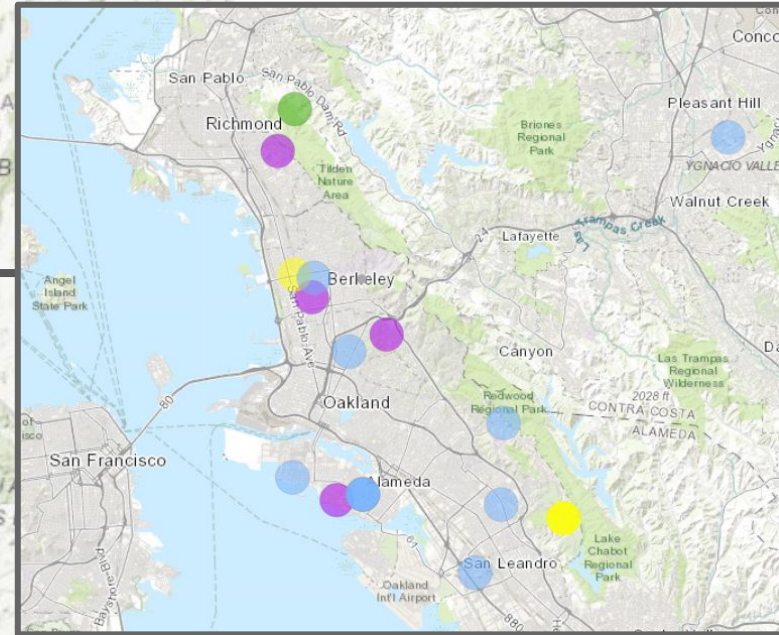
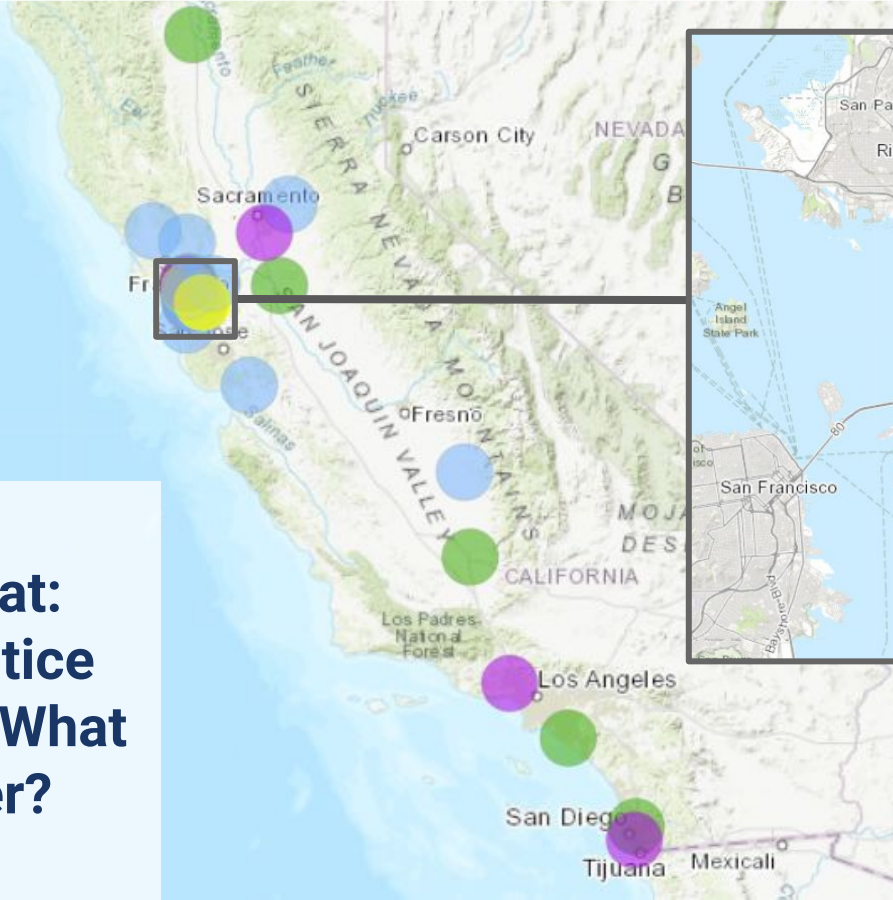


Welcome to the Mapping for Spatial & Environmental Literacy Webinar Series!

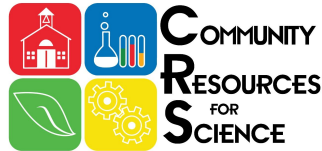
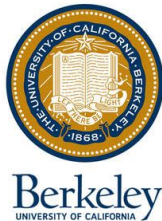


Type in the chat:
What do you notice
about this map? What
do you wonder?

