Do-It-Yourself Geo Apps MOOC

Guided Exercise

Build a Web App with Web AppBuilder

Section 4 Exercise 1

08/2017

esri

THE SCIENCE OF WHERE™

Build a Web App with Web AppBuilder

Time to complete
Approximately 50-60 minutes.

Introduction

In this exercise, you will author a web map in ArcGIS Online using the Smart Mapping tools and layers from the Living Atlas of the World and Esri demographic data. You will then publish that web map as a web app using Web AppBuilder for ArcGIS.

As you work through the exercise, remember that there are many ways to author a web map and configure a web app. We will show you one, but feel free to explore and customize your program as you see fit.

Let's get started!

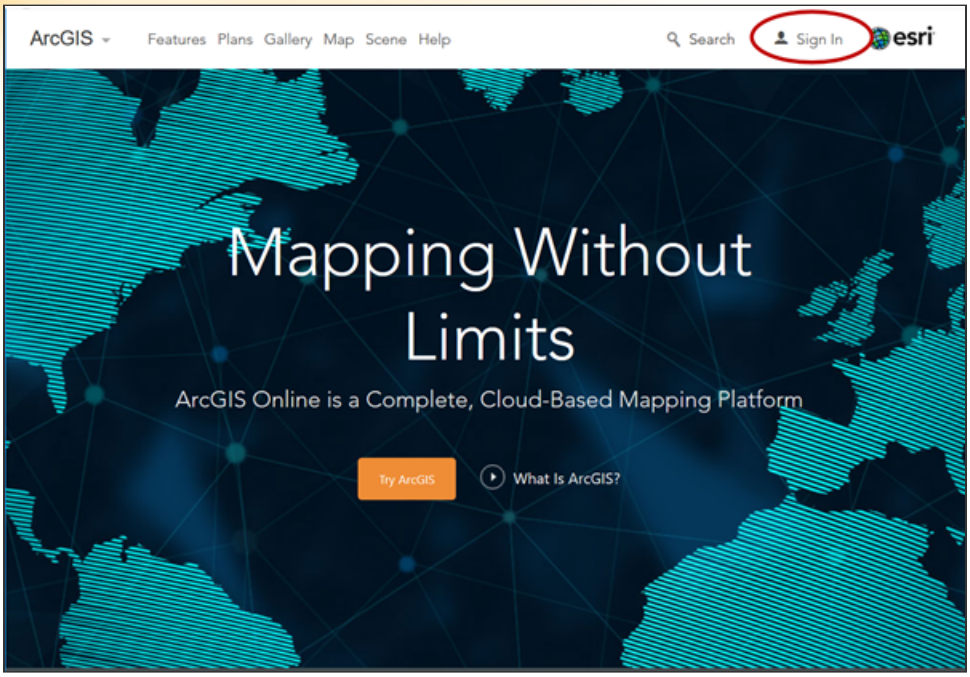
Step 1: Add data to a web map

First, you will create your initial web map and add some data to it.

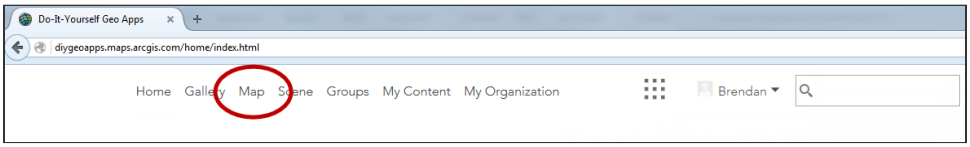
a. Open a new Internet browser tab or window.

b. Browse to arcgis.com and sign in to ArcGIS Online using the ArcGIS Online credentials explained at the start of this course.

Note: The Section 1 Exercise 1 PDF explains how to determine your ArcGIS Online credentials (username and password) for this course. If you have trouble signing in, email gistraining@esri.com for assistance.



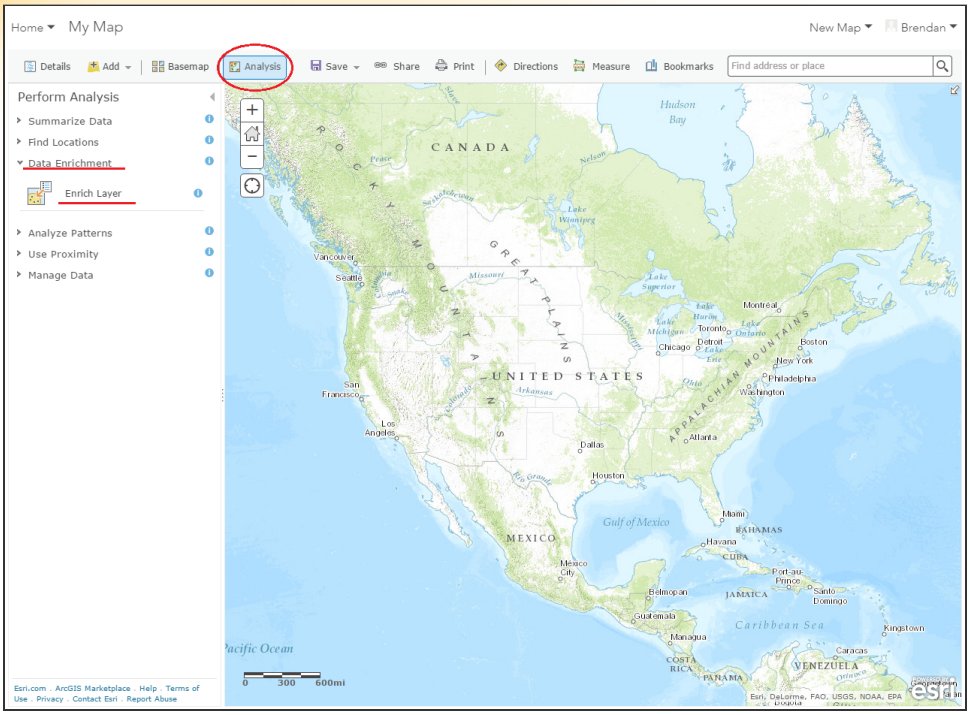
c. At the top of the page, in the navigation bar, click Map.



Note: If a web map that you were working on outside of this exercise loads, save it, and then click New Map and, from the drop-down list, click Create New Map.

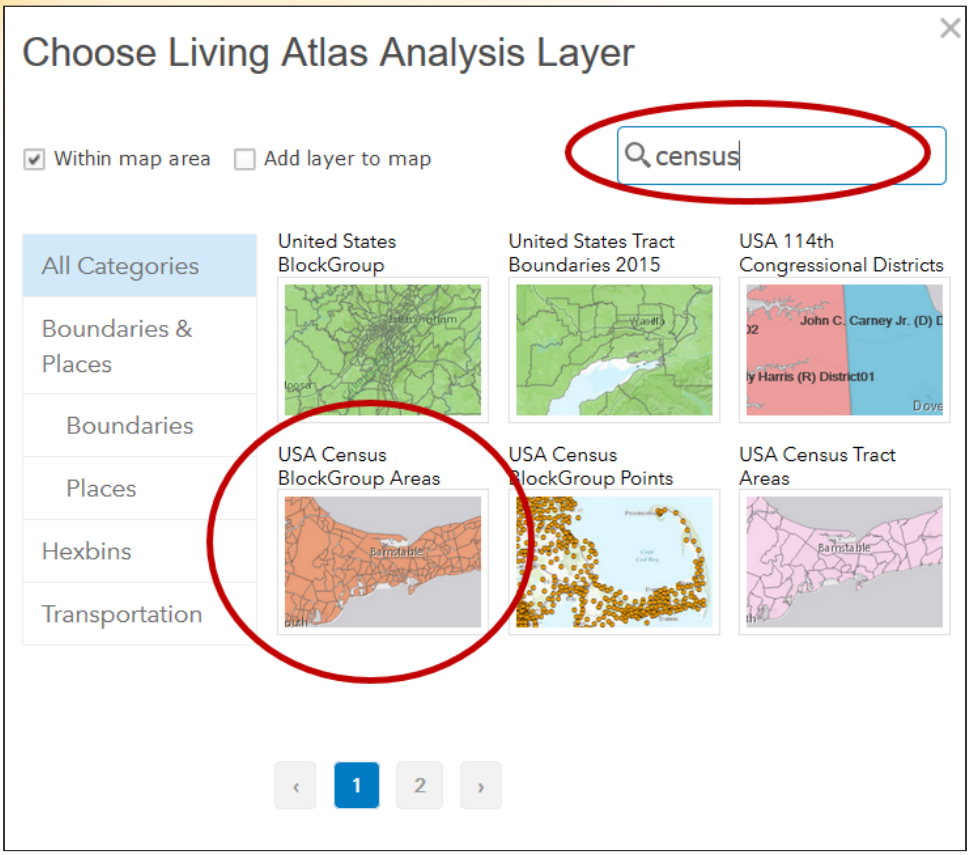
You should now have a blank web map. You are ready to begin adding data to it using the Enrich Layer tool. The ArcGIS Online Enrich Layer tool lets you add a wide variety of information about people and places to either your existing data locations or locations from the Living Atlas of the World (that you access within the tool). Because you do not already have locations, you will use the latter option to create an enriched layer.

d. Click the Analysis button, expand Data Enrichment, and then click Enrich Layer.



e. Under Choose Layer To Enrich With New Data, select Choose Living Atlas Analysis Layer.

f. In the pop-up, in the search box, type **census** and click USA Census BlockGroup Areas.



