

Activity: Compost Hub and Community Research

Topics:

- Environmental Justice
- Community Research
- Technology in Science

Teacher's Guide:

Activity Overview:

Students will utilize web tools, including the free online GIS software Google Earth Pro, and federal and regional databases, to identify optimal locations for community composting centers. Additionally, they will assess the site's physical characteristics and create a socioeconomic profile of the surrounding community.

Note: This activity complements the “Community Composting Hub” project in this module. We recommend using this activity to guide the group project, but it can also be completed independently.

Introduction

Composting is a proven and scalable strategy for diverting organic waste from landfills and converting it into a valuable soil amendment to produce healthy food. At the community scale, composting has the potential to mitigate greenhouse gas emissions associated with centralized composting systems, support agroecological systems, and foster food and social justice. This project will allow students to think critically about the resources and considerations needed to develop community compost centers.

Materials List

- Class set of computers with Google Earth Pro software
- Class set of printed student worksheets (Available [HERE](#))
- Google Earth Pro software on instructor device
- Projector

Instructions - Identifying a Community and Selecting A Site

1. *Prepare in advance:*
 - a. **Download Google Earth Pro on your and your students' devices.** If this is your first time using the application, follow the pop-up tutorial to get familiar with the program's controls.

Consider the following criteria for selecting a community:

1. **Relevance to students.** Be as local as possible! This helps the activity be relevant to students and allows you as an instructor to best use your experiences as a local.
2. **Pick a defined community; as well-defined as possible.** To ensure data is available for your community, choose a city, census tract, or government-recognized municipality with defined boundaries and population.
3. **Small enough to be manageable.** Smaller communities allow for an easier search for vacant plots

2. After identifying the community you want to work with, it's time to find a physical open space to label as the site of a future community composting hub. ***In the top toolbar, click on the clock icon. This will bring your imagery up-to-date.***



Navigate the map until you find an empty plot of land. These can be empty fields, old parking lots, or other publicly accessible spaces without standing structures. *Suggestion:* Choose a smaller plot (too large of a space can distract from the focus of the activity).



Note: Students will be tasked with creating a community space. Some features to consider are zoning, accessibility by car/transit/bicycle, and safety.

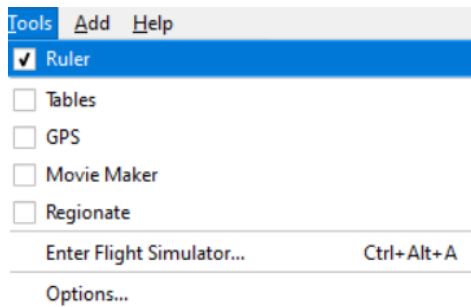
Guided Example

Location: *3603 M Street in the City of Merced, CA*

Features:

- A bus stop is located in front of the location
- Location can be accessed from all directions via bike lanes (as well as the large bike corridor in the middle of M Street)
- It has an access road that could serve as a drive-through

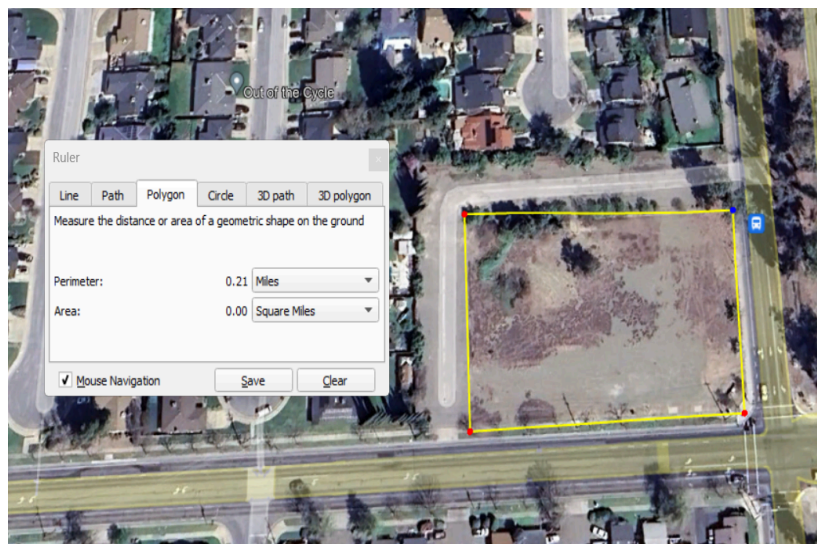
Note: While the space is on the larger side, it is just small enough that part of the land could be converted into a parking lot, a community garden, or a space for community gatherings. .



