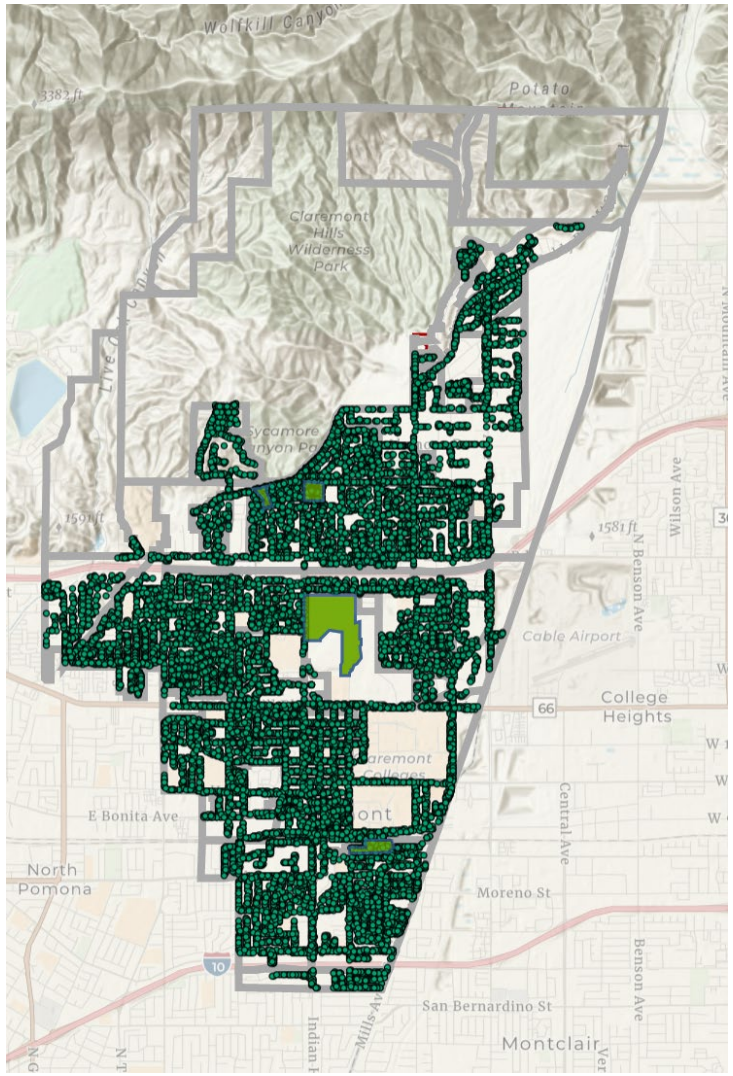
1. Go to ArcGIS Online Library and search for “parks”
2. Click the layer named “Claremont City Boundary” by bsims_hlplanning
3. Click the plus sign (+) to add it to your map content
4. You should see a minus sign (-) to indicated that you have added it to your map.
5. Results of this layer





Claremont Neighborhood Layer

1. Go to ArcGIS Online Library and search for "Claremont neighborhood"
2. Click the layer named "CityofClaremontNeighborhood" by claremontcolleges
3. Click the plus sign (+) to add it to your map content
4. You should see a minus sign (-) to indicated that you have added it to your map.
5. Results of this layer

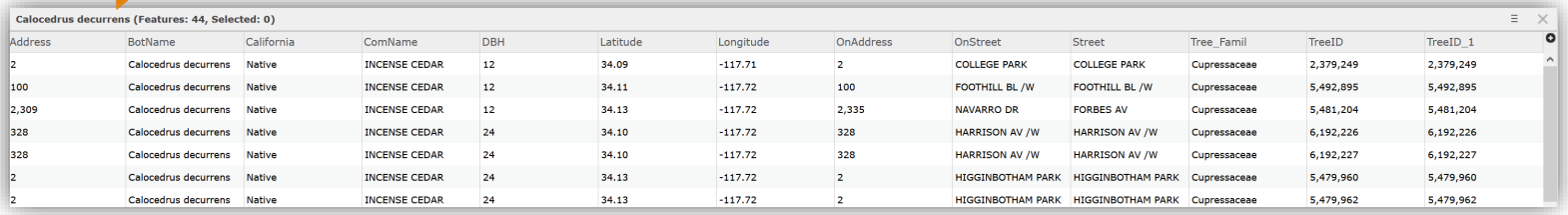


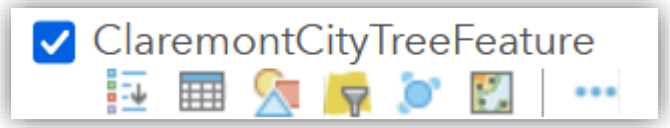
So much information – it hurts my eyes!

