

# **GIS 1: a very basic introduction**

By Vanessa Arias Casillas (Graduate Fellow)

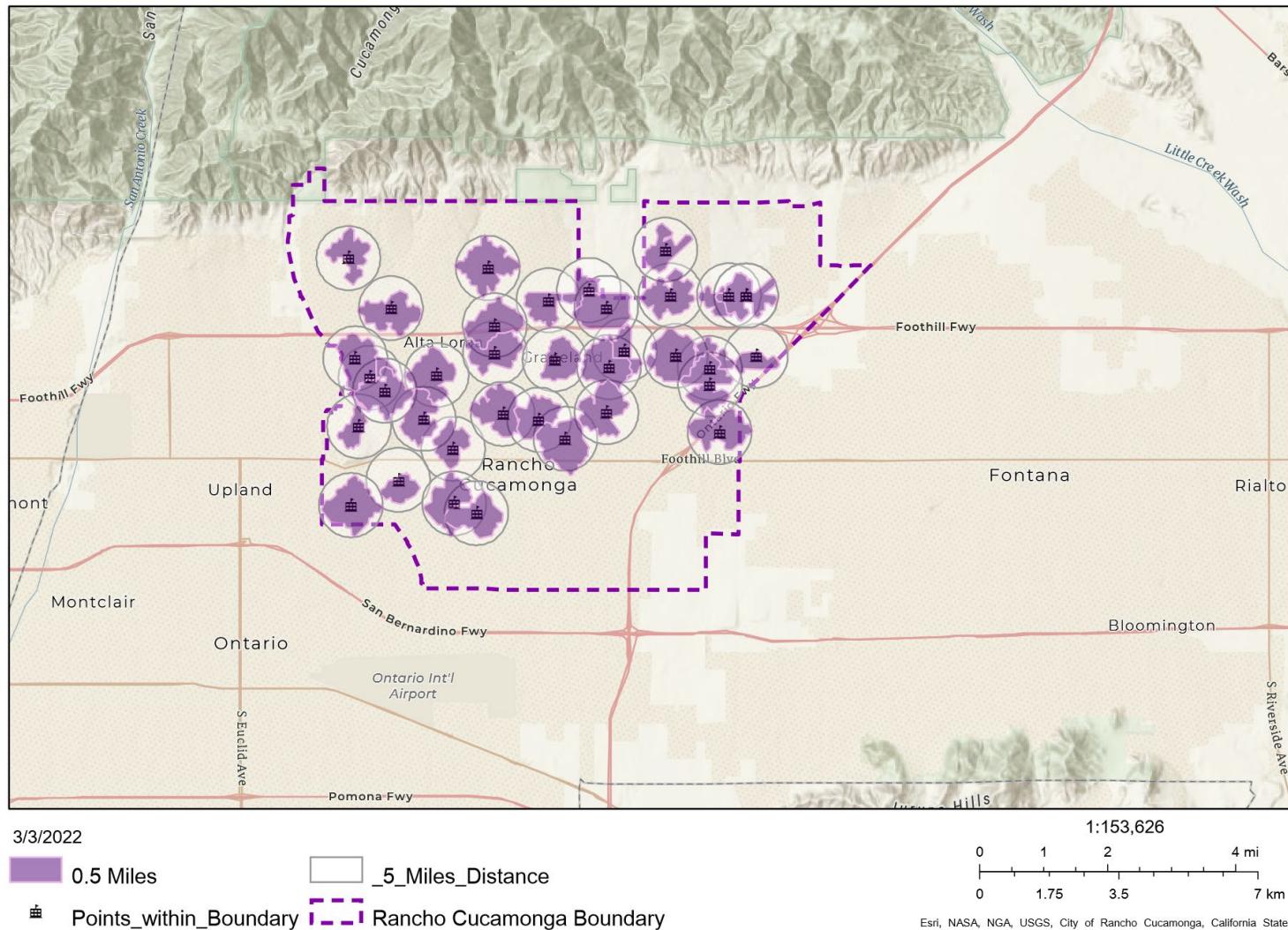
# Agenda

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

# Goal

- Navigate ArcGIS Online
- Make a simple map
- Run simple analysis with the data on your map
- Show your map your group or organization
- Make a PDF print for presentations and reports

## QCLworkshop Map

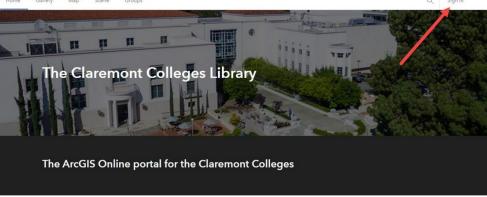


# CMC – ArcGIS

**Get an ArcGIS Account**

You can access ArcGIS Online directly with your Single Sign-On (SSO) credentials when you click "Sign In" from the [Claremont Colleges Library ArcGIS Portal](#).

[Access the Claremont ArcGIS Portal](#)



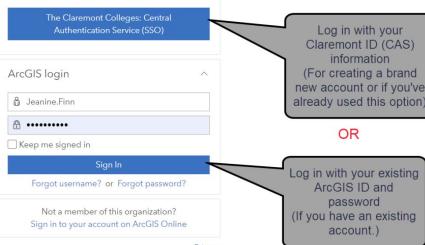
The ArcGIS Online portal for the Claremont Colleges

The Claremont Colleges Library Portal, sign in link is in the top right

If you have existing credentials from ArcGIS Online, you can continue to log in with those.

Sign in to The Claremont Colleges Library 

**Two ways to log in to ArcGIS**



ArcGIS login

Jeanine.Finn

Keep me signed in

Sign In

Forgot username? or Forgot password?

Not a member of this organization?  
Sign in to your account on ArcGIS Online

Privacy

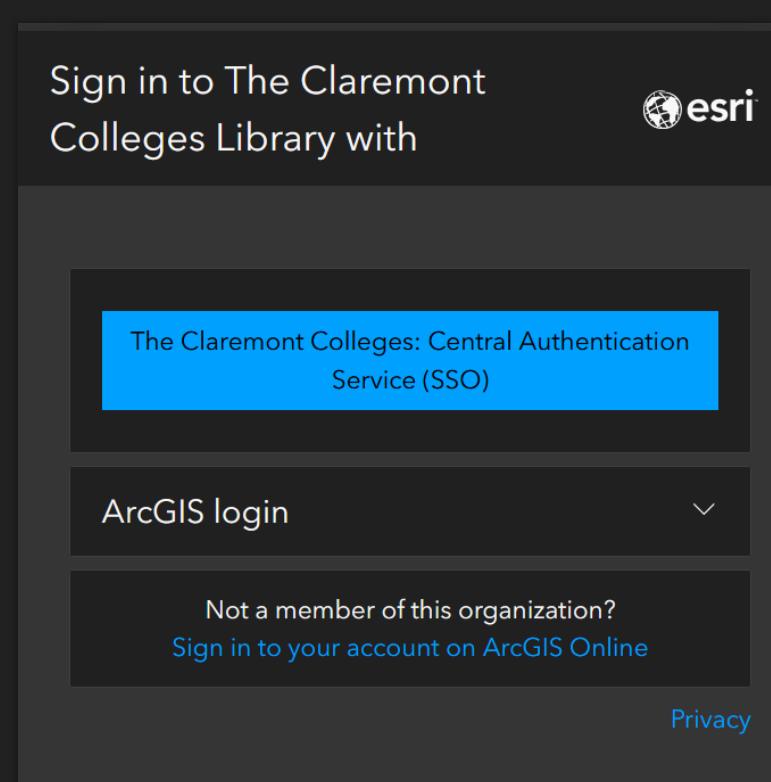
Log in with your Claremont ID (CAS) information  
(For creating a brand new account or if you've already used this option)

OR

Log in with your existing ArcGIS ID and password  
(If you have an existing account.)

ArcGIS sign on screen. Two ways to log in to ArcGIS: 1. Login with your Claremont ID (CAS) information (for creating a brand new account or if you've already used this option). OR 2. Log in with your existing ArcGIS ID and password (if you have an existing account).

# Organization and login



The Claremont Colleges Library

Home    Gallery    Map    Scene    Groups    Content    Organization    [Overview](#)    [Members](#)

The Claremont Colleges Library

Subscription ID  
9377927143

System health  
✓ All systems operational

Newest members

View all members

CP Chardy Paige

MV Mirek Vanis

NS Nathan Shankar

JB Jon Burkart

Administrative contacts

JF Jeanine Finn

Open Data groups

View all

B Basemaps 2019  
Contributors: 1 Items: 32

HMC Clinic  
Contributors: 9 Items: 0

Latest 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 Dia Mundial de la Tierra Con...

by CWeisman21@cmc.edu\_clare...

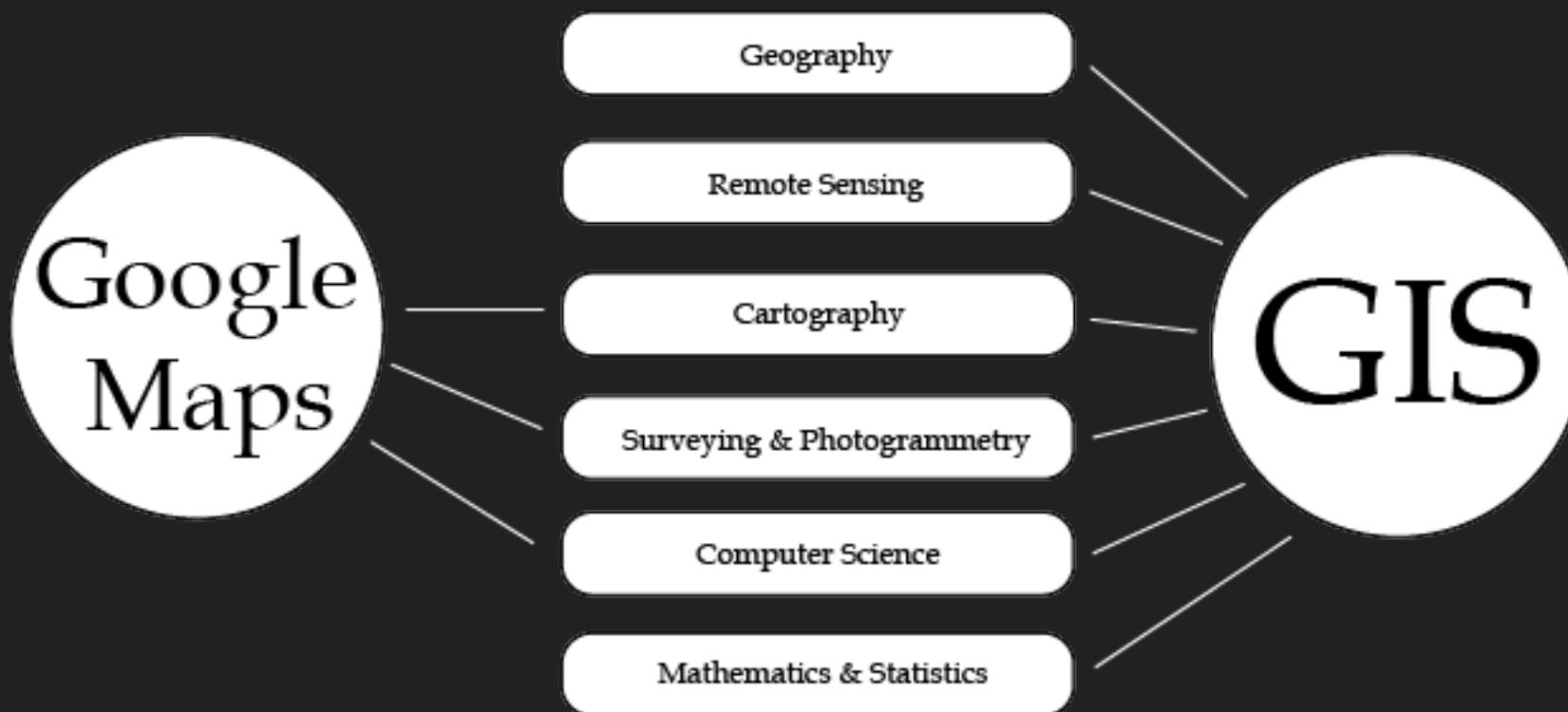
Created: Dec 21, 2021  
Updated: Jan 4, 2022  
View Count: 3

View all content

Trust Center | Contact Esri | Report Abuse | Contact Us

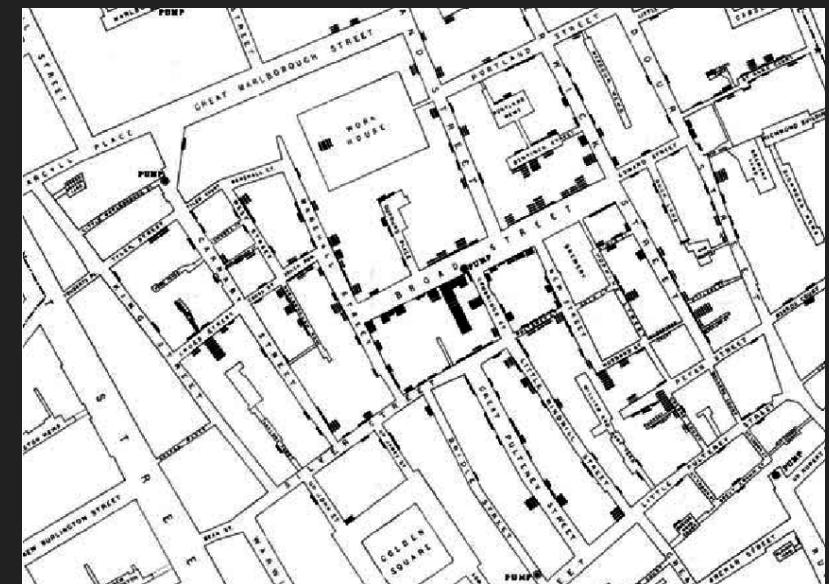
# Home view

# First Question people think of when learning GIS: GOOGLE MAPS – Is it GIS?



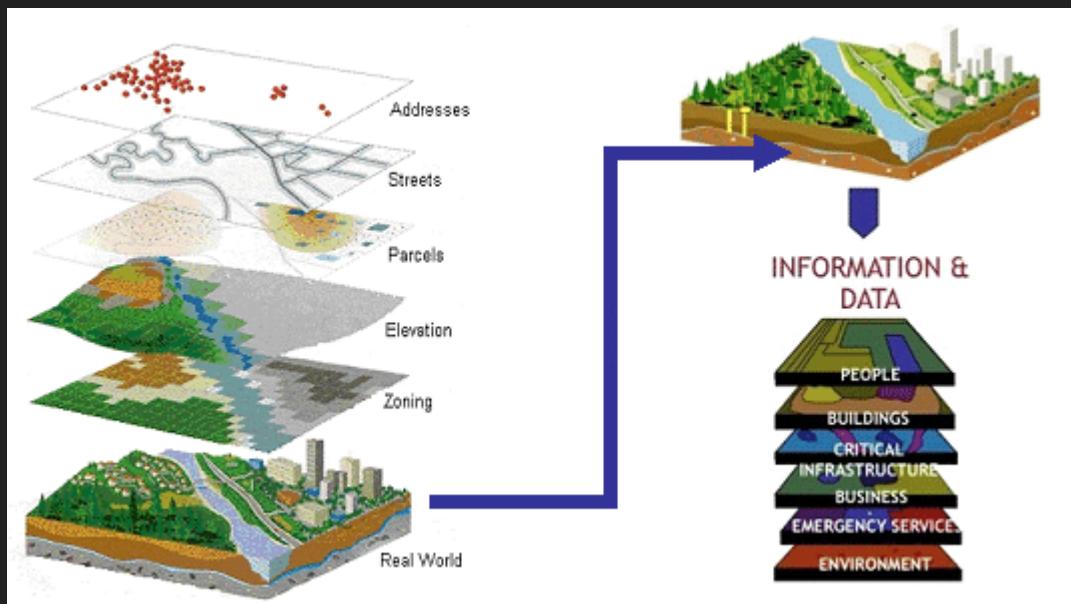
# GIS? Quick Overview

- GIS: Geographic Information Systems
  - Storing, retrieving, comparing spatial data
- ESRI: Environmental Science Research Institute (The Science of Where)
  - **Jack Dangermond** Redlands
- 1854 Cholera Epidemic – London: Dr. John Snow
  - Mapped cholera deaths
  - Determined water pump source