This layer is from the Living Atlas of the World, a collection of authoritative geographic information available in ArcGIS Online. Some of the layers in the Living Atlas are published by Esri, and others are submitted by ArcGIS users.

There are three main types of layers: feature (points, lines, or polygons), tile (georeferenced images), and image (georeferenced images with data associated to every pixel). Layers are the basic geographic information that we work with to create web maps and apps in ArcGIS Online. Anyone can nominate a layer for the Living Atlas, but Esri evaluates every layer to make sure that it is of sufficient quality to be included.

If you don't have your own data, or are looking for other layers to include in your web maps, apps, or analysis, the Living Atlas is a great place to start. If you or your organization has data that you think would be valuable to other web mappers and app creators, consider nominating it for the Living Atlas. It is a great repository of geographic information that is growing by the day!

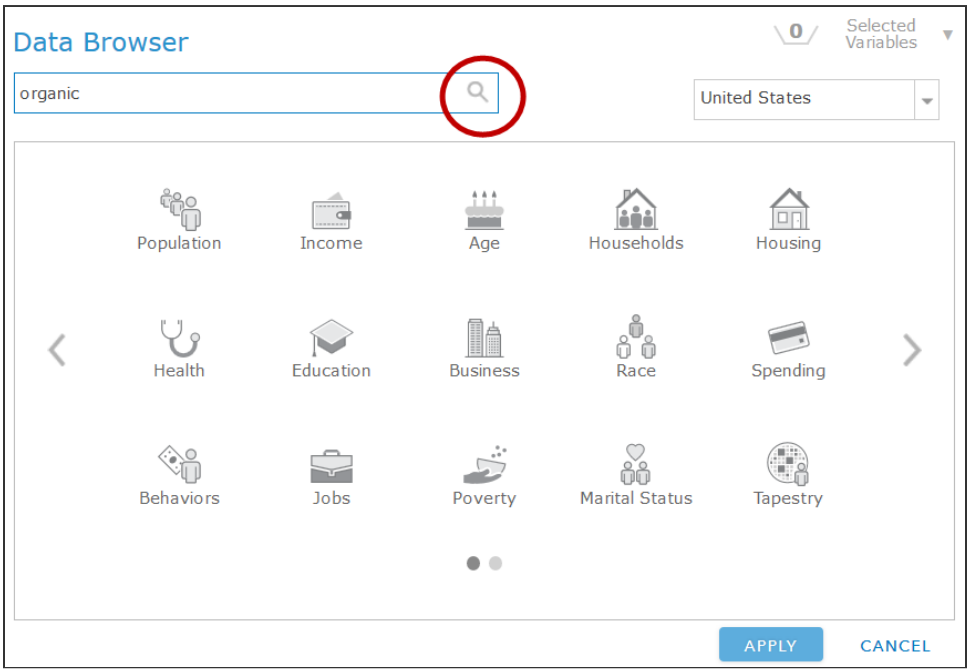
Let's continue creating the web map. Next, you want to locate data to enrich the census block groups with information about organic food spending habits among adults.

Step 2: Enrich the map with demographic data

a. In the Enrich Layer pane, click Select Variables.

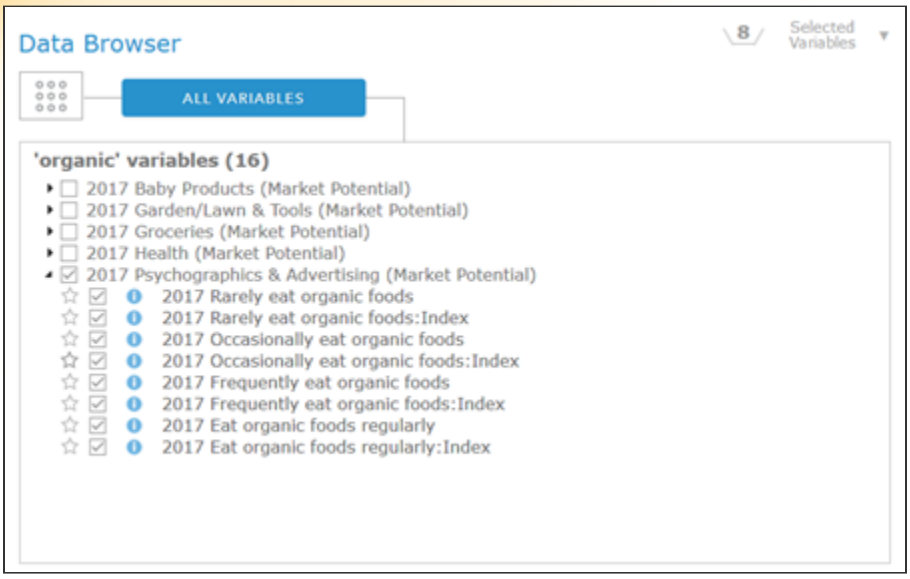
b. If necessary, in the drop-down menu in the upper-right corner, select United States.

c. Type **organic** in the Data Browser search field, and then click the magnifying-glass icon.



d. Select the 2017 Psychographics & Advertising (Market Potential) check box.

e. Click the triangle next to it to expand the section and view all eight variables.

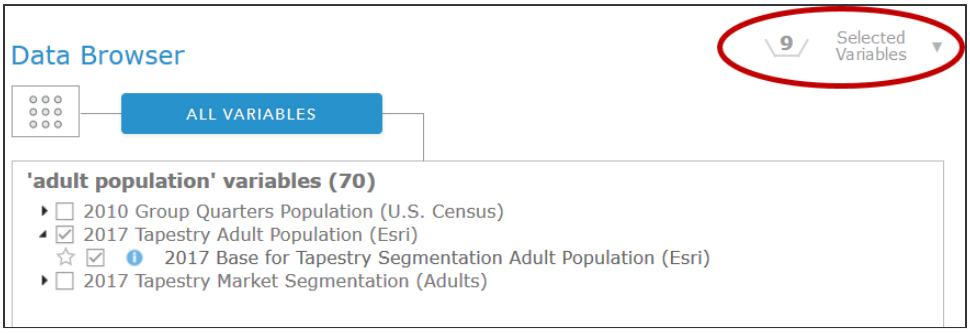


f. Click Back.

g. Type **adult population** in the Data Browser search field, and then click the magnifying-glass icon.

h. Expand 2017 Tapestry Adult Population (Esri), and select the 2017 Base For Tapestry Segmentation Adult Population (Esri) check box.

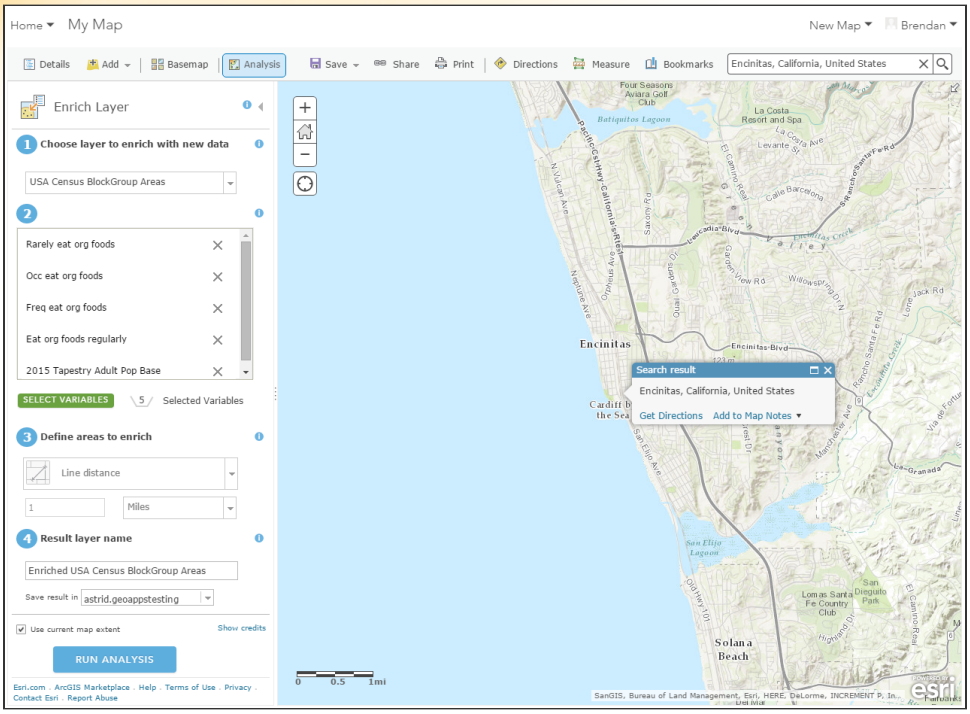
You should see that there are nine selected variables in the upper-right corner of the Data Browser pop-up.