3. **Now that you have identified a site, it's time to save it!** In the upper left-hand corner of your screen, select '**Tools**' and then '**Ruler**'

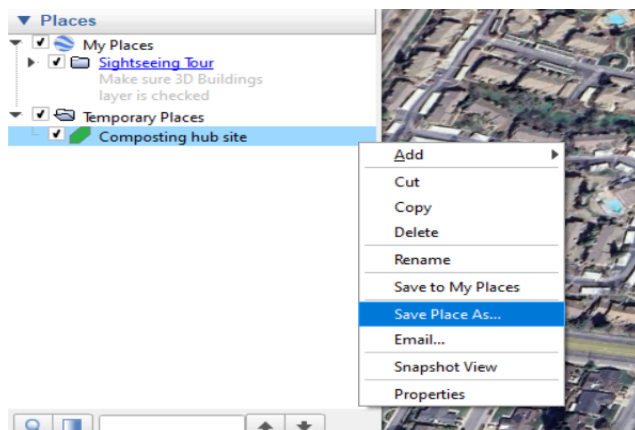
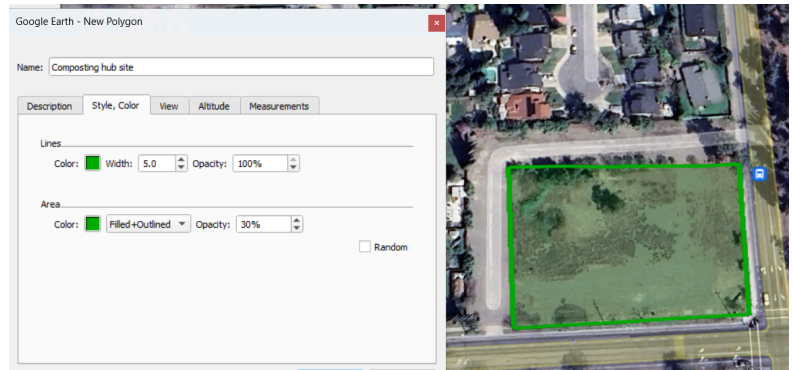
4. **Mark the boundaries of your chosen site using the Polygon Tool.**

To do this, click on the corners of the site to create a perimeter. If your open space is not a perfect rectangle, you can use multiple points to create curves. Save your boundaries by clicking the '**Save**' button.



5. After clicking 'Save,' a menu will pop up that allows you to **name your site and add color to its perimeter and area.**

Reduce the opacity of the 'Area' (Refer to the settings in the image for a translucent overlay with bold borders)



6. **Download your saved site** by clicking the tab with your site name in the 'Places' bar and selecting 'Save Place As'. You will be able to save the area as a KMZ file. If you utilize Google Classroom or Canvas, you can use that platform to share the KMZ file with your students.

7. **Download the file onto your students' computers.** Students only need to click on the file to open the software (as long as Google Earth Pro has already been installed on their devices) and populate the site onto their map.

Instructions: Guiding Students Through a Digital Site Visit

Note: Steps that require students to use their worksheets have an **asterisk (*)**.

Suggestion: Project the *Instructions Guide* on the screen and perform a walk-through of the steps.

1. **Have your students open the KMZ file** and allow Google Earth Pro to populate the shaded region of space onto their maps.

Guiding Question

- What are some features of a vacant plot we may want to know if we plan to develop a community space on it?

2. Have students click the clock icon in the top toolbar to bring the map up to date.
3. *Have students identify the address of the vacant plot.
4. Instruct students to right-click on the highlighted left-hand bar to generate a small menu, and select '**Properties**' (near the bottom).
5. *Select '**Measurements**' and record displayed values for perimeter and area. We recommend that students select meters as their unit of measurement.
6. In the uppermost left-hand corner of their screen, students should select the '**Tools**' tab and then '**Ruler**'.
 - a. *Suggestion*: We recommend students change units to meters. If students are working with a square-shaped site, like the one in our example, have them simply measure length and width. If the shape is more complex, have them split the land into separate, easier shapes, and use other measuring tools to obtain more detailed information about the length of each side.
7. *Have students record their measurements.
8. Have students drop down into street view mode. Students should move up and down the roads passing the site and note features of interest. Examples: Does the area have lots of tree cover? Are the sidewalks outlining the land accessible to people with disabilities?
9. *Have students make qualitative observations of the site.
10. Have students zoom back out to get a bird's eye view of their site. Some features to consider identifying: Are there bike lanes nearby? Are there transit routes nearby?
11. *Have students note down all qualitative observations about their site.

Instructions - Guiding Students Through Community Research

The following portion of the activity requires students to use federal and regional databases (available in the “Links for Web Search” section).