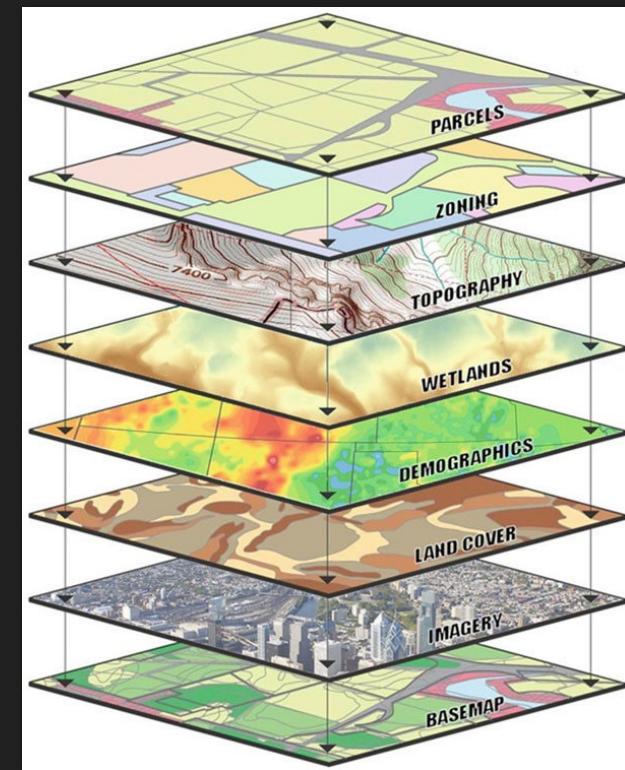


[https://www.researchgate.net/figure/John-Snows-famous-map-of-the-1854-Broad-Street-epidemic-attempted-to-positively\\_fig1\\_220144184](https://www.researchgate.net/figure/John-Snows-famous-map-of-the-1854-Broad-Street-epidemic-attempted-to-positively_fig1_220144184)

# Layers and Layers and Layers



Shukla, Yogita. (2012). Innovative Geospatial Solutions - Key to India's Transport Infrastructure.



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.

# Groups – add yourself

The screenshot shows a user interface for managing groups. At the top, there is a navigation bar with links for Home, Gallery, Map, Scene, Groups (which is underlined, indicating it's the active page), Content, and Organization. To the right of the navigation bar are icons for search, notifications, and a user profile. The user profile shows the name "Vanessa Casillas" and the email "VanCasillas@cmc.edu\_cl...". Below the navigation bar is a blue header bar with the word "Groups" on the left, and three tabs on the right: "My Groups", "Featured Groups", and "My Organization's Groups". Underneath the header is a search bar with a placeholder "Search My Groups" and a "Create group" button. On the left side, there is a "Filters" section with a toggle switch for "Only show groups with new membership requests". Below the filters is a dropdown menu for "Owner" with options: "VanCasillas@cmc.edu\_claremont", "Another organization member", and "Someone outside the organization". The main content area displays a single group entry: "QCL Workshop" (owner: VanCasillas@cmc.edu\_claremont, created and last updated on Mar 3, 2022, viewable by Everyone (public)). There is also a "Delete group" link next to the group name.

Home    Gallery    Map    Scene    Groups    Content    Organization

Vanessa Casillas  
VanCasillas@cmc.edu\_cl...

Groups    My Groups    Featured Groups    My Organization's Groups

+ Create group    Search My Groups    Title    Filter

Filters

Only show groups with new membership requests

Owner

VanCasillas@cmc.edu\_claremont  
Another organization member  
Someone outside the organization

1 - 1 of 1

**QCL Workshop**  
Owner: VanCasillas@cmc.edu\_claremont  
Created: Mar 3, 2022   Last updated: Mar 3, 2022   Viewable by: Everyone (public)

Workshop

Delete group

# Planning a Map: a simple map

1. Problem – why are we making a map?
2. Data – what layers do we need?
3. Analysis – what layers do we need to adjust or make?
4. Edits – who is looking at the map?
5. Results – does it tell a visual story?



# Classic ArcGIS

Home ▾ My Map

Details Add Basemap Analysis

About Content Legend

Make your own map

It's easy to make your own map. Just follow these steps:

1. Choose an area.  
Pan and zoom the map to an area or search by its name or address.
2. Decide what to show.  
Choose a Basemap then Add layers on top of it.
3. Add more to your map.  
Add notes to draw features on the map.
4. Save and share your map.  
Give your map a name and description then share it with other people.

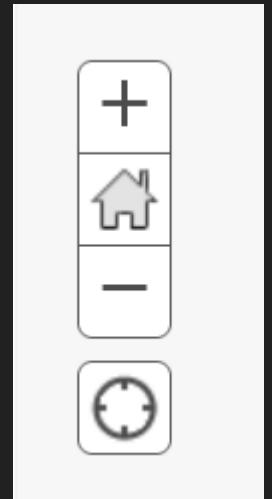
Save Share Print Directions Bookmarks Find address or place

Open in new Map Viewer New Map Vanessa

0 2 4 km

County of Los Angeles, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA | County of Los Angeles, Esri, HERE, Garmin, SafeGraph, METI/NASA, U...

esri

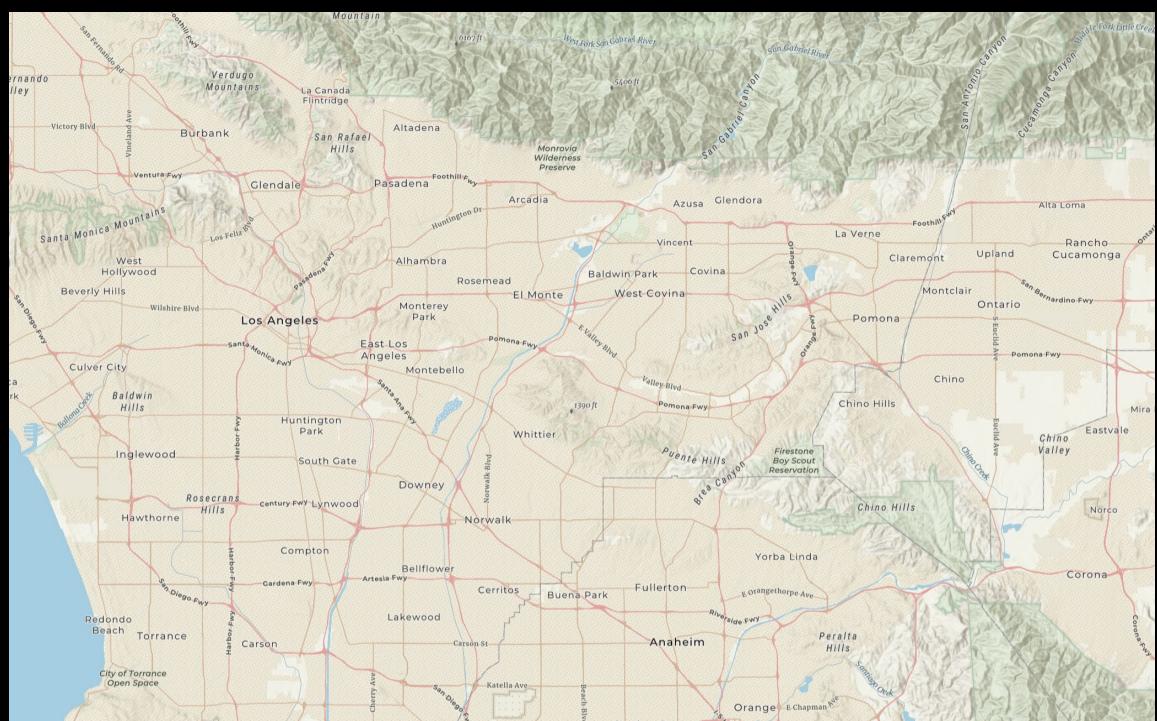


# Base Maps

Basemap | Analysis

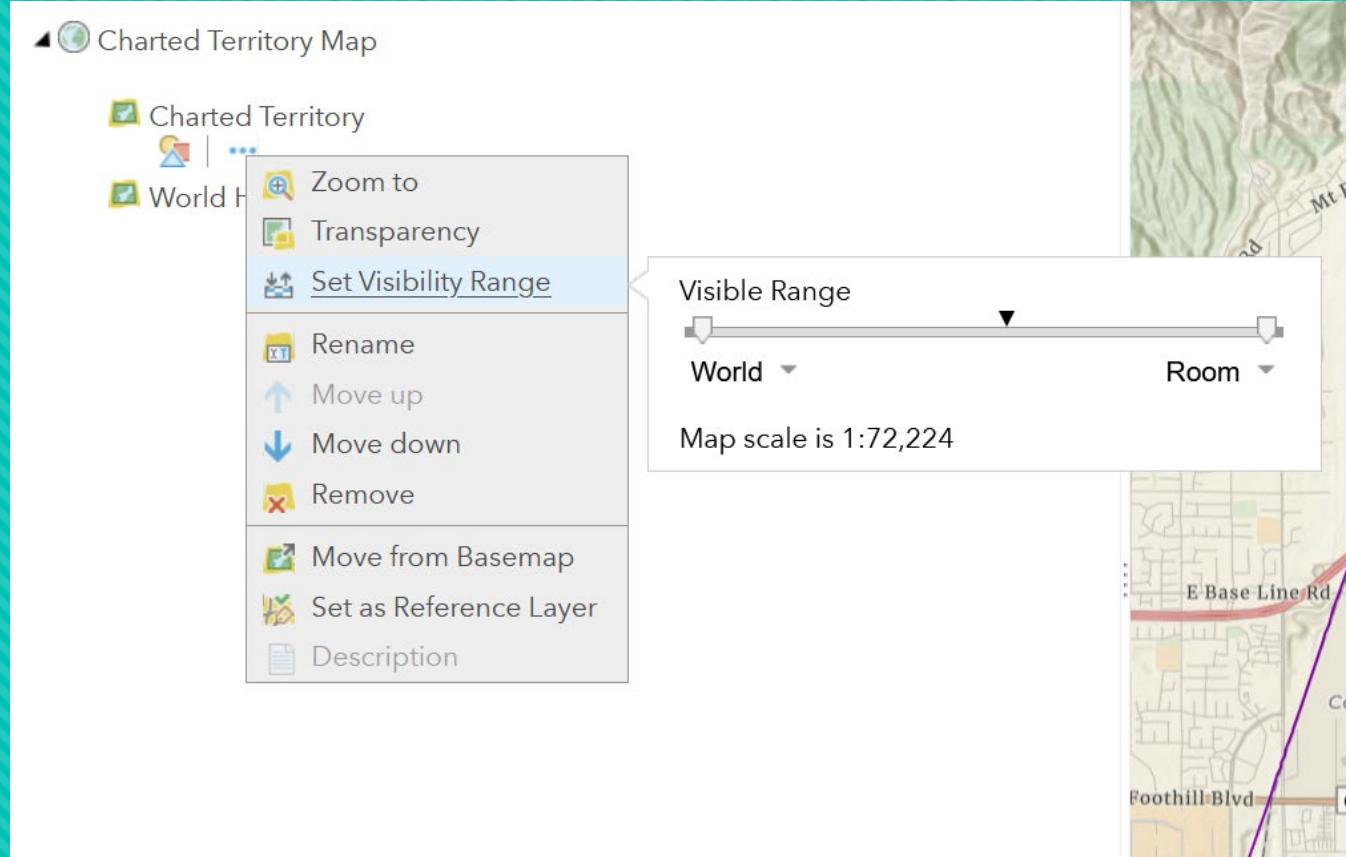
Select a basemap

- BFS Wingtra Aerial Survey
- Charted Territory Map
- Colored Pencil Map
- Community Map
- Dark Gray Canvas
- Dark Gray Canvas
- Firefly Imagery Hybrid
- Human Geography Dark
- Human Geography Map
- Human Geography Map
- Imagery
- Imagery Hybrid



# Base map

Overview



The screenshot shows the 'Living Atlas' search interface with the query 'schools'. It displays four layers listed under the heading '245 layers':

- School District Boundaries - Current**: by National Center for Education Statistics, Updated: 2/18/22
- NZ School Enrolment Zones**: by Eagle Technology Group Ltd, Updated: 10/19/21
- NZ Schools Directory**: by Eagle Technology Group Ltd, Updated: 3/3/22
- U.S. Public Schools (with Placekey)**: by esri\_placekey, Updated: 10/9/20

Each layer entry includes a small thumbnail, the layer name, the source, and the last update date. There are also 'Check' and 'Edit' buttons next to each entry.

