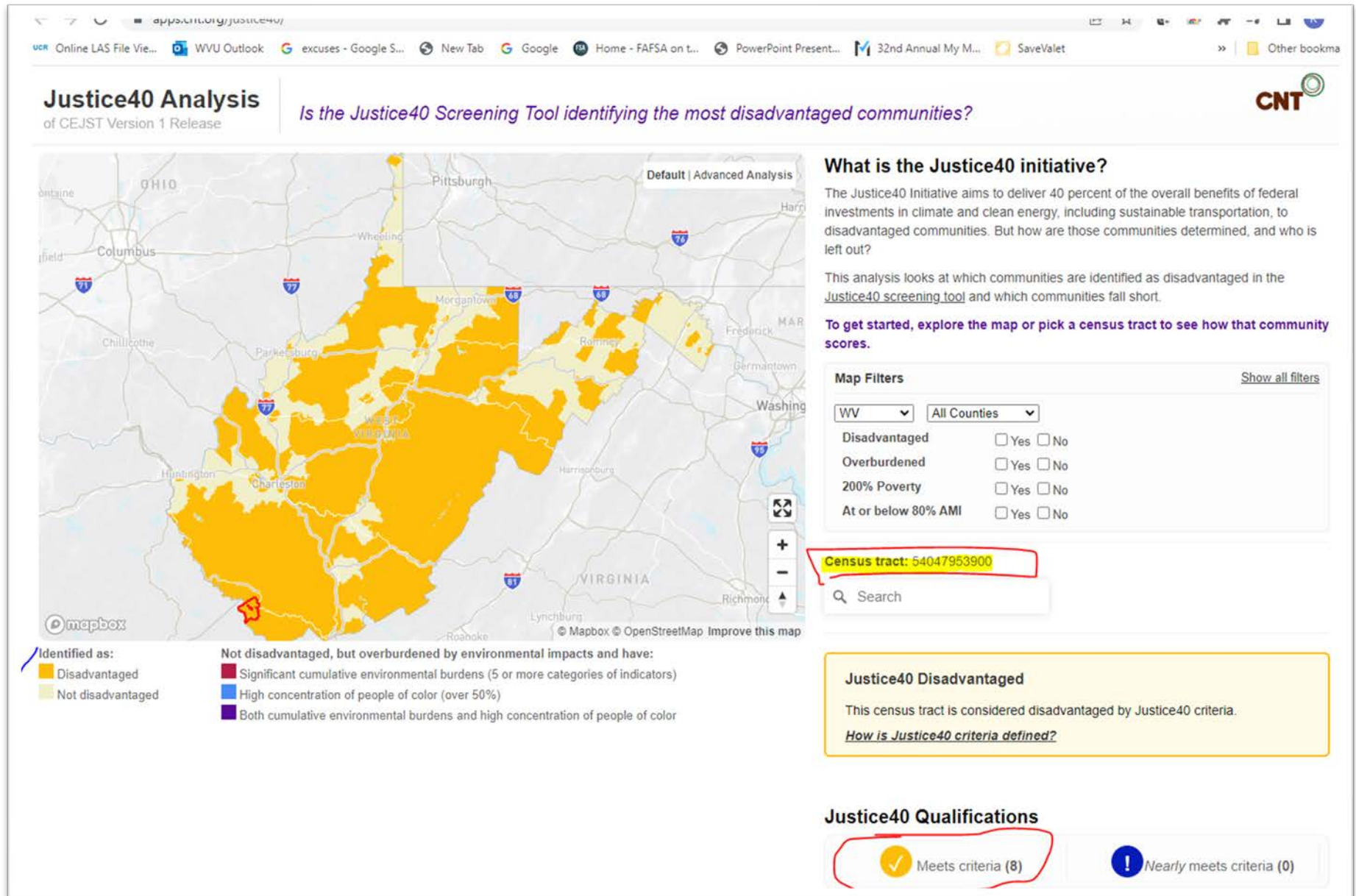


APPENDIX C: WV Equity and Climate Change Statements

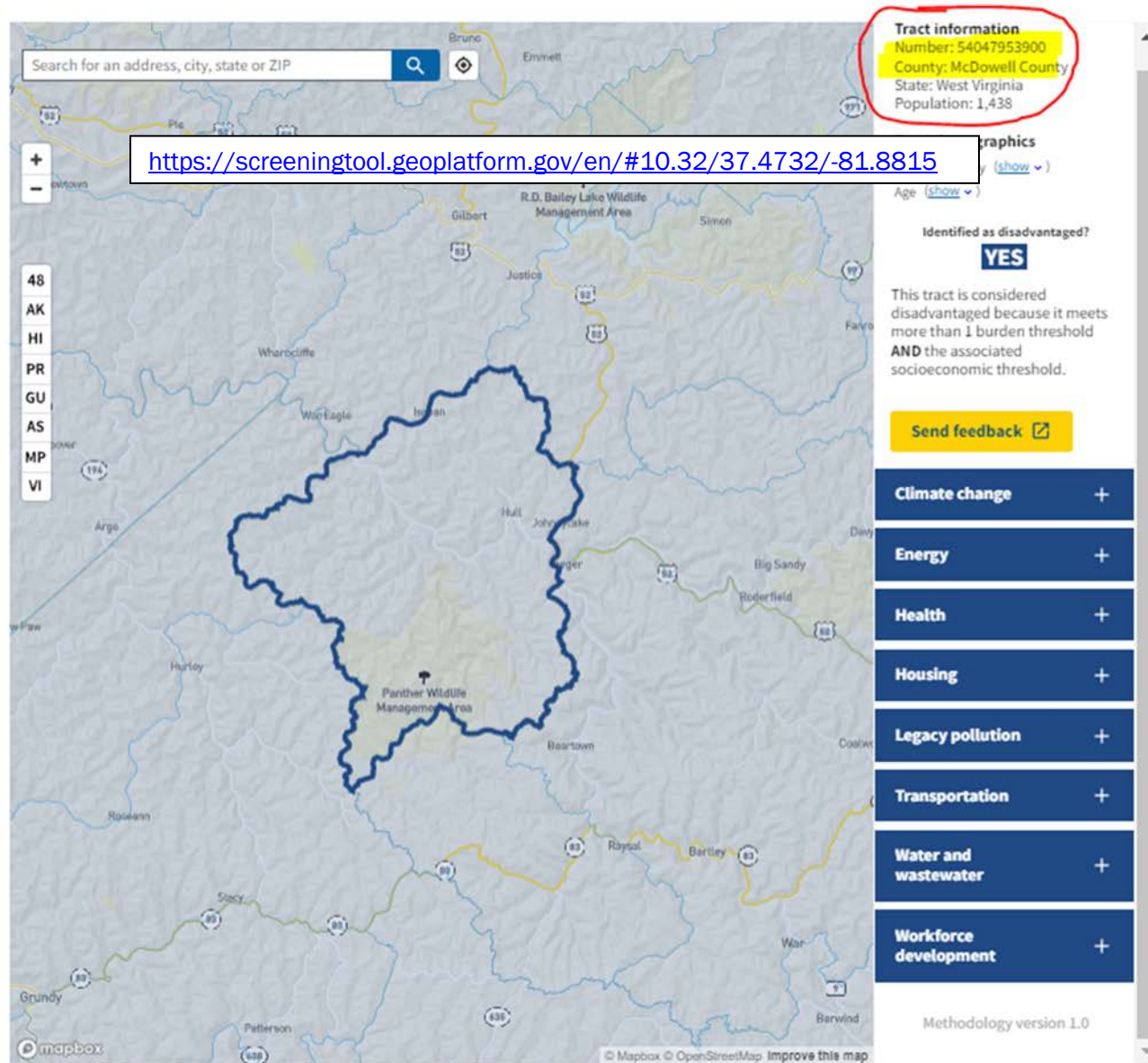
- The Climate and Economic Justice Screening Tool (CEJST) by the Council on Environmental Quality (CEQ) is an [interactive map](#) and uses datasets that are indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. The tool uses this information to identify communities that are experiencing these burdens. These are the communities that are disadvantaged because they are overburdened and underserved. The majority of census tracts in West Virginia are considered disadvantaged. [CEJST Screening Tool](#) | [Justice40 Analysis Disadvantaged](#)
- For FY 2023, The Appalachian Regional Commission released the [FY 2023 interactive map](#) of county economic status and distressed areas in Appalachia. The classification system compares each county in the region to national averages to understand how counties are performing in areas such as unemployment rate, per capita market income, and poverty rates. 18 of West Virginia's counties are labeled as "distressed," meaning that they are in the worst 10% of US counties. Another 15 counties in the state are "at risk," meaning they are in between the worst 10 to 25% of US counties. That means more than half of the state's counties are either distressed or at-risk. Over the past several years, the number of distressed counties in West Virginia has been steadily increasing. [ARC Report](#) | [Online Map](#)
- The 2020 CDC Social Vulnerability Index for West Virginia shows 14 counties with high vulnerability and 14 counties with moderate to high vulnerability. These social vulnerability factors may weaken a community's ability to prevent human suffering and financial loss in a disaster. [CDC Online Map](#).
- West Virginia ranked 1st highest in the nation for the prevalence of poor physical health, poor mental health, and activity limitations due to poor physical or mental health. Source: [WV DHHR](#).
- A 2023 Census report says that eleven counties in West Virginia are in persistent poverty. The counties are Barbour, Braxton, Clay, Fayette, Lincoln, Logan, McDowell, Mingo, Monongalia, Summers, and Webster counties. According to the detailed report, 14.4% of West Virginians live in persistent poverty census tracts, and approximately 16.8% of West Virginians are considered impoverished. The report states that areas considered to be in persistent poverty have had a poverty rate of at least 20% for more than 30 years. Based U.S. Census Bureau data from 1989 to 2019, approximately 10.6% of counties in America and 6.1% of the country's population lived in persistent poverty counties. [Census Release](#) | [Report](#) | [WV Census Tracts](#)
- West Virginia has numerous small communities in which large tracts of the jurisdiction are in the Special Flood Hazard Area and thus especially vulnerable to climate change riverine flood impacts. Many of the vulnerable communities were established in the early-20th century along narrow river valleys and steep mountainsides during the boom of coal mining and timbering extraction industries.
- In West Virginia, according to nonprofit First Street Foundation's October 2021 report titled "[The 3rd National Risk Assessment: Infrastructure on the Brink](#)," 46 percent of the roads in the state and 51 percent of the state's critical facilities — [the highest state-level figures in the Nation](#) — would be closed by flooding. Using modeling that incorporates climate change, First Street's risk assessment report quantifies the huge current and future number of critical facilities and road segments that would be shut down by an average flood.

Figure C-1. CEJST Screen Tool utilized for Mitigation COMS FY23 Projects. Most of West Virginia is “disadvantaged.”



creeningtool.geoplatform.gov/en/#10.32/37.4732/-81.8815

Figure C-2. Example of all 8 environmental, climate, and socioeconomic indicators impacted for census tract in McDowell County.



