

# Guided Exercise

## Create Collection and Publishing Apps From a Single Feature Layer

Section 2 Exercise 1

08/2017



# Create Collection and Publishing Apps From a Single Feature Layer

## Time to complete

Approximately 50-60 minutes.

## Introduction

In this exercise, you will create:

1. A GeoForm, which is a web data-collection app.
2. A Summary Viewer app, which can display crowdsourced data.

A GeoForm allows users to enter data through a form and thereby add locations and information to a hosted feature layer in a web map, both of which must be public-facing and editable. What's cool about hosted feature layers is that you can add them to multiple web maps, and you can create multiple web apps from a single feature layer. (We will explain more about feature layers later.) GeoForms are a great way to crowdsource data; they allow you to collect data and display it in another web app.

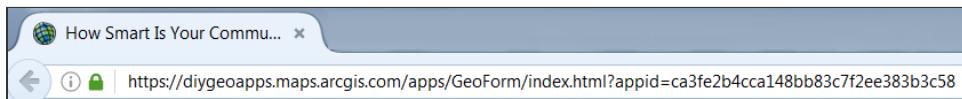
Confused? Let's see it in action.

## Step 1: Explore a crowdsourcing geo app

First, you will examine a simple survey that uses a GeoForm to collect crowdsourced data.

- a Open a new Internet browser tab or window.
- b Browse to <https://diygeoapps.maps.arcgis.com/apps/GeoForm/index.html?appid=ca3fe2b4cca148bb83c7f2ee383b3c58>. This form is an example of a GeoForm.

*Note: If you copy the URL and paste it into your browser's address bar, be sure there are no spaces.*



- c Complete the survey.

- d Submit your entry.

**1. Enter Information**

Score  
 

Rate how well you think your community uses spatial technology on a scale of 1 to 5. 5 = You regularly use spatial technology to learn about your community or communicate with your local government. 1 = You never use spatial technology to learn about your community or communicate with your local government.

Comments  
 

**2. Select Location**

Specify the location for this entry by clicking/tapping the map or by using the following option.

Latitude: 17.84108, Longitude: 170.23905



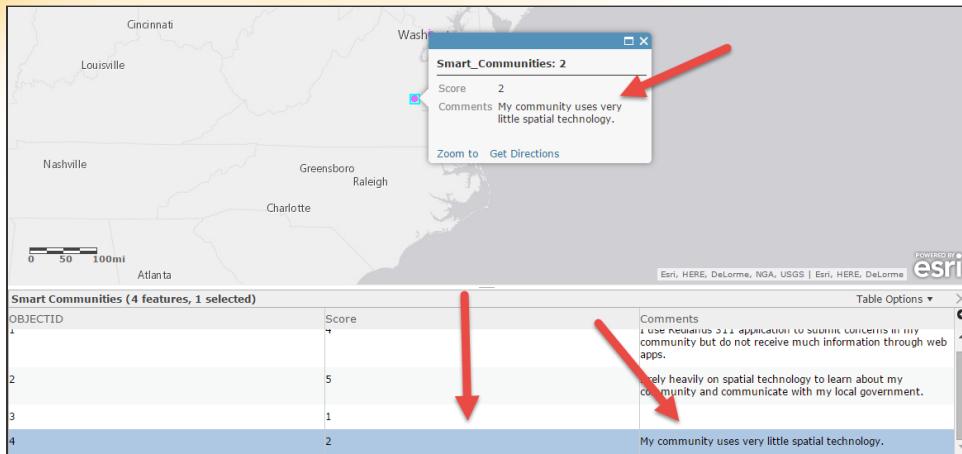
**3. Complete Form**

Add this information to the map.



Along with a score and comment, you have just added a location point to a feature layer in a web map. If you were to open that web map, you would be able to view all the data that has been submitted through the form. **The following graphic shows the web map that was used to create the GeoForm you just used.**

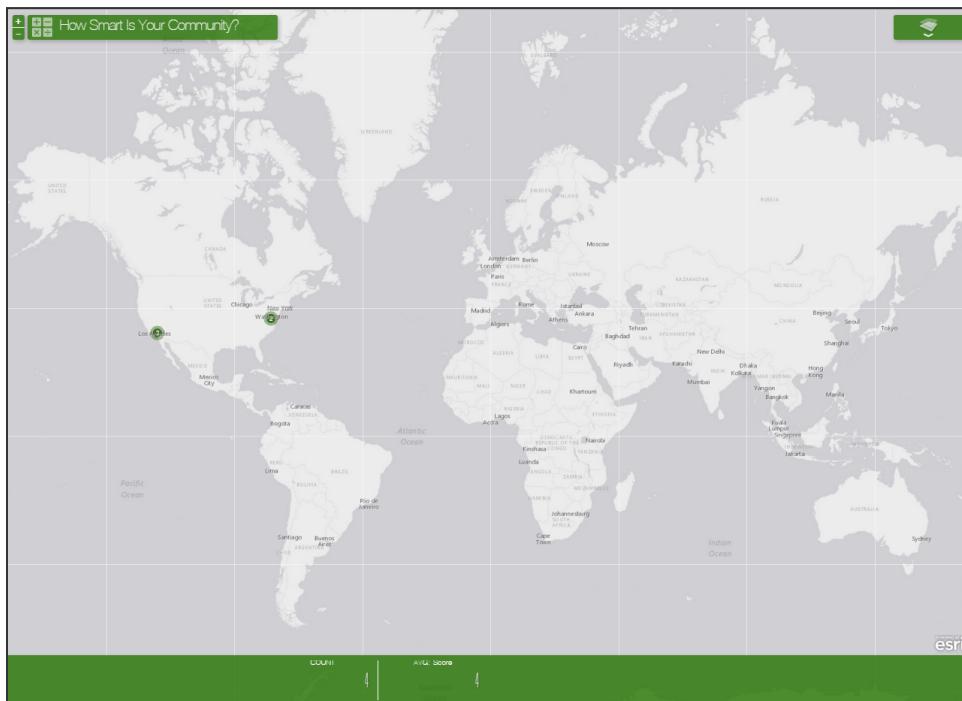
*Note: You cannot access this web map.*



After you have collected data with your GeoForm, **you can use the web map to publish another web app** for users to view the data. Let's see what that would look like.

- e Browse to <http://diygeoapps.maps.arcgis.com/apps/SummaryViewer/index.html?appid=adbf97131fd34655878b93051e2b47b3>.

You should see something like the following graphic (you will see more points on the map from other students who have submitted their surveys):



This **Summary Viewer app** displays the data collected in the GeoForm you filled out.

Note: If you don't see very many points on the map, don't worry; it just means that not many students have submitted their surveys yet. Check back in a day or two to watch the number of features grow.

The Summary Viewer allows you to view the number of features that are within the map extent, as well as summary statistics for particular values. In this configuration, the app returns the count and the average score for all of the points within the map extent.

- f Zoom and pan around (click and drag) the map, and watch as the count and average score changes based on the map extent.

Summary Viewer apps are a great way for users to explore data for different geographic areas simply by panning and zooming.

The cool thing about this app is that it was created using the same feature layer and web map that the GeoForm was built from. By constructing both a collection and a display app from a single feature layer, you ensure that any new data from the collection app is added to the display app in real time. Use this workflow if the collected data does not need to be vetted before it is made public.

Now that you've seen how a GeoForm can be used to collect data and how that data can be shared through a secondary app, we'll show you how to build your own.

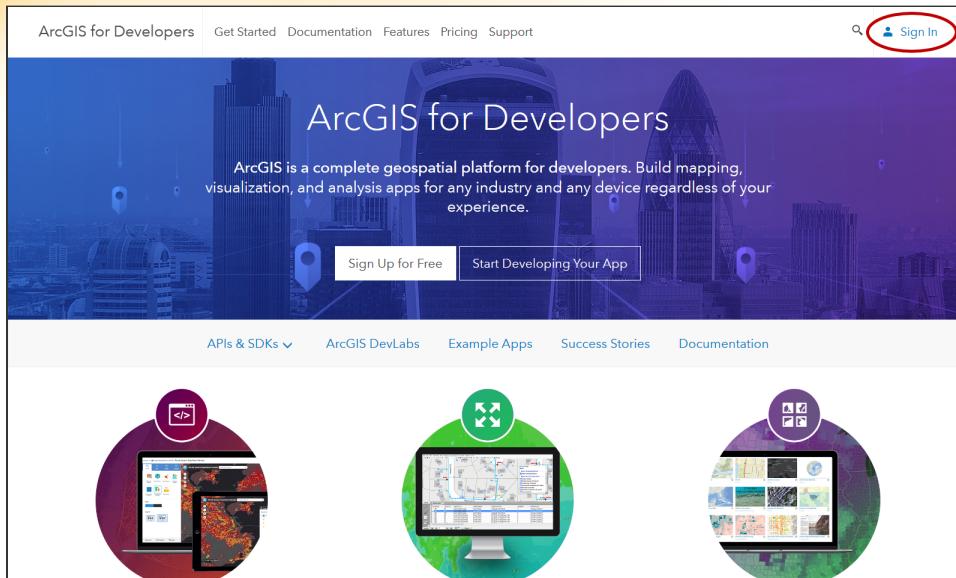
## Step 2: Create a feature layer

While you can create GeoForms for pretty much anything you are interested in, for this exercise, you will recreate the Smart Community survey GeoForm.