The screenshot shows the 'Add' ribbon in a map application. The ribbon tabs include:

- Add** (selected tab, indicated by a yellow background)
- Basemap**
- Map Notes**

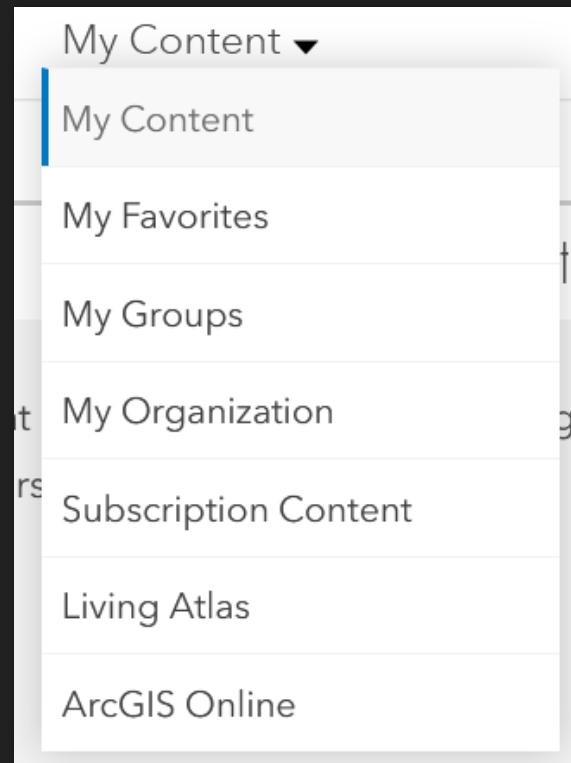
Below the ribbon, there is a search bar labeled 'Search for Layers' and a list of options:

- Search for Layers
- Browse Living Atlas Layers
- Add Layer from Web
- Add Layer from File
- Add Map Notes

# Living Atlas

Layers and layers and layers

# My Content



# Reading Layers and giving credit



School District Boundaries - Current 

Feature Layer by National Center for Education Statistics

Updated: January 6, 2022

 Authoritative 

This composite file contains elementary, secondary, and unified school district boundaries collected for the National Center for Education Statistics by the U.S. Census Bureau.

Description

This composite file contains elementary, secondary, and unified school district boundaries collected for the National Center for Education Statistics by the U.S. Census Bureau.

The National Center for Education Statistics' (NCES) Education Demographic and Geographic Estimate (EDGE) program develops annually updated school district boundary composite files that include public elementary, secondary, and unified school district boundaries clipped to the U.S. shoreline. School districts are single-purpose administrative units designed by state and local officials to organize and provide public education for local residents. District boundaries are collected for NCES by the U.S. Census Bureau to support educational research and program administration, and the boundaries are essential for constructing district-level estimates of the number of children in poverty.

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)

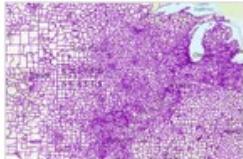
- Title
- Updated
- Description
- Terms of Use
- Credits (Attribution)
- Owner
- Managed by
- View Count
- Created
- Shared with

# Libraries

Living Atlas ▾

Q schools

Items: 238

 School District Boundaries - Current  
by National Center for Education Statistics  
Updated: 1/6/22

☰   

ArcGIS Online ▾

Q claremont

Items: 183

 Claremont City Boundary  
by bsims\_hplanning  
Updated: 10/26/20



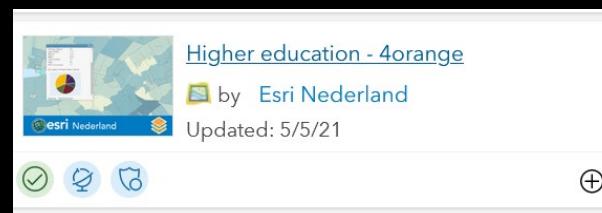
# All fun and games till you run out of Credits!!!

## ○ 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



Add layer

Living Atlas ▾

Q schools

Items: 238

- School District Boundaries - Current  
by National Center for Education Statistics  
Updated: 1/6/22
- NZ School Enrolment Zones  
by Eagle Technology Group Ltd  
Updated: 10/19/21
- NZ Schools Directory  
by Eagle Technology Group Ltd  
Updated: 1/7/22
- U.S. Public Schools (with Placekey)  
by esri\_placekey  
Updated: 10/9/20
- Private School Locations - Current  
by National Center for Education Statistics  
Updated: 10/28/21
- Public School Locations - Current  
by National Center for Education Statistics  
Updated: 6/29/21

# Credits Talk

My settings

General

Licenses

Credits

## Credits

Credits

Remaining **299.50**

Assigned **300.00**

Credits are the currency used across ArcGIS and are consumed for specific transactions and types of storage. Any ArcGIS software that interacts with ArcGIS Online can use credits. Most of what you do in ArcGIS Online does not require credits. In many cases, credit-consuming activities carry a relatively low cost.

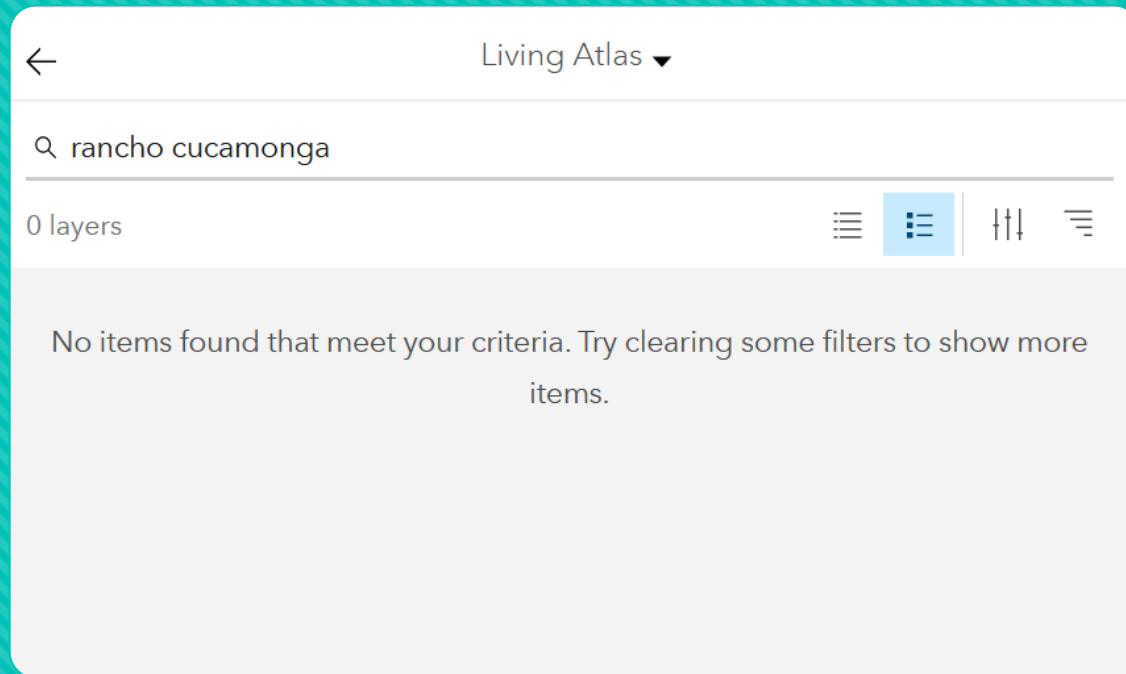
[Learn more about credits](#)

← Living Atlas ▾

Q rancho cucamonga

0 layers

No items found that meet your criteria. Try clearing some filters to show more items.



← ArcGIS Online ▾

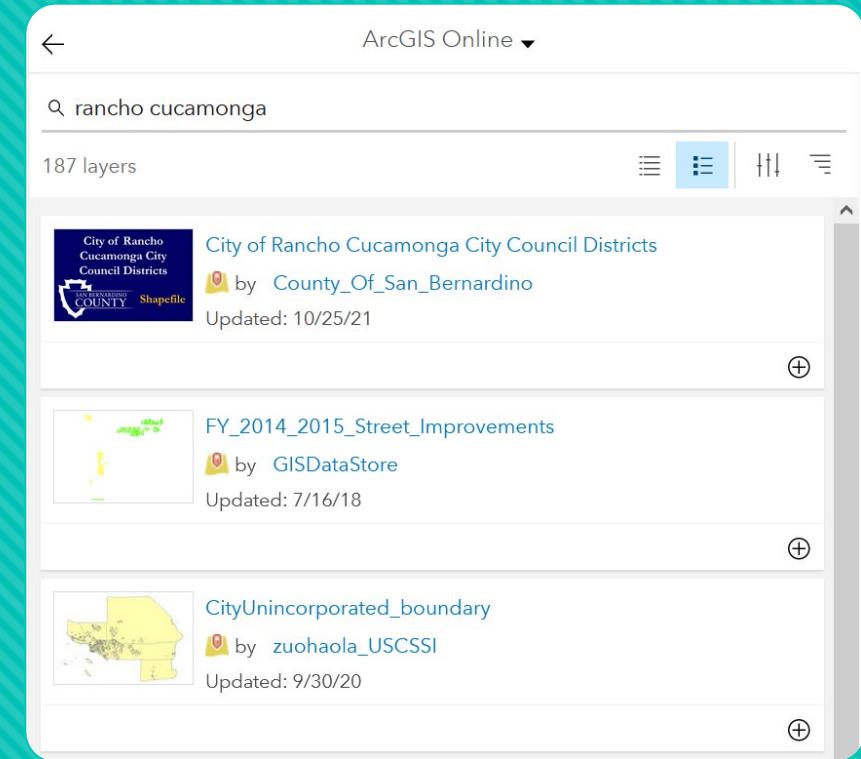
Q rancho cucamonga

187 layers

 City of Rancho Cucamonga City Council Districts  
by County\_Of\_San\_Bernardino  
Updated: 10/25/21

 FY\_2014\_2015\_Street\_Improvements  
by GISDataStore  
Updated: 7/16/18

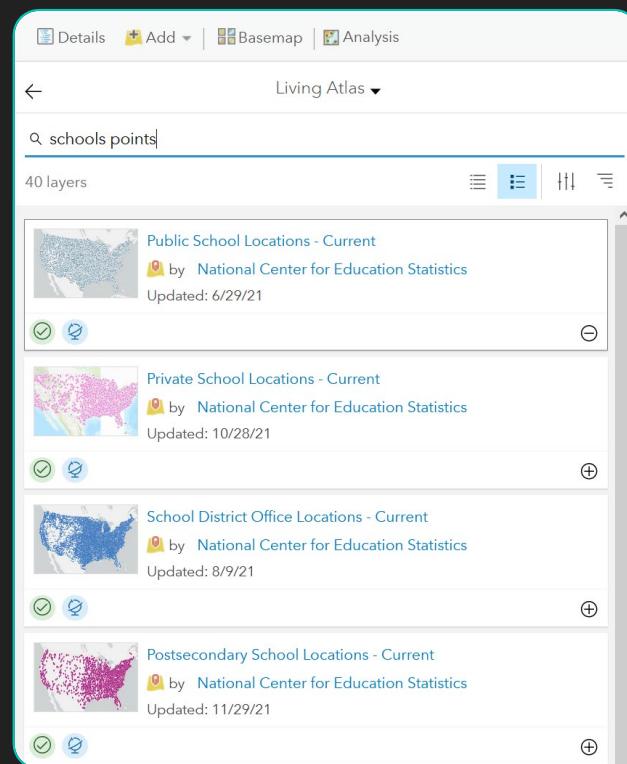
 CityUnincorporated\_boundary  
by zuohaola\_USCSSI  
Updated: 9/30/20



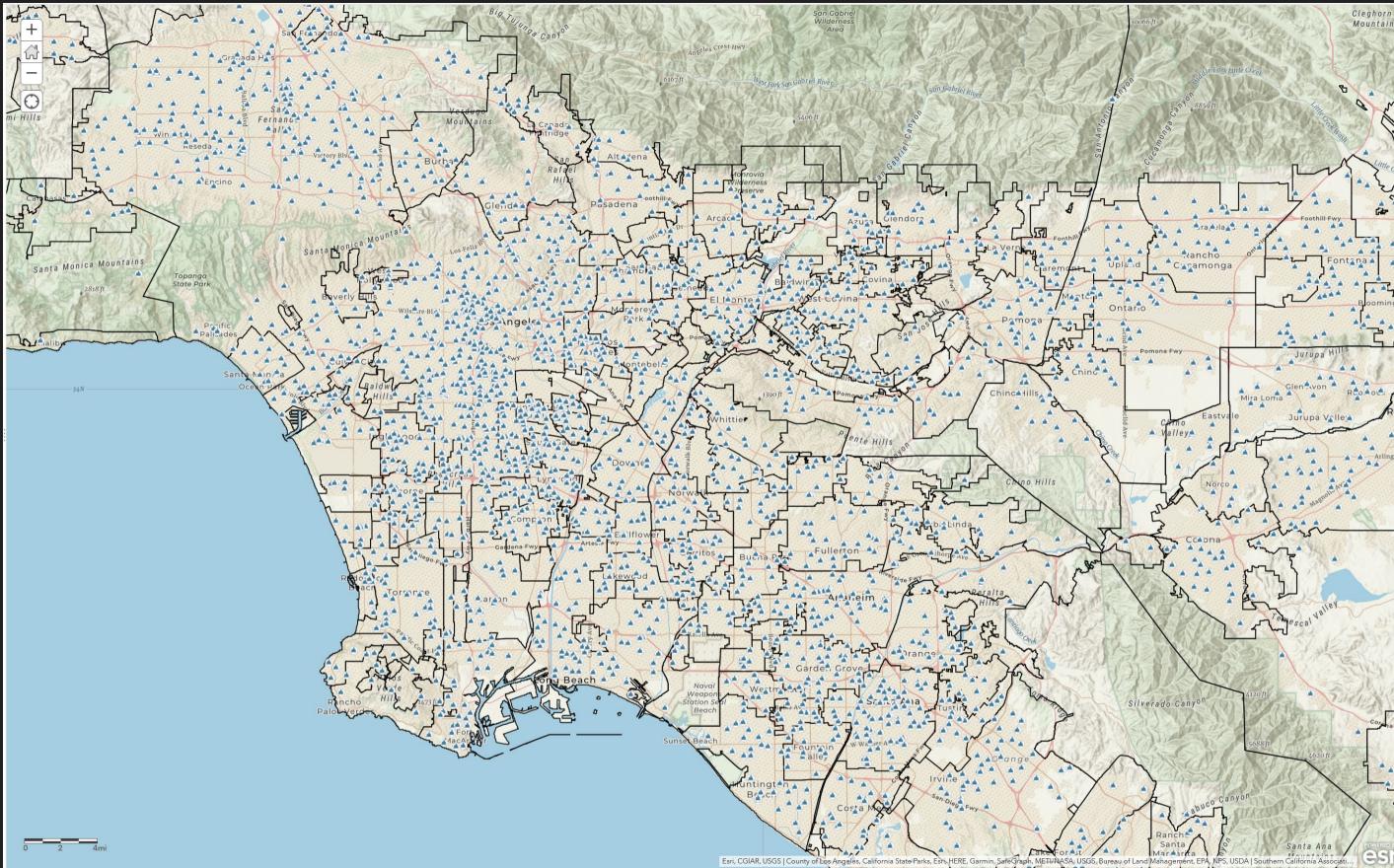
# Rancho Cucamonga

Where to live?

