



# Mobile Field Data Collection with Survey123 for ArcGIS

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[www.youtube.com/geographyuberalles](http://www.youtube.com/geographyuberalles)

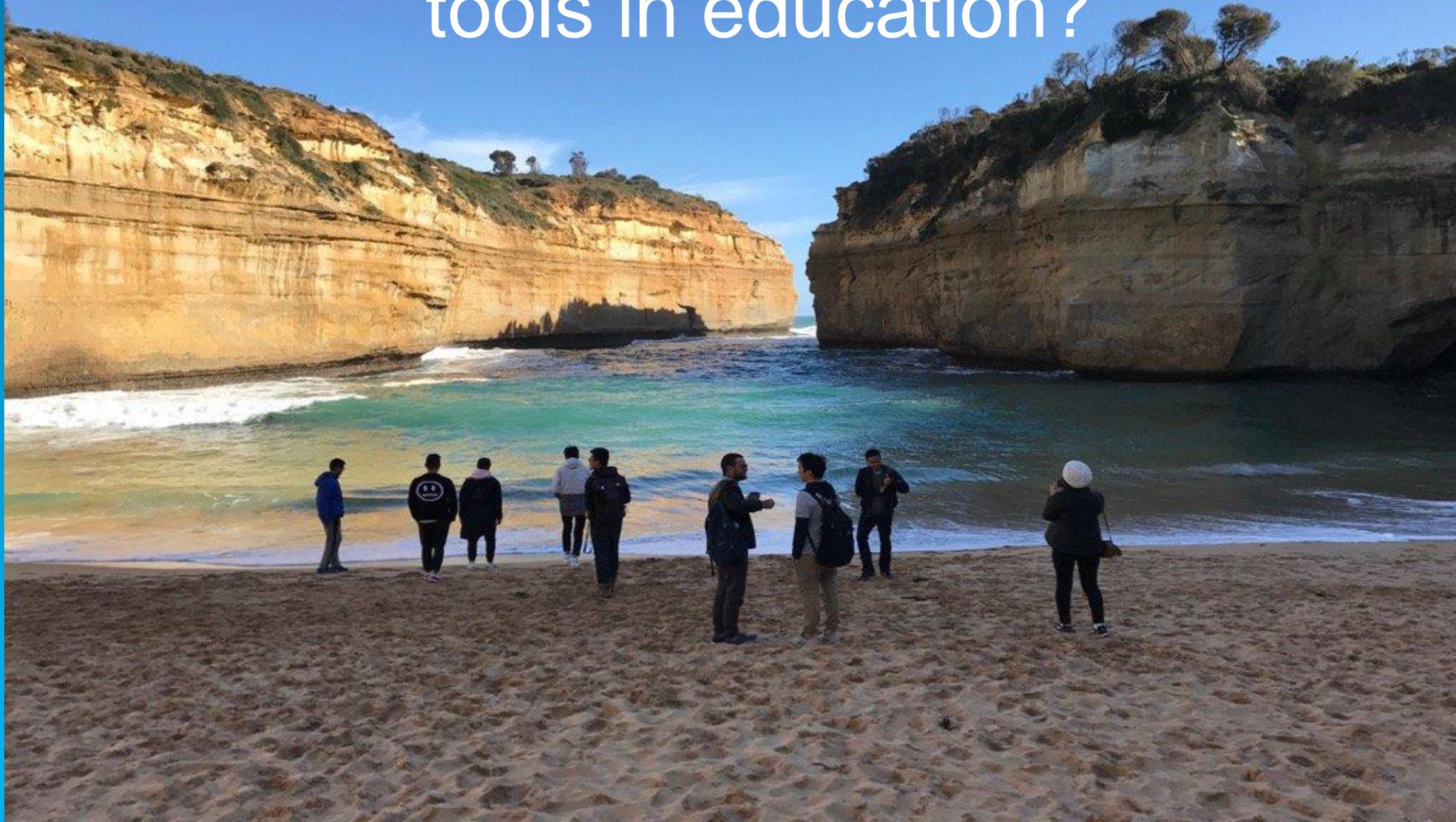
[Twitter.com/josephkerski](https://twitter.com/josephkerski)

[spatialreserves.wordpress.com](http://spatialreserves.wordpress.com)

**GIS  
INSPIRING  
WHAT'S  
NEXT**

- 1. Introduction: Why Survey123?**
- 2. Add data to an interactive editable web map.**
- 3. Create a Survey123 using web tools and share it in a web map**
- 4. Collect data in the field using Survey123.**

# Why use mobile GIS-enabled tools in education?





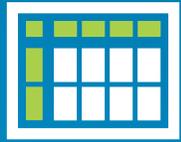
1. Develop skills in field data collection, citizen science, data assessment, mapping, spatial analysis.



2. Connect students to real issues in their community and the environment **and** skills in solving the issues.



# Why Survey123 ?



## 1- Ask Questions

(Design & Publish)



## 2- Get Answers

(Capture Data)

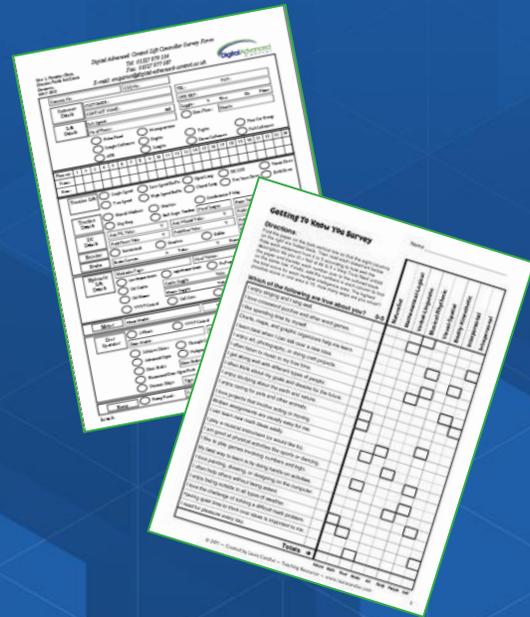


## 3- Make Decisions

(View & Analyze)

# Field Data Capture with Survey123

- Forms are about the most natural way to capture information



Smart data validation

Location services

Camera

Internet (Data Services)

External sensors

- Works from any device:

- Desktops (Windows, Mac, Linux), Smartphones, Tablets (iOS, Android, Windows)
- Web and native

## Campus Vegetation Mapping

Map Vegetation - trees, shrubs, and other plants - on your campus.

### Deciduous or Evergreen? \*

Indicate whether the plant is deciduous or evergreen.

### Condition \*

Indicate how healthy the plant is.

