

# FIELD DATA COLLECTION WITH THE ARCGIS ONLINE GEOFORM APP: EXERCISE 3A



## : Field Data Collection with the ArcGIS Online GeoForm App

Using a GPS-enabled tablet or smartphone to collect data in the field.

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# Field Data Collection with the ArcGIS Online GeoForm App:

## Exercise 3a

### FIELD DATA COLLECTION WITH THE ARCGIS ONLINE GEOFORM APP

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#### *Time to complete*

*Approximately 50-60 minutes in the classroom*

*Approximately 50-60 minutes in the field*

*An Internet Connection is needed for the classroom portion*

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In this exercise we will use ArcGIS Online and the ArcGIS GeoForm App to:

- 1) Prepare a map and data for field data collection**
- 2) Create a GeoForm webapp**
- 3) Collect features in the field with a tablet or smartphone and the GeoForm webapp**
- 4) Add field data collected features to a web map**
- 4) Share your Map Online as a webapp**

### Introduction

Tablets and smartphones are increasingly used to collect field data for use in geographic information systems. There are many map and form-based apps that will allow you to input field data and geolocate it using the tablet or phones internal GPS or an external GPS receiver. In this exercise, you will use ESRI's ArcGIS Online and the GeoForm webapp. This works on tablets or phones, Android or iOS. It integrates seamlessly with ArcGIS Online, yet allows for work to be done offline, when no internet connectivity is available. Collected data can be synched with ArcGIS Online once internet connectivity is resumed.

Before going to the field, data are created or prepared in ArcGIS Desktop. An ArcGIS Online Map is then created and shared for the project. In this exercise, the data have already been prepared in ArcGIS Desktop and uploaded to ArcGIS Online. You will set up a data collection form and create and share a map in ArcGIS Online for field use.

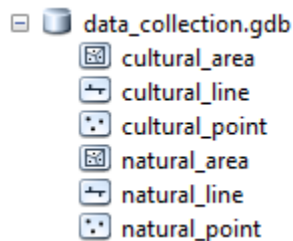
## Let's Get Started: data preparation

Before we go to the field and collect data, you must prepare your data for collection and publish a web map that can be loaded into the Collector app for field use.

## Part 1. Prepare data in ArcGIS Desktop. (Note: This portion has been done for you)

Prior to working in ArcGIS Online, ArcGIS Desktop must be used to create empty datasets that will be populated in the field. It is important to think about the type of features you will collect along with the descriptive information about each one needed. This is done in ArcGIS Desktop by creating a feature class for each geometry type (point, line, or polygon). Each feature class requires an attribute table with a field for each descriptive element you

wish to



include.

For this exercise, you will collect natural and cultural features in each geometry. A basic set of attributes will be collected. These include the name of the feature, a brief description, and a category or type description.

[illegible]

Click any field to see its properties.

Field Properties		
Alias	Type	
Allow NULL values	Yes	
Default Value		
Domain	Type	
Length	25	

Import...

Note that the Type field in the natural features includes a Domain, which allows the field to include a pick list of allowable descriptions. In this case, for Type, you are limited to Biophysical or Geophysical.

Coded Values:

Code	Description
1	Biophysical
2	Geophysical

Once the features are created, they are published as a service to ArcGIS Online, where they can be accessed for use in a web map.

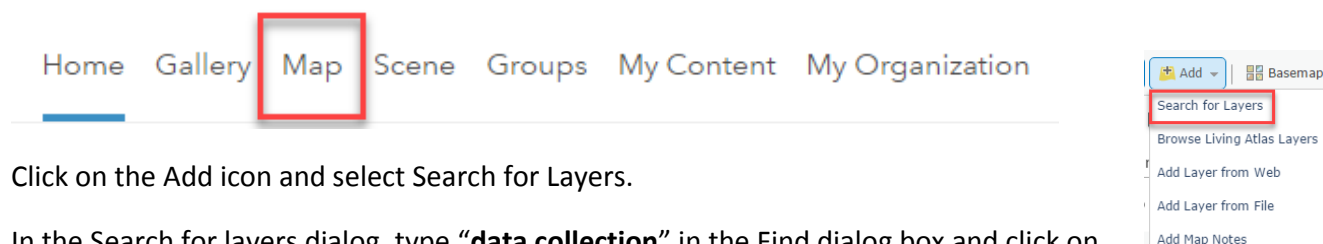
## Part 2. Prepare data in ArcGIS Desktop.

You will now create a map in ArcGIS Online that will be used for storing and managing the features you collect with the Collector app.

### Step 1. Create the base map.

Log into ArcGIS online with your assigned student account.

Select Map from the menu bar at the top of the ArcGIS Online page.



Click on the Add icon and select Search for Layers.

In the Search for layers dialog, type “**data collection**” in the Find dialog box and click on GO.

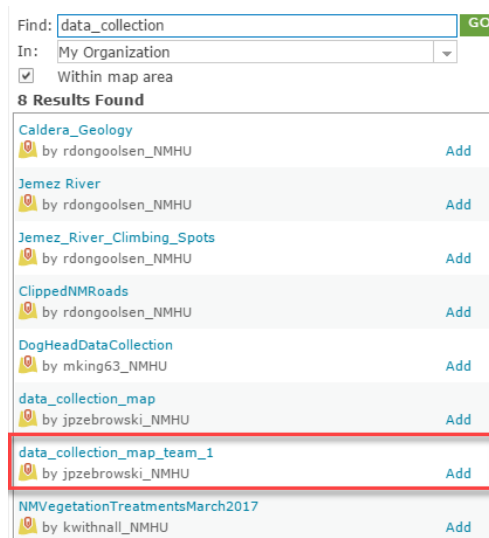
Find the **data\_collection\_map\_team\_x** file (x = your assigned team number) and select Add. Select

**DONE ADDING LAYERS**

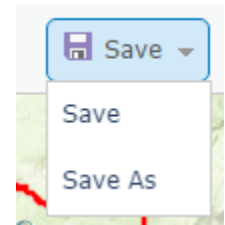
Six feature classes will be added to the map, three each for natural and cultural features, one in each geometry, point, line, and polygon.