First, you need a hosted feature layer. A hosted feature layer is a collection of geographic data in the form of points, lines, or polygons that support vector querying, visualization, and editing. Feature layers are added to the Map Viewer in ArcGIS Online, where you can symbolize, analyze, and combine them with basemaps and other feature layers to create great-looking web maps. Remember, the Map Viewer is the place where we author maps; web maps themselves should not be shared with people who are not involved in the map-making process. Web apps, or geo apps, are the mechanism for sharing—or, in this case, collecting-geographic information.

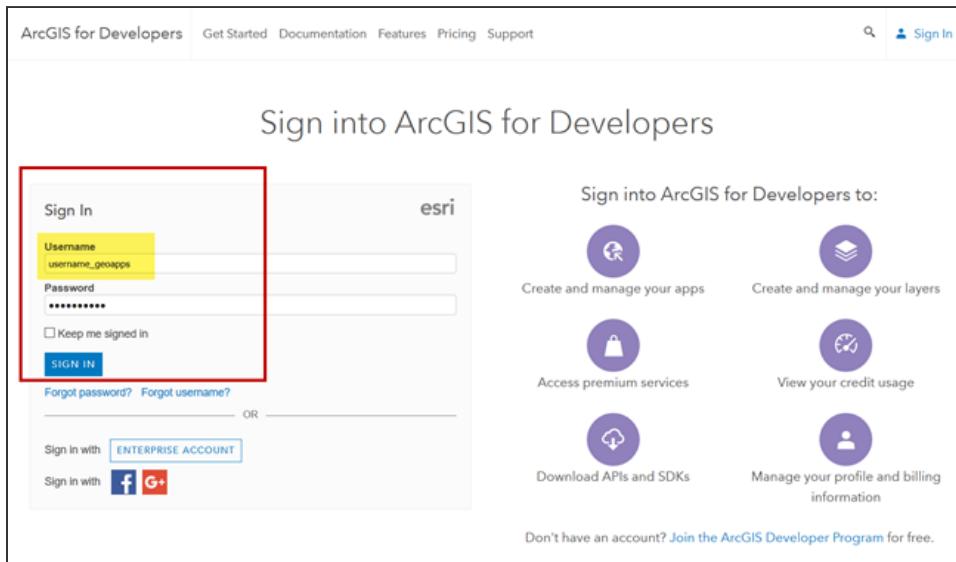
- a Browse to [developers.arcgis.com](http://developers.arcgis.com).

## Do-It-Yourself Geo Apps MOOC

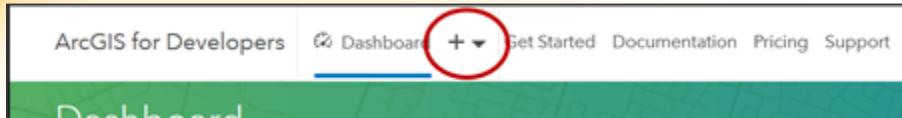


- b At the top of the page, click Sign In and sign in to ArcGIS for Developers using the ArcGIS Online credentials explained at the start of this course.

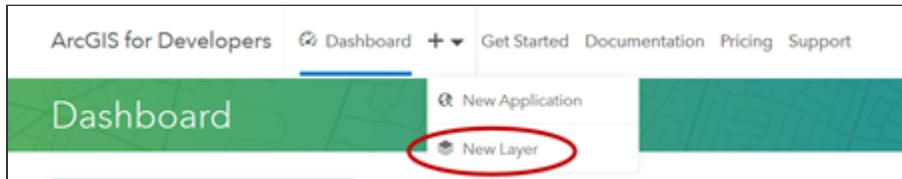
Note: The Section 1 Exercise 1 PDF explains how to determine your ArcGIS Online credentials (username and password) for this course. If you have trouble signing in, email [gistraining@esri.com](mailto:gistraining@esri.com) for assistance.



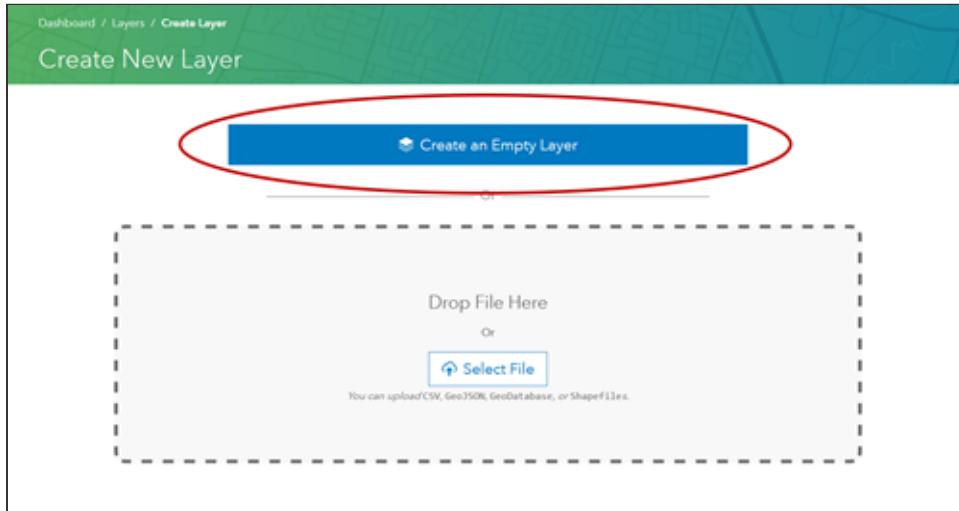
- c At the top right of the window, click the plus sign button.



- d Click New Layer.



- e On the Create New Layer page, click Create an Empty Layer.



- f Complete the New Layer Details section as follows:

- For Title, type **Smart Community Survey (Your Name)**.

Note: Be sure to add your name to the end of the title.

- For Tags, type **geoform, smart communities**, pressing Enter after typing each tag.



Dashboard / Layers / Create Layer

## Create New Layer

Details      Geometry      Fields      Settings

New Layer Details

Title: Smart Community Survey (Your Name)

Service Name: https://services.arcgis.com/ogid/rest/services/smart\_community\_survey/FeatureServer

Tags: geoform X smart communities X Enter tags...

< Restart      **Geometry >**

The 'Geometry >' button is circled in red.

g Click Geometry.

h On the Geometry tab, in the Geometry field, confirm that Points is selected. In the Spatial Reference field, confirm that 4326 is selected and then click Fields.

## Create New Layer

Details      **Geometry**      Fields      Settings

**Geometry**

Points

The type of geographic features your layer will store.

**Spatial Reference**

4326

The WKID for the coordinate system of your layer. Recommended values are 4326 (WGS 84 Lat/Lng) or 102100 (Web Mercator)

< Details      **Fields >**

The 'Fields >' button is circled in red.

i On the Fields tab, in the Field Name box, type **Score** and, from the Type drop-down list, select Integer, and check the Required check box.

Add Field

Field Name	Type
Score	Integer <input checked="" type="checkbox"/> Required <input type="button" value="Add Field"/>

- j Click Add Field.
- k To define another field, type **Comment** in the Field Name box and, from the Type drop-down list, select String, and click Add Field. Then click Settings.

Details      Geometry      Fields      Settings

Fields

Field Name	Field Alias	Field Type	Required	
score	Score	Integer <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Required	<input type="button" value="Delete"/>
comment	Comment	String <input type="checkbox"/>	<input type="checkbox"/> Required	<input type="button" value="Delete"/>

Add Field

Field Name	Type
<input type="text"/>	String <input checked="" type="checkbox"/> Required <input type="button" value="Add Field"/>

- l On the **Settings page**, in the Attachment Settings and Share Layer sections, accept the defaults.
- m In the Permissions Settings section, check Enable Editing and then click Create Layer.