### Height in Feet \*

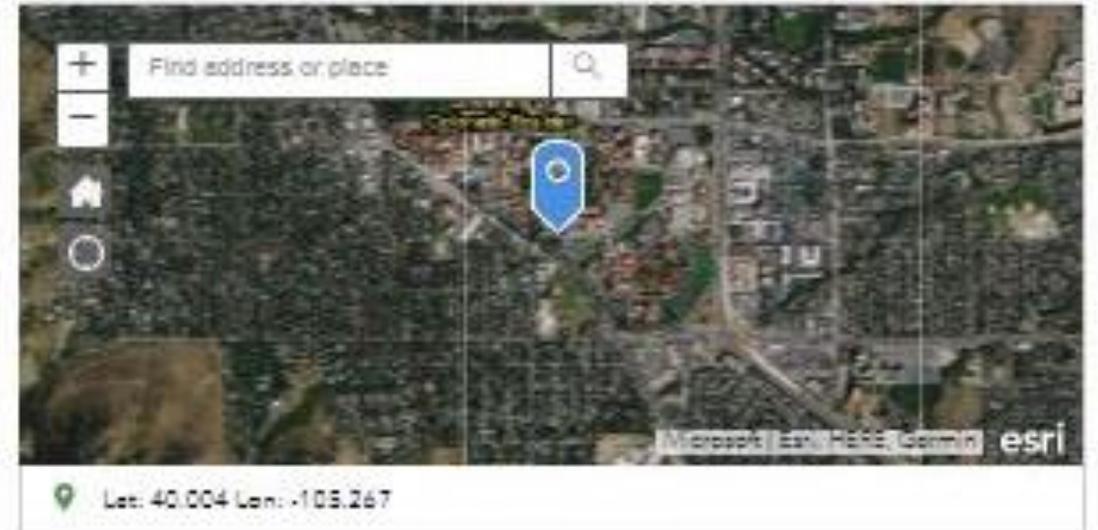
Indicate the height in feet to nearest integer.

Please input a number between 1 and 150.

### Species

Indicate the tree species (maple, oak, locust, agave, etc.)

### Location \*



Find address or place

Lat: 40.004 Lon: -105.267

### Submit Photograph Here

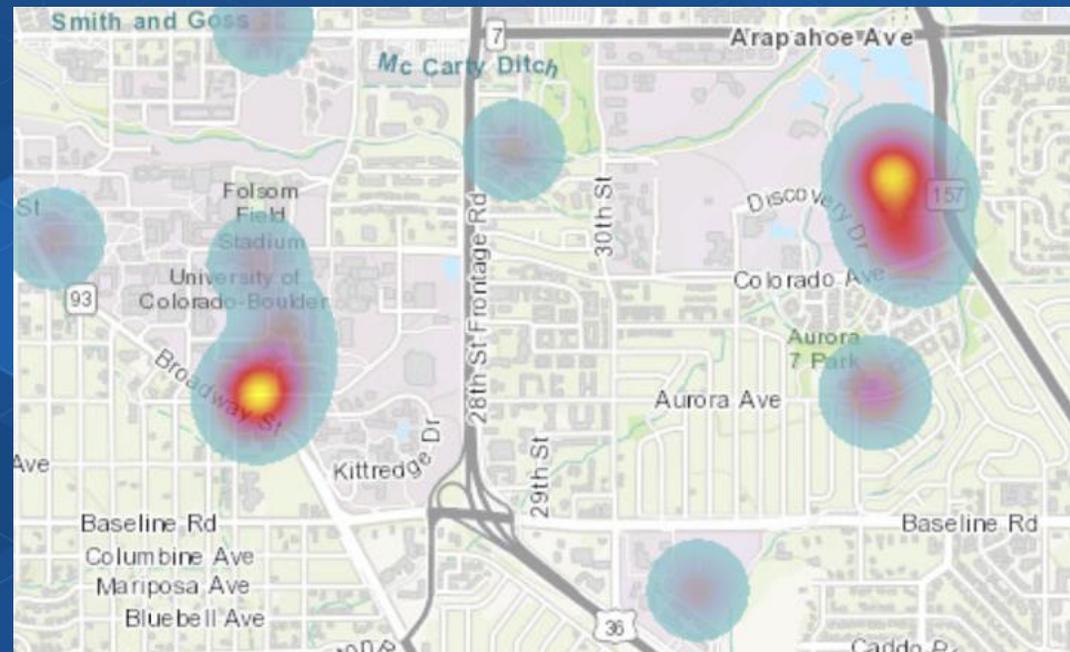
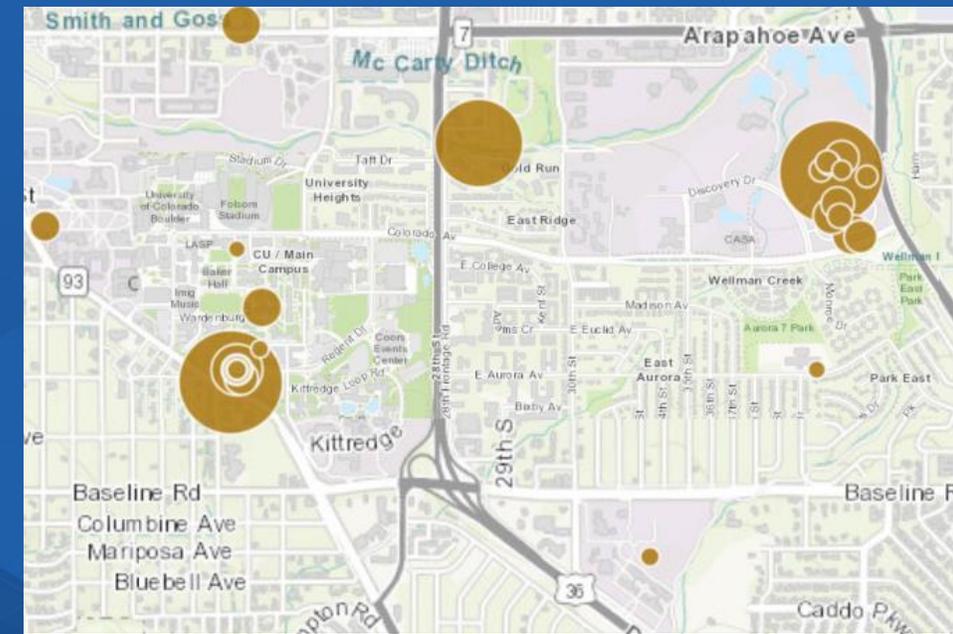
Submit your photograph here (max size = 10 MB)

Click here to upload file. (<10MB, support: jpg, jpeg, png, gif)

