

UA Libraries Data Cooperative Unit's

GIS TUTORIALS

DATA WRANGLING AND CREATING NEW GEOSPATIAL DATA

NONE

SOFTWARE USED

2

TUTORIAL NUMBER



DIFFICULTY LEVEL



LEVEL OF STOKE

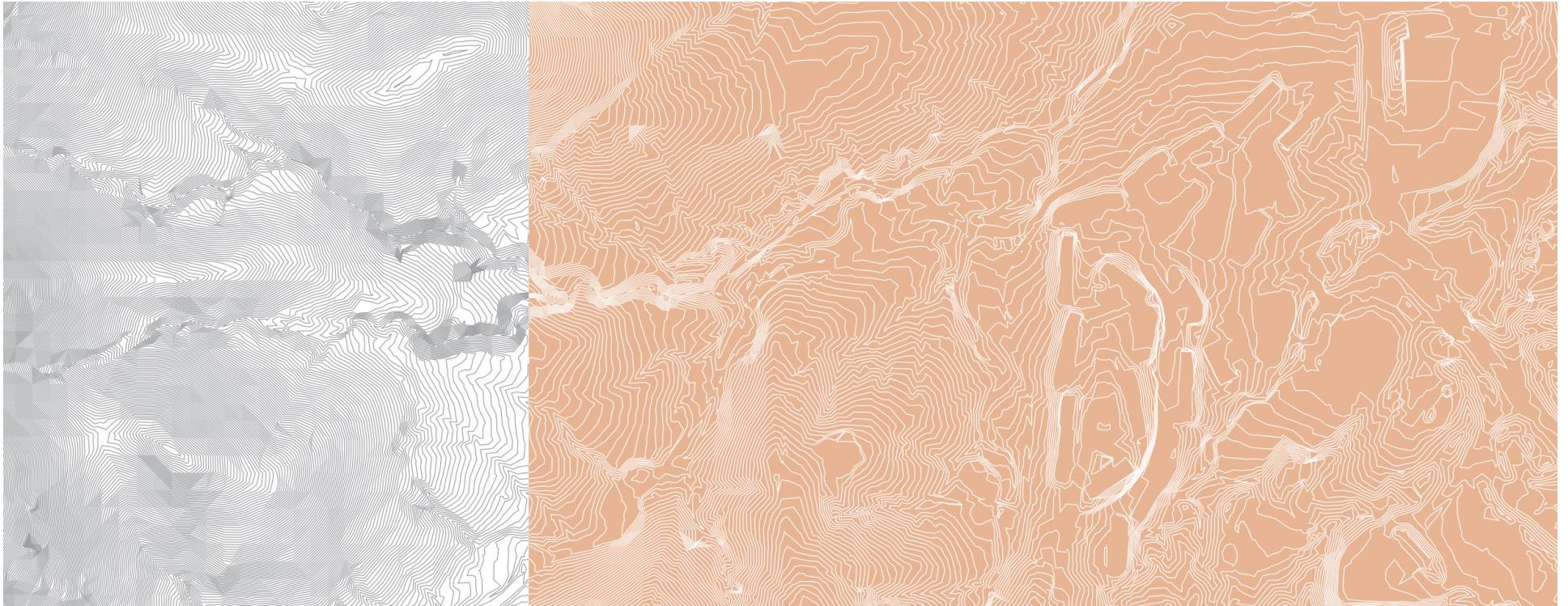


HARDWARE NEEDED:

desktop or laptop computer
internet connection

SOFTWARE NEEDED:

none



INTRODUCTION

2

The purpose of this tutorial is to teach you how to do basic data wrangling tasks in ArcGIS Online. Often-times when you download secondary (data that is collected by someone else) GIS data it may be larger than the study area that you are interested in, or contain observations that may not be useful to the analysis that you are going to undertake. Most, if not all, GIS projects contain some form of data wrangling tasks that will provide you with geospatial data that is more relevant to your intended project.

Please note: This tutorial is a continuation of the previous tutorial, please refer to this tutorial in order to follow this tutorial in its entirety.

Upon completion of this tutorial, you should be comfortable:

1. Use the data table to create a subset of geospatial data based on different query types.
2. Use location and extraction tools to create a subset of data based on geographic locations.

REOPENING A PREVIOUS PROJECT

Reopen the ArcGIS Online map you created in the previous tutorial and make sure the following Hosted Feature Layers are added to the map (you may have different names):

Western US Dams
Arizona Major Water Courses
Arizona Water Basins

1. In the Content toolbar open up the layers pane and click on the options icon next to your dams Hosted Feature Layer.

Click on Show table.

2. The table contains all the attributes (characteristics) of the individual feature and is displayed as a table of rows (features) and columns (attributes) contained within the Hosted Feature Layer

ATTRIBUTE TABLES:

Attribute tables consist of the following characteristics:

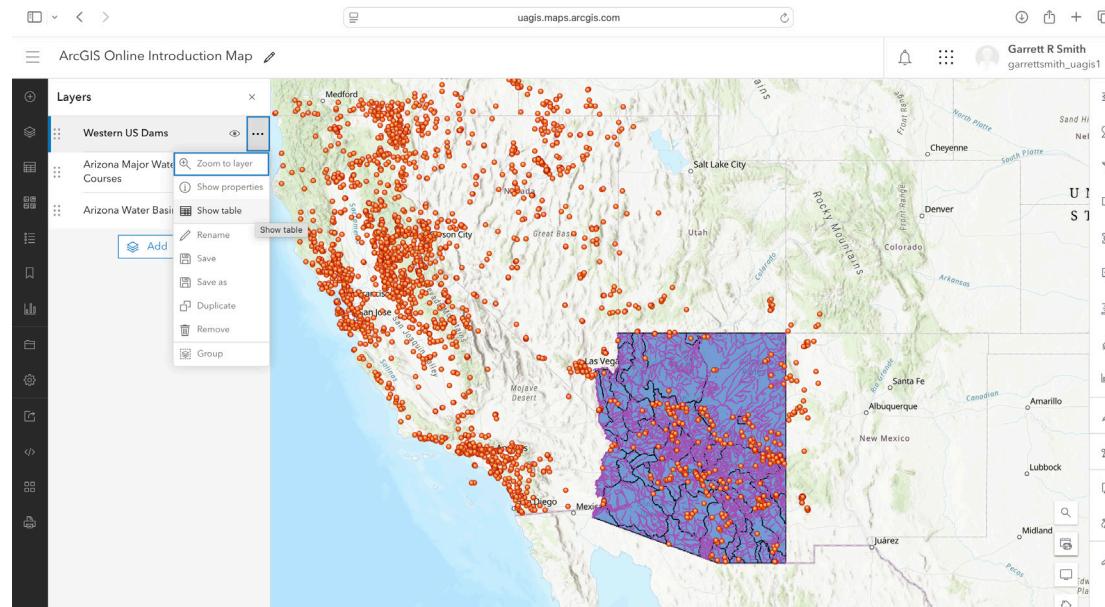
Tables that contain rows

All rows in the table have the same fields

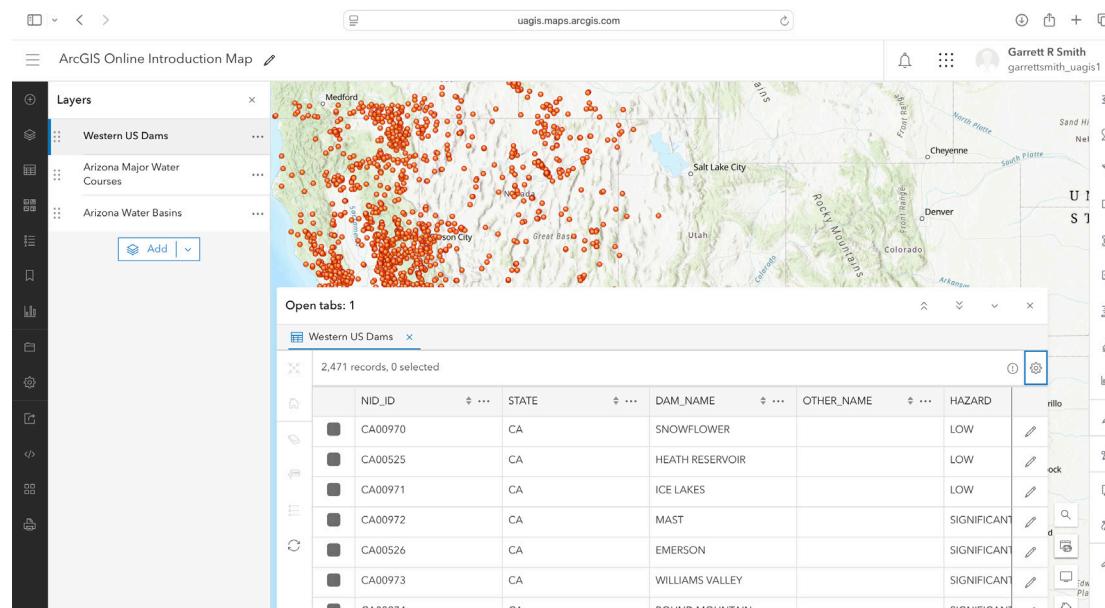
Each column has a data type (integer, decimal, number, character, date)

HELPFUL HINT:

Whenever loading new data into a GIS project it is good practice to (1) place the data on the Map to ensure that it is contained within your study area and to (2) open the attribute table after loading the data into the Contents pane to make sure that there are attributes listed that will ensure that you are able to complete your GIS analysis.



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SIMPLE DATA QUERY AND CREATION

1. In the Settings toolbar click on Analysis the click on Tools.
2. In the tools pane expand Find Locations and click on Find by Attributes and Location.

Open tabs: 1

NID_ID	STATE	DAM_NAME	HAZARD
CA00970	CA	SNOWFLOWER	LOW
CA00525	CA	HEATH RESERVOIR	LOW
CA00971	CA	ICE LAKES	LOW
CA00972	CA	MAST	SIGNIFICANT
CA00526	CA	EMERSON	SIGNIFICANT
CA00973	CA	WILLIAMS VALLEY	SIGNIFICANT

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Finds the features or parts of features that meet specified spatial or attribute criteria.

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3. In the Find Attributes and Location pane click on Build new query.

4. In the Query builder window select Attribute expression.

Click on Next.

NID_ID	STATE	DAM_NAME
CA00970	CA	SNOWFLOWER
CA00525	CA	HEATH RESERVOIR
CA00971	CA	ICE LAKES
CA00972	CA	MAST
CA00526	CA	EMERSON
CA00973	CA	WILLIAMS VALLEY

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NID_ID	STATE	DAM_NAME
CA00970	CA	SNOWFLOWER
CA00525	CA	HEATH RESERVOIR
CA00971	CA	ICE LAKES
CA00972	CA	MAST
CA00526	CA	EMERSON
CA00973	CA	WILLIAMS VALLEY

4

5. In the Query builder window match the following:

Find features from
Your dam layer

Where
All of the following are true

STATE equals AZ

Click on Add.

