Tools needed:
QGIS
Software to manage .xls and .csv (e.g., Excel, Numbers)

Data needed:

- Data from Carbon Mapper Data Portal or API (see steps below)
- Climate Trace Waste Inventory
    1. Access: https://climatetrace.org/data, download Solid Waste CSV
    2. Once downloaded, filter to gas=CH4, start_time=2022
- World State Boundaries
    1. Access: https://gadm.org/data.html, download global or for a specific country
- World Cities
    1. Access: https://hub.arcgis.com/datasets/esri::world-cities/about, download desired format - I used CSV)

Steps:

1. Get Carbon Mapper data.
    a. If using the API, here is an example API call for CM sources data: *https://api.carbonmapper.org/api/v1/catalog/sources.geojson?sectors=6A&plume_gas=CH4&instrument=emi&status=published&minpoints=1&eps=500*
    b. If not using the API:
        i. Go to https://data.carbonmapper.org/
        ii. Using the filter tools, filter for "Solid Waste" as the Sector, "NASA EMIT" and "Planet Tanager" for the instruments, and set Plume Cluster Distance to 1000 meters.
        iii. Go to "Downloads" and in "Source Download", download the "Filtered Sources".
2. Clean up the inventory data.
    a. Open Climate Trace "solid-waste-disposal_emissions_sources.csv" and filter to gas=CH4, start_time=2022. Save as new csv.
    b. Open the .xls file downloaded from FLIGHT and delete the top rows above the column headers (probably the first 4 rows). Save (Excel) or "export" (Numbers) as a .csv file.
3. Load data into QGIS
    a. Open QGIS
    b. Load: State Boundaries, World Cities, Carbon Mapper Sources, and Climate Trace (filtered)
        i. For shapefiles use: "Layer>Add Layer>Add Vector Layer"
        ii. For .csv files use: "Layer>Add Layer>Add Delimited Text Layer"
            1. Ensure that it shows the "X field" as LONGITUDE and "Y field" as LATITUDE.
4. Match Carbon Mapper sources to site and jurisdiction data.
    a. Assign Jurisdiction:

i. “Vector>Data Management>Join by Location”. Select first dataset as Carbon Mapper Sources and then second dataset as GADM_ADM!_States, Leave default settings
    1. From GADM_ADM!_States you can use the attributes “GID_0”, “COUNTRY”, “NAME_1”,”ENGTYPE_1”, and ”ISO_1” to help differentiate between countries and sub-national jurisdictions.
    2. This new layer that combines the sources and jurisdiction will be called “Joined Layer”. Rename this layer “Sources Layer”.

b. Assign Major city:
    i. In “Processing” menu, select “Toolbox” and search for “Join attributes by nearest”
        1. Select the first dataset as our new “Sources Layer” from Step 4a and the second dataset as World Cities
        2. Set maximum distance allowance to 0.5 degrees (~50 km)
            a. From the World Cities you can use “X”, “Y”, “CITY_NAME”, and ”POP”
        3. This new layer that combines the sources and cities will be called “Joined Layer”. Rename this layer “Sources with Cities Layer”.

c. Assign inventory facility:
    i. Similar to Step 4b, in use the “Join attributes by nearest” function.
        1. Select the first dataset as our new “Sources with Cities Layer” and the second dataset as the Climate Trace inventory.
        2. Set maximum distance allowance to 0.05 degrees (~5km)
        3. This new layer that combines the sources and inventory data will be called “Joined Layer”. Rename this layer “Sources Final”.