



FIELD DATA COLLECTION & VISUALIZATION GUIDE

A guide to create field data collection aids and visualize results in ArcGIS Online and StoryMaps

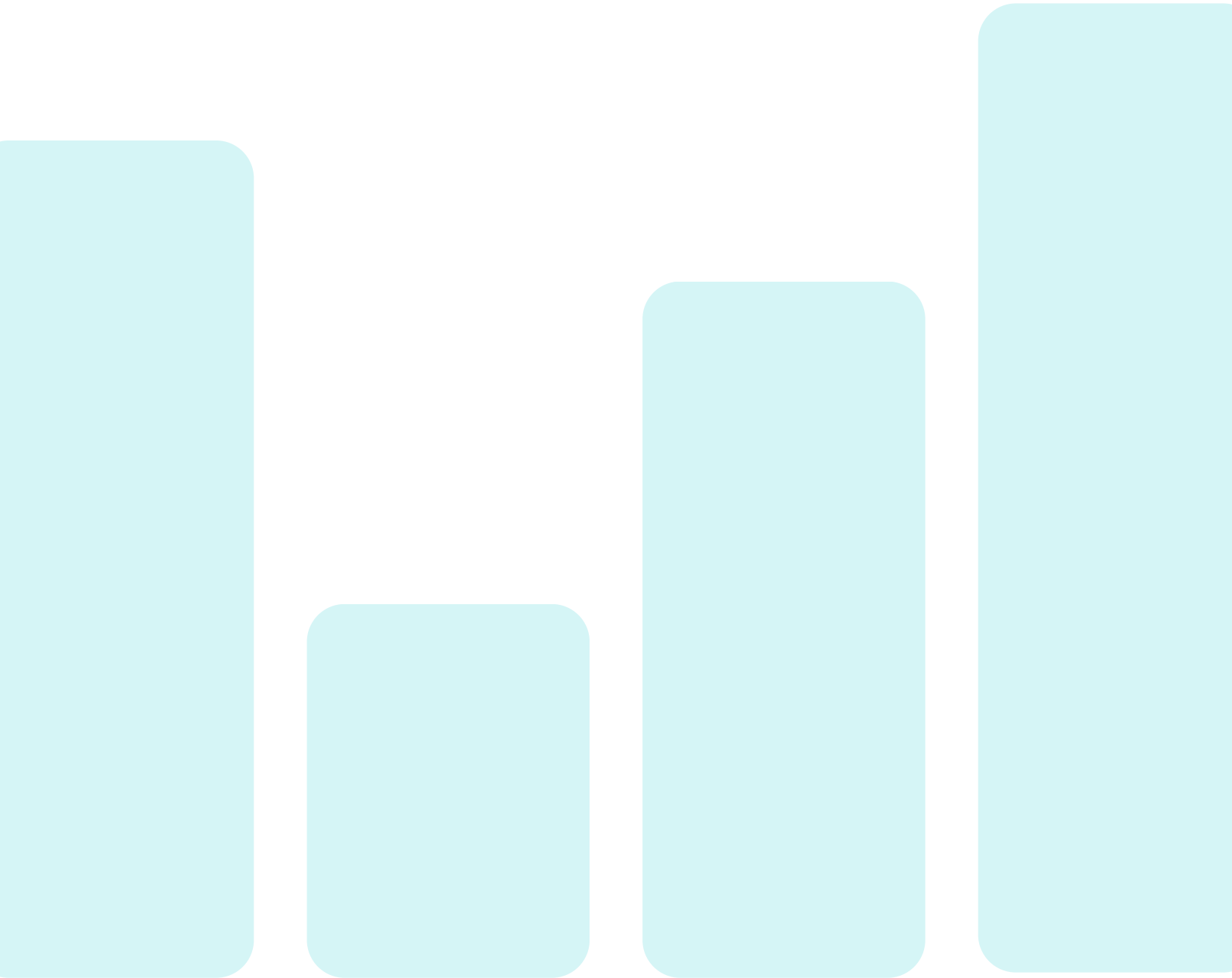


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Field Data Collection & Visualization Guide Overview

This guide walks you through how to collect data in the field and then visualize your results in ArcGIS Online and StoryMaps.

- Step 1: Create your field data collection form
- Step 2: Enter field data into a spreadsheet
- Step 3-4: Upload and visualize your data in ArcGIS Online
- Step 5-7: Share your results using StoryMaps

1. Create Your Field Data Collection Form

A printable data collection template is provided to help you get started, and you can customize it as needed. This form is designed to be filled out by hand in the field because tallying item quantities is usually faster on paper. If you prefer, you can convert the questions into an online form (e.g., Google Forms), but printed forms are recommended for ease of counting.

Download the Printable Form:

This form captures:

- Location information
- Types and quantities of trash collected
- Notes on species impacted
- General observations

Print multiple sheets to capture this data at each site you will be visiting.

A Note on Coordinates

ArcGIS Online requires coordinates in **Decimal Degrees** (example: 48.93934410644928, -125.54583434350748). Google Maps provides coordinates in this format, making it an easy tool to use in the field. You will need a phone or device to record coordinates unless you:

1. **Pre-select your sites**
2. Give each site a name (e.g., *Site A*)
3. Bring a printed map showing their locations.

If you encounter an unexpected location during fieldwork, mark it on your printed map and look up the exact coordinates in Google Maps once you return.

2. Enter Your Field Data Into a Spreadsheet

This guide uses Excel, but any spreadsheet program will work.

Consistency is crucial; ArcGIS Online groups data based on exact text matches. Spelling, spacing, and capitalization must be identical.

For example: “Plastic bag” versus “Plastic Bags” would be treated as two different categories. Using data validation with dropdown lists helps prevent errors.

An Excel spreadsheet template is included with this guide (Clean-up Data Template), but if you want to build your own, follow the steps below. If you are using the template, skip to Step 3.

a. Setup Your Spreadsheet

Create a new Excel file and add column headers such as:

- | | |
|--------------|--------------------|
| ◦ ObserverID | ◦ Type |
| ◦ Date | ◦ Specific Type |
| ◦ Location | ◦ Quantity |
| ◦ Latitude | ◦ Species Impacted |
| ◦ Longitude | ◦ Notes |

After adding headers:

- Select the first cell
- Go to **Insert → Table**
- Make sure **My table has headers** is checked

b. Create Dropdown Lists (Data Validation)

Dropdowns help keep your data clean and consistent.

Create a sheet for your category lists

1. Add a new sheet (e.g., “Data Validation”).
2. List all categories that should have dropdowns (e.g., Plastic, Metal, Foam, etc.). If you have a primary trash type (Plastic) and want to subcategorize it (Plastic bottles), create a list with all the subcategories and ensure the header is spelt the same was as it was in your primary list (Plastic). You can also look at the template for reference.
3. Select cells in each list and create a **Named Range**:
 - Go to **Formulas → Defined Names → Create from Selection**
 - Select only **“Top Row”**

You can confirm the names under **Formulas → Name Manager**.

Do this for every list you plan to use.

c. Add Dropdowns to Your Main Data Sheet

Return to the “Field-collected data” sheet.

Dropdown for primary trash Type

1. Highlight the entire Type column.
2. Go to **Data → Data Validation**.
3. Select **Allow: List**.
4. Enter =Type (or whatever your named list is called).

Dependent dropdown for SpecificType

For example, when “Plastic” is chosen as the Type, the options under SpecificType should only show plastic-related options.

1. Highlight the **SpecificType** column.
2. Go to **Data → Data Validation**.
3. Select **Allow: List**
4. In the Source field, enter the formula: =INDIRECT(G1)

(G1 is the Type column in your template, adjust if yours is different.)

To work correctly, each Type must have a matching named list with the exact same spelling (e.g., Plastic → Plastic).

d. Create a Coordinates Sheet

This sheet allows Excel to automatically fill in latitude and longitude based on a selected location.

1. Add a new sheet titled **Coordinates**.
2. Create three headers: **Location, Latitude, Longitude**.
3. Select the first cell and insert a table. Make sure **My table has headers** is checked.
4. Under **Table Design**, in the far-left corner, rename your table **Coordinates** (this is important for the following formula to work).
5. Enter each site name and its coordinates.
6. Select all cells under Location and create another Named Range called Location.

Linking coordinates to your main sheet

In the main sheet:

- In the **Location** column, add a dropdown using the named list: =Location
- In the **Latitude** column, enter: =IFNA(VLOOKUP(D2,Coordinates,2,0), "")
- In the **Longitude** column, enter: =IFNA(VLOOKUP(D2,Coordinates,3,0), "")

(Adjust D2 if your Location column is in a different position.)

Now, selecting a site name will automatically fill its coordinates.

3. How to Use the Excel Template

The provided Excel template has **three sheets**:

1. Field-collected data

- Enter all field observations here.
- Most columns use dropdowns for easy, error-free input.

2. Data Validation

- Stores all trash category lists.
- Update this sheet if you need to add or change any items.
- Be sure items remain inside the existing tables so the dropdowns continue to work.

3. Coordinates

- Enter each site and its latitude/longitude here.
- The Field Data sheet will automatically fill coordinates based on your selections.

Once these two supporting sheets are updated, you can begin entering your field data.

Converting and Saving Your Data for ArcGIS Online

Since this guide is using the free version of ArcGIS Online, we will save our excel workbook at a .csv and then convert our .csv into a GeoJSON for ease of use when visualizing our data in a web map.

To save correctly in Excel:

- Go to **Save As**
- Choose **CSV (.csv)**
- Make sure you are currently viewing the **Field-collected data** sheet
- Name it (ex. CleanUpData_11DEC2025) and save it somewhere appropriate.
- Click **OK** on the warning that CSVs can only save one sheet

To convert your .csv to a GeoJSON

- Go to <https://geoutil.com/converters/csv-to-geojson.html>
- Drag and drop your .csv the the Load Files box.
- Click the Floppy disc to download.

Congratulations! You prepared your data to be visualized on a map.

4. Upload and Visualize Your Data in ArcGIS Online

In this step, you will upload your GeoJSON file to ArcGIS Online and visualize your data in a way that best represents your project. Depending on the information you collected, there are many ways to tell your story. This guide covers both quantitative (how much) and qualitative (what type) visualization methods.

a. Sign in to ArcGIS Online

If you do not yet have an account, follow the instructions below. The first set of instructions is for Teachers, the second is for personal use.

Request a Teacher Account

- Go to the [Esri Canada K-12 Education Portal](#).
- Fill out the [Signup for ArcGIS for Schools Form](#).
- Provide your name, school email, school name, and school board.
- Check your email for an official invitation link from Esri Canada to finish setting up your administrative login.

Request Student Accounts

- Once your teacher account is active, open the [Esri Canada Student Account Request Form](#).
- Submit the form specifying how many accounts you need for your class.
- Esri Canada will batch-create these and email you when they are ready.

Additional Information about your Esri Teacher Account

Logins and Privacy

- Individual Logins: each student receives their own unique username and password to access their personal workspace.
- Privacy Protections: You do not need to use real student email addresses. You can map all student IDs to a single teacher/school email to keep student identities secure and private.

Monitoring Student Work

- Full Visibility: teachers can view, monitor, and manage everything the students create.
- Control Level: Because your teacher account acts as the organization administrator, you can access the central dashboard to look at individual maps, change item ownership, or safely delete files.
- Public Sharing: Students cannot publish their maps to the public internet on their own. Teachers can use a "Showcase Account" to review, approve, and safely share excellent student work externally.

Student Account Limits

- No Practical Limits: There is no restrictive limit on how many student accounts you can add.
- Free Resource Allocation: The Esri Canada ArcGIS for Schools Bundle provides free, unrestricted access for all classrooms, enabling you to add multiple classes or entire grades as needed.

For personal use:

1. Go to: www.esri.com/en-us/arcgis/products/create-account
2. Choose Create an ArcGIS Public Account (do not select the trial).
3. Enter your name, email, and create a unique username and password.
4. Verify your email using the link sent to you.
5. Once activated, sign in to ArcGIS Online.

b. Upload Your .csv or GeoJSON

If you have a teacher account:

1. After signing in, click **Content Tab**.
2. Select **New item**.
3. Drag and drop your .csv file or click **Your device** to browse for it.
4. Select the option that says "Add (your file) and create a hosted feature layer or table" and click **Next**.
5. The next page will be a list of your fields being pulled from your .csv. Click **Next**.
6. The next page is asking to select your location fields. Ensure the Location Type and the Fields match for Latitude and Longitude. Click **Next**.
7. (Optional) Update the title, add tags, or write a short summary.
8. Click **Save**.
9. You will be taken to the item page for your newly created feature layer.
10. Click **Open in Map Viewer** on the right-hand side.

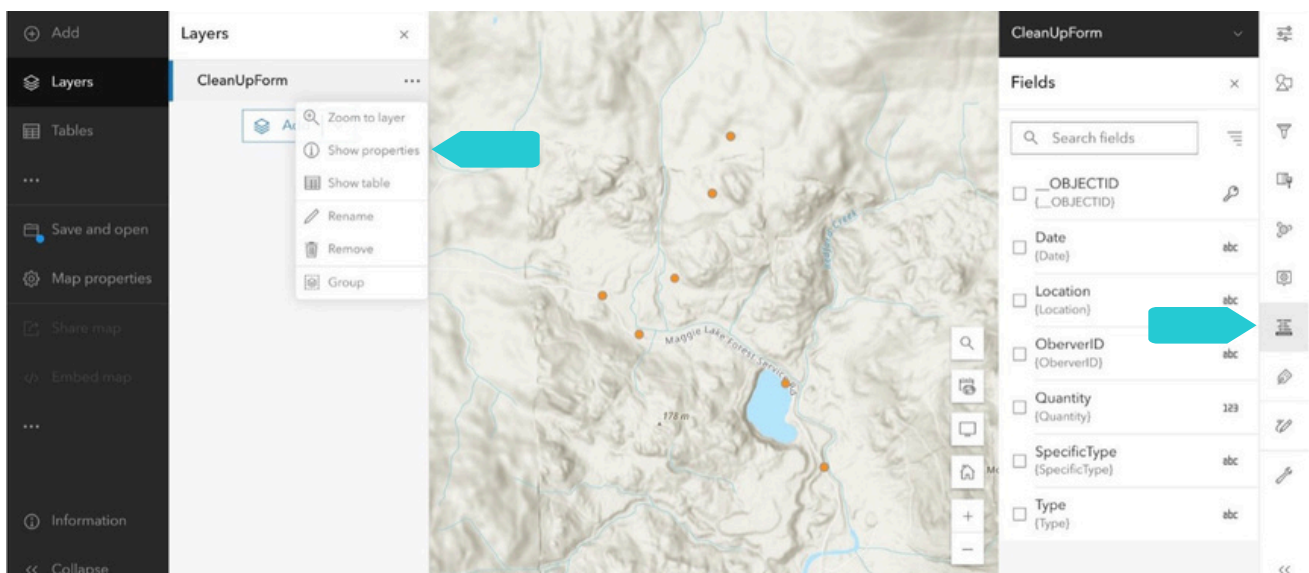
If you have a personal free account:

1. After Signing in, click the **Content** tab.
2. Select **New item**.
3. Drag and drop your GeoJSON file or click **Your device** to browse for it.
4. (Optional) Update the title, add tags, or write a short summary.
5. Click **Save**.
6. You will be taken to the item page for your GeoJSON.
7. Click **Open in Map Viewer** on the right-hand side.