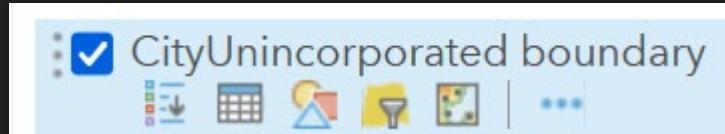
# Schools in the area



# So much information – it hurts my eyes!



# Filter



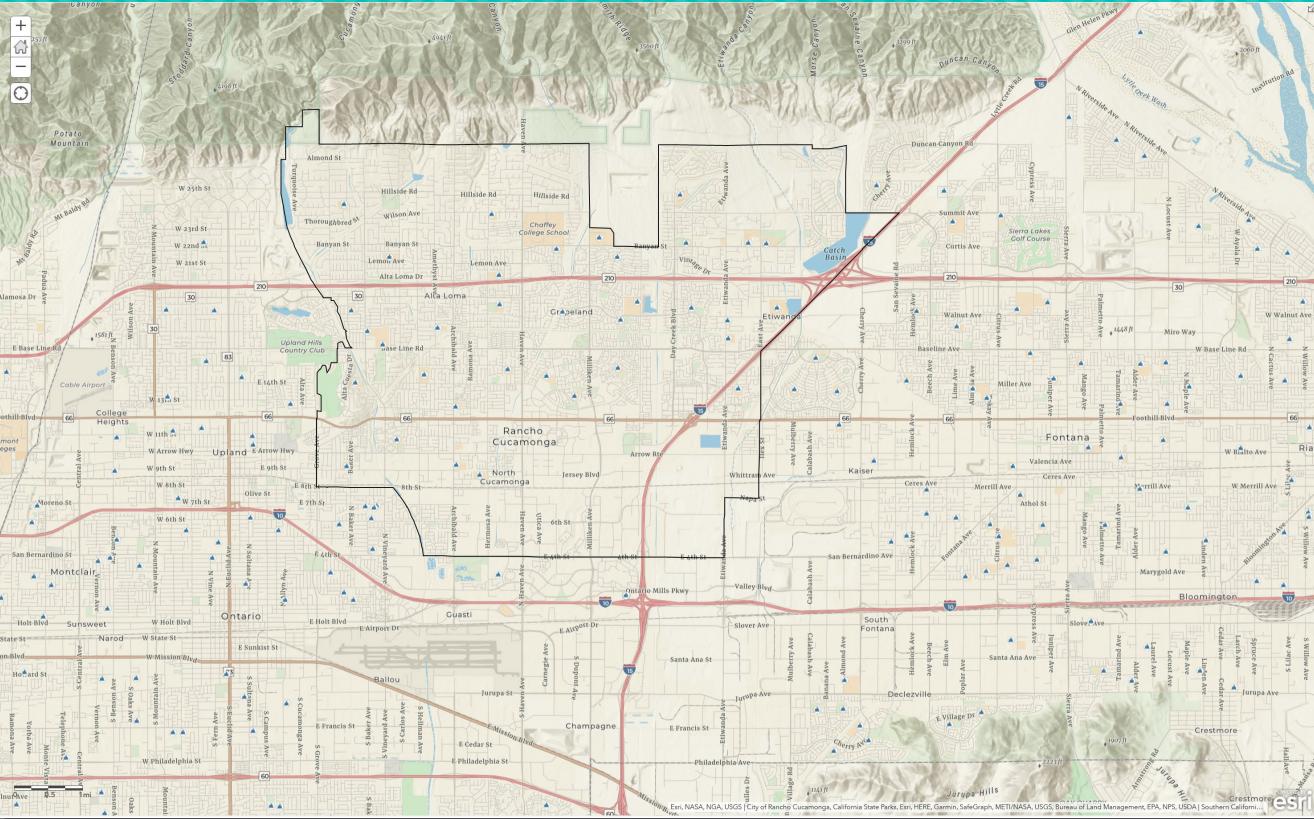
Filter: CityUnincorporated\_boundary

Create + Add another expression  Add a set

Display features in the layer that match the following expression

CITY is Rancho Cucamonga  
 Value  Field  Unique  
 Ask for values

APPLY FILTER APPLY FILTER AND ZOOM TO CLOSE

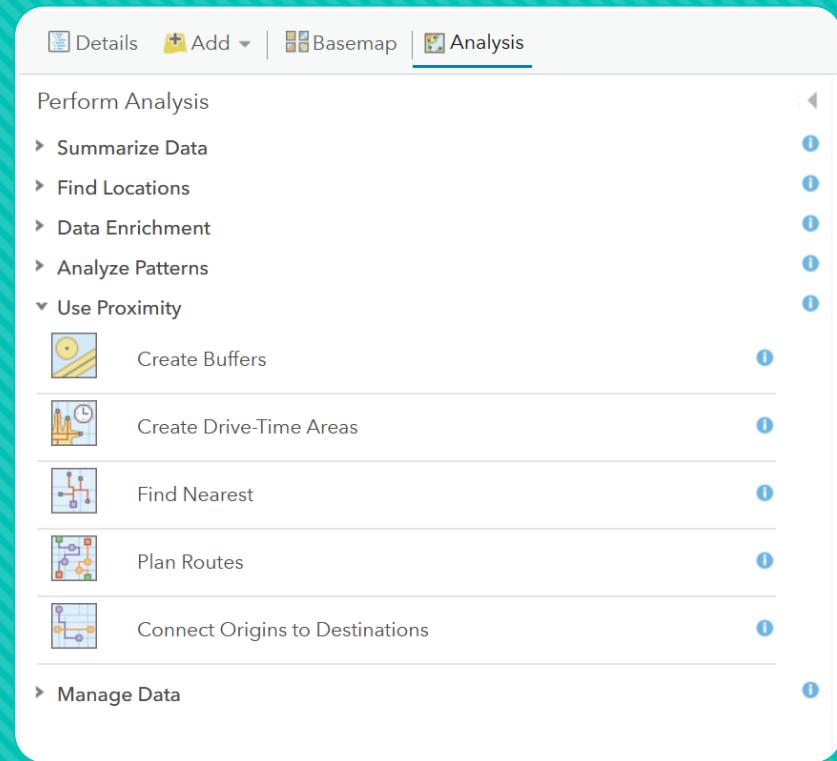
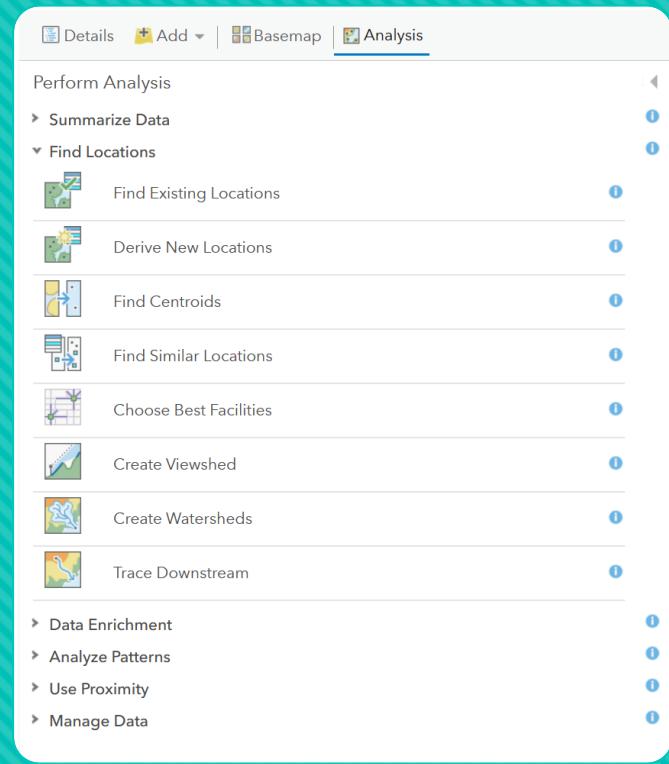


# Result

# Analysis – Making our own layers

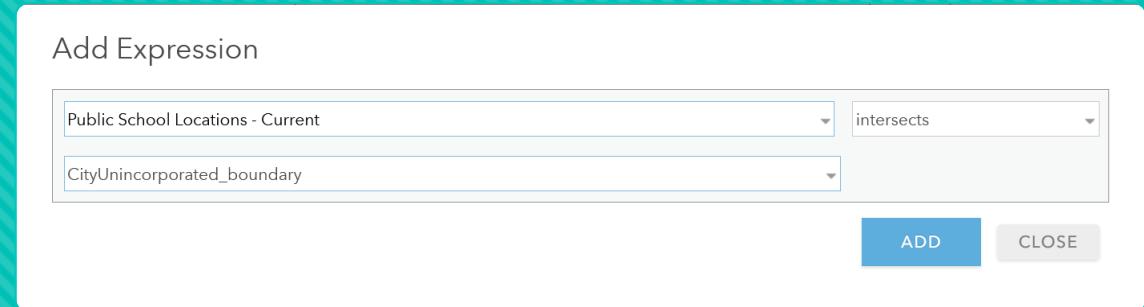
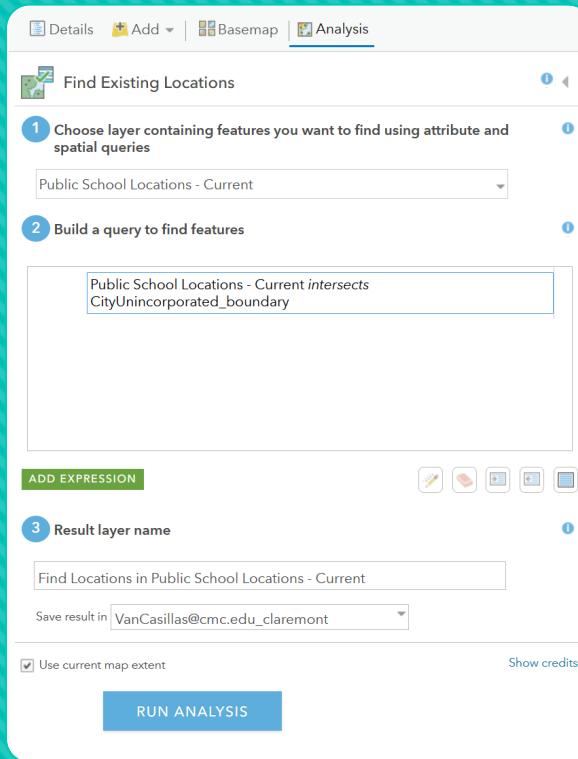
The screenshot shows a map application interface. At the top, there is a navigation bar with four items: 'Details' (selected), 'Add', 'Basemap', and 'Analysis'. Below the navigation bar, there are three buttons: 'About', 'Content' (selected), and 'Legend'. A section titled 'Contents' follows, containing a list of checked items: 'Public School Locations - Current', 'CityUnincorporated boundary', and 'Charted Territory'. There is also a '...' button at the bottom right of the list.

The screenshot shows the same map application interface, but the 'Analysis' tab is now selected in the top navigation bar. The 'Content' tab is no longer selected. Below the navigation bar, there is a list titled 'Perform Analysis' with the following items: 'Summarize Data', 'Find Locations', 'Data Enrichment', 'Analyze Patterns', 'Use Proximity', and 'Manage Data'. To the right of each item in the list, there is a small blue circular icon with a white question mark.