Analysis

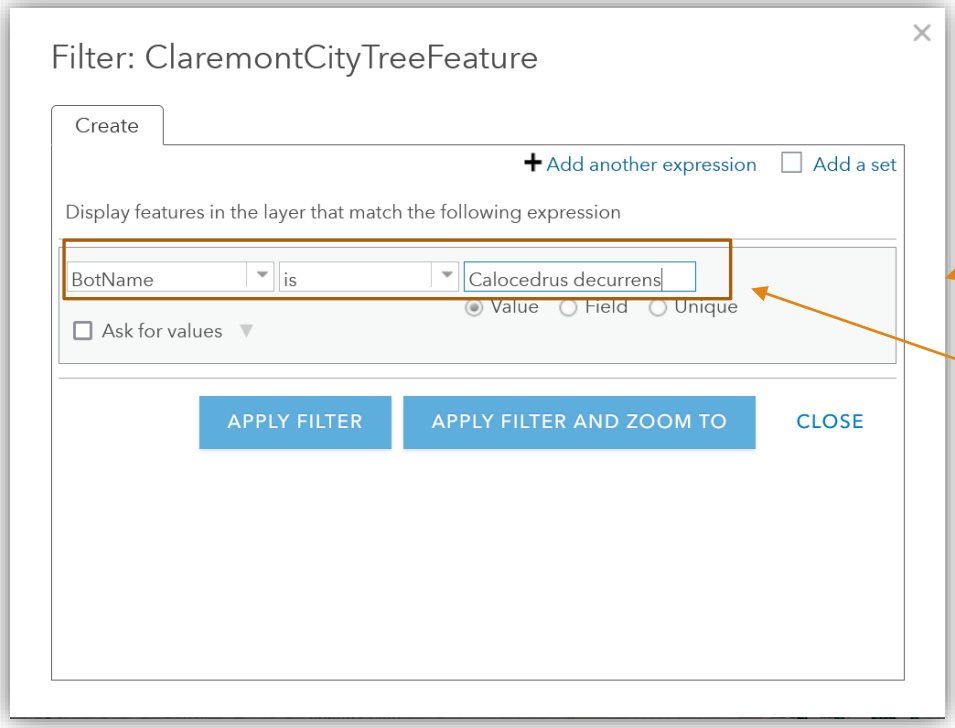
Filter

Table



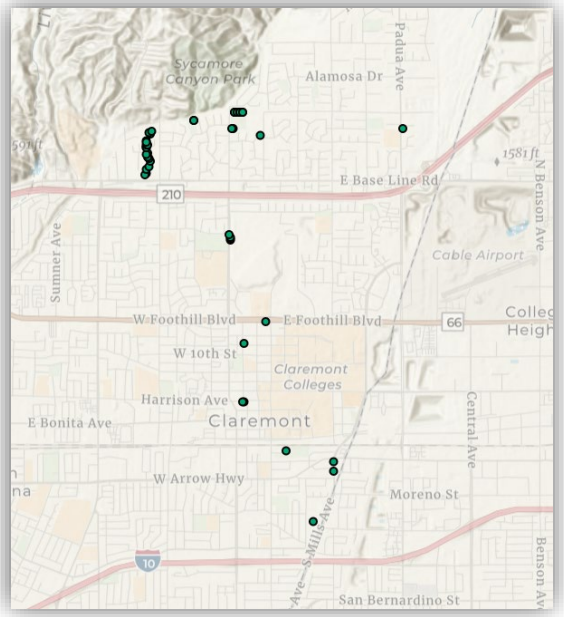


Legend | Table | Style | Filter | ClusterPoints | Analysis | Options

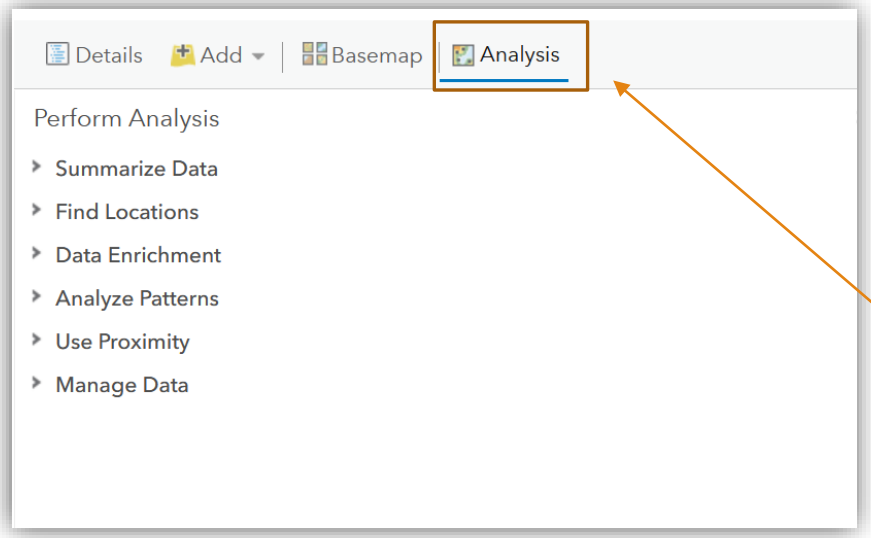


Type in the value you want to filter

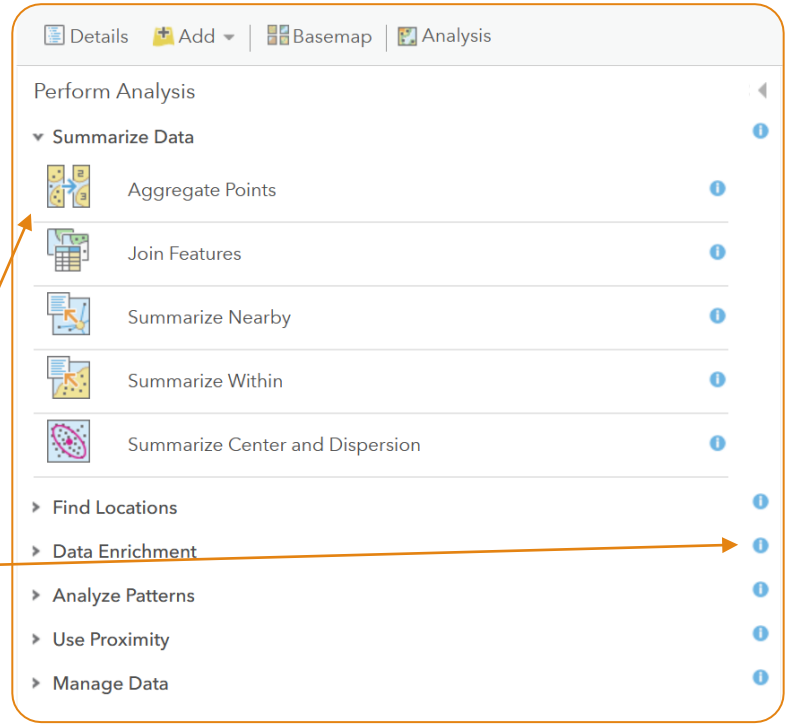
When you click [Apply], the results will be.

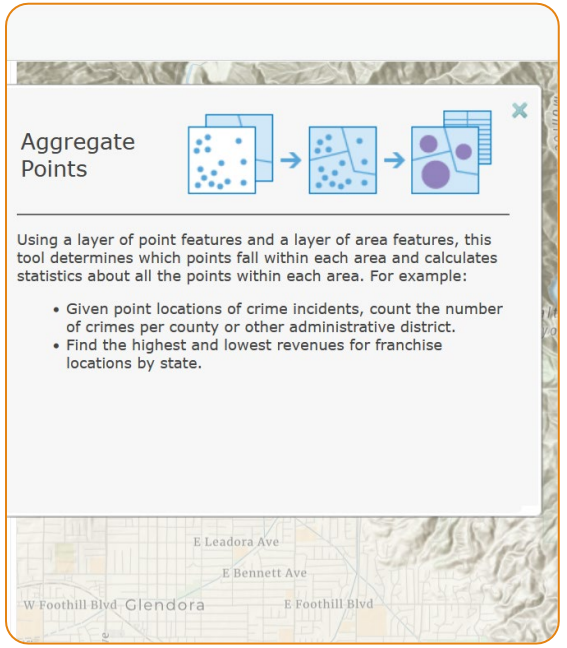


Analysis – Making our own layers



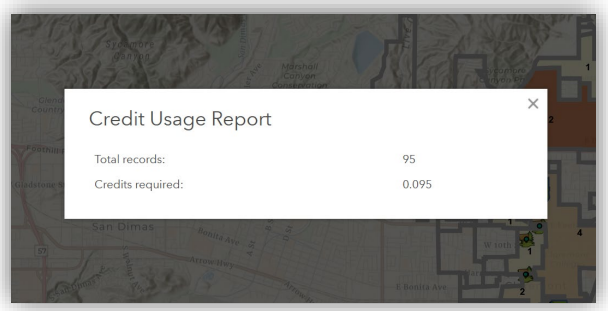
Click the Analysis tab

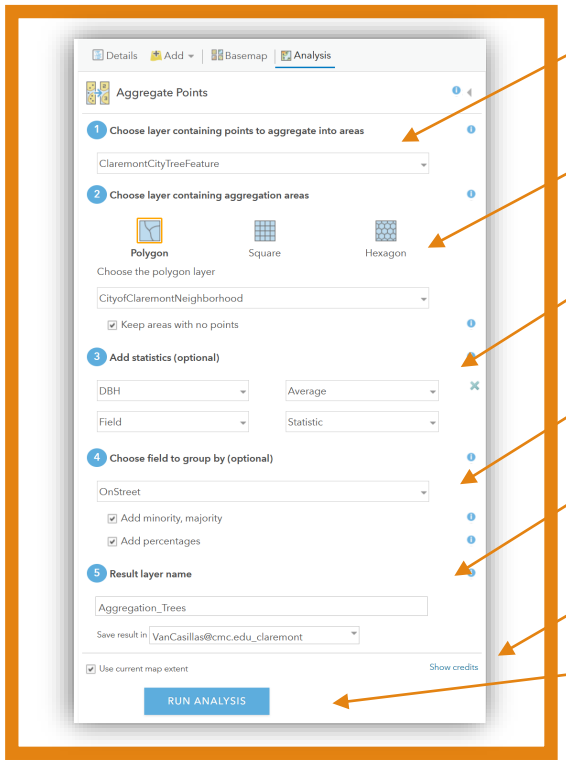




These analysis cost credits to use, we will be using Aggregate Points today, But I explore each one later by clicking on the blue “I”

Be careful of credits!