Click on the Add icon again, find the **Mora\_Watershed\_HUC\_08** feature class, and add it to the map

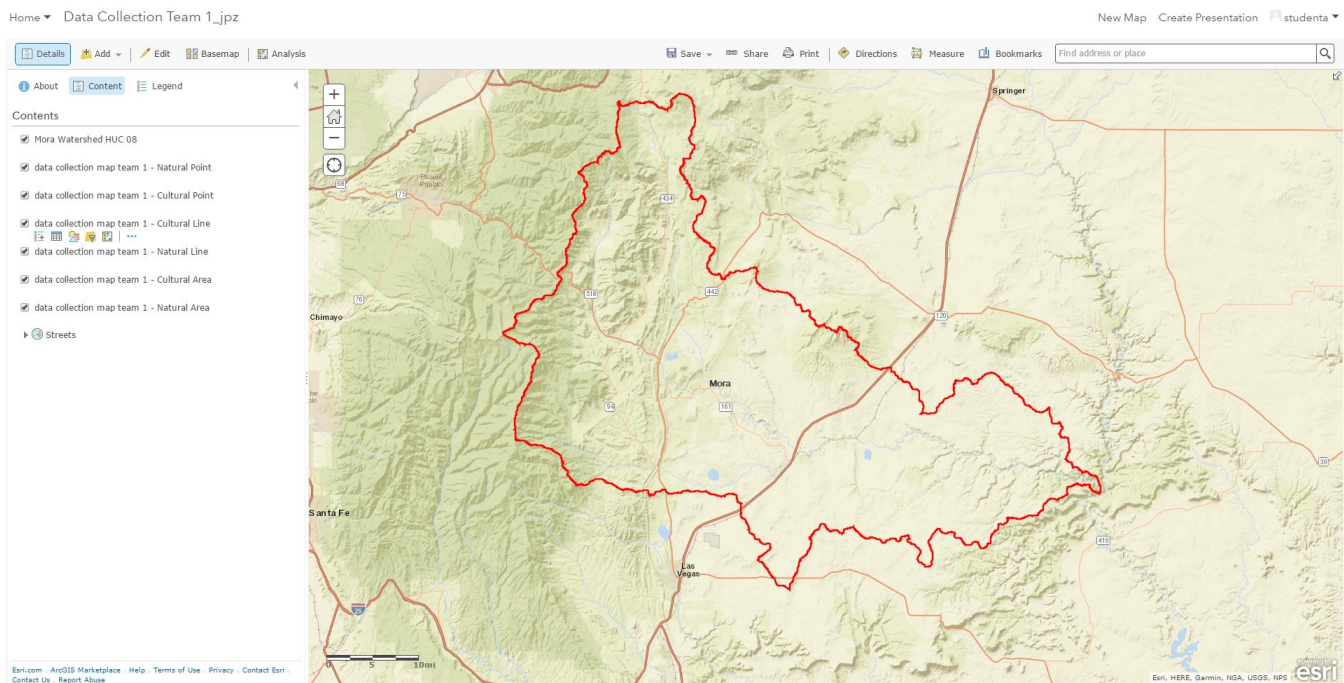
Zoom the map so the Mora watershed fills the map display.



Select Save as and save your map with the following name: **Data Collection Team X\_xyz** (**x** = your assigned team number, **xyz** = your initials). For tags, type **data collection**, **Mora watershed**. For the summary, type **Map for storing natural and cultural features collected in the Mora watershed**. Save it in your student account folder.

A screenshot of the 'Save Map' dialog box in ArcGIS Online. The dialog box has a title bar with a close button (X). It contains four input fields: 'Title:' with the text 'Data Collection Team 1\_jpz'; 'Tags:' with two tags 'data collection x' and 'Mora watershed x', and a link 'Add tag(s)'; 'Summary:' with the text 'Map for storing natural and cultural features collected in the Mora watershed'; and 'Save in folder:' with a dropdown menu showing 'studenta\_NMHU'. At the bottom are two buttons: 'SAVE MAP' (blue) and 'CANCEL' (light blue).


Your map should look something like this:






## Step 2. Configure the data collection form.

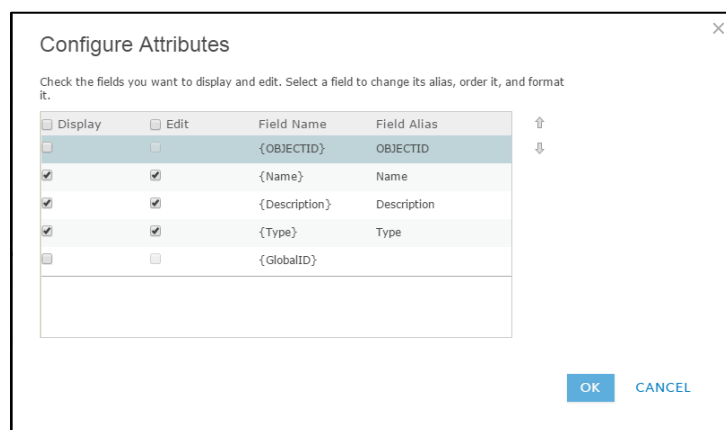
You will now configure pop-up to create a data collection form for the Collector app. The map's pop-up options determine what fields are available to be viewed and edited in the Collector app.