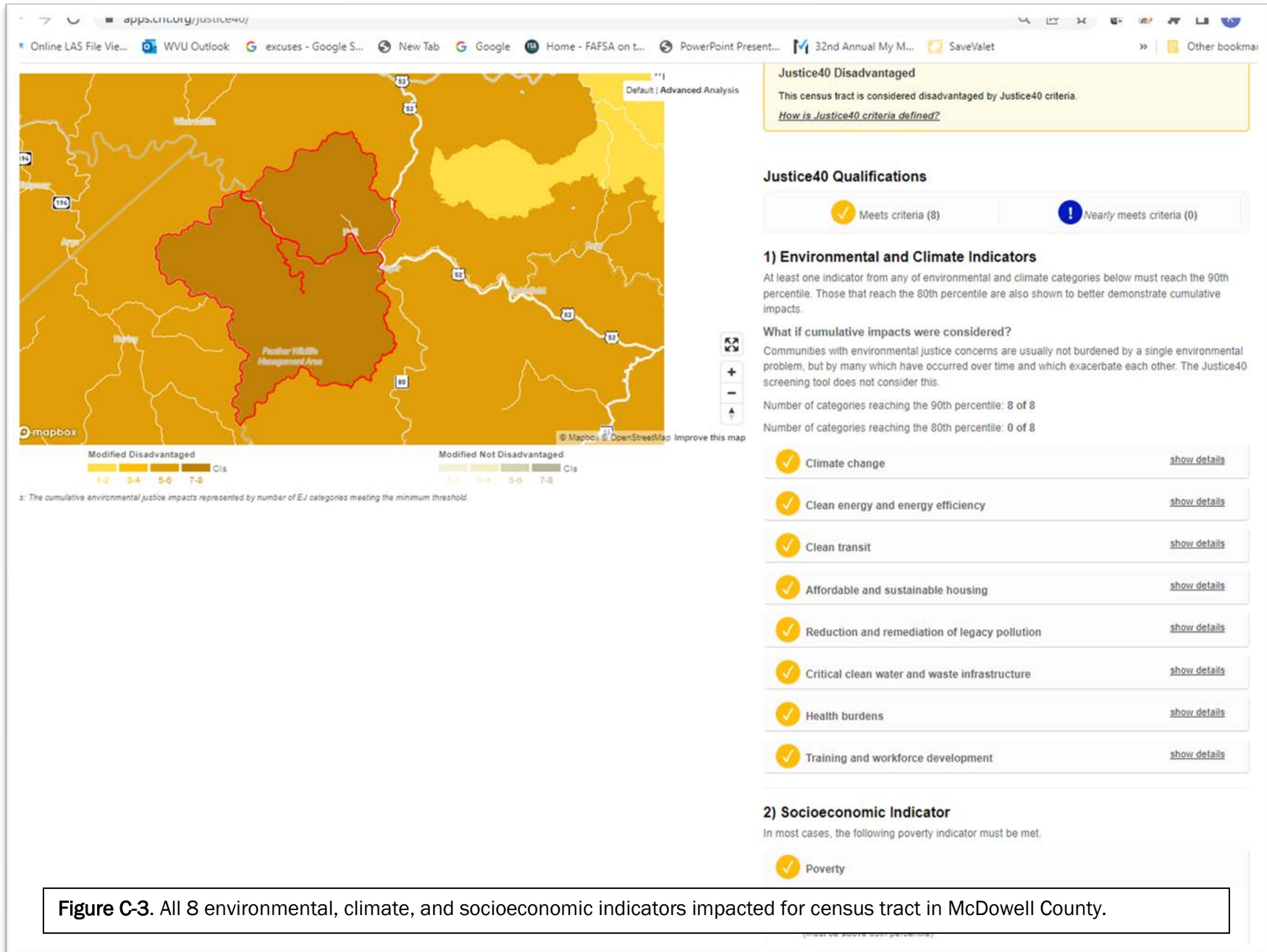
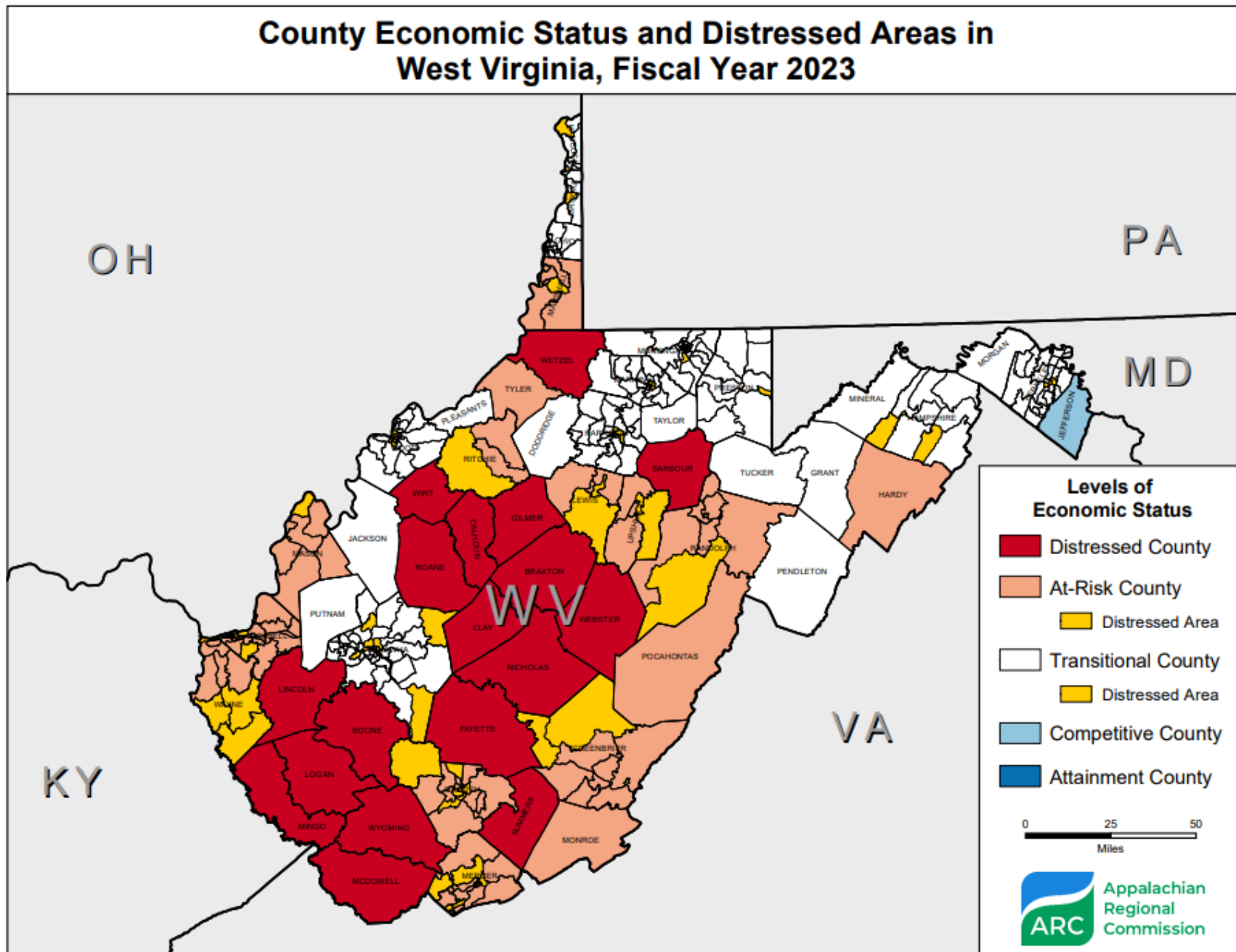


Figure C-3. All 8 environmental, climate, and socioeconomic indicators impacted for census tract in McDowell County.

Figure C-4. 2023 ARC Distressed Areas in West Virginia



- [USACE Ohio River Basin Climate Change Models](#) (Figure 1) forecast *substantial* stream flow increases for West Virginia. According to the report, watershed sub-basins located northeast, east, and south of the Ohio River are expected to experience greater precipitation and thus higher stream flows – up to 50% greater – during the period 2011-2099. See pages 15 and 16 of the report showing forecasted percent changes in Annual Mean Streamflow for three time periods: 2011-2040, 2041-2070, and 2071-2099. The potential impacts to infrastructure in these sub-basins where climate change models forecast higher stream flows is dramatic and potentially devastating.

Generally, modeling results indicate a gradual increase in annual mean temperatures between 2011 and 2040 amounting to one-half degree per decade, with greater increases between 2041 and 2099 of one full degree per decade. Hydrologic flow changes show substantial variability across the ORB through the three time periods, with Hydrologic Unit Code (HUC)-4 sub-basins located northeast, east, and south of the Ohio River expected to experience greater precipitation and thus higher stream flows—up to 50% greater—during most of the three 30-year periods. Conversely, those HUC-4s located north and west of the Ohio River are expected to experience ever-decreasing precipitation (especially during the autumn season) resulting in decreased in-stream flows—up to 50% less—during the same periods.

The potential impacts to infrastructure, energy production, and both aquatic and terrestrial ecosystems over the three 30-year time periods range from minimal in some HUC-4 sub-basins to

1

Institute for Water Resources—Responses to Climate Change Program
Ohio River Basin Pilot Study

Extract from [Ohio River Basin Climate Change](#) study in which West Virginia will experience greater precipitation and thus higher stream flows.

