



Mapping Without Limits

ArcGIS Online is a Complete, Cloud-Based Mapping Platform

ArcGIS Online

Overview

ArcGIS Online is a web-based mapping and app-building site created by Esri, one of world's leaders in GIS software. In an effort to empower users of all levels to create interactive maps and applications that are easy to share, Esri developed ArcGIS Online (commonly called AGOL) platform to realize its vision. With both a free version for lay users and an organizational account for larger enterprises, the functionality is tailored to different mapping and application needs. Not only can users create custom maps using their own data, but they can also publish ready-to-use apps that make sharing information easy and intuitive for their audience. This guide explores the capabilities that come with the free version, which is available to anyone with an Esri Global Account.



Apps for Everyone

Ready-to-Use Maps

Visualization

Analytics

Administration

ArcGIS Marketplace

ArcGIS Solutions

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Tools for Developers

Setting Up

You should make an ESRI Global Account before starting. While you can make maps and applications using ArcGIS Online without an account, your creations will **not** be saved. For the purpose of this guide, we will set up a free Esri Global Account, which you can use to access ArcGIS Online and all of Esri's training resources.

- Go to <http://www.arcgis.com> and click on **Sign In**.
- At the bottom of the page, click on **Create an account** -> **Create an ArcGIS public account** and fill in the necessary information.
- After creating your profile, you can start using ArcGIS Online.

In this guide, we are going to learn how to create basic maps by using different features such as adding layers, changing the symbology of the layers, as well as creating and sharing web applications. Once you have finished this tutorial, you will have a good understanding of the main functions of ArcGIS Online and can start creating simple maps. You will learn how to utilize online data available through ArcGIS online as well as uploading data from multiple sources.

Note: While the layers and links mentioned in this guide are accurate at the time of publication, resources online break or get changed constantly. If you find that a link does not work or a layer displays different data than this tutorial presents, it is best to search your link or layer online to find a more up-to-date resource. If this fails, please contact Eva Dodsworth at edodsworth@uwaterloo.ca for assistance.

Getting Started

To begin, click the **Map** link at the top toolbar, next to **Scene**, on ArcGIS Online. Afterwards, click **Open in Map Viewer Classic** on the upper-right corner of the web page (Figure 1). This will pull up a new blank map named My Map (Figure 2) in Map Viewer Classic. Take a moment to become familiar with the different parts of your map. Left of the title is a dropdown menu for navigating through ArcGIS Online. The top-right-hand corner of the page has a **New Map** link that opens a new blank map. Next to that is your account username with a dropdown menu for account settings. The left sidebar contains the details of your map, including three tabs: **About** (About this Map), **Content** (Show Contents of Map), and **Legend** (Show Map Legend).

There are several links along the top of the map allowing you to do various things with your map. The **Add** button provides a dropdown menu with different options for adding data. The **Base map** button allows you to choose from 16 different styles of map that will underlie your data (Topographic is the default).

The **Save** button will update and save your map as you progressively add more features to your project. The **Share** icon pops up a dialog box giving various options for distributing your map.

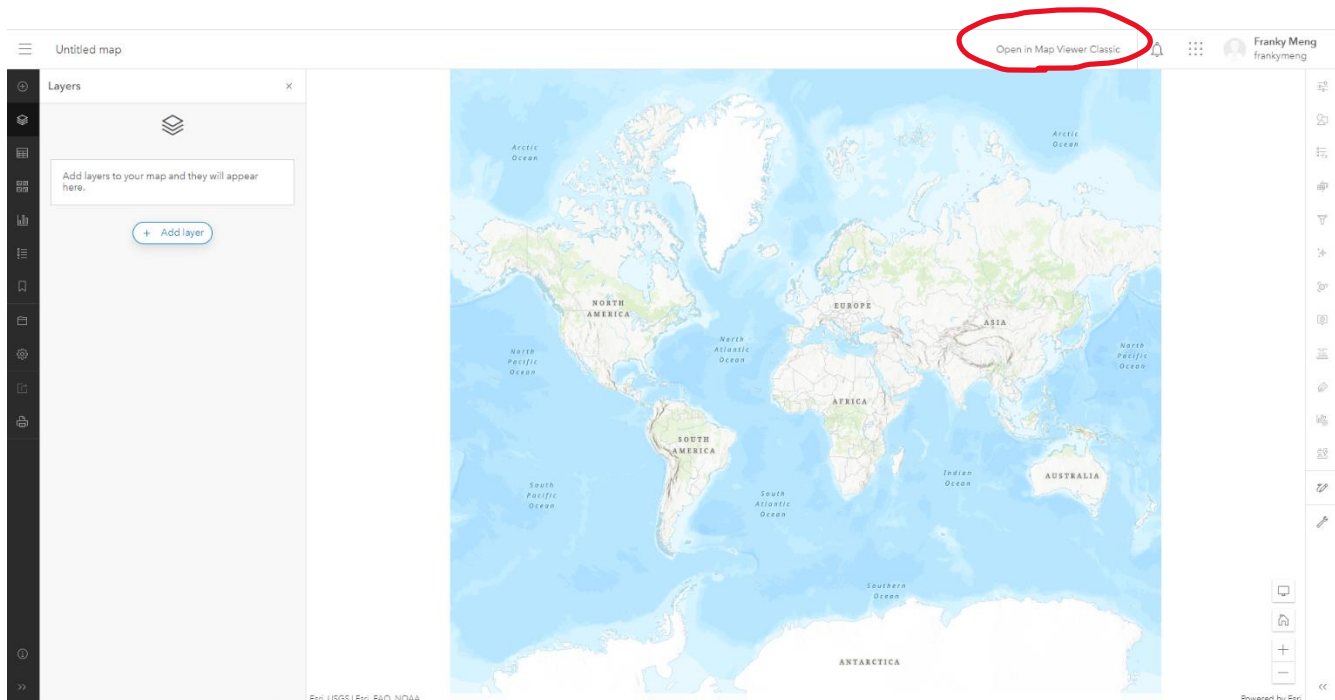


Figure 1 – Map Viewer

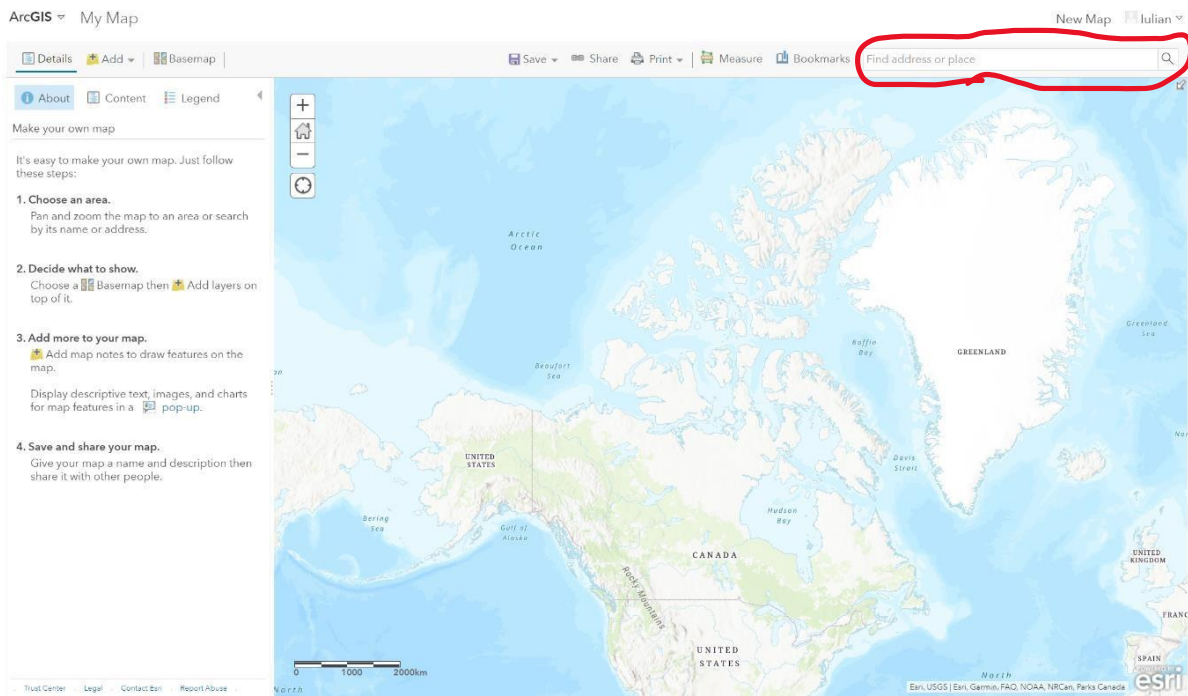


Figure 2 - My Map Viewer

Print takes a snapshot of the map and its peripheral info for printing. By using the **measure area and distance (Measure)** tool you can get directions from point A to B, measure distances and identify its latitude-longitudinal coordinates, as well as finding the area of a shape drawn on the map. The bookmarks tool allows you to save a location by recording the extent and position on the map, allowing you to switch between multiple places.

Afterwards, you may want to use the Search box to find an address or a place (upper-right corner of Figure 2). Navigating the map is easy: click and drag to Pan the map and Zoom In and out using the scroll wheel on your mouse.

Picking a Location

For this tutorial, you will be creating a map that displays various parks and popular tourist attractions located in Honolulu, Hawaii. The capital city of Hawaii is Honolulu, located on Oahu Island, which is one of the eight main islands in Hawaii. You will be using data primarily from the ArcGIS Online server and the City and County of Honolulu's Open Data Catalogue (<http://honolulu-cchnl.opendata.arcgis.com>).

The first step in working with your map will be to choose a location to work in. For this guide, we will use Honolulu, Hawaii. In the Search box, type in **Honolulu** and select the **Honolulu, HI, USA (City and County of Honolulu)** option (Figure 3).

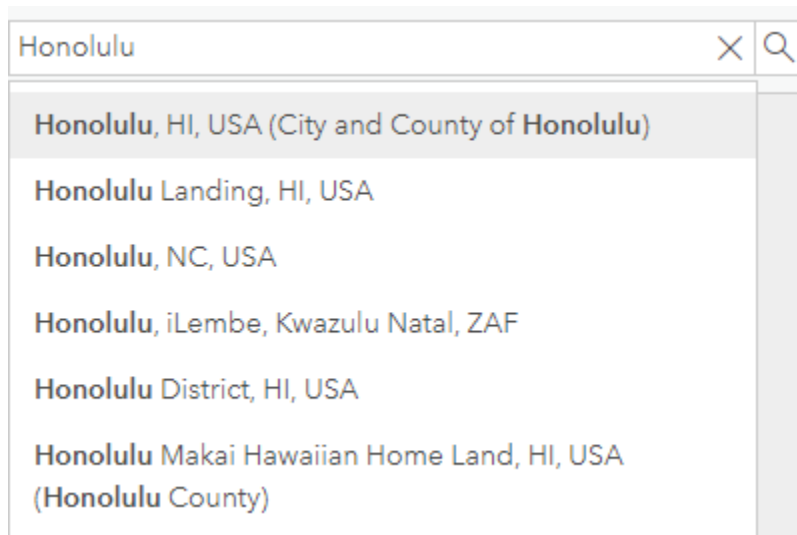


Figure 3 – My Map Search Box

At this point, you should save the map and give it some information. Note that the map extent will also be saved, so make sure you are zoomed into Honolulu. The image below (Figure 4) displays the map extent that covers the City of Honolulu.

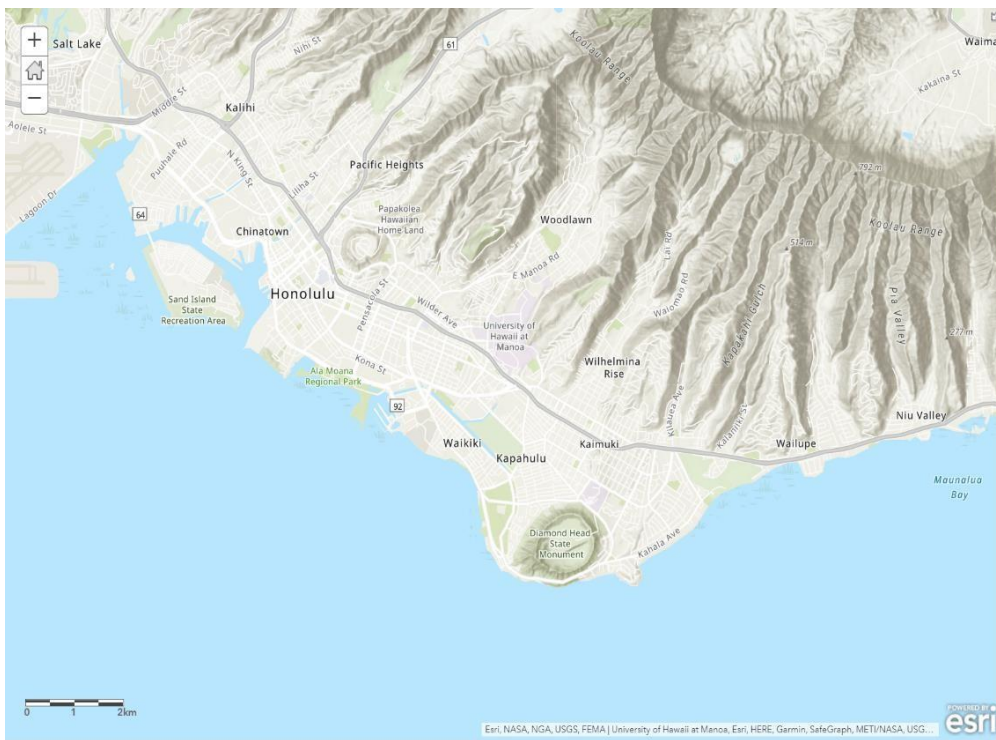


Figure 4 - City of Honolulu View Extent

Click on **Save** and click on either the **Save** or **Save As** option (Figure 5) and name the map. You can use the information below (Figure 6) to populate the fields or come up with your own **Title** (short, but descriptive), **Tags**

(keywords that are used for searching purposes), and **Summary** (a brief description of what the map is). The saved map can be found under **Content -> My Content**.

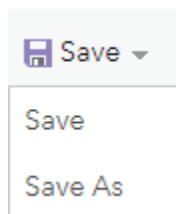


Figure 5 - Save Map Dropdown Menu

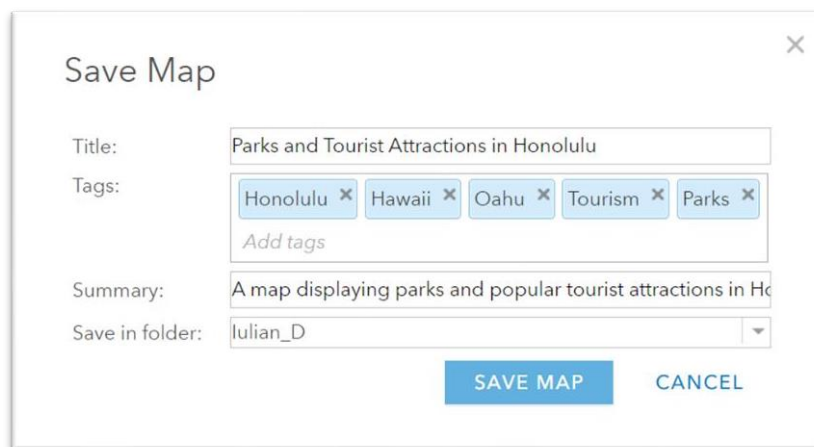


Figure 6 - Save Map Pop-up Field

Creating New Data

Now that you have a set location, you can start adding features to your map. To do this, you need to Add Map Notes, which function as editable layers in the map. Click the Add menu and choose Add Map Notes (Figure 7). This pops up a dialog box, which allows you to name your notes and choose from several different templates for different applications. For now, keep the default settings and click **Create** (Figure 8).

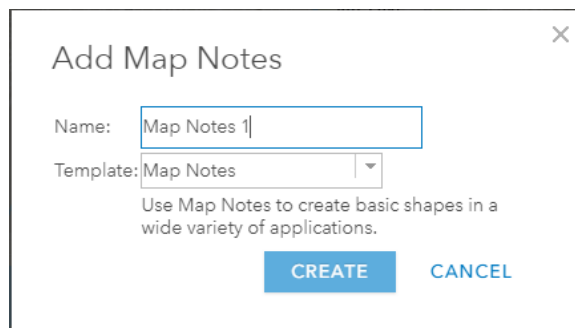
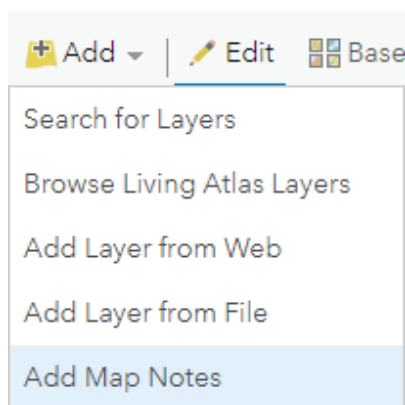


Figure 8 – Add Map Notes Pop-up Window

Figure 7 – Add Dropdown Menu (1)

You will notice that the **Details** pane on the left automatically changes to **Edit** pane, which contains tools for creating four basic features: Points, Text, Lines and Areas. You will start by creating a point feature using the Pushpin. Click on the **point tool**, and then zoom into the **Diamond Head State Monument**. After selecting the Pushpin from the point tool, zoom into the Diamond Head State Monument found on the Southeastern part of the island. Name the point Diamond Head State Monument. You can either leave the description blank or fill it in with a brief overview about the site. If you want to change the appearance of your marker, click **ChangeSymbol** and choose from the various menu options and colors (these options would be good to explore for future reference).

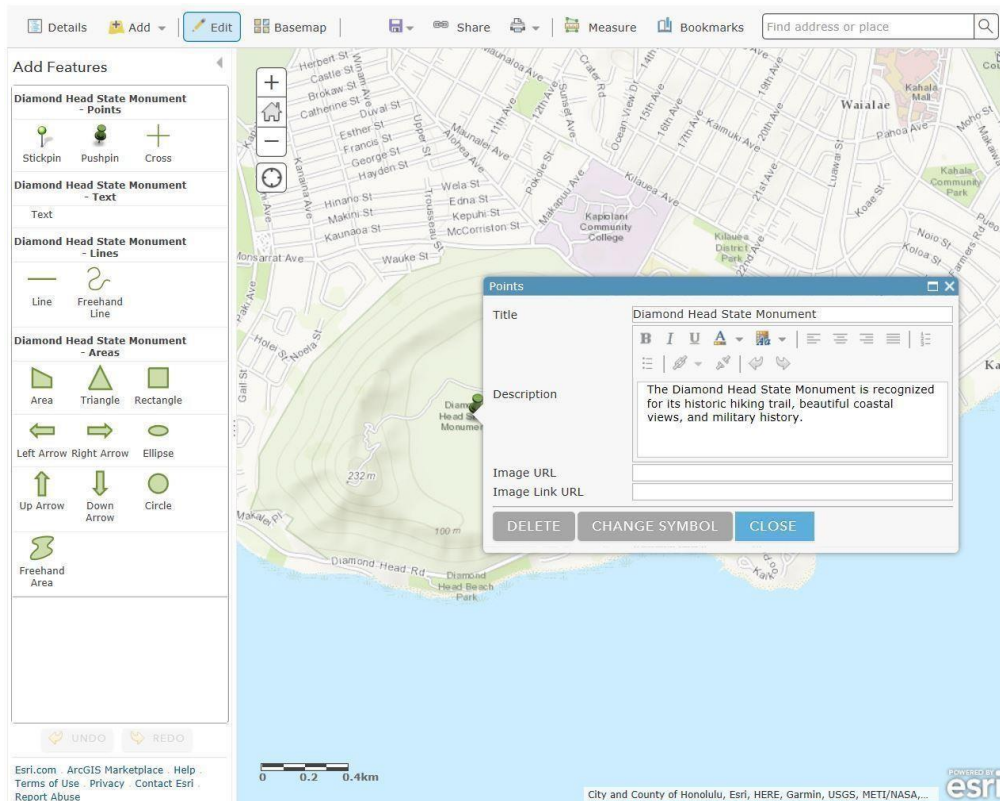


Figure 9 - Adding in Pushpin Feature with Descriptions

There are numerous options for adding an Area (also known as a polygon), but the most commonly used tool is **Area** (Figure 10) which allows you to draw each vertex of your feature with a click of the mouse (double-click to finish your drawing and closes the polygon). Choose this tool and draw an area around Honolulu Zoo.

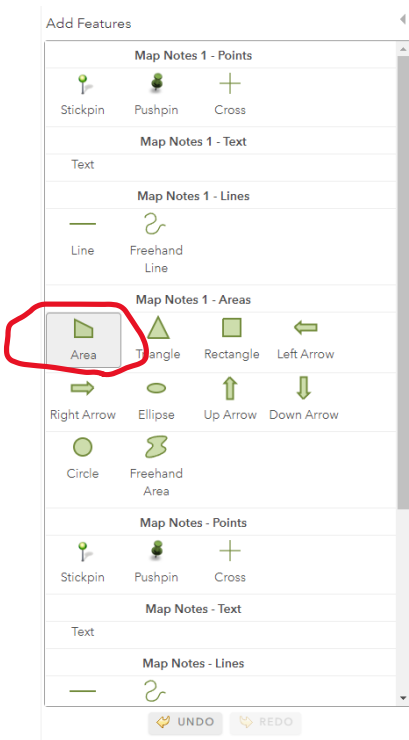


Figure 10 – Add Features Pane

When the callout box appears after you have created the area, enter the information as seen below.

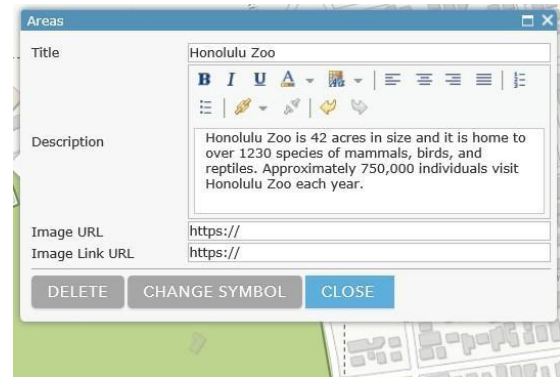


Figure 12 - Polygon Callout Box



Figure 11 - Honolulu Zoo Polygon

Next, you will add a path using a Line feature. There are two options for this: **Line and Freehand Line** (red circle on Figure 13). The former lets you draw each vertex with a click of the mouse; the latter requires you to click and hold while you draw your segment freehand. Choose one of these options and draw a path from the **Kapiolani Community College to Ala Wai Golf Course** (you can draw the route any way you please, as long as you follow established roadways/pathways in Honolulu). Name the path Kapiolani Community College to Ala Wai Golf Course and click close.

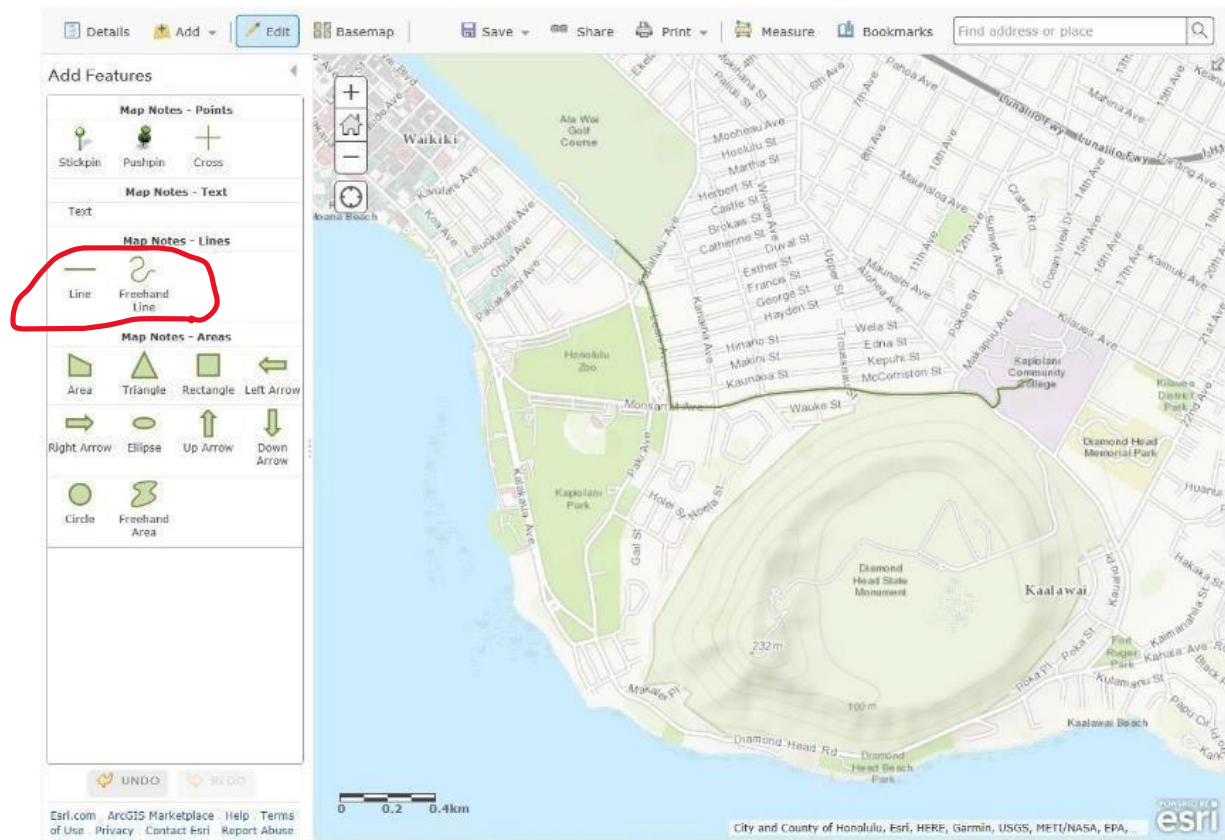


Figure 13 - Line Drawing from Kapiolani Community College to Ala Wai Golf Course

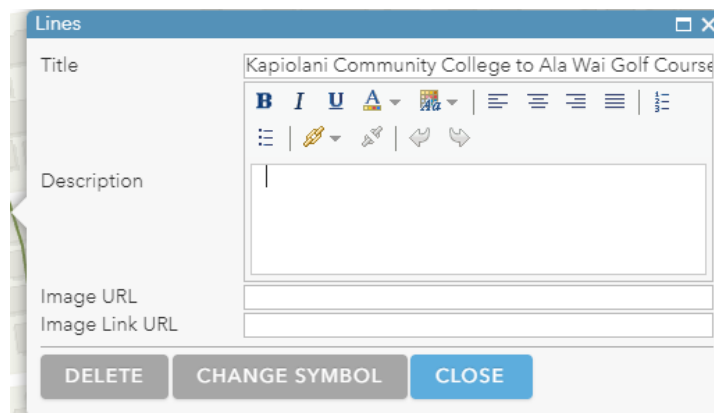


Figure 14 – Lines Pop-up Window

You can change the symbol or edit vertexes for any of the features you have created. Since the features you have created so far have a space for Name and Description, we will not cover the Text feature. However, if you simply wanted to add a Text note to your map, this method could be useful.

Adding Pre-existing Data

Using Map Notes, you created your own data layers inside the map. However, sometimes the data you need may already exist. ArcGIS Online has several ways of adding data to your map. The easiest way is to search for data from the Add menu by clicking on Add and choosing **Search for Layers** (Figure 15). Next select **My Content** drop down menu and select **ArcGIS online** (Figure 16). In the search box, type in **Reprojected_Parks_CIPs** and press **Enter**. Click on the icon of that layer (Figure 17).

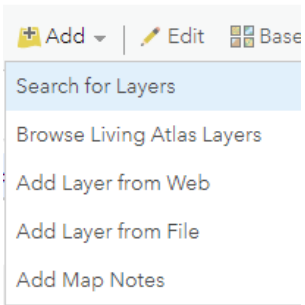


Figure 15 – Add Dropdown Menu (2)

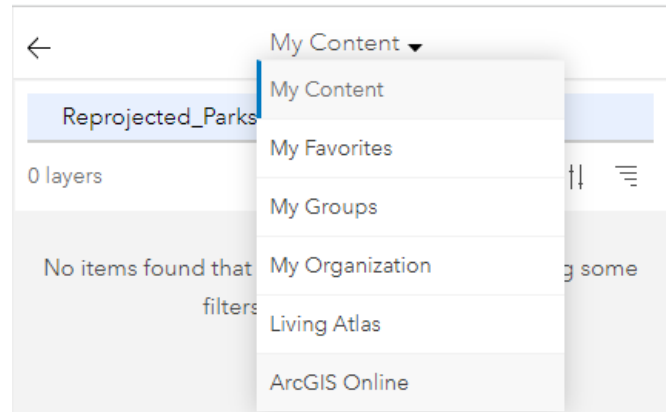


Figure 16 – My Content Dropdown Menu

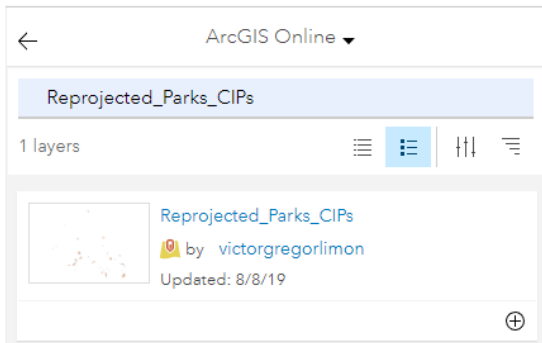


Figure 17 – Reprojected Parks CIPs Layer from ArcGIS Online

Navigate to the Details tab and select content. Two layers should be added to your map. Only have the Reprojected Parks PlusMissing2007019 layer checked (Figure 18).

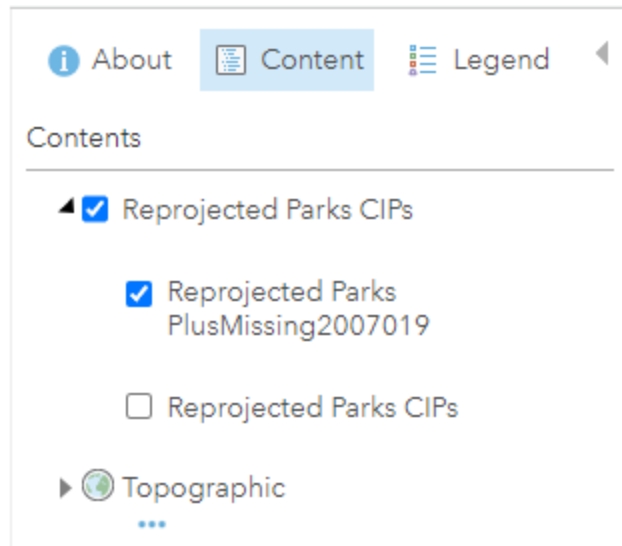


Figure 18 - List of Layers under Content

You can modify the symbology of the 'Reprojected Parks PlusMissing2007019' layer. Click on Contents and hover your pointer over the layer where four icons will appear under it (Figure 19).

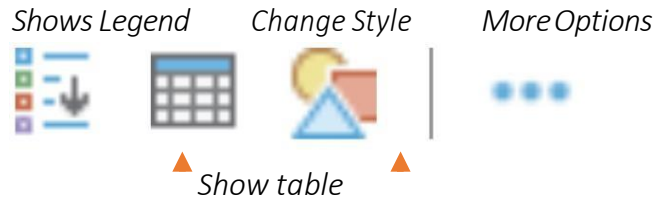


Figure 19 - Close-up Icon Display

- a) **Show legend** will drag down a legend of that specific attribute.
- b) **Show table** will open up the attribute table.
- c) **Change Style** enables you to customize the symbol.
- d) **More Options** contains more useful tools, that will be described later in this tutorial.

Select the Change Style icon. Under Choose an Attribute to Show leave the option to Show location only. Under Select a drawing style, click Options. Click on Symbols, and the pop-up window enables you to change the color of the symbol, transparency, size, and pattern (Figure 20).

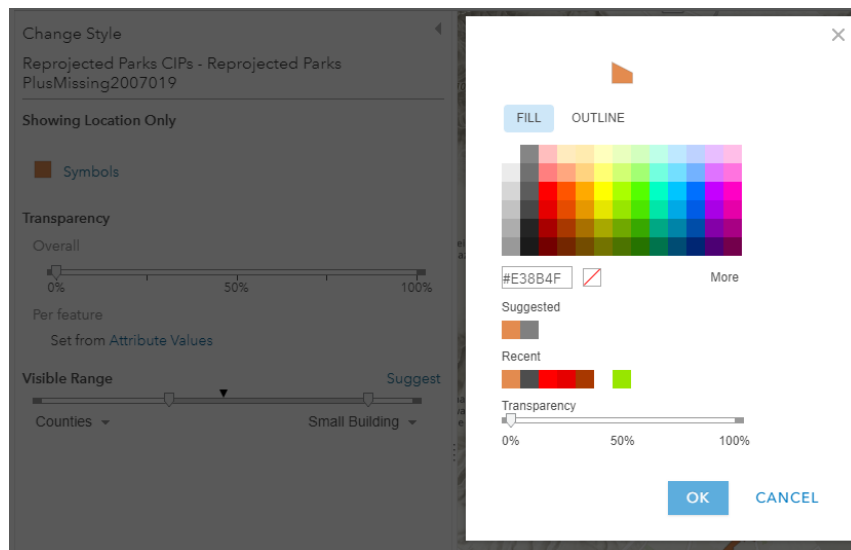


Figure 20 - Change Style Window

Another method for adding data is through a hosted web service. Click on the Add dropdown menu and choose Add Layer from Web. In the dialog box, enter the following URL:

https://geodata.hawaii.gov/arcgis/rest/services/SoH_Imagery/WV2_2016/MapServer

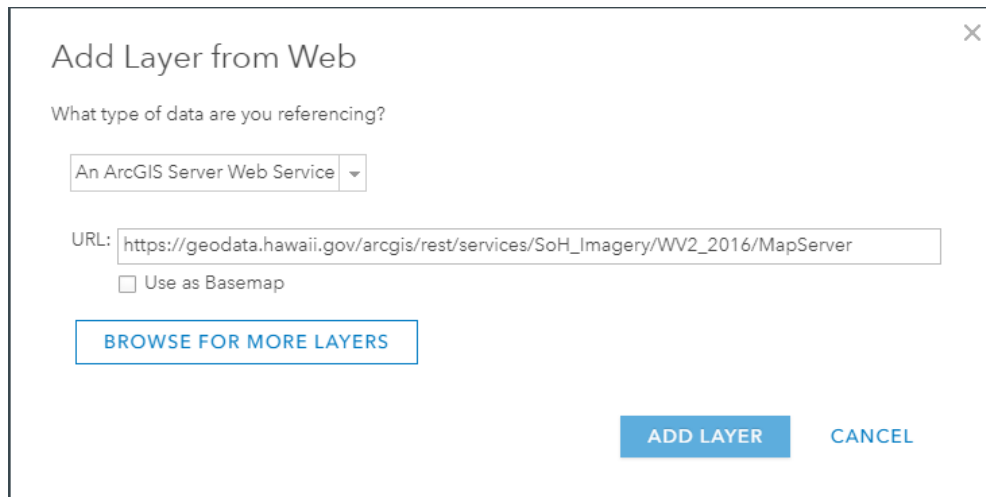


Figure 21 - Add Layer from Web Window

You should then click Add Layer. This imagery service is provided by the State of Hawaii. Please note that due to copyright restrictions on this layer, you can only view it up to a certain view level. Once you have zoomed in too close, it will stop drawing.

The final method of adding data is to Add Layer from File, which uses your own locally stored data files. There are several file types you can upload: Esri Shapefiles (in zipped format); comma, semi- colon, or tab delimited text files (CSV or TXT); and GPS Exchange Format (GPX); each allows you to upload a maximum of 1000 features.

Uploading Data Files

For this section, we are going to utilize the City and County of Honolulu’s Open Data Catalogue, which features datasets available to the public for general use (see the Open Data City and County of Honolulu User License for details). To access the data, go to the following link:

<http://honolulu-cchnl.opendata.arcgis.com/>.

Shapefiles

We’ll begin with one of the most common geospatial data formats, the Shapefile (.shp). The shapefile format was created by Esri, it can be read by virtually any GIS program, including some programs that aren’t primarily intended for GIS such as AutoDesk’s drafting software AutoCAD.

In ArcGIS Online, shapefiles need to be uploaded in a zipped format in order to be read properly because a shapefile (singular) is actually made up of several different files (plural) all with the same name but different file extensions, such as .dbf, .prj, .xml, and others. All files must be present for a shapefile to be useable.

On the Honolulu Open Geospatial Data portal main page: <http://honolulu-cchnl.opendata.arcgis.com/>, scroll to the bottom of the page and select **Parks and Recreation** (Figure 22). Do a key word search for **Parks** and select the data link **Parks** (Figure 23). Once the data page opens, you can preview the data. To download the data in Shapefile, spreadsheet or KML format, click on **View Full Details** (Figure 24) and then click **Download** (Figure 25). To download the data specifically in Shapefile format, click on **Download** button under Shapefile (Figure 25). The file is delivered in zipped(.zip) format. This data includes information about parks, open spaces, and outdoor recreational facilities managed by the City and County of Honolulu.

The data preview page (Figure 24) lets you preview the data on the map in spatial format and in tabular format by clicking **View Table**.

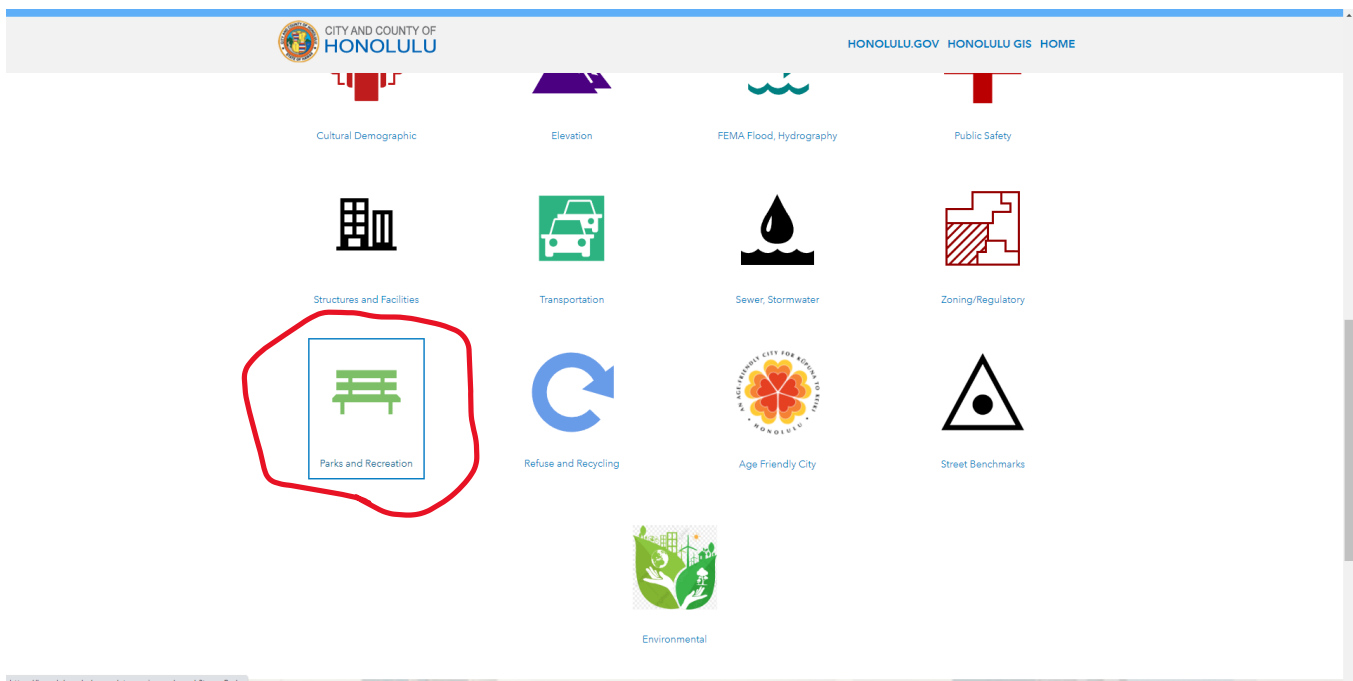


Figure 22 - Honolulu Open Geospatial Data Portal Main Page (1)

Q Parks

All Data Documents Apps & Maps

Filters **Reset** 1 - 19 of 19 results **Relevance**

Content Type

- Feature Layer
- Table

Categories

- AFC Public
- Age Friendly City

Tags

Last Updated

Data

Parks

City & County of Honolulu GIS | honolulugis

Parks, open spaces, and outdoor recreational facilities managed and maintained by the City and County of Honolulu. To reference or identify City Park boundaries for administrative or planning purposes.

Type: Feature Layer Rows: 429
Last Updated: October 19, 2021 Tags: honolulu, oahu, parks, city county parks, recreation, o...

Data

Parks Survey Comfort Stations

City & County of Honolulu GIS | holisgis

A survey of city park comfort stations around Oahu that are scored by condition and need of repairs.V2

Type: Feature Layer Rows: 198
Last Updated: January 5, 2016 Tags: Honolulu, City and County of Honolulu, Hawaii, Oahu,...

Data

https://honolulu-cchh.opendata.arcgis.com/maps/parks

Figure 23 - Honolulu Open Geospatial Data Portal Results Page

City & County of Honolulu

Parks 429 records **View Table**

HonoluluGIS Office - HOLIS
City & County of Honolulu GIS

Summary

Parks, open spaces, and outdoor recreational facilities managed and maintained by the City and County of Honolulu. To reference or identify City Park boundaries for administrative or planning purposes.

View Full Details

Details

- Dataset**
Feature Layer
- February 11, 2021**
Info Updated
- October 19, 2021**
Data Updated
- March 23, 2016**
Published Date
- 429 Records**
View data table
- Public**
Anyone can see this content
- Custom License**
View license details

City and County of Honolulu, Esri, HERE, Garmin, USGS, NGA, EPA, USDA | Honolulu Land Information System (Holis) Department of and Permitting, City and County of Honolulu

Powered by Esri

Figure 24 - Parks Preview Page

Figure 25 - Parks Download Page

From the **Add menu**, choose **Add Layer** from File and use the Choose File button to upload the **Regional_Parks.zip** file you just downloaded. Accept the default selection to Generalize features for web display and then click **Import Layer**. The newly imported layer is now visible in the **Contents pane** as well as on the map (you may need to zoom out or pan the map to see the features). You can click on a Park feature to reveal a pop-up window with more information about that parks, open space and outdoor facilities.

Figure 26 - Add Layer from File Window

After uploading the file, options to change the style of the Parks features appear in the content panel. Leave everything in the content panel as default. Your map represents the names of the various Parks, open space and outdoor facilities that are located in the City of Honolulu. The features are represented by using different styles (ex. Color, linewidth, types). Your map should look similar to the one below.

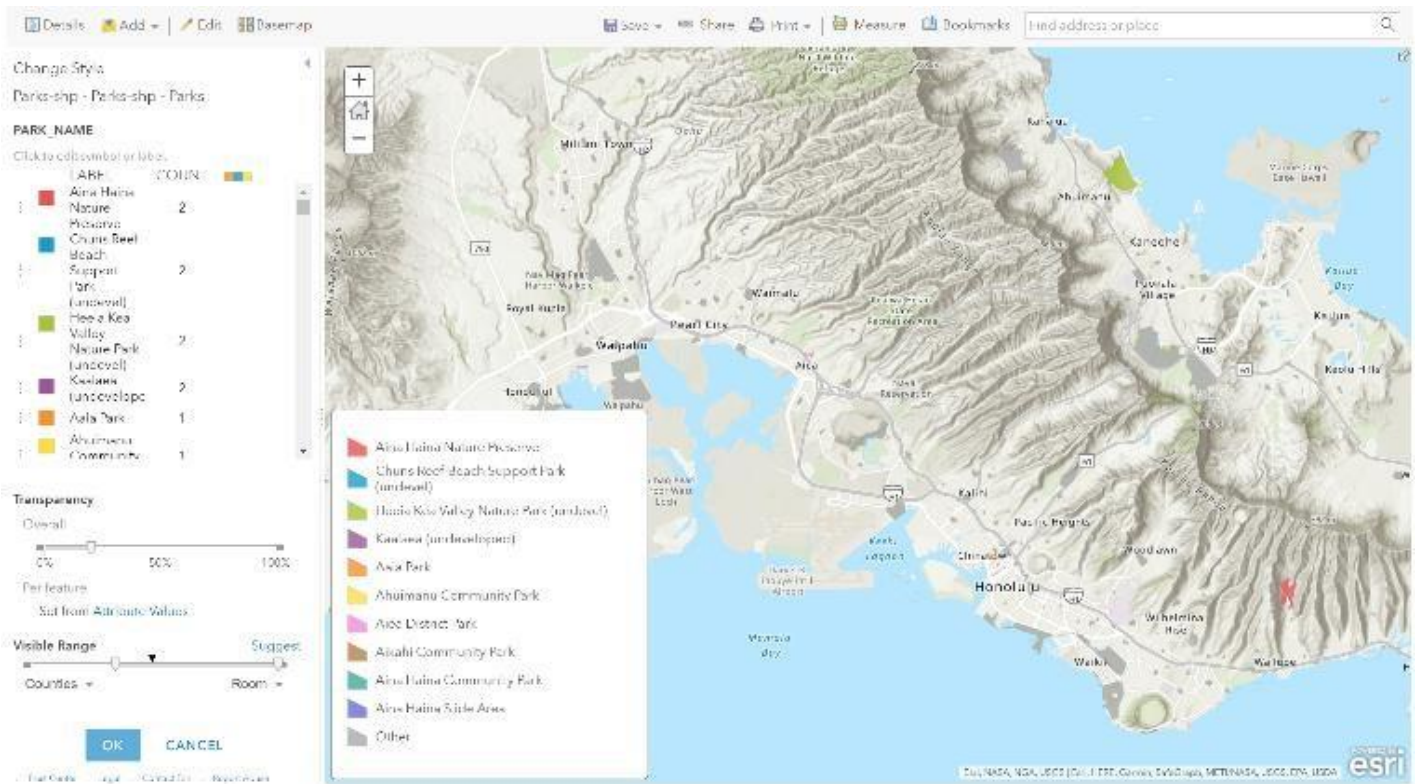


Figure 27 - Parks in Unique Symbology

The various colored polygons represent different parks, outdoor facilities and open space. Take a notice at the legend.

Tabular Data

As you may have noted while adding the Regional Parks shapefile, one of the options under import is importing data in CSV (Comma Separated Values) file format. When formatted correctly, CSV and TXT files provide tabular information that can be plotted by either physical address or geographic coordinates (i.e. latitude-longitude, or lat-long).

Once again, go to the Honolulu Open Geospatial Data Catalogue (<http://honolulu-cchnl.opendata.arcgis.com/>) and search for the **Electric Vehicle Charging Station (EVCS)** layer (Figure 28). Click on it. Make sure the file type is set to **CSV** and download the file. With CSV and TXT files, you can use the standard **Add Layer from File** method or you can simply drag and drop the file on the map.



Figure 28 – Honolulu Open Geospatial Data Portal Main Page (2)

Electric Vehicle Charging Station (EVCS)

HonoluluGIS Office - HOLIS
City & County of Honolulu GIS

View Map Download More

Summary
Electric Vehicle Charging Station (EVCS) locations in City & County of Honolulu parking areas
Electric Vehicle Charging Station (EVCS) locations in City & County of Honolulu parking areas

Looking for something else? See other datasets nearby

Attributes (25)

Name	Type	Action
ID	Text	[Bar Chart Icon]
Name	Text	[Bar Chart Icon]
Location	Text	[Bar Chart Icon]
Landmark	Text	[Bar Chart Icon]

Details

- Dataset**
Feature Layer
- October 14, 2020**
Info Updated
- October 14, 2020**
Data Updated
- October 14, 2020**
Published Date
- 8 Records**
View data table
- Public**
Anyone can see this content
- Custom License**
View license details
- Relevant Area**

Figure 29 – Electric Vehicle Charging Station (EVCS) Layer

After the CSV file has been imported, your map will look like the image below. The **Change Style** panel is automatically generated on the left side of the page. Select the attribute to **show location only** and the drawing style to **Location (single symbol)**. The different colored dots on the map are the various charging stations located in Honolulu. You may change the feature, such as **symbol (color, fill, and outline), transparency and visible range** by clicking on “options” in the **Location(single symbol)** tab (Figure 30).

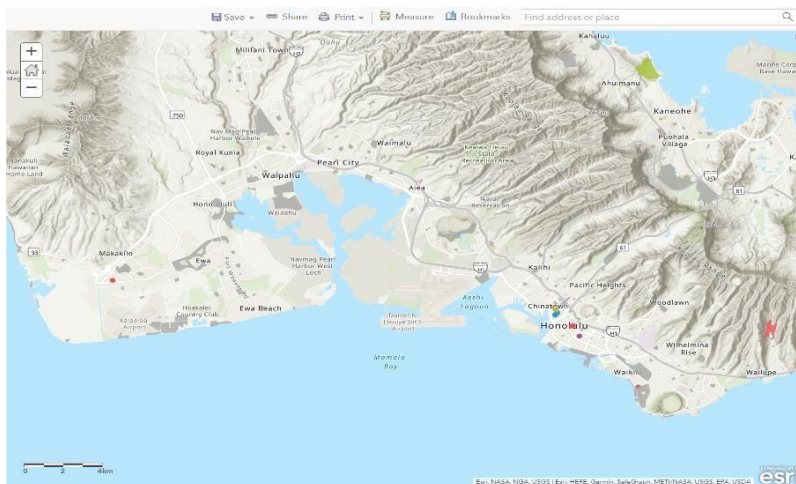


Figure 30 - Map Display of Imported CSV and Parks

KML Files

Although not mentioned in the **Add Layer** from file dialog, KML files can be added to your maps from **Content** (ArcGIS Online). Google created this popular file format (Keyhole Markup Language) and used in their popular Google Earth application. The City and County of Honolulu’s Open Data Catalogue offers their data in KML format.

From the City and County of Honolulu’s Open Data Catalogue (<http://honolulu-chnl.opendata.arcgis.com>), search Existing Bike Facilities and download the dataset as a **KML file**. From your map window, go to the **ArcGIS dropdown menu** in the top-left corner and choose **Content** (Figure 31). On this page, are all the items you have created in ArcGIS Online. Click on **+ New Item** (Figure 32) and browse to the **Existing_Bike_Facilities.kml** file you just extracted by clicking Your device in the pop-up window (Figure 33).

The Add Item dialog also requires you to **add Tags** to your new item, which helps your item get found in searches. Type the words **Honolulu and Bike Facilities** in the box (use the Tab key to add additional tags) and click **Save** (Figure 34).

Once the KML has finished uploading, the item description page will appear showing the details of your newly added layer (Figure 35).

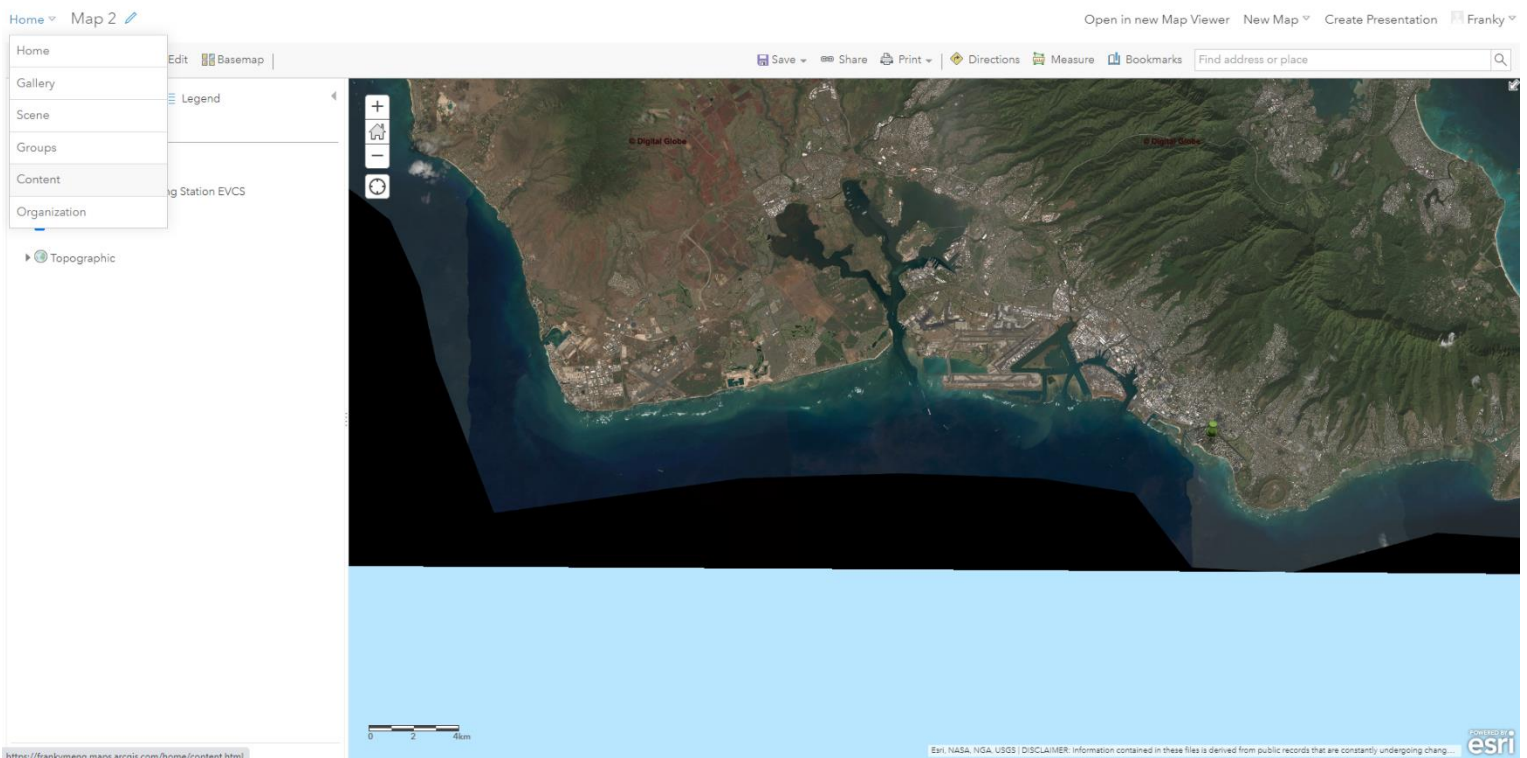


Figure 31 – ArcGIS Online Content Page

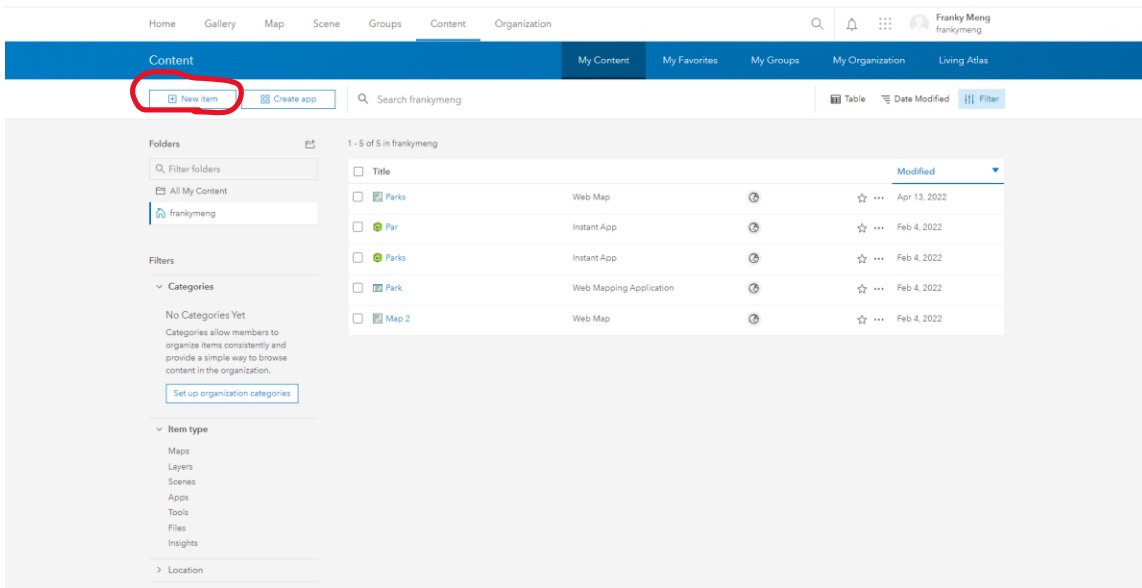


Figure 32 – ArcGIS Online Content Page

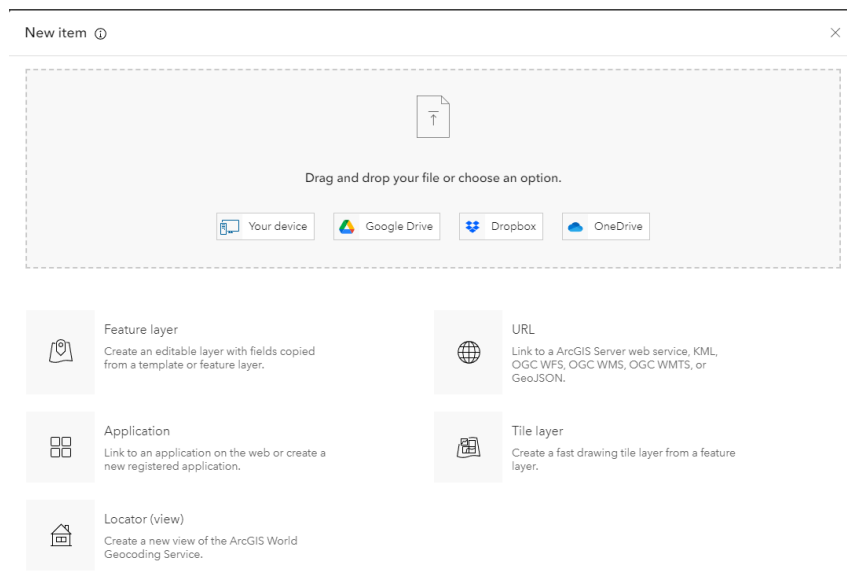


Figure 33 – New Item Upload Pop-up Window



Figure 34 – New Item Description Pop-up Window

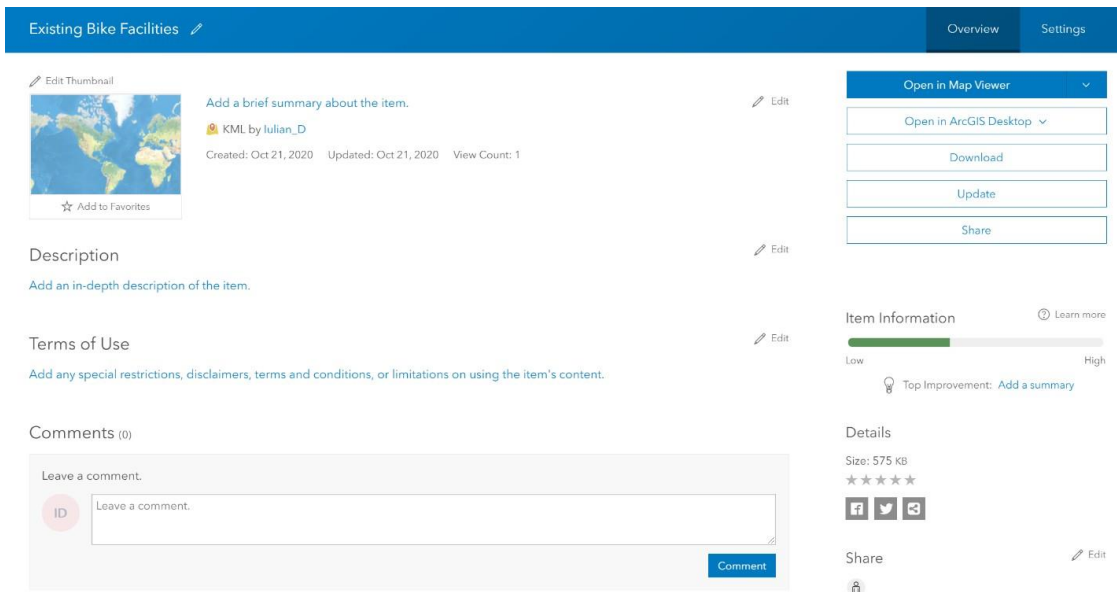


Figure 35 - Layer Description Page

Before you can add the KML file to your map, you will need to share it with the public. Click **Share**, then check the box to share the item(s) with: **Everyone (public)** and click **Save** (Figure 36).

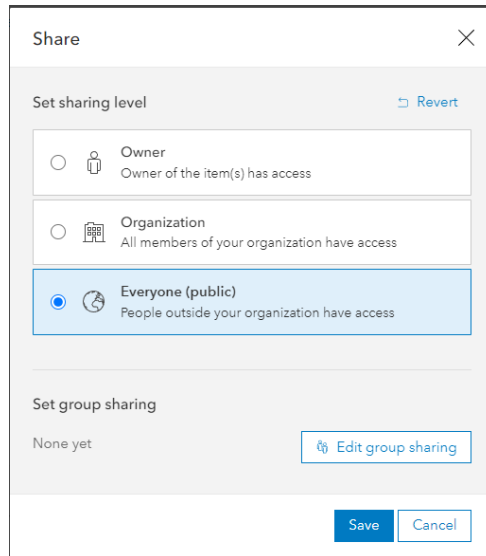


Figure 36 - Share Option Pop-up Window

Go back to the Content page where you will now see your Existing Bike Facilities layer listed in the Content Table.

Editing and viewing attribute information

Turn off all the layers except for Electric Vehicle Charging Stations. Add 2-3 charging stations to the Electric Vehicle Charging Stations layer.

Before editing, go to the **Electric Vehicle Charging Stations** layer, open the attribute table and select **Change Style**. Chose the **attribute as NAME** and **Location (single symbol)** (Figure 37). Then select the **Edit** tab to start adding charging stations to you file by clicking **New Feature** on the **Add Features** panel (Figure 38). Try adding charging station points to the parking lots at **Aloha Stadium** and **Diamond Head** or any other landmark.

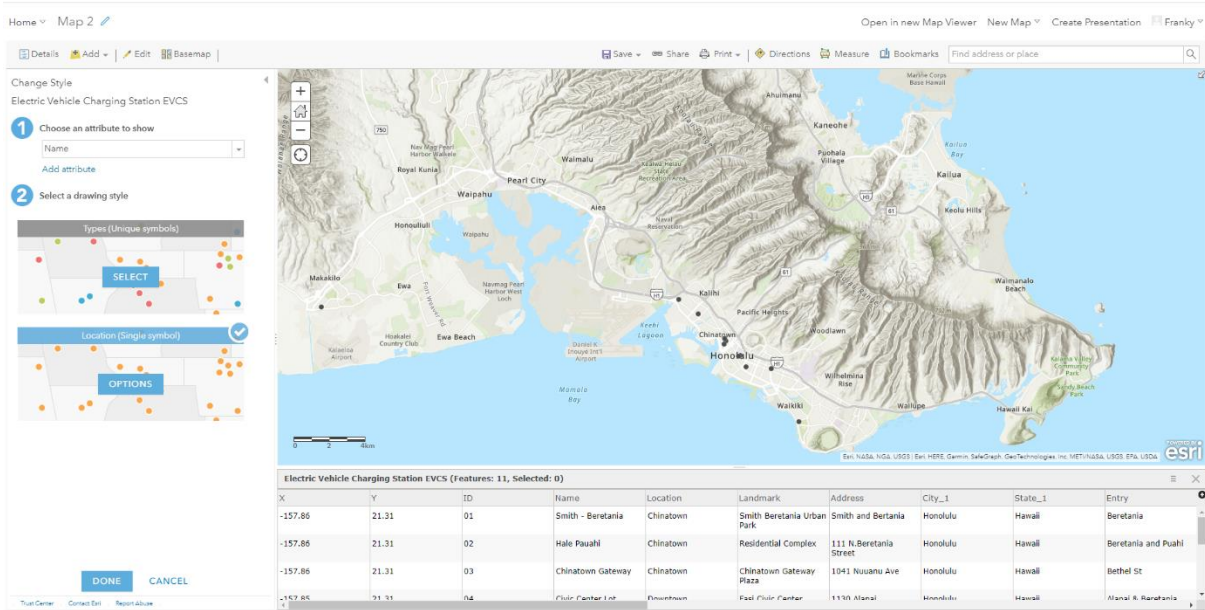


Figure 37 – Map with Change Style Panel and Attribute Table

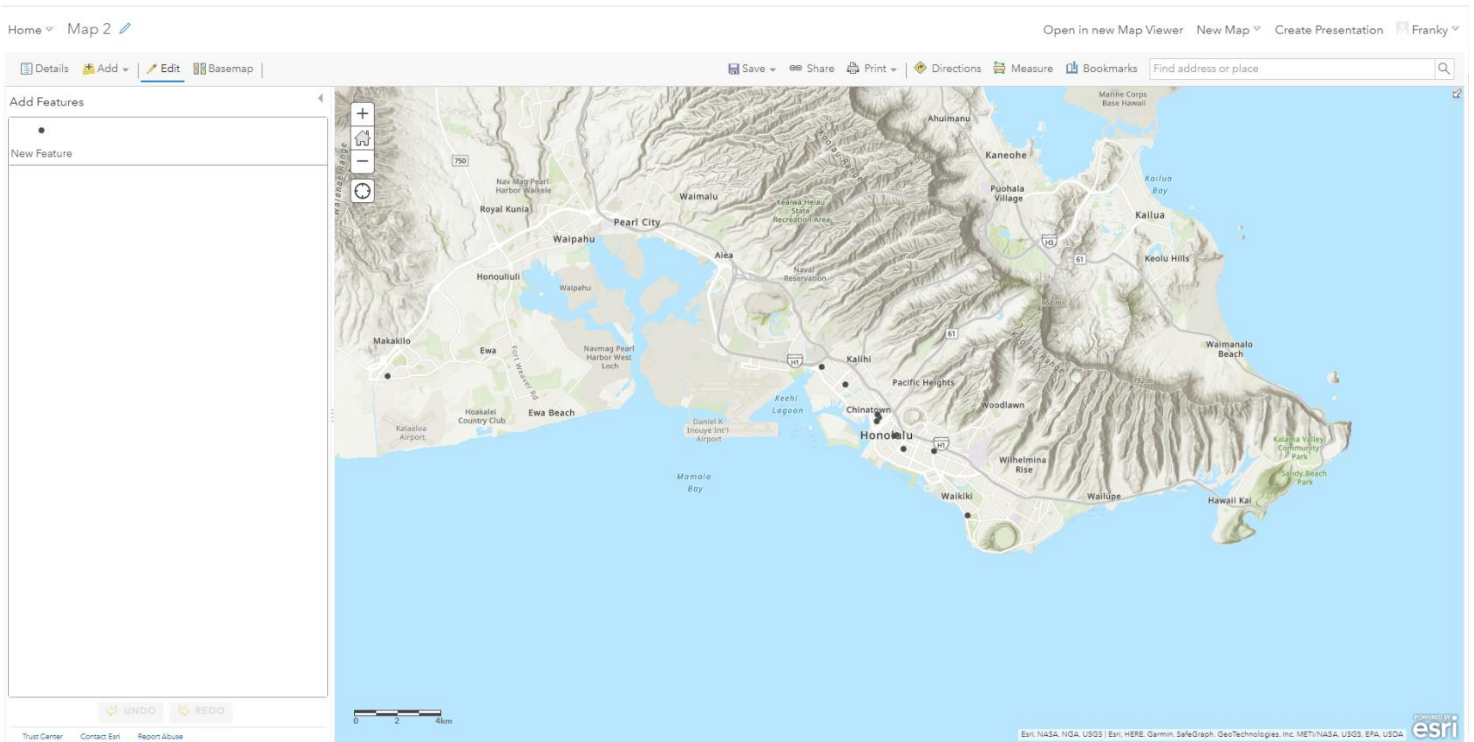


Figure 38 – Map with Add Features Panel

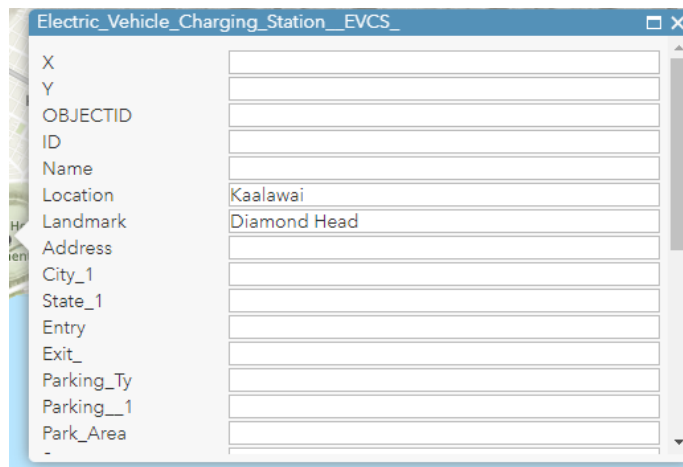


Figure 39 – Feature Description Pop-up Window

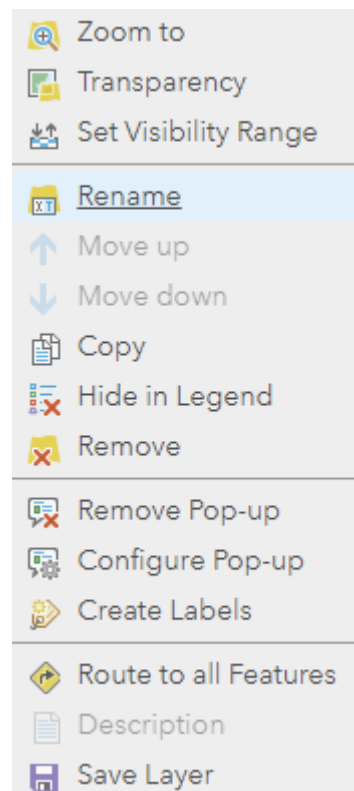


Figure 40 – More Options Dropdown Menu

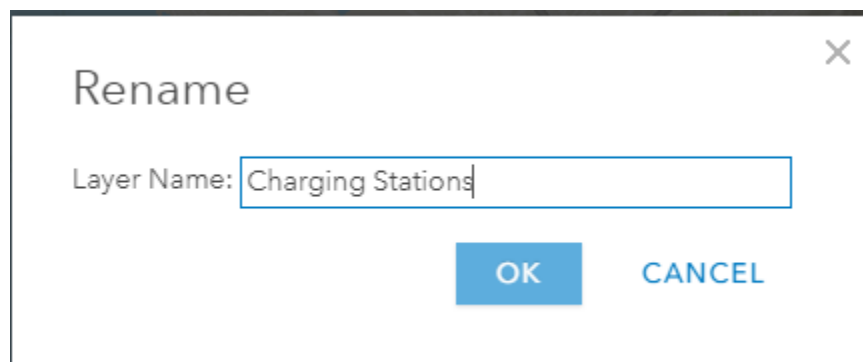


Figure 41 – Rename Pop-up Window

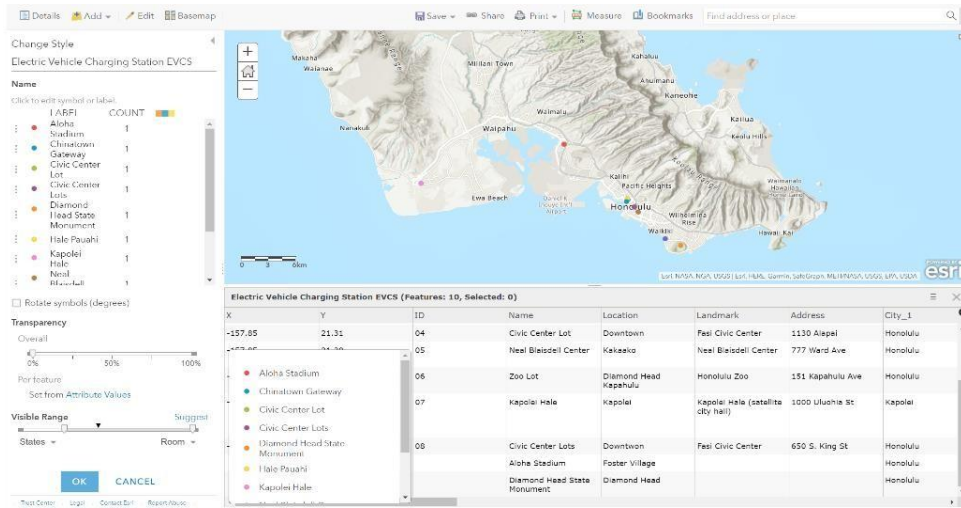



Figure 42 - Creation of New Point Features

Once you found a landmark, click on the dot within the table of contents to place a point and fill in the following: Label the **Name** as the **name of a particular landmark** and the **Location** as the **name of the neighbourhood**. Leave the rest blank (Figure 39). Lastly rename the layer into Charging Stations by clicking  under the layer name. Select **Rename** on the dropdown menu (Figure 40). Enter **Charging Stations** in the pop-up window and click **OK** (Figure 41). Finally, open up **show table** below the layer and see the **new charging stations** that you have added onto the table. Also, you can double check through the legend if they have appeared or not (Figure 42).

Customizing Your Layers

Under the Contents tab of your map's Details, you should now see a number of different layers and a base map (Topographic). You will also notice that to the right of each item has 3 blue dots. Clicking the **blue dots** reveal a dropdown menu showing the various actions you can perform on a given layer (Figure 40). Options will vary by layer.

Let's use some of the menu options to tidy things up a bit. First, **rename WV2 2016 to Oahu Aerial 2016**. Finally, change the **Transparency of the Oahu Aerial 2016 layer to 50%** (Figure 43).

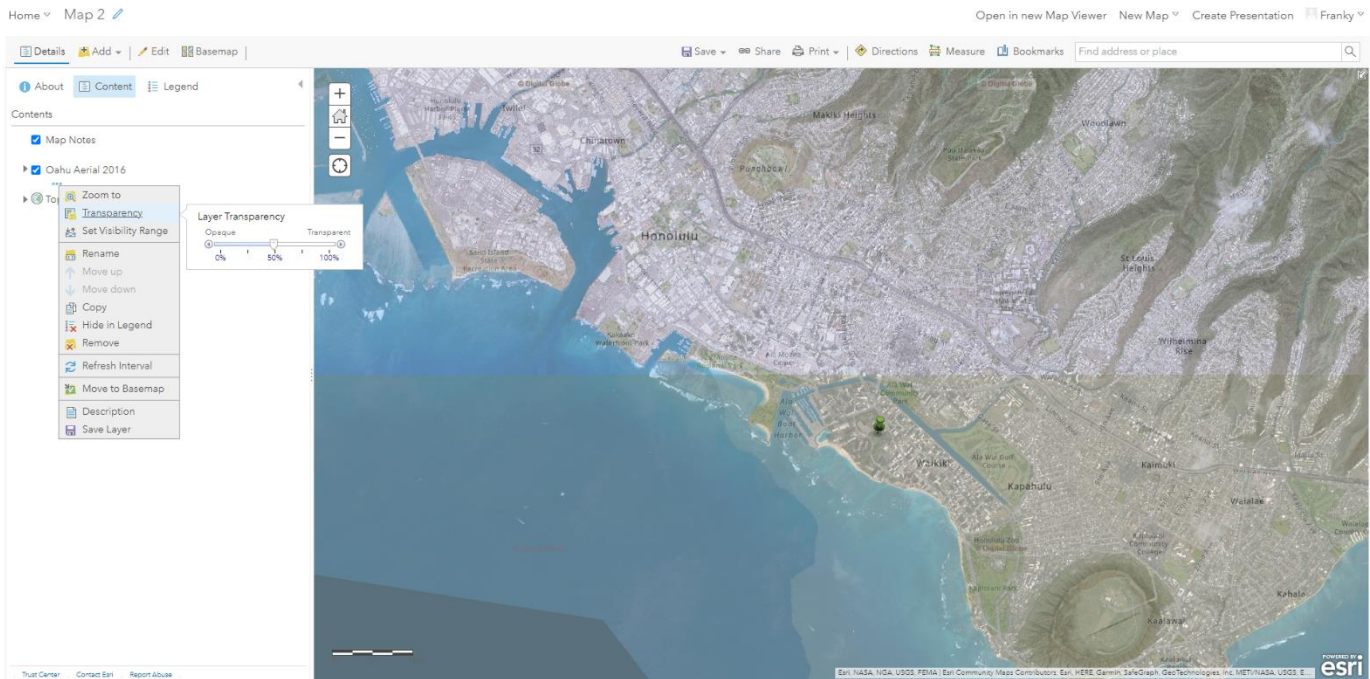


Figure 43 – Transparency Pop-up with Map

One last customization you'll perform is **Set Visibility Range**. This allows you to control which layers are visible at various zoom levels. Since the aerial imagery is of little use when zoomed out too far to see much detail, we'll set the visibility range so it doesn't show past a certain extent. Click on the menu next to Oahu Aerial 2016 and hover over Set Visibility Range. Change the dropdown for **in closer than: to 1:40,000 (Town)**. Now zoom out on the map until the aerial imagery disappears. Notice how much easier it is to read the map at this scale when the aerials are hidden from view.

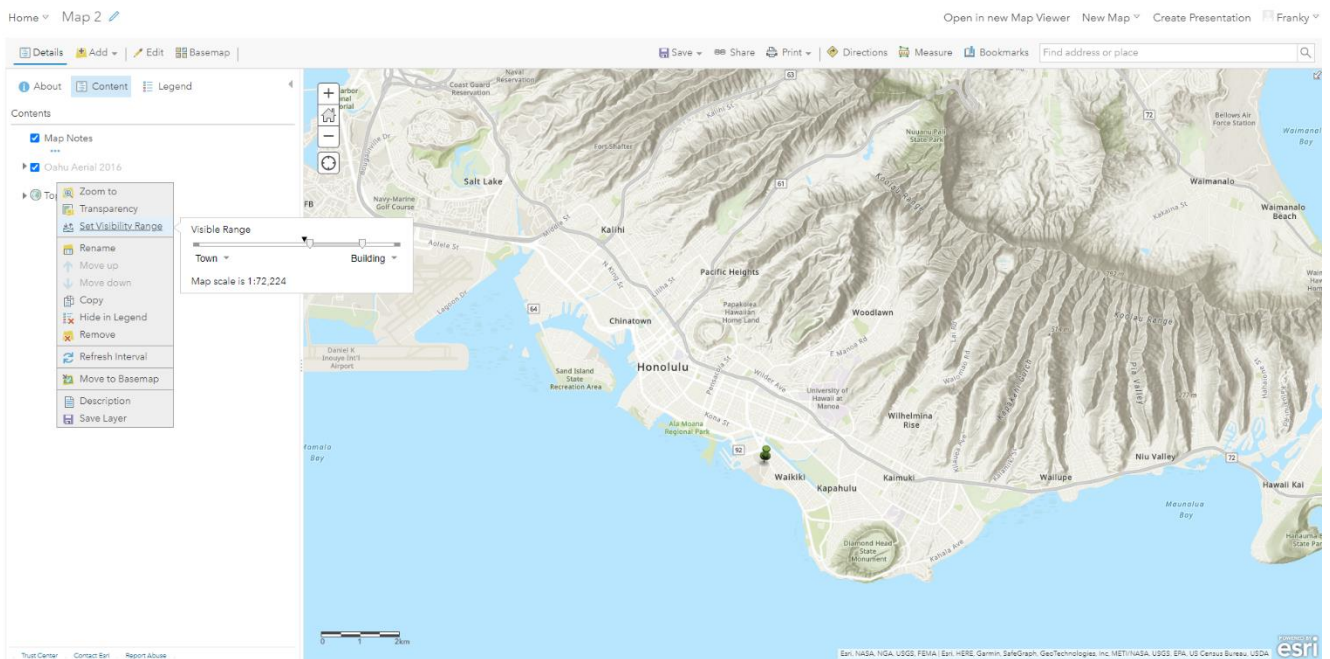


Figure 44 – Set Visibility Range Pop-up with Map

Note: ArcGIS Online also has tools that can be used to Perform Analysis on the data you add or create. This functionality is only available on layers where editing has been enabled. Where editing has been disabled (as is the case with Canada Median Age), Perform Analysis will not be an option in the dropdown menu. However, you can still customize the pop-up information on such layers by using the Configure Pop-up option in the menu. Because this guide is intended as an overview of ArcGIS Online, we won't cover the Perform Analysis or Configure Pop-up tools. Nevertheless, feel free to explore these options on your own to see what the possibilities are for you and your data.

Accessing the Attribute Table

Behind each piece of spatial data there is tabular information. Often times this information can be very useful to determine the usefulness of an ambiguous dataset or give insight to what types of analysis is possible. For example, a set of address points may also contain information about the type of building it is.

To view the attribute table of a layer, there is a **table icon** under the layer title. Click on it to reveal the **attribute table** (Figure 45).

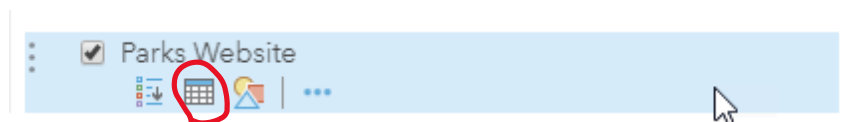


Figure 45 - Table Icon

You can sort the table based on different columns. Note what entries show up at the top and bottom of the list when you sort the table by each column name.

Sharing Your Map

Share

Choose who can view this map.
Your map is currently shared with these people.

Everyone (public)
 frankymeng
 Members of these groups:
 CEAGES Workshop

Link to this map
 Facebook Twitter
 Share current map extent

Embed this map

Figure 46 - Share Window

Up to this point, your map has been saved to your free ArcGIS Online public account. However, since only you have access to this account, you'll need to share your map for others to see it. Sharing a map can be done from many different places on the site as well as in many different ways.

You can share directly from the map by saving the most current changes and then click **Share**. You can also share your map from the My Content page or the Web Map details page. After checking the box to share with everyone (public), the link to your map will be accessible to anyone.

Besides linking to and posting through social media, you can also Embed in a Website and Make a Web Application. The option to embed the map in a website provides you with simple configurations incorporated into the HTML code seen inside the text box. You then copy and paste that code to embed it in a website.

Embed in Website

Choose the size of your map.

W X H Allow responsive sizing

Copy and paste HTML to embed in website.

`<style>.embed-container {position: relative; padding-bottom: 80%; height: 0; max-width: 100%;} .embed-container iframe, .embed-container o...`

Map Options

Choose options to display on your map.

Zoom Control Scale Bar
 Home Button Location Search
 Basemap Selector Map Details
 View larger map Legend
 Disable scroll zoom Preview image

Choose your theme.
 Light Dark

Map Preview

Figure 47 - Embed in Website Options

The option to make a Web Application is slightly more involved, but still relatively easy to set up. Click this option to open the dialog box, which features numerous templates for publishing your map as a web application. Click on the thumbnail images and it will give you a brief description of how each template is used.

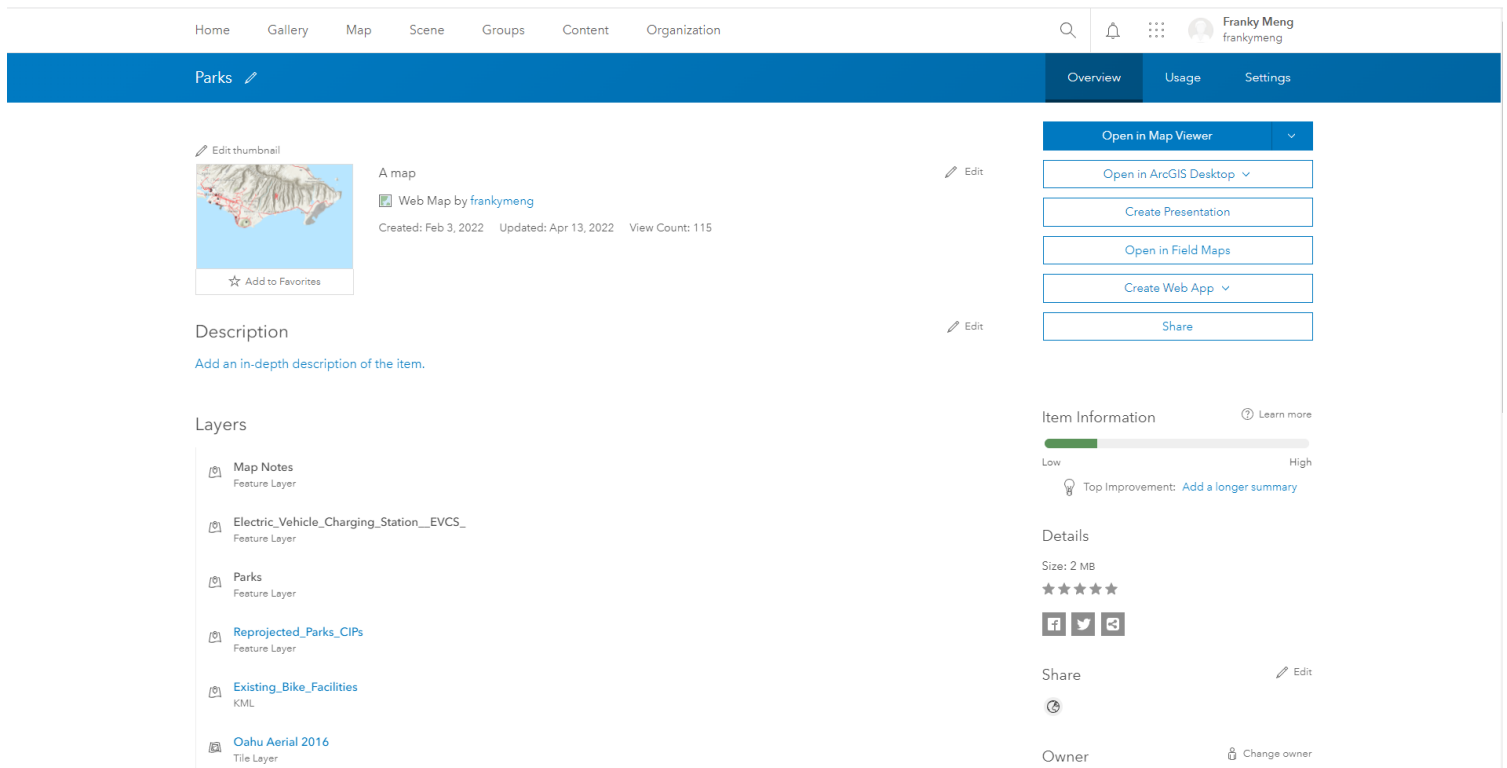


Figure 48 – Web Map Description Page

For this map, we will use the **Basic Viewer** template as a way to share our web map outside of the ArcGIS Online viewer where we created it. Select **Create Web App** on the final web map description page (Figure 48) then click and enter the information for your web application as seen below, and then click **Done**.

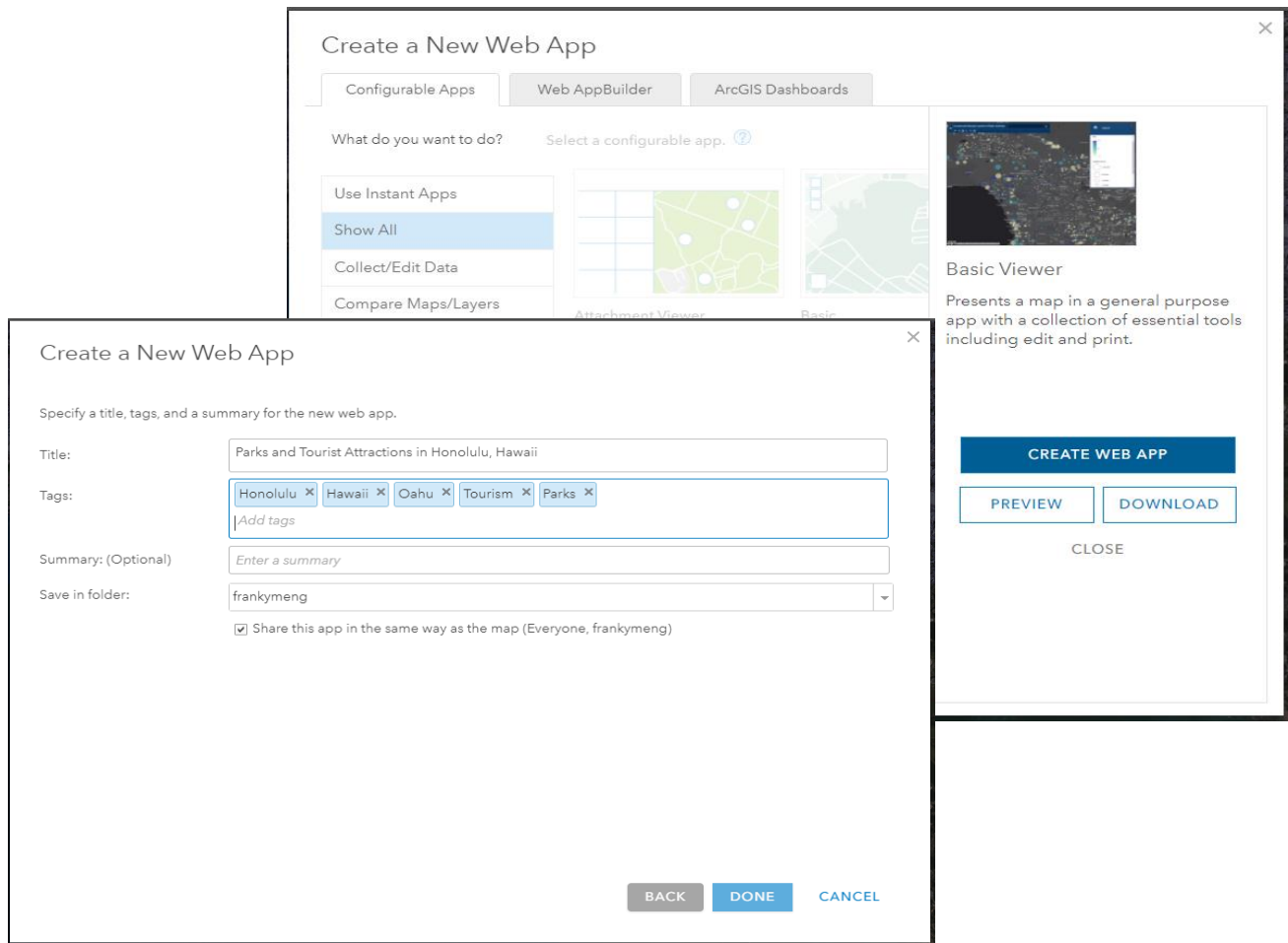


Figure 49 - Create a New Web App Pop-Up Page

At this point, some important information appears on the screen. Both the web map and the web application are shared.

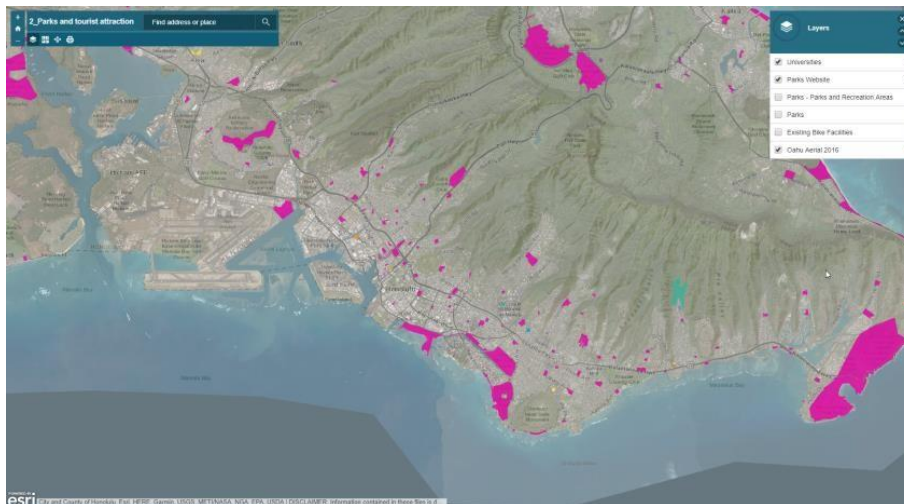


Figure 50 - Web App View of City of Honolulu

Open the application to see what you have created (Figure 50). If you want to make changes to the default settings, go back to the web application page and click **Configure** (Figure 52), then through the tabs adjust **General**, **Theme**, **Options**, and **Search** (Figure 51).

Configure: Park and Tourist Attractions in Honolulu, Hawaii



Figure 51 – Tabs in the Web Application Configure Page

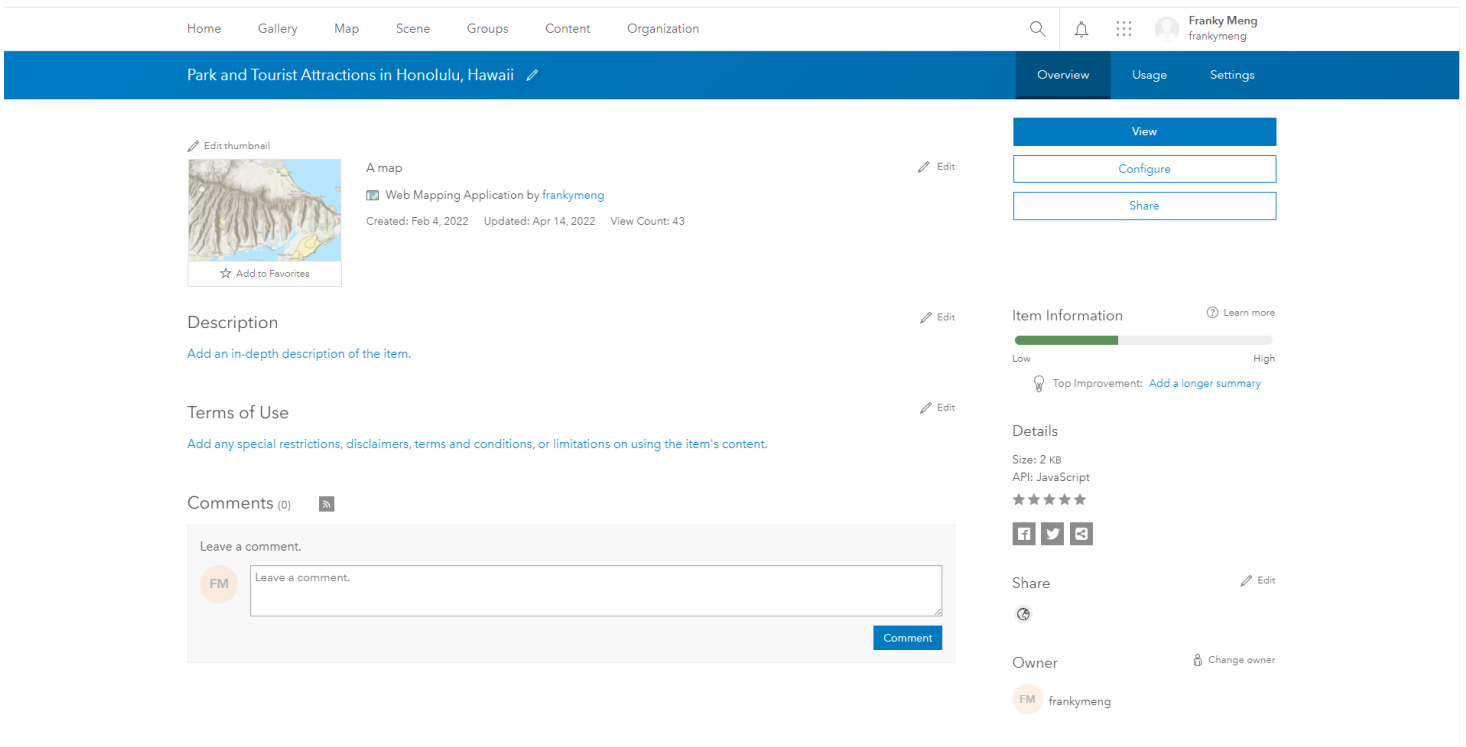


Figure 52 – Web App Description Page

Wrapping Up

ArcGIS Online provides an easy way for users to create and share maps. When compared with an organizational account, the free public account has some limitations. For example, you cannot upload image files to your **My Content** folder with a public account, but this functionality is possible with an organizational one. Even with the public account, you probably would have noticed that there are many other features of this mapping platform that weren't covered in this guide. However, this introduction should give you the foundation for continuing to explore the options on your own.

Much of how and what you learn will be by trial-and-error—even with this guide. So take the time to discover the different tools and templates, the data and displays. See how geospatial data can enhance your digital information and make data more meaningful by adding the geographic element!

Reference

Images from <http://www.arcgis.com>

UNIVERSITY OF WATERLOO GEOSPATIAL CENTER

<https://uwaterloo.ca/library/geospatial/>

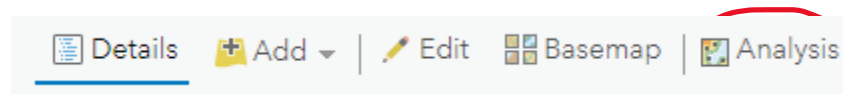
April 2022



Optional: Spatial Analysis

ArcGIS Online allows you to do analysis on your spatial data right from your browser. While not as powerful or densely featured as ArcMap, ArcGIS Pro, or other GIS software like QGIS, the convenience and accessibility of AGOL spatial analysis makes it a useful tool for the budding GIS technician. Spatial analysis can be done by users with a licensed account, therefore readers without licensed accounts should consult the section headed **Organizational Accounts and Service Credits** about who to see about arranging an organizational (paid/licensed) account and what to ask for.

In AGOL, spatial analysis occurs in the Map screen, which is the same screen you accessed during the tutorial. On the toolbar that contains buttons with section and sidebar expansions that you explored during your tutorial (figure below), click on the **Analysis** button.



Many kinds of analysis are available from AGOL. They are organized into functional categories. Complete documentation of the analytical tools can be found at <https://doc.arcgis.com/en/arcgis-online/analyze/perform-analysis.htm> but a concise description of some useful tools is below:

Summarize:

- **Aggregate points:** If you have a point feature and a polygon feature, running this tool will tell you how many points are within the polygon, and provide aggregate statistics about the points within the polygons.
- **Join features:** If you have two features that are related by attribute (ex. They share a field/column, such as the IDs every point is assigned and a real world object has the same ID in both feature layers) or related by space (ex. They occupy the same location in both feature layers), then you can “join” them together so that you can access the information of both features inside of one.
- **Summarize nearby:** Finds and selects the features that are a defined distance from your desired feature.
- **Summarize within:** If you have two layers, and one of them is a polygon layer, you can calculate the statistics of the features that are spatially within the polygon areas.

Analyze:

- **Find hot spots:** If you have a polygon feature and a point feature, this tool will generate a polygon feature showing a comparison of which polygons have more points – effectively a density map with defined polygon boundaries. This output identifies “hot spots” where spatial events (ie. Points) occur more frequently in the time frame that the points exist in.
- **Find point clusters:** If you have a point feature layer, this tool will classify them based on their spatial distribution.
- **Interpolate points:** If you have a point feature layer, this tool will generate the calculated interpolated value of areas in between points. For example, this is useful if you want to generate a temperature map using the recorded temperatures at select weather monitoring stations.

Proximity:

- **Create buffers:** This tool will make a polygon feature that shows a set distance around your input feature.
- **Find nearest:** This tool will look for the nearest feature from within the layer to the selected feature.

Optional: Templates

For the times where you want to jump-start the development of your web map or web application, templates of common products are available for your use.

Templates are formatted as web applications. You will need creation privileges, which is given by default to users with the Creator user type within an organization.

- 1) Templates are available from the right-hand side of your web map under Create a Web App. Select your template and change the properties of it to suit your needs.
- 2) You can download an existing template and modify it with your data to suit your purpose. See the templates at <https://www.arcgis.com/home/group.html?id=2f0ec8cb03574128bd673cefab106f39#overview> for a list of templates that may be useful to you.
- 3) You can code an original template using the application base available from ESRI at <https://github.com/Esri/application-base-js>. Note that application programming is beyond the scope of this tutorial appendix, though many Javascript resources are available by ESRI under their developers' page.

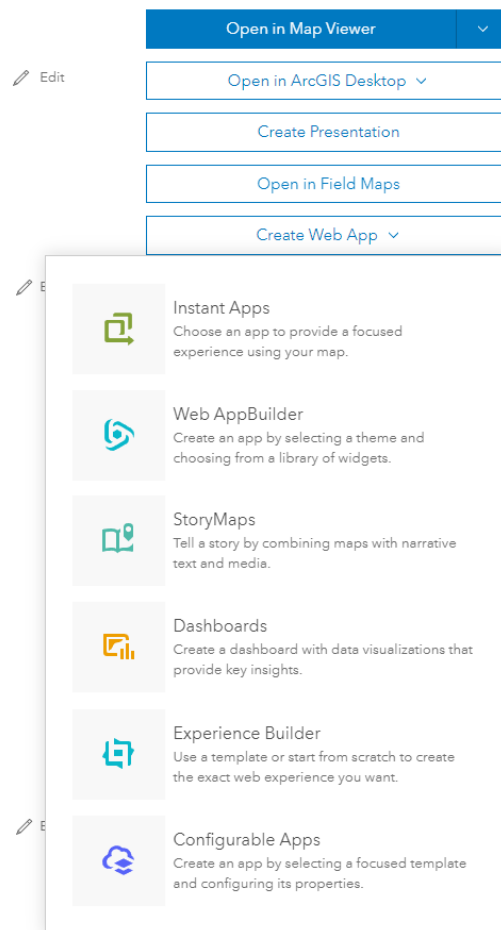


Figure 53. The “Configurable Apps” option available on the right-hand side of an existing web map.

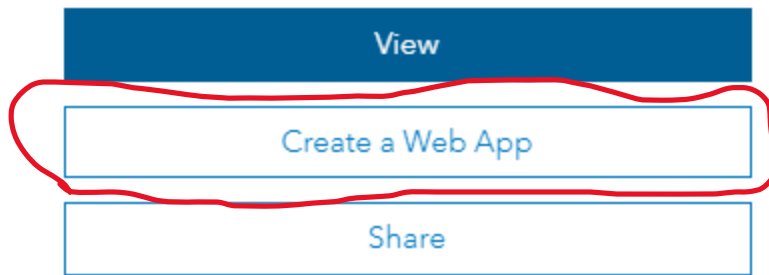


Figure 54. The options on the right-hand side of an existing web app template.

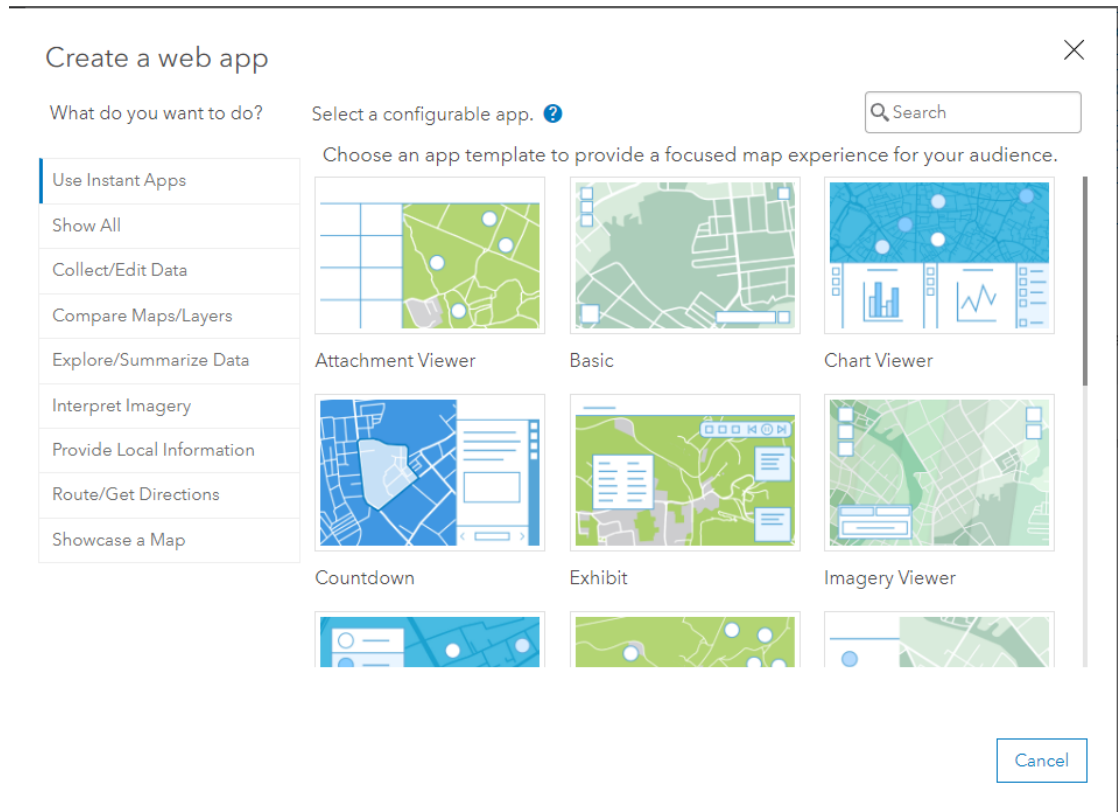


Figure 55. The templates available by default for a web map.

Optional: Organizational Accounts and Service Credits

If you created a personal account for the purpose of this tutorial, then it is likely a free account. The true power of ArcGIS Online becomes apparent in the paid versions made available through your organization or institution. Consult your GIS department, IT department, or mapping help desk about getting set up with credentials and permissions that would give you the ability to do the mapping and analysis that you need.

You may need to specify to your aiding technician what permissions and roles you might need. Use this key to figure out what user role and permissions are right for you.

- Viewer – Viewers cannot create, edit, analyze, or distribute data available on an organization’s account, but are able to see it. This is typically what role you will need should you require secure access to data but are not affiliated with the organization.
- Editor – Editors have access to the data and editing functions on data. However, this does not extend to the Editor the ability to create datasets, perform analysis, or share their work (or any work they were given access to). This role is useful for persons assigned with maintenance of already existing datasets.
- Creator – Creators can access and edit data, as well as create new datasets, share data (ex. Export to website, change ArcGIS Online permissions to who can view data, etc.), and perform analysis. This role is useful for people who are members of a project and are developing new data and products.
- GIS Professional – The GIS Professional role has the same abilities as a Creator, but also has access to ArcGIS Pro (the desktop client meant to pair with ArcGIS Online).

Other user types exist, such as Field Editor and Insight Analyst. These user roles are specific to other ESRI applications and are outside the scope of this tutorial.

Also note that these roles and permissions are set by default. Your aiding technician may be able to add custom permissions to your role based on the needs of your project. Discussing your project needs with the technician is the best way to determine the user role and permissions that are best for you.

Service Credits (credits, for short) are ESRI’s method of quantifying and monetizing ArcGIS Online’s hosting and geoprocessing power. Certain intensive operations, such as geocoding, require credits, which are purchased and pooled for use. Furthermore, hosting layers on ESRI’s AGOL servers will incur credit costs once a threshold of memory is passed. It is wise to ask your aiding technician about your organization’s credit pool and to plan ahead to ensure that your project does not exceed the resources available to your organization.