March 31 2021

Mapping for Spatial & Environmental Literacy

**The
Lawrence**
Hall of
Science
UNIVERSITY OF CALIFORNIA, BERKELEY



Hana Moidu, PhD Candidate, Department of Environmental Science, Policy, Mgmt, UC Berkeley

Sarah Pedemonte, Learning and Teaching Group, The Lawrence, UC Berkeley

Betsy Mitchell, PhD, Science Content Specialist, UC Berkeley Natural Museums

Joanna Totino, Director Bay Area Science Project, The Lawrence, UC Berkeley



Goals of this webinar:

- 1. Build understanding of spatial data**
- 2. Connect spatial data to answer environmental questions**
- 3. Explore how to access ArcGIS products**
- 4. Learn how to collect your own data with Survey123**



Goals of NEXT webinar:

- 1. Access existing spatial data**
- 2. Visualize spatial data on ArcGIS**
- 3. Analyze spatial data on ArcGIS**



Group Agreements

- Take space/make space
- Presume positive intentions, and take responsibility for your impact
- Stay curious and ask questions
- Mute when you are not talking
- Keep your camera ON whenever possible

native-land.ca

YOU ARE
ON
Chochenyo Ohlone
LAND.



USDAC.US/nativeland
#HonorNativeLand

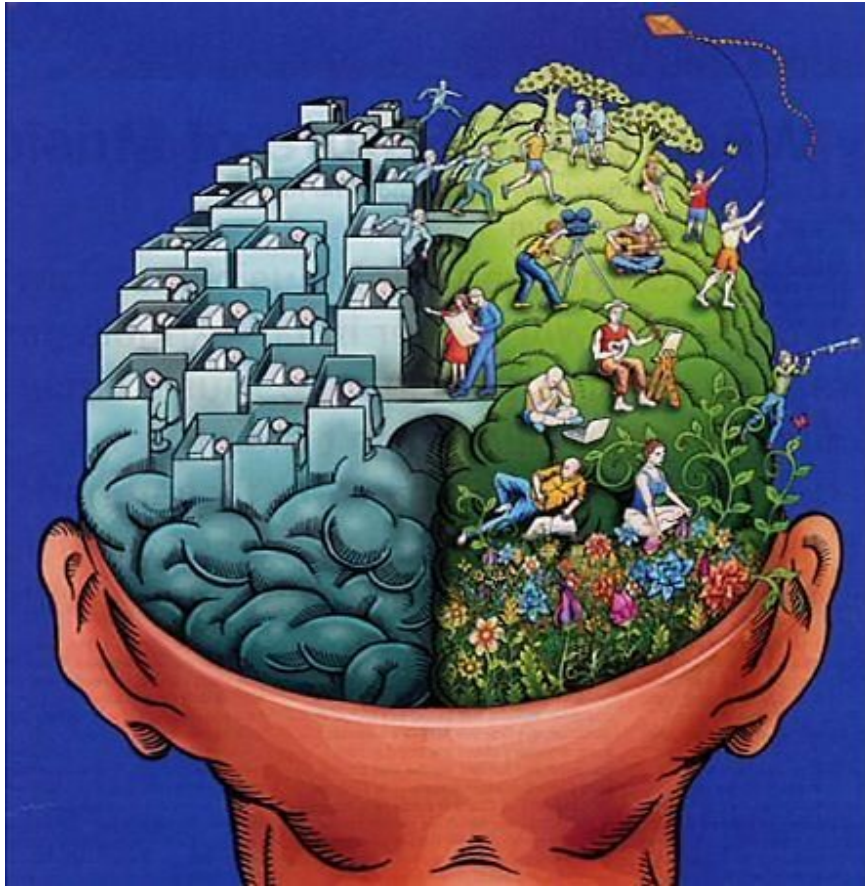
AUTUMN
+ DAWN

Art by Autumn Dawn Gomez
(Taos Pueblo / Comanche)
@pimikwusii



IMAGINING AMERICA
artists + scholars in public life

1. Build understanding of spatial data



What comes to mind when you think about spatial data/spatial literacy?

Put any thoughts you have in the chat!

1. Build understanding of spatial data

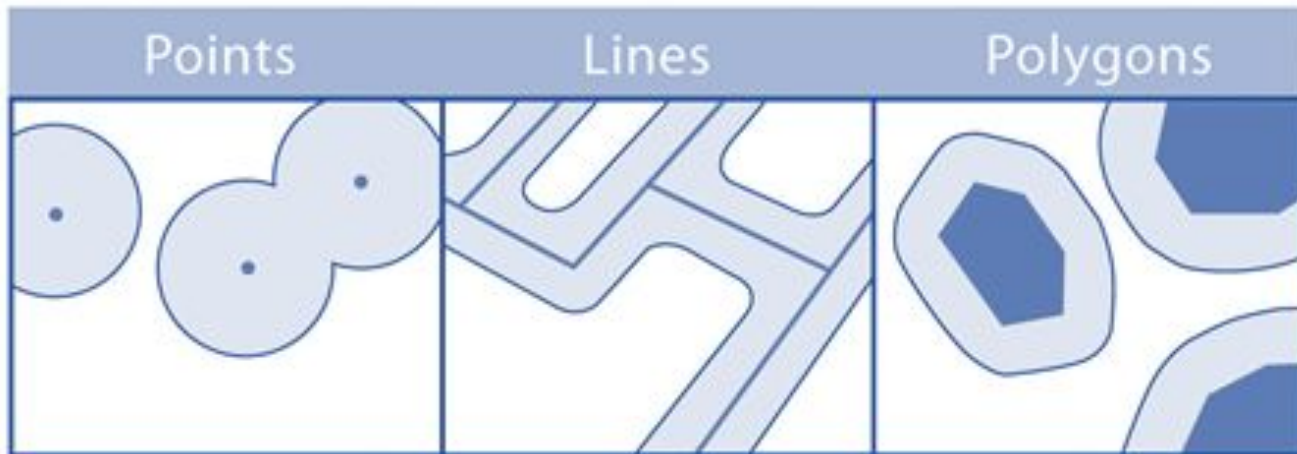
“Spatial Literacy” is the ability to be able to include the spatial dimension in our thinking and problem solving