Institute for Water Resources—Responses to Climate Change Program
Ohio River Basin Pilot Study

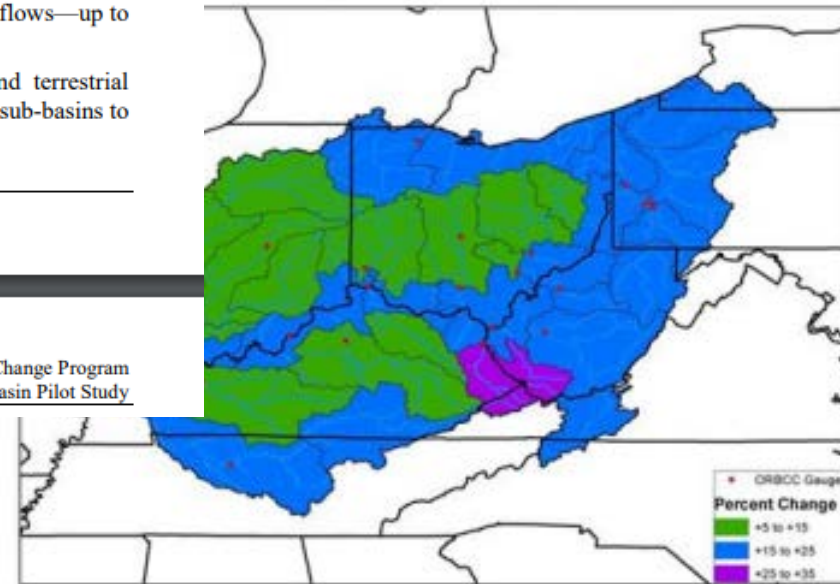


Figure 7-4: Forecasted Annual Mean Percent Change in Streamflow (2071–2099)

Figure C-5. USACE Climate Models indicate greater precipitation and higher stream flows

- A climate seminar hosted by FEMA Region 3 in July 2022 presented climate tools such as NOAA's Climate and Hazard Mitigation Planning [CHaMP](#) and [Climate Explorer](#) Tools which show historical and future climate precipitation/temperature trends. For West Virginia, recorded climate data shows that average temperatures have increased over the last 50 years for the states in FEMA Region 3 by 2.5 to 3.5 degrees Fahrenheit. The climate model projections show an increase in precipitation and temperature for both Low and High Emission futures (2022 to 2099) for West Virginia.

NOAA's Climate and Hazard Mitigation Planning (CHaMP) Tool: <https://champ.rcc-acis.org/>