Attachment Settings  
Allow attached images and other files to individual features.

Share Layer  
This layer can be accessed by:  
Me (Private)  
And members of these groups:  
Choose groups...  
These settings will replace the current sharing settings.

Permissions Settings  
Enable editing.  
Keep track of created and updated features.  
Keep track of who created and last updated features.  
Enable Sync (layer can be taken offline to be viewed, edited, and synchronized).

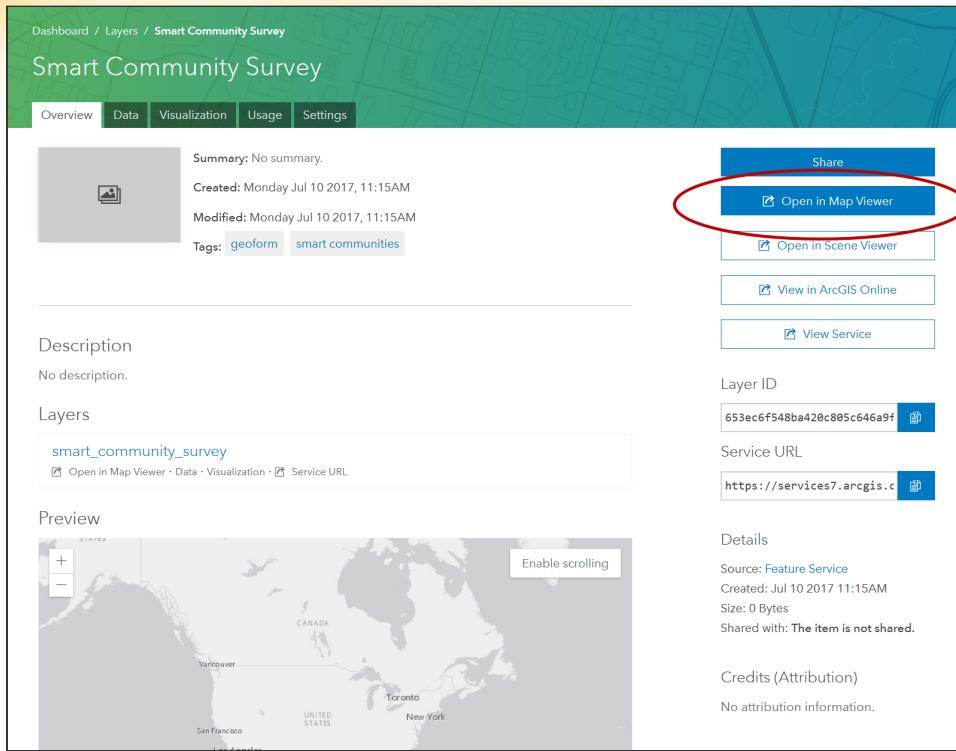
[Fields](#) [Create Layer](#)

You are directed to a page with information about your new feature layer. There is no data in it yet, which is why you want to build a GeoForm to populate it. To create the GeoForm, you need to work with the feature layer in ArcGIS Online.

### Step 3: Edit and save the map

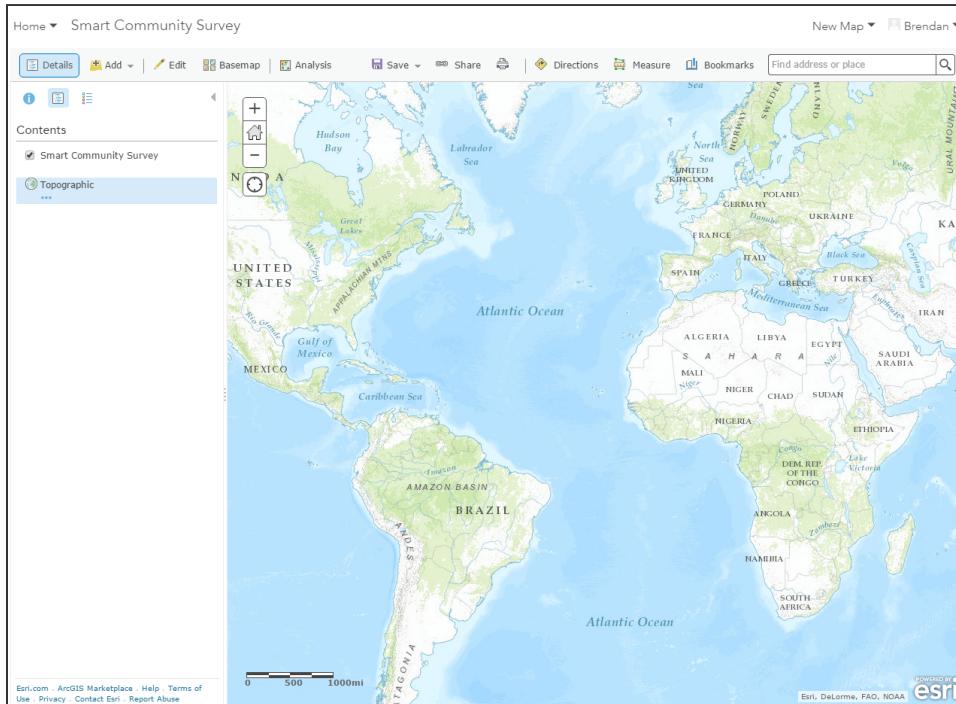
- a On the feature layer's item details page, click Open In Map Viewer.

# Do-It-Yourself Geo Apps MOOC



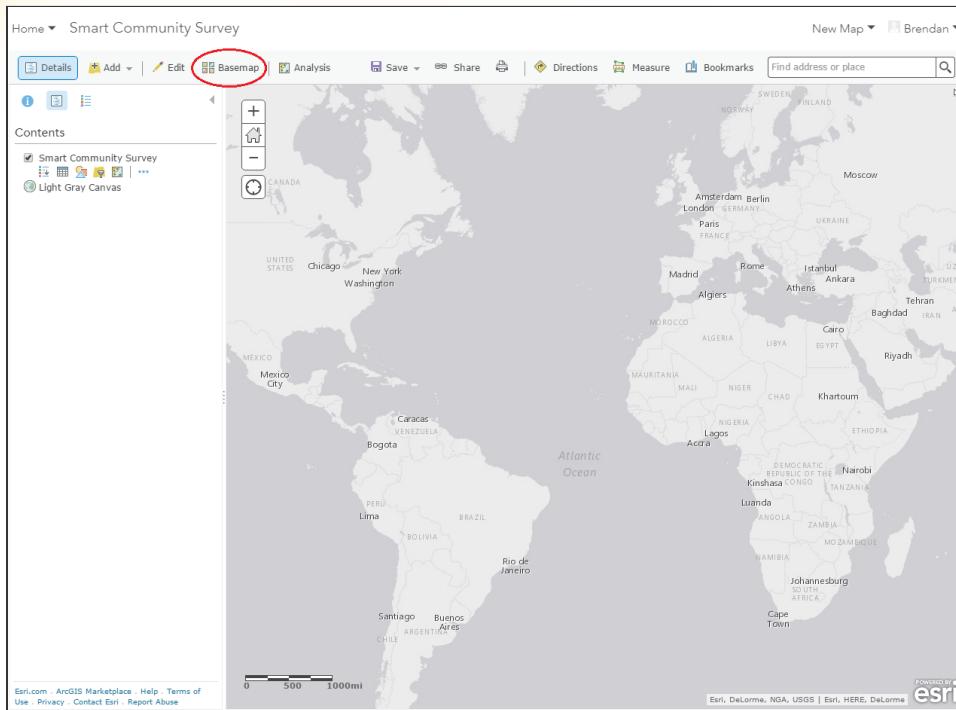
The screenshot shows the ArcGIS Online item details page for a feature service named "Smart Community Survey". The top navigation bar includes "Overview", "Data", "Visualization", "Usage", and "Settings". The "Data" tab is selected. The main content area displays a summary, creation and modification dates, and tags ("geoform", "smart communities"). A "Description" section is present but empty. Below it, a "Layers" section shows a single layer named "smart\_community\_survey" with a link to "Open in Map Viewer". A "Preview" section contains a map of North America and Europe. On the right side, there are sharing options: "Share", "Open in Map Viewer" (which is circled in red), "Open in Scene Viewer", "View in ArcGIS Online", and "View Service". Below these are "Layer ID" and "Service URL" fields, and a "Details" section with source information and sharing status.

