Climate Explorer: Tool Overview and Guidance

crt-climate-explorer.nemac.org

GLISA developed this tool guidance based on their experience as a potential user. It is intended to help other users in the Great Lakes region better understand the tool and its potential applications. For an in-depth walkthrough of how to use the tool, please see this tutorial video.

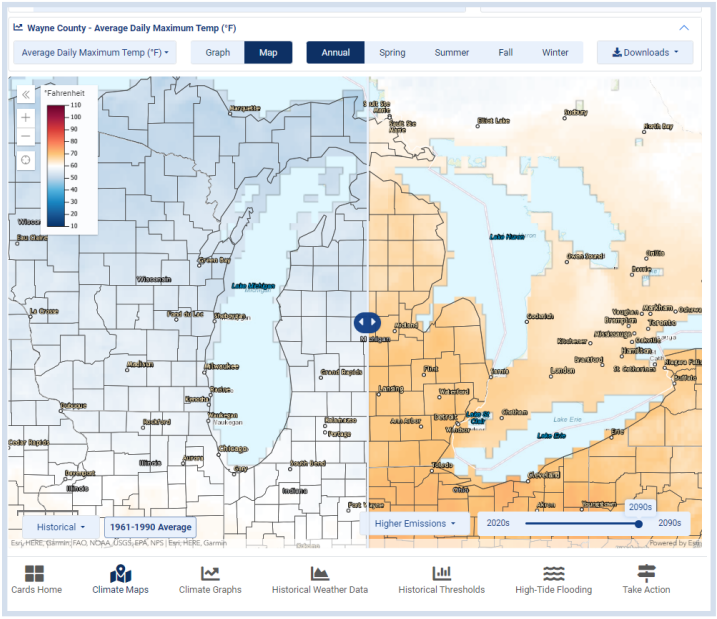
Overview

The Climate Explorer tool provides historical observations and future projections for multiple climate indicators, including temperature and precipitation. The tool's interactive maps and graphs display past and projected future climate conditions and historical weather data and thresholds.

Outputs

- Users enter a location to view climate maps and graphs for:
  - Temperature
  - Precipitation
  - Daily thresholds
  - Heating and cooling degree days
  - Growing degree days
- Comparisons can be made between historical observations and future projections, or between multiple emissions scenarios of future projections using a slider bar feature on the map.
- Custom thresholds for temperature and precipitation can be specified to view the number of days per year that a given location surpassed that threshold.
- Outputs may be viewed at the following time scales: maps (annual, seasonal); graphs (annual, monthly); and daily weather station data (user-customizable range of months or years).
- All figures and data can be downloaded for external use.
- A tutorial available within the tool may help users better understand and interpret its outputs.

Landing page of the Climate Explorer displaying multiple data options to explore for the specified location. Credit: NOAA.



Map of average daily maximum temperature from the Climate Explorer. Credit: NOAA.

Applications and Use

- **Intended audience:** Data provided by the tool may be relevant for decision-makers seeking local or regional information about projected risks, as well as to identify and understand potential vulnerabilities in their community and areas for improvement to increase resilience.
- **Background needed:** The tool does not require background knowledge or expertise to use, and is straightforward to navigate. Users simply input a given location and explore its climate conditions.
- **Example of potential uses:** A community may use the tool's maps and graphs to understand how total precipitation and heavy precipitation are projected to change from historical conditions, in order to assess the vulnerability of their infrastructure to stormwater runoff or plan future development strategies. See tutorial video for example demonstration.

Potential Limitations and Considerations

- In the Great Lakes region, the high-tide flooding output is not applicable because only tidal gauge stations in oceanic coastal locations are utilized. Coastal information relating to the Great Lakes themselves is not part of the tool.
- The tool uses future climate projections for North America that are credible for most common applications. However, models that were specifically designed for the Great Lakes region offer better representation of its regional climate. An example of climate projections developed for the Great Lakes region can be found here.
- If there are no stations in the specified county, then historical weather data may be drawn from averages of stations in nearby counties.

Data Sources

Data type	Source
Graphs and maps historical observations	National Center for Environmental Information (NCEI)
Climate model projections	Statistically downscaled climate projections for North America (LOCA)
Stations observations and climate normals	NCEI Global Historical Climatology Network Daily database
High tide flooding observations and projections	NOAA — Patterns and Projections of High-tide Flooding

More Information on the Tool

The Climate Explorer is managed by National Oceanic and Atmospheric Administration (NOAA)'s Climate Program Office, and hosted by the National Environmental Modeling and Analysis Center (NEMAC) at University of North Carolina-Asheville. The tool was first developed in 2013, and most recently updated in October 2021, by an interagency team of federal climate model experts, including NOAA, the Environmental Protection Agency, National Aeronautics and Space Administration, the U.S. Geological Survey, NEMAC, and the Northeast Regional Climate Center at Cornell University. The tool and its products are all publicly available. For questions or comments on the Climate Explorer, please contact: noaa.toolkit@noaa.gov.

This guidance document and accompanying tutorial video were developed by GLISA, NOAA's Great Lakes Climate Adaptation Partnerships (CAP, formerly RISA) team, under a project funded by Michigan Sea Grant to help make climate, weather, and coastal resilience tools more accessible to end users in the Great Lakes region. They were created for educational purposes only and are in no way affiliated with the Climate Explorer or its developers.