6. In the Find Attributes and Location pane provide an appropriate Output name and choose the folder you originally created for this project for the output to be saved in.

Scroll down and click RUN.

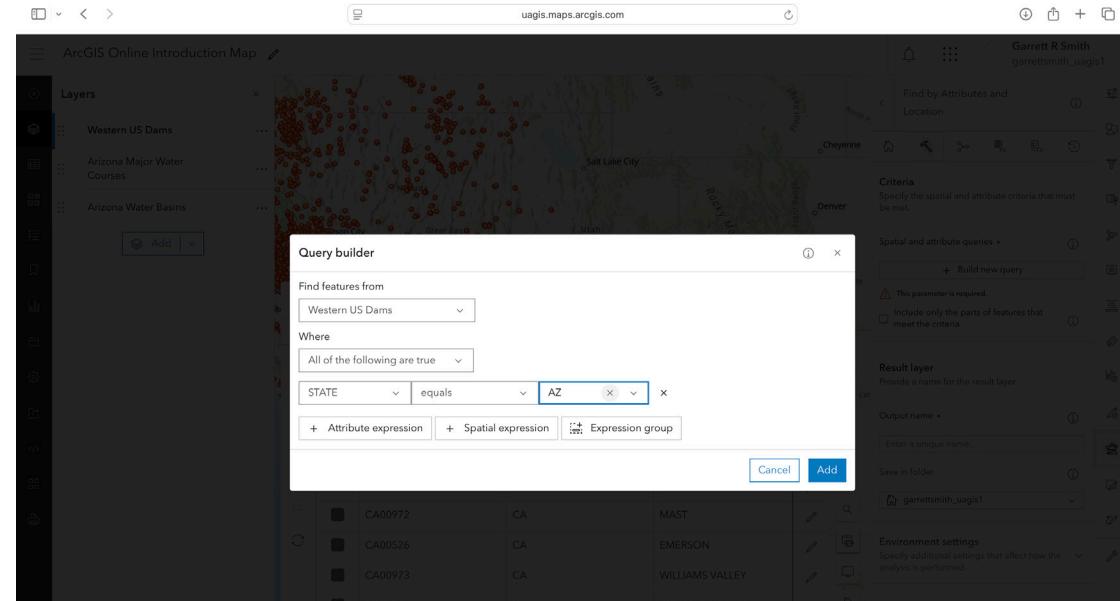
Note: This process may take a few minutes to process and once the process has completed your new Hosted Feature Layer will be added to your map.

Close the Data Table.

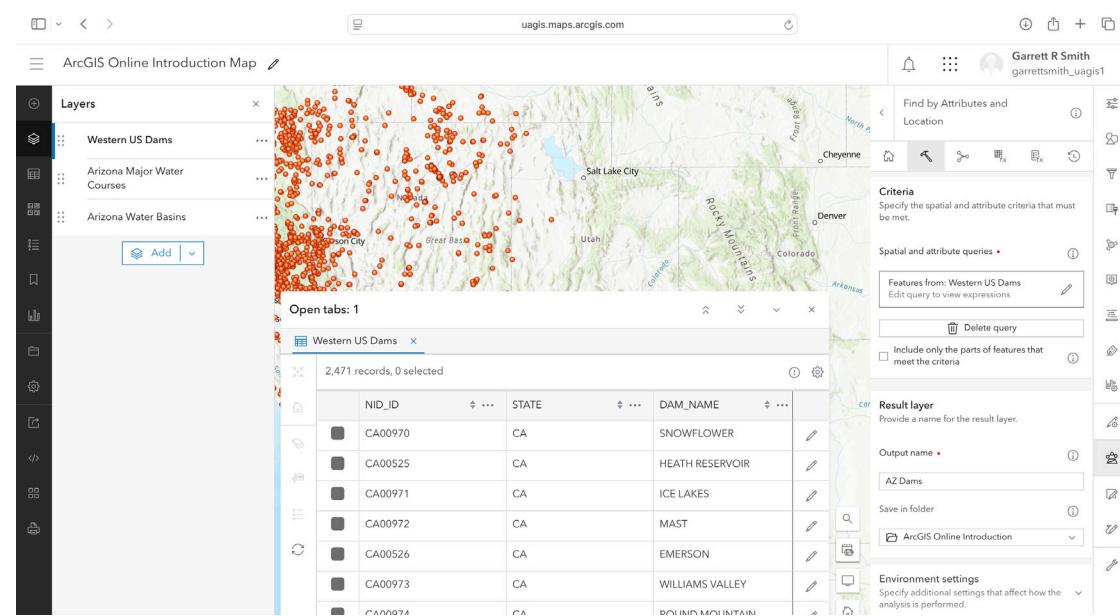
FIND BY ATTRIBUTES AND LOCATION:

The Select By Expression window allows you to select features in a map based on a certain attribute (characteristic). It allows you to create a subset of the data based on a defined conditional statement.

In this case, you are asking ArcGIS Online to select all the features (rows) in the Dam Hosted Feature Layer that are located in Arizona. This is a conditional analysis and the condition is dams that are located in Arizona.