Note: Two databases are California-specific. They are maps of disadvantaged communities highlighting environmental burdens across California.

Social and environmental justice (EJ) are important to consider when designing a community space. Using these resources is optional, but we strongly recommend incorporating EJ into the activity.

If you are not in California, many other states have similar tools, such as the [Colorado Disadvantaged Communities Map](#) or the [Michigan Environmental Justice Screen](#).

TIP: Search for “(state) disadvantaged communities map” or “(state) enviro screen” to see if your state has an equivalent resource.

Activity Instructions:

1. Instruct students to open the [ISLR Map of Community Compost Centers](#). Turn on filters under “Community Composters” and **find the nearest composting operation to your vacant plot**.
 - a. *Guiding Questions:*
 - i. How close is the nearest compost center to your site?
 - ii. Based on its location on the map, what community do you think it serves?
 - iii. Is the center active?
2. Next, have students access the [MLA Language Map](#). Click on the location of your vacant plot. **Write the top three languages spoken in the community.**
3. Next, students should access [Census Bureau Data](#). This web tool contains many different types of data. Refer to the following steps.

Explore Census Data

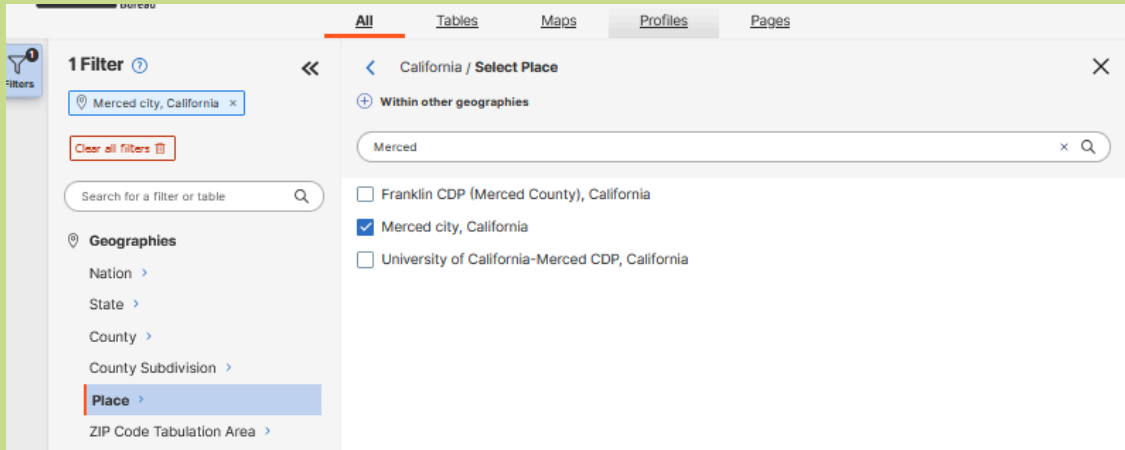
Learn about America's People, Places, and Economy

Find Tables, Maps, and more...

