SAS Hackathon | Fall 2024

Track 1 | Data for Good | Climate Change + Vulnerable Populations in the United States

- **Overview**
  - This SAS Hackathon 2024 Student Track focuses on visualizations and low- and no-code analysis in SAS Viya, particularly SAS Visual Analytics
  - In this track, students will explore the link between economically vulnerable populations and the geographic areas expected to be most affected by climate change.
    - Students will use data produced by the U.S. Government to examine recent county-level data for economically vulnerable populations and compare that to climate change impact estimates from the *Fifth National Climate Assessment*.
  - This track is a great starting point for those new to SAS analytics – and analytics in general.
- **Learning Objective(s)**
  - Provide an interesting use case to help students gain experience with the SAS Viya ecosystem, particularly with:
    - Geo-mapping
    - Dashboard creation
    - Exploratory data analysis
  - Given that the final output are videos posted to their SAS Communities Team page, students will practice how to distill a month's worth of work into just a few minutes. Learning how to share results succinctly – and to a general audience – is a very important part of an analyst's role.
- **More Background Information**
  - Students will produce a detailed analysis of the U.S. regions policymakers should be most concerned about, in identifying vulnerable populations likely to be disproportionately affected by climate change. Results can be shared in a dashboard – or any other medium students deem effective.
  - We provide environmental data from the *Fifth National Climate Assessment (NCA5)*. More specifically, the data provided are for the *Global Warming Projections at 3 degrees Celsius (5.4 degrees Fahrenheit)* above the pre-industrial levels measured from 1851 to 1900. Students can choose which variables in that report they deem most important to measure the adverse impacts of climate change.
    - The data were updated in April 2024.
  - Data on economic vulnerability come from the *Social Vulnerability Index (SVI)* produced by the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR). These data help public health officials and local planners better prepare for emergencies with a general goal of decreasing suffering and economic loss, while also reducing health inequalities.
   - These data were released in May 2024.

- Other data sources include:
  - Employment data from the [Local Area Unemployment Statistics](#) produced by the U.S. Bureau of Labor Statistics
  - Income and poverty estimates from the [Small Area Income and Poverty Estimates (SAIPE) Program](#), which is part of the United States Census Bureau.
  - Students are welcome to create indexes to combine several measures.
  - Finally, and not a requirement, students can add additional data from external sources if it leads to a more robust analysis.
- **Research Questions**
  - Which measures did you find most important in your analysis of the link between climate change projections and current measures of social vulnerability?
  - What methodology did you use to determine which counties policy makers should be most concerned about in terms of economically vulnerable populations and climate change predictions later in this century? And why did you choose this methodology?
  - Which 50 U.S. counties are you most concerned about? And why?
  - Finally, what other factors should policymakers consider based on your analysis?
- **Output**
  - As part of the SAS Hackathon, the final output for submissions are videos submitted to the Team profile page.
  - In both videos, students should share which measure(s) they found most important, and chose, to evaluate economic vulnerability and the adverse impacts of climate change – and to answer the research questions outlined above.
    - Please briefly share your methodological approach to support your assertions.
  - Beyond creating maps of relationships between economic vulnerability and climate change predictions, the final output should include a list of the *top 50 most vulnerable counties in the U.S.* – as well as analyses supporting why those counties were chosen.
- **Helpful Hints**
  - When it's time to start the data analysis – ensure that you understand the data before jumping right into the analysis. You can/should:
    - Check the government sites listed above to better understand the definitions of the variables.
    - Check for missing values. Ask: is the data ready for modeling – or does it need a bit more work?
  - Use the SAS Hackathon 2024: Student Track Support discussion as needed.

More Info on the Primary Data Resources
- **Fifth National Climate Assessment**
  - Helpful starting point:
    - [Fifth National Climate Assessment (globalchange.gov)](#)
    - [National Climate Assessment Interactive Atlas (globalchange.gov)](#)
  - Climate Change Example:

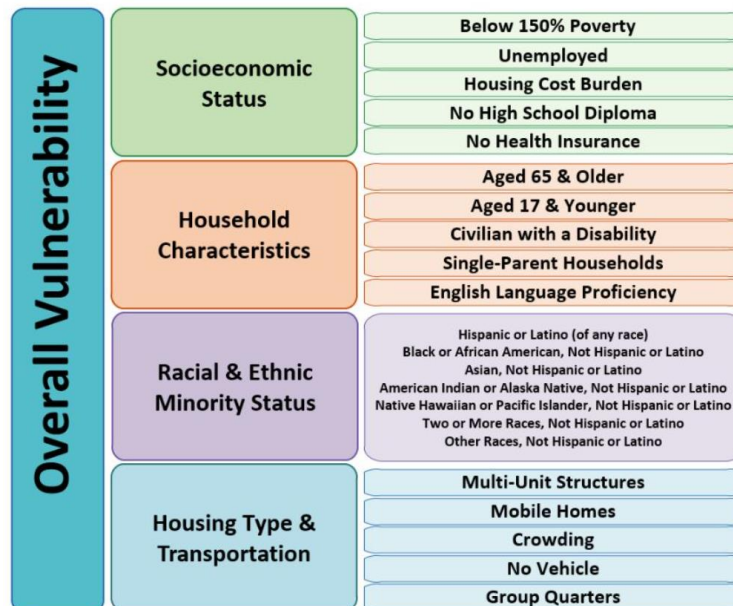- https://atlas.globalchange.gov/datasets/nationalclimate::nca5-atlas-global-warming-level-3-deg-c/about
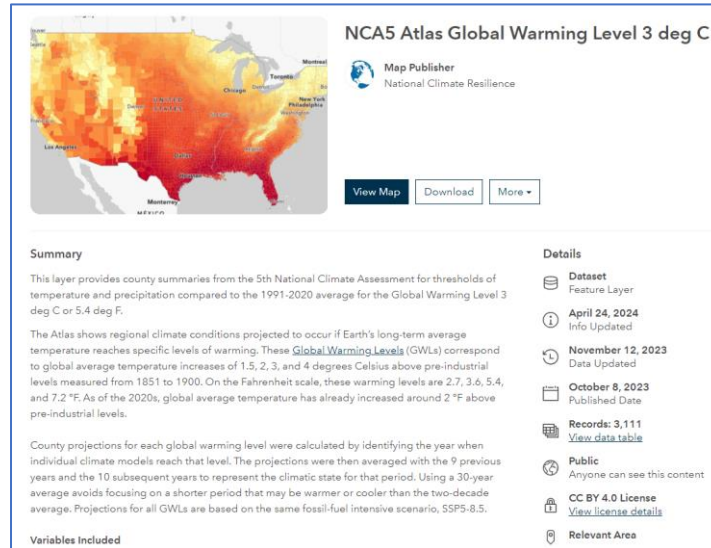
- **Social Vulnerability Index:**
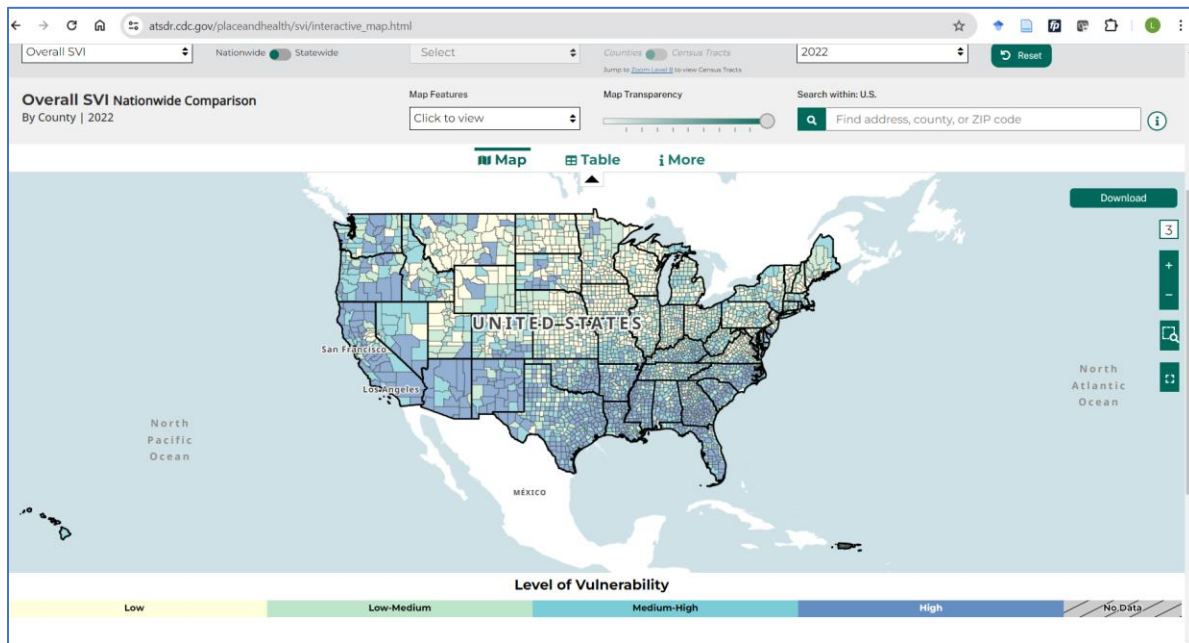 - **Helpful starting point:**
    - https://www.atsdr.cdc.gov/placeandhealth/svi/index.html
  - **Overview of the index:**

  - CDC/ATSDR Interactive Map:

Appendix: Learning Resources
- [SAS Skill Builder for Students](...) Courses
  - [Explore and Visualize: Getting Started](...)
  - [Mapping and Esri Integration on the SAS® Viya® Platform](...)
- [SAS Hackathon Enablement Week](...) Recordings
  - [Welcome to SAS Viya Week + Overview of SAS Viya Ecosystem](...)
  - [Data Discovery, Part 1: Starting Your Analysis in SAS Visual Analytics](...)
  - [Encore, Part 1: Ethical Data Analysis](...)