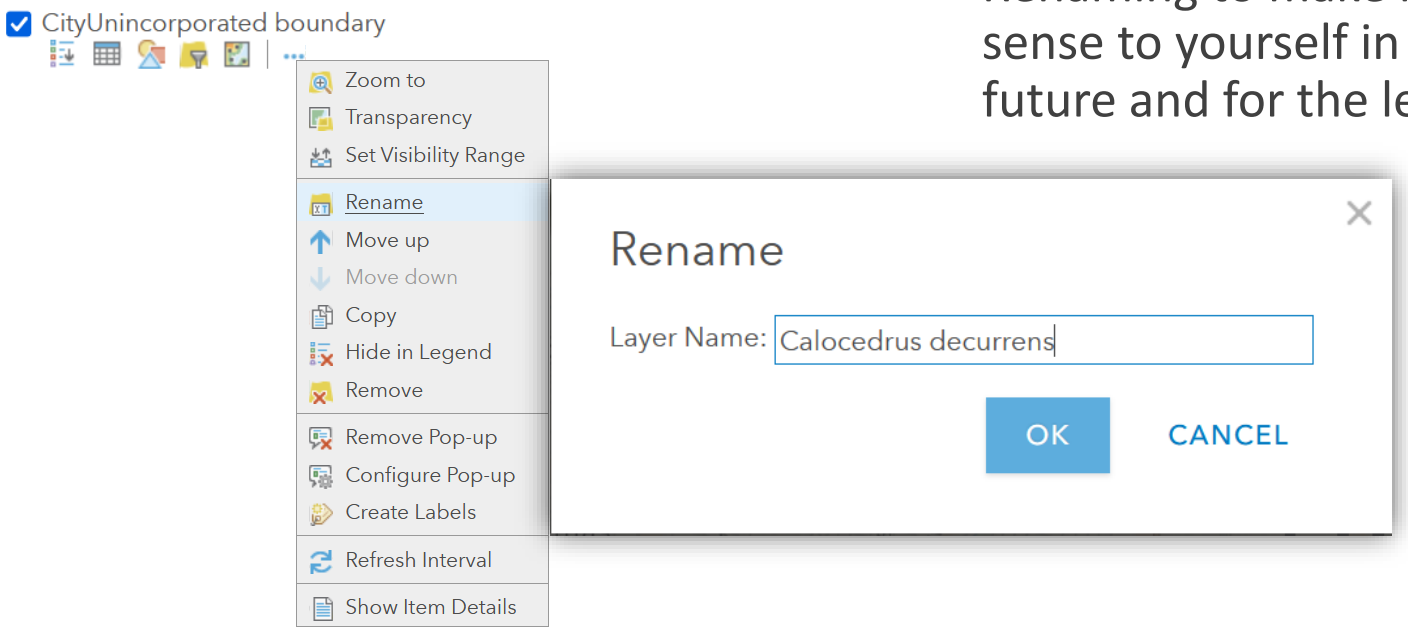


Aggregate Points

1. Choose the “ClaremontCityTreeFeature” layer
2. Choose Polygon and “CityofClaremontNeighborhood” layer
3. Choose “DBH” and “Average”
4. Choose “OnStreet”, check Add minority, majority and Add percentages
5. Name your Layer whatever you want and save in folder
6. Check your credits by clicking Show credits]
7. Click [Run Analysis]

Style Edits

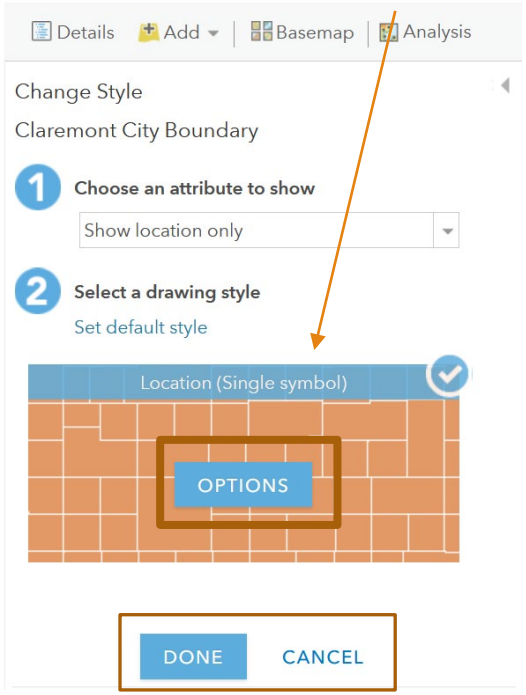
Renaming



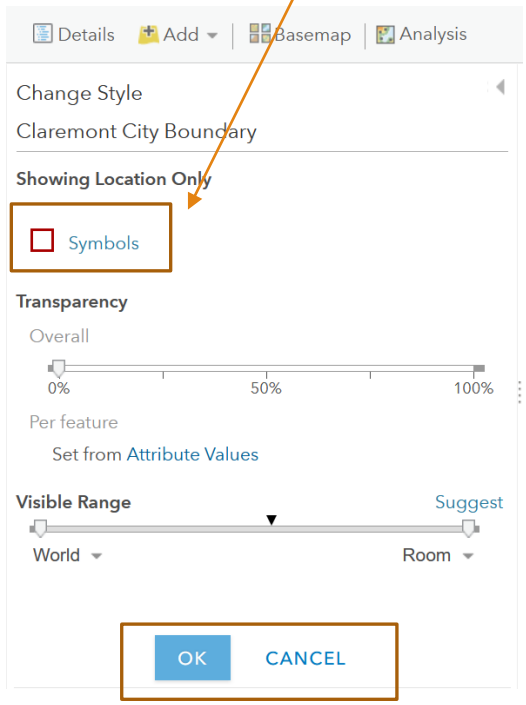
Renaming to make more sense to yourself in the future and for the legend

Claremont Boundary Line Style Edits

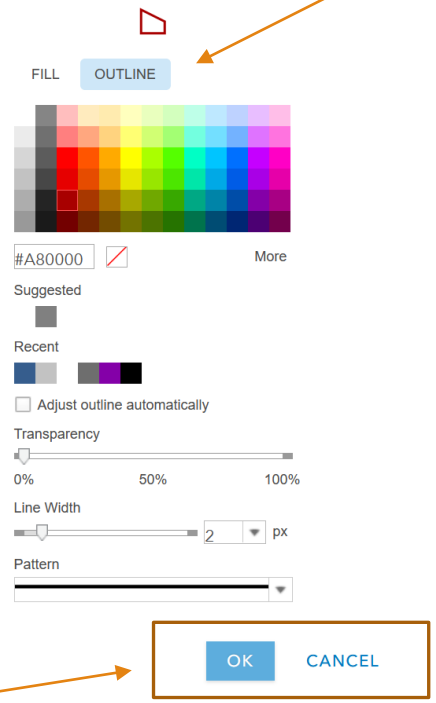
Click the attribute, you would like to display, we will be using “show location only” then click [options]

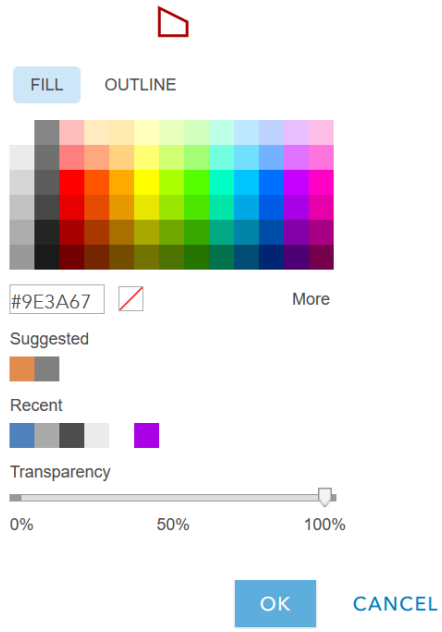


Click the symbols, You can also change Transparency and visible range for layer here.