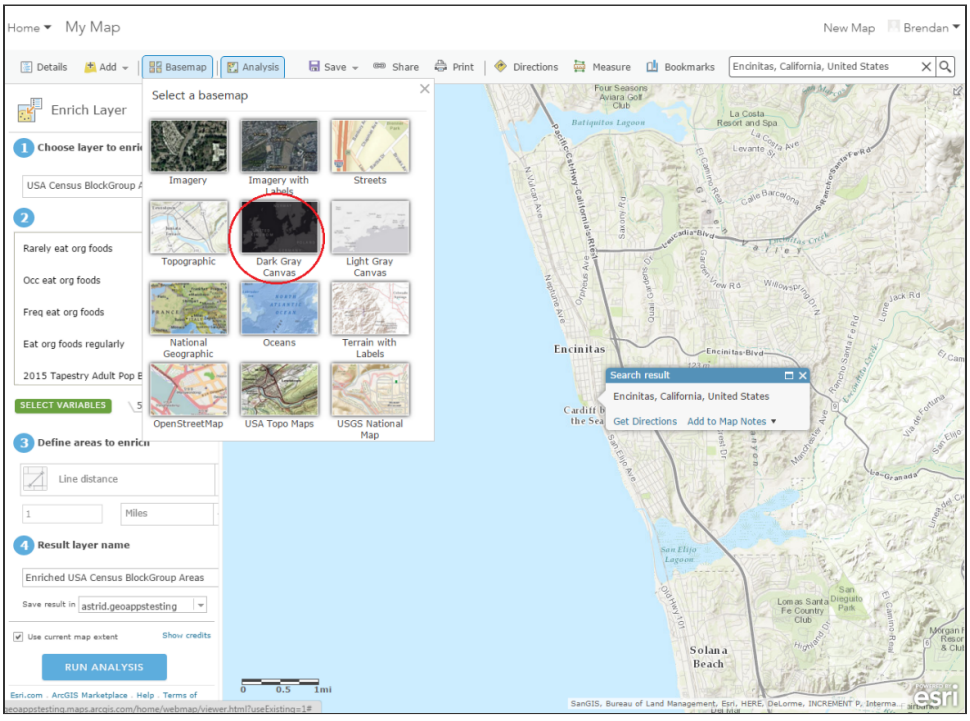
i. Click Apply.

In ArcGIS Online, you have access to global demographic, spending, lifestyle, and business datasets. In this exercise, you added Esri demographic data from the United States.

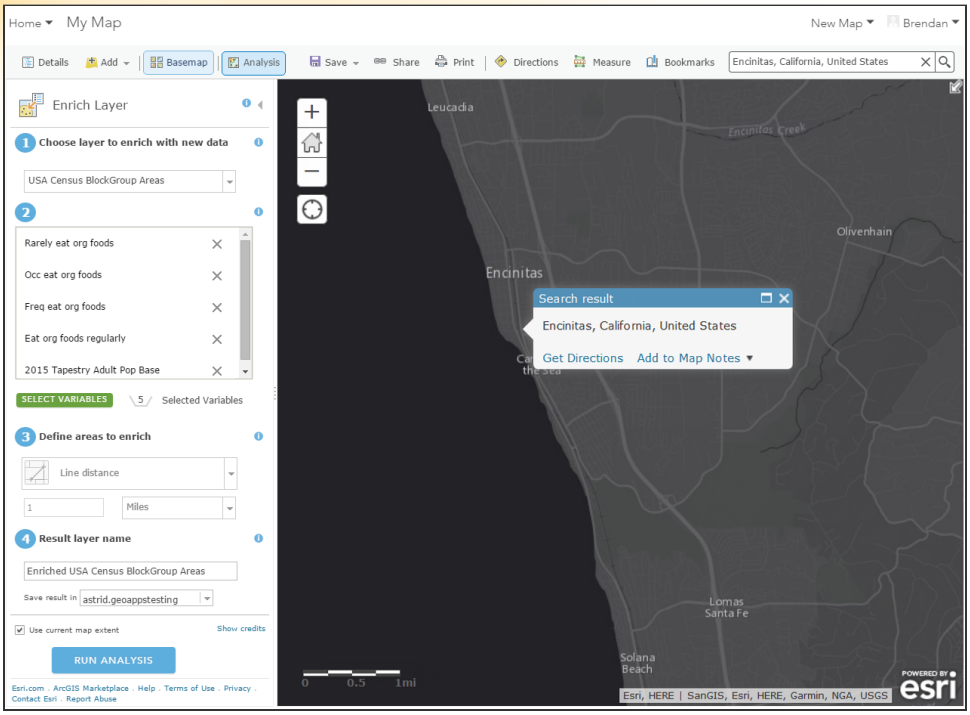
j. In the Map Viewer search field, type **Encinitas, California, United States** and click the magnifying-glass icon.



k Click the Basemap button and select Dark Gray Canvas.



Your map will look like this:

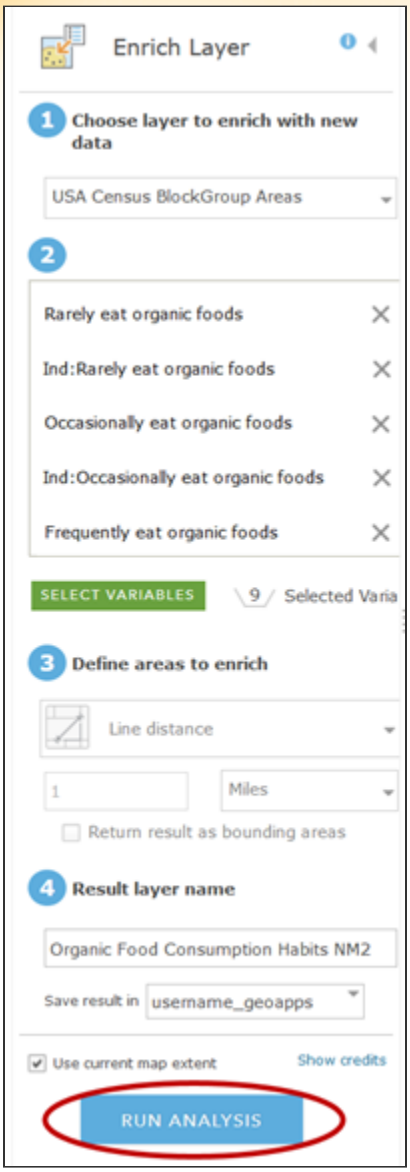


l. In the Enrich Layer pane, change the Result Layer Name to **Organic Food Consumption Habits_[your name]**.

m. Make sure that the Use Current Map Extent check box is selected.