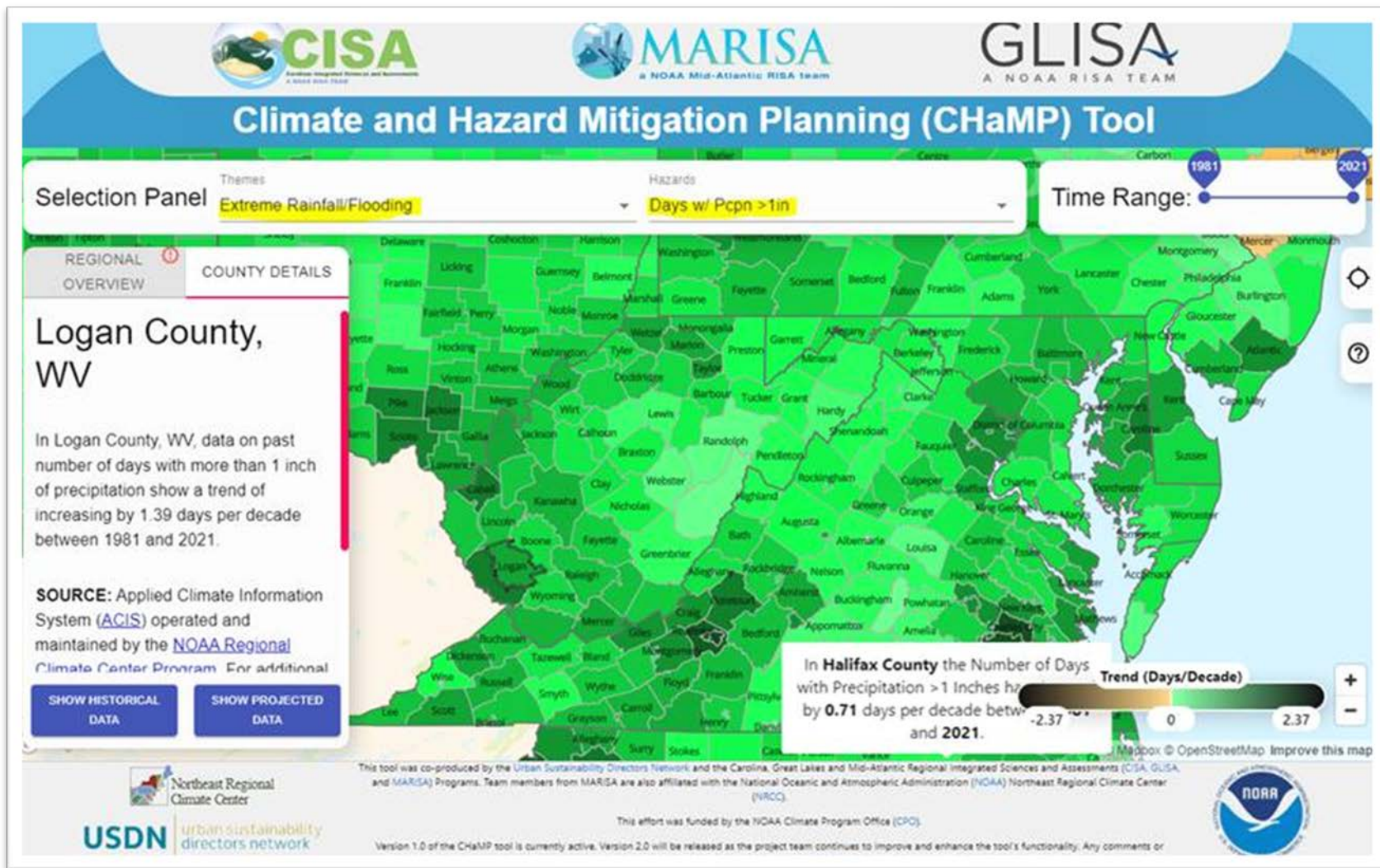


Figure C-6. NOAA's Climate and Hazard Mitigation Planning (CHaMP) Tool

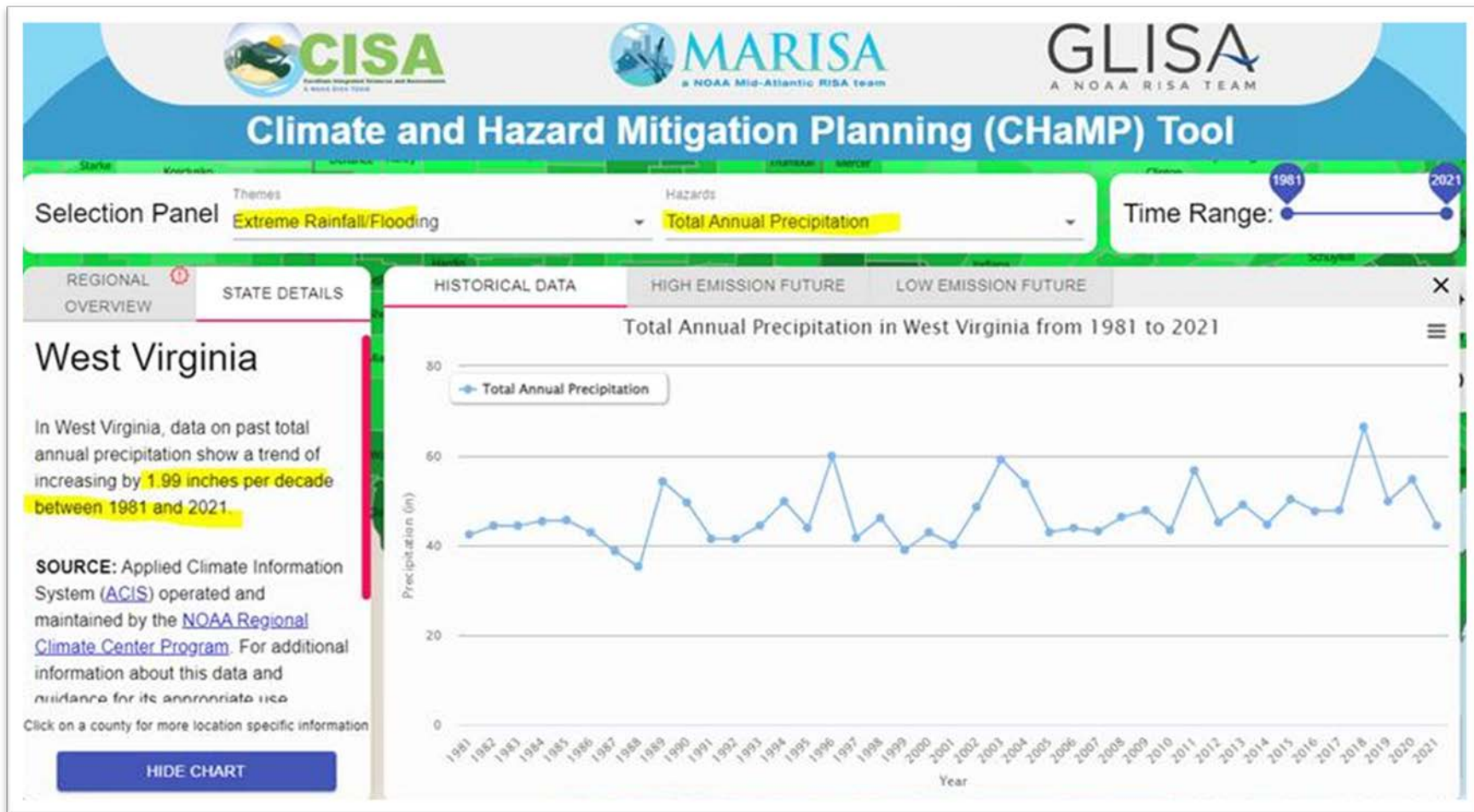


Figure C-7. NOAA's Climate and Hazard Mitigation Planning (CHaMP) Tool