Using spatial data in the classroom can engage students with issues relevant to them and connect them with their local environment

1. Build understanding of spatial data

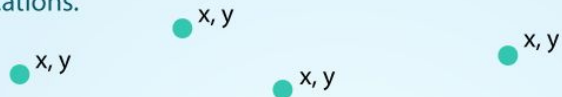
All the spatial data (termed: features) we will be using is based on **POINTS, LINES, and POLYGONS**



1. Build understanding of spatial data

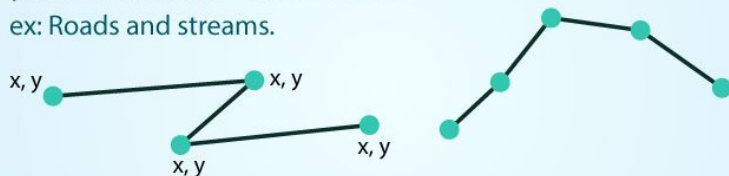
POINTS: Individual x, y locations.

ex: Center point of plot locations, tower locations, sampling locations.



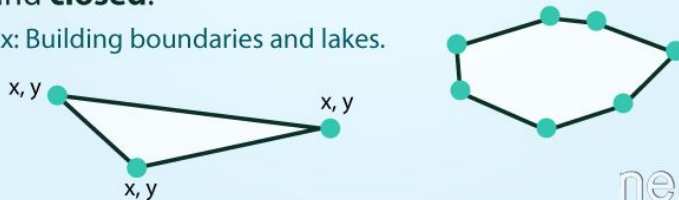
LINES: Composed of many (at least 2) vertices, or points, that are connected.

ex: Roads and streams.



POLYGONS: 3 or more vertices that are connected and **closed**.

ex: Building boundaries and lakes.



neon

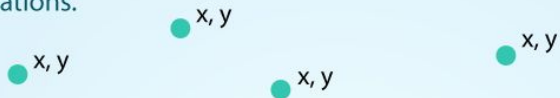


name	shape
road	line
market	point
lake	polygon

1. Build understanding of spatial data

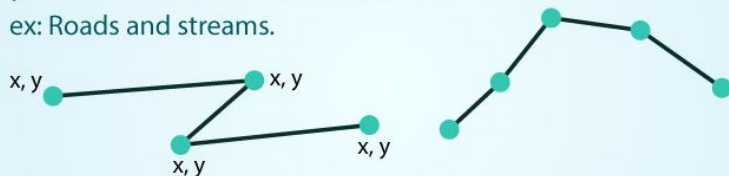
POINTS: Individual x, y locations.

ex: Center point of plot locations, tower locations, sampling locations.



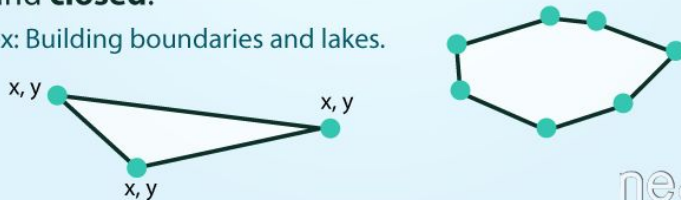
LINES: Composed of many (at least 2) vertices, or points, that are connected.

ex: Roads and streams.



POLYGONS: 3 or more vertices that are connected and **closed**.

ex: Building boundaries and lakes.