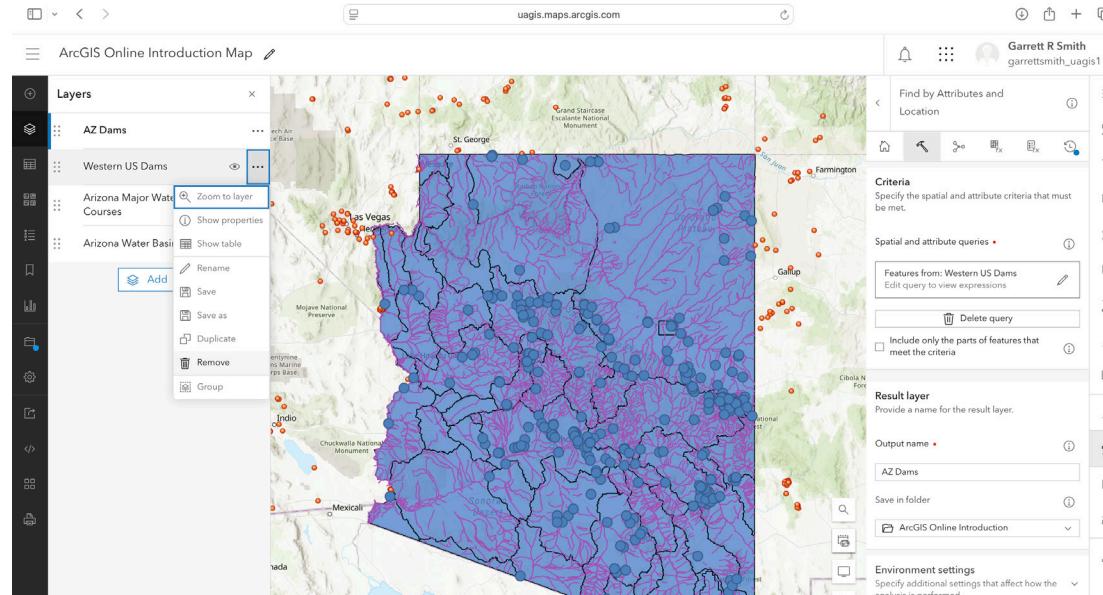
5



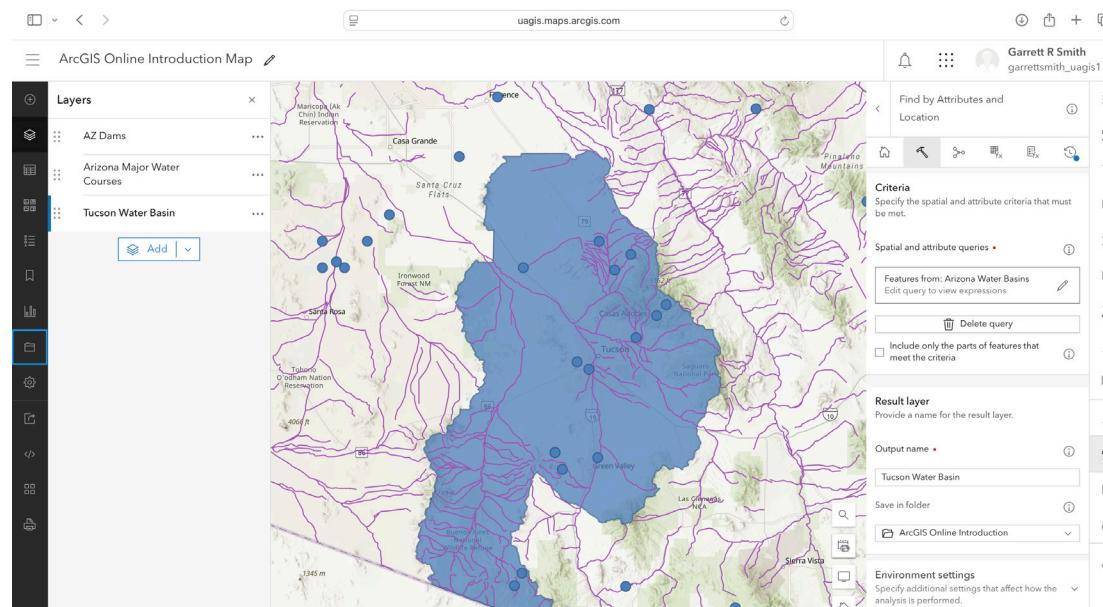
6

7. In the Content toolbar click on the options icon next to your original dams Hosted Feature Layer and select Remove.

8. Repeat the previous steps to create a Tucson Water Basin Hosted Feature Layer using the your water basins Hosted Feature Layer and the Find Attributes and Location pane.