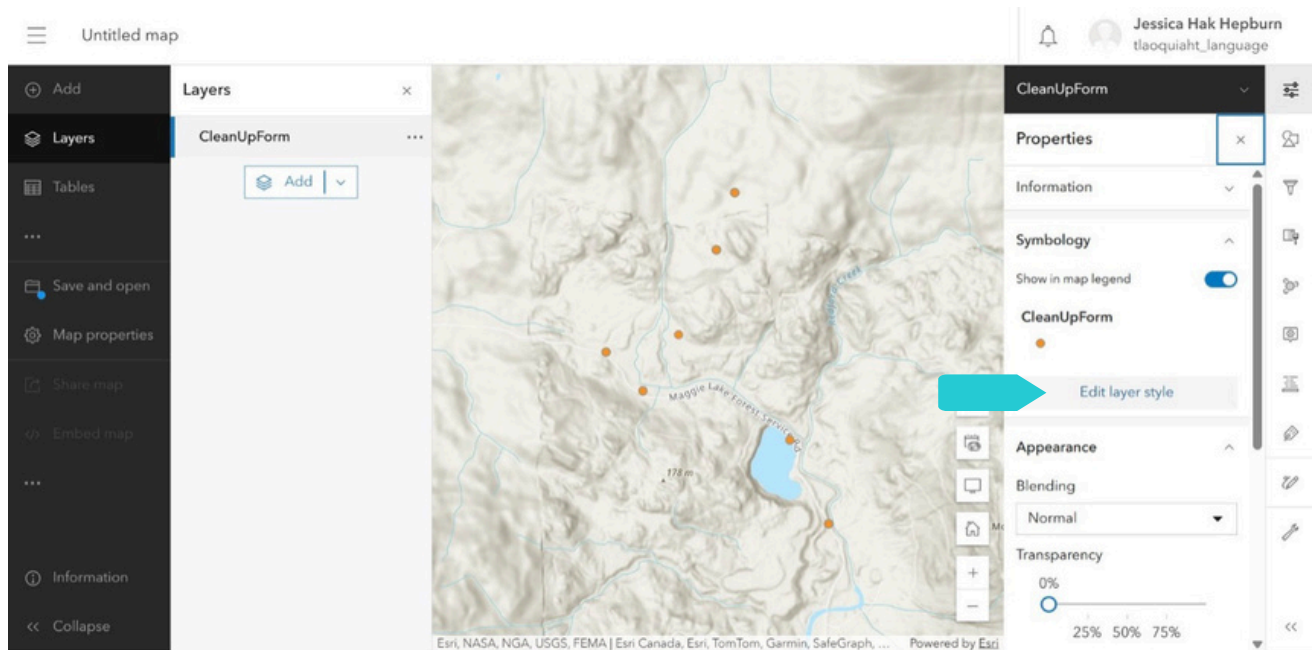
c. Visualize Your Data Quantitatively (by Amount)

This step shows how to symbolize your data based on the quantity of trash collected at each site. This requires a numeric field (e.g., Quantity).

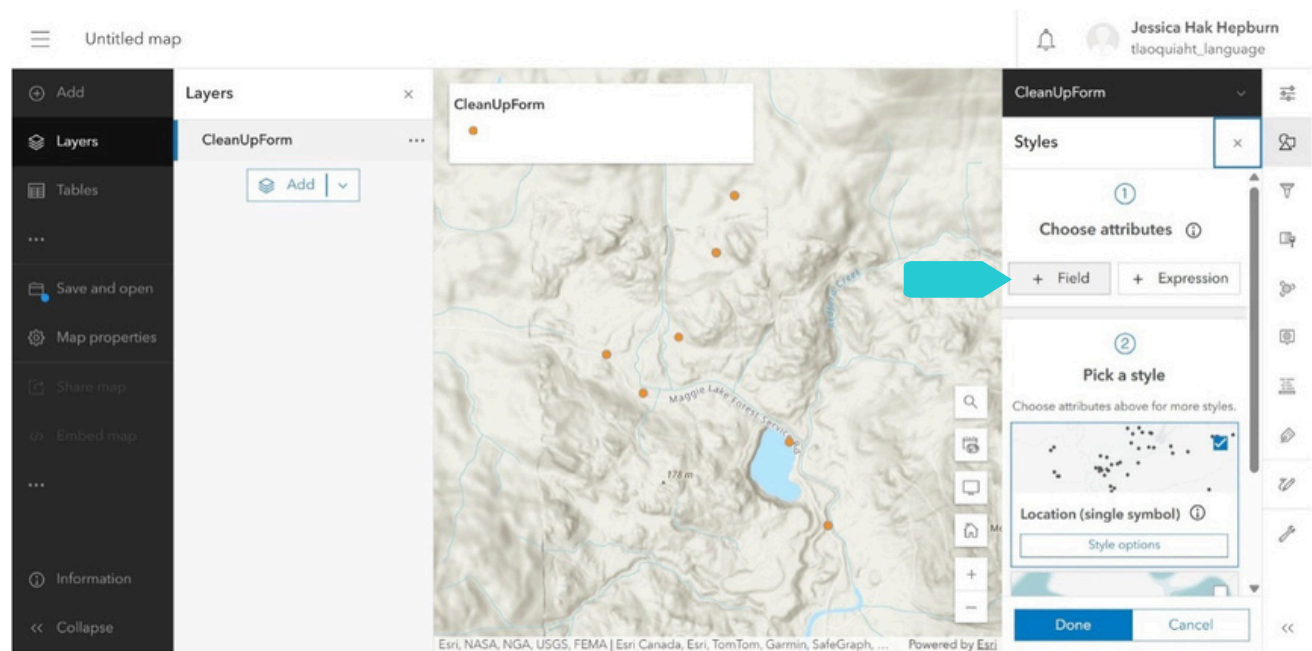
1. In the **Contents** panel, click your layer and select **Show properties**



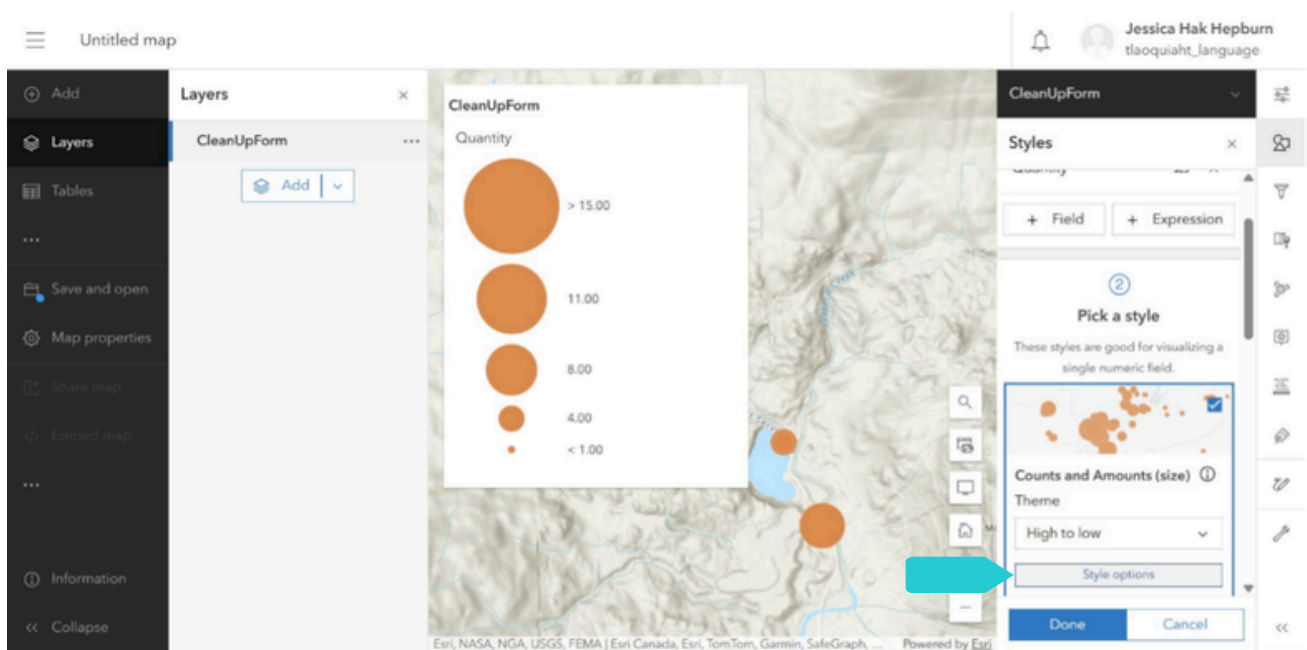
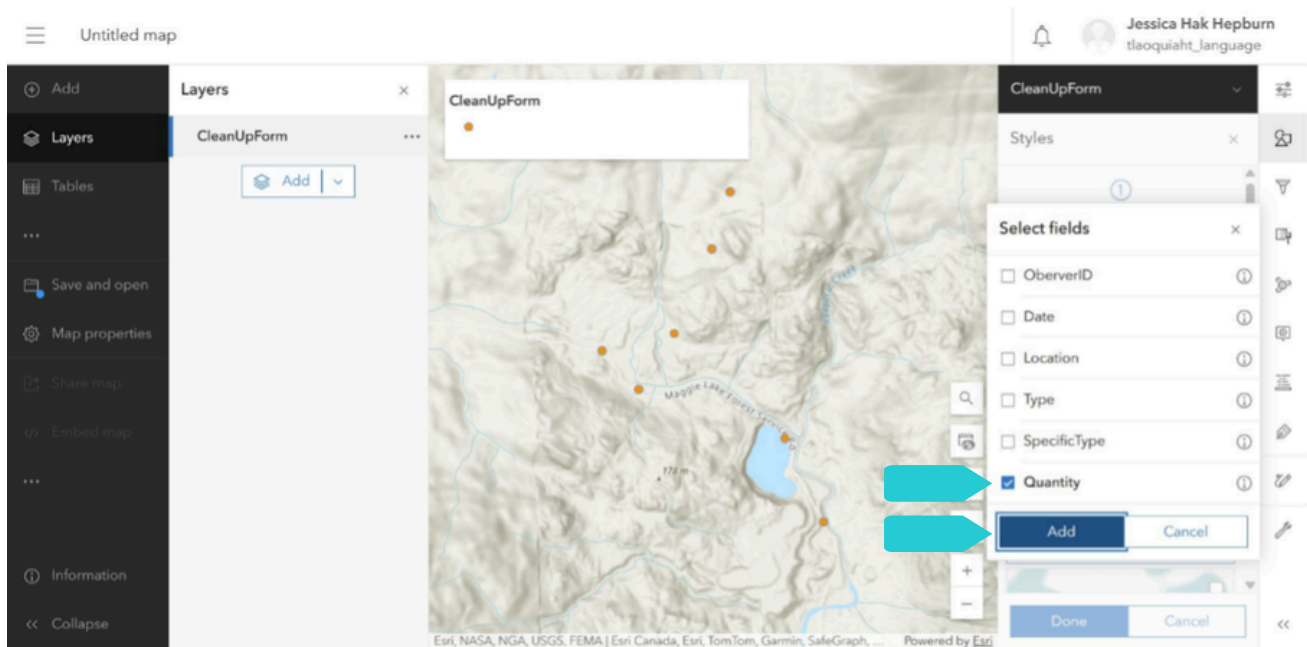
Go to **Edit Layer Style**



2. Under **Choose attributes**, select **Field**.

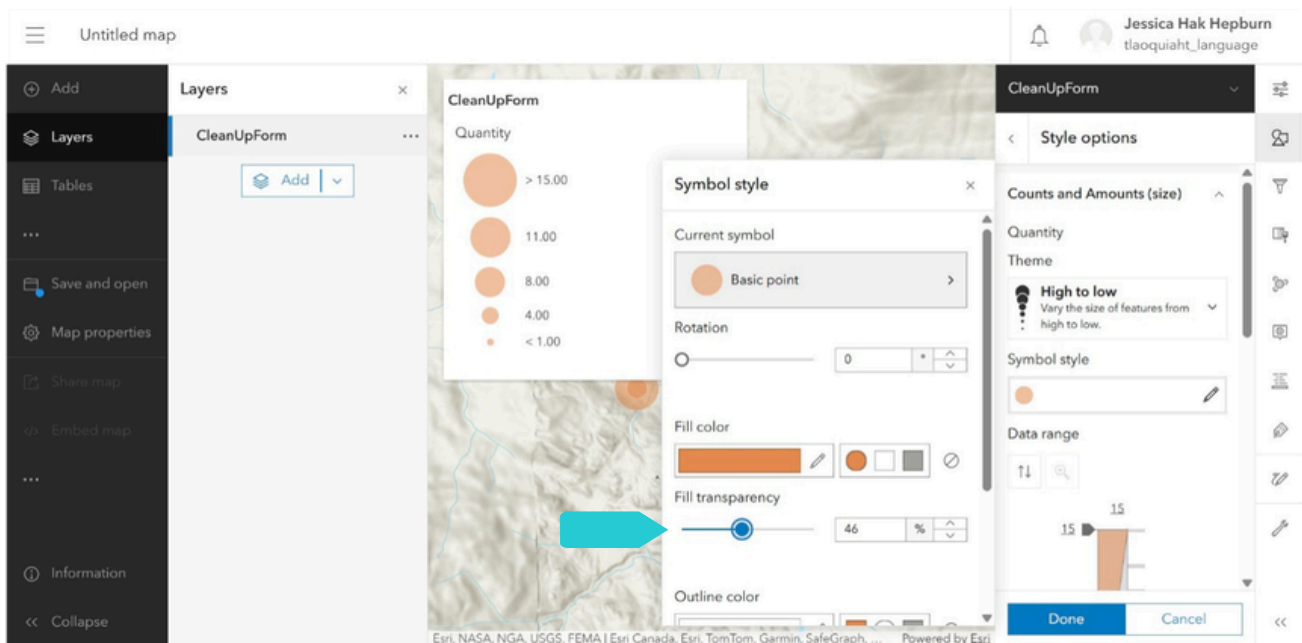


3. Check **Quantity** and click **Add**.
4. Click **Style options**.



5. Click **Symbol style** to adjust the shape, color, and transparency of your points.

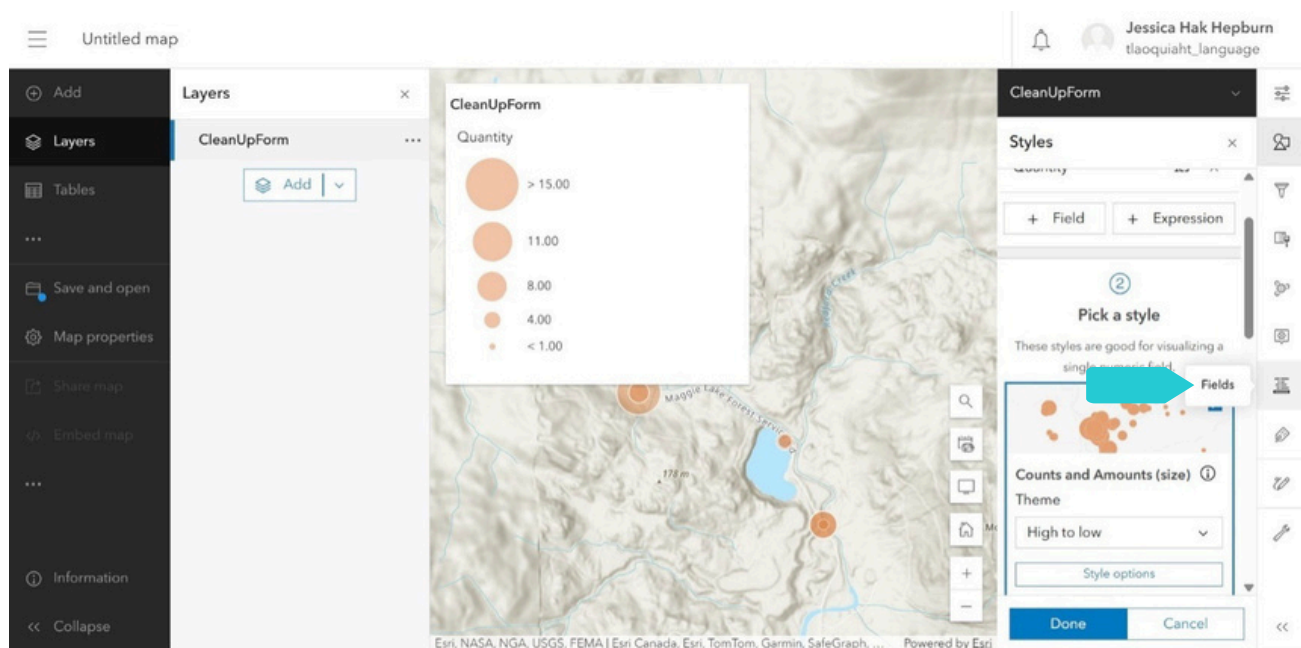
- Because multiple points may overlap at the same location, reduce the **opacity** so stacked points remain visible.
- Click **Done** when finished.