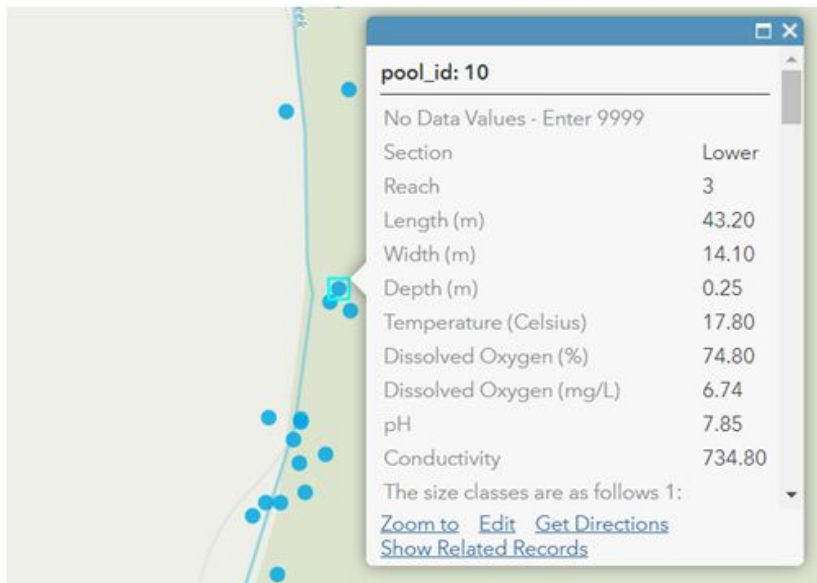
neon



Can you think of any examples of what could be collected as a point, line, or polygon?

1. Build understanding of spatial data

Each feature (a point, line, or polygon) is associated with **ATTRIBUTES**



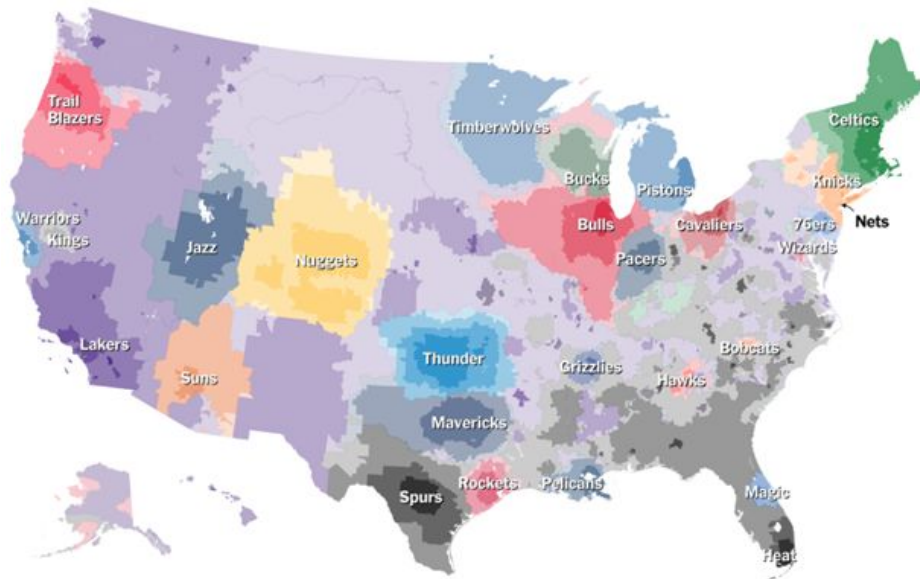
Attributes are **observations** related to a **feature**. In this example, each **point feature** represents an individual pool in a stream. The **attributes** associated with each **point** describes its size and water quality.

2. Connect spatial data to answer environmental questions

Spatial data can be used to tell a story... the data that you use depends on what kind of story you want to tell – choose something that interests you!

Which Team Do You Cheer For? An N.B.A. Fan Map

By TOM GIRATIKANON, JOSH KATZ, DAVID LEONHARDT and KEVIN QUEALY. UPDATED October 19, 2014



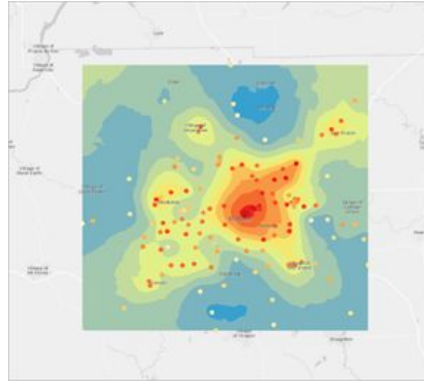
Every Place Has Its Own
Climate Risk. What Is It
Where You Live?



2. Connect spatial data to answer environmental questions

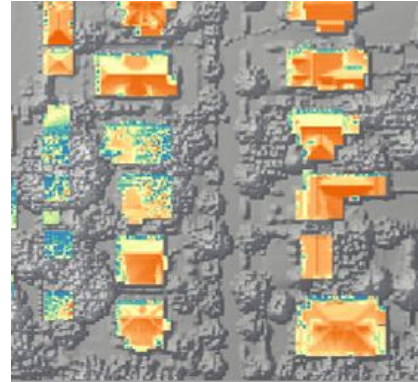
Examples of spatial stories you can tell with your class:

Urban Heat Island



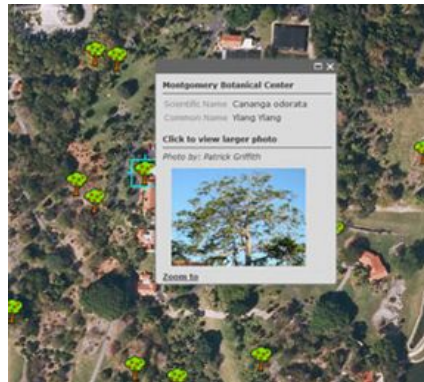
- **Air temperature** in several locations to understand **urban heat islands**

Green Infrastructure



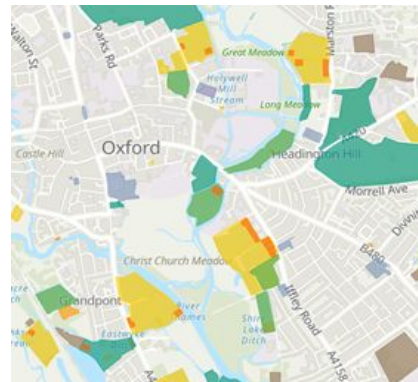
- Find examples of **green infrastructure** – stormwater mediation, solar panels, etc!