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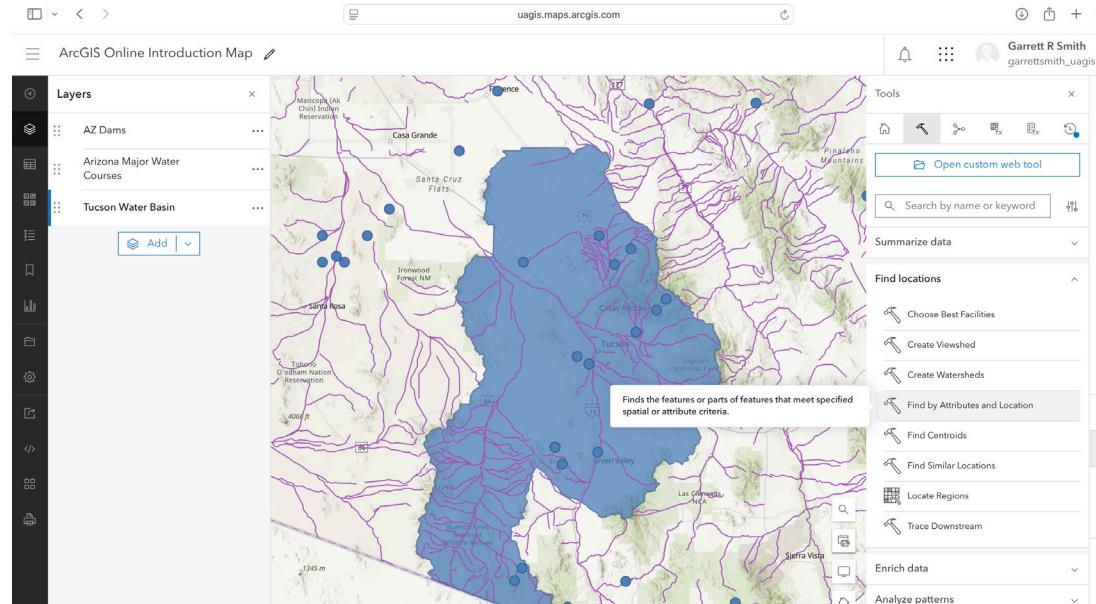
LOCATION DATA QUERY AND CREATION

1. In the Settings toolbar click on Analysis the click on Tools.

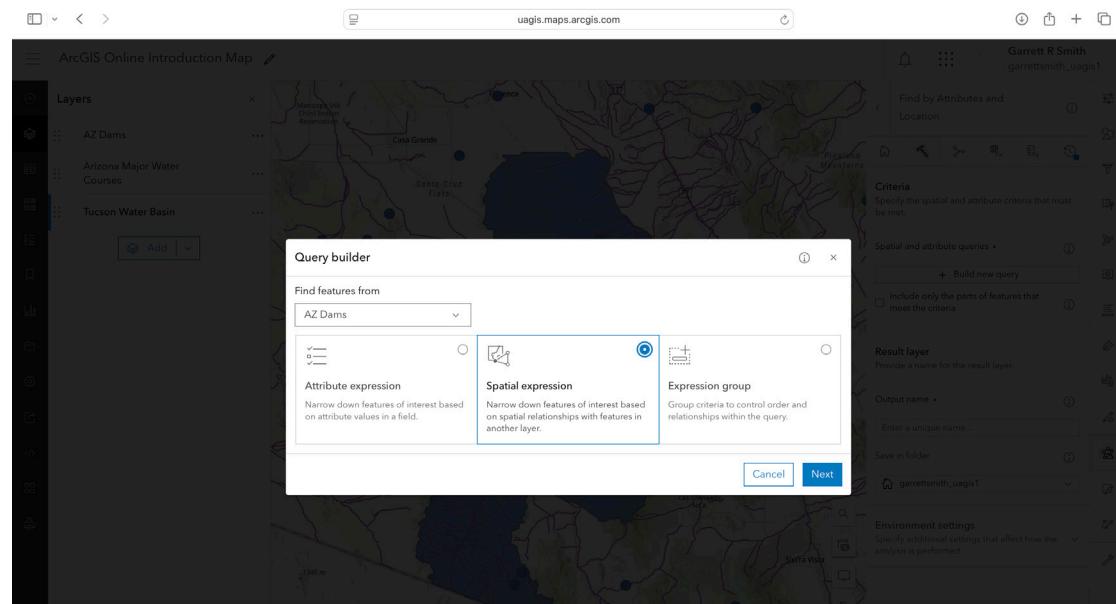
In the tools pane expand Find Locations and click on Find by Attributes and Location.

2. In the Query builder window select Spatial Expression.

Click Next.



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3. In the Query builder window match the following:

Find features from
Your Arizona dams Hosted Feature Layer

Where
All of the following are true

Completely within
Your Tucson water basin Hosted Feature Layer

Click Add

4. In the Find Attributes and Location pane provide an appropriate Output name and choose the folder you originally created for this project for the output to be saved in.

