Supplemental Material

Supplemental Tables

Vance-Chalcraft, H.D. et al. Social justice, community engagement, and undergraduate STEM education: Participatory science as a teaching tool

Table S1. List of crowdsourced databases, platforms, and portals with data relevant to social justice. This list is not meant to be exhaustive, but to provide examples of participatory data sources that can be used to teach students about social justice.

Source	Relevance to Teaching about Social Justice
SciStarter, www.scistarter.org	Portal with searchable database in which projects are tagged based on various characteristics, such as alignment with United Nations Sustainable Development Goals. The SciStarter database includes projects on CitSci.org, CitizenScience.gov, and other sources.
CitSci, www.CitSci.org	Citizen science platform that hosts projects and facilitates their implementation
Anecdata, www.anecdata.org	Platform that hosts citizen science projects and facilitates their implementation
CitizenScience.gov, www.citizenscience.gov	U.S. government website providing access to a catalog of federally supported citizen science projects, a toolkit to assist with designing and maintaining projects, and a gateway to a community of practitioners

Data for Black Lives, https://d4bl.org/	Network focused on using data (including crowd-sourced information) to bring awareness to how algorithms and analysis can reflect systemic biases and reinforce discriminatory practice
Open Street Map, http://www.openstreetmap.org	Crowdsourced information about the built infrastructure and amenities
Humanitarian Open Street Map, http://www.hotosm.org	Open mapping data for disaster management, reducing risks, and contributing to the United Nations Sustainable Development Goals

Table S2. List of databases and tools with demographic or mapping data that could be synthesized with participatory data sources to evaluate the distribution of natural and built environment resources.

Source	Relevance to Teaching about Social Justice
American Community Survey from the U.S. Census Bureau, https://www.census.gov/programs-surveys/acs	Data on demographic information freely available at census tract and block group levels
Human Development Index from the United Nations, https://hdr.undp.org/data-center/human-development-index#/indicies/HDI	Data on demographic information freely available at the country level
EJScreen by the U.S. Environmental Protection Agency, https://www.epa.gov/ejscreen	Environmental justice mapping and screening tool that provides a nationally consistent dataset for combining environmental and demographic indicators for an area in the form of maps and reports.

Climate and Economic Justice Screening Tool by the Council on Environmental Quality, https://screeningtool.geoplatform.gov/en/about#3/33.47/-97.5	Interactive map that uses datasets that are indicators of burden in various categories (e.g., climate change, health, legacy pollution) to identify disadvantaged communities
PLACES data repository and interactive maps by the Center for Disease Control and Prevention, https://www.cdc.gov/places/index.html	Data related to health disparities in the U.S. with small area estimates for counties, places, census tracts, and zip codes
Mapping Inequality Project, https://dsl.richmond.edu/panorama/redlining	Free digitized versions of former Home Owners' Loan Corporation Residential Security maps (redlining maps)
Greenlink Equity Map (GEM) by Greenlink Analytics, https://www.equitymap.org/	Web application that displays social and environmental disparities across neighborhoods and cities to advance clean energy consumption and support equitable decision-making processes and policies.
EnviroAtlas by the U.S. Environmental Protection Agency, https://www.epa.gov/enviroatlas	Interactive web-based tool that provides geospatial data, easy-to-use tools, and other resources related to ecosystem services, their chemical and non-chemical stressors, and human health. Educational materials for Kindergarten - undergraduate are available on the EnviroAtlas website.

Table S3. List of training resources relevant to exploring data to conduct social justice research projects. This list is not meant to be exhaustive, but to provide examples of training programs and opportunities that can be pursued to gain a better grasp of accessing and utilizing environmental, demographic, and health data for social justice aims.

Training Resource	Description
U.S. Environmental Protection Agency EJScreen Office Hours and Training, https://www.epa.gov/ejscreen/ejscreen-office-hours-training	Periodic virtual training webinars to demonstrate how to use EJScreen and bi-monthly 'Office Hours' hosted by EPA for users of EJScreen, to provide opportunities for the public to talk with EPA EJScreen experts about many topics including how to use and apply the tool, technical issues, and any other questions
U.S. Environmental Protection Agency EnviroAtlas Training Webinars and Online Tutorials, https://www.epa.gov/enviroatlas/tutorials	Online repository of interactive tutorials (Story Map, YouTube training videos, and instructional guides)
U.S. Census Bureau Tutorials, https://www.census.gov/data/what-is-data-census-gov/guidance-for-data-users/video-tutorials.html	Online video tutorials about how to access 2020 census data in data.census.gov
Centers for Disease Control and Prevention Training Webinar – Using Geographic Information Science to Advance Health Equity and Environmental Justice, https://www.train.org/cdctrain/course/1071462/	Online training webinar that discusses the process of geovisualization, hypothesis generation, data exploration, and communication and knowledge transfer in conducting environmental justice research; provides examples of geographic information science (GIS) application in environmental justice/health equity projects

Environmental Justice Bootcamp at Columbia University Mailman School of Public Health, https://www.publichealth.columbia.edu/research/precision-prevention/environmental-justice-boot-camp-theory-and-methods-study-environmental-health-disparities	Two-day intensive course for researchers at all career stages featuring seminars and applied analytical sessions on key concepts, exposure assessment techniques, epidemiologic methods, community engagement and health policy applications, and statistical analytic approaches for conducting effective and solution-driven environmental justice research.
Harvard University T.H. Chan School of Public Health – The Public Health Disparities Geocoding Project, https://www.hsph.harvard.edu/thegeocodingproject/the-public-health-disparities-geocoding-project-2-0/	Archive of training materials (training manual, data, case study examples, and recordings of training sessions) from four-day virtual training developed in 2022 on why and how to analyze population health and health inequities in relation to census tract, county, and other georeferenced societal and environmental data
Institute for the Quantitative Study of Inclusion, Diversity, and Equity – Data4Justice Accelerator Program, https://qsideinstitute.org/data4justice-accelerator-program/	A year-long program designed to help individuals build skills that will allow them to design and execute social justice research and evaluation projects. The program includes a 7-week summer intensive phase focused on learning the basic data science skills needed to find, procure, clean, and analyze data and applying those skills to a social justice research question defined by the participant. The summer intensive is followed by ongoing engagement during the academic year.