Trees in the Neighbourhood



- Map types of **trees**
- Do you see **animals** or **bugs** on the tree?







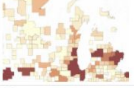













Public Greenspace



- Closest **greenspace**?
- What **facilities** are there?
- How many **people** do you see?

2. Connect spatial data to answer environmental questions

What spatial data exists?

 <p>USA States (Generalized) Feature Layer By esri_dm USA States (Generalized) provides 2017 boundaries for the States of the United States in the 50 states and the District of Columbia.</p> <p>Authoritative</p>	 <p>USA Counties (Generalized) Feature Layer By esri_dm USA Counties (Generalized) provides the county boundaries of the United States in the 50 states and the District of Columbia.</p> <p>Authoritative</p>	 <p>USA Crime Index Map Image Layer By esri This layer shows the total crime index in the U.S. in 2020, by state, county, ZIP Code, tract, and block group. ArcGIS Online subscription required.</p> <p>Premium Content Authoritative</p>	 <p>USA Drought Intensity (Current Conditions) Map Image Layer By esri Current drought conditions from the U.S. Drought Monitor, updated weekly.</p> <p>Subscriber Authoritative</p>
 <p>USA Counties Feature Layer By esri_dm USA Counties provides the county boundaries of the United States in the 50 states, the District of Columbia, and Puerto Rico.</p> <p>Authoritative</p>	 <p>USA Current Wildfires Feature Layer By esri_livefeeds2 This layer shows wildfires that have been updated within the past 7 days in the United States from IRWIN and NIFC information.</p> <p>Authoritative</p>	 <p>USA Core Based Statistical Area Feature Layer By esri_dm U.S. Core Based Statistical Areas provides the names, types, populations, and 2010 U.S. Census demographic information for the core based statistical areas of the United States.</p> <p>Authoritative</p>	 <p>Statewide Basin Management Action Plan (BMAP) General Ar... Feature Layer By FDEPOpenDataPortal To spatially represent the areas where a BMAP is being prepared and areas where a BMAP is adopted. The purpose of this layer is to show the land areas subject to a BMAP and the water areas that are being restored.</p> <p>Authoritative</p>
 <p>USA Native Lands Feature Layer By esri_landscape2 This layer displays lands owned or managed by Native American Tribes and other native people of the United States.</p> <p>Authoritative</p>	 <p>Satellite (MODIS) Thermal Hotspots and Fire Activity Feature Layer By esri_livefeeds2 Thermal activity detected by the MODIS sensors on the NASA Aqua and Terra satellites during the last 48 hours.</p> <p>Authoritative</p>	 <p>ACS Health Insurance Coverage Variables - Centroids Feature Layer By esri_demographics This layer contains the most current release of data from the American Community Survey (ACS) about health insurance coverage by type and by age group. These are 5-year estimates shown by tract, county, and state centroids.</p> <p>Authoritative</p>	 <p>ACS Race and Hispanic Origin Variables - Boundaries Feature Layer By esri_demographics This layer contains the most current release of data from the American Community Survey (ACS) about population broken down by race and Hispanic origin. These are 5-year estimates shown by tract, county, and state boundaries.</p> <p>Authoritative</p>
 <p>USA Major Cities Feature Layer By esri_dm This layer presents the locations of cities within the United States with populations of approximately 10,000 or greater, all state capitals, and the national capital.</p> <p>Authoritative</p>	 <p>USA Weather Watches and Warnings Feature Layer By esri_livefeeds2 A live data feed from the National Weather Service containing official weather warnings, watches, and advisory statements for the United States.</p> <p>Authoritative</p>	 <p>2020 USA Traffic Counts Feature Layer By esri This feature layer contains traffic counts in the United States.</p> <p>Premium Content Authoritative</p>	 <p>ACS Poverty Status Variables - Boundaries Feature Layer By esri_demographics This layer contains the most current release of data from the American Community Survey (ACS) about poverty status by age group. These are 5-year estimates shown by tract, county, and state boundaries.</p> <p>Authoritative</p>
 <p>Recent Weather Radar Imagery Map Image Layer By NOAA-GeoPlatform Weather Radar (NEXRAD) Reflectivity Mosaics from NOAA/NWS RIDGE2 for Alaska, CONUS, Puerto Rico, and Hawaii for last 3 hours.</p> <p>Authoritative</p>	 <p>Current Weather and Wind Station Data Feature Layer By esri_livefeeds2 The Current Weather and Wind Station Data layer is created from hourly METAR station data provided from NOAA and contains approximately 11 weather variables for each location.</p> <p>Authoritative</p>	 <p>Esri Hydro Reference Overlay Tile Layer By esri_landscape2 This layer provides a reference overlay highlighting water features for use with layers related to the natural sciences.</p> <p>Authoritative</p>	 <p>ACS Median Household Income Variables - Boundaries Feature Layer By esri_demographics This layer contains the most current release of data from the American Community Survey (ACS) about median household income by race and by age of household. These are 5-year estimates shown by tract, county, and state boundaries.</p> <p>Authoritative</p>

Nearly anything you can think of!