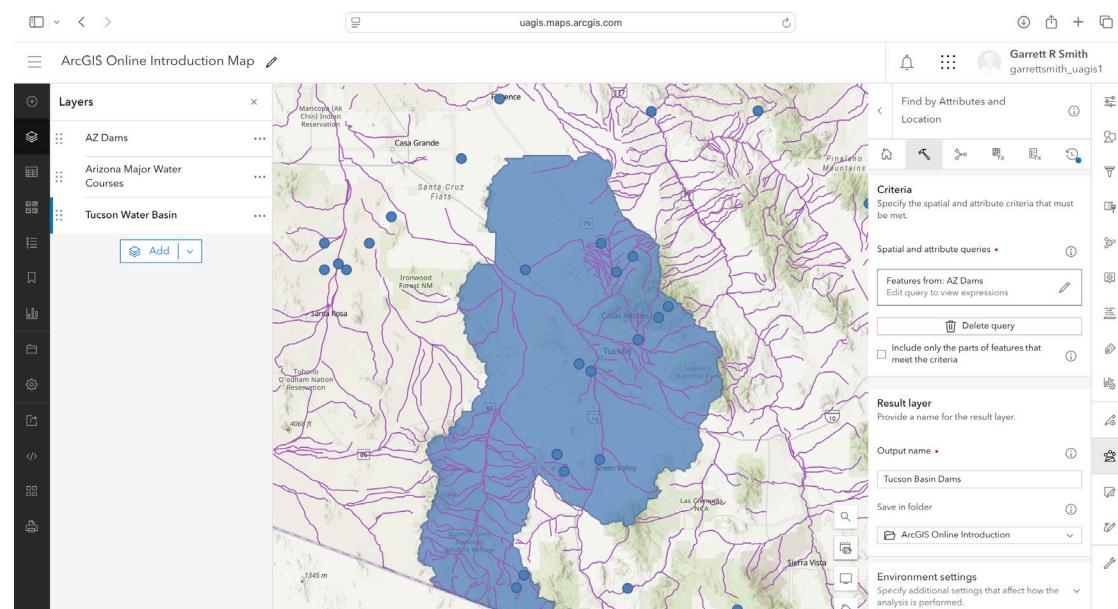
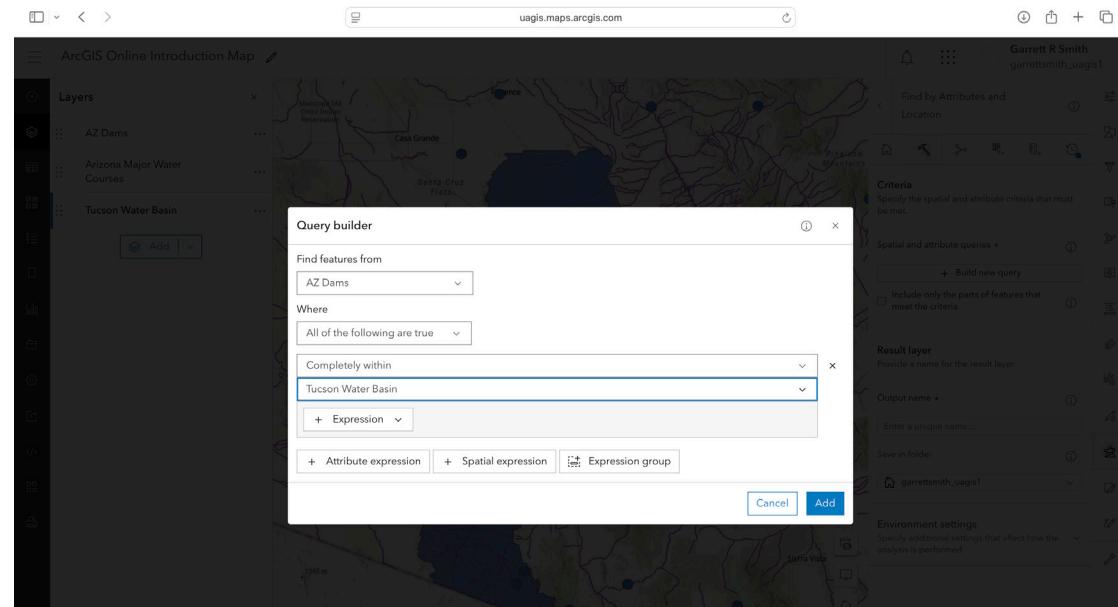
Scroll down and click RUN.

Note: This process may take a few minutes to process and once the process has completed your new Hosted Feature Layer will be added to your map.

SPATIAL EXPRESSIONS:

Spatial expressions allows you to select features from one Hosted Feature Layer based on their geographic relationship with another Hosted Feature Layer in a separate Hosted Feature Layer.

In this case, you are asking ArcGIS Online to select all the features (rows) in the Arizona dams Hosted Feature Layer that are located in the Tucson water basin Hosted Feature Layer. This is a geographic analysis and the geography are the dams that are located completely within the Tucson water basin.



EXTRACTING DATA

1. In the Settings toolbar click on Analysis the click on Tools.

In the tools pane expand Manage Data and click on Overlay Layers.

2. In the Overlay Layers pane under Input Features match the following:

Input Features
Your Arizona water courses Hosted Feature Layer

Overlay Features
Your Tucson water basin Hosted Feature Layer

Overlay type
Intersect

Output geometry
Line

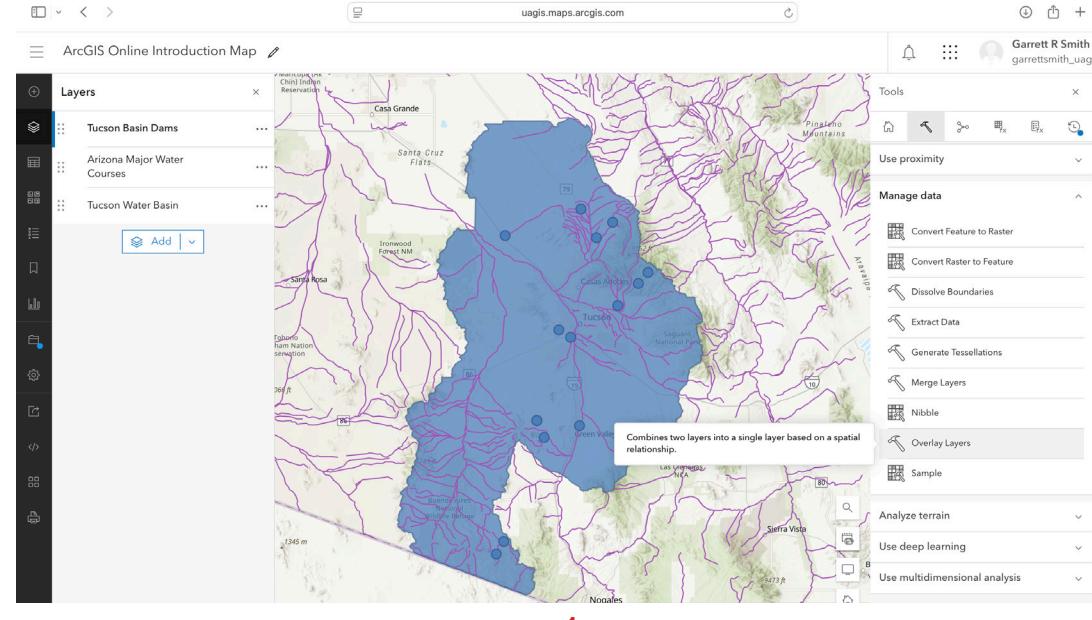
Provide an appropriate Output name and choose the folder you originally created for this project for the output to be saved in.