Submit your Data

# Spatial Analysis Tools

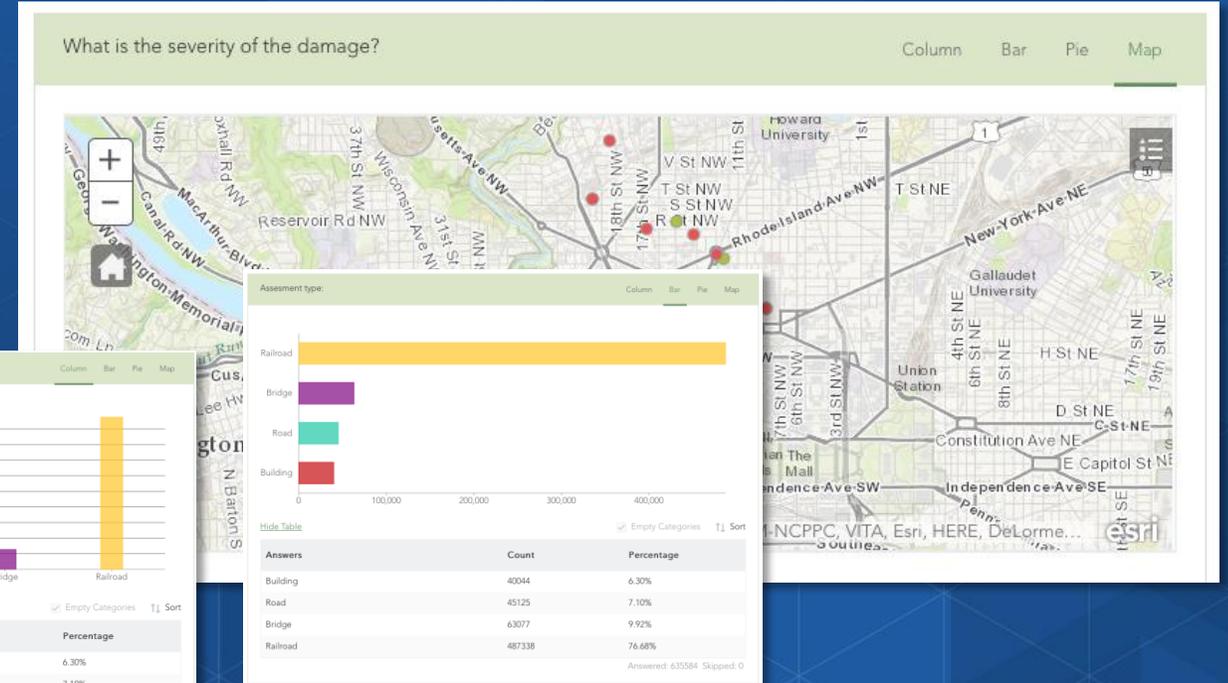
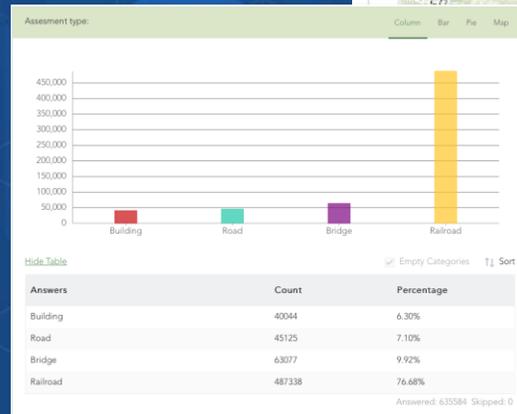
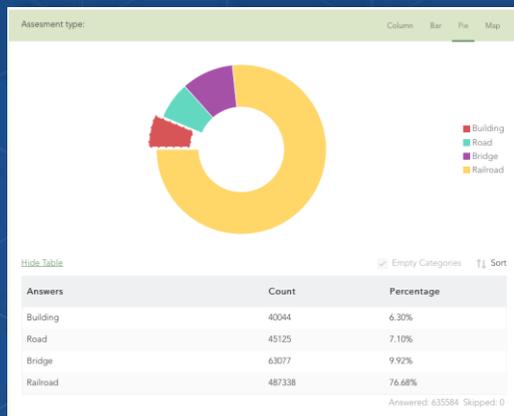
- Symbolize, classify your data on maps
- Investigate statistically significant hotspots
- Proximity, routing, overlay, and other map analysis tools
- Add and analyze additional data



# Reporting tools



- Understand data submission patterns
- Create detailed survey reports
- Aggregate survey data
- Selectively download data



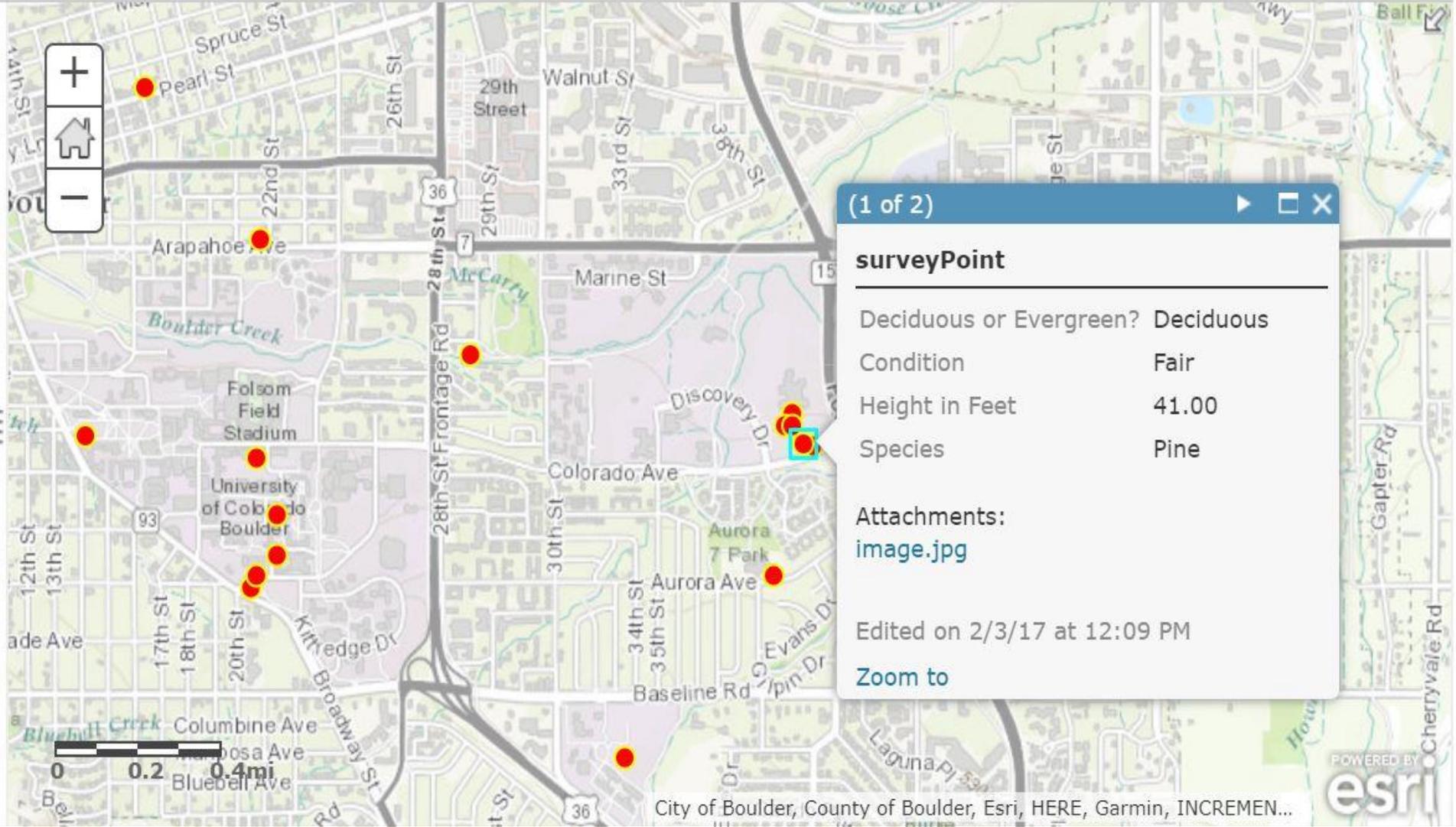
 Details |  Edit |  Basemap |  Share |  Print ▾ |  Measure |  Bookmarks |  

### Legend

**University Campus Vegetation Mapping Survey**

-  Survey Point



## The End Goal

**Not** points on the map,  
but *understanding the  
phenomenon, spatial  
patterns, linkages, trends  
in the data you are  
collecting.*

Hence, spatial analysis.