An aerial map of a city block with a semi-transparent white box overlaid in the center. The map shows buildings, streets, and trees. Street names visible include '17th St', 'Ganesville St', and '15th St'.

BREAKOUT ROOM

With your small group:

- 1. Reflect on what spatial data and literacy mean to you**
- 2. Think of times when you use spatial data in your day-to-day life. What about in your classroom?**
- 3. Be ready to share with the whole group**

3. Explore how to access ArcGIS products

ArcGIS is a geographic information system (GIS) for working with maps and spatial data maintained by the Environmental Systems Research Institute (ESRI)

ArcGIS products we will discuss:

1. ArcGIS Online
2. StoryMaps
3. Survey123

...but there are more!



ArcGIS



Survey123
for ArcGIS

3. Explore how to access ArcGIS products




ArcGIS Online is a cloud-based mapping and analysis tool



Use ArcGIS online to load existing and self-generated data determine spatial relationships and create maps


3. Explore how to access ArcGIS products

StoryMaps is a tool to create inspiring, immersive stories by combining text, interactive maps, and other multimedia content. Think of it like a PowerPoint or Prezi presentation but focusing on telling a story with interactive maps

The Science of Where   


How Ocean Currents Impact the World

the growing season, determines the type of agriculture and hence many other economic activities of the region.




Caribbean seashore of Nicaragua with endless coconut palms.
Photo credit: Witold Frączek

The coconut palm is a good example of how the circulation of ocean currents can impact a plant's natural geographic extent. It is generally believed that the coconut palm originated in the Southern Asia (India-Indonesia) region, and distributed its coconut fruit around the world by floating on ocean currents. On the other hand, the coconut tree has strong environmental requirements - very warm temperature, water-saturated soil (could be salty)



LEGEND

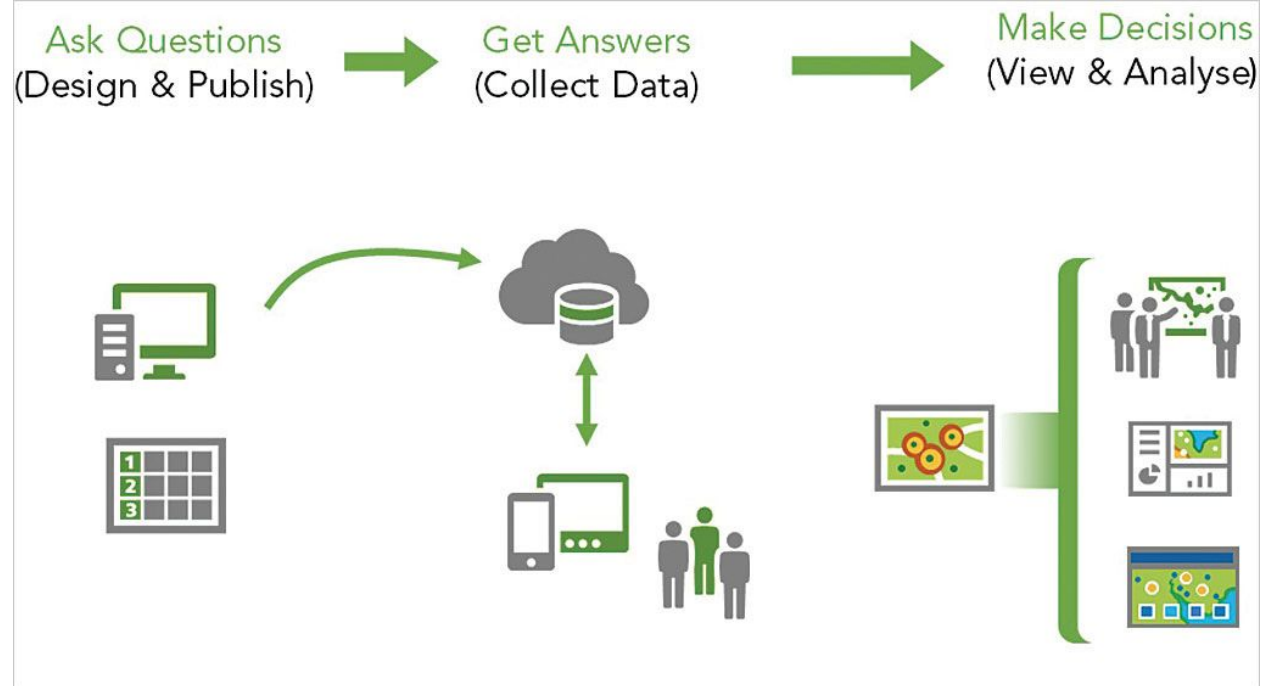
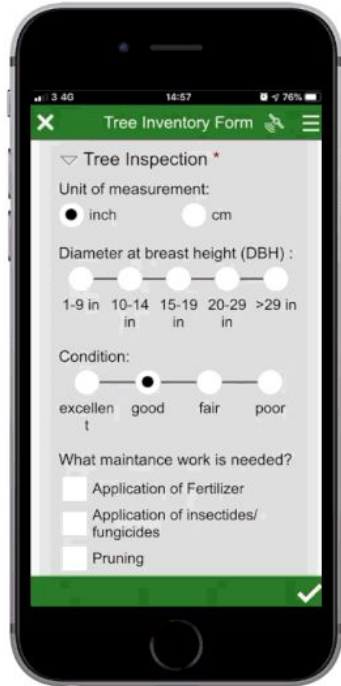
- Major Ocean Currents
 - Warm
 - Cold
- Coconut Palm Extent
- Coconut Palm Zone
- Equator