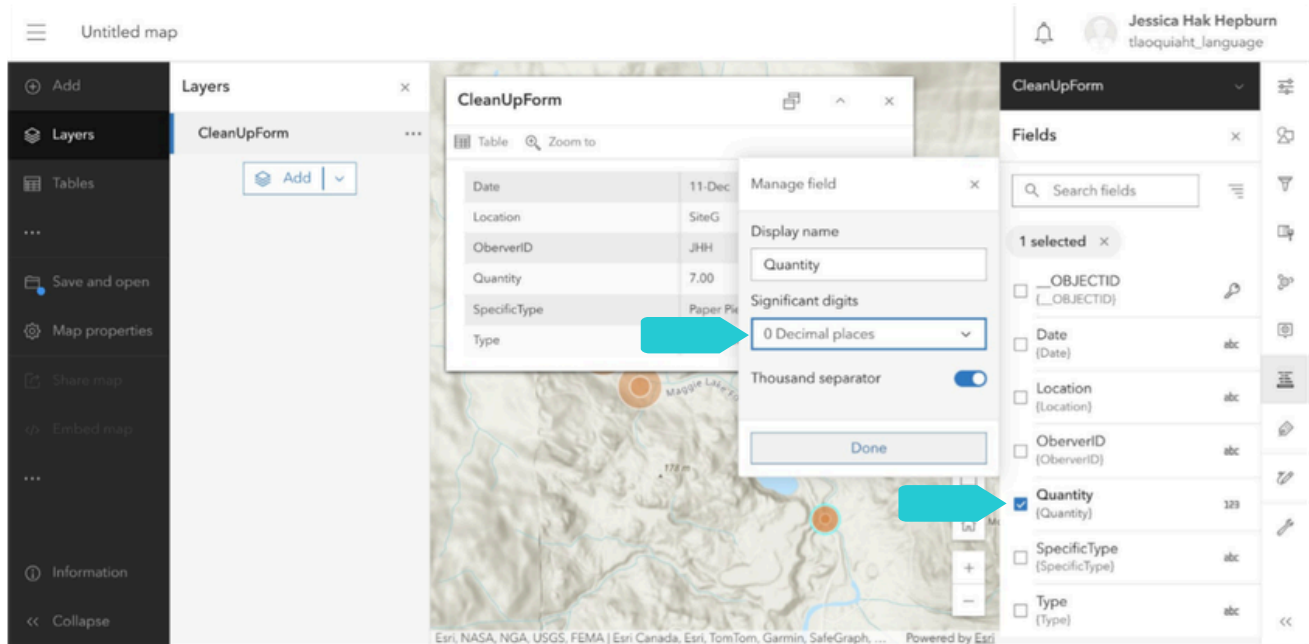
6. To adjust size range of point sizes, scroll to **Size range** in the **Style options**.

7. To format the numbers (whole numbers make more sense for this data):

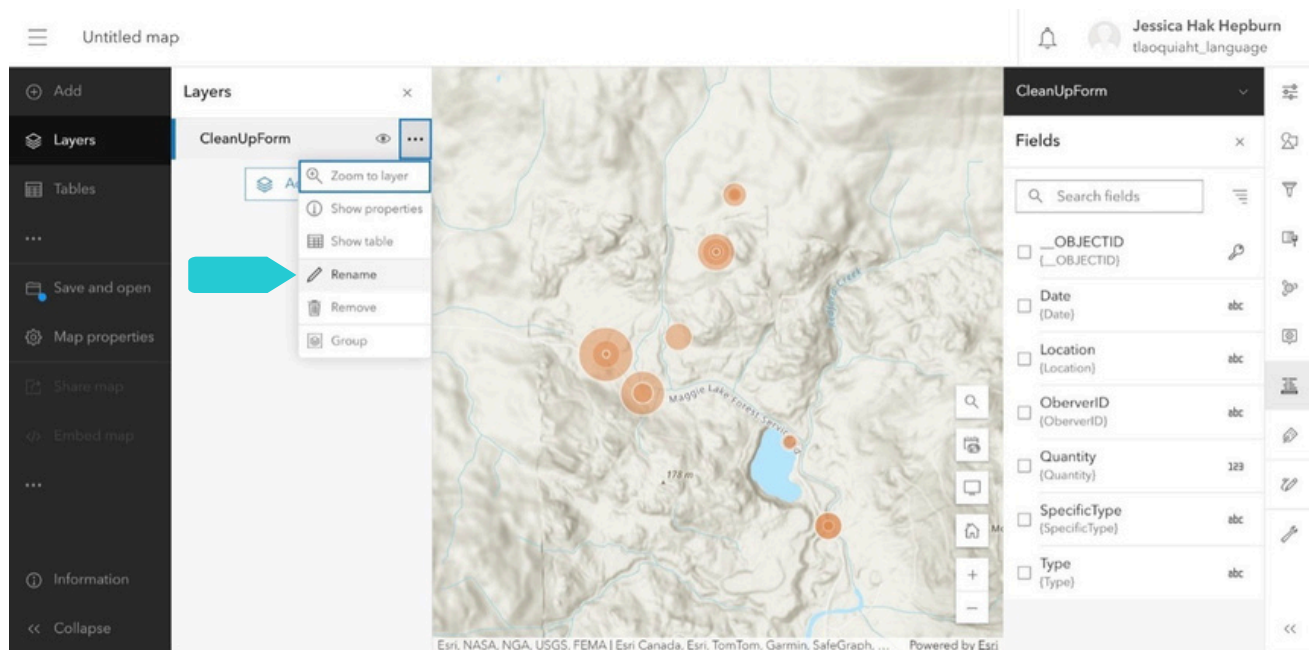
- Go to **Fields**.



- Select **Quantity**.
- Set **significant digits** to 0 decimal places.
- Click **Done**.

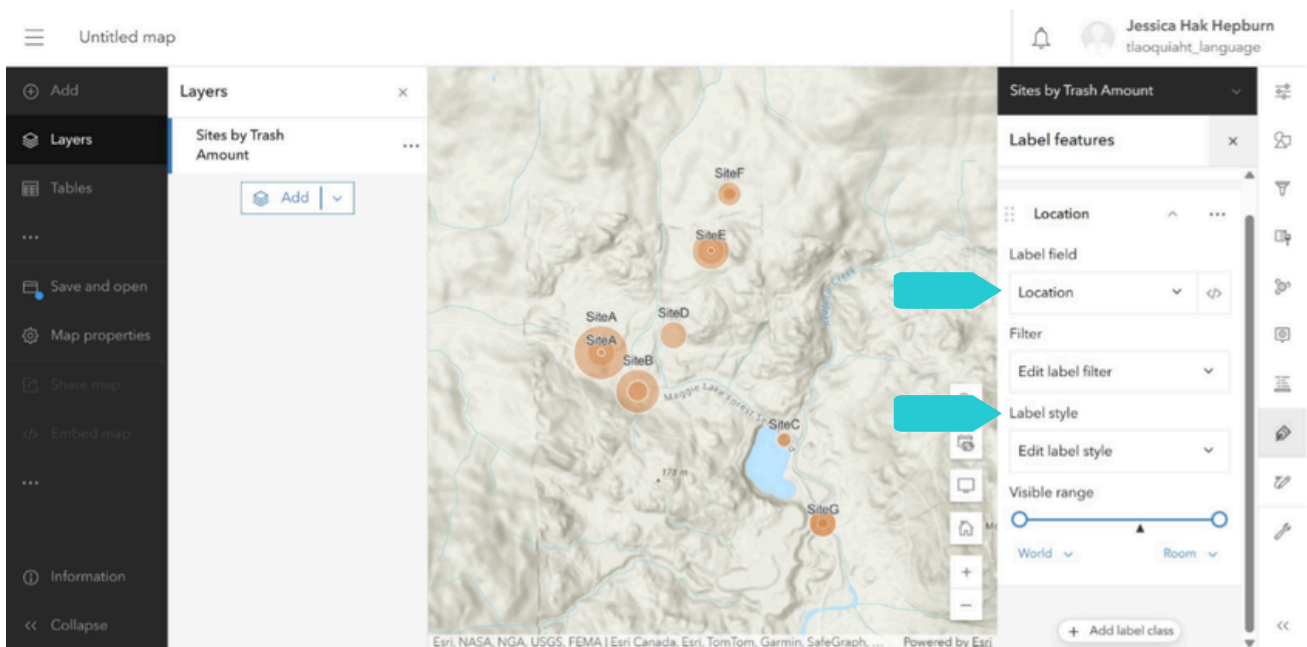
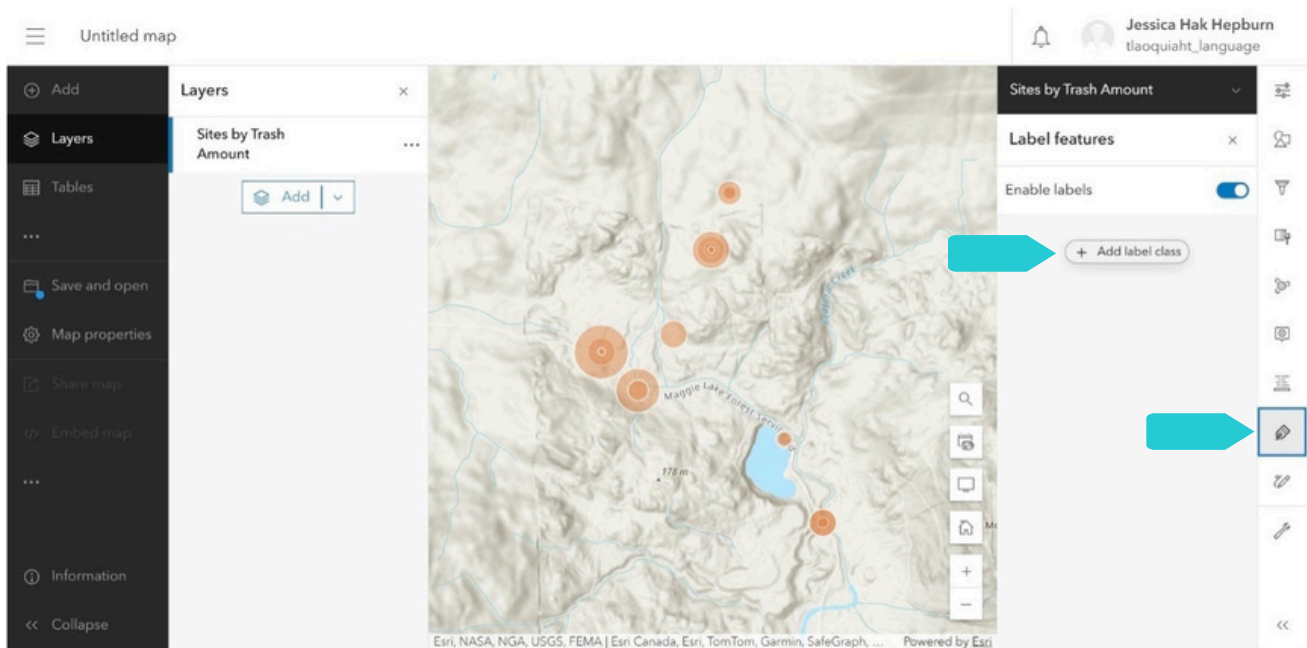


- Rename your layer to reflect what it shows:
- Click the three dots next to the layer.
- Select **Rename**.



9. Add labels:

- Go to **Labels**.
- Turn labels on and click **Add label class**.
- Set Label field to **Location**.
- (Optional) Adjust font, size, and color under Label style.



Well done! You have now symbolized your cleanup data by quantity at each site. Save your map. Next, you will symbolize the data by type.

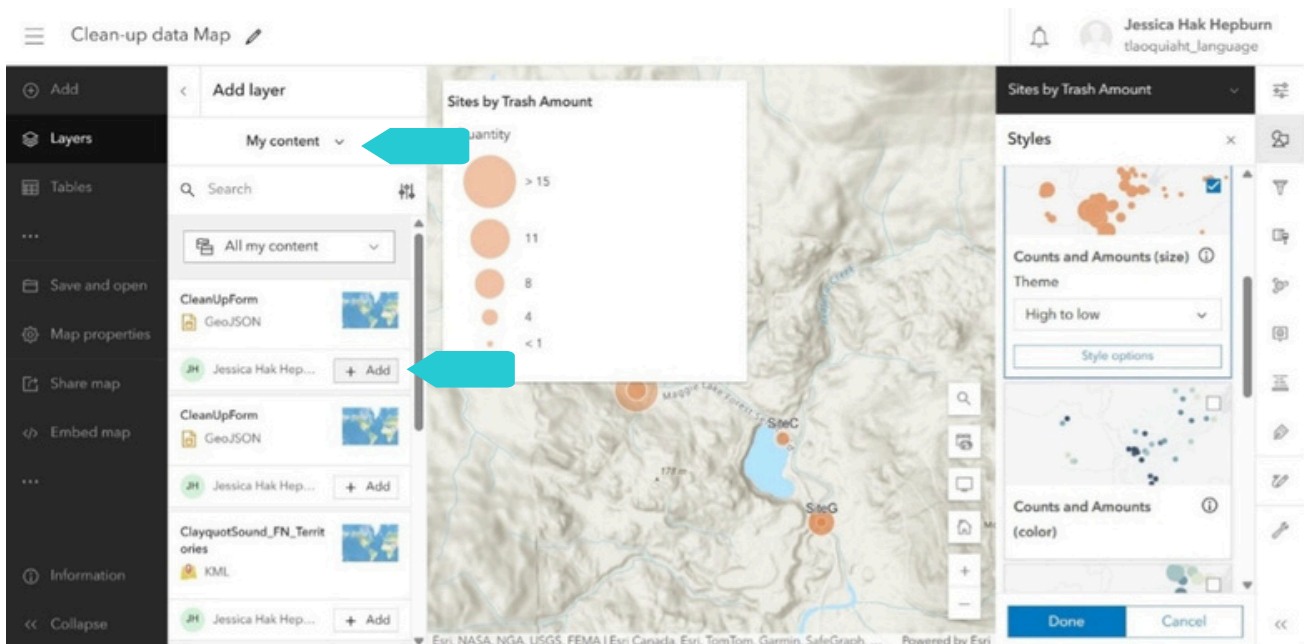
d. Visualize Your Data Qualitatively (by Type)

This guide uses the free version of ArcGIS Online, which has some limitations for visualizing complex datasets. If your data includes primary trash categories (e.g., Plastic, Metal) and subcategories (e.g., Plastic bottles, Plastic bags), you can use the following workaround:

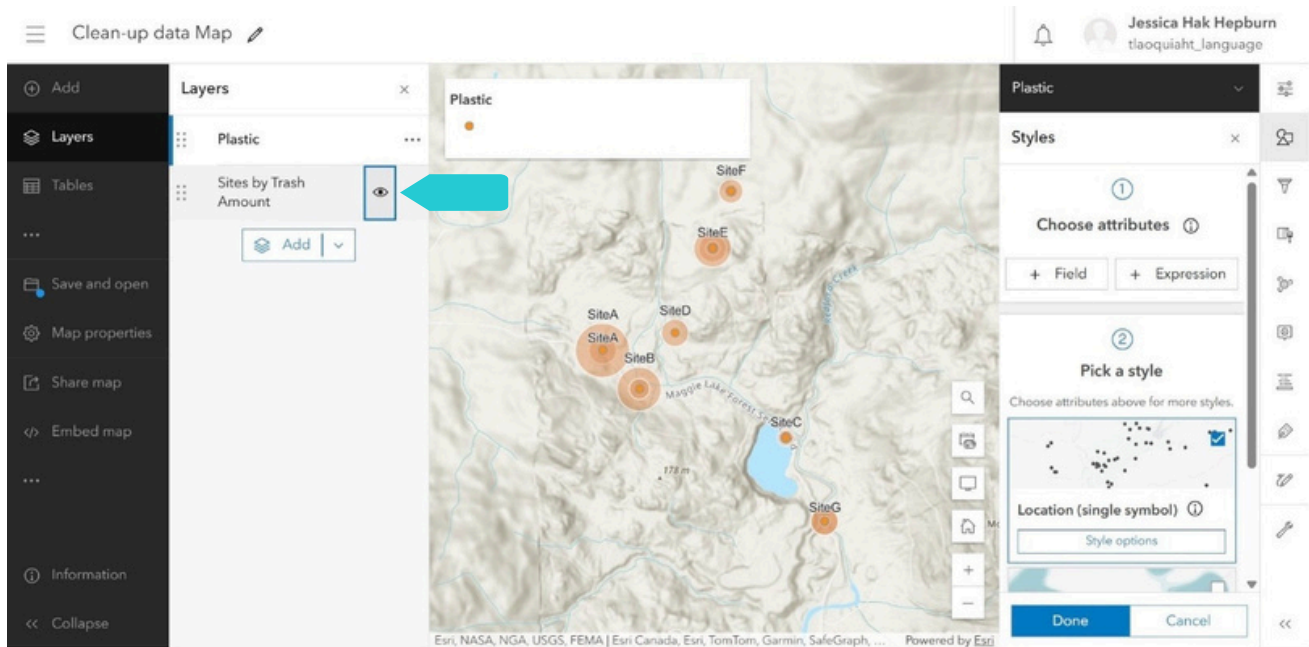
- Create copies of your layer.
- Apply a filter to each layer copy based on a primary trash type.
- Aggregate each filtered layer to show which subcategories were collected at each site.

This approach allows you to view all trash types at a single location, even with the limitations of the free account.

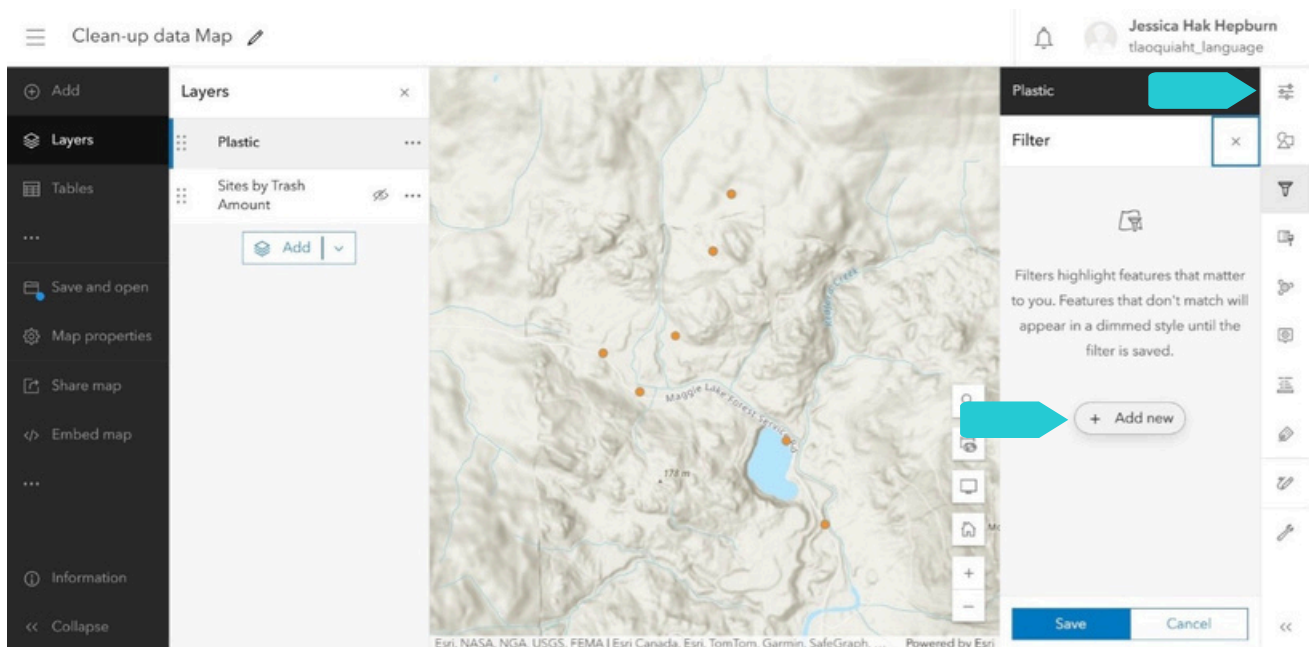
1. Add your layer again to create a copy. Underneath your layer in the **Contents panel**, click **Add**, and then add your layer. Then click the arrow to go back to the Contents



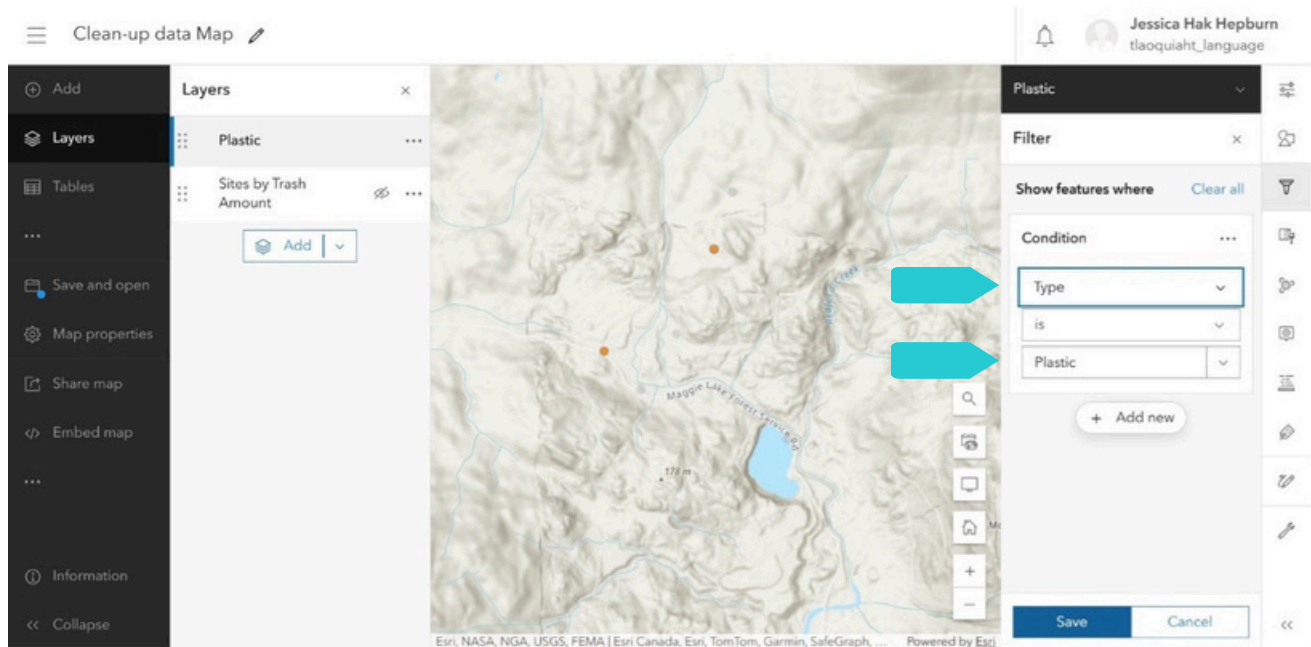
2. Rename this new layer **Plastic**.
3. Turn off the quantitative layer by clicking the **eye icon**.



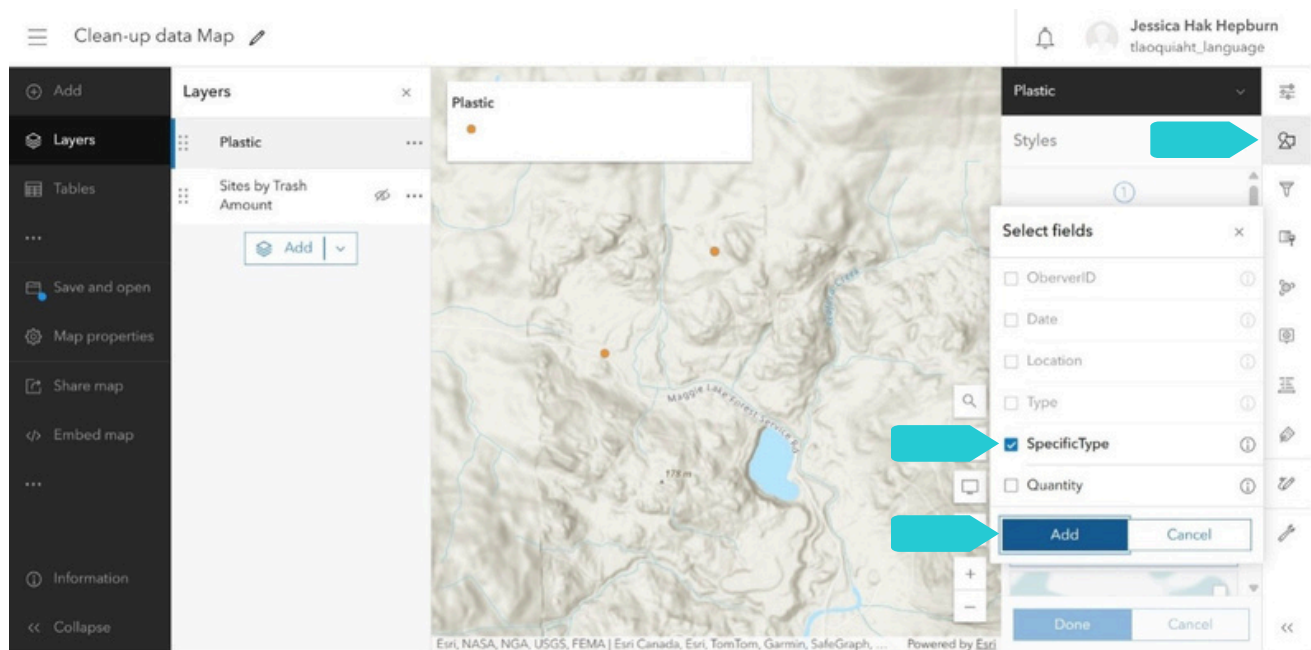
4. Select **Filter** on the right-hand side and click **Add new**.



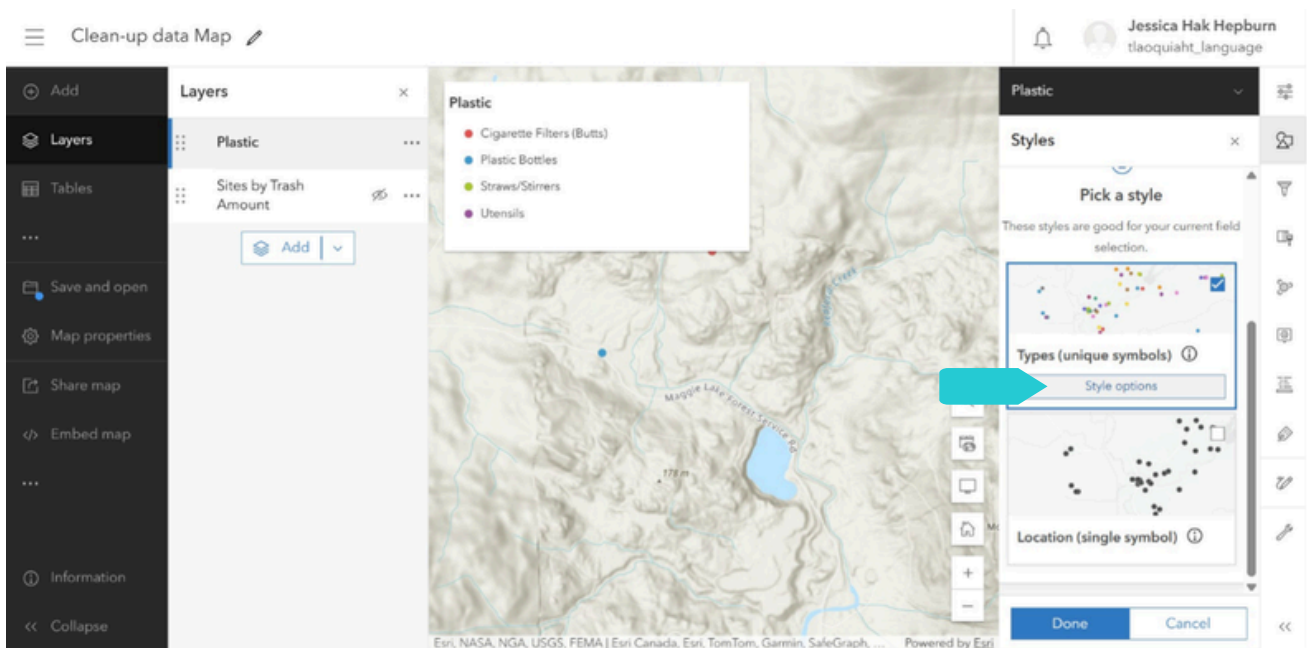
5. Change the condition to **Type** is **Plastic** and click **Save**.



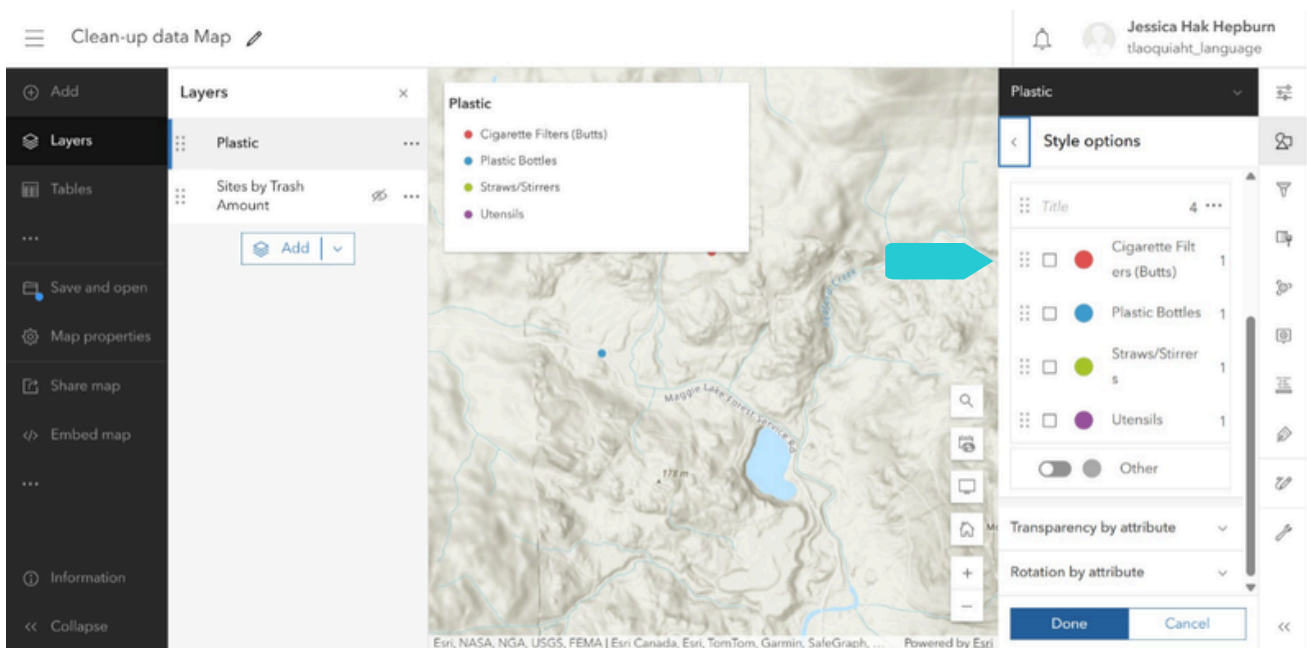
6. Open the **Styles** panel, click **Field**, select **SpecificType**, and click **Add**.