Change the line width to “2” under the outline tab, leave fill the same



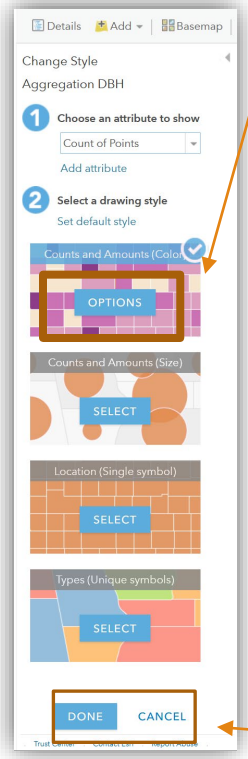


End step: Click [OK] twice and then [Done]

*warning: if you do not click [Done], it will not save to content and map

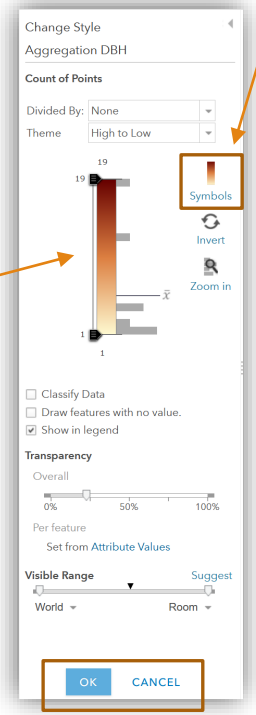
Aggregation DBH Style Edits

Click the attribute, you would like to display, we will be using “Count of Points” then click [options]

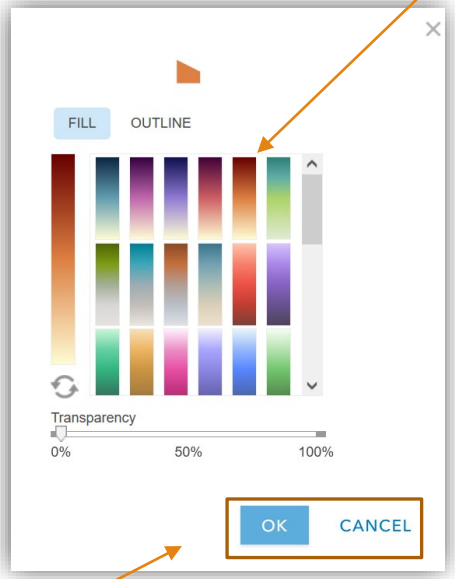


Click the symbols, You can also change Transparency and visible range for layer here.

*Note: this is the result color



Change the Fill to the 5th one in the Fill tab, leave outline the same

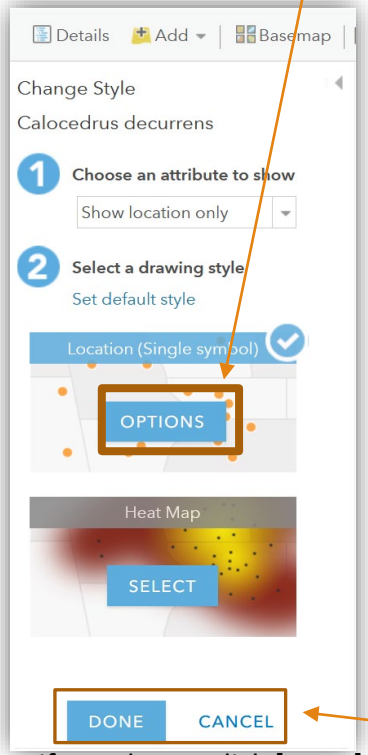


*warning: if you do not click [Done], it will not save to content and map

End step: Click [OK] twice and then [Done]

Aggregation DBH Style Edits

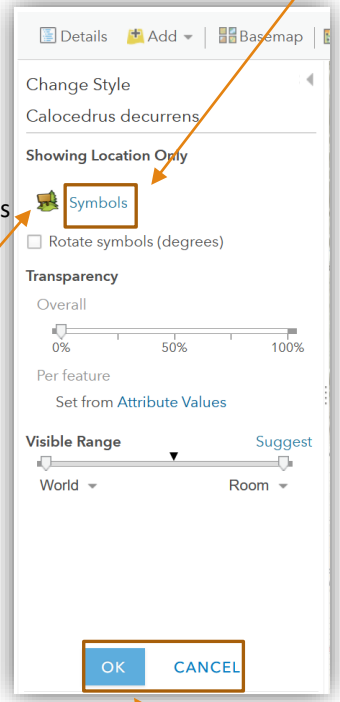
Click the attribute, you would like to display, we will be using “Show Locations only” then click [options]



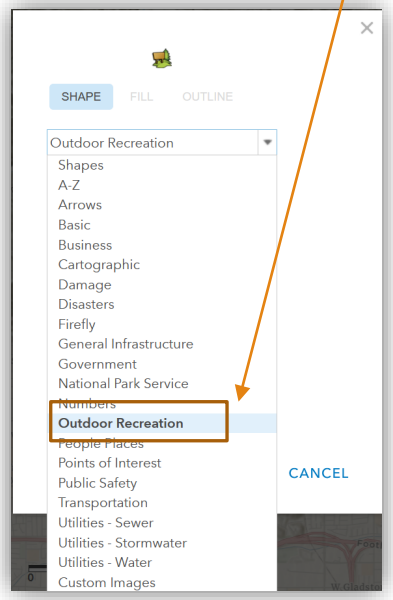
*warning: if you do not click [Done], it will not save to content and map

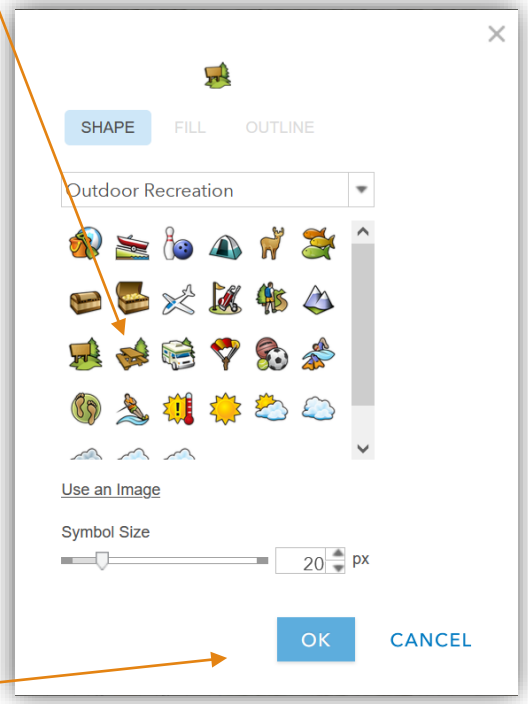
Click the symbols, You can also change Transparency and visible range for layer here.