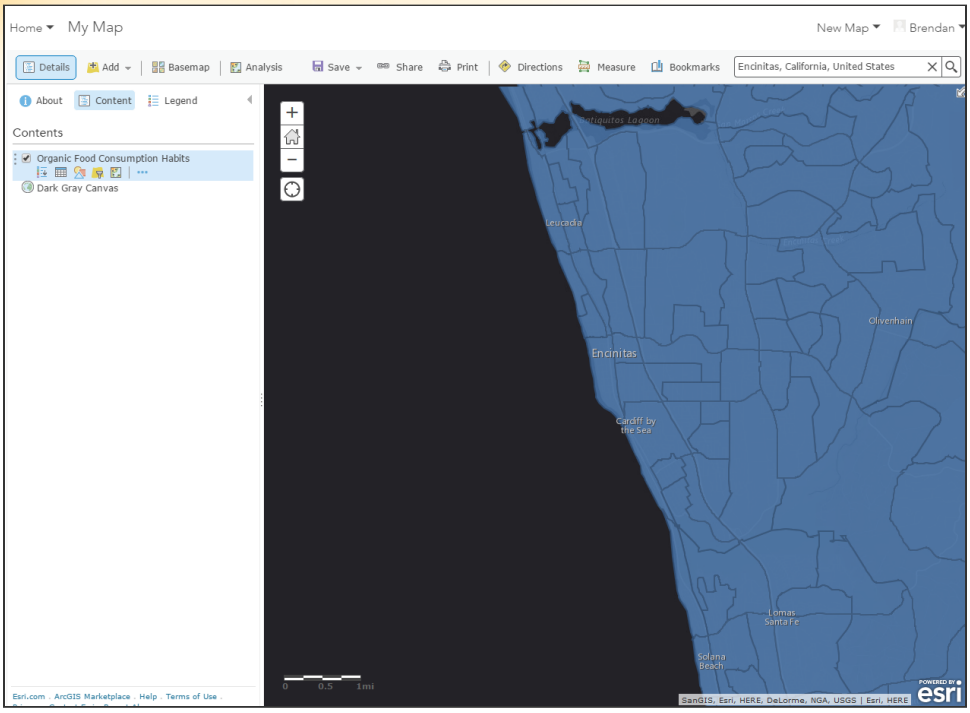
Note: This will ensure that the analysis is performed only on the areas within the current map extent.

n. Click Run Analysis.



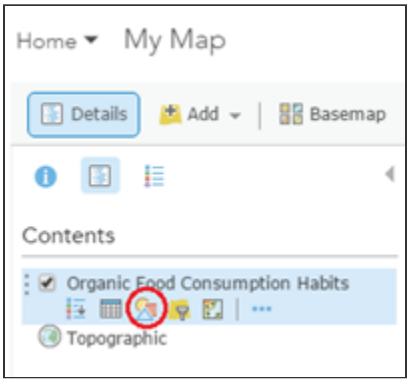
Note: Processing time for the analysis will depend on a few factors, including the number of features in the current extent and Internet traffic. If your analysis does not complete after four minutes, try saving the map and refreshing the page, or exit ArcGIS Online and try again later.

- When your results layer finishes loading, you should see something similar to the following image. The blue symbology is the default symbology with the dark gray basemap.

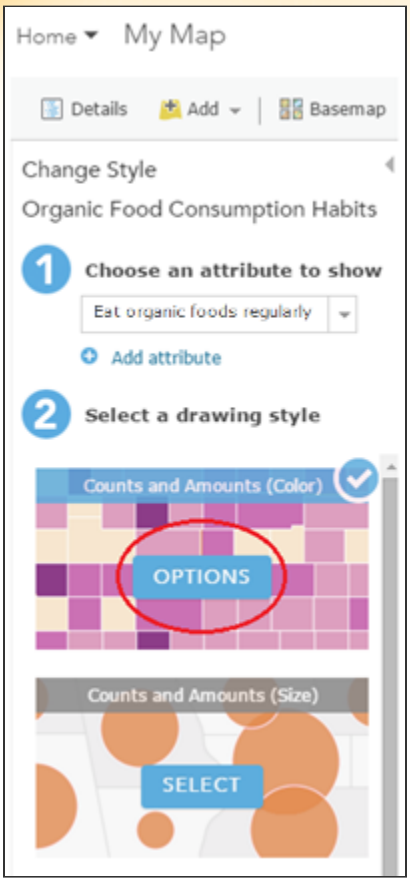


Now, you are going to change the symbol style so that each block group is rendered according to the number of people who regularly consume organic foods, making the map message clearer.

p. In the Contents pane, hover your mouse pointer over the Organic Food Consumption Habits [your name] layer and click the Change Style button.



q. Under Choose An Attribute To Show, select Eat Organic Foods Regularly, and then click Options for Counts And Amounts (Color).



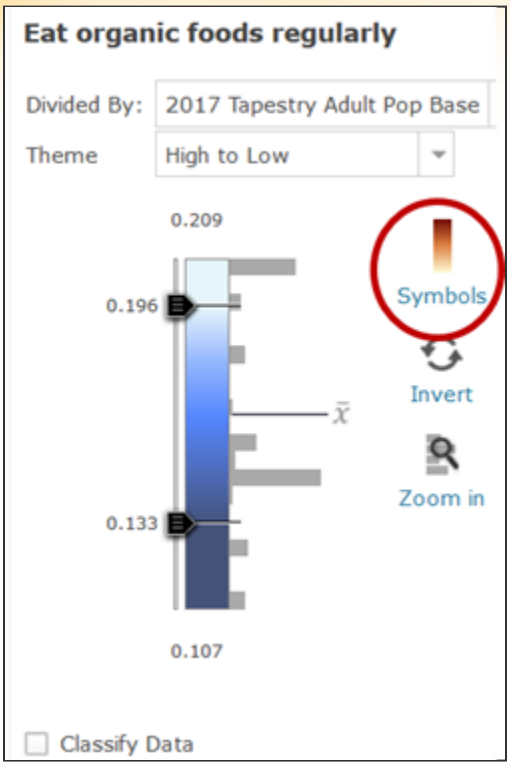
It's difficult to map population totals by area, so you are going to normalize the information by dividing the number of people who eat organic foods regularly by the total adult population.

r. For Divided By, select 2017 Tapestry Adult Pop Base.

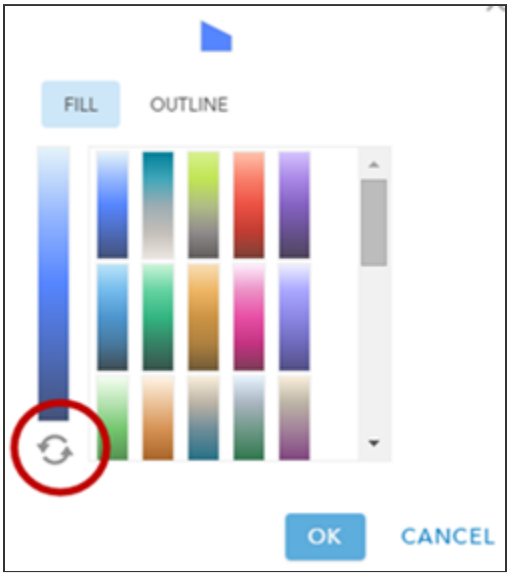
Now, let's change the color scheme being used to render the polygons. You want areas with a greater percentage of adults who regularly consume organic foods to have a darker color.

Step 3: Change the map's color scheme

a. On the right side of the Change Style pane, click Symbols.



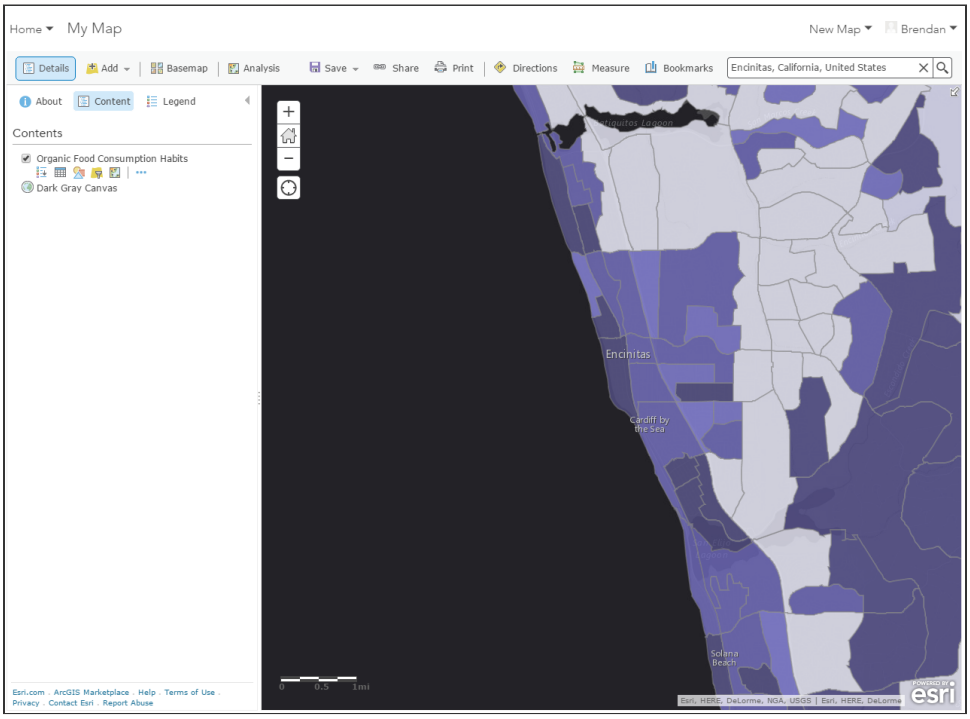
b. In the second row, select the purple color ramp, and then invert it by clicking the rotating-arrows icon so that the darkest purple represents the highest value.



c. Click OK.

d Click OK again, and then click Done.