- b) Adjust your view so that you see the Atlantic Ocean and the surrounding continents.



The screenshot shows the ArcGIS Map Viewer interface. The left sidebar contains a "Contents" panel with a checked checkbox for "Smart Community Survey" and an unchecked checkbox for "Topographic". The main map view shows the Atlantic Ocean and parts of North America, South America, Europe, and Africa. The map includes labels for countries, bodies of water like the Hudson Bay, Labrador Sea, North Sea, Black Sea, and Mediterranean Sea, and various rivers and mountain ranges. A scale bar at the bottom left indicates distances from 0 to 1000 miles. The bottom right corner features the Esri logo.

- c Click Basemap and select the Light Gray Canvas basemap.



- d Click Save and, from the drop-down list, choose Save.
- e In the Save Map dialog box, enter the following information:
- For Title, type **Smart Community Survey**.
  - For Tags, type **smart communities** and **geoform**. Press Enter after typing each tag.
  - For Summary, type **Web map for a smart community survey**.

A screenshot of the 'Save Map' dialog box. It has four input fields: 'Title' with 'Smart Community Survey', 'Tags' with 'smart communities' and 'geoform' separated by a comma, 'Summary' with 'Web map for a smart community survey.', and 'Save in folder' with 'brendanstudent\_geoapps'. At the bottom are 'SAVE MAP' and 'CANCEL' buttons.

Note: Accept the default value for the Save In Folder field.

- f Click Save Map.

Now that the web map is saved, you can create a GeoForm.

### Step 4: Use a GeoForm to collect crowdsourced data

You will create a GeoForm web app that can be used to collect crowdsourced data. First, you will share your map.

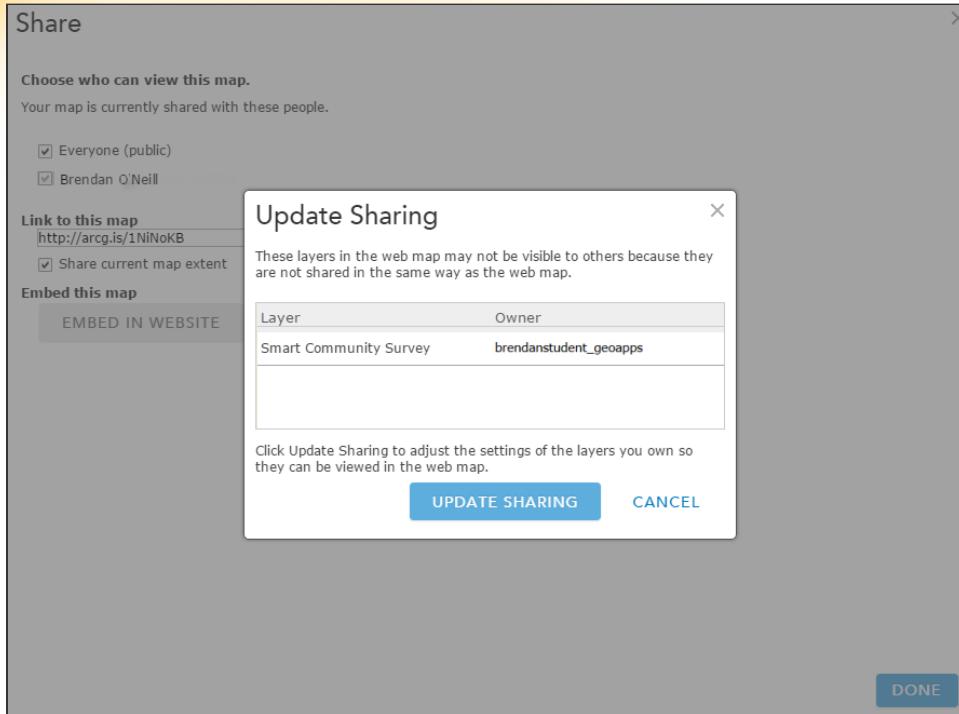
- a From the ribbon at the top of the ArcGIS Online window, click Share.



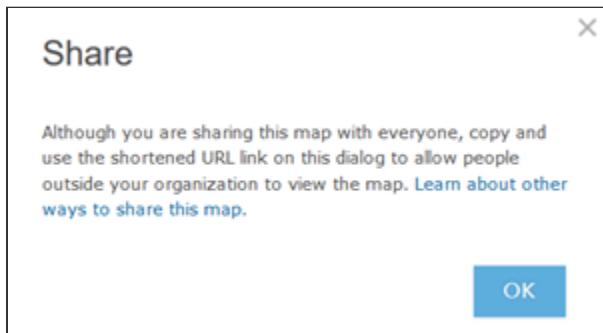
- b Share your map with everyone by selecting the Everyone (Public) check box.

Remember, you are creating a crowdsourcing app, so you want it to be accessible to the public. By default, your feature services and web maps are private. When you update the sharing settings of a web map, you will be asked whether you would like to update the sharing settings for the feature services in that web map. Generally, you will want to update the feature services' sharing settings to align with the web map. If you do not, someone could access your web map but receive an error message (for example, when a web map is shared with everyone, but the feature service is set to private).

- c Click Update Sharing.



- d In the Share message box, click OK.



- e Click Create A Web App.



- f In the list on the left, select Collect/Edit Data, and then click GeoForm.

Create a New Web App

Configurable Apps    Web AppBuilder

What do you want to do?    Select a configurable app. [?](#)   

Show All    Collect new data or edit the location and field values of existing data

**Build a Story Map**

**Collect/Edit Data** »   

Compare Maps/Layers

Explore/Summarize Data

Map Social Media

Provide Local Information

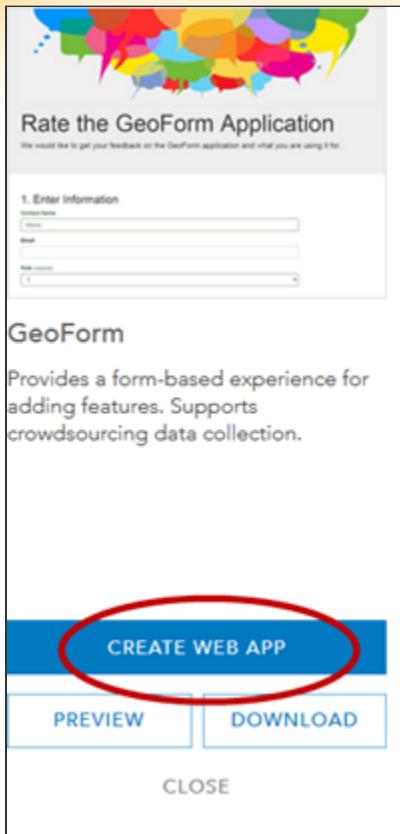
Route/Get Directions

Showcase a Map

**GeoForm**   

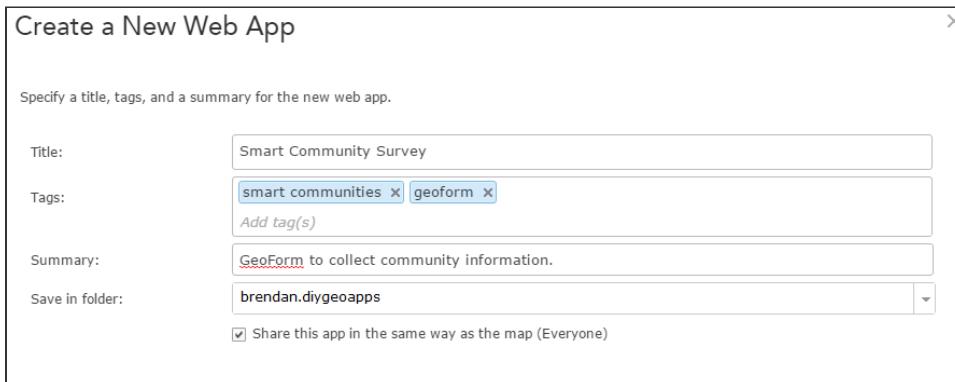
BACK    CANCEL

- g In the right pane, click Create Web App.



**h** In the Create a New Web App dialog, enter the following information:

- For Title and Tags, accept the defaults.
- For Summary, type **GeoForm to collect community information**.
- For Save In Folder, accept the default.