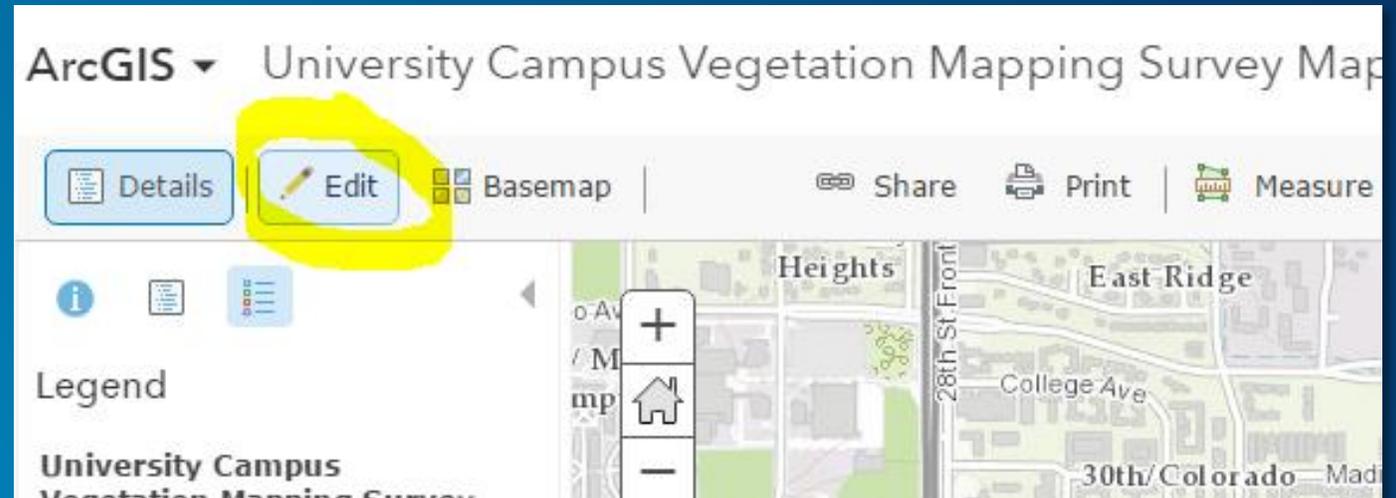


Survey123 creates an **editable map layer**.

Several ways exist to create an editable layer:

### Without pull down menus

- Add and publish a CSV file
- Create a GeoForm web app from your published CSV
- Add and publish a shapefile



### With pull down menus

- Publish from ArcGIS Desktop
  - ArcMap or ArcGIS Pro
- Create with Survey123
  - Using Excel
  - Using Web

You can also add data directly on the map in a web browser:

The screenshot displays the ArcGIS Online interface for a map titled "University Campus Vegetation Mapping Survey Map from Survey123". The "Edit" button in the top toolbar is highlighted in yellow. A popup window for a "surveyPoint" is open, showing the following data:

surveyPoint	
Deciduous or Evergreen?	Deciduous
Condition	Good
Height in Feet	3.00
Species	Hot
Attachments:	IMG_5544.JPG
Edited on 2/3/17 at 12:01 PM	
<a href="#">Zoom to</a>	

The map shows a city street grid with several red dots representing survey points. A scale bar at the bottom indicates 0, 0.1, and 0.2 miles. The Esri logo is visible in the bottom right corner.

Open a web browser and go to this form that has been set up with Survey123 for campus vegetation mapping:

<https://survey123.arcgis.com/share/933b03f8109e411cab344453dbd7a865> or  
<http://bit.ly/2pbnWDT>,

which looks like the form shown here.

**Campus Vegetation Mapping**

Map Vegetation - trees, shrubs, and other plants - on your campus.

**Deciduous or Evergreen? \***  
Indicate whether the plant is deciduous or evergreen.

-Please Select-

**Condition \***  
Indicate how healthy the plant is:

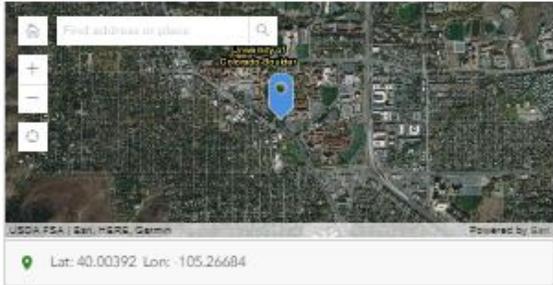
Good

**Height in Meters \***  
Indicate the height in meters to nearest integer.

Please input a number between 1 and 150

**Species**  
Indicate the tree species (maple, ash, locust, spruce, etc.)

**Location \***



Find address or place

USDA, FSA | San, MSRE, Germn

Powered by Arc

Lat: 40.00392 Lon: -105.26684

**Submit Photograph Here**  
Submit your photograph here (max size = 10 MB)

Click here to upload image file. (<10MB)

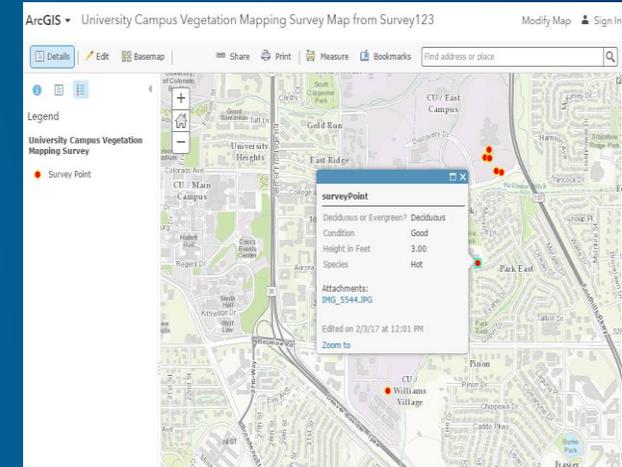
Submit your Data

Powered by Survey123 for ArcGIS

1. Fill in these 4 fields, pan the map or enter an address or a city, and place the placemark on the location of your tree. If you have a photograph online of that tree that either you have taken or have permission to use, download it to your computer and submit it at the bottom of the form.

2. Visualize results that you **and your classmates** have submitted, on this map: <http://esriurl.com/campusvegsurvey123map> (or <http://arcg.is/2l0UL2O>).

Photos, if they exist, will be listed as “attachments”:



# Examine the Form Design and Data

The screenshot displays the Survey123 for ArcGIS interface. At the top, the survey title is "University Campus Vegetation Mapping Sur...". The navigation bar includes "Overview", "Design" (the active tab), "Collaborate", "Analyze", and "Data". The user is identified as "Joseph".

The main content area is titled "Campus Vegetation Mapping" and includes the instruction: "Map Vegetation - trees, shrubs, and other plants - on your campus." Two questions are visible:

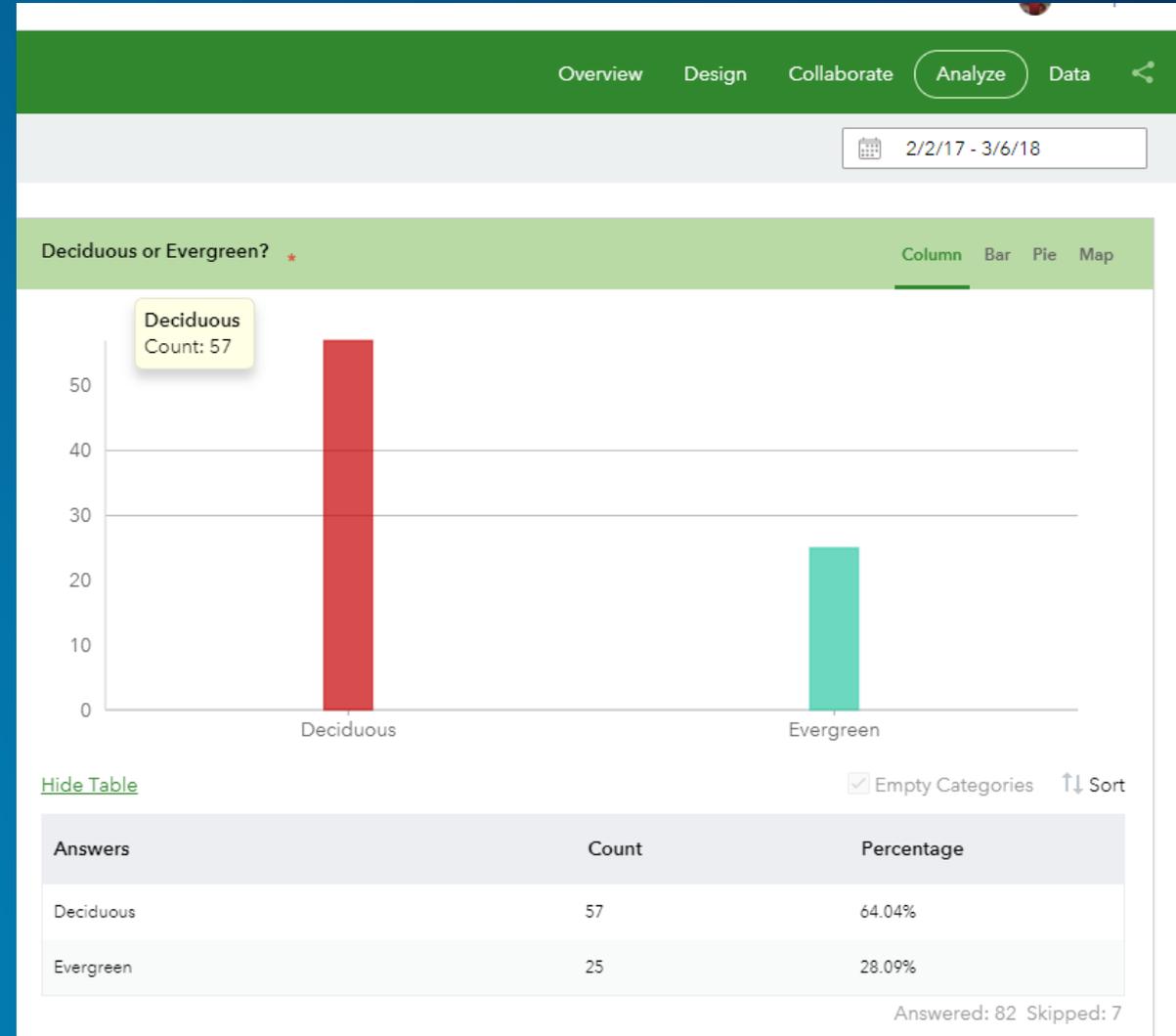
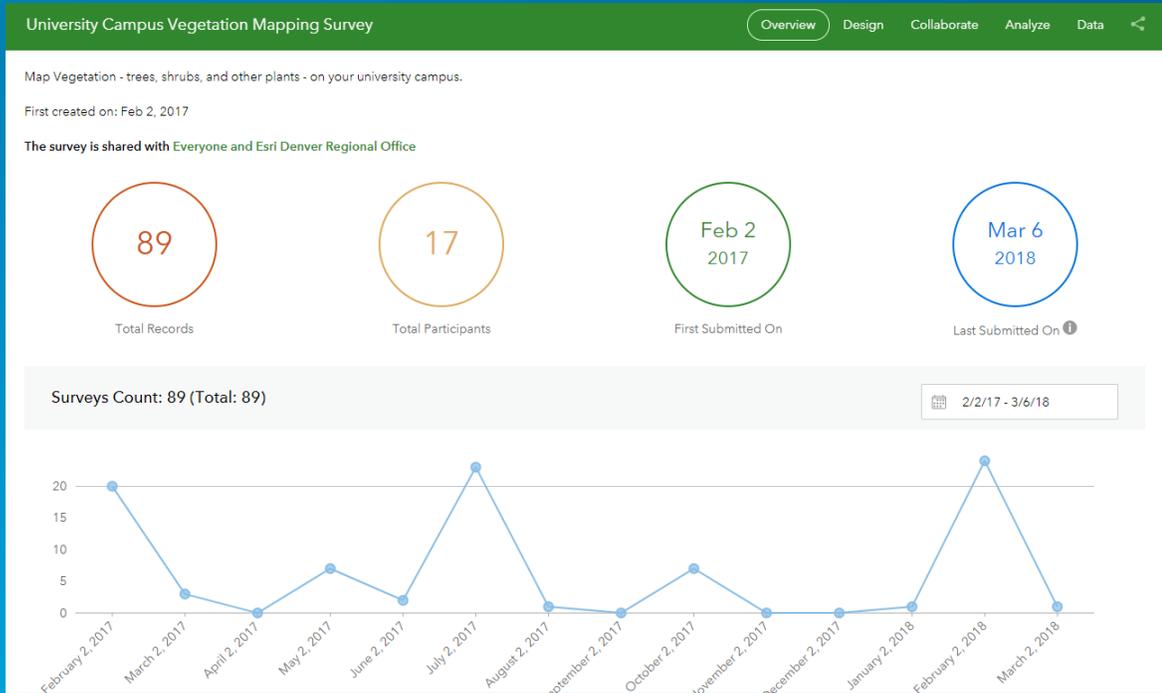
- Deciduous or Evergreen? \***  
Indicate whether the plant is deciduous or evergreen.  
The dropdown menu is currently set to "-Please Select-".
- Condition \***  
Indicate how healthy the plant is.  
The dropdown menu is currently set to "Good".

On the right side, there is a "Common Questions" panel with the following options:

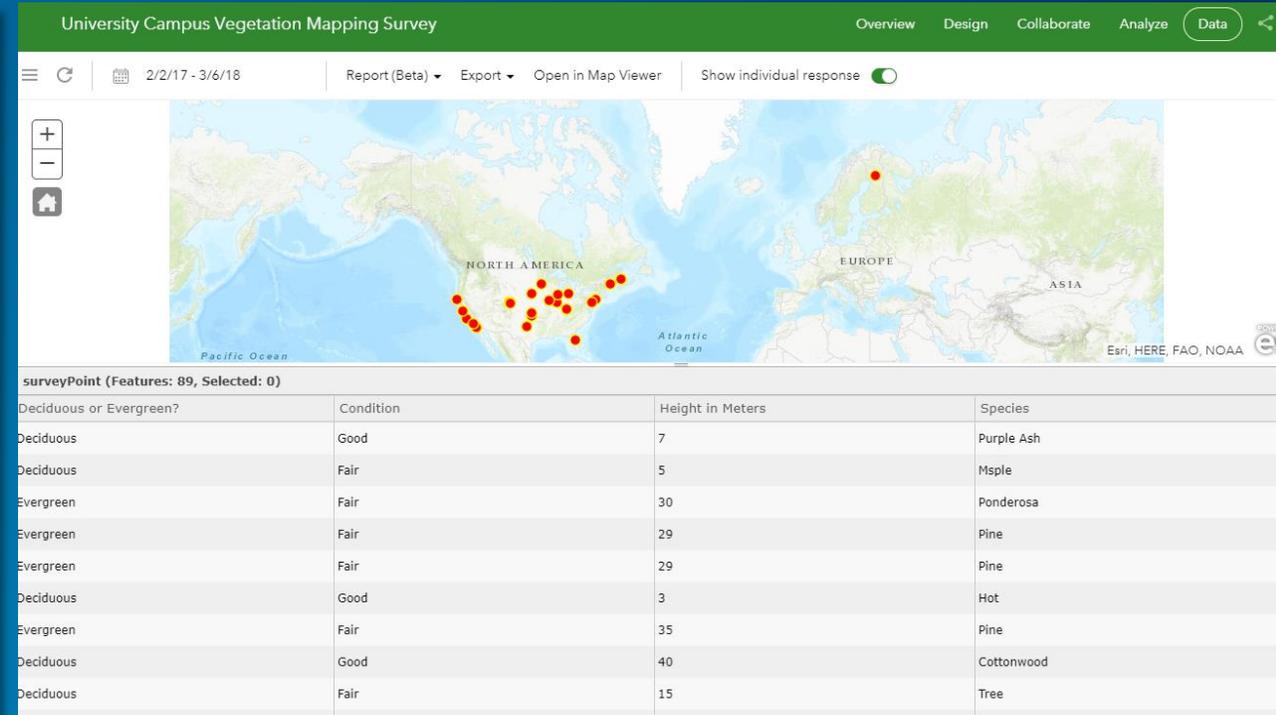
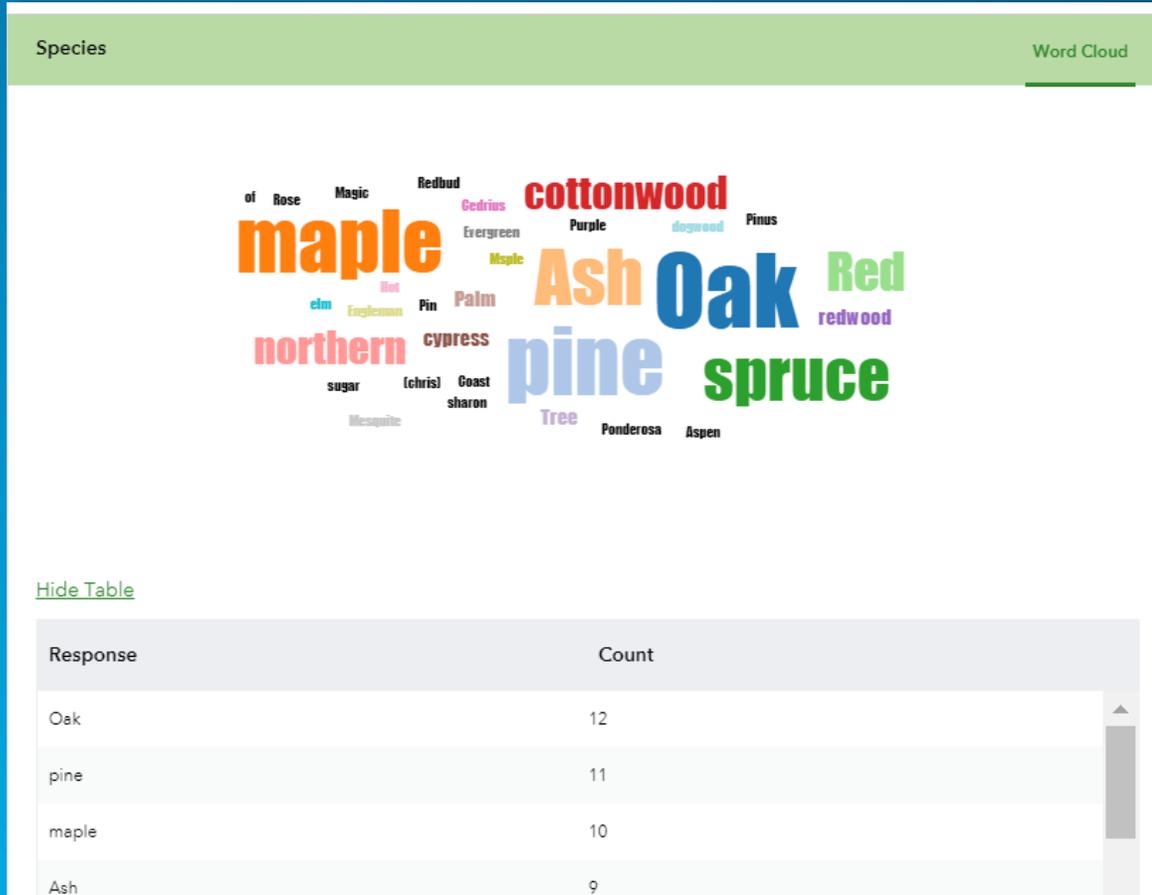
- Singleline Text
- Multiline Text
- Single Choice
- Multiple Choice
- Dropdown
- Rating
- Likert
- Number
- Date
- Time

At the bottom of the interface, there are buttons for "Save...", "Preview", and "Publish".

# Examine the Form Design and Data



# Examine the Form Design and Data



# Examine Existing Surveys

Survey123 for ArcGIS    My Surveys    Help     Joseph

Joseph's Surveys    [+ Create a New Survey](#)    Search

All surveys     



Record(s): 544 

Survey of 2017 Solar Eclip...



Record(s): 0 

Pedestrian Friendliness

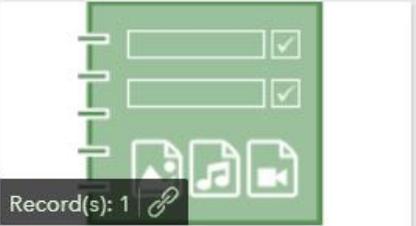
    



Record(s): 0

19 June 2017 Campus Fi...



Record(s): 1 

19June2017 New EdUC ...

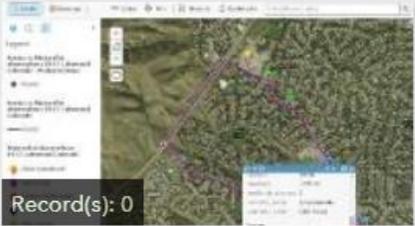
    



Record(s): 6 

Cloud Observations

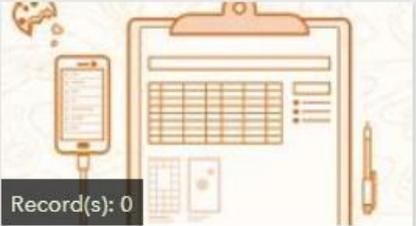
    



Record(s): 0

Pedestrian Counts 2



Record(s): 0

Vegetation Mapping at a ...



Record(s): 0 

Pedestrian Counts

## Yes, you can download the Survey123 data

- If you want to use it in ArcGIS Pro, SAS, Tableau, R, Excel
- To have a back-up of the data
- For enterprise integration with Oracle, Microsoft SQL Server, etc.

<https://community.esri.com/groups/survey123/blog/2015/11/10/downloading-data-captured-with-survey123-for-arcgis>

Export from “My Surveys” on <http://survey123.arcgis.com> or from feature layer on [www.arcgis.com](http://www.arcgis.com) > Export.

## Yes, you can integrate Survey123 with higher precision GPS

Survey123 for ArcGIS can be combined with an external GNSS receiver in some cases. Some mobile phones and GNSS receivers support connectivity via Bluetooth. If this is the case, the location from the GNSS receiver will be used by Survey123 for ArcGIS.

Example showing how you can connect a Bad Elf receiver with Survey123: <https://bad-elf.com/pages/using-survey123-with-a-bad-elf-gps-receiver>

Other GNSS receivers such as EOS-GNSS, Geode from Juniper Networks, Leica GGO4+ etc.