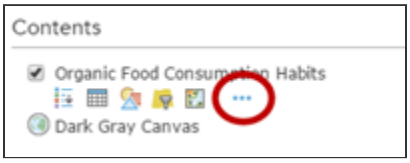
Your map should look something like this graphic:



Step 4: Configure information pop-ups

Now, let's configure the map's information pop-ups.

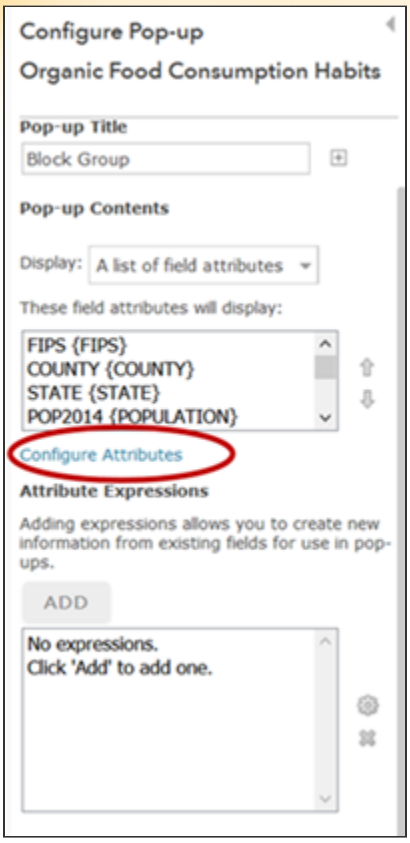
a In the Contents pane, hover your mouse pointer over your layer and click the More Options button.



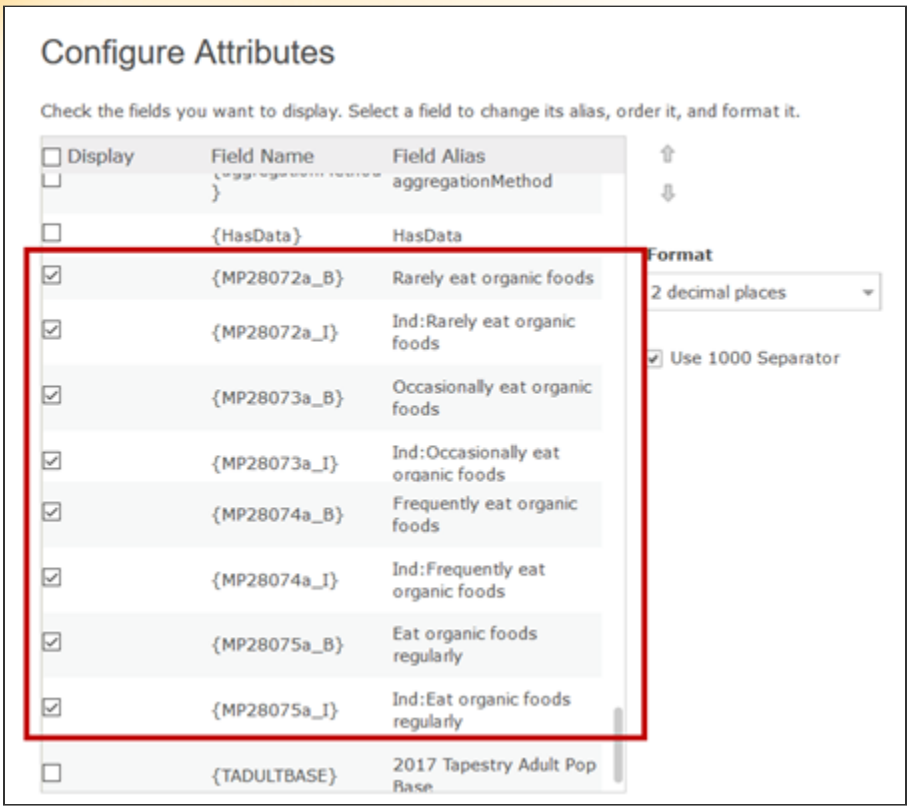
b Click Configure Pop-Up.

c Change Pop-Up Title to **Block Group**.

d Click Configure Attributes (in the middle of the pane).



e. Choose to display only the eight fields with information about consuming organic foods.

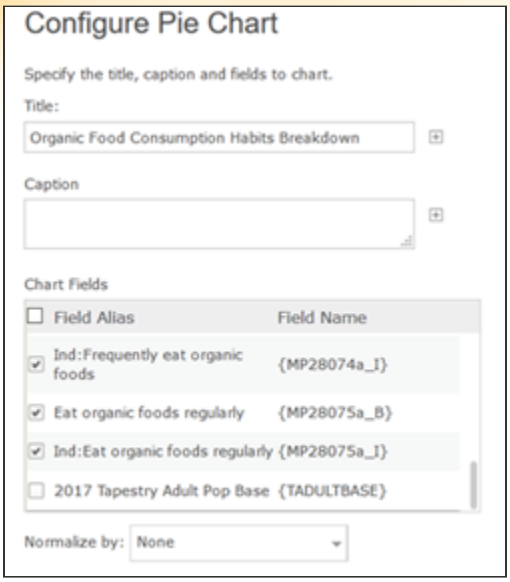


f Click OK.

Now, you will add a pie chart to your pop-up.

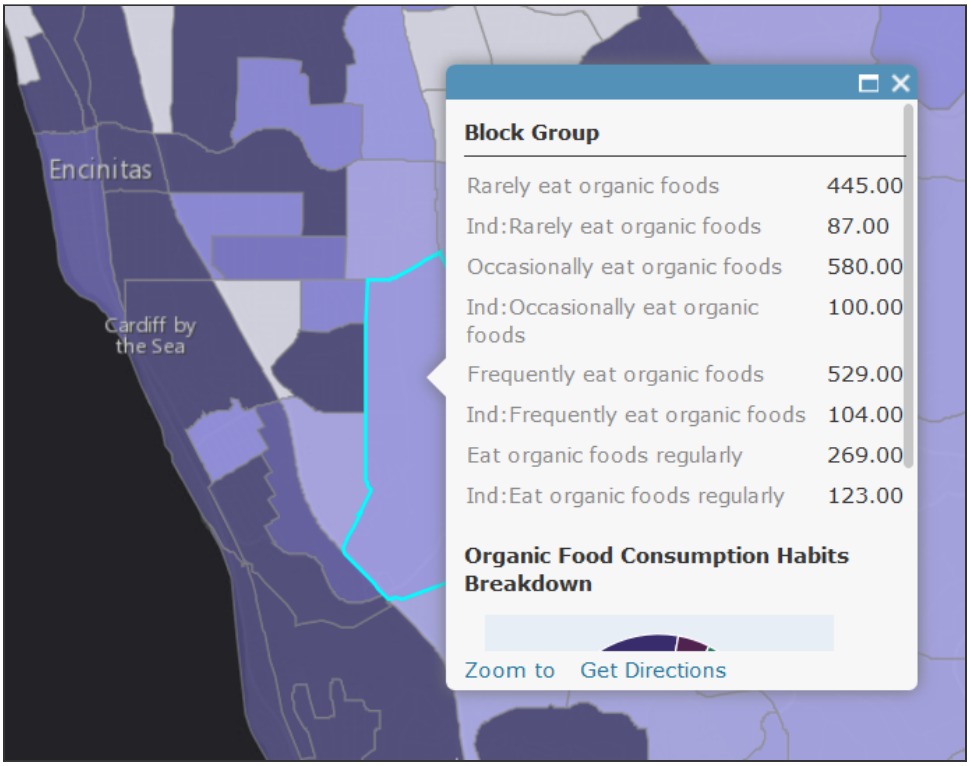
g Below Pop-up Media, click Add and select Pie Chart.

h For Title, type **Organic Food Consumption Habits Breakdown**, and select the eight fields dealing with organic food consumption.



i Click OK to close the Pop-up dialog, then click OK to save and close the Configure Pop-up pane.

j Click a block group on your map. You should see something like this graphic:



k. Hover over the sections of the pie chart to see which attribute fields they represent.

Your web map is looking pretty good. It's time to build a web app so that you can share it with the public.