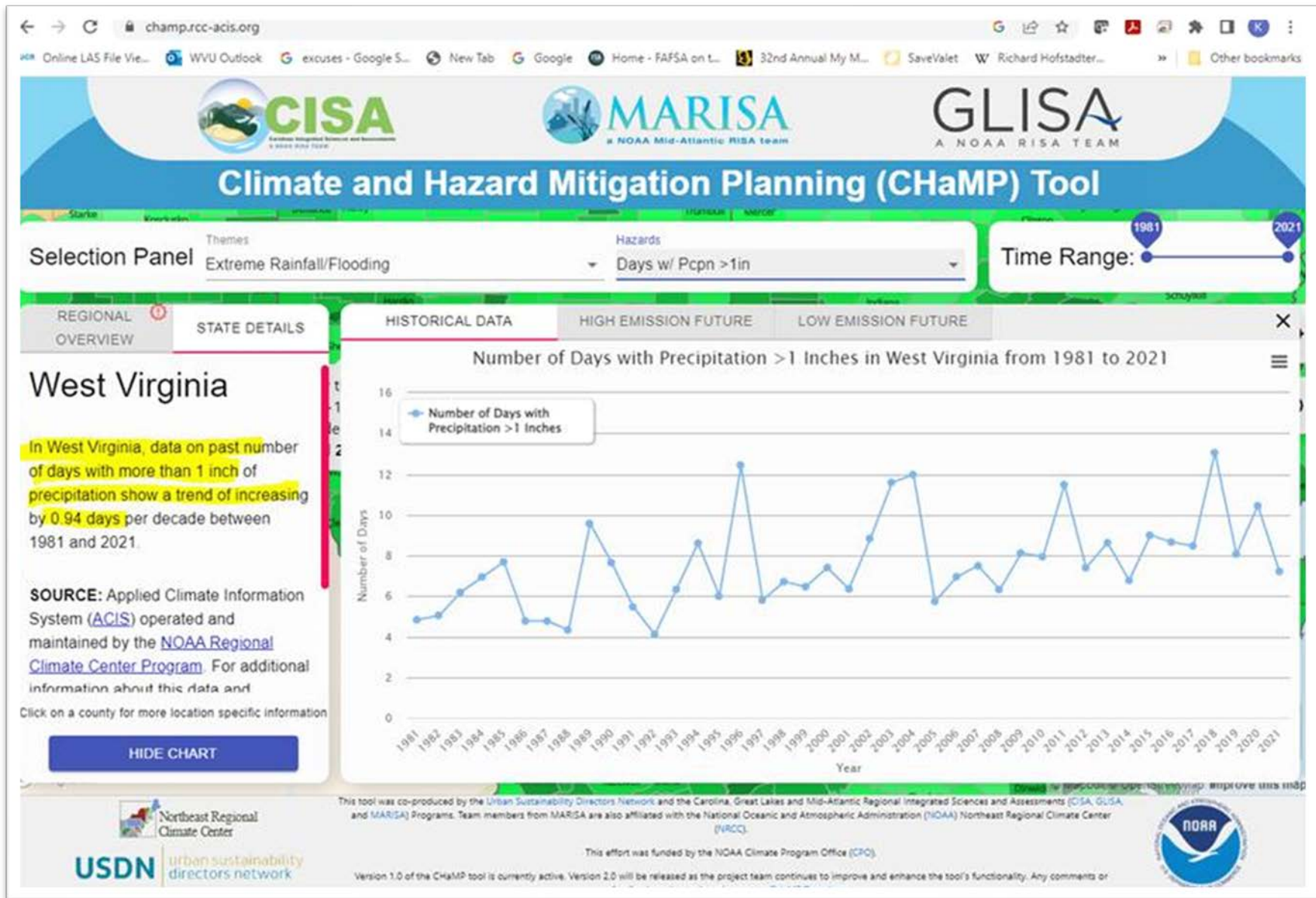


Figure C-8. NOAA’s Climate and Hazard Mitigation Planning (CHaMP) Tool

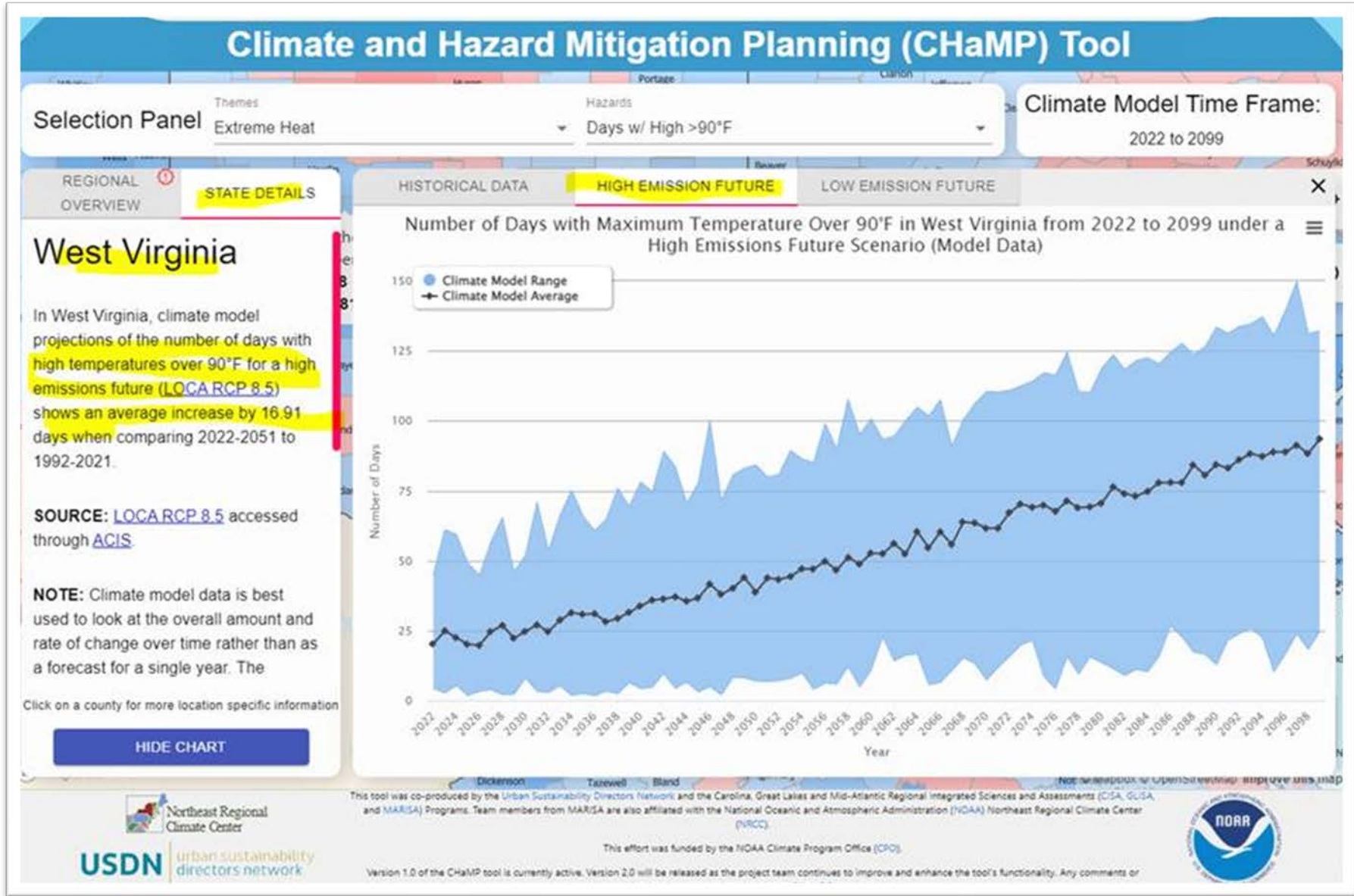