*Note: this is the result icon



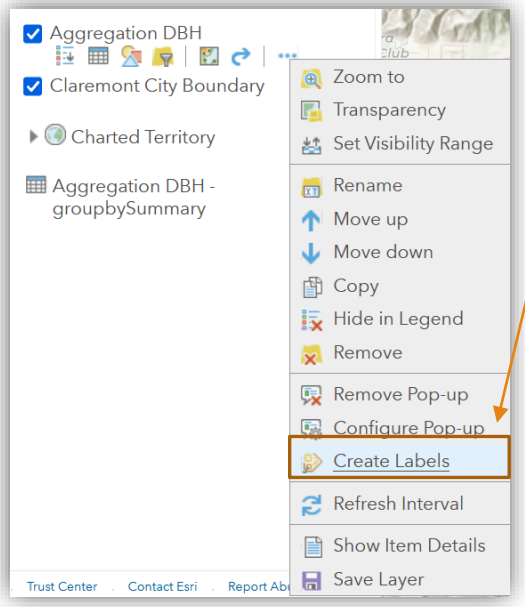
Click “Outdoor Recreation” and click the icon that has a post and tree (third row, second column)





End step: Click [OK] twice and then [Done]

Labels

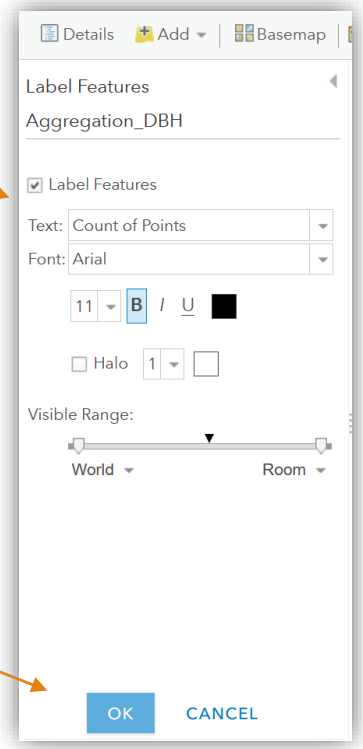


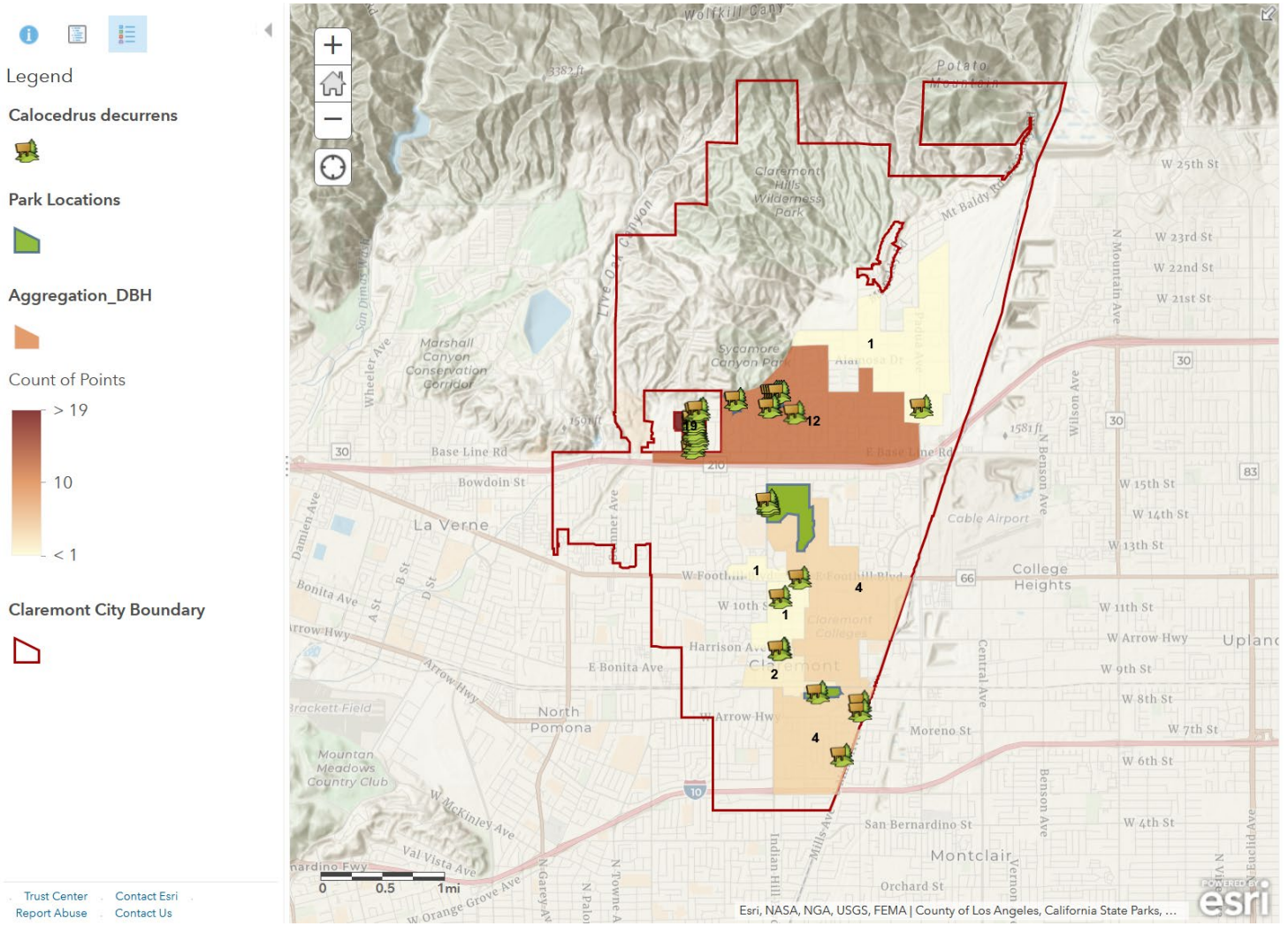
You can add labels from the options icon

Make sure the “Label Features” is enabled

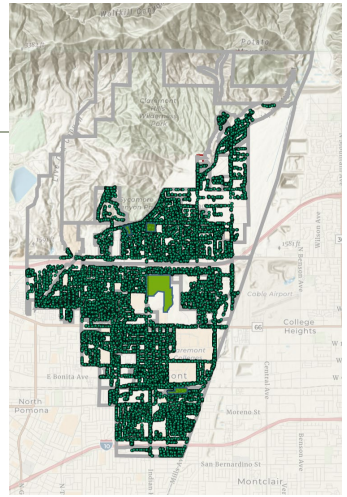
Choose “Count of Points” and 11 size font