7. Click **Style options** under **Types** (unique symbols).

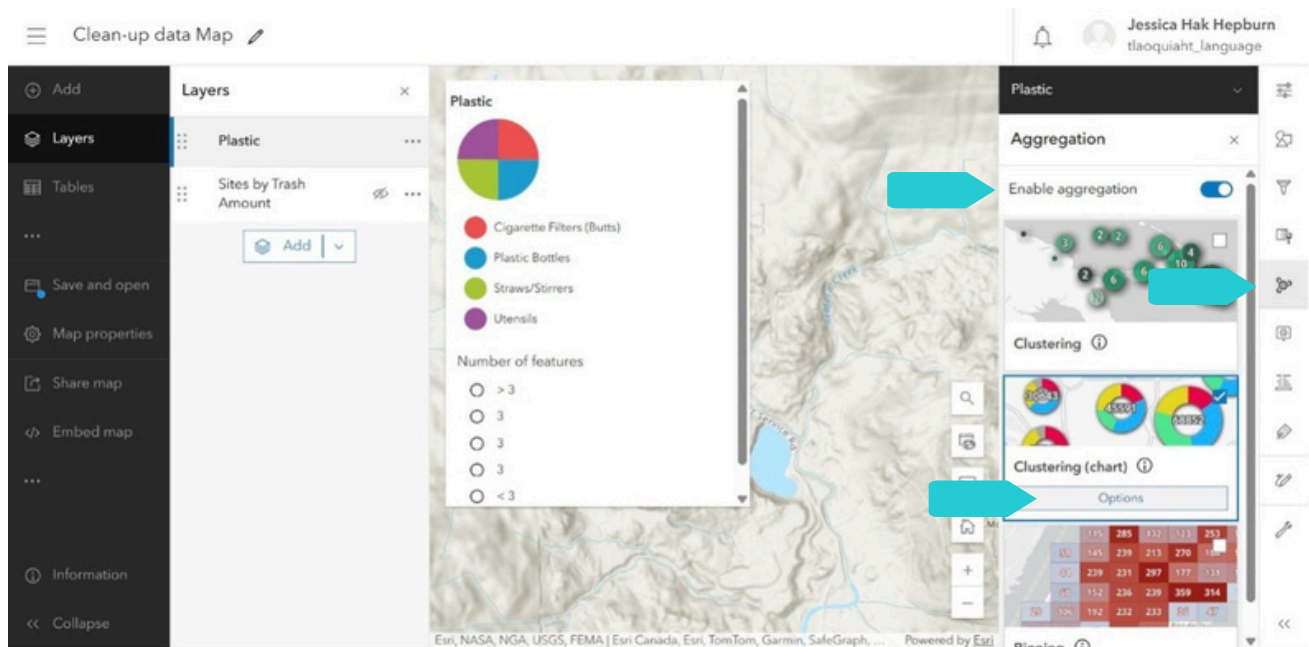


8. Customize the **shape, color, and size** of each subcategory by clicking the symbol next to each type. Click **Done** when finished.



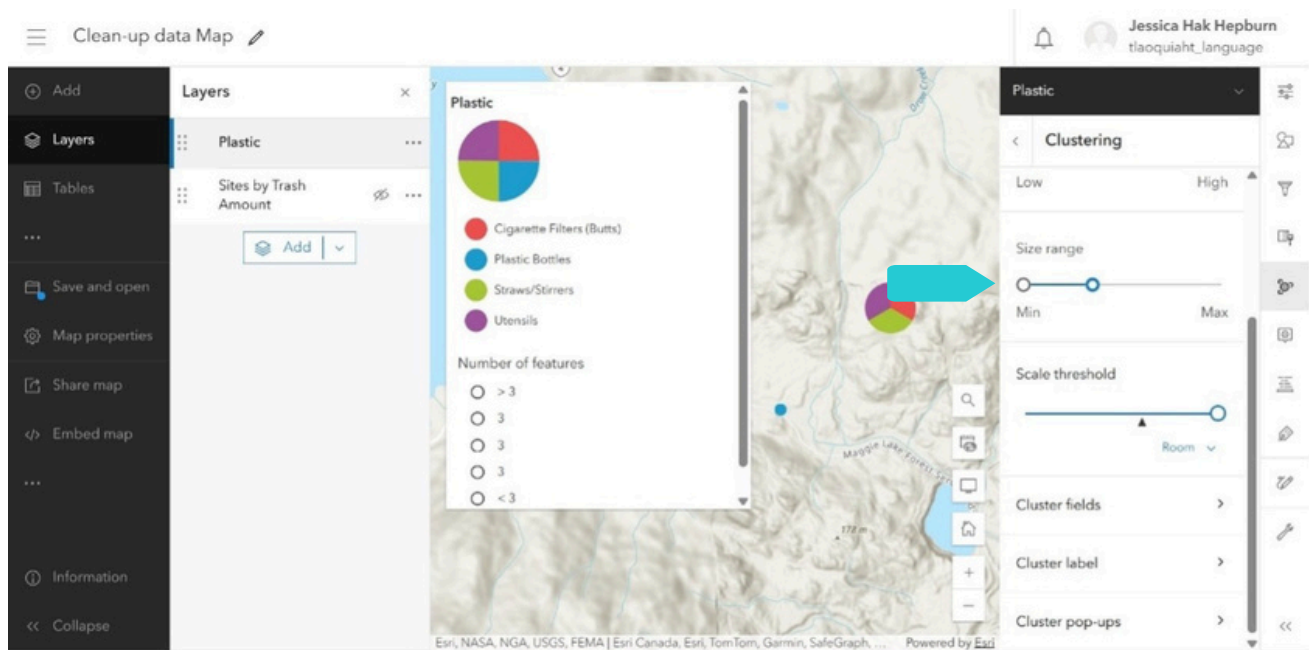
9. To display stacked points, aggregate the data:

- Click **Aggregation**, toggle on **Enable aggregation**, select **Clustering (chart)**, and open **Options**.



10. By default, point size represents the number of records at each site.

- If you want to remove this quantitative effect, adjust the size range so all points are the same size.
- This allows all plastic subcategories to be visualized equally.



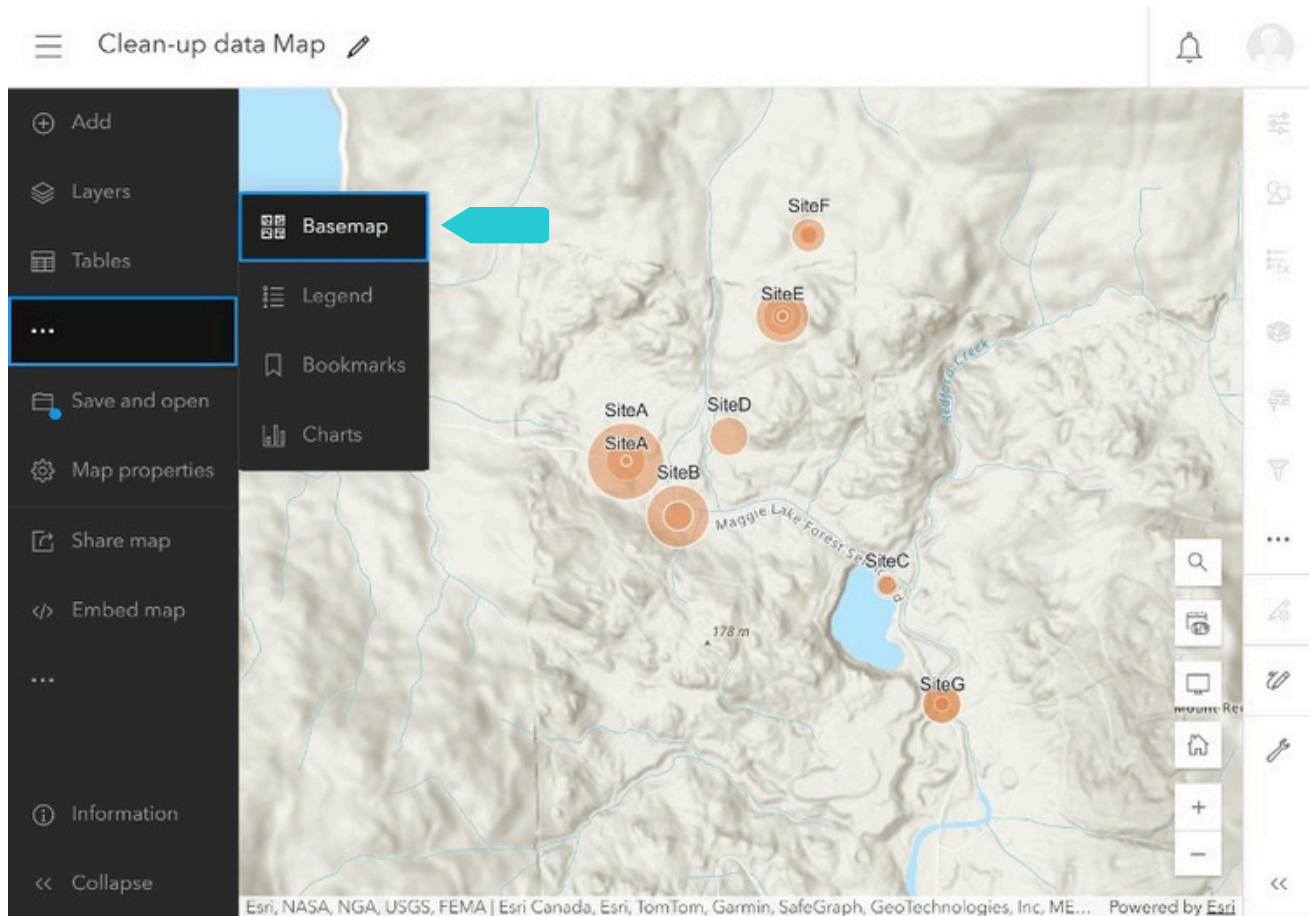
11. Repeat this process for other trash categories if desired.

12. **Save** your map.

e. Change Basemap and Add Bookmarks

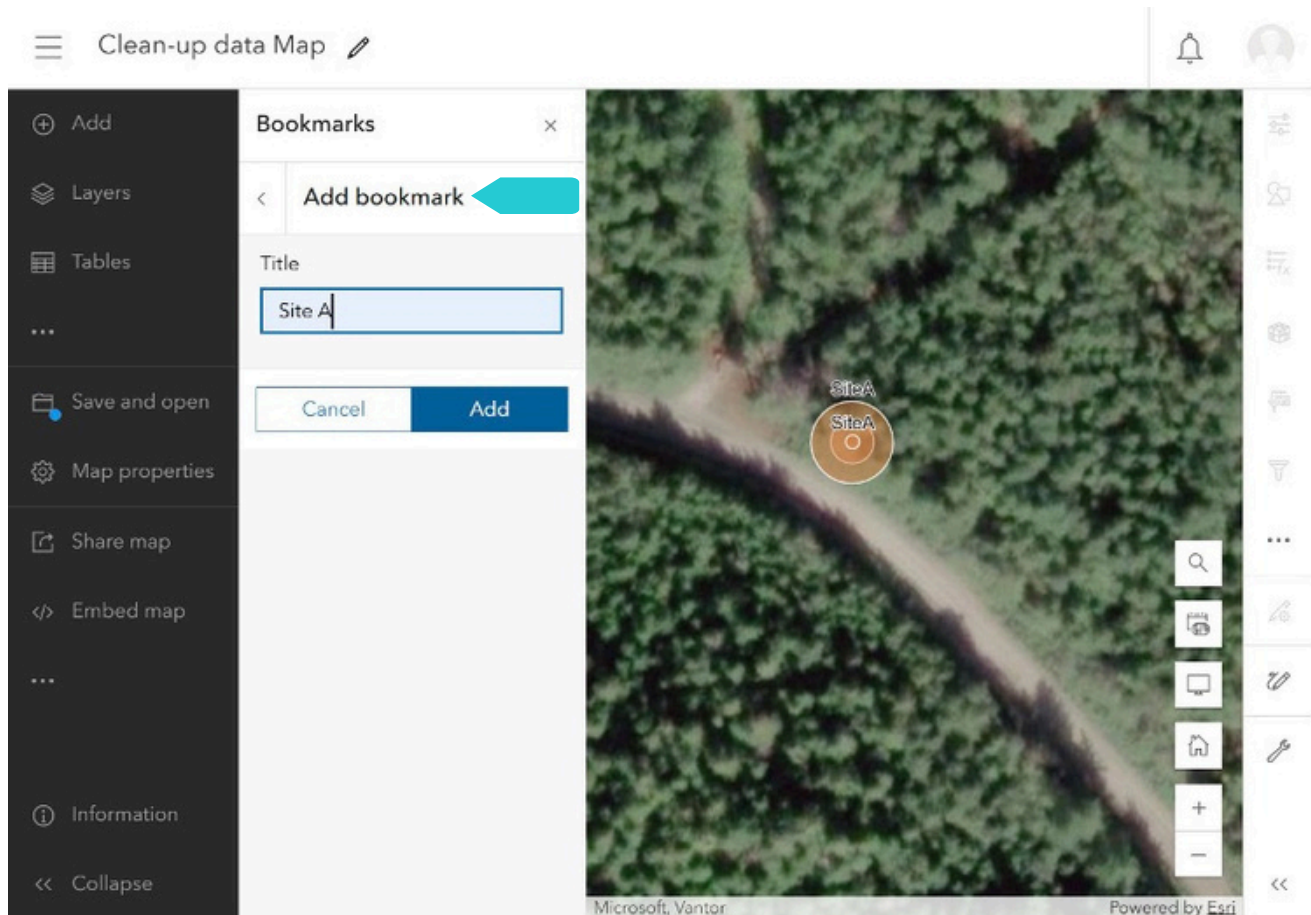
Bookmarks are useful for highlighting key areas when you move your map into ArcGIS StoryMaps.

1. To change the basemap, go to the **Basemap** tab and select one of your choice.



2. To add bookmarks:

- Open the **Bookmarks** tab.
- Click **Add bookmark**.
- Zoom to the desired location, give it a title, and click **Add**.
- Repeat for all locations you want to highlight.



3. **Save** your Map.