Select the More Options tool  next to the first data collection layer in your map's table of contents.

Choose Configure Pop-up. 

Ensure the Show Pop-ups box is checked.

Select Configure Attributes. Make sure the Display and Edit check-boxes for Name, Description, and Type are checked. These are the only boxes that should be checked. Then select OK.



Configure Attributes

Check the fields you want to display and edit. Select a field to change its alias, order it, and format it.

Display	Edit	Field Name	Field Alias
<input type="checkbox"/>	<input type="checkbox"/>	{OBJECTID}	OBJECTID
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	{Name}	Name
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	{Description}	Description
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	{Type}	Type
<input type="checkbox"/>	<input type="checkbox"/>	{GlobalID}	

OK CANCEL


Explore, but do not change, the other options in the Configure Pop-up dialog. Select OK.

Check the Pop-up configuration for the other data collection layers to make sure they are the same as this one.

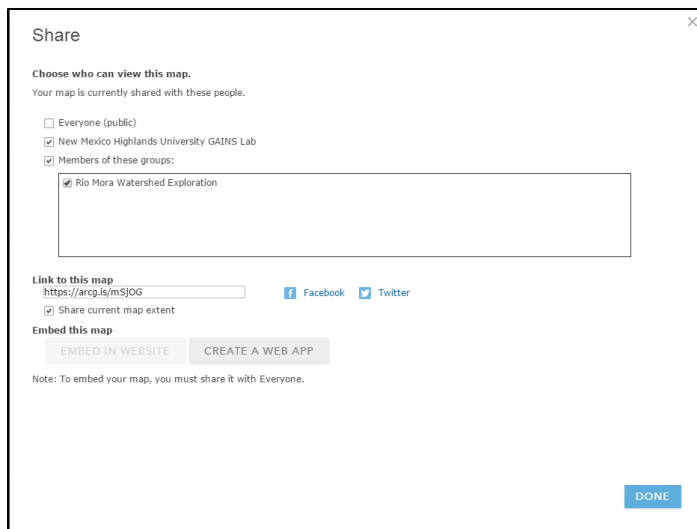
Save the map.

## Step 3. Share the map.

Now you need to share the map and adjust some setting to make it available for use in the Collector app.

Select  from the top menu.

Select New Mexico Highlands University GAINS Lab and Rio Mora Watershed Exploration. Then select Done.



Share

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

☐ Everyone (public)  
☒ New Mexico Highlands University GAINS Lab  
☒ Members of these groups:  
☒ Rio Mora Watershed Exploration

Link to this map  
<https://arcgis.com/jog> [Facebook](#) [Twitter](#)  
☒ Share current map extent

Embed this map  
[EMBED IN WEBSITE](#) [CREATE A WEB APP](#)

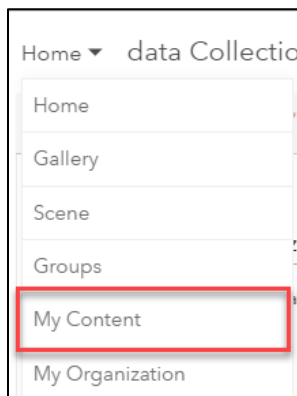
Note: To embed your map, you must share it with Everyone.

[DONE](#)

Save your map.

Now you will adjust some settings:

Click the pull-down arrow next to Home on the top left menu. Then select My Content.



+ Add Item ▾   Create ▾   Share   Delete   Move ▾				
<input type="checkbox"/>	Title	Type	Modified	Shared
<input type="checkbox"/>	▲ Data Collection Team 1_jpz	<input checked="" type="checkbox"/> Web Map	Apr 9, 2017	Organization
<input type="checkbox"/>	Main Overview Map	View item details Open in map viewer Open in ArcGIS Desktop Create presentation	Apr 7, 2017	Not Shared
<input type="checkbox"/>	Points of Interest Along the Santa Fe Trail	on	Apr 7, 2017	Not Shared

Select view item details from the pull down menu next to the name of your map.

Select the Settings tab.

Check the box next to **Prevent this item from being accidentally deleted** and select Save.

Ensure **Enable offline mode** is checked.

Uncheck the **Routing** and **Measure Tool** under **Application Settings**.

Overview Usage Settings

General Settings Web Map Settings

General Settings

Delete Protection

☒ Prevent this item from being accidentally deleted.

Delete Item

Extent

Top: 36.43

Left: -105.9

Bottom: 35.45

Right: -103.87

Set Extent

Save Cancel

Web Map Settings

Save As

☒ Allow others to save a copy of this item.

Offline Mode

☒ Enable offline mode.

Show advanced options

Web Map Settings

Save Cancel

Save As

☒ Allow others to save a copy of this item.

Offline Mode

☒ Enable offline mode.

Show advanced options

Application Settings

Select the tools and capabilities to enable in applications that access this web map

☐ Routing

☐ Measure Tool

☒ Basemap Selector

☒ Find Locations [-]

Hint text

Place or Address

☐ By Layer

☒ By Address

Save Cancel

Save the Web Map Settings and the Application Settings.

Return to the map view and save the map.

Congratulations, you have now prepared a map for online and offline use in the Collector for ArcGIS app.



## Part 3. Create the GeoForm Webapp.

Select Share and then select Create a Web App.