POWERED BY 

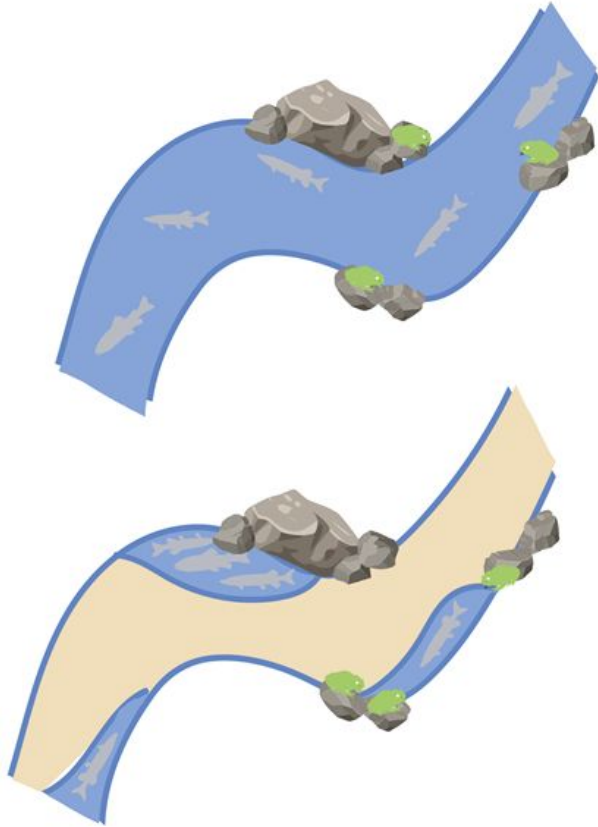
Earthstar Geographics | Source: Esri, DigitalGlobe, GeoEye, Earth...

3. Explore how to access ArcGIS products

Survey123 is a form-based tool for creating, sharing, and analyzing surveys. Collect information that is linked to a spatial location that is automatically synced to upload to your ArcGIS account



4. Learn how to collect your own data with Survey123



Coyote_Creek

The size classes are as follows 1: <10 | 2: 10-100 | 3: 100-500 | 4: 500-1000 | 5: >1000

Roach Juvenile

1 2
 3 4
 5

Roach Adult

1 2
 3 4
 5

Sucker Juvenile

1 2
 3 4
 5

Sucker Sub-Adult

1 2
 3 4
 5

3. Explore how to access ArcGIS products

Account Type	Sign-In	What you can do	What you cannot do
None (anonymous)	None	<ul style="list-style-type: none">● View publicly shared maps, data● Submit data with Survey123 for existing surveys	<ul style="list-style-type: none">● Save changes or modifications to maps or data● Analyze spatial data● Create surveys on Survey123
Public	Individual signs in to their own public account, licensed for personal use	<ul style="list-style-type: none">● View publicly shared maps, data● Save changes or modifications to maps or data● Submit data with Survey123 for existing surveys● Create maps using ArcGIS Online● Create StoryMaps	<ul style="list-style-type: none">● Analyze spatial data● Create surveys on Survey123
Organizational	Organizational subscription for your school; each member has a private, unique log-in	<ul style="list-style-type: none">● View shared maps, data● Save changes or modifications to maps or data● Submit data with Survey123 for existing surveys● Create maps using ArcGIS Online● Create StoryMaps● Analyze spatial data● Create surveys on Survey123	

4. Learn how to collect your own data with Survey123

Get to know your local environment by collecting data on trees in your neighbourhood using this survey!



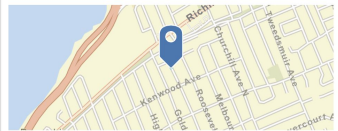
Tree Survey

Let's get to know the trees in our neighbourhood!

Complete this survey for every tree on your block.

Click the 'crosshair' button to record your location. *

45°23'N 75°45'W ± 10 m



What type of tree is it?

