

2026 Center for the Environment (CfE) Summer Undergraduate Research Program Training Plan

Project Title: Subsidized Housing and Extreme Heat Exposure

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Mentee: Eliana Oden, Environmental Engineering '27

Program Overview

Over the course of a 9-week summer research program, Eliana will:

- Work on a research project studying subsidized housing and extreme heat exposure
- Gain hands-on experience with secondary data collection, cleaning, and analysis
- Gain hands-on experience with academic writing
- Gain co-authorship on the academic paper(s) resulting from the project

Weekly Plan

Week 1 — Literature Review

Get familiar with existing research on subsidized housing and extreme heat exposure, starting with a foundational paper on extreme heat vulnerability among subsidized housing residents.

- At the check-in meeting: search the literature together and organize sources in a shared reference library
- To-do: write a short (~2 page) literature review synthesizing findings from the existing literature

Week 2 — Housing Database

Get familiar with a national database of subsidized housing properties.

- At the check-in meeting: review the data dictionary together, identify useful variables, and decide on cleaning steps — e.g., filtering incomplete or out-of-scope records, and creating binary indicators for subsidy type (e.g., LIHTC, Section 8, Section 202, Section 515, Public Housing), along with location and unit-count fields
- To-do: clean the housing database and produce a descriptive statistics table for the cleaned data set, including missingness

Week 3 — Measuring Extreme Heat

Explore how extreme heat is measured in the existing literature and what measurement data are available (e.g., gridded temperature data, temperature/humidity heat index, county-level heat alert records).

- At the check-in meeting: discuss available data sources and decide on the extreme heat measure to use for the project
- To-do: collect and clean the extreme heat data

Week 4 — Other Heat Vulnerability Variables

Review additional literature on heat vulnerability and social vulnerability frameworks.

- At the check-in meeting: decide on additional variables needed to capture heat vulnerability, such as air conditioning access, energy insecurity, housing quality, green space access, urban heat island effects, housing age, resident composition, and proximity to cooling centers, then identify available data sources
- To-do: collect, clean, and integrate the identified data

Week 5 — Constructing a Heat Vulnerability Index

Learn the process of Principal Component Analysis (PCA) as a method for combining multiple indicators into a single index.

- At the check-in meeting: walk through the PCA process together
- To-do: conduct the PCA analysis and construct a Heat Vulnerability Index

Week 6 — Data Visualization

Continue the data analysis and begin exploring visualization approaches (e.g., maps, charts) for presenting findings.

Week 7 — Poster Preparation

Finalize data linkage and analysis, benchmark results against comparison groups, and begin drafting the research poster.

Week 8 — Poster & Paper Draft

Refine the poster based on feedback and begin working on the academic paper draft.

Week 9 — Poster Presentation & Paper Draft

Present the research poster and continue developing the paper draft.

Post-Program

Mentors continue refining the paper draft until it is ready for submission to an academic journal, and convert the research findings into a public-facing data product.