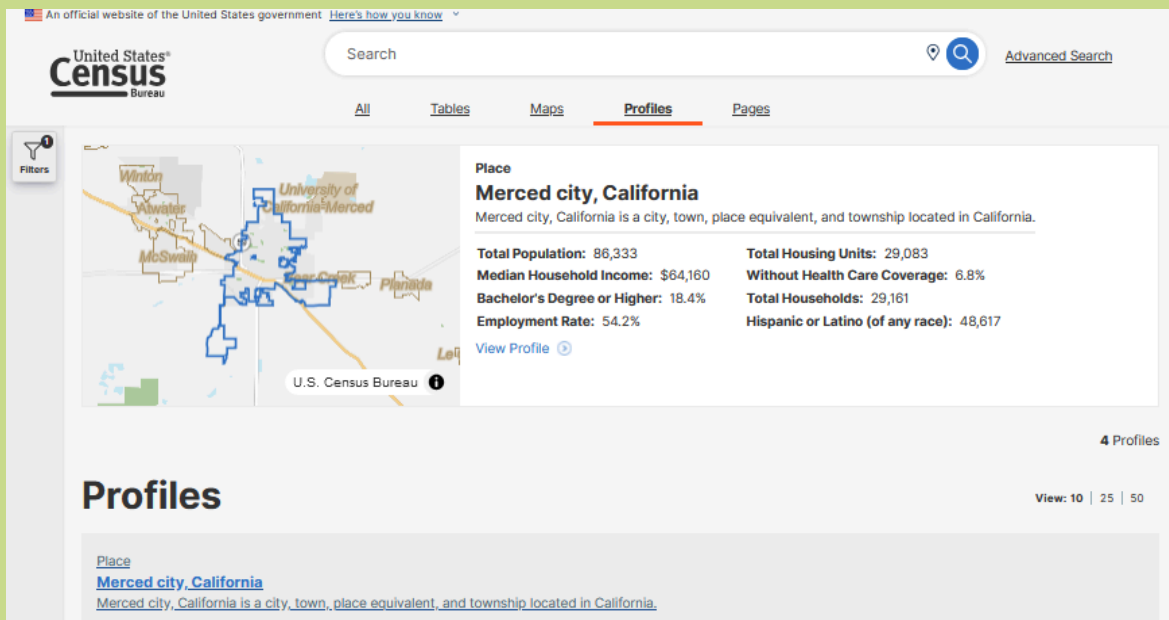


[Help](#) [Feedback](#) [Advanced Search](#)

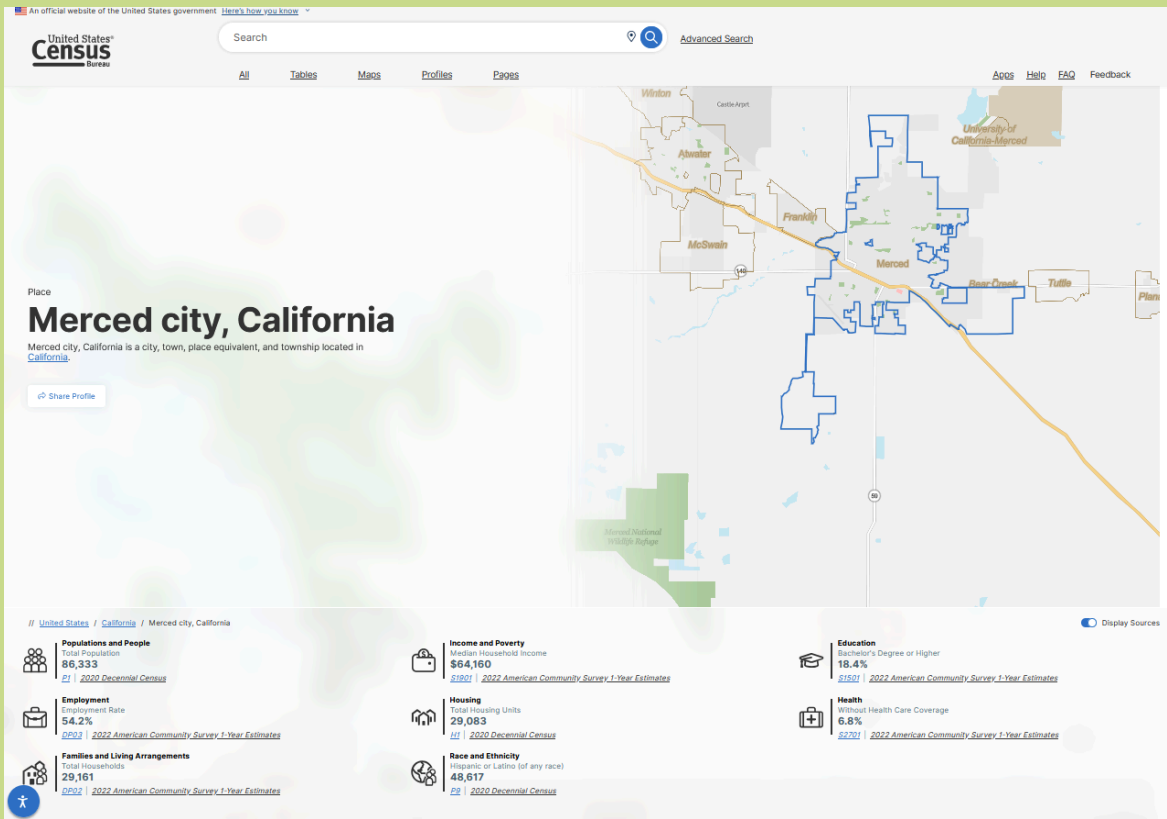
1. Select '**Advanced Search.**' To locate your community, use the filters in the left-hand bar, under "Geographies." When you selected a community for this activity, you used city boundaries, county subdivisions, census tracts, etc.