The 'Share' dialog box is shown with the following options:

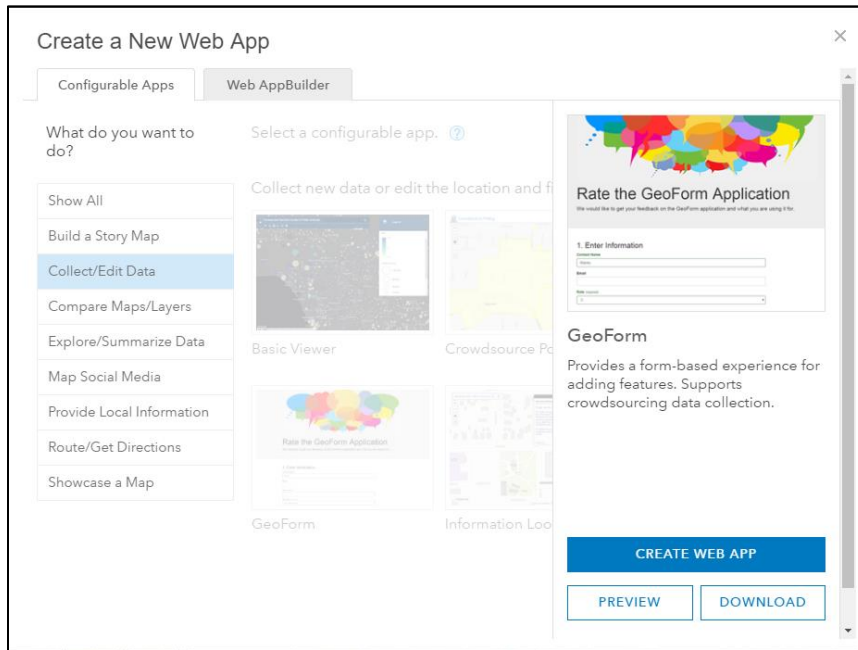
- Choose who can view this map.**  
Your map is currently shared with these people.
- ☐ Everyone (public)
- ☒ New Mexico Highlands University GAINS Lab
- ☒ Members of these groups:
  - ☒ Rio Mora Watershed Exploration
- Link to this map**  
 [Facebook](#) [Twitter](#)
- ☒ Share current map extent
- Embed this map**
- Note: To embed your map, you must share it with Everyone.
- 

Select Collect/Edit data from the options under What do you want to do. Then select GeoForm from the list under Select a configurable app.

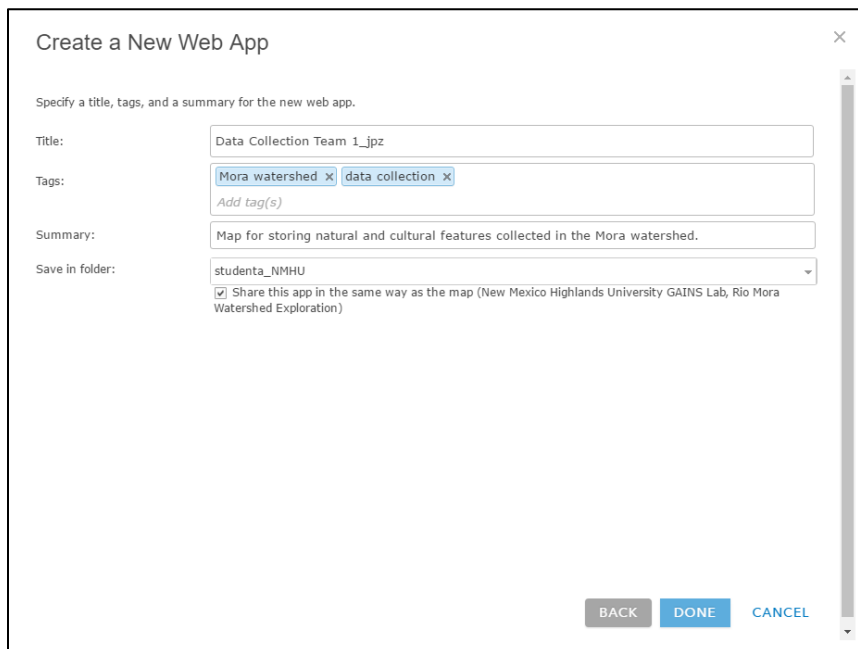
The 'Create a New Web App' dialog box is shown with the following options:

- Configurable Apps** (selected) | **Web AppBuilder**
- What do you want to do?**
  - Show All
  - Build a Story Map
  - Collect/Edit Data** (selected)
  - Compare Maps/Layers
  - Explore/Summarize Data
  - Map Social Media
  - Provide Local Information
  - Route/Get Directions
  - Showcase a Map
- Select a configurable app.**
- Collect new data or edit the location and field values of existing data**
  - Basic Viewer**
  - Crowdsourcing Polling**
  - Edit**
  - GeoForm** (selected)
  - Information Lookup**
  - Story Map Crowdsourcing (beta)**

Select Create Web App.