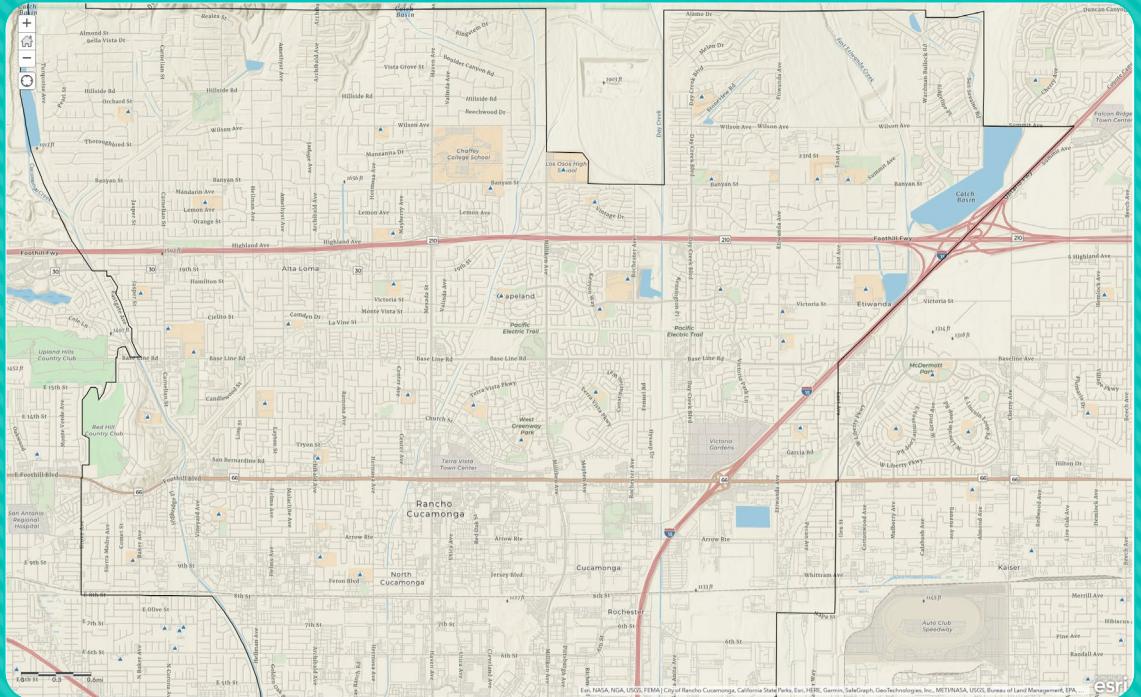
# Analysis

Coolest feature in ArcGIS Online – my opinion



# Adding an Expression

Think about what you want to get as a result



## Credit Usage Report

Total records:

86

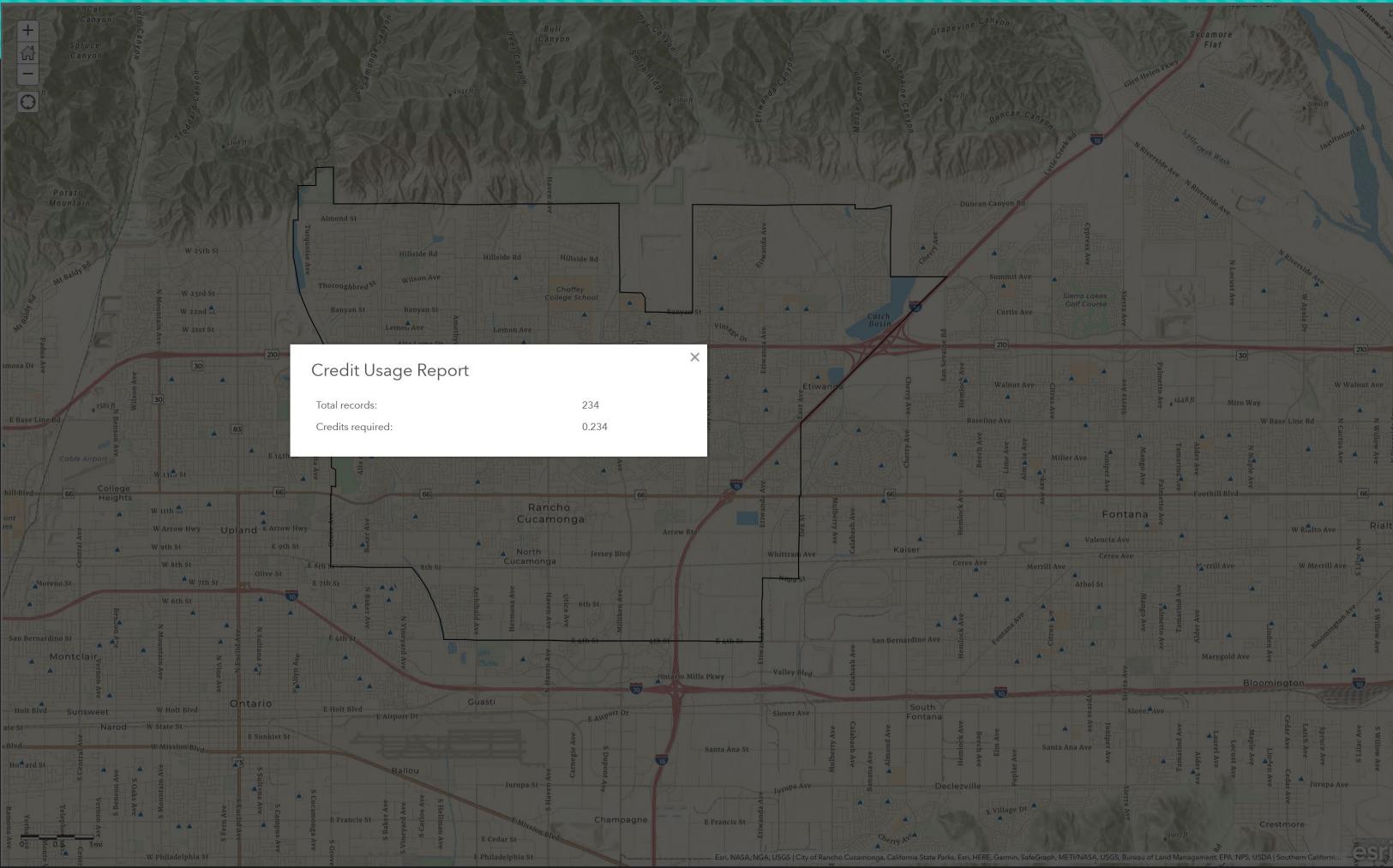
Credits required:

0.086

# Credits...

Always think of credits

# Credits...



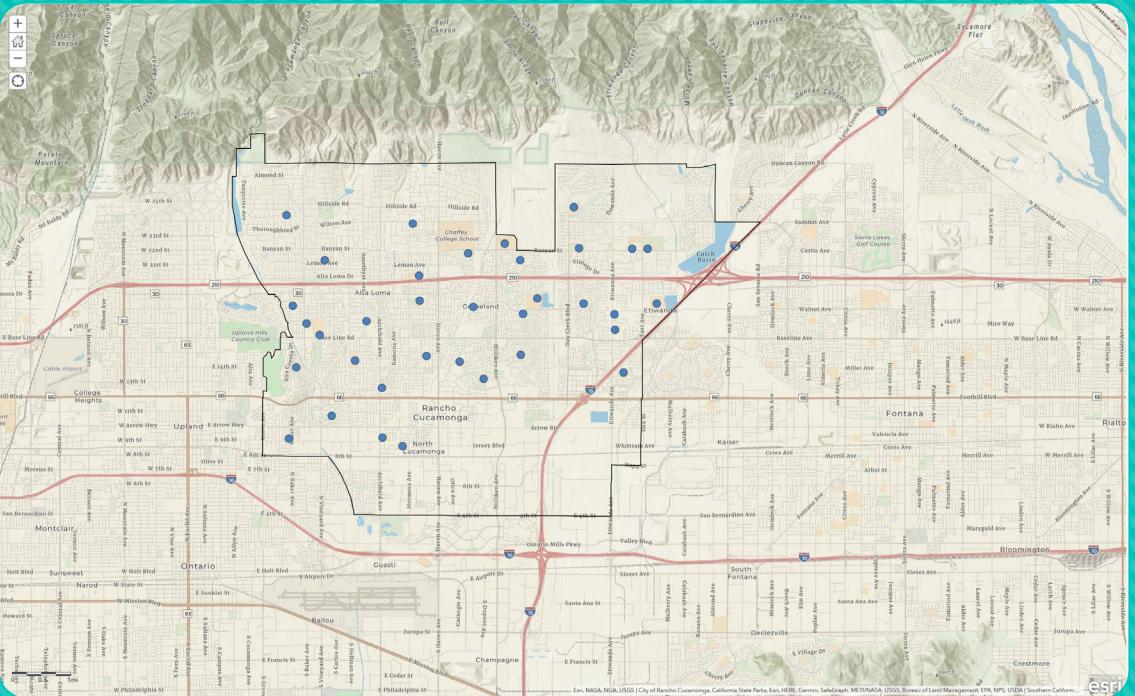
## Home ▾ My Map

Details Add ▾ | Basemap | Analysis

About Content Legend

### Contents

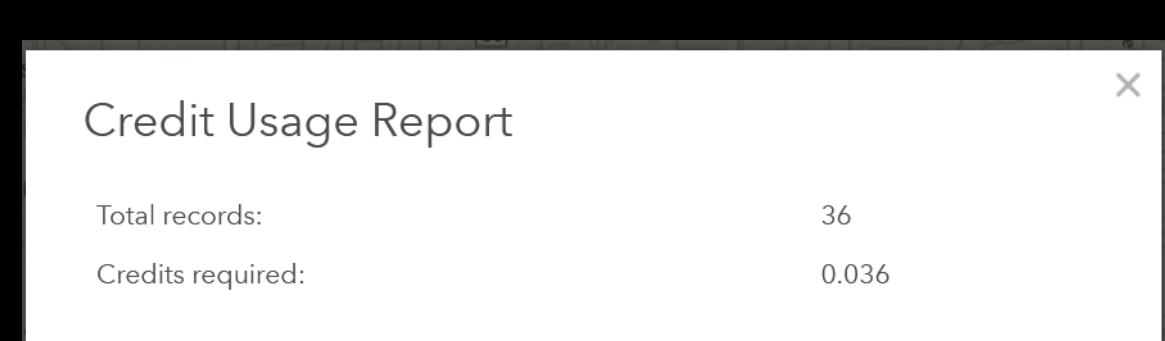
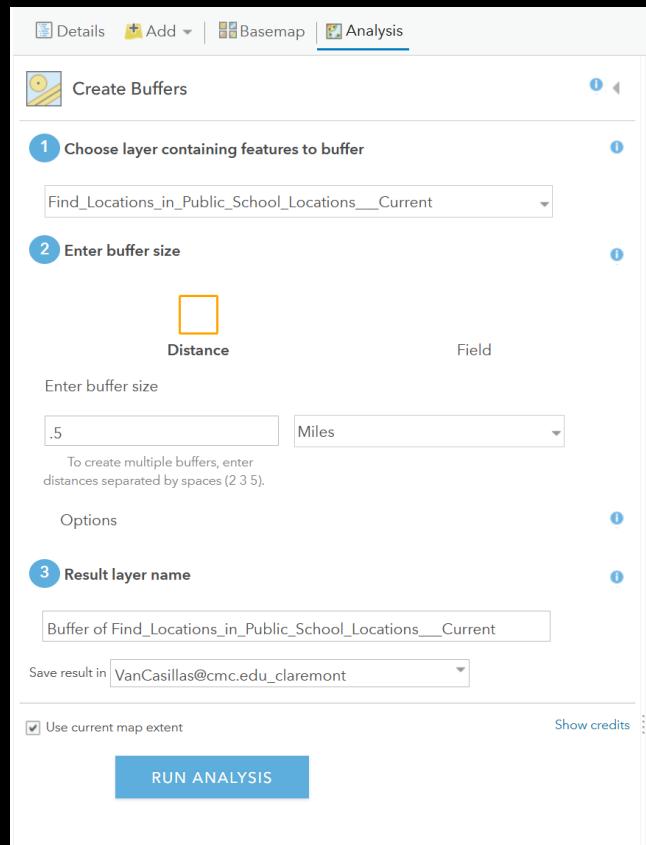
- Points within Boundary
- Public School Locations - Current
- CityUnincorporated boundary
- ▶ Charted Territory



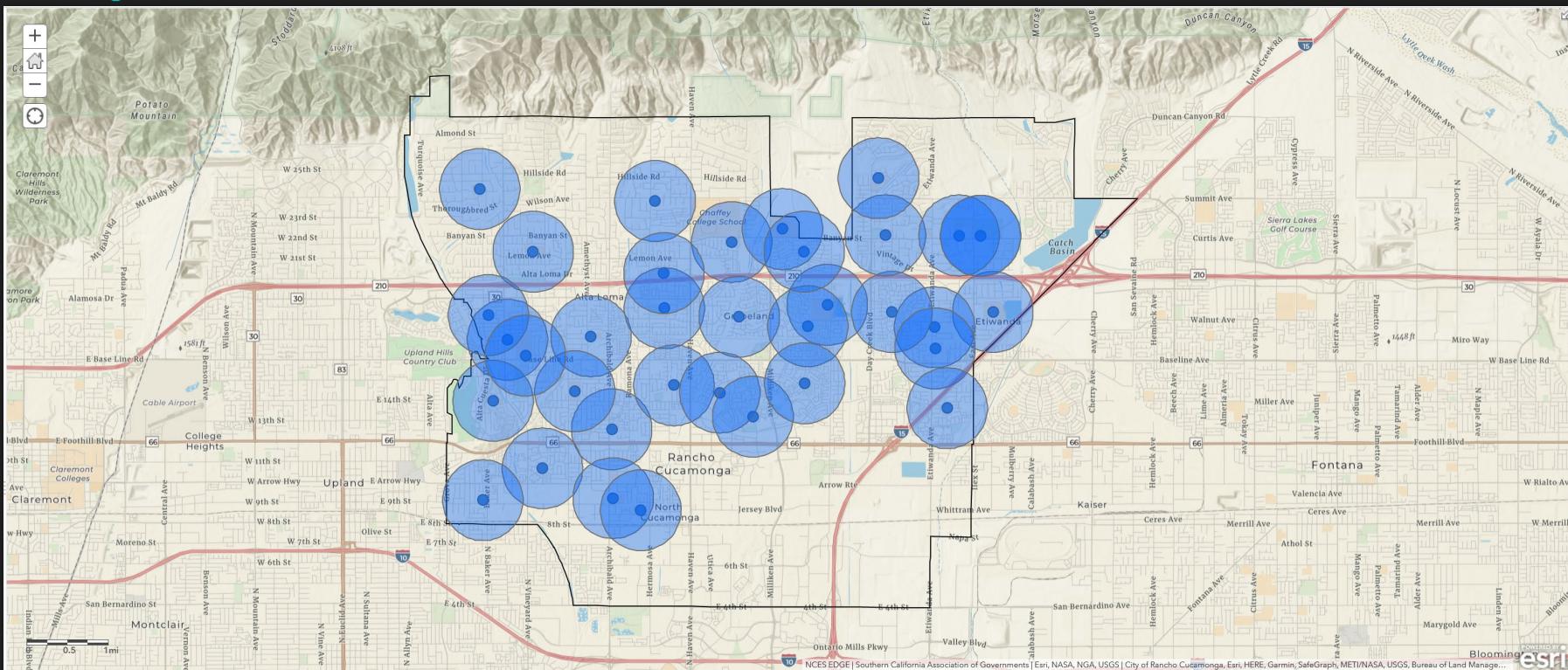
# Result

Points on map – so what?

