North Carolina Assessment - Source & Methodology

Economic Stability

Income - Median Family Income

Data Background

The American Community Survey (ACS) is a nationwide survey designed to provide communities with reliable and timely social, economic, housing, and demographic data every year. The ACS has an annual sample size of about 3.5 million addresses, with survey information collected nearly every day of the year. Data are pooled across a calendar year to produce estimates for that year. As a result, ACS estimates reflect data that have been collected over a period of time rather than for a single point in time as in the decennial census, which is conducted every 10 years and provides population counts as of April 1. The Census Bureau combines 5 consecutive years of ACS data to produce estimates for geographic areas with fewer than 65,000 residents. These 5-year estimates represent data collected over a period of 60 months. Because the ACS is based on a sample, rather than all housing units and people, ACS estimates have a degree of uncertainty associated with them, called sampling error. In general, the larger the sample, the smaller the level of sampling error. Data users should be careful in drawing conclusions about small differences between two ACS estimates because they may not be statistically different.

Citation: U.S. Census Bureau: UNDERSTANDING AND USING AMERICAN COMMUNITY SURVEY DATA: WHAT ALL DATA USERS NEED TO KNOW (2018).

For more information about this source, including data collection methodology and definitions, refer to the American Community Survey data user's website.

Methodology

Counts of family households and families by income level are acquired from the U.S. Census Bureau's American Community Survey (ACS). Data represent estimates for the 5-year period 2019-2023. Mapped data are summarized to 2023 census tract boundaries. A family consists of a householder and one or more other people living in the same household who are related to the householder by birth, marriage*, or adoption. Family households have a minimum of two members, and thus *family* income is typically larger than *household* income. Median income figures are only available for those geographic areas reported in the ACS. Due to the nature of medians, report areas based on multiple counties or custom areas will return "no data".
For more information on the data reported in the American Community Survey, please see the complete American Community Survey 2023 Subject Definitions.

**Note: In Census Bureau tabulations, beginning in 2023, unless otherwise specified, the terms "spouse", "married couple" and "marriage" include same-sex couples and marriages.*

Notes

Race and Ethnicity
Race and ethnicity (Hispanic origin) are collected as two separate categories in the American Community Survey (ACS) based on methods established by the U.S. Office of Management and Budget (OMB) in 1997. Indicator race and ethnicity statistics are generated from self-identified survey responses. Using the OMB standard, the available race categories in the ACS are: White, Black, American Indian/Alaskan Native, Asian, and Other. An ACS survey respondent may identify as one race alone, or may choose multiple races. Respondents selecting multiple categories are racially identified as "Two or More Races". The minimum ethnicity categories are: Hispanic or Latino, and Not Hispanic or Latino. Respondents may only choose one ethnicity. All social and economic data are reported in the ACS public use files by race alone, ethnicity alone, and for the white non-Hispanic population.

Physical Environment

Climate & Health - Flood Vulnerability

Data Background

The Environmental Protection Agency or EPA is an agency of the US federal government with purpose of protecting human health and the environment. It ensures that environmental protection is an integral consideration in US policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade

Methodology

The LandScan USA Population Database provides estimated population counts at 3 arc-second (~90m) resolution for nighttime and daytime, for the continental United States, Hawaii, Alaska, and the five permanently inhabited USA territories. Residents, prisoners, workers, students, shoppers, and stay-at-home populations are modeled. These are baseline population estimates, which do not include transitory populations such as business travelers and tourists. The EPA EnviroAtlas dataset provides an estimate of the 100-year floodplain for the conterminous United States at 30-meter resolution to fill the gaps in the FIRM. The model hit rate for the CONUS was 0.79 compared to the FIRM, indicating that the model captured 79% of the 100-year floodplain identified by FEMA. The intersection of the population raster and flood hazard raster was summarized for each county within the continental U.S to estimate the population living within flood hazard areas.

Climate & Health - High Heat Index Days (Relative)

Data Background

Since 2002, the CDC National Environmental Public Health Tracking Network (Tracking Network) brings together health data and environment data from national, state, and city sources and provides supporting information to make the data easier to understand. The Tracking Network has data and information on environments and hazards, health effects, and population health.

Measures of the Historical Temperature & Heat Index include

1. Number of Extreme Heat Days (as reported in this indicator report)
2. Dates of Extreme Heat Days
3. Number of Extreme Heat Events
4. Dates of Extreme Heat Events
5. Daily Estimates of Maximum Temperature for Summer Months (May-September)
6. Daily Estimates of Maximum Heat Index for Summer Months (May–September)
7. Weekly Average Maximum Temperature

Data for the first six measures are obtained from the Forcing File A of Phase Two of the North American Land Data Assimilation System (NLDAS-2) (1979-ongoing), and are available for all states except Alaska and Hawaii. For the last measure - Weekly Average Maximum Temperature, data are obtained from the Gridded 5km GHCN – Daily Temperature and Precipitation Dataset (nCLIMGRID) - Gridded 5km GHCN-Daily Temperature and Precipitation Dataset, Version 1 (noaa.gov) (2017-ongoing). For more information please check out the Tracking Network's indicator page for Historical Temperature & Heat Index.

Methodology

Heat index data are obtained from the CDC Environmental Public Health Tracking division. The CDC provides the following information about the underlying data and calculation:

The heat measures are derived from estimates of air temperature (K) at 2 meters above the surface, specific humidity (kg/kg) at 2 meters above the surface, and surface pressure (Pa) from Forcing File A of Phase 2 of the North American Land Data Assimilation System (NLDAS-2). NLDAS-2 is available at the 1/8th-degree grid (approximately 14x14 km) and consists of 103,936 grid cells that cover the entire United States, excluding Alaska and Hawaii.

The gridded raw data were summarized to the U.S. county or census tract level to aid in estimating population exposure to high temperature and heat index conditions and to enable linkage with health-related datasets. To accomplish this, U.S. census block group centroids were attributed to individual NLDAS grid cells based on a containment relationship. Maximum daily temperature and heat index were determined for each block group by identifying the maximum hourly value for each

day. Using census block group population as weights, population-weighted averages by U.S. county and census tract were calculated.

Heat index was estimated using a modified version of the Rothfusz regression as implemented by the National Weather Service [1]. Relative humidity (needed for heat index calculation) was calculated from specific humidity data acquired from NLDAS-2 using the Wexler saturated water vapor pressure equation [2].

The 90th, 95th, 98th, and 99th percentile values of the daily heat metrics were determined for each county and census tract for the period between 1979 and 2021 (May – September values only). Extreme heat days are classified according to the following thresholds: (1) absolute (e.g., 90°F, 95°F, 100°F, 105°F) and (2) relative (e.g., 90th, 95th, 98th, and 99th percentile) values.

References:
1. Heat Index Equation. The National Weather Service. Last modified May 2014.https://www.wpc.ncep.noaa.gov/html/heatindex_equation.shtml
2. Cosgrove, B. A., Lohmann, D., Mitchell, K. E., Houser, P. R., Wood, E. F., Schaake, J. C., ... & Luo, L. (2003). Real-time and retrospective forcing in the North American Land Data Assimilation System (NLDAS) project. Journal of Geophysical Research: Atmospheres, 108(D22).