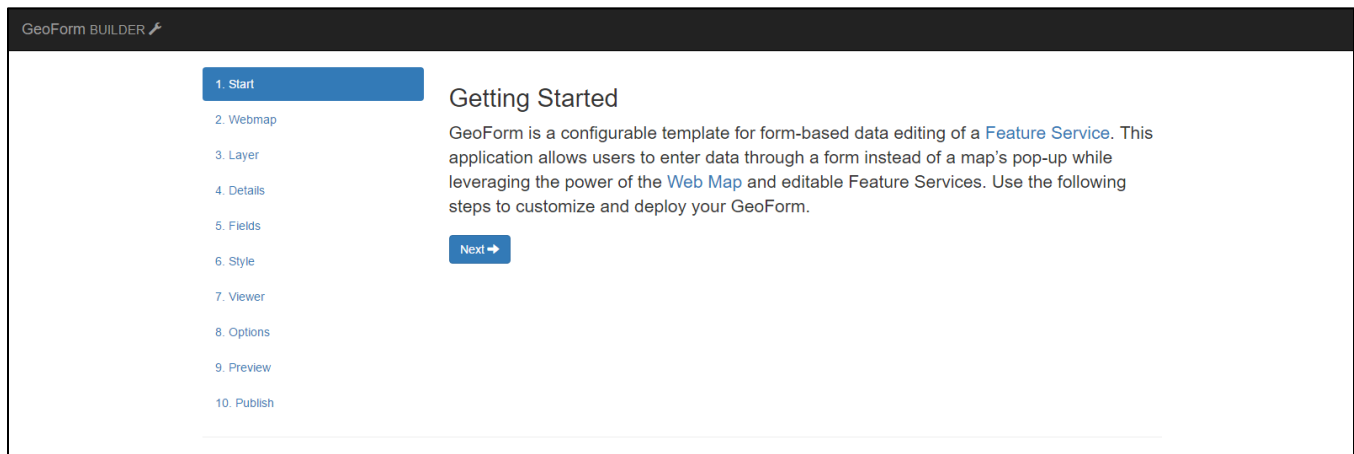


The title, tags, and summary from your Web map should automatically populate the metadata for your app.

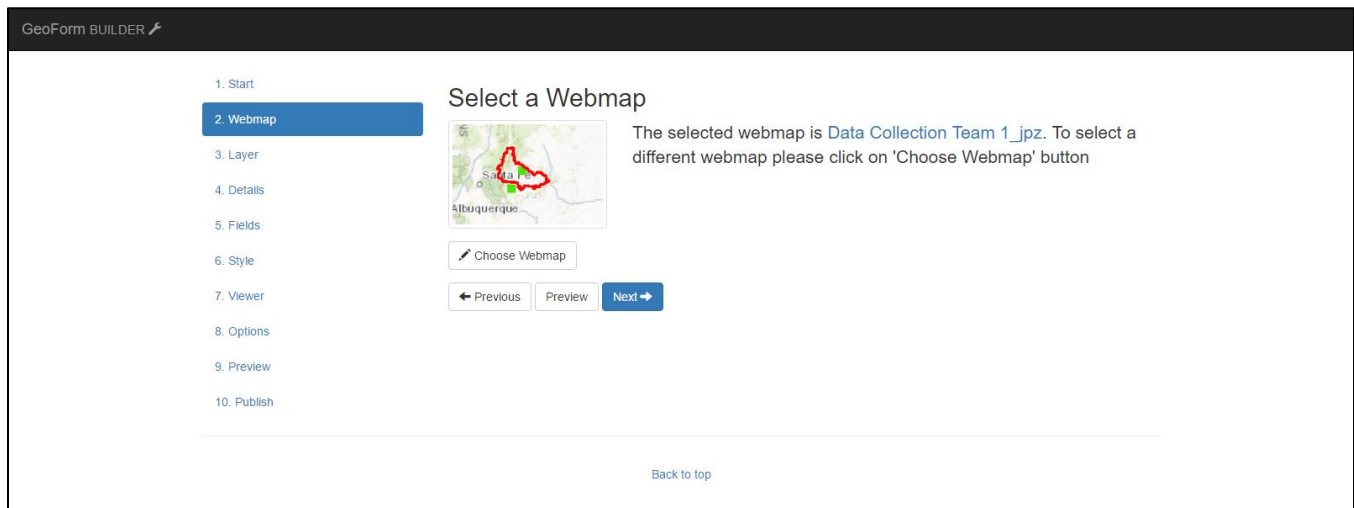


Select done and your app will now be ready for configuration.

Read the information in the Getting Started page of the GeoForm builder. Then press next.



In the Select a Webmap page, make sure your data collection map is selected and then press next.



Select All layers on the Select Editable Layer(s) page. Then press Next.

GeoForm BUILDER

1. Start  
2. Webmap  
3. Layer  
4. Details  
5. Fields  
6. Style  
7. Viewer  
8. Options  
9. Preview  
10. Publish

### Select Editable Layer(s)

This is the layer(s) that the GeoForm will be built from. The layer must be a feature service that is enabled for editing with sharing permissions appropriate for your audience. If all layers are selected, the form will allow a user to choose which form layer to submit to.

**Layer**

All Layers

← Previous Preview Next →

[Back to top](#)

Enter the following in the Form Instructions and Details section. “Enter information about your feature on this form. Note that there are two categories of natural features, biophysical and geophysical. Choose the appropriate type.” Press Next.

GeoForm BUILDER

1. Start  
2. Webmap  
3. Layer  
4. Details  
5. Fields  
6. Style  
7. Viewer  
8. Options  
9. Preview  
10. Publish

### 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**

Data Collection Team 1\_jpz

**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**

Enter information about your feature on this form. Note that there are two categories of natural features, biophysical and geophysical. Choose the appropriate type.

Make sure attachments are enabled on the Fields page. Review and accept the defaults. Then press Next.

GeoForm BUILDER

1. Start

2. Webmap

3. Layer

4. Details

5. Fields

6. Style

7. Viewer

8. Options

9. Preview

10. Publish

### Select Layer

Natural Point

### 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
1	<input checked="" type="checkbox"/>	Name	Name	
2	<input checked="" type="checkbox"/>	Description	Description	
3	<input checked="" type="checkbox"/>	Type	Type	

☒ **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**

Accept the defaults under the Style, Viewer and Options sections (make sure Enable offline support is checked on the Options section).