Survey123 can also automatically capture some location metadata as described here:

<https://community.esri.com/groups/survey123/blog/2016/11/03/extracting-information-from-geopoint-questions>

To extract specific GNSS metadata such as numSatellites, VDOP, HDOP etc, then you need to: combine Collector for ArcGIS with Survey123 for ArcGIS as described here:

<https://community.esri.com/thread/195790-survey123-high-accuracy-gps-data-collection-oh-my>

Or wait for Survey123 version 3.0, which will include direct connectivity to external GNSS receivers.

For more information:

<https://community.esri.com/thread/195790-survey123-high-accuracy-gps-data-collection-oh-my>

## **Survey123 is Citizen Science Enabled I**

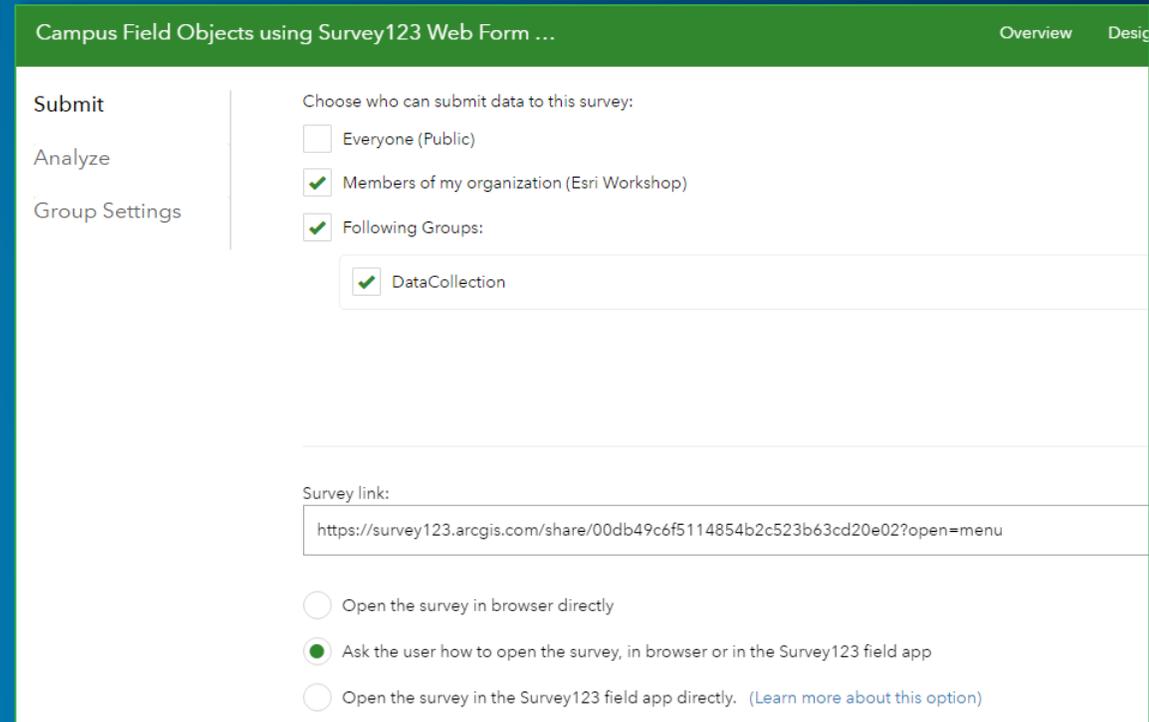
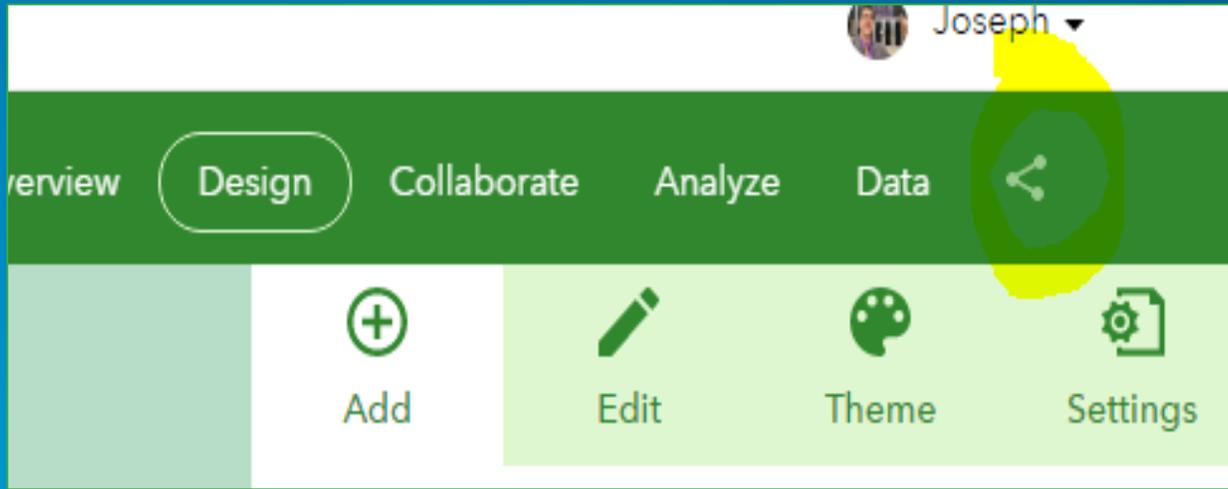
**Do you have to be logged in to ArcGIS Online to take the survey or view the web map?**

**No. Survey123 allows for forms to be added to by anyone; that is, truly crowdsourced. The resulting map can be shared with anyone; so that anyone with the URL will be able to open the map.**

**You can choose to not share your survey with everyone, in which case, those wishing to add data to the survey need to have an ArcGIS Online account, be logged in, and have the Survey123 for ArcGIS app on their smartphone. Advantages to NOT sharing with everyone:**

- 1. The Survey123 app looks a bit nicer than the web browser display.**
- 2. The Survey123 app allows for off-line data collection.**

# Survey123 is Citizen Science Enabled II



# 2 ways to create a Survey123

Today we will use this method



## Create a New Survey

### Using the web designer

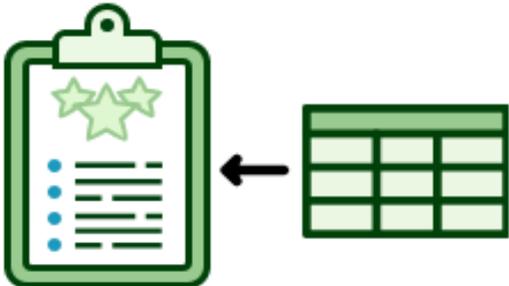
- Get started quickly
- Best for simple surveys
- Author your survey graphically



Get Started

### Using Survey123 Connect

- Using a desktop application
- Full smart form capabilities
- Author through XLSForms (spreadsheet)



Get Started

# **Create Survey using Survey123 Connect (Excel) method**

- 1. Survey123.arcgis.com > Build survey using Survey123 Connect**
- 2. In Excel, build survey using worksheets**
- 3. Publish survey to ArcGIS Online; test; create map from survey; save; share.**
- 4. Collect data in the field using Survey123 app on smartphone (or web browser if crowdsourced).**

type	name	label	hint
date	<u>ReportDate</u>	Date	
time	<u>ReportTime</u>	Time	
begin group	basic	Collect Field Data:	
<u>select_one LivNonLiv</u>	LivNonLiv_1	Living or <u>Non Living</u> ?	
<u>select_one ObjectType</u>	ObjectType_1	Select Object Type:	
end group			
integer	<u>Height_m</u>	<u>Height_m</u>	Give height in meters rounded to nearest integer
<u>geopoint</u>	Location	Location	
image	Photograph	Photograph	