- Deciduous
- Coniferous
- Fruit Tree

Approximately how big is the tree?

- Less than one storey
- Greater than one storey

Take a photo if you'd like!

Click the "+" button at the bottom-right to collect another observation. When you are done collecting, click the check mark on the bottom-right, and click "Send now". Thanks for your participation!

1 of 1

An aerial map of an urban area with a semi-transparent white box overlaid in the center. The map shows buildings, streets, and green spaces. The text is centered within the white box.

BREAKOUT ROOM

In your small group:

- 1. Given the tree survey data, what kinds of environmental or social justice questions would you be interested in?**
- 2. What additional data would you need to answer those questions?**
- 3. Be ready to share out with the whole group**

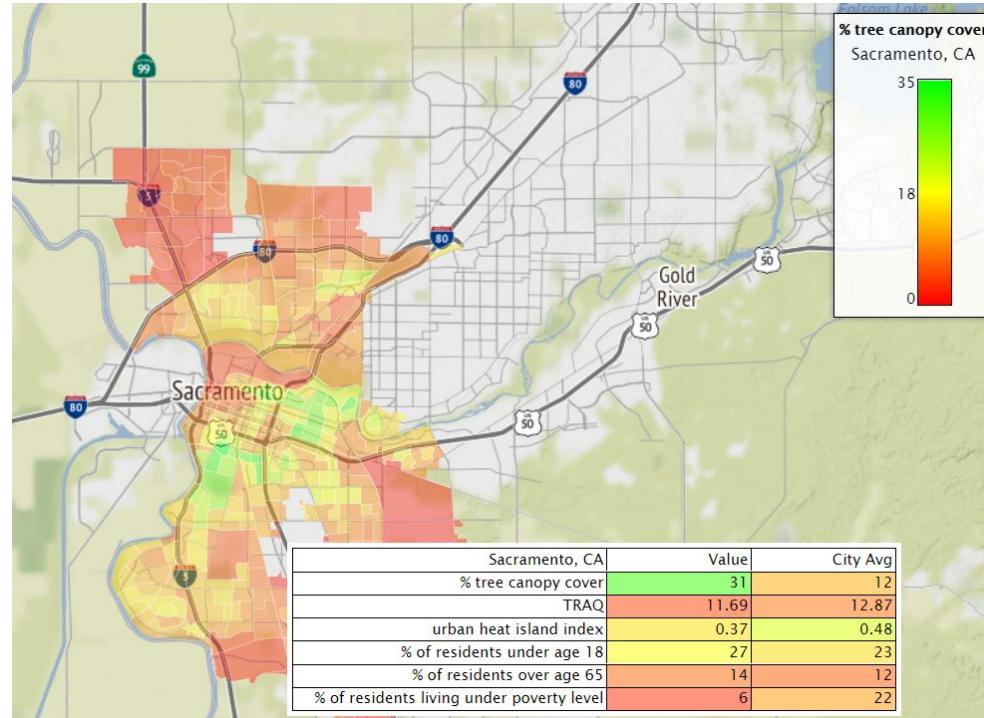
4. Learn how to collect your own data with Survey123

- 1. Access the sample tree survey via browser or Survey123 app (it's free!)**
 - a. Open the camera app on your phone**
 - b. Hold it over the QR code ----->**
 - c. Click the pop-up at the top of your screen**
 - d. Open the survey in the field app if you have it downloaded, otherwise open the survey in your browser**
- 2. For the field app: sign into your account if you have one- if you don't, you can collect data anonymously**
- 3. Go outside and collect data for every single tree on one side of your block (between two intersections)**
- 4. When you are done collecting data, upload your results**



4. Learn how to collect your own data with Survey123

During our next webinar, we will take a look at the data that you collected and try to analyze it together!



Summary

1. Using spatial data in the classroom can engage students with issues relevant to them and connect them with their local environment
2. Spatial data can be represented as **points, lines, or polygons**
3. You can use spatial data and mapping tools to tell stories of all kinds
4. ArcGIS is a great tool to visualize and analyze spatial data
5. ArcGIS products that you can use in the classroom include:
 - a. ArcGIS Online - to create maps
 - b. StoryMaps - to tell stories using interactive maps
 - c. Survey123 - to collect form-centric data

An aerial map of a city block, likely Berkeley, California, showing streets and buildings. A semi-transparent white rectangular overlay is centered on the map, containing text. The text is in a bold, dark blue font. The map shows streets such as 17th St, 16th St, 15th St, and Ganesville St. Buildings are shown in shades of grey and yellow, and trees are green.

THANK YOU!

**See you April 1st for the second webinar
in the series!**

**In the meantime, feel free to send me
any questions at
hanamoidu@berkeley.edu**

4. Learn how to collect your own data with Survey123

If you are submitting the survey using the field app, use the 'crosshair' button to record your location. If you are submitting the survey using your phone browser, use the following steps to record your location by **CLICKING THE RED CIRCLED OPTIONS**

Let's get to know the trees in our neighbourhood!

Complete this survey for every tree on your block.

Click the 'crosshair' button to record your location.*