Click okay





A better visual story

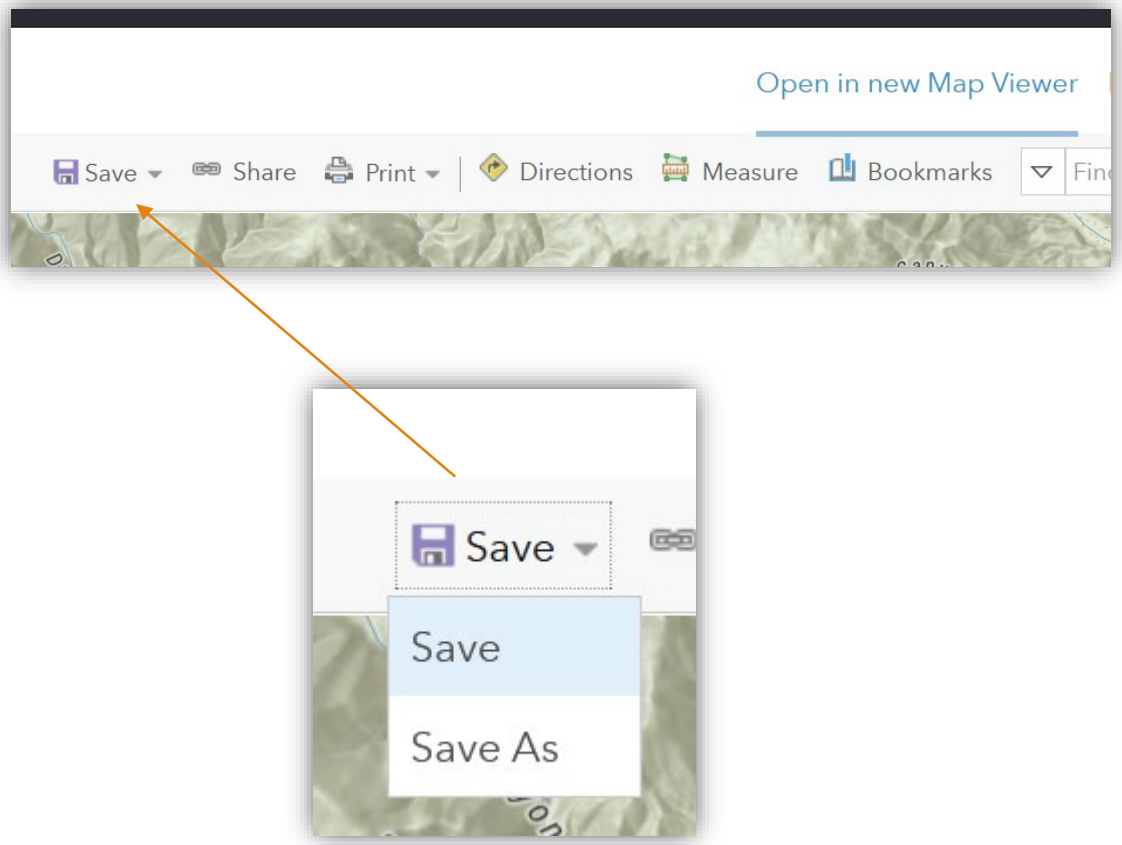


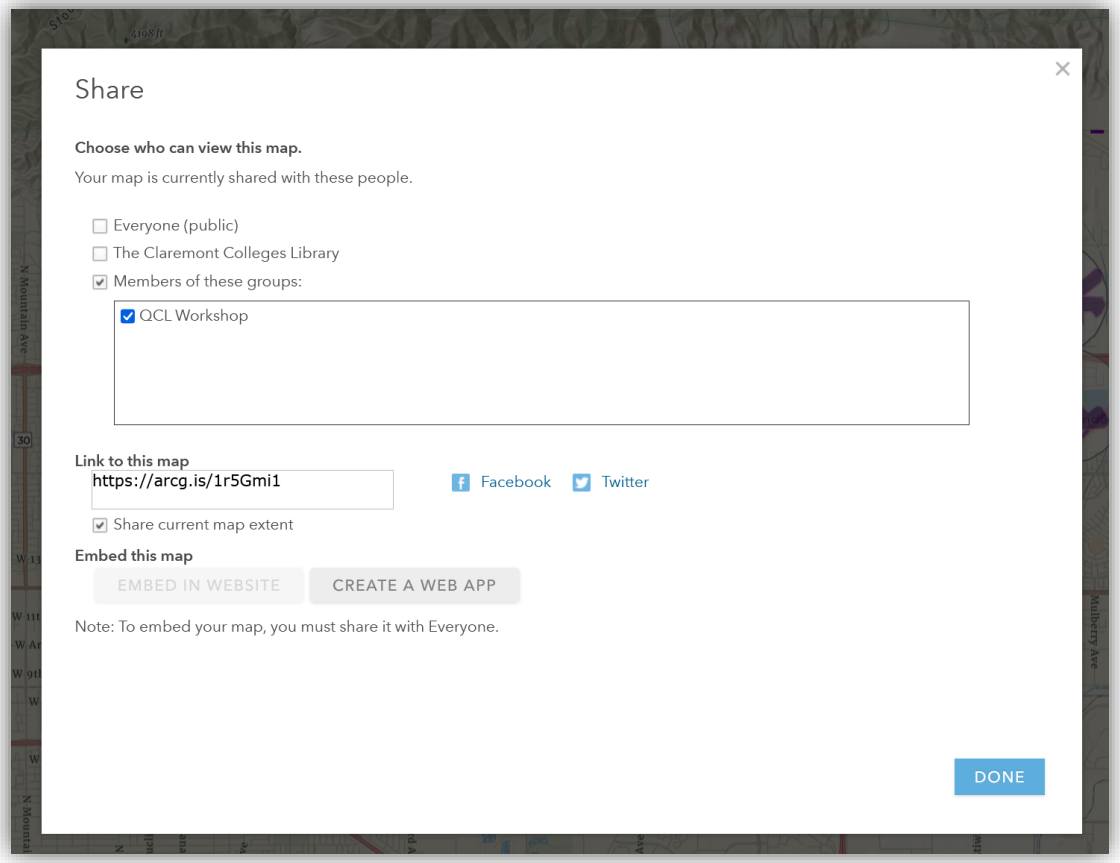
Steps

- 1. Layers
  - Claremont Trees – filter to BotName is Calocedrus decurrens
  - Neighborhood
  - Claremont Boundary
  - Park – My group
- 2. Analysis
  - Aggregation – trees in neighborhoods
    - DBH is measured on standing trees outside of the bark. Diameter can be calculated by measuring the circumference of the tree, then divide circumference by π (3.1416)
- 3. Filter out blanks
- 4. Edits
  - Labels
  - Icons
  - Shading

Last Steps

Save and Share





Go to New ArcGIS Online Map

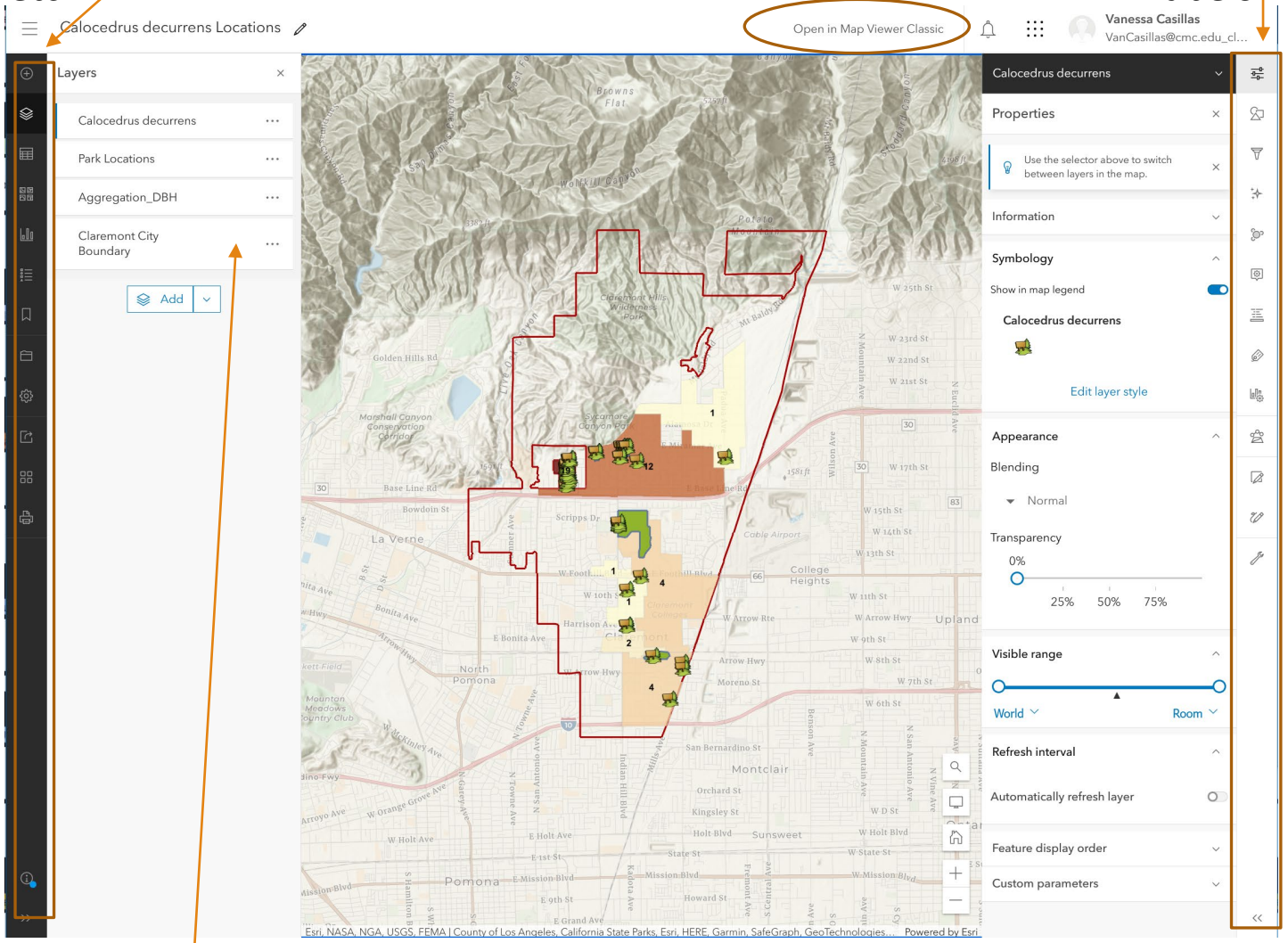
Everything you learned you can do here, it is just a new look