Scroll down and click RUN.

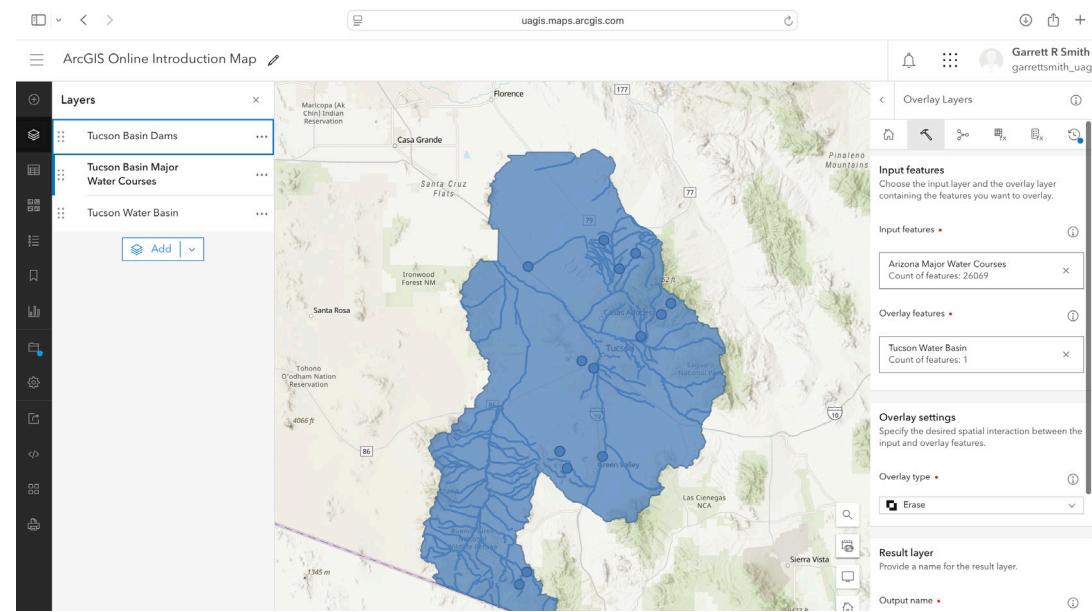
Note: This process may take a few minutes to process and once the process has completed your new Hosted Feature Layer will be added to your map.

OVERLAY TOO:

The Overlay tool allows you to cut out features from one feature layer based on the boundaries of another feature layer. This tool is particularly useful when you are creating a study area and/or area of interest for your project and you need all of your data to be confined to the same boundary.



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1. Open the Find by Attributes and Location and choose Attribute Expression.

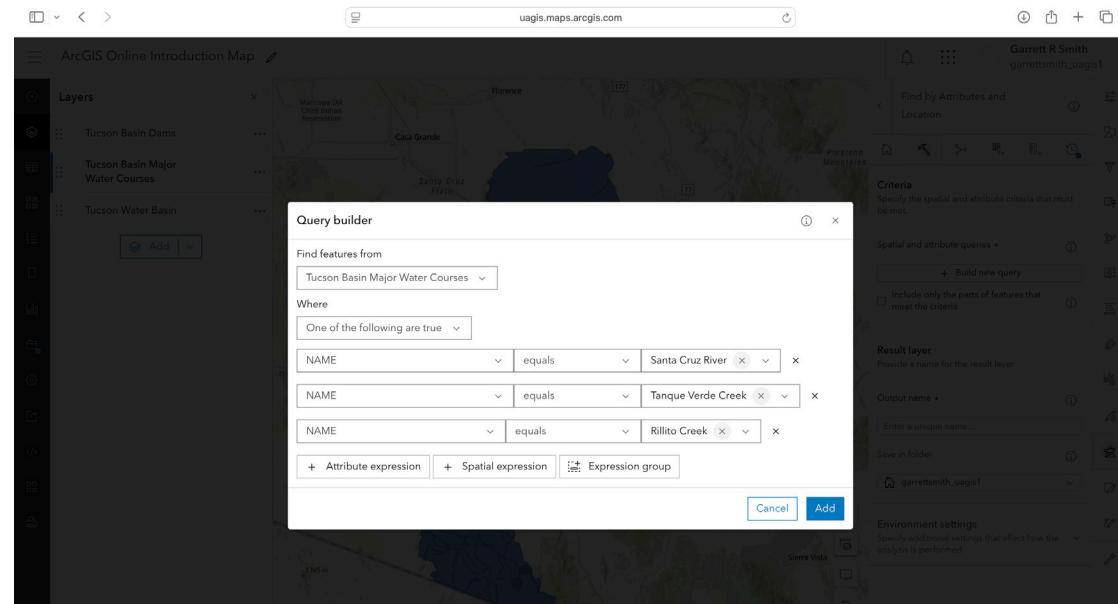
2. In the Query builder window match the following:

Find features from
Your Tucson water courses Hosted Feature Layer

Where
One of the following are true

NAME equals Santa Cruz River
NAME equals Tanque Verde Creek
NAME equals Rillito Creek

Click on Add.