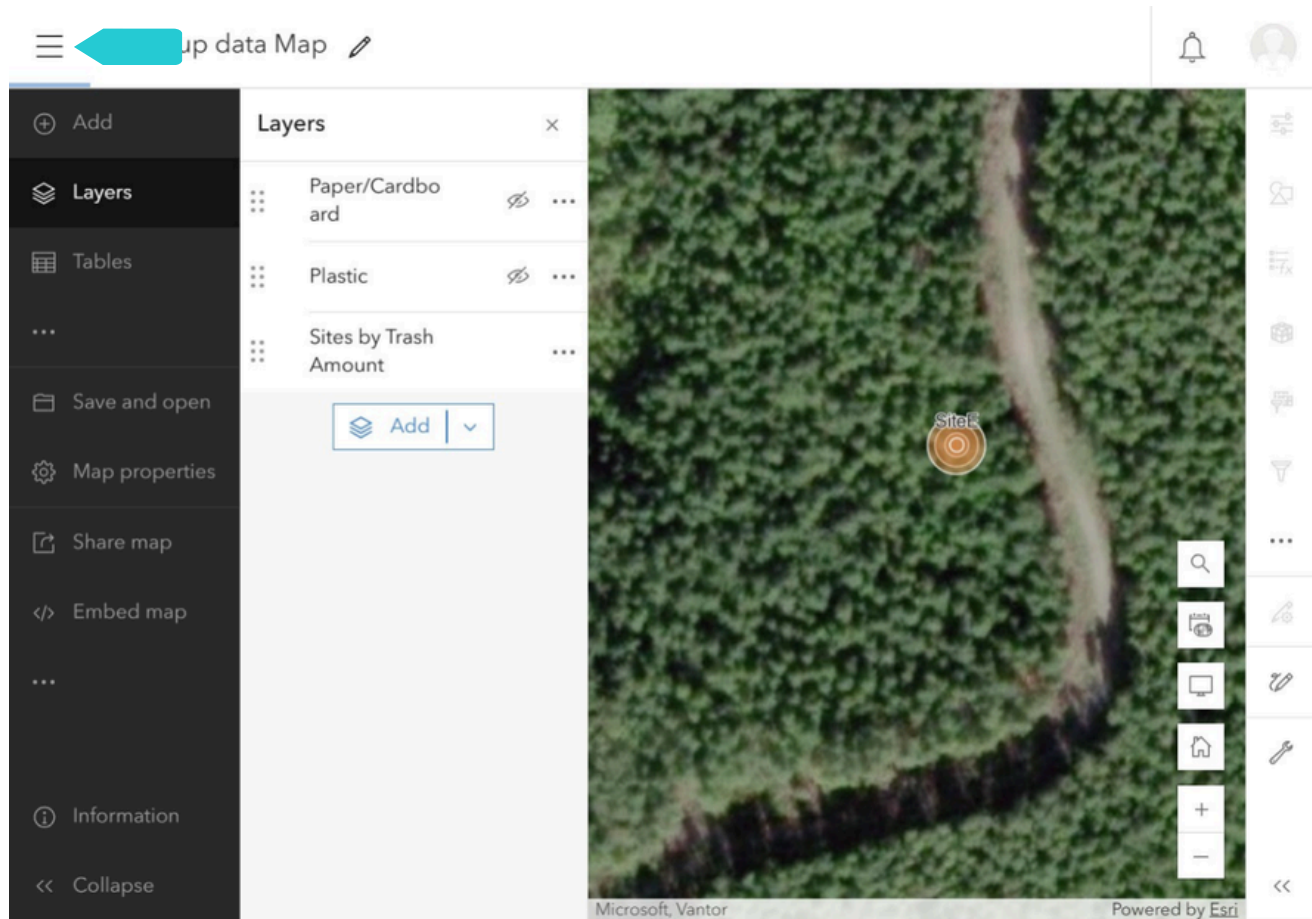
Nicely done! You have now created a web map to be used in StoryMaps.

5. Share your results using StoryMaps

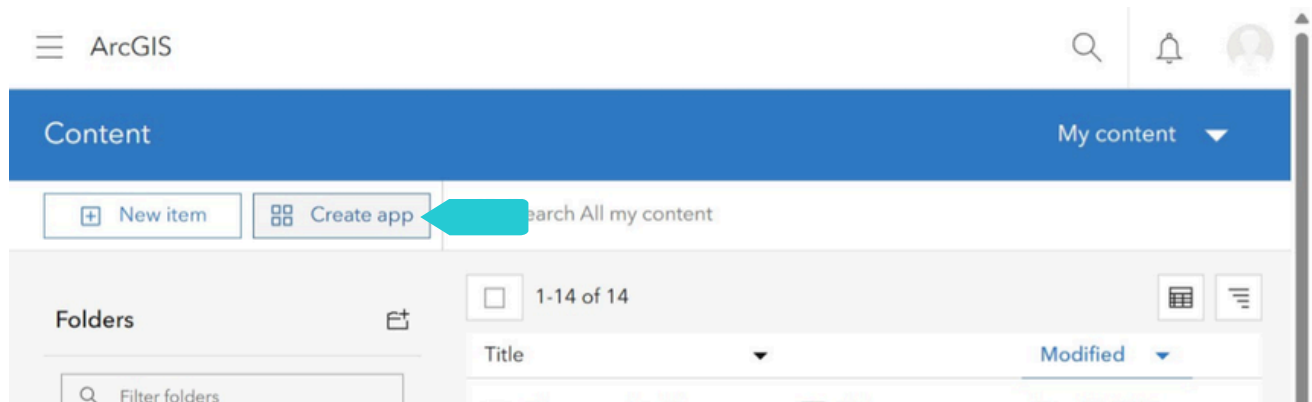
ArcGIS StoryMaps lets you create interactive, web-based stories by combining maps with text, images, videos, and other media. This section focuses on adding and using the web map you just created.

6. Create a New StoryMap

1. Go to Content in your ArcGIS Online account (top-left menu).

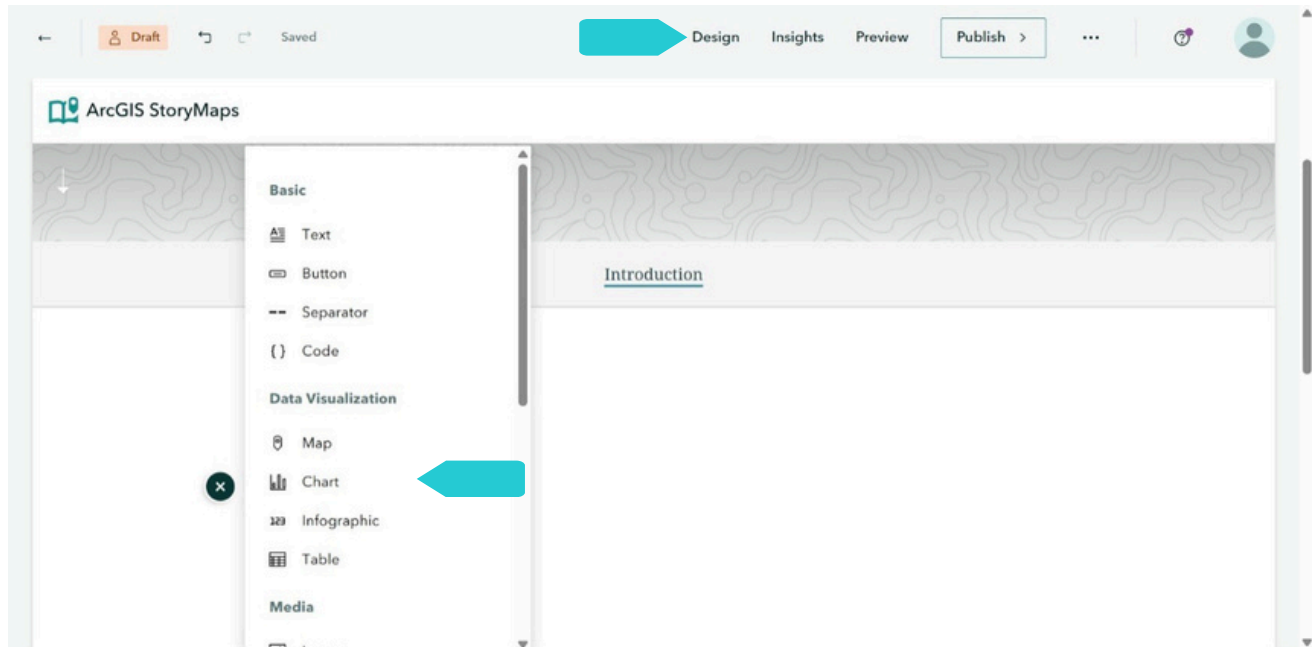


2. Click **Create app** and select **ArcGIS StoryMaps**.

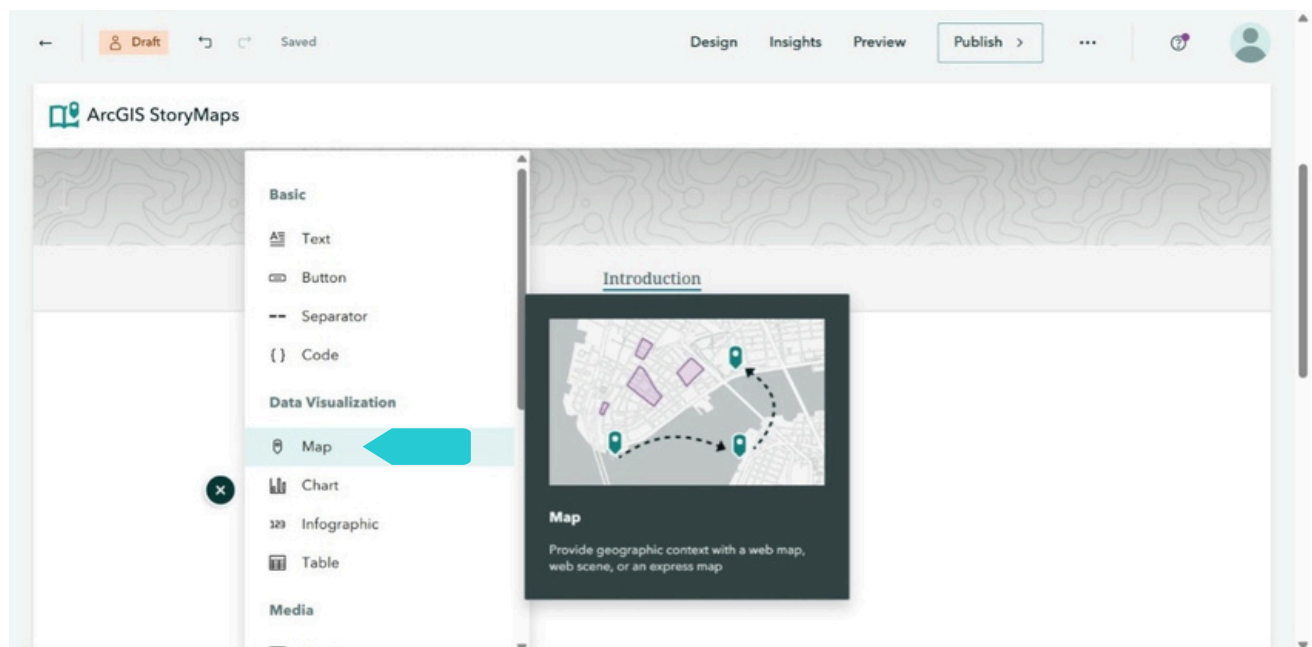


7. Tell Your Story

StoryMaps uses a block-based builder to combine maps and multimedia into engaging narratives. You use the plus sign to add the different blocks such as text, images, videos and maps. You can change the design of your StoryMap under the **Design** tab.

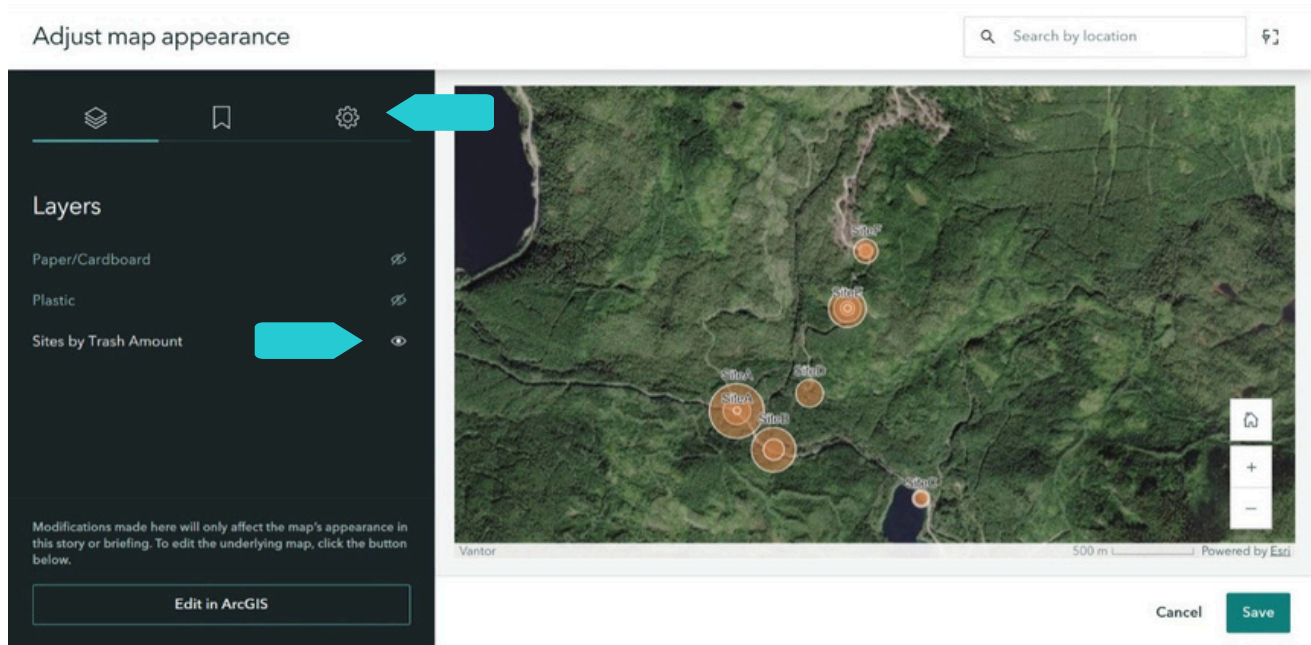


1. Add a **title** and **subtitle**.
2. Click the plus (+) button to add blocks.
 - Select **Map**, then choose the web map you created.