Not all the features are here yet

Layers, Base map, printing, saving, etc.

Switch back and forth as long as you save

Editing, Analysis, labels



To edit you will click on layer you want to edit on left and right will change to that layer's edits

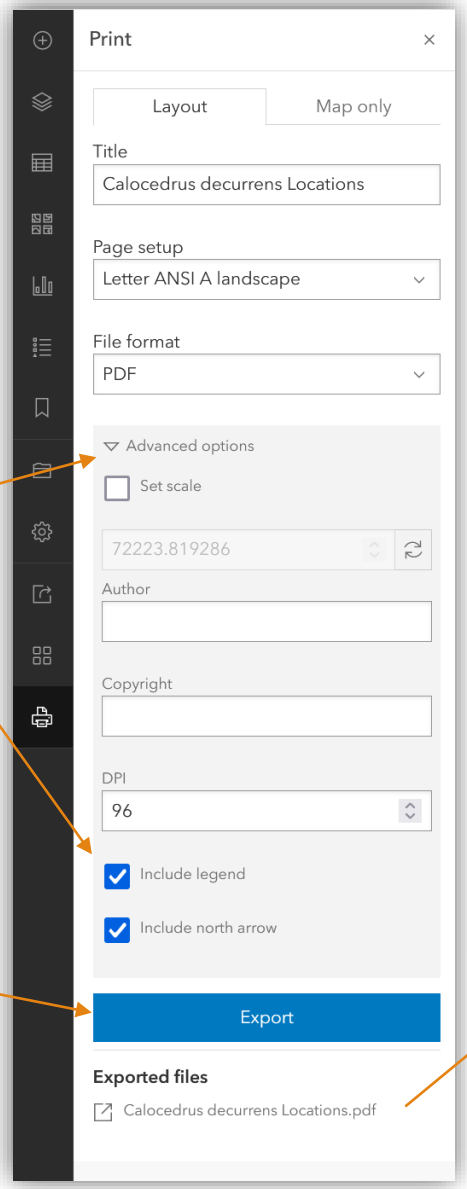
Printing a Map

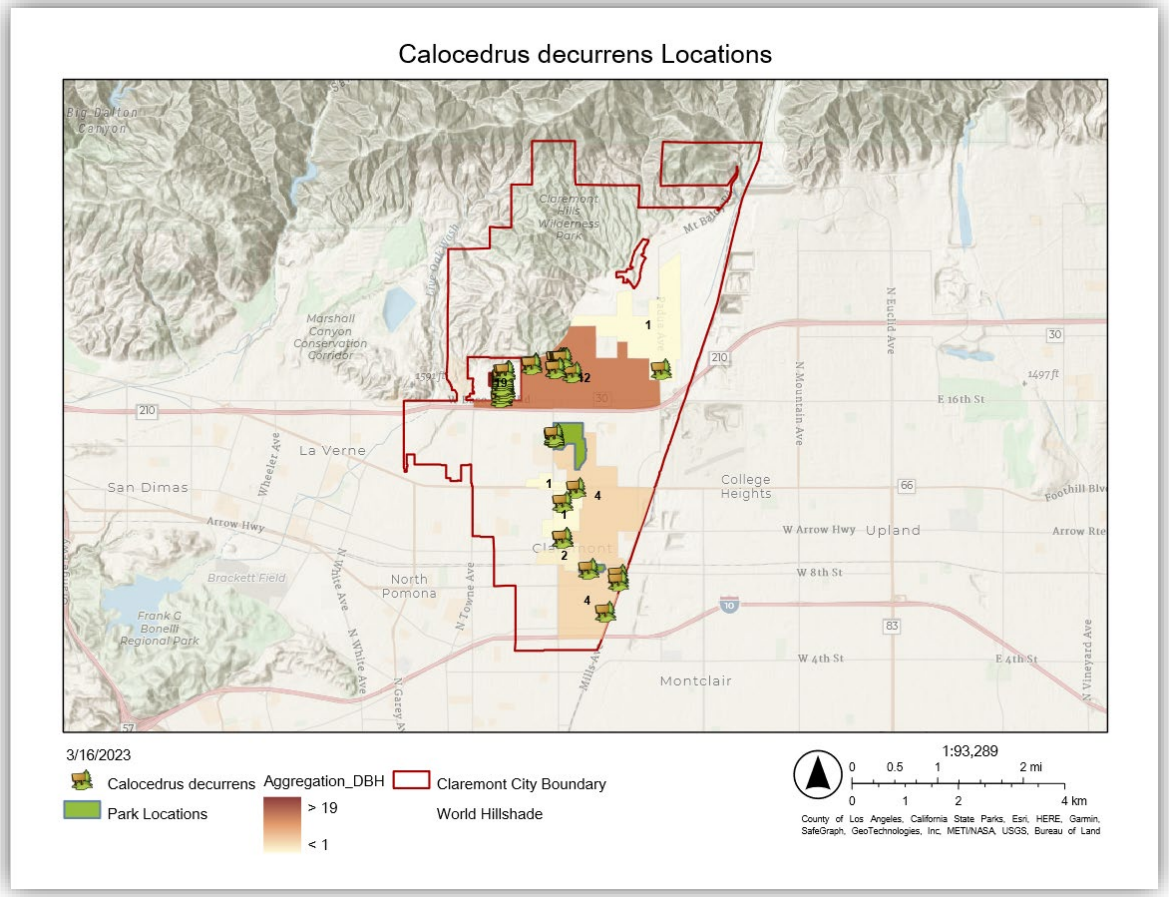
Click on “Advanced options” and check mark “Include legend” and “Include north arrow”