Figure C-9. NOAA's Climate and Hazard Mitigation Planning (CHaMP) Tool

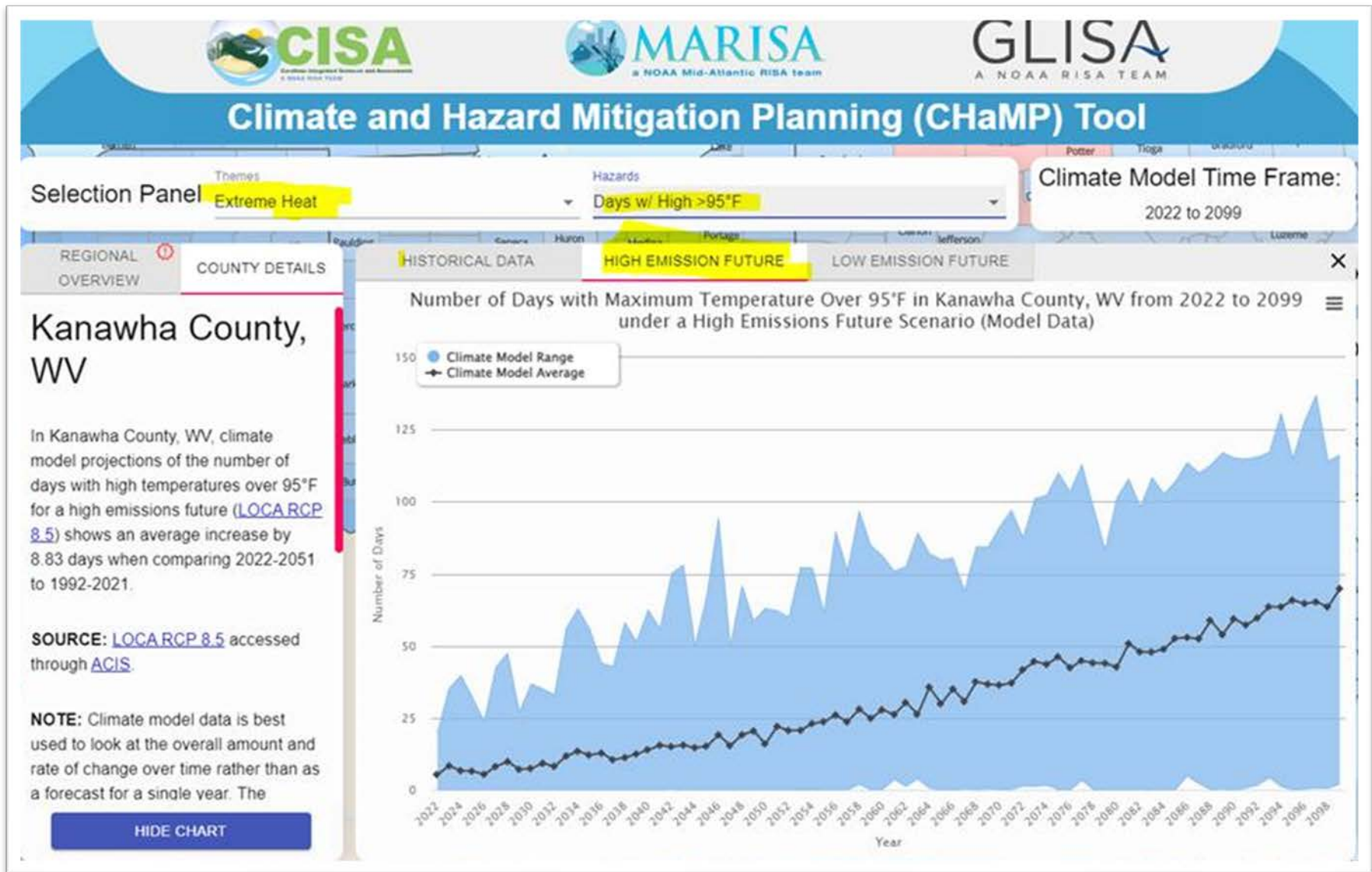


Figure C-10. NOAA’s Climate and Hazard Mitigation Planning (CHaMP) Tool

Climate Explorer Tool: <https://crt-climate-explorer.nemac.org/>