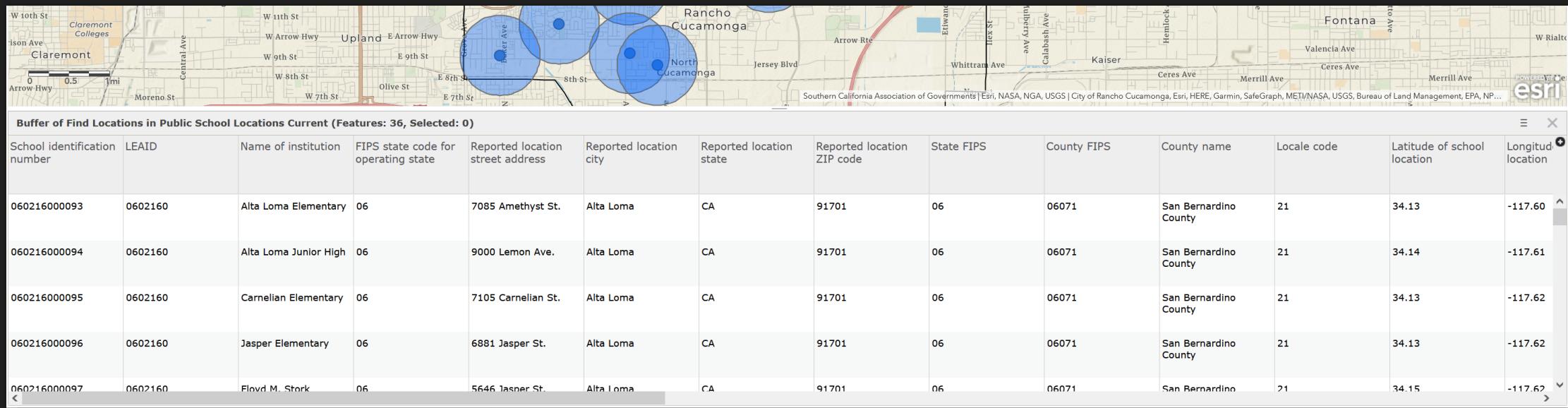
# Create Buffers - Analysis



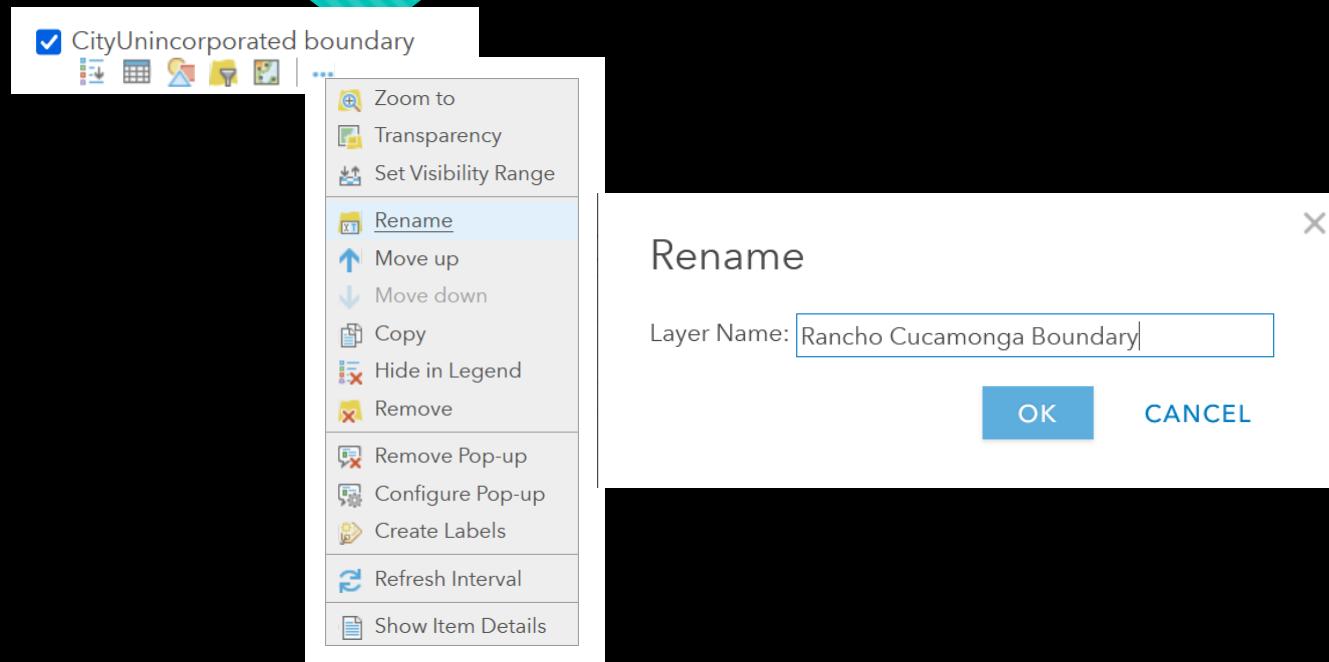
# Result



# Table – Raw data



# Renaming



- Renaming to make more sense to yourself in the future.

# Rancho Cucamonga Boundary Line

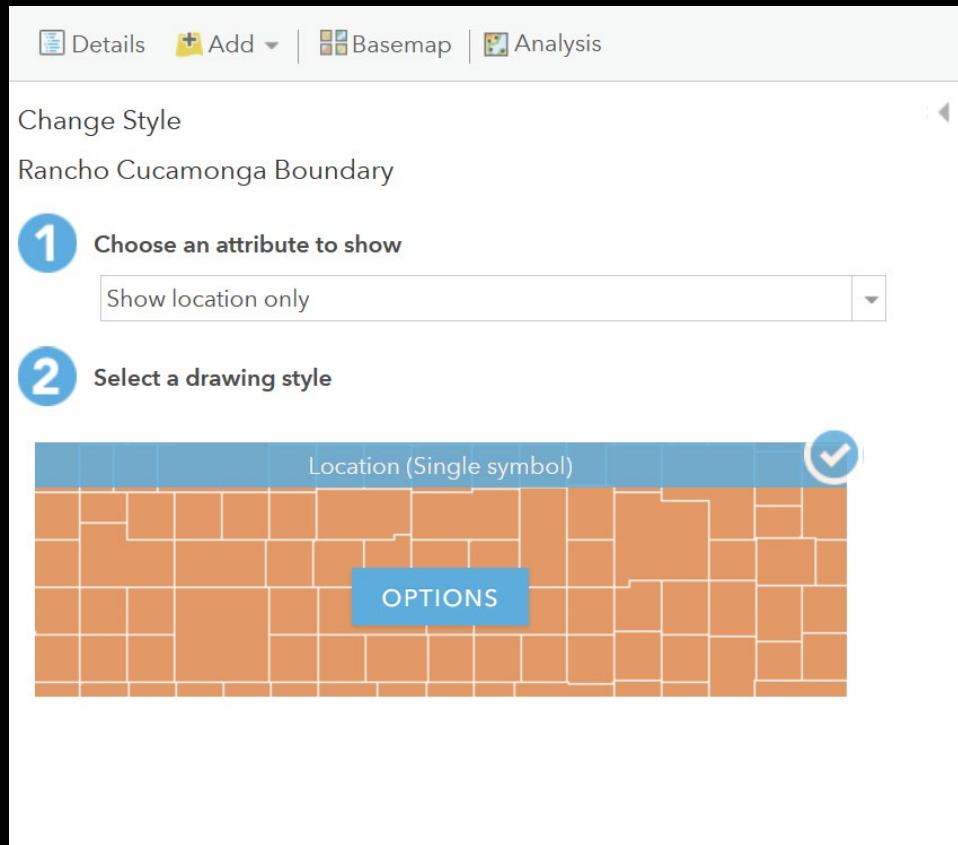
Details Add | Basemap Analysis

Change Style  
Rancho Cucamonga Boundary

1 Choose an attribute to show  
Show location only

2 Select a drawing style

Location (Single symbol)



Details Add | Basemap Analysis

Change Style  
Rancho Cucamonga Boundary

Showing Location Only

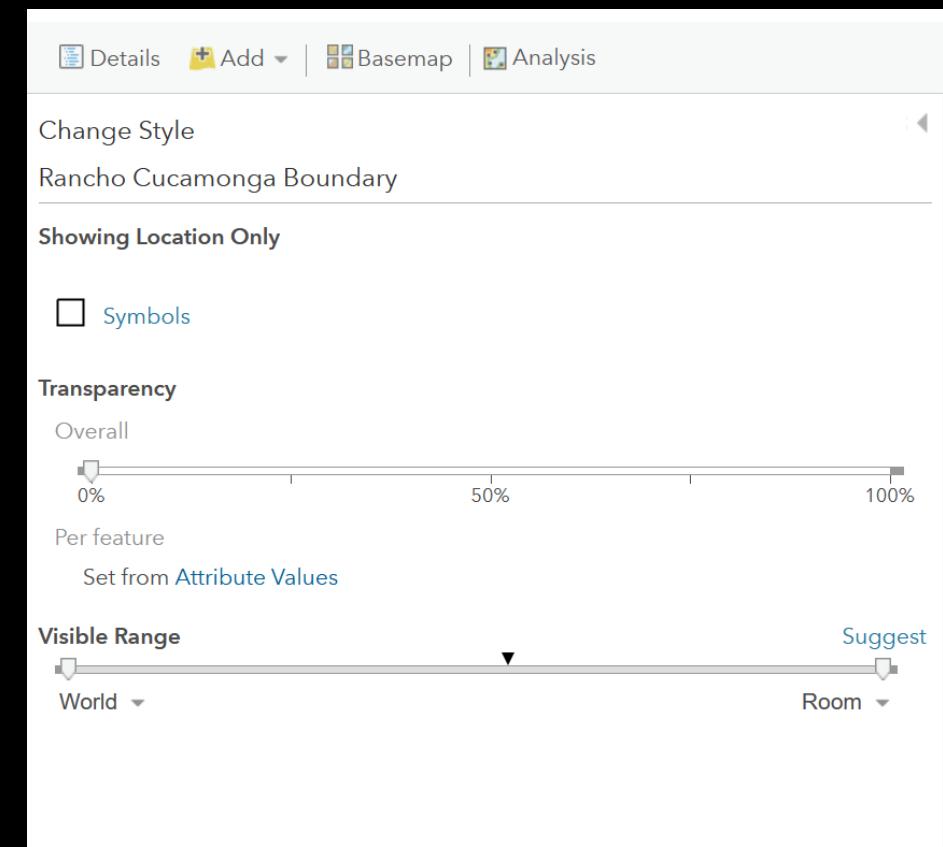
Symbols

Transparency

Overall  0% 50% 100%

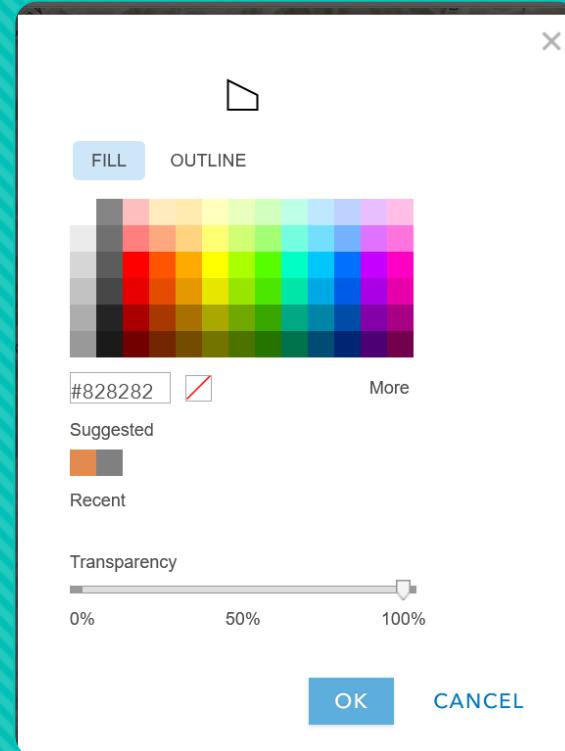
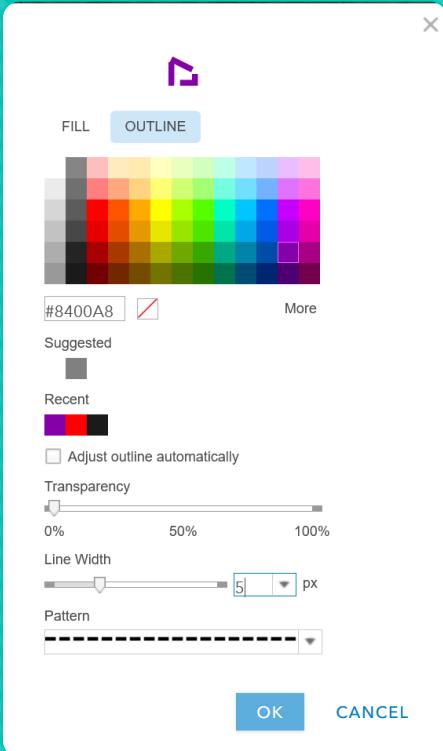
Per feature Set from Attribute Values

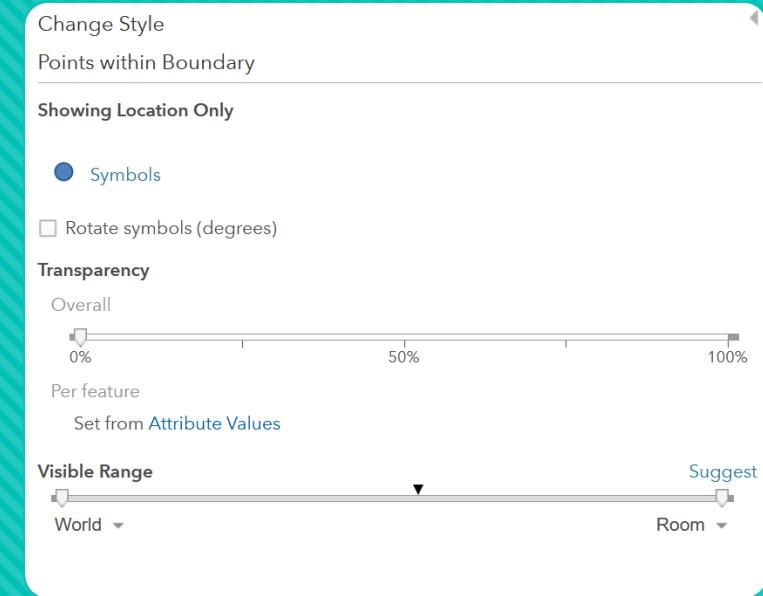
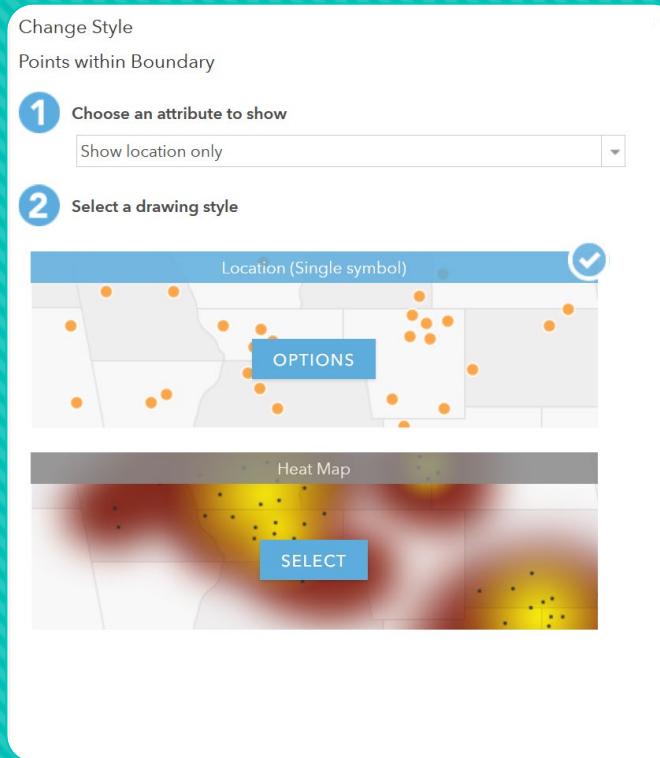
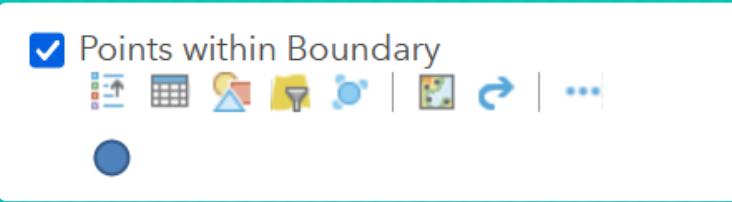
Visible Range  World Suggest Room