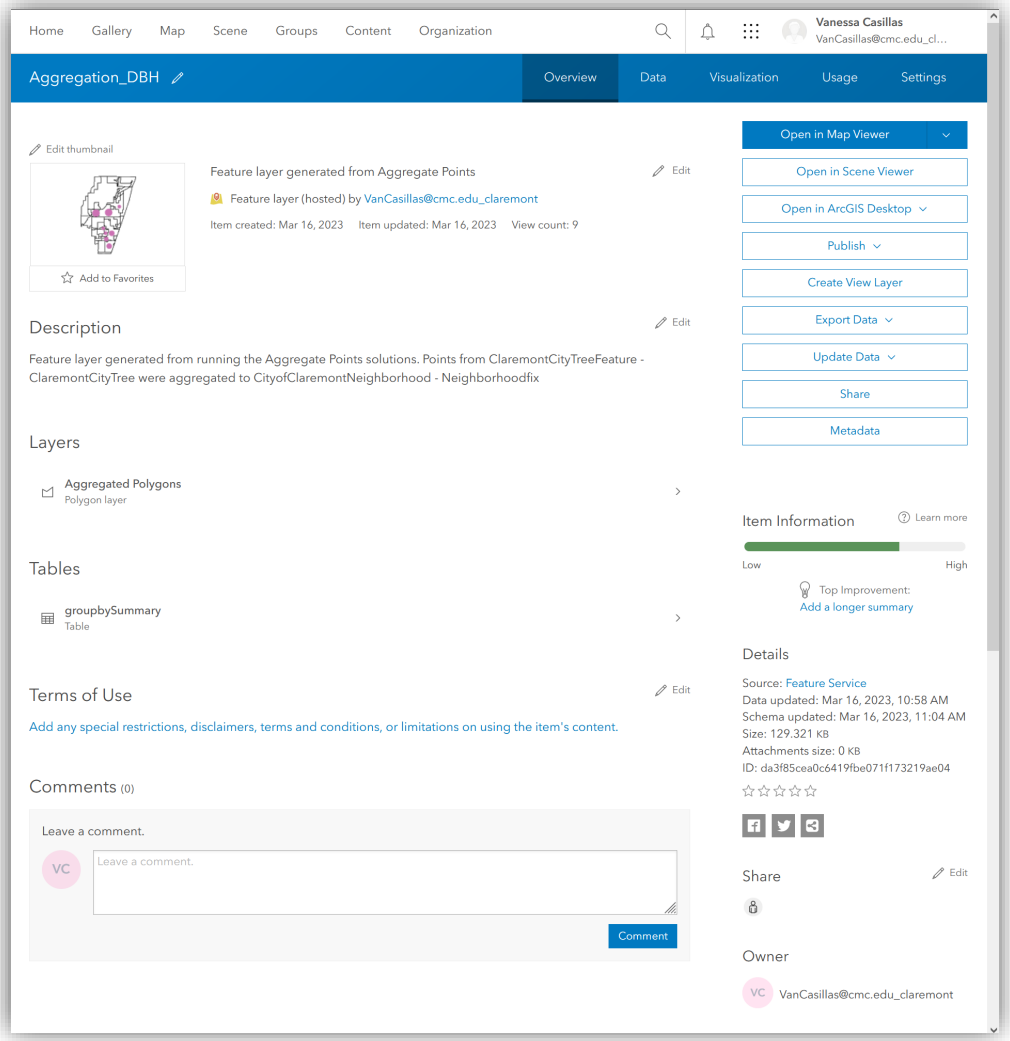
You can change file format and Title here, if you like

When you are ready click Export and it will export a file when you click on the name of the file for you in a new tab

Note: it takes a bit to process



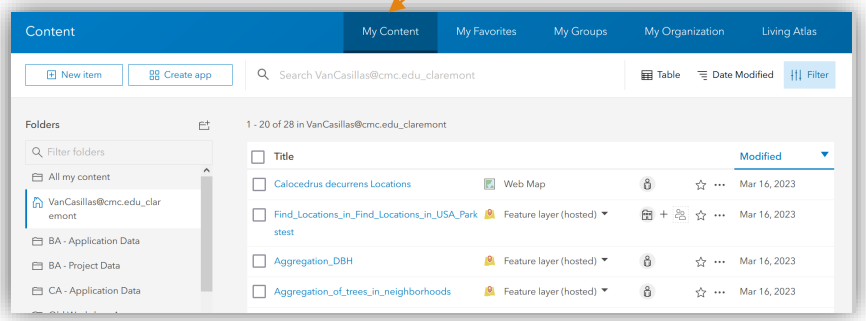




Edit your Layers Information

- Title
- Updated
- Description
- Terms of Use
- Credits (Attribution)
- Owner
- Managed by
- View Count
- Created
- Shared with

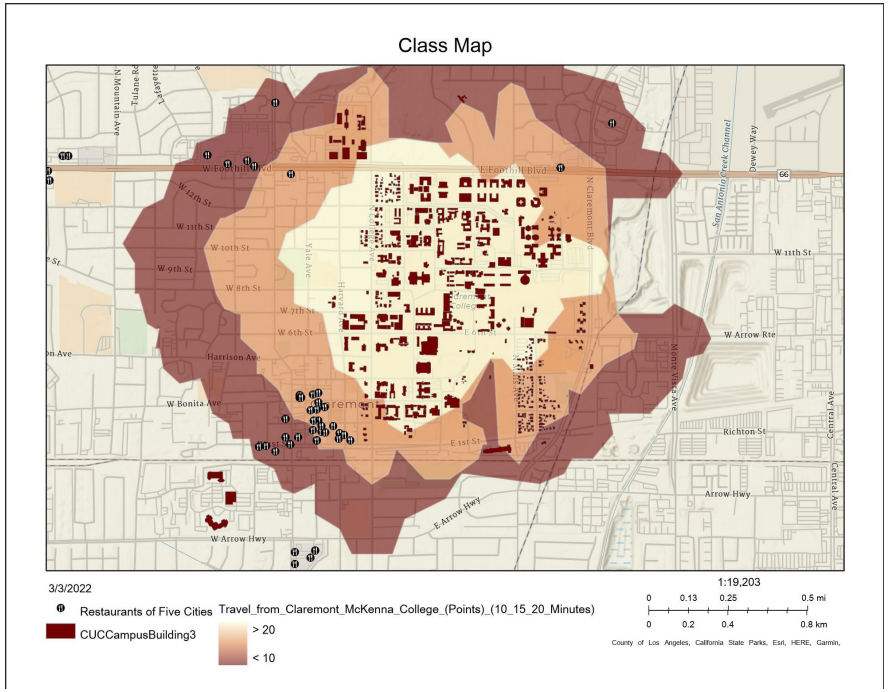
Go to content tab to see all our layers and web map



Homework – Be Creative

Make a map using the City of Claremont and the Claremont colleges and change the style to Claremont colleges colors

- You need at least three layers, rename them to whatever you like as long as it makes sense
  - Restaurants
    - Filter restaurants for just the City of Claremont
  - Claremont Boundary
    - We used this one
  - Claremont Colleges
  - Not required Bonus layer: add a time to walk to restaurants from college to restaurant (hint: you do not have to do an analysis, this layer already exist in the ArcGIS Online library
- Share it to the group receive credit



Resources

ERSI: https://www.esri.com/en-us/home

ArcGIS: https://learn-arcgis-learngis.hub.arcgis.com/

Library: GIS Mondays https://library.claremont.edu/

Contact

QCL: QCL@cmc.edu

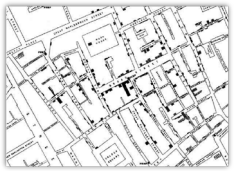
Vanessa: vanessa.casillas@claremontmckenna.edu

LinkedIn: https://www.linkedin.com/in/vanessaariascasillas/

References

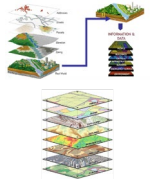
Slide 7:

https://www.researchgate.net/figure/John-Snows-famous-map-of-the-1854-Broad-Street-epidemic-attempted-to-positively_fig1_220144184



Slide 13:

Shukla, Yogita. (2012). Innovative Geospatial Solutions - Key to India's Transport Infrastrcuture
Kolios, Stavros & Vorobev, Andrei & Vorobeva, Gulnara & Stylios, Chrysostomos. (2017). WebGIS Applications for Weather, Marine, and Atmospheric Environments. 10.1007/978-3-319-53086-4_2.



All Section Pictures: Power point Stock

Hands-on Pictures: Screen shots from ArcGIS Online