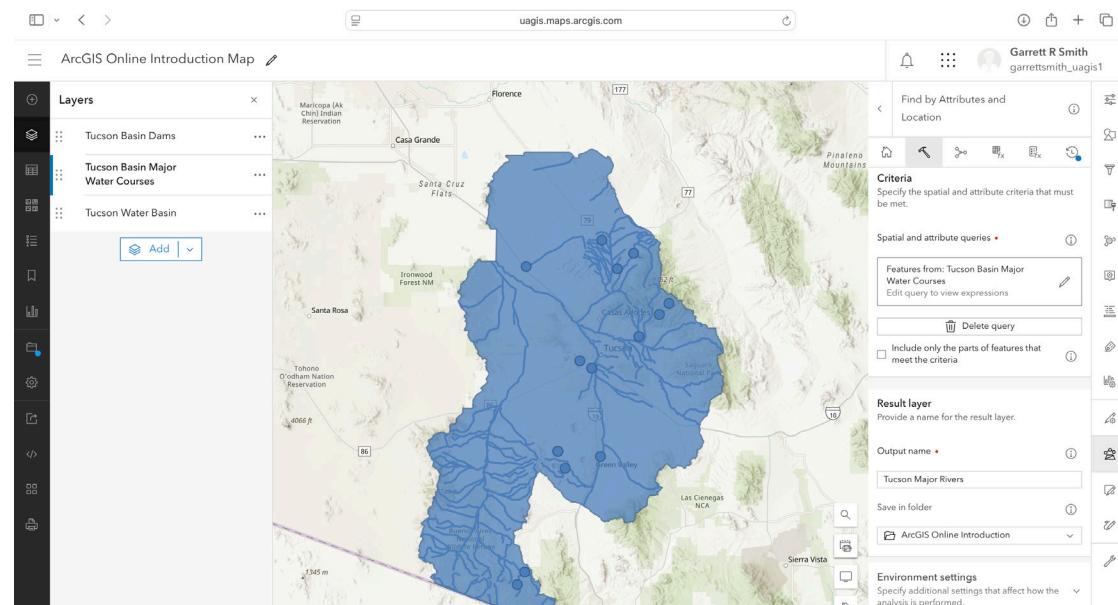


2. In the Find Attributes and Location pane provide an appropriate Output name and choose the folder you originally created for this project for the output to be saved in.

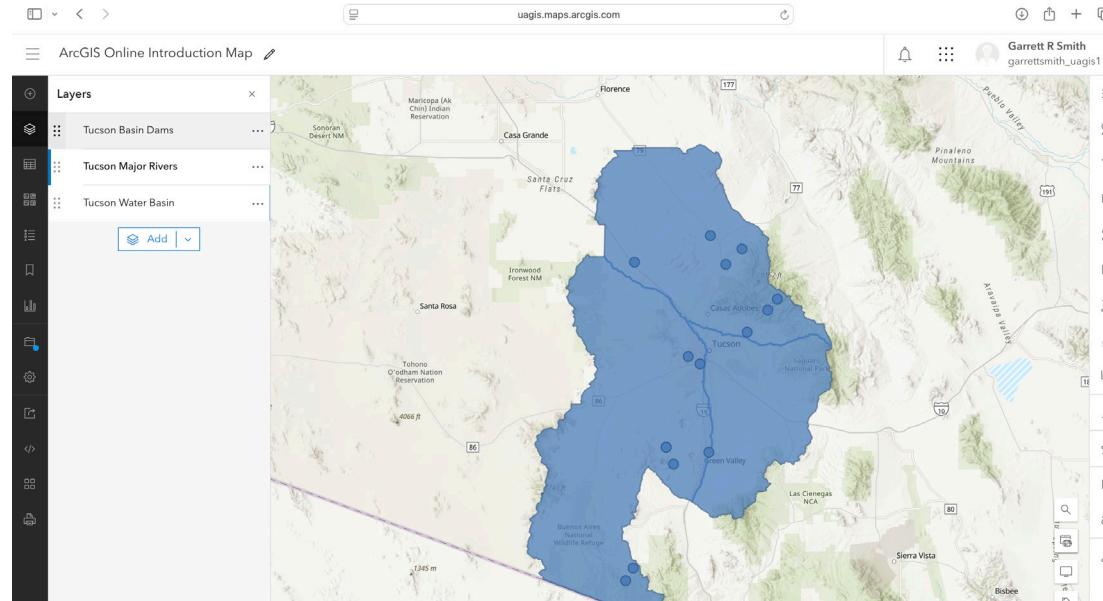
Scroll down and click RUN.

HELPFUL HINT:

When writing multiple conditional statements it is important to understand the difference between the All of the following and one of the following. The All statement implies that the values from all of your expressions are found within the same attribute field (column), while the One statement implies that each of the attributes is unique from one another.



3. Add all of your Tucson Hosted Feature Layers to your map and click Save in the Content toolbar.



3

END