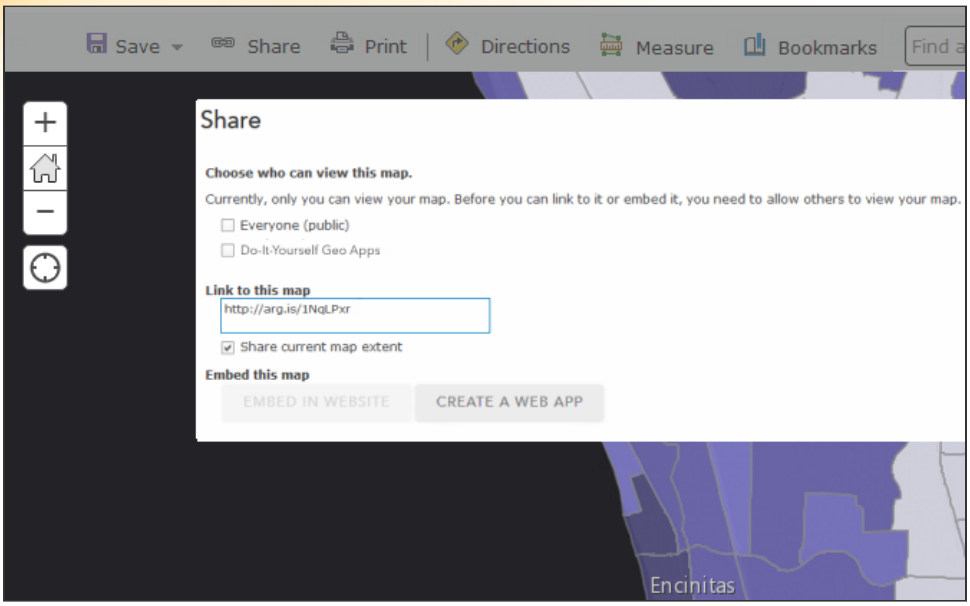
Step 5: Use Web AppBuilder to build a web app to share with the public

First, you need to save your map.

a. Click Save and, from the drop-down list, click Save As.

b. Type an appropriate title, tags that will help users find your web map, and a descriptive summary. Keep the default folder. Click Save Map.

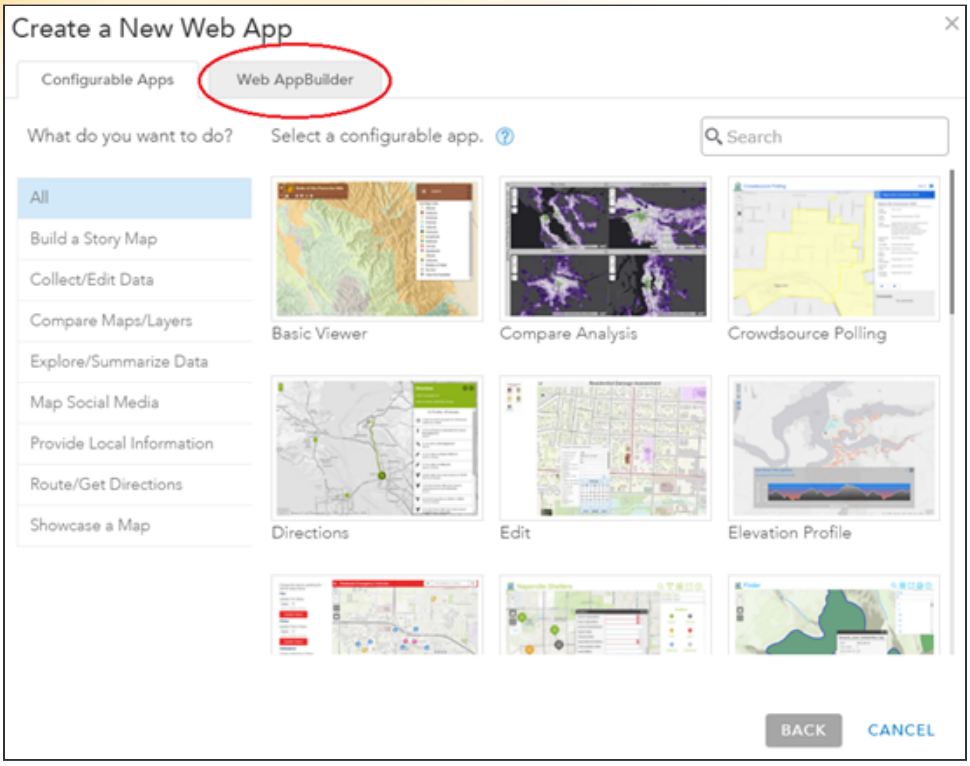
c. From the menu bar at the top of the map, click Share, and then click Create A Web App.



You will see a window with configurable apps, which you can sort by the categories on the left. You will use some of these configurable apps in other sections of this course, but for this exercise, you will create a custom app using Web AppBuilder for ArcGIS.

Web AppBuilder for ArcGIS provides a foundation for building web apps that can run on any device. It allows you to build focused software programs and incorporate a library of tools (widgets) without writing a single line of code.

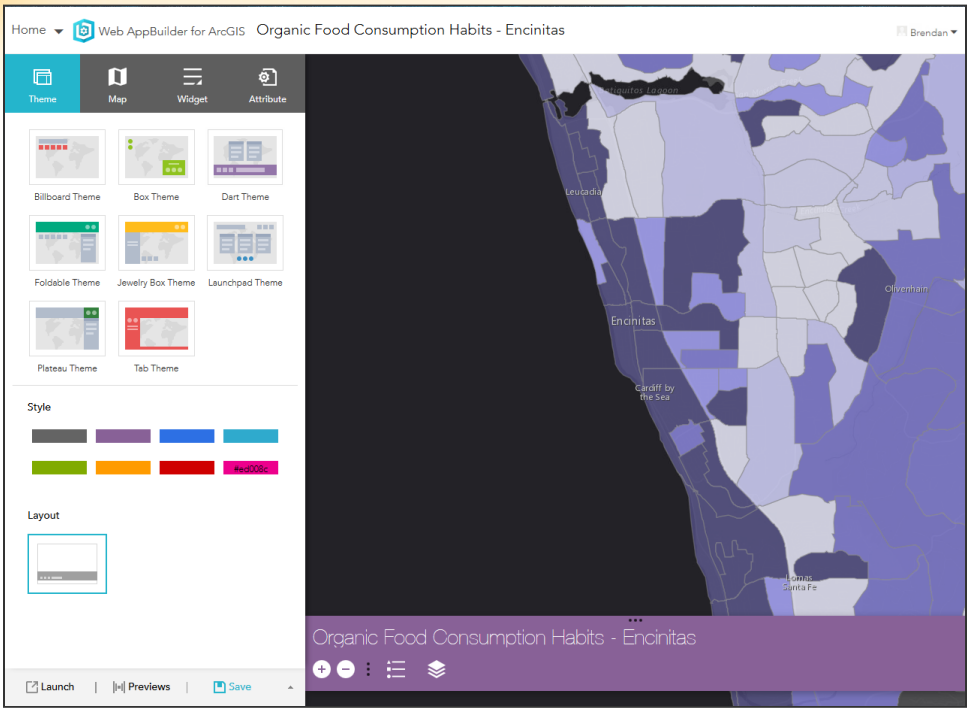
d. Click the Web AppBuilder tab.



e Type an appropriate summary, and make any necessary adjustments to the title and tags.

f Click Get Started.

You should see something like this graphic:

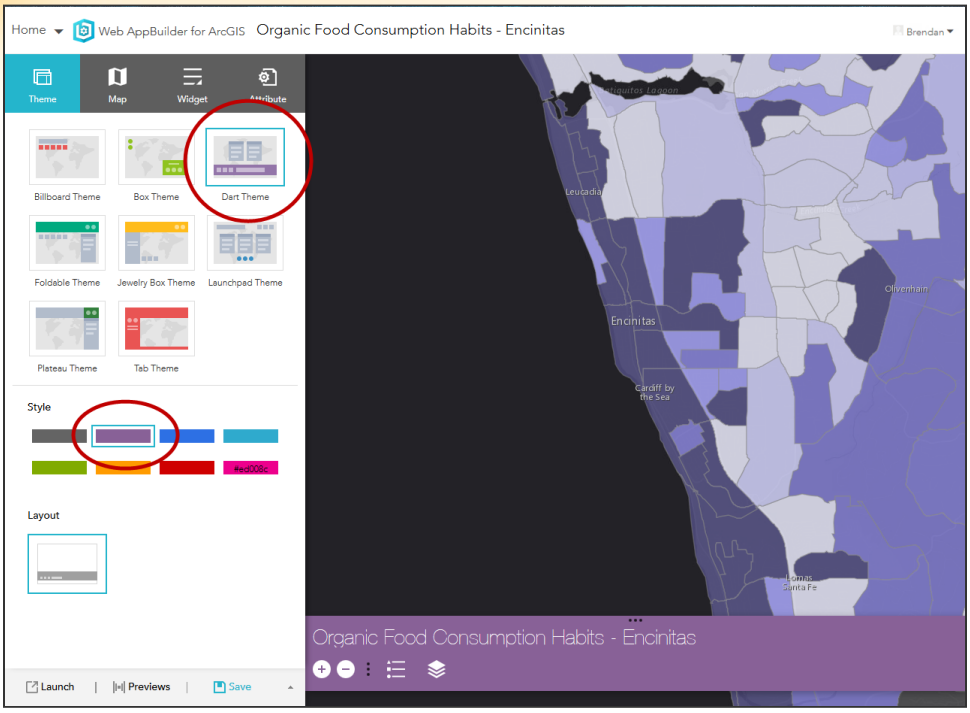


Note: The default theme is the Foldable Theme; this example uses the Dart Theme.