GeoForm BUILDER

1. Start

2. Webmap

3. Layer

4. Details

5. Fields

6. Style

7. Viewer

8. Options

9. Preview

10. Publish

### 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

Preview the Webapp and if everything looks good, press Next.

The screenshot shows the 'GeoForm BUILDER' interface. On the left is a vertical navigation menu with steps 1 through 10. Step 9, 'Preview', is highlighted with a blue bar. The main content area is titled 'Preview Application'. It features a header with a small icon, the text 'Data Collection Team 1\_jpz', and a paragraph: 'Enter information about your feature on this form. Note that there are two categories of natural features, biophysical and geophysical. Choose the appropriate type.' Below this, there are two sections: '1. Select Form' with a dropdown menu showing 'Natural Point', and '2. Enter Information'.

Press Save and your GeoForm is ready for deployment.

The screenshot shows the 'GeoForm BUILDER' interface. On the left, the navigation menu now has step 10, 'Publish', highlighted with a blue bar. The main content area is titled 'Save Application'. It contains the text: '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.' Below this text are three buttons: 'Previous' (with a left arrow), 'Save and Exit' (with a document icon), and 'Save' (with a document icon). At the bottom center, there is a link that says 'Back to top'.







A window with a web link and various sharing options will appear. Write down the link and, optionally, email the link to yourself.

Success! Item saved


Your GeoForm has been updated & published!

### Share This Form

Tell others to contribute using the following options.



### Form Link



Close

## Part 4: Collect data with the GeoForm

While the GeoForm can be used to interactively collect data on any computer with a web browser, its real power is in the ability to use it on a tablet or smartphone in the field.

Although you do not need internet access to collect data, you will need to open the application at a location where you have internet available. Also, location information may not be very good when working off line.

Open a browser on your handheld device and navigate to the url you copied from the previous section.

Log in to ArcGIS Online with your student credentials.

Your GeoForm will open and you can start entering data. To collect the location of your device, you may need to add https:// to the beginning of the url if it is not already present (e.g.

**https://nmhu.maps.arcgis.com/apps/GeoForm/index.html?appid=1affb098e0c04da7bbea8e96abf141f9)**

The image displays two side-by-side screenshots of a web browser on a mobile device, showing the ArcGIS Online GeoForm application interface.

**Left Screenshot:** The browser address bar shows the URL `https://nmhu.maps.arcgis.com/aj`. The page title is "Data Collection Team 1\_jpz". Below the title, there is a brief instruction: "Enter information about your feature on this form. Note that there are two categories of natural features, biophysical and geophysical. Choose the appropriate type." The form is divided into three main sections:

- 1. Select Form:** A dropdown menu with "Natural Point" selected.
- 2. Enter Information:** Fields for "Name" (containing "Tree01"), "Description" (containing "Juniper"), and "Type" (a dropdown menu with "Biophysical" selected). Below these is an "Attachment" section with a "Select File" button. A green box shows a file named "1491776272080180137969.jpg" with a size of "756.04kb".
- 3. Select Location:** A section with a map and a "Locate Me" button.

**Right Screenshot:** This screenshot shows the "3. Select Location" section in more detail. It includes a search bar with "Find address or place" and a "Locate Me" button. Below the search bar, the map shows a location with coordinates "Latitude: 35.86690, Longitude: -104.86100". The map displays a red outline of a region and a green dot indicating the current location. Below the map, there is a "4. Complete Form" section with the text "Add this information to the map." and two buttons: "Submit Entry" and "View Submissions". A "Back to top" link is visible at the bottom.

You can add a photo from your device's camera by pressing Select File under the Attachment section.

Use the Locate Me button to collect the location at your device.

Note: If you are working offline, you must open the application while online and leave the browser open until you connect to the internet again. The data will automatically synchronize after a few minutes.

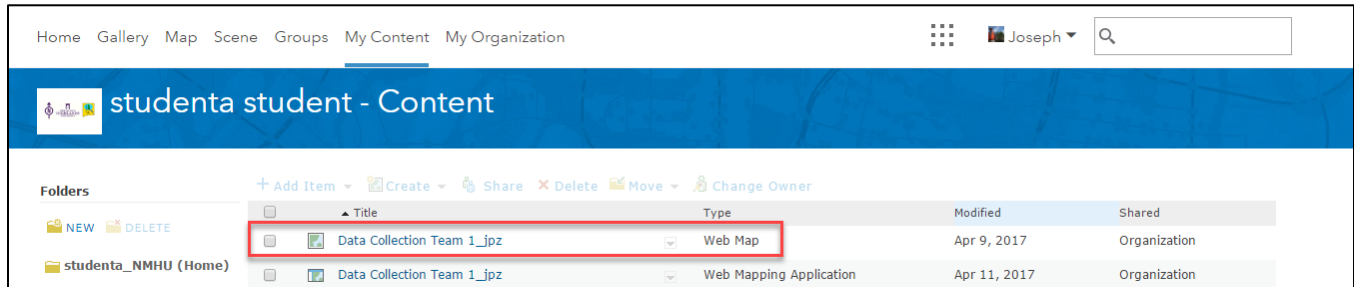
Select Submit Entry once you have entered the data in your form. A blank form will then appear.

Select View Submissions to see all the locations you have collected.