# Be Picky

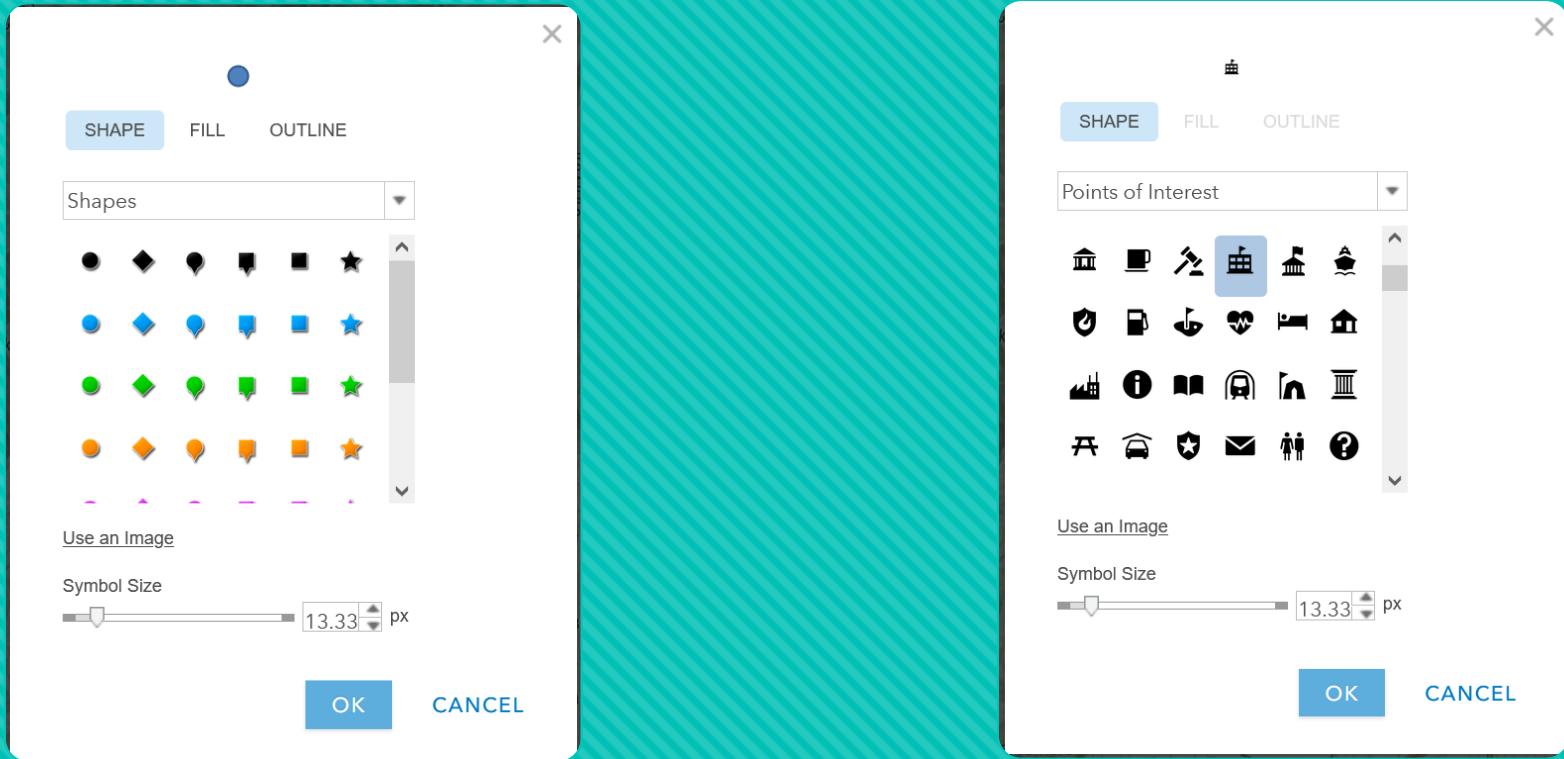
What will catch the eye?





# RC Public Schools

## Symbols

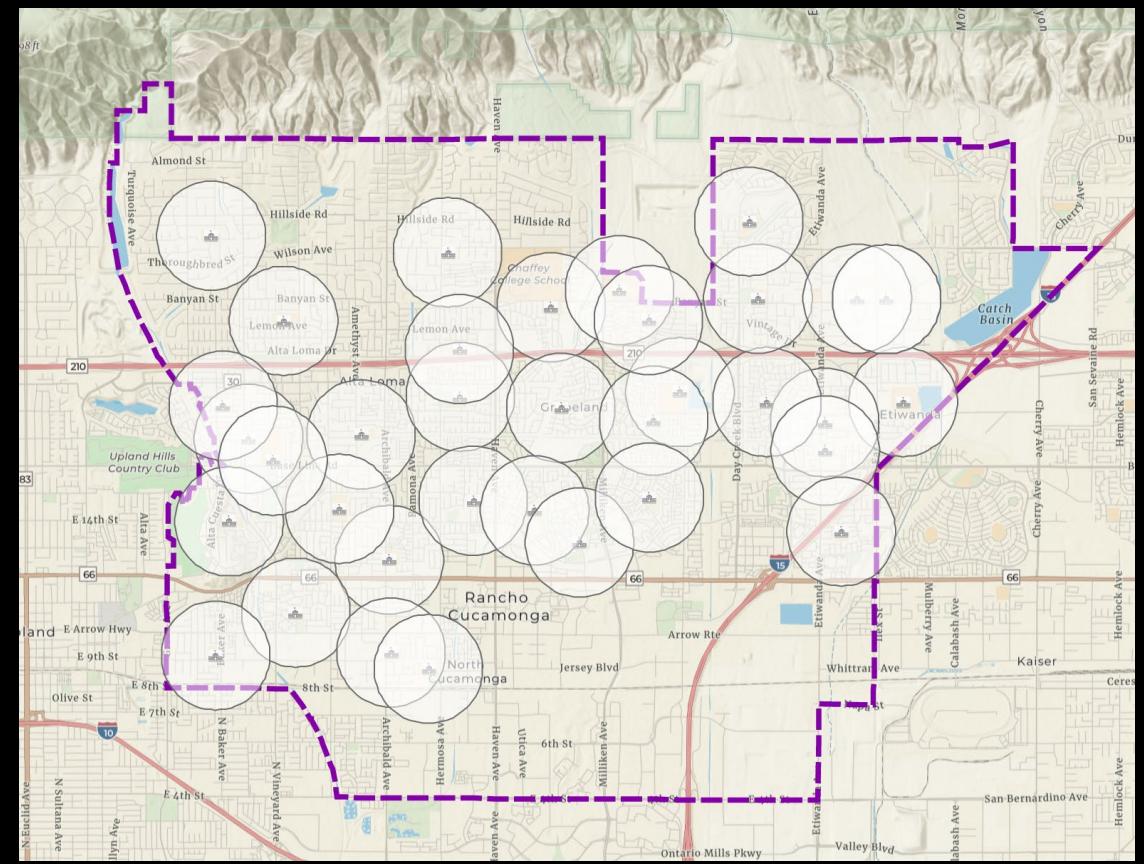
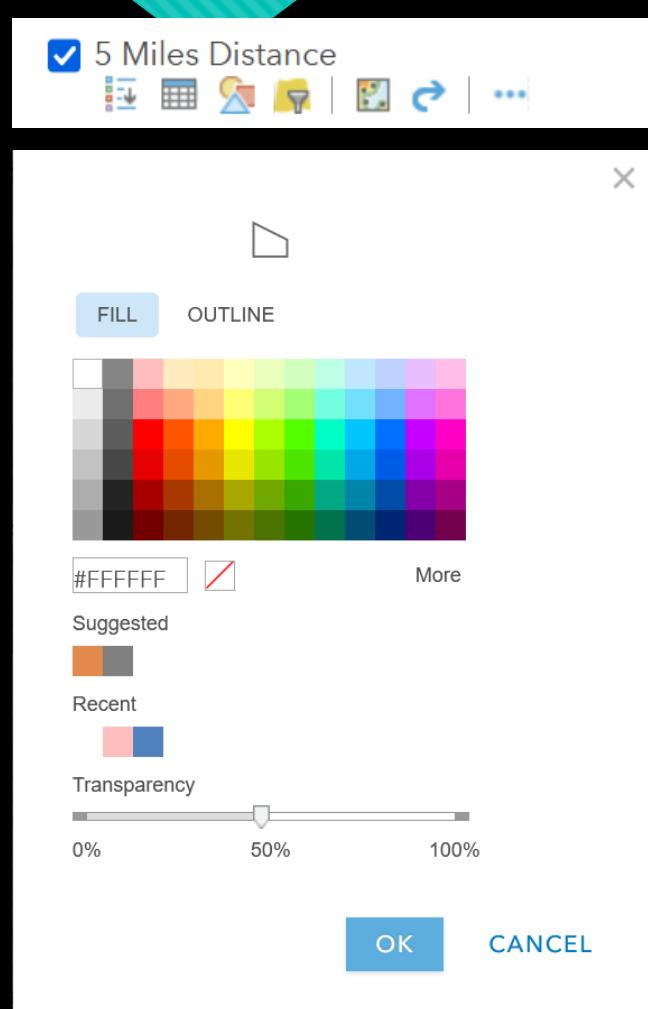


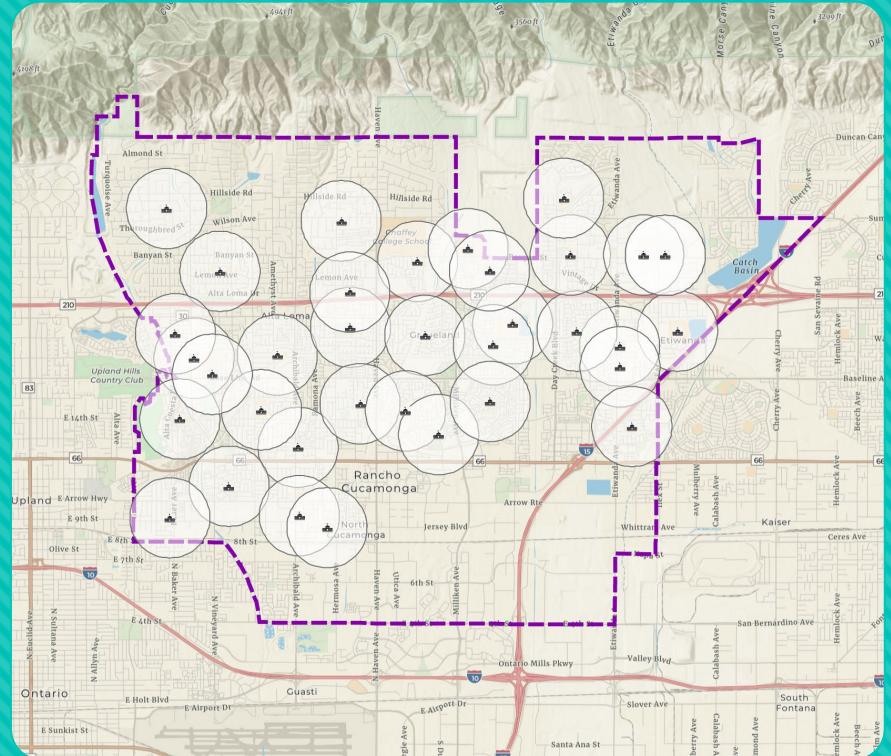
# Default Image

Which will be quick for the eye?

# Be Picky

⌚ Watch out for your overlapping layers





Details Add Basemap Analysis

About Content Legend

### Contents

- Points within Boundary
- 5 Miles Distance
- Rancho Cucamonga Boundary
- Public School Locations - Current
- Charted Territory
- ...

# Moving Layers Around

What is your story?

**Create Drive-Time Areas**

1 Choose point layer to calculate drive-time areas around  
RC Public Schools

2 Measure  
Walking Distance .5 Miles

To output multiple areas for each point, type sizes separated by spaces (2 3 5 5).