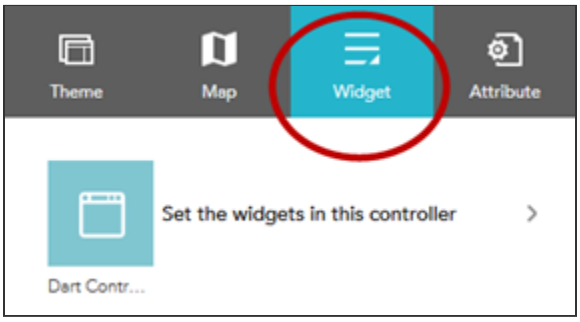
g We are going to show you a single configuration for the app, but feel free to explore the different tools in Web AppBuilder. Use the documentation or just poke around!

Step 6: Configure the app

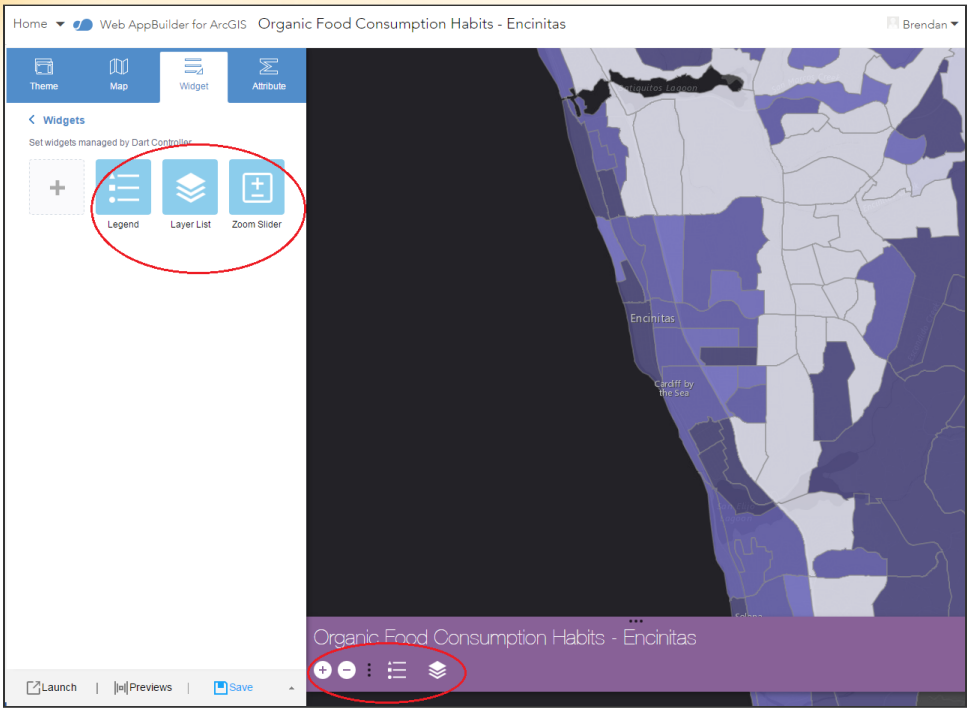
a Click Dart Theme and choose a style.



b. Click the Widget tab, and then click Set Widgets In This Controller.



The widgets in the left pane (Zoom, Legend, and Layer List) correspond to those that appear by default at the bottom of the app in the control bar.



You are going to add a Chart widget.

c. In the left pane, click the plus sign to add a widget.

There are a lot of widgets to pick from! You want to keep your app simple, so you are going to add only a Chart widget.

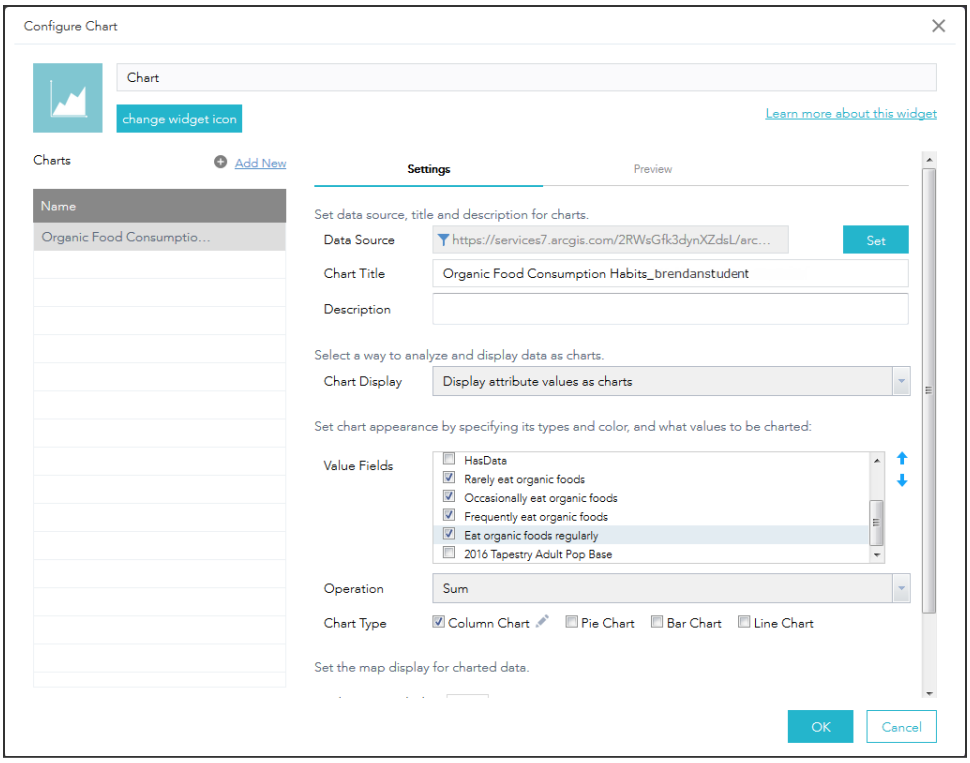
d. Click Chart, and then OK.

e. Click Add New.

f. Select your Organic Food Consumption Habits map (to add it as the data source for the chart), and then click OK.

g Edit the following fields according to the graphic below:

- Chart Title
- Chart Display
- Value Fields
- Operation
- Chart Type



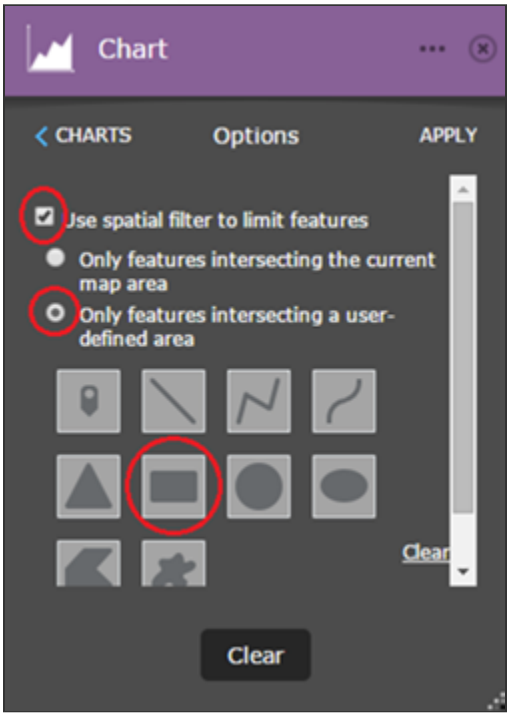
h Click OK.

Your Chart widget appears in the control bar now.

i In the control bar, click the Chart button to test the widget.