Create a New Web App

Specify a title, tags, and a summary for the new web app.

Title: Smart Community Survey

Tags: smart communities x geoform x  
Add tag(s)

Summary: GeoForm to collect community information.

Save in folder: brendan.diygeoapps

Share this app in the same way as the map (Everyone)

**i** Click Done.

You are directed to the GeoForm Builder, which will help you configure your app.

### Step 5: Use the GeoForm Builder to configure the collection app

- a In the GeoForm Builder, on the Start tab, click Next.

The web map you want to use for the GeoForm is already selected. The selected web map is the Smart Community Survey map you created previously.

- b On the Select A Webmap page, click Next.
- c On the Select Editable Layer(s) page, from the Layer drop-down, choose the **Smart\_Community\_Survey layer**, and then click Next.

This is the hosted feature layer you created previously.



- d On the Form Details tab, enter the information in the table below into the Title and Form Instructions & Details sections.

Title	Form Instructions & Details
How Smart is Your Community?	Fill out the simple survey below about your community. The results of the survey will be used to create a web application that will show citizen perceptions of how smart communities are around the world.

- e Use the following graphic to help you complete the rest of the Form Details page.

### Form Details

Use the Form Detail boxes below to customize the Title, add a custom logo, and provide a short description for your GeoForm audience. In the description you can add links to other resources, contact information, and even point your audience to a web mapping application featuring all of the data collected with the GeoForm.

#### Header Size

- Use Small Header
- Use Large Header

Use large or small heading for your form. A large header may help define the purpose of your application but it takes up more room on your screen.

#### Title

How Smart Is Your Community?

#### Logo Image

 http://www.mysite.com/myimage.png

- Disable Logo

You can configure the GeoForm to Show/Hide the Logo in the form header

#### Form Instructions & Details



Fill out the simple survey below about your community. The results of the survey will be used to create a web application that will show citizen perceptions of how smart communities are around the world.

[← Previous](#)

[Preview](#)

[Next →](#)

- f Click Next.
- g Uncheck the Enable Attachments check box.
- h Click the Configure button for the Score field.

### Select Form Fields

Here you can select which fields will be visible to your GeoForm audience, edit the Labels they will see, and add a short Description to help with data entry.

Order	Enabled	Field	Label 	Configure
#	<input checked="" type="checkbox"/>	Score	Score	
#	<input checked="" type="checkbox"/>	Comments	Comments	

[← Previous](#)

[Preview](#)

[Next →](#)

- i Enter the information in the table below into the Help Text section, and then click Close.

Title	Help Text
Help Text	Rate how smart you think your community is on a scale of 1 to 5. 5 = You regularly use spatial technology to learn about your community or communicate with your local government. 1 = You never use spatial technology to learn about your community or communicate with your local government.

Configure Field 'Score'

**Help Text (optional) i**

Rate how smart you think your community is on a scale of 1 to 5. 5 = You regularly usi

Provide a short description or instructions for this field.

**Hint (optional) i**

Placeholder text for the field.

**Display As**

Text

**Close**

- j For the Comment field, click the Configure button.
- k Enter the information in the table below into the Comment section, and then click Close.

Title	Help Text
Help Text	Tell us a little more about how your community uses/does not use spatial technology.

- l Click Next.

### Select Form Fields

Here you can select which fields will be visible to your GeoForm audience, edit the Labels they will see, and add a short Description to help with data entry.

Order	<input checked="" type="checkbox"/> Enabled	Field	Label <small>i</small>	Configure
1	<input checked="" type="checkbox"/>	Score	Score	
2	<input checked="" type="checkbox"/>	Comment	Comment	

**Enable Attachments**

You can enable/disable the attachments here

**Attachment Required**

If necessary, users can be required to enter an attachment.

**Attachment Button Label**

This text will appear next to the Attachment Button. You can use this space to describe what you would like your audience to attach (photo, video, document, etc.), the file format you are asking for (.jpeg, .png, .docx, .pdf, etc.), and any additional instructions

**Attachment Description**

If necessary, you can provide additional attachment instructions here.

 Previous

Preview

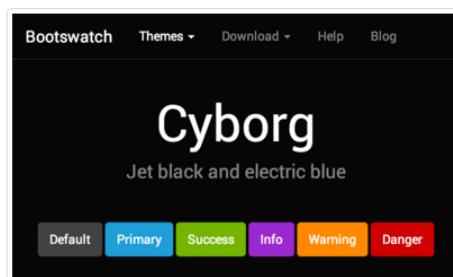
 Next 

- m Select the theme you prefer. In the example we showed earlier, we used the Cyborg theme, but **feel free to explore other themes**. Click Next.

### Select Form Theme

Style your GeoForm using the themes below based on your preference.

Cyborg



 Previous

Preview

 Next 

- n Under Viewer, for the Display Field, select Score and then click Next.

### Configure Viewer

Set options for viewing submissions collected from the GeoForm.

Disable Viewer

You can configure the GeoForm to disable/enable the viewer

#### Smart\_Community\_Survey Display Field

Score

Selected display field will be shown in the viewer as a title

◀ Previous

Preview

Next ➔

In the example we showed earlier, we chose to display the layer, disable social media sharing buttons, and limit the select location to My Location and Search.

- Configure the options as you see fit, and then click Next. Feel free to use the following graphic to help guide you.

### Options

Enable offline support

Store submissions when there is no network connection and submit them when a connection is restored.

Show Layer

You can configure the GeoForm to Show/Hide Layer. This option only applies to a single layer setup.

Social media sharing buttons

Social media buttons allow your audience to easily share your GeoForm once they have made a submission

Default Map Extent

The map will reset to the default extent in your web map after submission - this can be disabled at any time.

Locate On Load

You can configure the GeoForm to use the current location on page load

Show Basemap Toggle

You can configure the GeoForm to Show/Hide the Basemap Toggle

#### Push pin

Blue



Choose from a variety of colors for the map pushpin, it should be different from the map symbology to help the user put their submission on the map

#### Select Location By

My Location

Search

Latitude & Longitude Coordinates

USNG Coordinates

MGRS Coordinates

UTM Coordinates

Allow users to select a location using these methods.

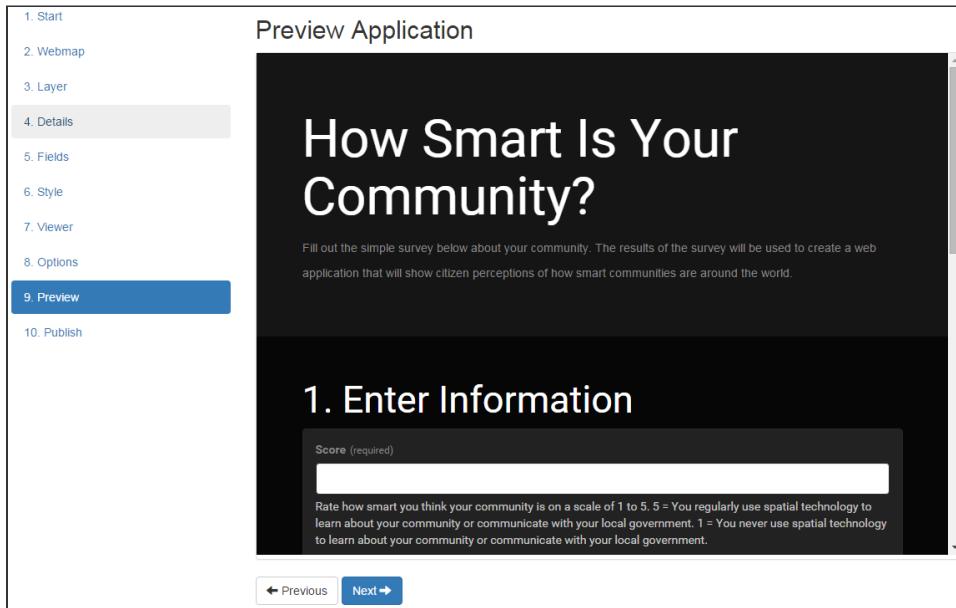
◀ Previous

Preview

Next ➔

After configuring the options, you are directed to the Preview page. However, you can select Preview from the side menu at any time to preview any changes you make.

- p When you are satisfied with your application, click Next.



Preview Application

How Smart Is Your Community?

Fill out the simple survey below about your community. The results of the survey will be used to create a web application that will show citizen perceptions of how smart communities are around the world.