<u>list_name</u>	<u>name</u>	label	image	<u>label::language1</u>	Object
<u>LivNonLiv</u>	Living	Living			
<u>LivNonLiv</u>	<u>Non_Living</u>	<u>Non Living</u>			
<u>ObjectType</u>	tree	tree			Living
<u>ObjectType</u>	shrub	shrub			Living
<u>ObjectType</u>	<u>other_living</u>	other living			Living
<u>ObjectType</u>	chair	chair			<u>Non_Living</u>
<u>ObjectType</u>	bench	bench			<u>Non_Living</u>
<u>ObjectType</u>	trashcan	trashcan			<u>Non_Living</u>
<u>ObjectType</u>	<u>other_nonliving</u>	other nonliving			<u>Non_Living</u>

## **Create Survey using Survey123 Web method**

- 1. Survey123.arcgis.com > Build survey using web**
- 2. From web form, drag and drop items to survey**
- 3. Publish survey to ArcGIS Online; test; create map from survey; save; share.**
- 4. Collect data in the field using Survey123 app on smartphone (or web browser if crowdsourced).**

## Add 5 items

1. Date. Label: Date. Hint: Fill in the date when you collected the data. Default Value: Select "Submitting Date." Save.
2. Multiple Choice > Edit > Label: Species. Hint: What object are you collecting? 4 choices: Beech, Pine, Ash, Other. Save.
3. Multiple Choice > Edit > Label: Condition. 3 choices: Good, Fair, Poor. Save.
4. Number > Label: Height (m). Hint: Indicate height to nearest meter. Default value: 1. This is a required question. Must be an integer. Set Min/Max value: Min = 1. Max = 30. Save.
5. GeoPoint. Label: Location. Hint: What is the location of the object? Default Map: Topographic. Home Location. Zoom to the workshop location.

Let's go out into the field!



Point web browser on your  
phone to the following URL:

<https://survey123.arcgis.com/share/933b03f8109e411cab344453dbd7a865>

or

<http://bit.ly/2pbnWDT>,

Comments?



Esri Training: <http://www.esri.com/training>

(1) Teaching with GIS – Field Data Collection Using ArcGIS.

(2) Survey123 for ArcGIS. <http://survey123.arcgis.com>

MOOCs:

<http://www.esri.com/mooc>

-- including Do-it-Yourself-Web-Apps

**Creating GeoForms -**

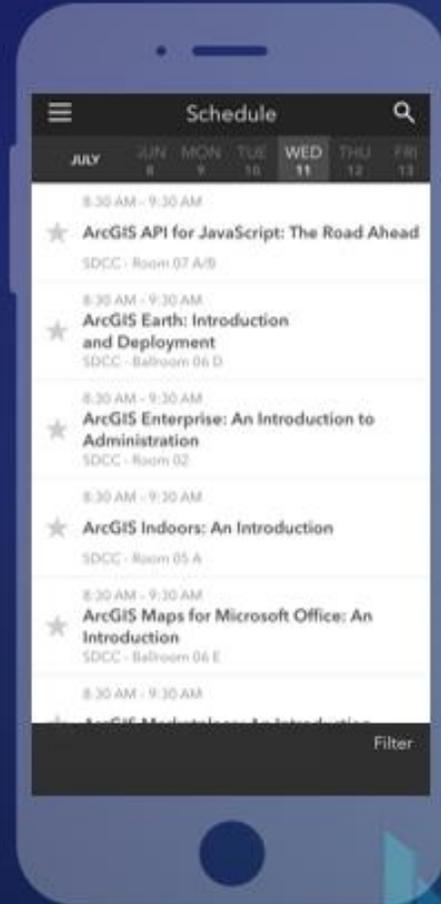
[http://esri.ca/sites/default/files/resources/cr/GeoForm\\_Web.pdf](http://esri.ca/sites/default/files/resources/cr/GeoForm_Web.pdf)

# Please Take Our Survey on the App

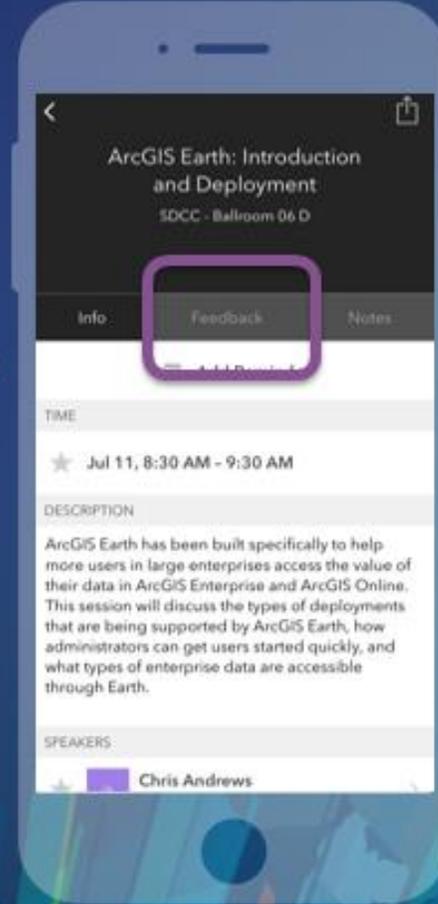
Download the Esri Events app and find your event



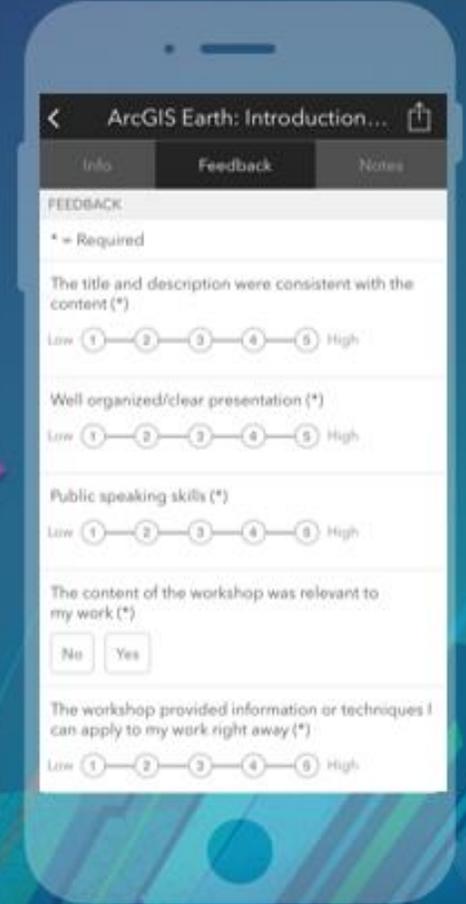
Select the session you attended



Select the Feedback tab



Complete answers and select "Submit"





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[www.youtube.com/geographyuberalles](http://www.youtube.com/geographyuberalles)

[Twitter.com/josephkerski](https://twitter.com/josephkerski)

[spatialreserves.wordpress.com](http://spatialreserves.wordpress.com)

**GIS  
INSPIRING  
WHAT'S  
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esri

THE  
SCIENCE  
OF  
WHERE