2. In our example, we defined the community surrounding our site as the City of Merced. We selected **Place >>> California >>> Merced city, California.**

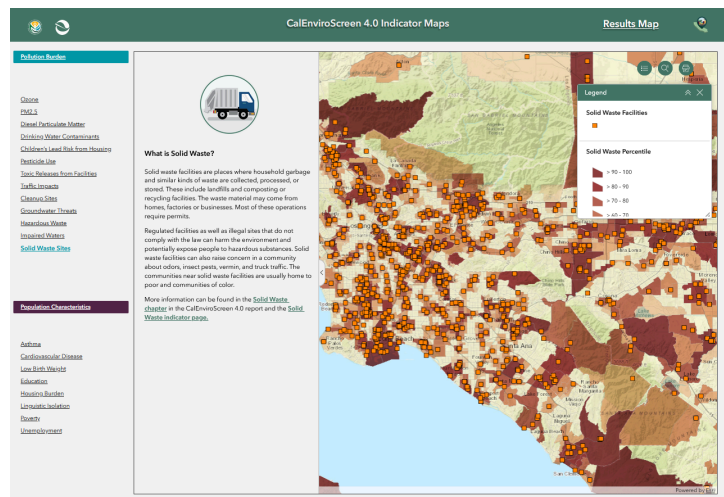


3. Select **'Profiles'** and click on the name of your city. You should get to a page that looks like the one below.

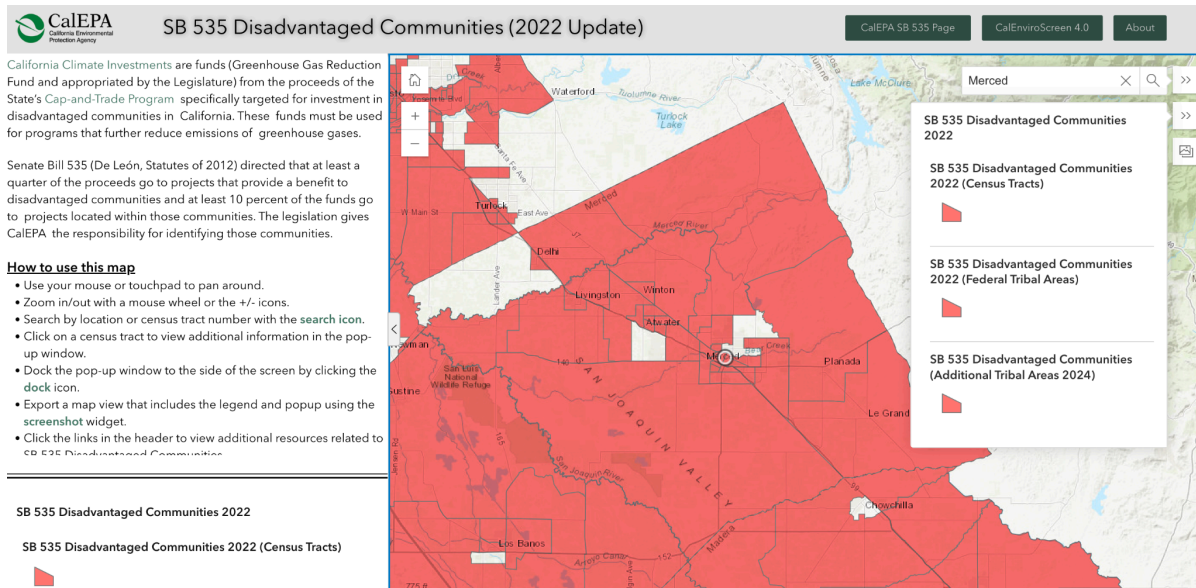


Once the "Profile" page has been opened, allow students to explore the web page and collect two pieces of information of their choosing they think would be helpful to know as they plan their composting center.

4. Have students access the link [CalEnviroScreen 4.0 Indicator Maps](#). Select **'Solid Waste Sites'** and determine if your vacant lot is in an area that faces environmental burdens because of nearby solid waste sites. *Which percentile does it fall within?*



5. Have students access [SB 535 Disadvantaged Communities 2022 \(arcgis.com\)](https://arcgis.com) to determine whether or not the vacant plot sits within a disadvantaged community.
 - a. Students can navigate the map or use the search box in the top right-hand corner to find their city.



Supplemental Materials - [Links for Web Search](#)

Links for Creating a Community Profile

1. Use the [ISLR Composting Hub map](#) to view where the nearest community composting center is to your vacant plot
2. The [MLA Language Map](#) is useful to identify the most commonly spoken languages in a region.
3. The [US Census Bureau](#) collects socioeconomic data from millions of Americans every ten years.

California-Specific Links

4. The [CalEnviroScreen 4.0 Indicator Maps](#) contain data about environmental burdens in CA communities.
5. The [SB 535 Disadvantaged Communities 2022 \(arcgis.com\)](https://arcgis.com) map shows environmentally disadvantaged communities in the state.