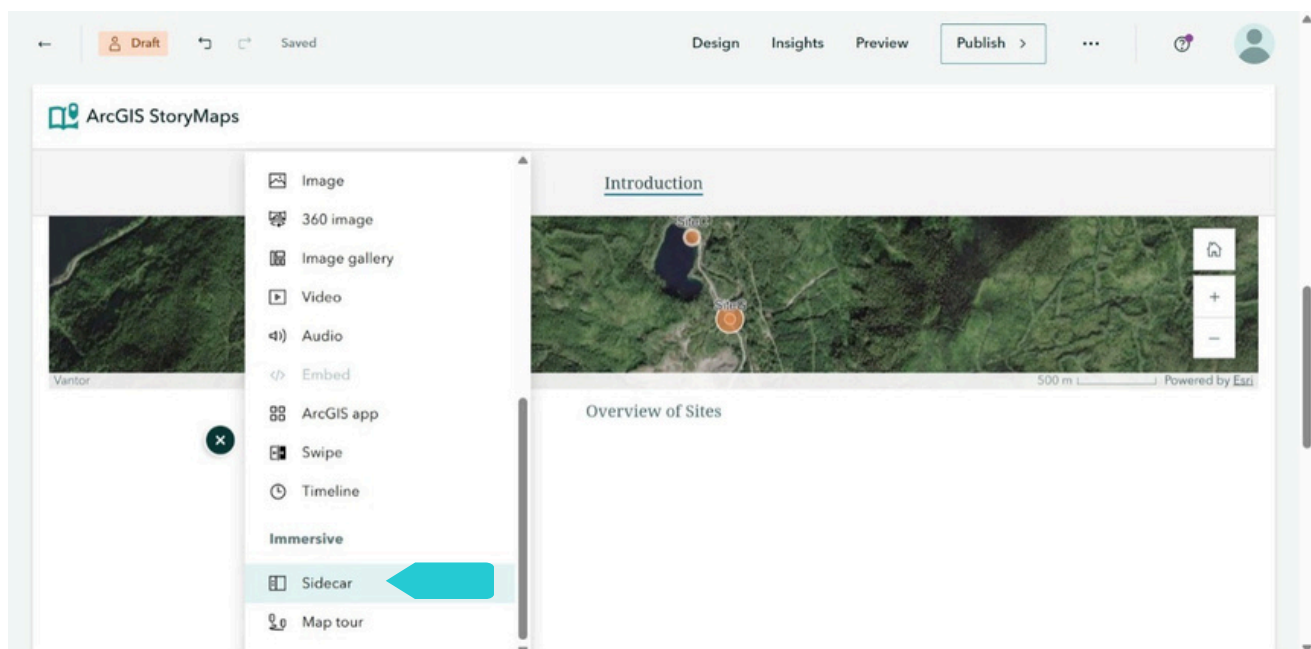
3. Configure the map:

- Toggle layers on or off using the **eye icons**.
- Set the map extent.
- Use the settings wheel to **enable the legend or pop-ups**.
- Click **Save**.



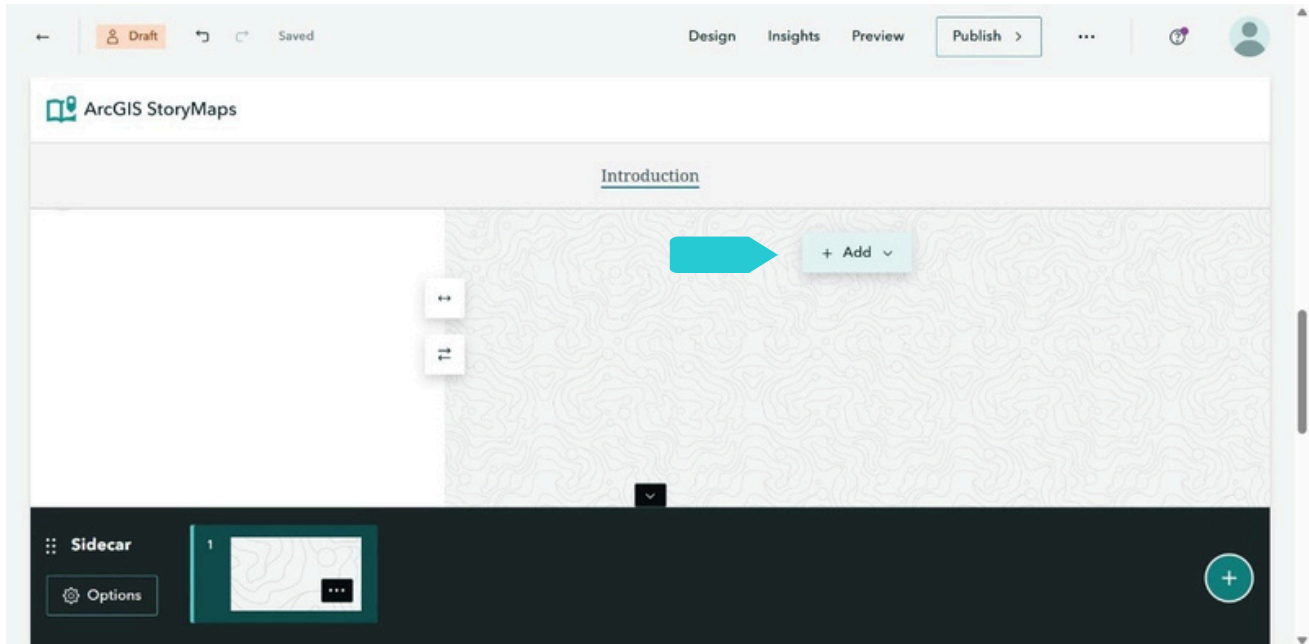
4. To create a more interactive experience, use the **Sidecar** block:

- Click the plus sign, select **Sidecar**, and choose a layout.



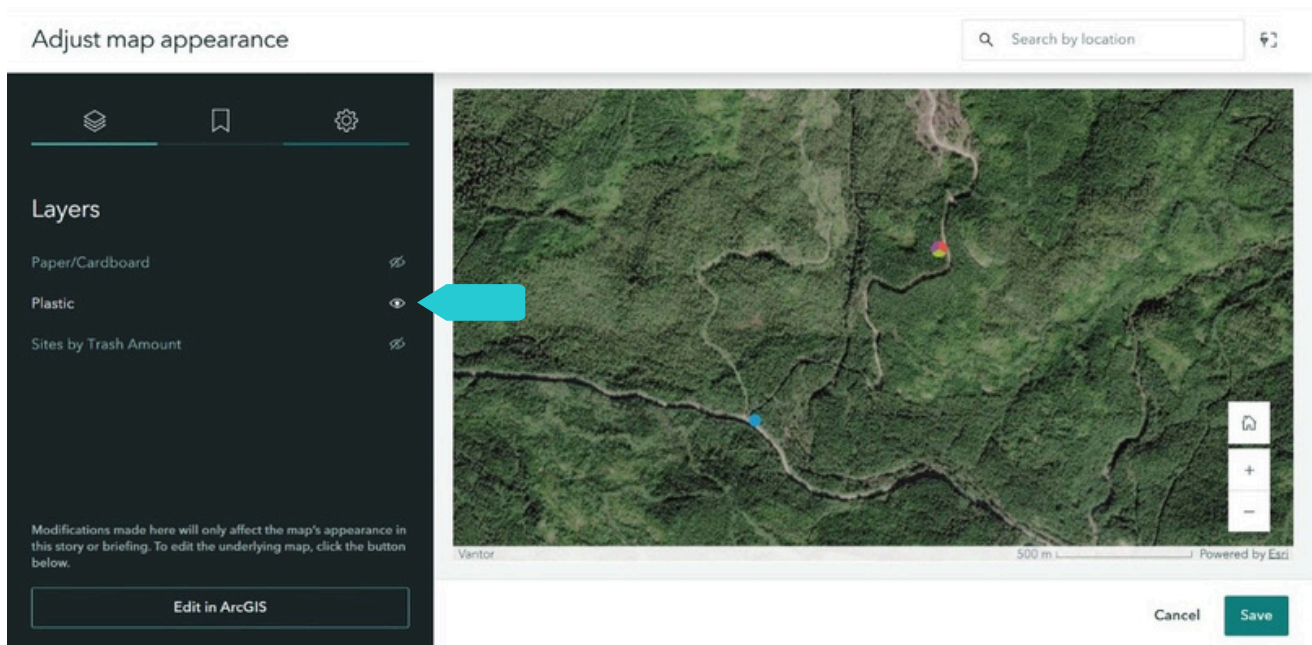
5. A Sidecar acts like a presentation, allowing you to show different map views alongside text and media.

- Click **Add**, select **Map**, and choose your web map.



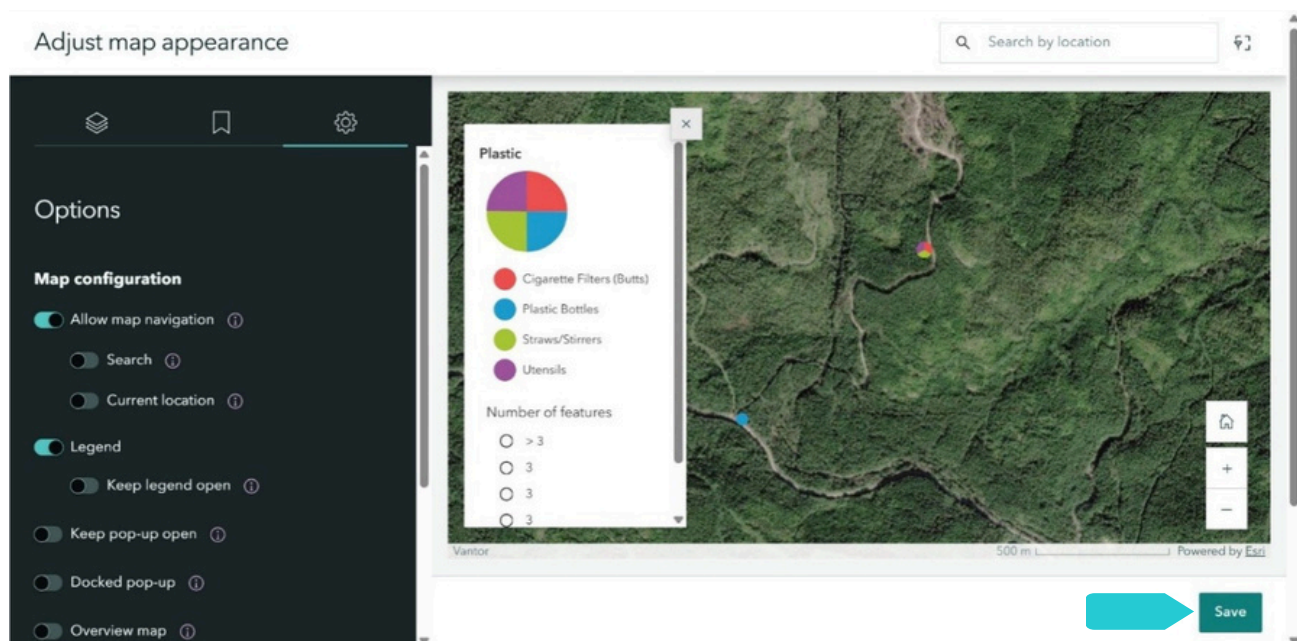
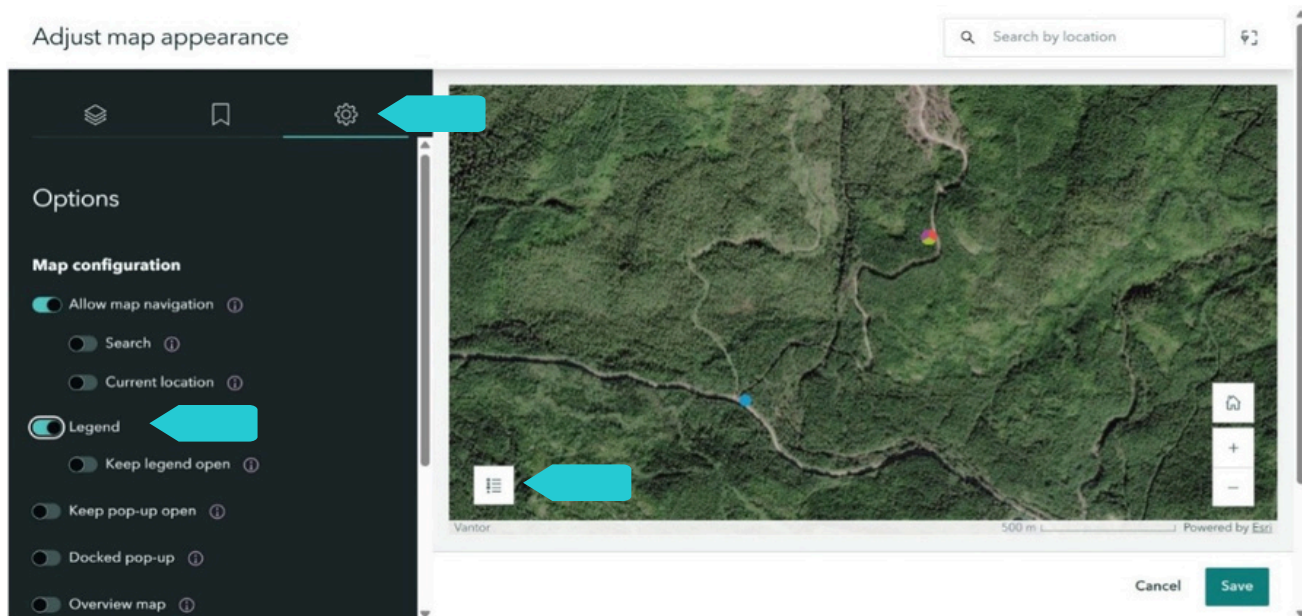
6. You will see the same interface as when you added the previous map. For this map, let's focus on Plastic.

- Turn on the **Plastic** layer and turn off all others.