Select barrier layers

Travel direction:  
Away from Facility Towards Facility

3 Areas from different points  
Overlap Dissolve Split

Show unreachable areas as holes

4 Result layer name  
Travel from RC Public Schools (.5 Miles)

Include reachable streets

Save result in VarCasillas@cmc.edu\_claremont

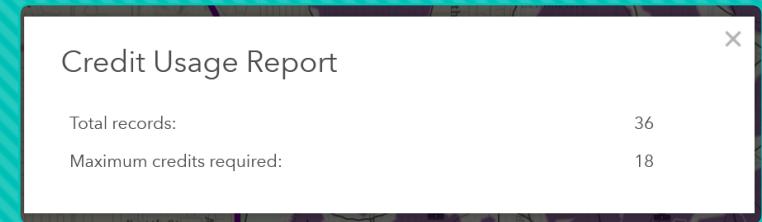
Use current map extent

RUN ANALYSIS

Details Add Basemap Analysis

Perform Analysis

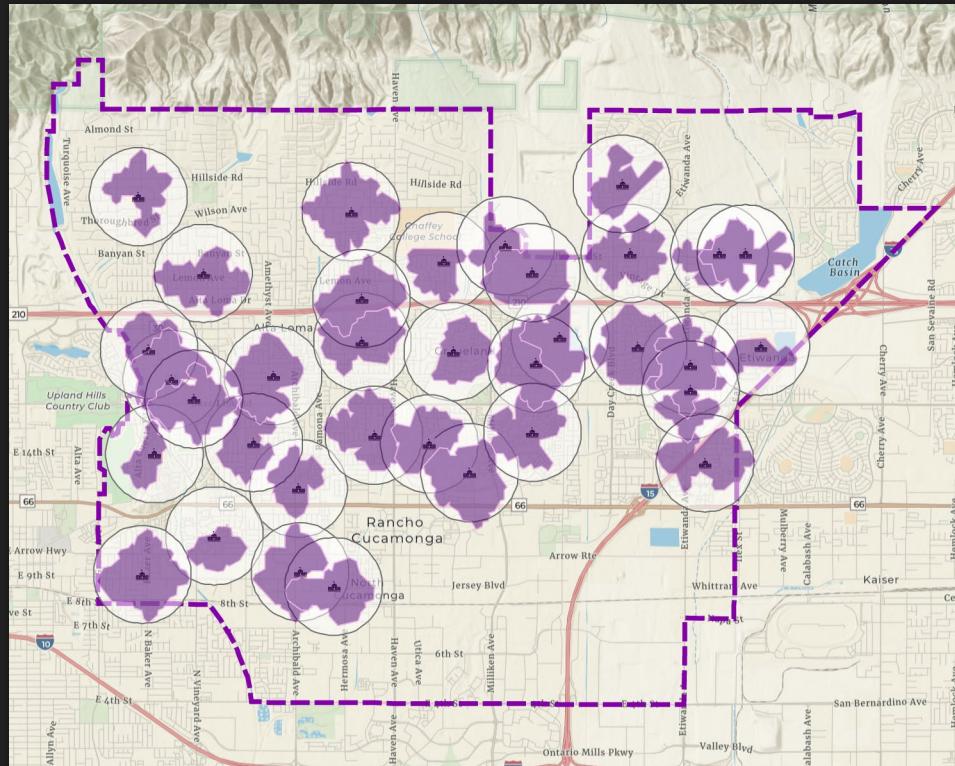
- Summarize Data
- Find Locations
- Data Enrichment
- Analyze Patterns
- Use Proximity
  - Create Buffers
  - Create Drive-Time Areas
  - Find Nearest
  - Plan Routes
  - Connect Origins to Destinations
- Manage Data



# Create Drive-Time Feature

Make sure to check your credits

# A better visual story



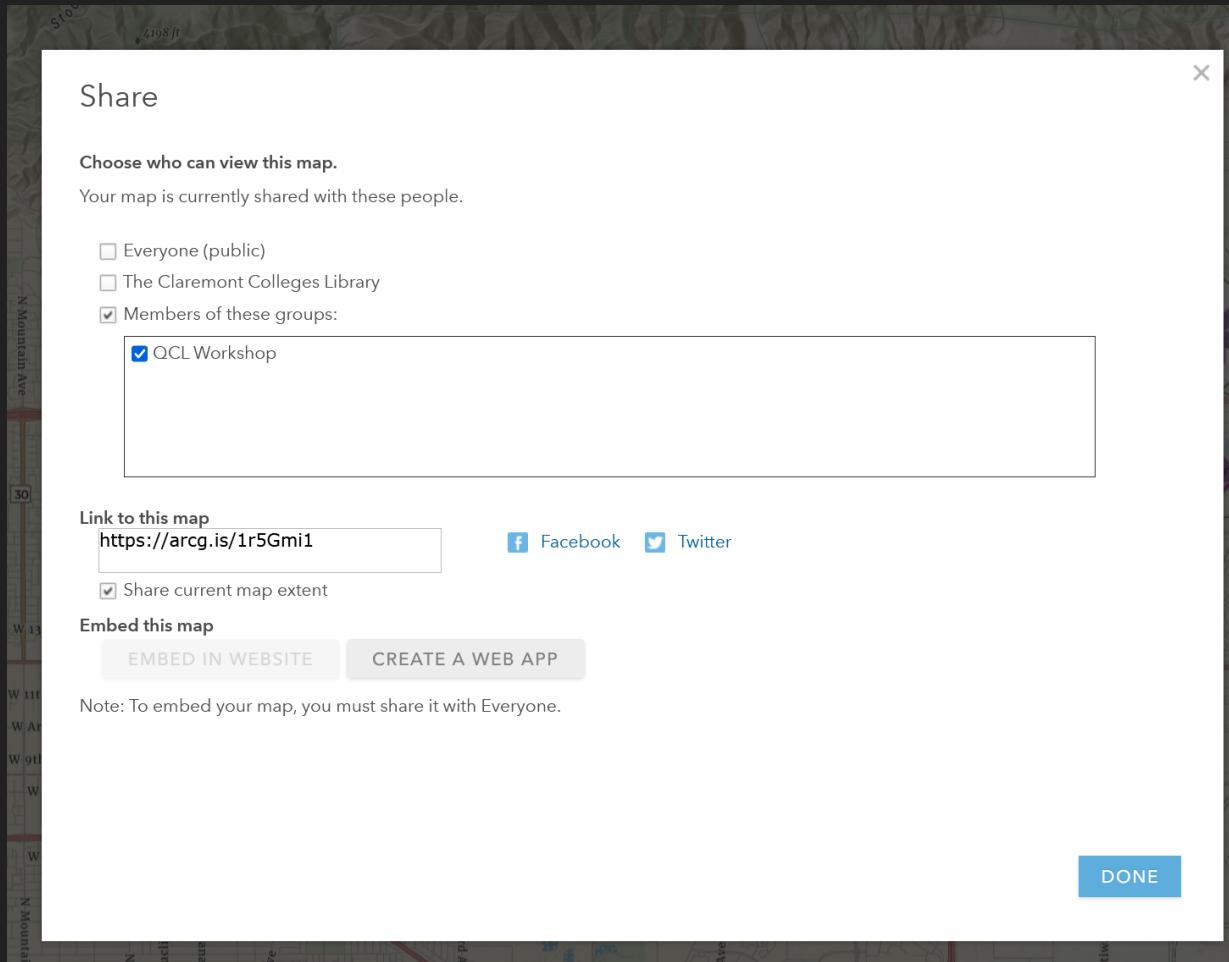
# Legend and Save

The screenshot shows a map application interface. At the top, there are navigation tabs: Details (selected), Add, Basemap, and Analysis. Below these are three buttons: About, Content, and Legend, with Legend being the active tab. The main area is titled "Legend". It contains four entries:

- Travel\_from\_Points\_within\_Boundary\_(5\_Miles)**: Represented by a purple triangle icon.
- Points\_within\_Boundary**: Represented by a blue square icon.
- \_5\_Miles\_Distance**: Represented by a yellow triangle icon.
- Rancho Cucamonga Boundary**: Represented by a purple dashed line icon.

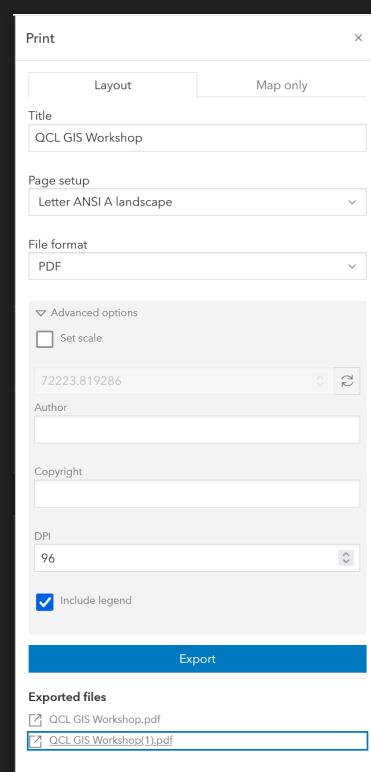
The screenshot shows a map application interface with a "Save" button highlighted. A dropdown menu is open, showing two options: "Save" and "Save As". Other buttons visible in the top bar include: Save, Share, Print, Directions, Measure, Bookmarks, and Open in new Map Viewer.

# Share

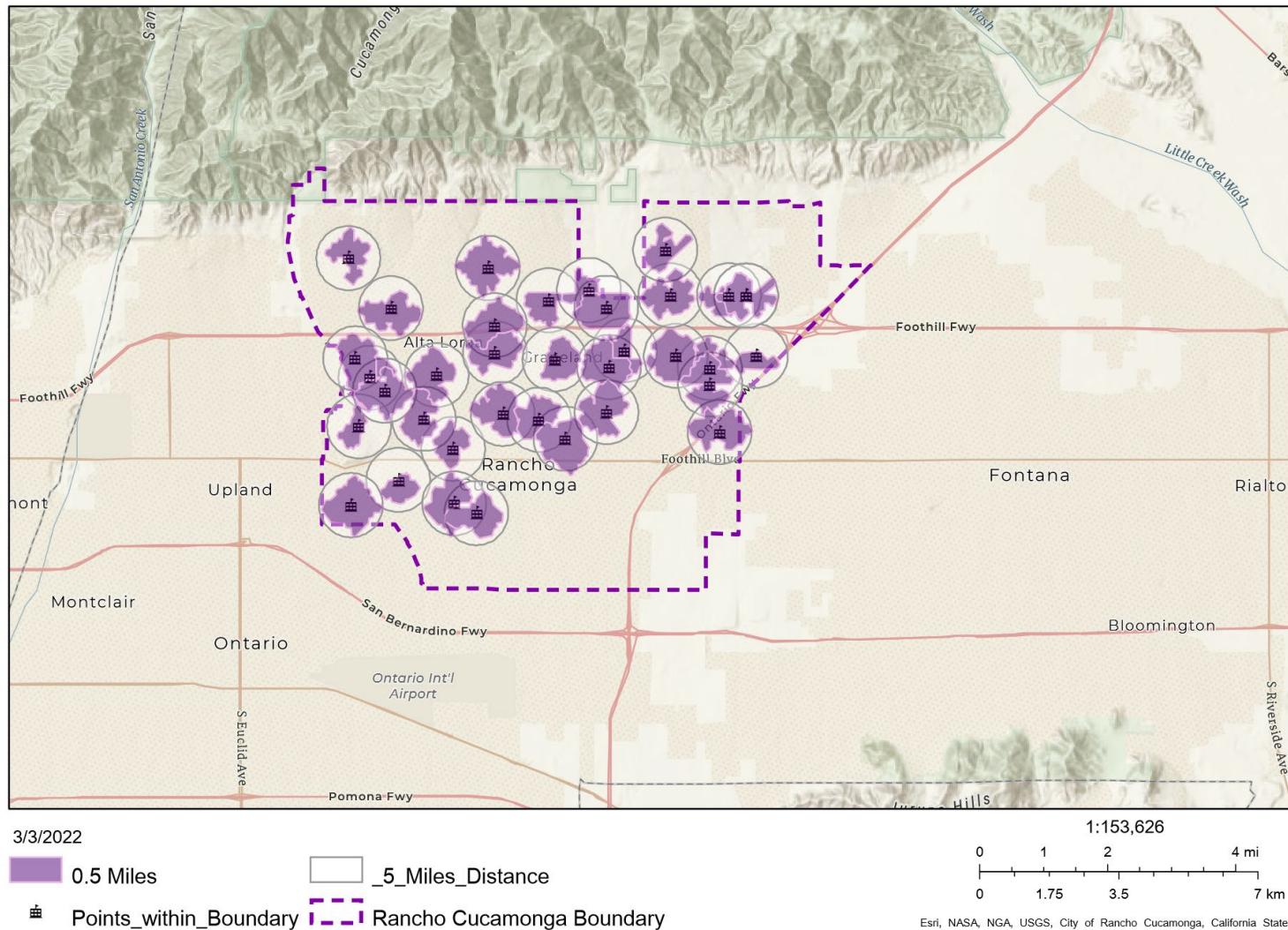


# Printing a Map

Go to New ArcGIS Online Map



## QCLworkshop Map



# Edit your Layers Information

The screenshot shows the ArcGIS item page for a feature layer titled "Travel\_from\_RC\_Public\_Schools\_(.5\_Miles)". The page includes sections for Overview, Data, Visualization, Usage, and Settings. The Overview section displays a thumbnail of the data, a description ("Feature layer generated from Create Drive Times"), credits ("Feature Layer (hosted) by VanCasillas@cmc.edu\_claremont"), and metadata like creation date (Jan 7, 2022), update date (Jan 7, 2022), and view count (10). A "Edit thumbnail" button is available. The right sidebar contains a context menu with options like Open in Map Viewer, Open in Scene Viewer, Open in ArcGIS Desktop, Publish, Create View Layer, Export Data, Update Data, Share, and Metadata. Below the menu is an "Item Information" section with a progress bar for improvement (Low to High) and a note to "Add a longer summary". The "Details" section lists source as Feature Service, last updated on Jan 7, 2022, at 12:59:29 PM, size as 2 KB, and attachments as 0 KB. It also shows a 5-star rating and social sharing icons for Facebook, Twitter, and LinkedIn. The "Owner" section shows "VanCasillas@cmc.edu\_claremont". The "Folder" section shows the item is in "VanCasillas@cmc.edu\_claremont". The "Categories" section indicates "This item has not been categorized". The "Tags" section lists "Analysis Result, Drive Times, RC Public Schools". The "Credits (Attribution)" section asks to "Acknowledge this item's source". The "URL" section provides the service URL: <https://services.arcgis.com/fVnyNwbpF>.

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

# Homework – Be Creative

- Make a map using the City of Claremont or the Claremont colleges
  - Share it to the group receive create

# GIS 2

- Continuing adding to map and looking at features
  - What makes a good map?
    - Labels
    - Colors
    - Scales
  - Importing your own data
    - Cleaning data before import
    - Having the right information for import
    - Talk about SQL, Excel and Tables
    - Charts and Graphs
  - Exporting into another ESRI program: Story Maps

# Resources

ESRI: <https://www.esri.com/en-us/home>

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

# Contact

- QCL: QCL@cmc.edu
- Vanessa: vanessa.casillas@claremontmckenna.edu