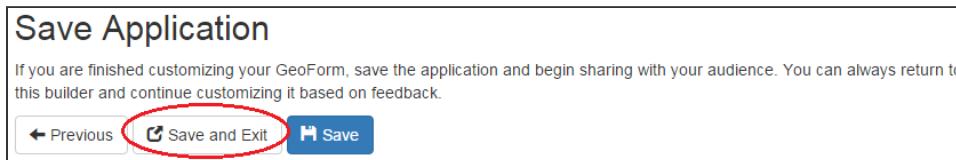
1. Enter Information

Score (required)

Rate how smart you think your community is on a scale of 1 to 5. 5 = You regularly use spatial technology to learn about your community or communicate with your local government. 1 = You never use spatial technology to learn about your community or communicate with your local government.

← Previous      Next →

- q Click Save And Exit.



Save Application

If you are finished customizing your GeoForm, save the application and begin sharing with your audience. You can always return to this builder and continue customizing it based on feedback.

← Previous      Save and Exit      Save

Congratulations, you just published a crowdsourcing geo app!

## Step 6: View the GeoForm web data-collection app

Let's see your GeoForm in action.

- a Click View Application.

Do you notice any differences between the GeoForm you used at the beginning of the exercise and the one you just created?

### Original GeoForm:

#### 1. Enter Information

Score

Select...

Rate how well you think your community uses spatial technology on a scale of 1 to 5. 5 = You regularly use spatial technology to learn about your community or communicate with your local government. 1 = You never use spatial technology to learn about your community or communicate with your local government.

Comments

Tell us a little more about how your community uses/does not use technology.

### Newly created GeoForm:

#### 1. Enter Information

Score (required)

Rate how smart you think your community is on a scale of 1 to 5. 5 = You regularly use spatial technology to learn about your community or communicate with your local government. 1 = You never use spatial technology to learn about your community or communicate with your local government.

Comment

Tell us a little more about how your community uses/does not use spatial technology.

In the original, a user can select a score from a drop-down menu, but a value is not required. In the newly created app, there is no drop-down menu, but a score value is required. These differences relate to the feature layers feeding these apps.

The original has domains to limit scores to numbers 1-5. Domains help ensure that the data that is collected is of the expected type. To include domains in a service, you must either create them in ArcMap or ArcGIS Pro before publishing to ArcGIS Online or add them by editing an existing service's JSON.

In the online feature layer creation tool from [developers.arcgis.com](https://developers.arcgis.com), you cannot establish domains for fields. However, you do have the option to require data entry for fields of your choice, similar to what you did for the Score field in the GeoForm you just created.

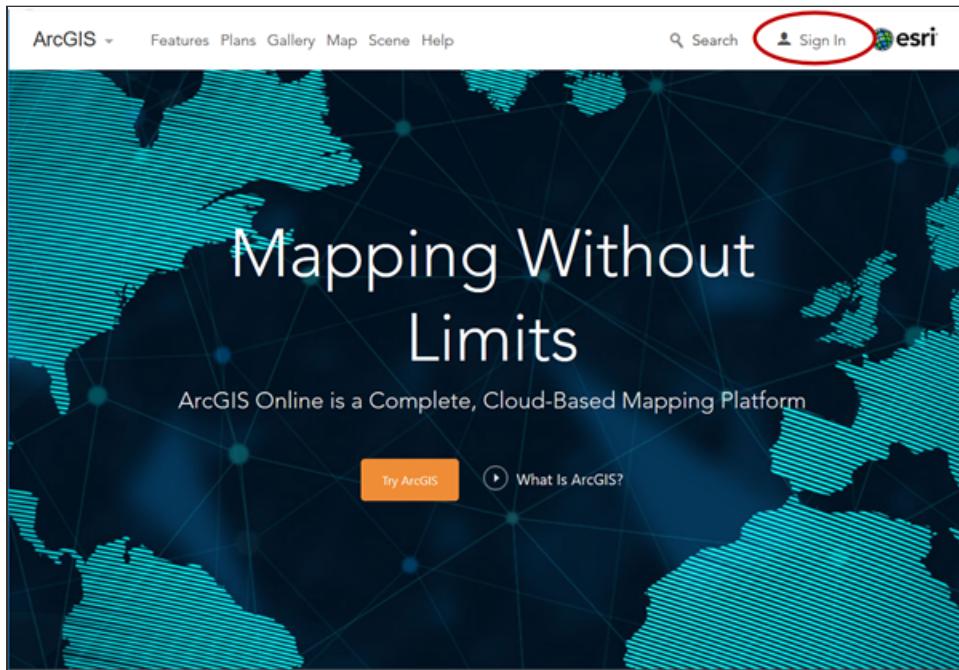
In the GeoForm you created, you used a very simple data model that has only two fields. When you create your own crowdsourcing apps, you can add as many fields as you want, which depend on the kind of data you need to collect. Remember what you are going to do with that data, though, when creating your data model. Will you want to filter it? Analyze it? Symbolize it based on a field? These factors, along with your survey taker's experience, are important considerations when collecting data.

### Step 7: Create a Summary Viewer app to display crowdsourced data

In this next section, you will create a Summary Viewer app to display crowdsourced data similar to the one you saw at the beginning of the exercise. There is only one problem: You haven't collected any data yet! For this exercise, we have provided you with a feature service with data in it, which you will add to a new web map. However, remember that the web map you created earlier for your GeoForm can also be used to publish a Summary Viewer app, or any other web app for that matter. To do so, you would simply open the web map you created for the GeoForm (Smart Community Survey) in the Map Viewer and start at Step 7j. If you'd like, you can complete this workflow, but the Summary Viewer app you create probably won't be very interesting!

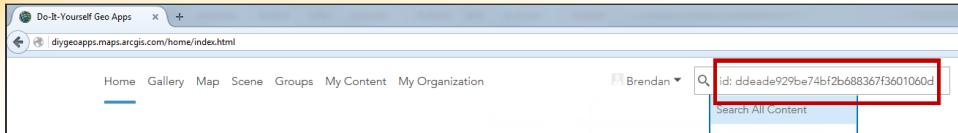
The dataset you will be using was created by generating 10 random points within every country in the world, and then assigning each point a score from 1 to 5. It is not the most realistic dataset, we admit, but it works for demonstration purposes.

- a Browse to [www.arcgis.com](http://www.arcgis.com) and sign in with your ArcGIS Online credentials for this course (if necessary).



- b At the top right area of the page, in the search box, copy and paste or type the following string of text (including **id:**):

**id: ddeade929be74bf2b688367f3601060d**

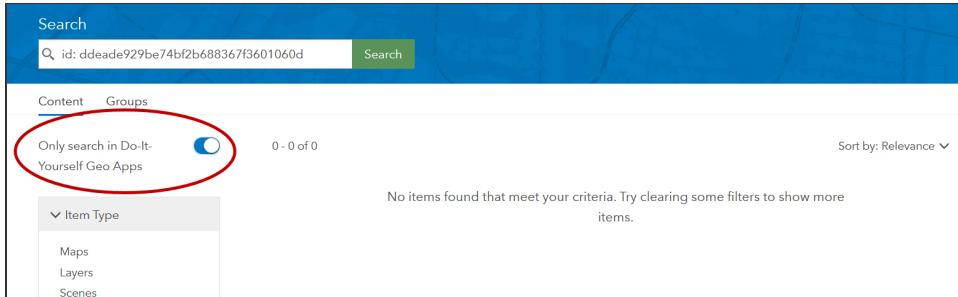


- c From the drop-down list, click Search All Content.

*Important: By default, ArcGIS Online searches for content only within your organization, so your search will not return any results.*

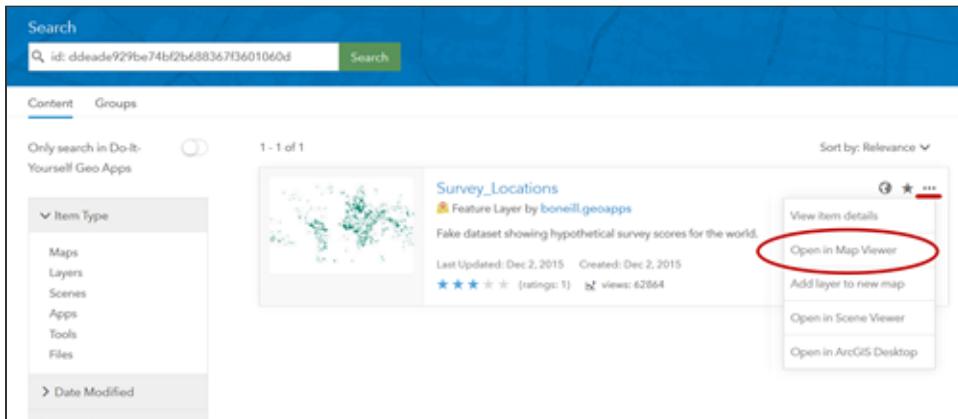
Since the feature layer you are searching for is content that exists in another organization, you will need to change the default search settings.