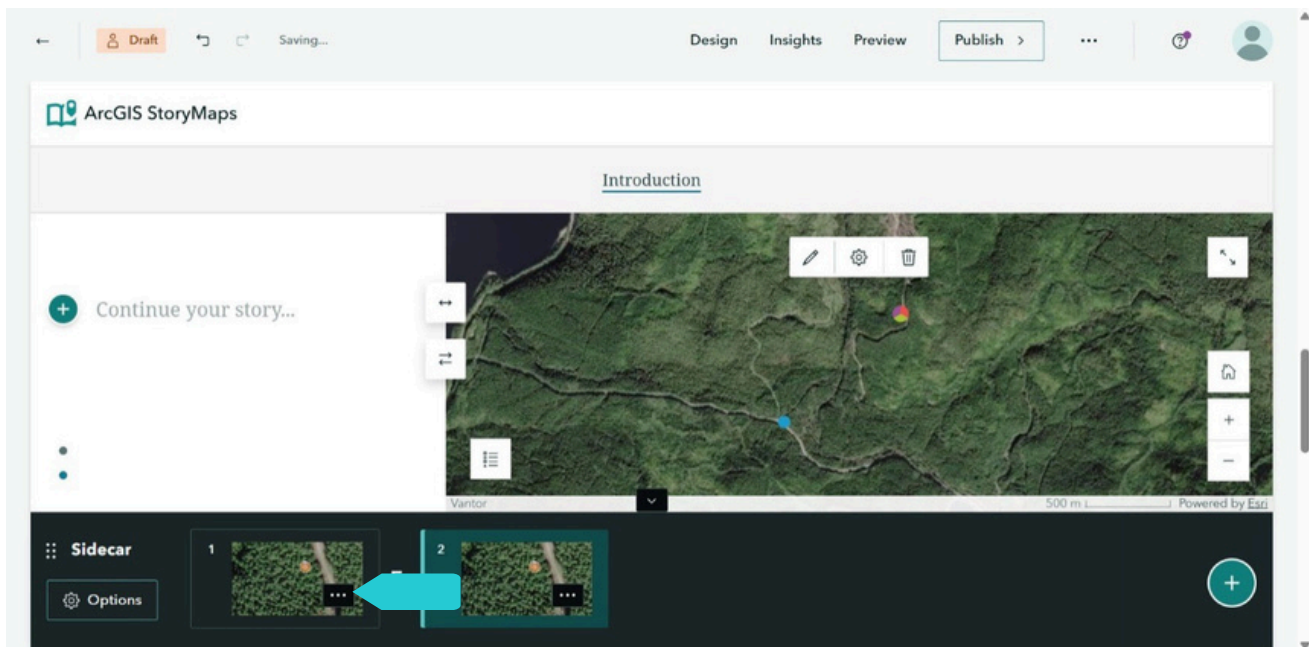


7. Add a **legend** using the **settings wheel**.

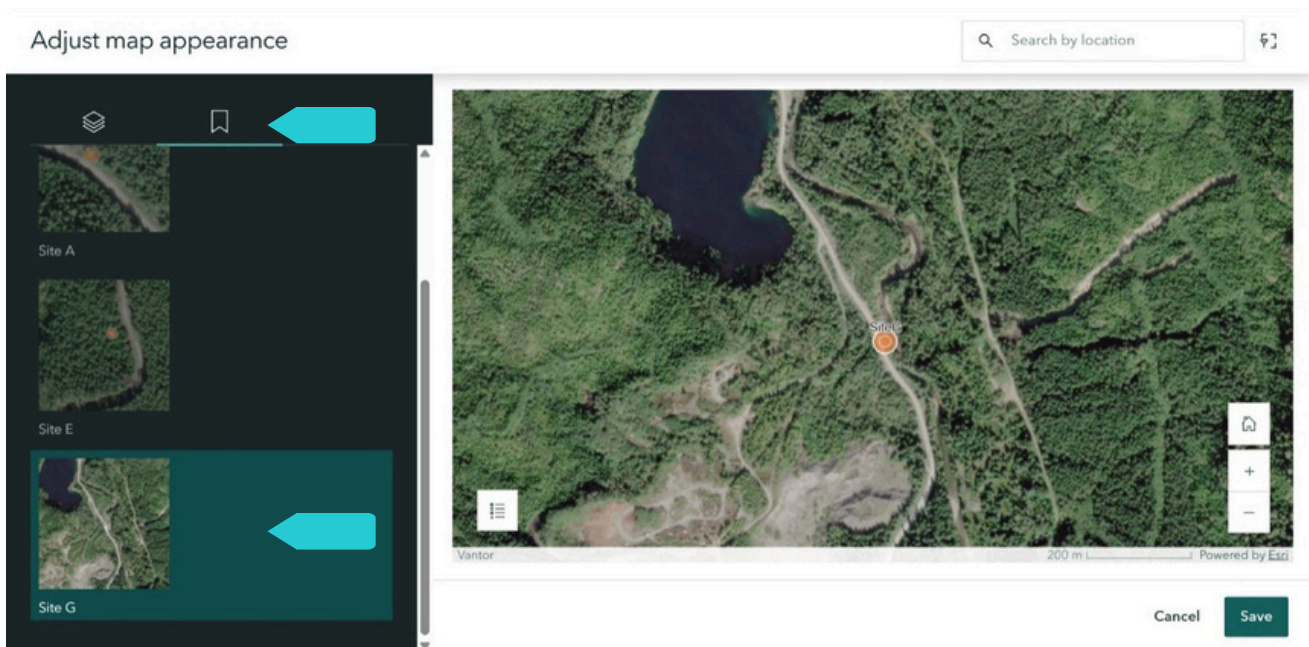
- Click **Save** when finished.



8. Add a new slide by clicking the **three dots** on the current slide and selecting **Add slide**

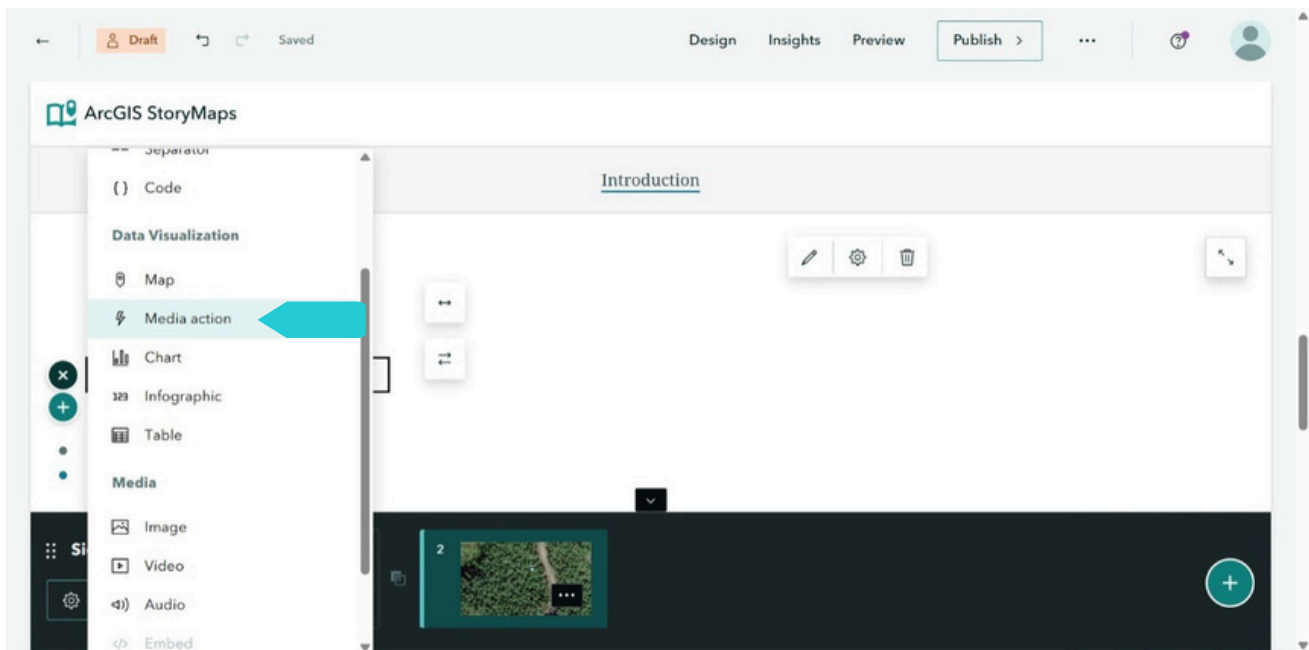


9. Go to the **Bookmarks** tab and select one of your bookmarks. Click **Save**.



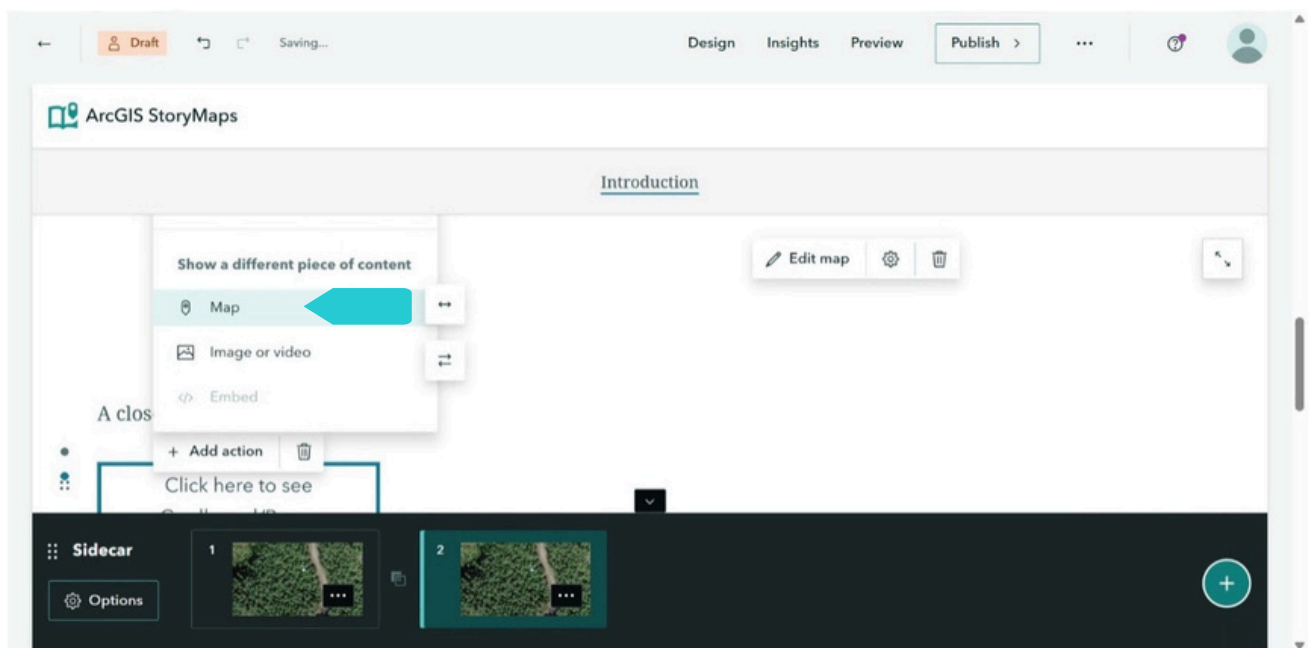
10. Use **Media Actions** to create interactive map changes:

- In the text panel, click the **plus sign** and select **Media Action**.

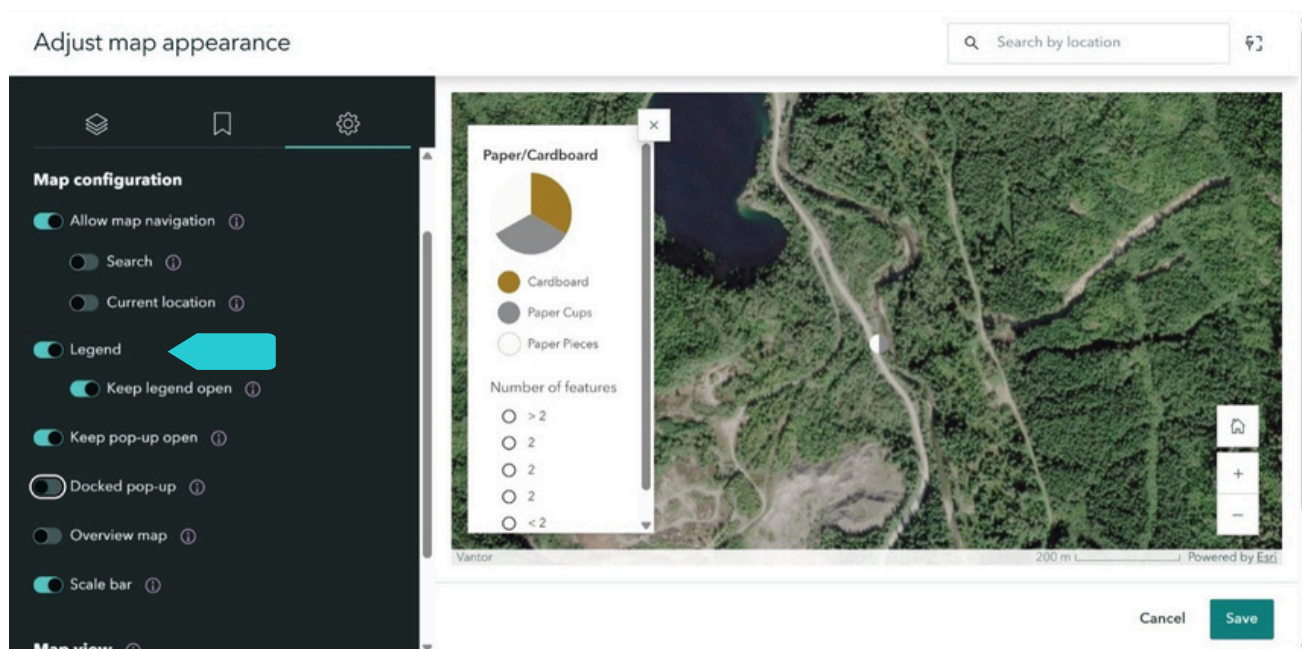


11. Write what will happen if the user clicks this text. In this case, we will highlight our cardboard/paper layer. Write "Types of cardboard/paper".

12. Click **Add Action**, then **Map**. Select your map.

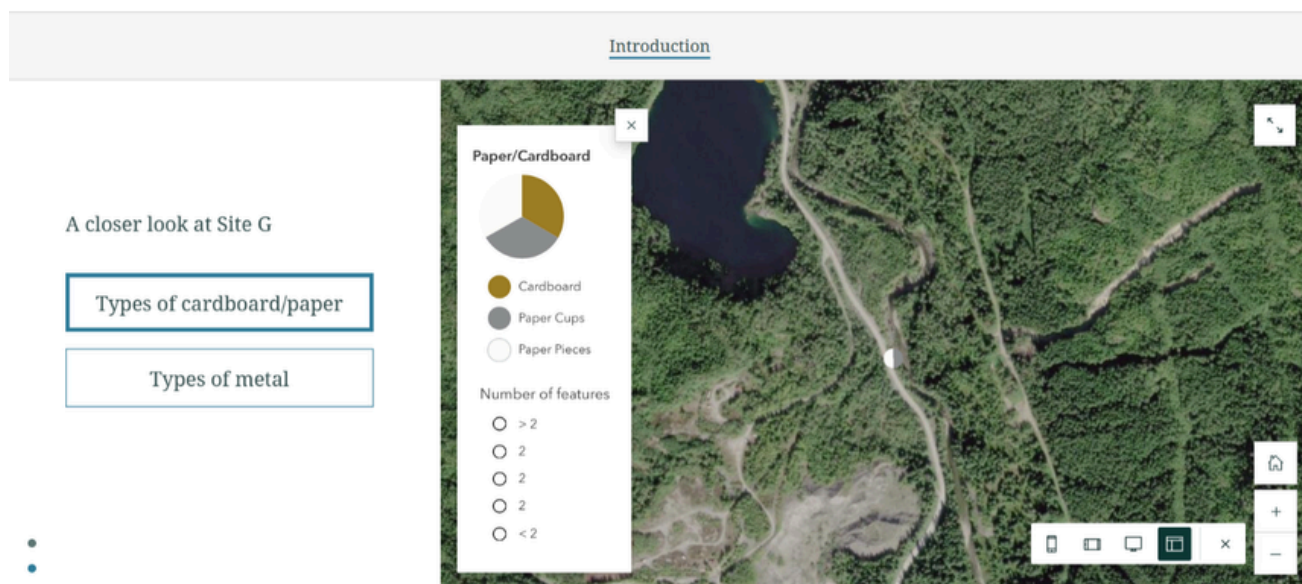


13. Turn on the **Cardboard/Paper** layer, enable the **legend and pop-ups**, and click **Save**. Users can now click the text to highlight different trash types.



14. Repeat this process for other layers as needed.

ArcGIS StoryMaps



Congratulations! You now know how to use two different map blocks in your StoryMap to display your field-collected clean-up data. Combine these with photos, videos and text visualize a rich account of your clean-up experience.

Curriculum created by **Jessica Hak Hepburn** for the West Coast NEST, an initiative of the Clayoquot Biosphere Trust, with funding provided by the NSERC PromoScience program.

What is West Coast N.E.S.T.?

The West Coast N.E.S.T. (Nature. Education. Sustainability. Transformation.) is a regional initiative led by the Clayoquot Biosphere Trust that connects communities, organizations, businesses, and knowledge holders on the west coast of Vancouver Island.

Through education, collaboration, and capacity-building, the NEST creates meaningful learning opportunities, promotes the region's diverse educational programs, and supports a resilient and diversified local economy.

The NEST also facilitates place-based learning by connecting learners with local experts, creating educational resources, and hosting community events.

Learn more at westcoastnest.org.

Looking for more place-based educational content?

The West Coast NEST connects visitors and residents with unique and impactful learning opportunities. Many of these come in the form of place-based, face-to-face, and hands-on activities, but the NEST also helps share the region's abundant knowledge with schools and learners from afar. You can explore local research and conservation work through our online collaborative resources such as our interview series and our StoryMaps collection.

For high school, university, and adult groups seeking immersive educational experiences, we also offer customized itinerary planning, on-site orientation, and ongoing support for each visit. Delivered by regional partners, each program can be tailored to include hands-on learning in areas such as Indigenous culture, ecology, sustainability, science, language, history, outdoor education, and the arts.

Contact info@westcoastnest.org to start planning.

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Have feedback?

We would love to hear from you! Reach out to info@westcoastnest.org to share feedback on our resources, suggest ideas for new learning materials, or ask questions. Your input helps us create tools that better support educators and learners.