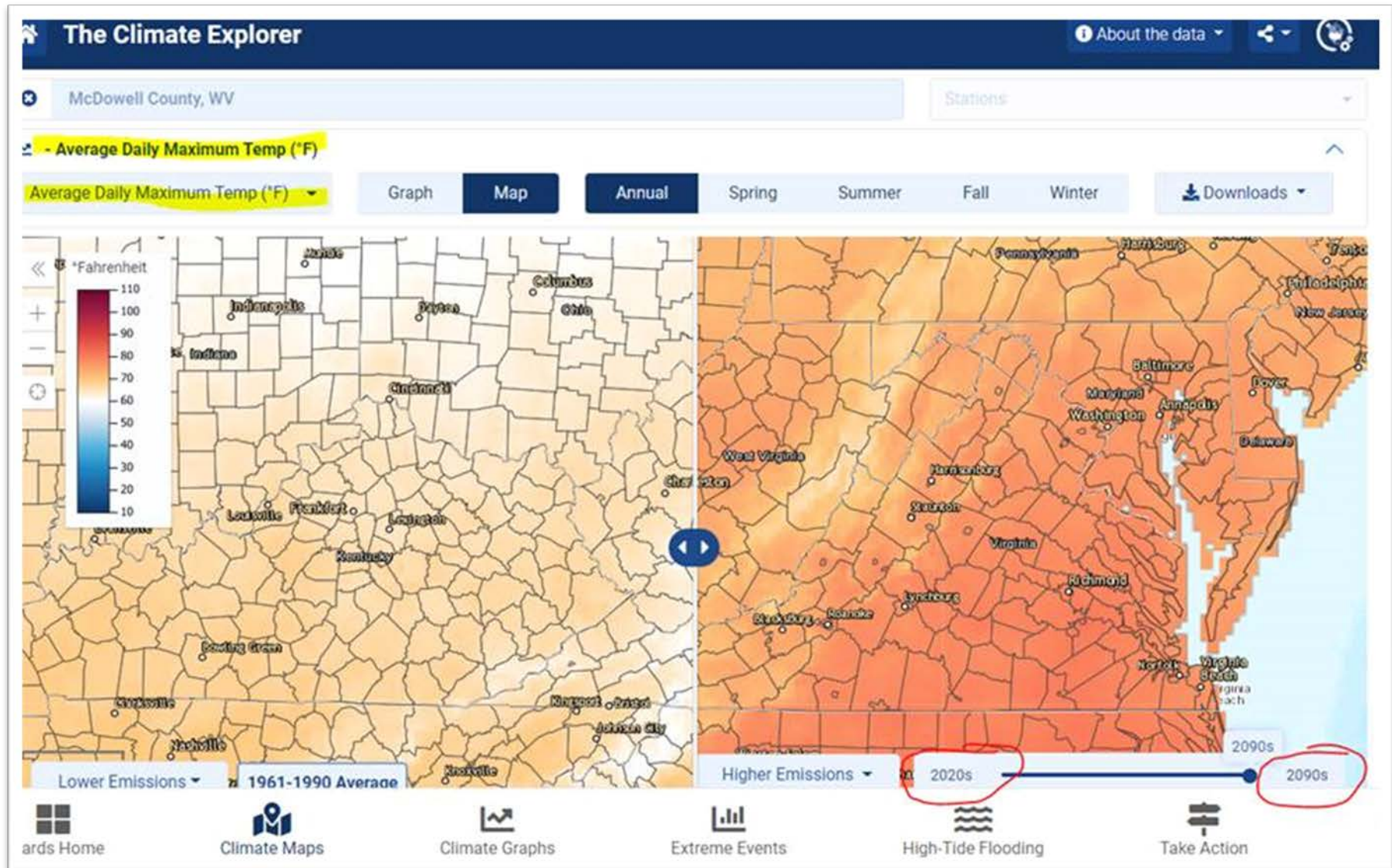


Figure C-11. NOAA's Climate Explorer Tool



Figure C-12. NOAA's Climate Explorer Tool

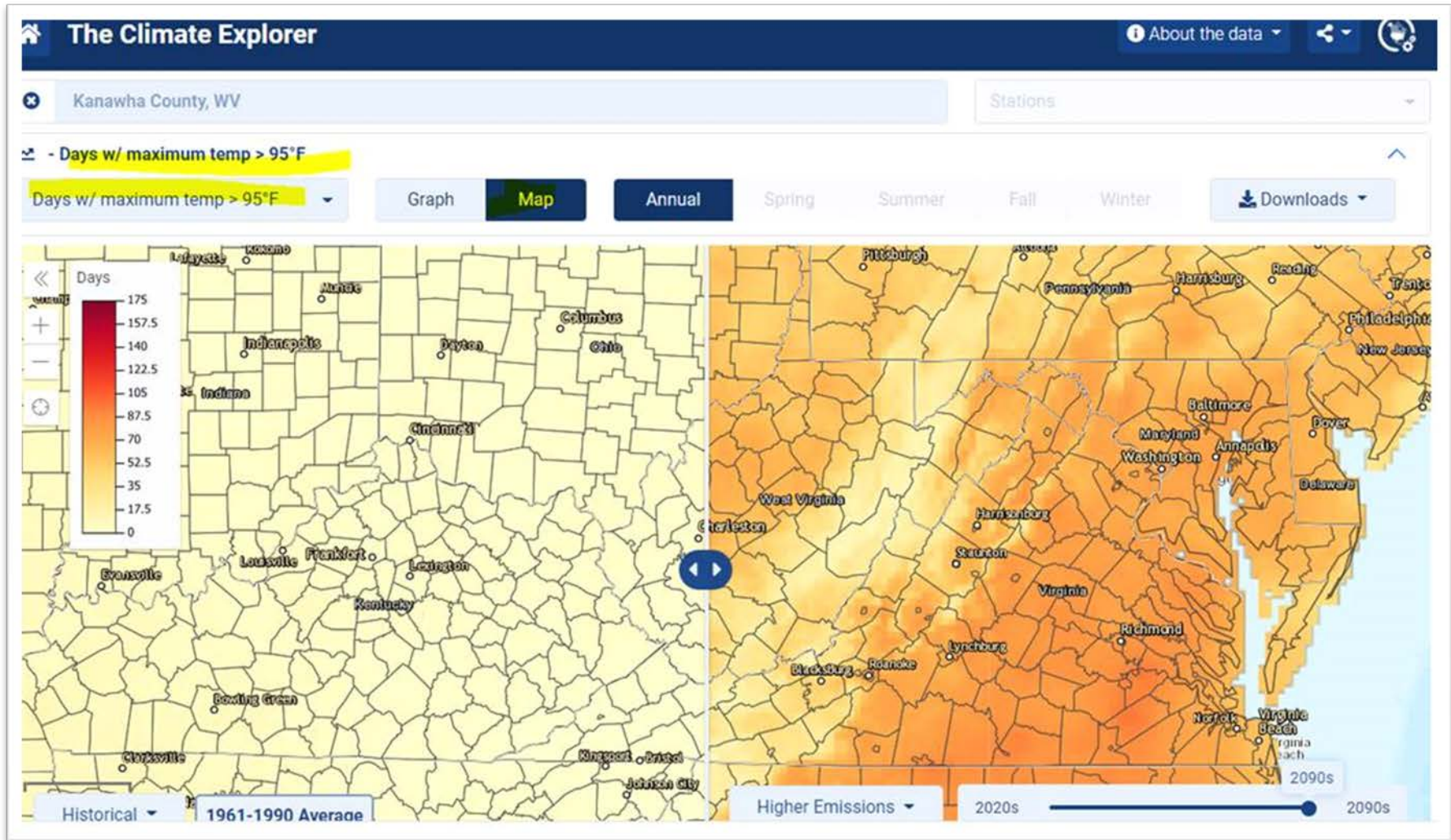


Figure C-13. NOAA's Climate Explorer Tool



Figure C-14. NOAA's Climate Explorer Tool

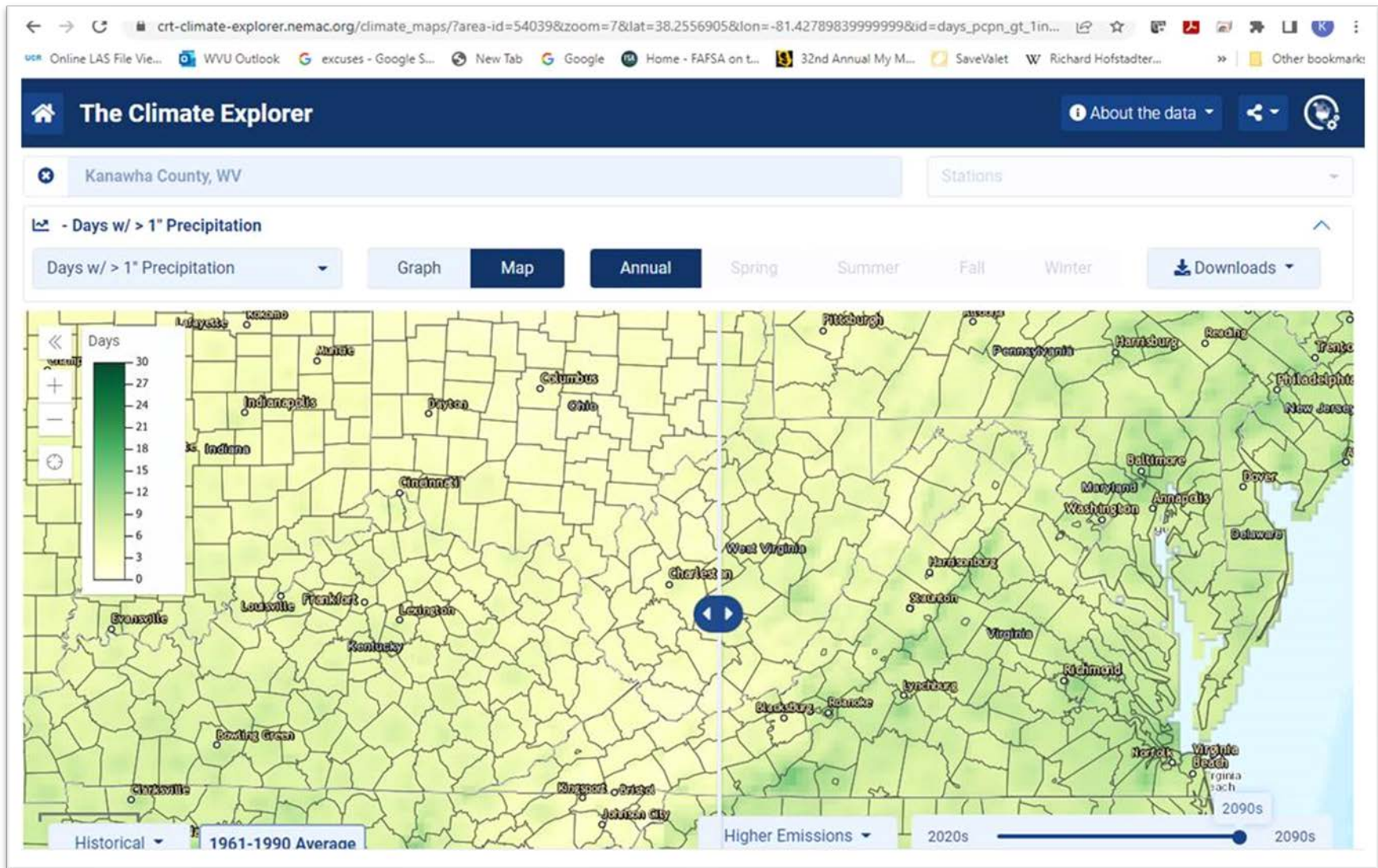


Figure C-15. NOAA's Climate Explorer Tool



Figure C-16. NOAA's Climate Explorer Tool