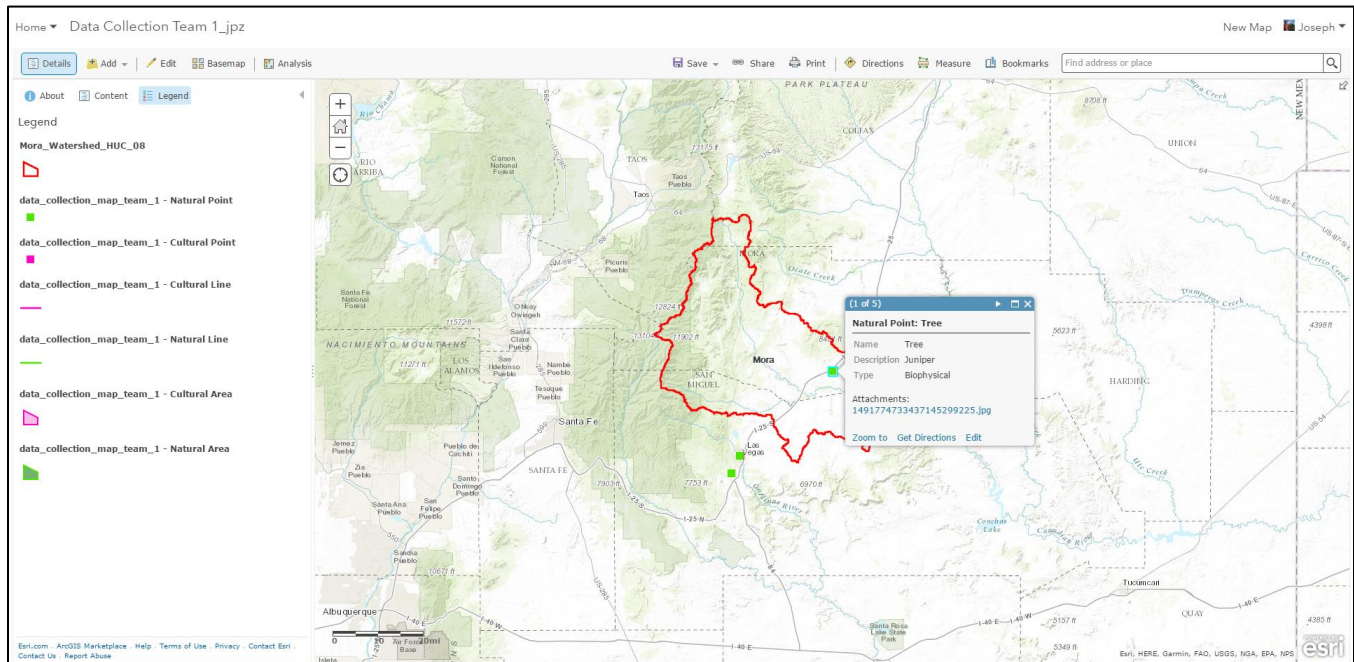
Press the back button on the browser to return to your form.

## Part 5: View the data you collected in the webmap and create a webapp to share your map.

Once you have returned to a computer and have synched any data you collected offline, log back into ArcGIS Online and open your web map. Close the browser on your phone or tablet.



Your web map will open. You can click on one of the features you collected. A pop-up window will appear showing the data you collected. If you took a photo, a link to the photo will show up under attachments. You can interactively edit or delete points by choosing Edit from the pop-up window.

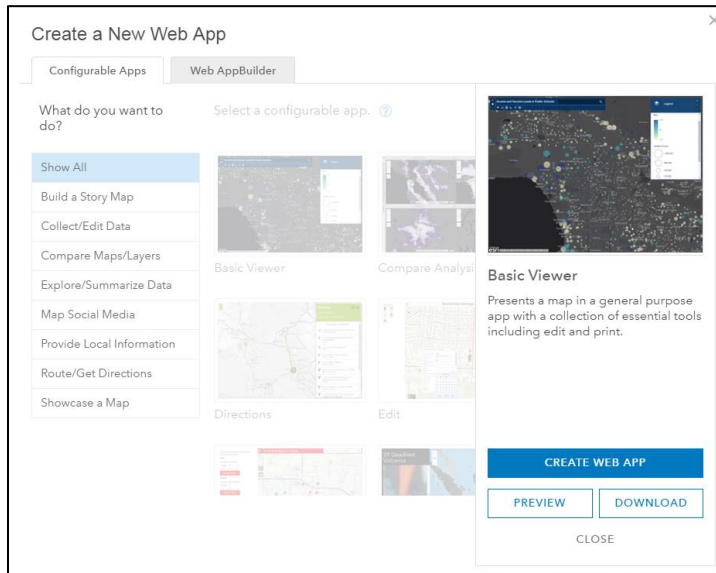


When you are satisfied with your map, save it and then select Share.

In the Share dialog, make sure the map is shared with the New Mexico Highlands GAINS Lab and the Rio Mora Watershed Exploration group.

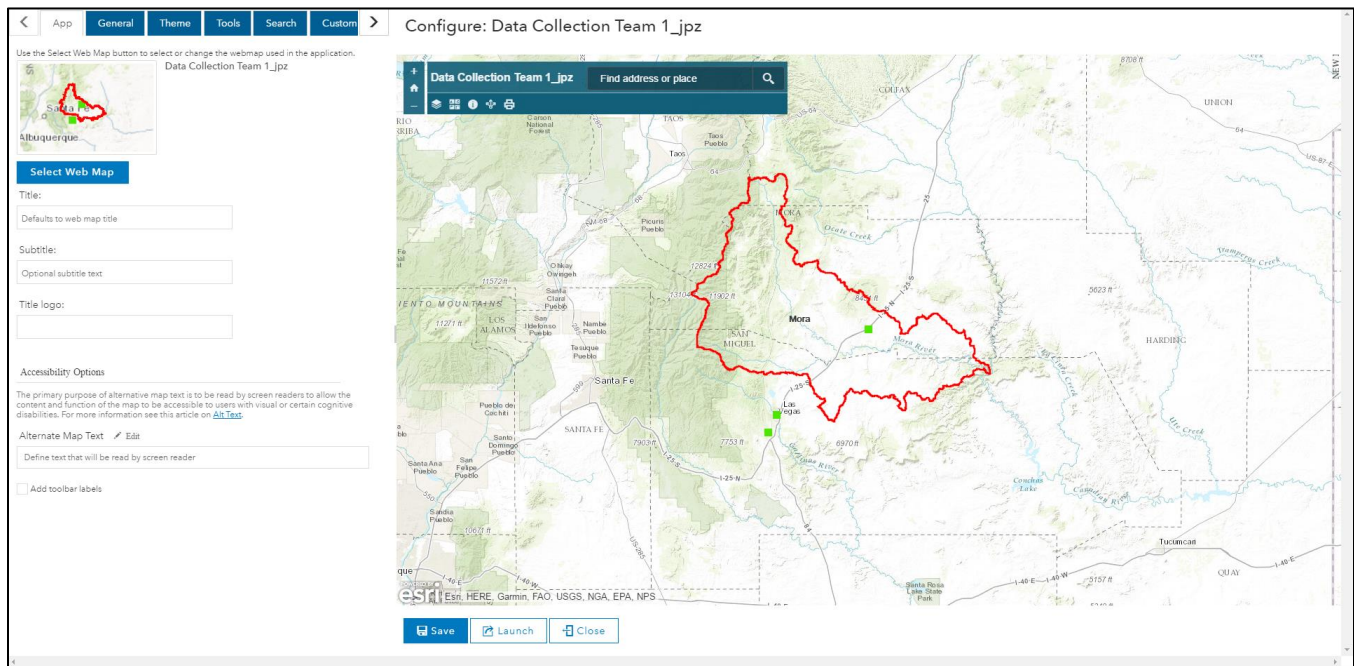
Select Create a Web App.

Choose the Basic Viewer and select Create Web App.



Accept the Title and tags shown. In the summary box, type **Web app for sharing natural and cultural features collected in the Mora watershed.** Select Done.

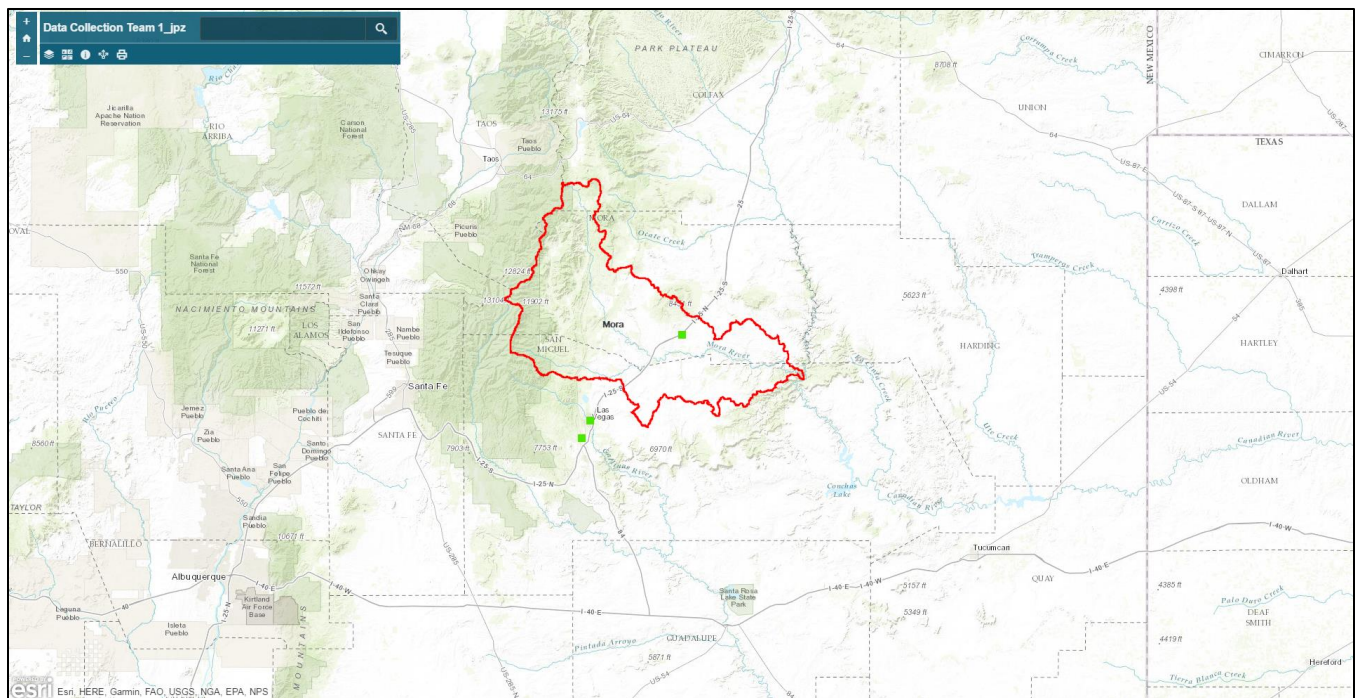
A dialog for configuring the web app appears.



Accept the default settings and press Save. Press Launch.



## Field Data Collection with the ArcGIS Online GeoForm App: Exercise 3a



The interactive web map application will open in a new browser tab. Zoom in and out, change the background, and explore the other tools available on the menu bar.

Press the Share icon on the menu bar.



Write down the map link for your web map and have one of your teammates open it in a new browser.

**Congratulations.** You have created a web map designed to support the collection of features using the GeoForm webapp. You then customized the GeoForm web app and collected data. Finally you examined the collected data in a web map and shared it as an interactive webapp.