- d Move the slider next to the Only Search In [your folder] text to the left.

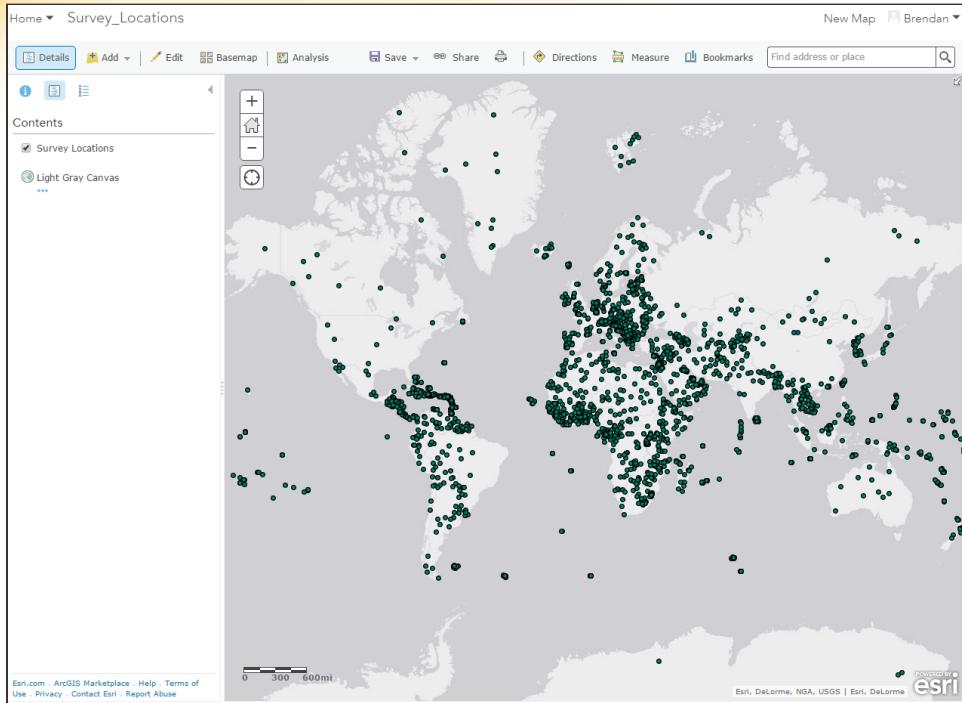


- e To the right of the result, click the ellipsis, and from the drop-down list, select Open in Map Viewer to add the layer to the Map Viewer.

*Note: If there is already data in the Map Viewer from a previous session, remove it, click Save and, from the drop-down list, click Save As, and then enter appropriate information for your web map.*

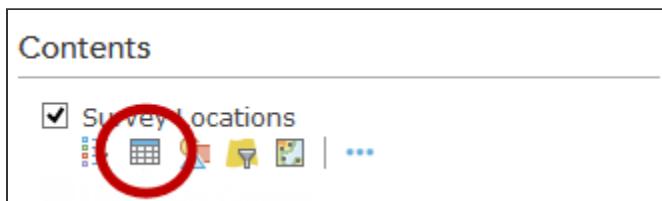


- f Change your basemap to Light Gray Canvas, and then zoom out and center your map so that you can see the distribution of points on different continents.

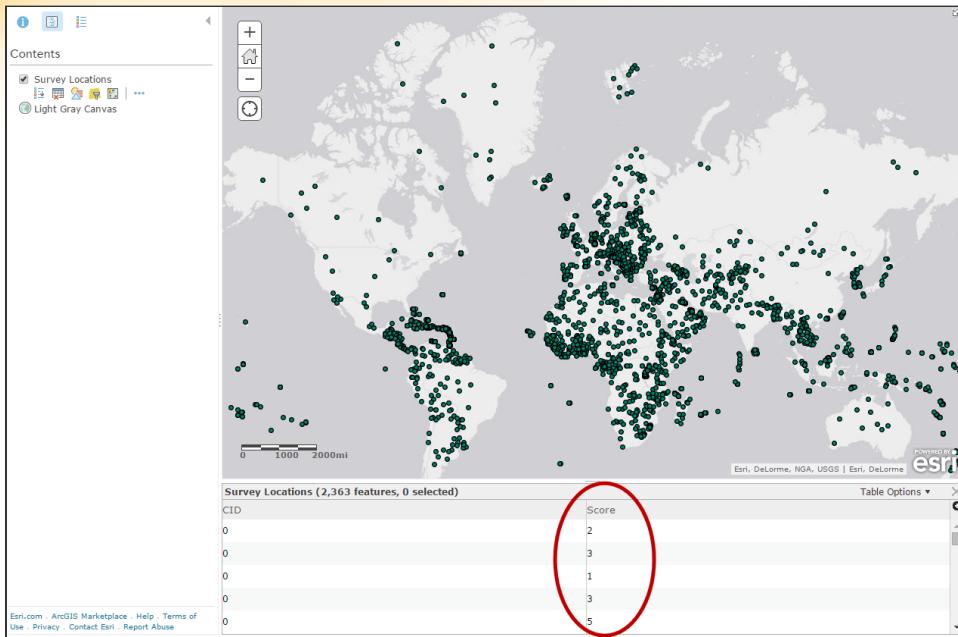


This data is fictitious, but imagine that each point represents an entry by a survey taker who has given her or his community a score on a scale of 1-5.

- g In the Contents pane, hover over the Survey Locations layer and click the Show Table button to open the layer's attribute table.



When it opens, you can see there is a Score field populated with numbers 1-5.



- h** Close the attribute table.

*Hint: Click the X in the upper-right corner of the table to close it.*

- i** Click Save and, from the drop-down list, click Save As, then complete the Save Map window with an appropriate title, tags, and summary.

*Note: You will save your map in your own folder.*

**Save Map**

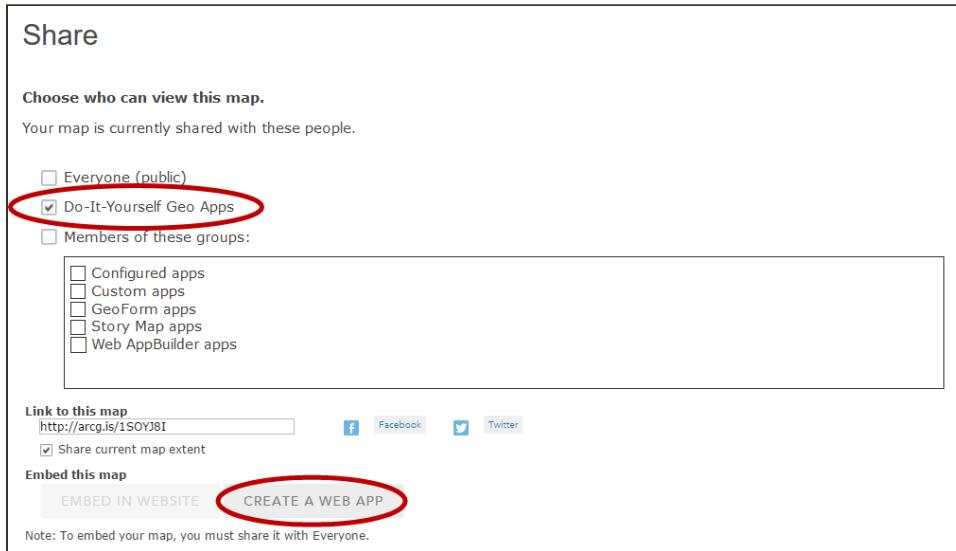
Title:	Smart Community Survey
Tags:	smart communities X geoform X Add tag(s)
Summary:	Web map for a smart community survey.
Save in folder:	brendanstudent_geoapps
<input type="button" value="SAVE MAP"/> <input type="button" value="CANCEL"/>	

- j** Click Save Map.