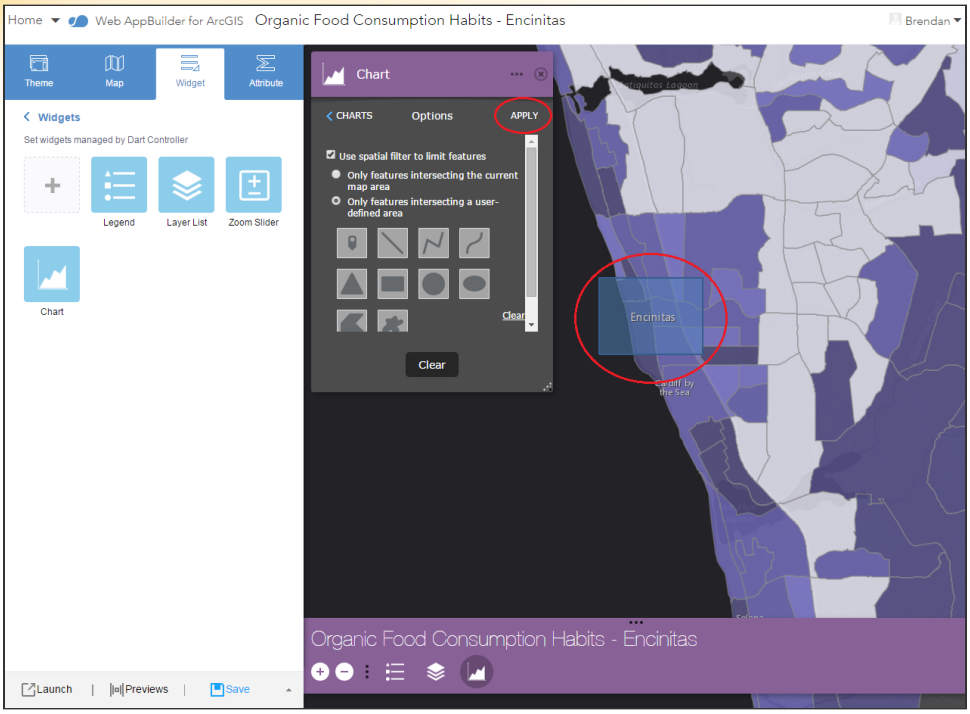
j Click the Organic Food Consumers Sum chart you just created.

k. Click Use Spatial Filter To Limit Features, select the Only Features Intersecting A User-Defined Area option, and then choose a drawing tool.



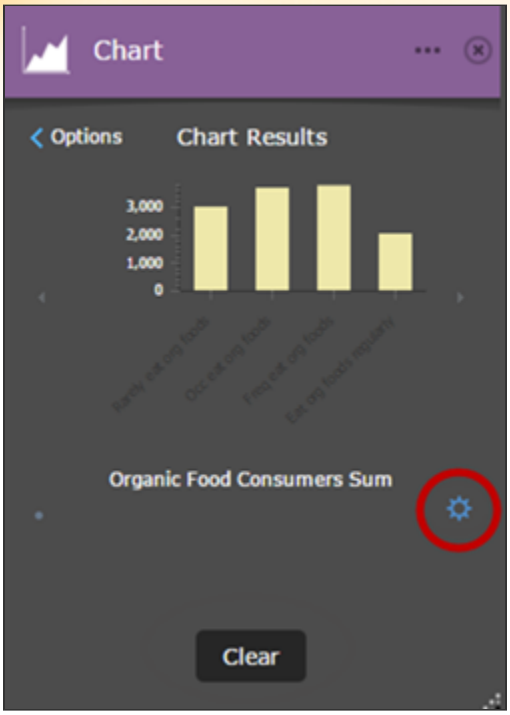
l. Click and drag on the map to select an area of interest.

m. Go back to the Chart pop-up and click Apply.



n Hover over the bar graph to see exact values returned for the area of interest.

o Click the cog icon to change the color of your chart, and then click Clear to begin the process again.



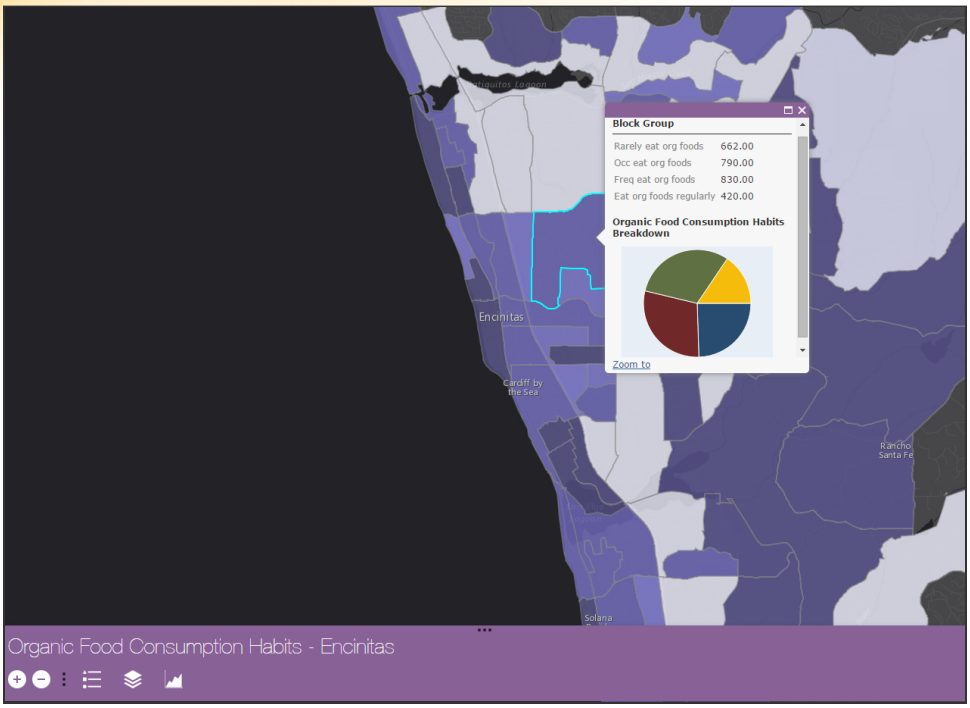
p Close the Chart pop-up.

Your web app looks pretty good!

q At the bottom of the builder, click Save.

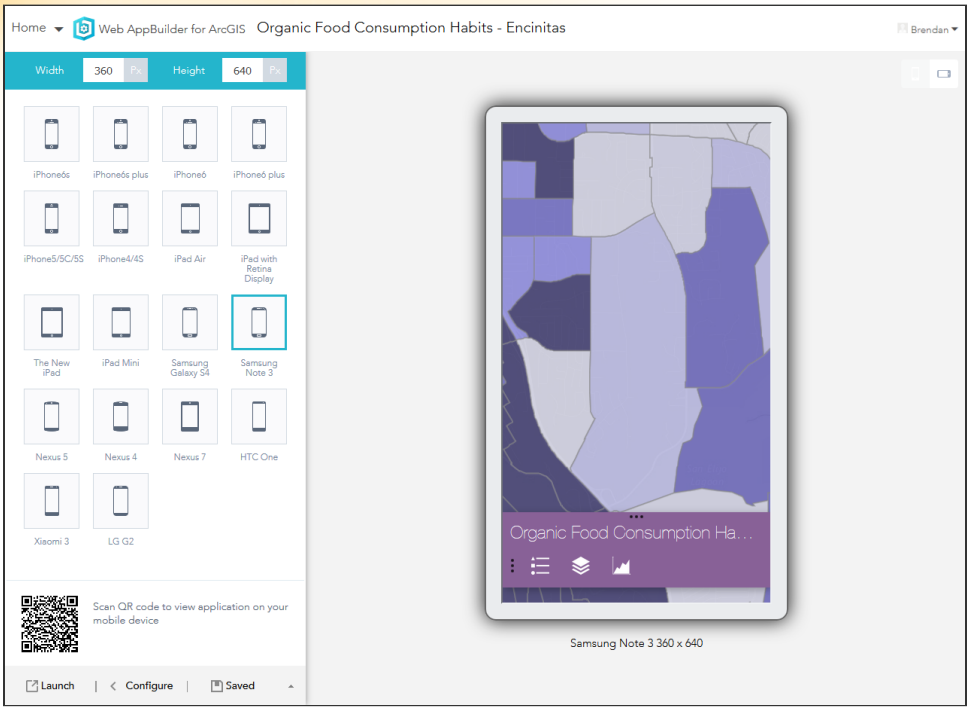
Step 7: Preview the app

a Click Launch to view your app in your browser.



b. Click Previews to preview what your app would look like on different devices.

c. If you like, select different devices to explore the previews.



Conclusion

Congratulations! You've just created and styled a web map using U.S. census block groups from the Living Atlas and market-potential data from Esri. You then published a custom web app that works with any device using Web AppBuilder for ArcGIS. Hopefully, you can use the skills that you learned in this exercise to build your own geo apps that benefit your community!