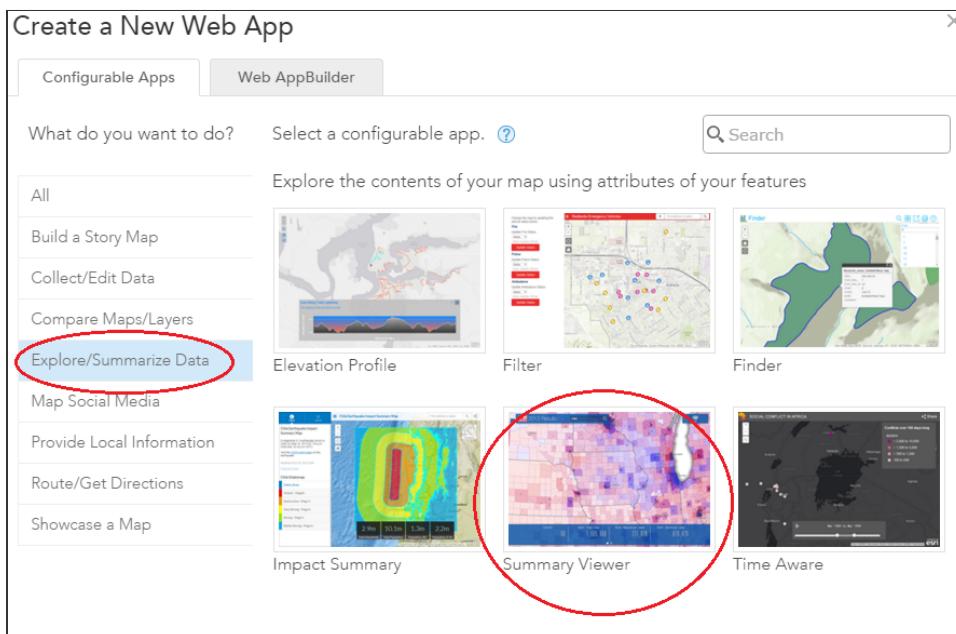
*Note: If prompted that a map with the title you provided already exists, modify the title to make it unique.*

- k** In the Map Viewer, click Share.

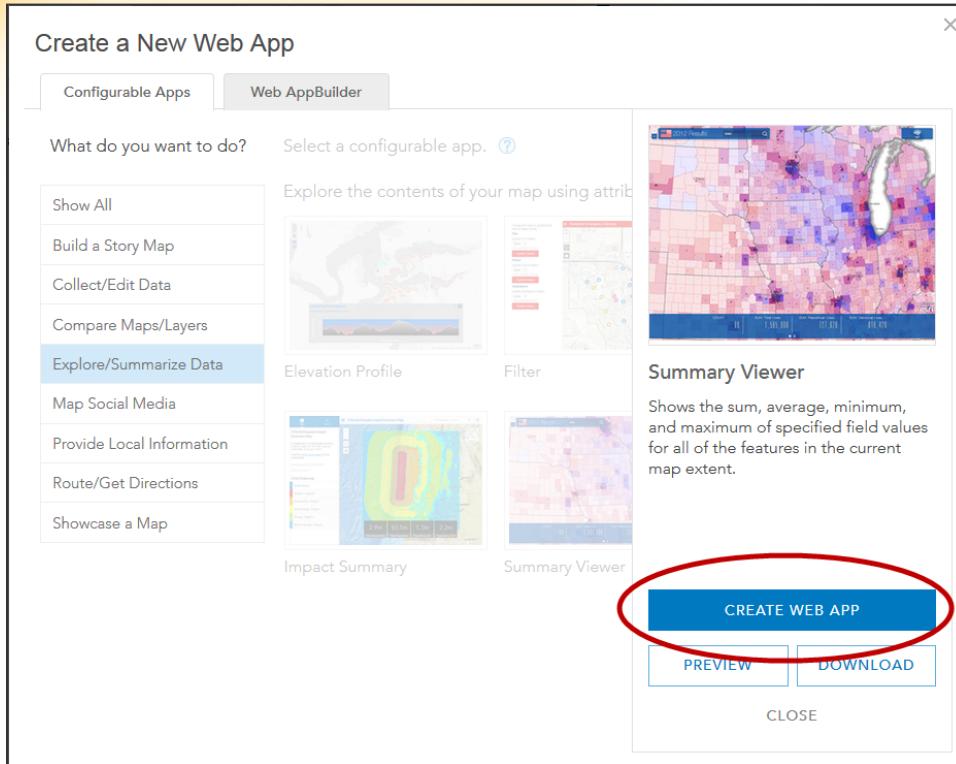
- I In the Share window, select the Do-It-Yourself Geo Apps organization, and then click Create A Web App.



- m From the pane on the left, select Explore/Summarize Data, and click the Summary Viewer configurable app template.



- n Click Create Web App.



- Make changes so that your window looks something like the following graphic, and then click Done.

Specify a title, tags, and a summary for the new web app.

Title: Smart Community Perception App [Your Name]

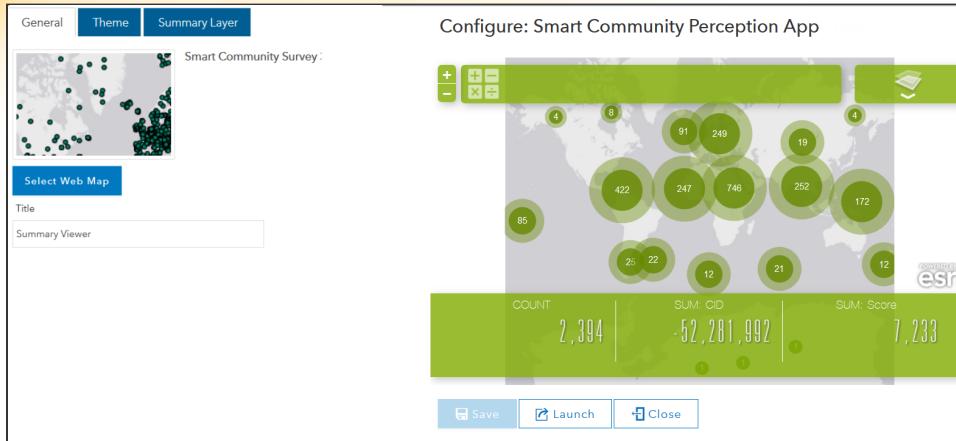
Tags: summary viewer x geoform x  
Add tag(s)

Summary: App that summarizes the results of a smart community perception survey.

Save in folder: brendanstudent\_geoapps

Share this app in the same way as the map (Do-It-Yourself Geo Apps)

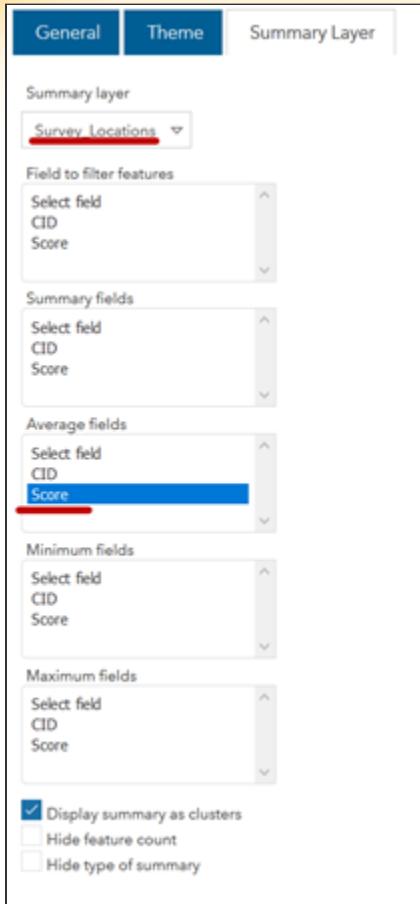
You should see something like this graphic:



Next, we are going to walk you through a very simple app configuration.

## Step 8: Configure the Summary Viewer display app

- a Select the General tab and type an appropriate title, such as **Smart Community Perception Map**.
- b Select the Theme tab and choose a color. [Click Save at any time to see your changes reflected in the preview.](#)
- c Next, select the Summary Layer tab and, from the drop-down list, select Survey\_Locations.
- d In the Average Fields section, select Score, and then click Save.



That's it!

Now, when you pan and zoom, the total number of surveys in the field of view will return along with the average score for all of the entries within the map extent. This way, you can see how people from different parts of the world perceive how tech-savvy their communities are.

- e Click Close to exit the builder mode. If you open your app, you should see something like this graphic:

