

Climate Change–Heat: Temperature

This metadata page provides a brief summary of this dataset. More detailed data and metadata may be available from the Louisiana Department of Health (LDH) Environmental Public Health Tracking Program and the CDC Tracking Program. Please refer to the contact information on the last page under ‘Questions?’

Definitions

Absolute Threshold. The lowest temperature that can be detected.

Extreme Heat. Extreme heat for Louisiana can be defined as a maximum daily Temperature of 95°-100° degrees Fahrenheit (F) (or approximately 35°-38° Celsius C)).

- The National Weather Service issues heat advisories when the temperature is greater than or equal to 103°F, or when the Heat Index (HI) is greater than or equal to 108°F.
- An excessive heat warning is issued when the temperature is greater than or equal to 105°F or the heat index is greater than or equal to 113°F.

Humidity. Humidity refers to the amount of water vapor in the air. Heat index can be explained as a measure of ‘how hot it feels’ when relative humidity is factored in with the actual air temperature. Relative humidity is a ratio, expressed in percent, of the amount of atmospheric moisture present relative to the amount that would be present if the air were saturated.

Data Source(s)

- [CDC Tracking Network](#)
- [North American Land Data Assimilation System \(NLDAS\) –Number of Extreme Heat Days](#)
- [Iowa Environmental Mesonet ASOS/AWOS/METAR Data Downloader – Heat Index*](#)
- [Southern Regional Climate Center – Climate Information Data Portal– Daily Maximum Temperature**](#)

*3/10/23: Some data sources shown in gray font are Tracking data that are temporarily unavailable (some monthly and annual data for Maximum Temperature and Heat Index by Climate Division).

The LDH Tracking Program downloaded temperature, heat index and precipitation data from the Southern Regional Climate Center’s climate data portal; from Iowa State University’s Iowa Environmental Mesonet ASOS-AWOS-METAR Data [Download Page](#); and from the US Centers for Disease Control and Prevention (CDC’s) National Environmental Public Health Tracking Network. Historical data (1895-2019) were obtained from NOAA’s “Climate at a Glance: Statewide Time Series.”

Vintage: The latest dataset available from LDH Tracking and CDC Tracking as of Feb 2023:

- Percent of Days, Maximum Temperature and Heat Index by Climate Division (95°F+), data years **2000 – 2018 (19-year)**
- Number of Extreme Heat Days, Daily Maximum Temperature by Absolute Threshold 95°F, 100°F, 105°F (May–Sept), data years **2000–2021**, from the CDC Tracking Program

Data Measure(s)

The LDH Health Data Portal contains information on the following climate change measures:

- Percent of days with Heat Index 95°F + (May-Sept) by Climate Division (2000-2018)
- Percent of days with Max Temp 95°F + (May-Sept) by Climate Division (2000-2018)
- Number of Extreme Heat Days, Daily Maximum Temperature by Absolute Threshold 95°F (May-Sept)
- Number of Extreme Heat Days, Daily Maximum Temperature by Absolute Threshold 100°F (May-Sept)
- Number of Extreme Heat Days, Daily Maximum Temperature by Absolute Threshold 105°F (May-Sept)

The 2000-2018 dataset was created as part of ongoing projects and the Extreme Heat in Louisiana [Topic Report](#), in collaboration with the State Climatologist.

Explore Data

The LDH Health Data Explorer (<http://ldh.la.gov/tracking>) is an online query tool which allows health, environmental hazard, exposure and population data to be explored and viewed side-by-side in tables, charts, and maps. These data can be downloaded, viewed and further analyzed.

To *Explore Data* on the query tool:

Step 1: Select Criteria

Category: Environmental Quality

Topic: Climate Change

Focus: Heat

Indicator: **Temperature**

Under Additional Options, Choose from the available Reporting Periods, Geography and Measures.

Heat and your Health

Extreme temperatures can overwhelm the human body's ability to regulate its temperature. Prolonged exposure to very high temperatures can result in illnesses such as heat rash, heat cramps, heat exhaustion, and heatstroke, which can lead to death. Certain medical conditions such as diabetes, cardiovascular disease, respiratory disease, and cerebrovascular disease (e.g. stroke) can be exacerbated by exposure to extreme heat.

A sequence of days over the **daily highs**, such as temperature of 95°F (35°C) and a heat index of 100°F (~38°C) have been shown to be a strong indicator of expected health impacts from heat. During extended periods of summer heat, a sequence of days where nightly temperatures (**daily lows**) do not fall below 75°F-80°F interfere with the body's ability to recover from high daytime temperatures, thereby introducing higher risk of heat-related illness emergency department visits and hospitalizations.

Heat stress affects everyone differently. At particular risk are adults who are older, people working outside, athletes, homeless individuals, individuals with underlying chronic disease(s), women who are pregnant, children and individuals who are taking drugs that affect temperature regulation (e.g., beta-blockers, diuretics, and major tranquilizers). Healthy teens and middle-aged adults are at risk as well if they engage in

vigorous physical activity (work or athletics) and do not take proper precautions. Increased metabolism places pregnant women at risk, potentially leading to premature labor or other adverse birth outcomes.

Heat and the Environment

The Fourth National Climate Assessment (U.S. Global Change Research Program, 2018) summarizes the current status of climate change in the United States, and outlines potential impacts for the future. Specifically related to the Southeastern United States and Louisiana, increasing temperatures are anticipated in future. This coupled with the associated increase in frequency, intensity, and duration of extreme heat events is expected to affect not only public health, but the natural and built environments, energy, agriculture, and forestry.

According to recent climate data, northern Louisiana registered a greater number of days where the maximum temperature exceeded 95°F. Southern Louisiana was somewhat more humid, so it may 'feel' oppressively hot, but not always reach high temperatures. Wetlands and naturally occurring bodies of water in South Louisiana actively regulate outdoor temperatures as they absorb heat through evaporation. Northern Louisiana registered a greater number of days than Southern Louisiana when the nighttime temperature did not fall below 80°F (27°C) as well. This is an important factor which may contribute to heat illness, particularly without adequate hydration and air conditioning, because the human body isn't able to cool down each day.

In Louisiana, thousands of workers are at risk of heat stress illness. Many industries and occupations are vulnerable, but those most affected by outdoor heat include construction, agriculture, and oil and gas well workers, comprising about 12.8% of Louisiana's workforce. As an example, males accounted for 81% of all ED visits; their rate was 4.5 times the female rate, and the rate for males was highest in the 30-39 year-old age group.

Data Methods

Louisiana Climate Divisions. To conceptualize heat and temperature, nine weather stations were selected to represent each of Louisiana's Climate Divisions. Stations were selected based on their high accuracy and availability of historical data. Daily temperature data for nine different weather stations was obtained from the Southern Regional Climate Center's Climate Information Data Portal (SRCC CLIMDAT).

Data gaps: Data gaps at Fort Polk can be filled in using the Natchitoches Regional Airport. Data from the IEM ASOS/AWOS/METAR Data Downloader can be acquired and used to fill in data gaps. Gaps in the other stations can be filled in using the nearest station.

- Using the daily temperature data, the number of days with a maximum temperature or heat index over 95 or 100°F was calculated and summed by month or year.
- Only the months May – September are displayed in this dataset. To capture the most relevant data as trends, the months May–September are displayed to determine average summer temperatures and when temperatures are highest.
- Percentile values were calculated using data for 1979-2020. (CDC Tracking)

Climate Division

Weather Station Name

Weather Station ID

| | | |
|----------------------|---|--------|
| <i>Northwest</i> | Shreveport Regional Airport | 13957 |
| <i>North Central</i> | Monroe Regional Airport | 13942 |
| <i>Northeast</i> | Tallulah-Vicksburg Regional Airport | 03996 |
| <i>West Central</i> | Leesville | 165266 |
| <i>Central</i> | Alexandria International Airport | 13934 |
| <i>East Central</i> | Baton Rouge Metropolitan Airport (Ryan Field) | 13970 |
| <i>Southwest</i> | Lake Charles Municipal Airport | 03937 |
| <i>South Central</i> | Lafayette Regional Airport | 13976 |
| <i>Southeast</i> | New Orleans International Airport | 12916 |

[Climate Data Portal](#) station of interest ID codes include: Alexandria – 13935, Baton Rouge – 13970, Fort Polk – 03931, Lafayette – 13976, Lake Charles – 03937, Monroe – 13942, New Orleans – 12916, Shreveport – 13957, Tallulah-Vicksburg – 03996.

Data Privacy and Suppression

Heat-Related Illness is rare. In some cases, temperature data are aggregated to the geography of climate division, to be available and viewable alongside heat-related illness data. Heat-Related Illness data are being aggregated to climate division since heat-related illnesses are rare, and parish-level heat health data often may not be shared due to requirements for privacy protection.

Data Limitations and Important Considerations

Temperature by Climate Division. Louisiana has nine climate divisions. The parishes within each climate division have nearly homogenous characteristics regarding temperature, precipitation and humidity. One weather station in each climate division was selected as a representative station. In the West Central and Southeast climate divisions, there were gaps in the primary weather station data (Fort Polk Army Airfield and New Orleans International Airport, respectively); therefore, data from a secondary weather station was used to fill in the gaps.

[Metadata](#) for ‘Number of Extreme Heat Days, Daily Maximum Temperature by Absolute Threshold’ can be found on the CDC website under 1. Indicators and Data: Search 2. Metadata Search, or through CDC’s Network and Data Explorer. Please refer to their website for updates and current information.

Please note the following important data limitations:

1. Modeled temperature data obtained from North American Land Data Assimilation System (NLDAS) used to create measures. More about NLDAS: <http://www.emc.ncep.noaa.gov/mmb/nldas/>
2. Measure was calculated only for months May through September.
3. Percentile values are calculated using data for 1979-2020.
4. Modeled data performs relatively well in estimating temperature, however, the estimates may differ when compared to weather station-based observations. The differences vary by region and some of these differences are expected from a meteorological perspective. As a result, an area may be described as having higher or lower temperatures than actually occurred.
5. Census tract and county-level estimates of temperature and heat index are obtained by processing modeled data, which are available by 1/8th-degree grid. The process of converting grid-level data to other geographies using a population-weighted centroid approach may lead to potential misclassification of temperature and heat index for some areas.
6. For more information on heat warnings and alerts, please refer to the National Weather Service website: <http://www.weather.gov/>

Data Re-release

This is a public dataset which can be freely shared. Personally identifiable health information have been removed. Please refer to the Data Methods section of these metadata from more information.

Data Citations

Please cite the US CDC, LDH Environmental Public Health Tracking Program Cooperative Agreement NUE1EH001490, and any data source(s) listed on Page 1 when re-sharing or applying these data in analyses or publications.

References for this metadata include the following sources:

[Extreme Heat in Louisiana: Staying Protected. Alexis Williams, Louisiana Department of Health.](#)

[Louisiana Morbidity Report, November 2019. Vol 1, No. 1.](#)

[USCDC Tracking Program](#) Metadata Pages. Suggested Citation: Accessed From: <https://ephtracking.cdc.gov/DataExplorer>. Accessed on [enter date].

Disclaimer

Data are intended to spur further research and should be used only as a starting point to understanding how the environment and other contributing factors may be connected to disease. Datasets presented on the LDH Health Data Explorer site are intended to answer some basic questions, but should ultimately lead to further inquiry and more detailed study.

Data limitations should be noted if conducting exploratory ecological studies with these data. Limitations may include data gaps, reporting discrepancies (for example, a disruption of reporting or instrument recording) and insufficient data on all potentially confounding factors. There are numerous additional factors which may contribute to disease onset. These include genetics, access to health care, existing health conditions, medicines, other chemical substances we come into contact with or ingest, nutrition, route and duration of exposure, level of activity, level of stress, and others.

Responsible use of this data requires exercising caution when drawing conclusions based solely on views of the limited available data. Any perceived relationship, trend, or pattern apparent in the data should not be interpreted to imply causation; may in fact be unrelated; and should be regarded as preliminary, and potentially erroneous, until more in-depth study and if applicable, statistical evaluation, can be applied.

The LDH Bureau of Health Informatics and Environmental Public Health Tracking Program cannot guarantee the completeness of the information contained in these datasets and expressly disclaim liability for errors and omissions in their content.

Additional Information

Please visit the following links for more information.

- [National Institute of Environmental Health Sciences - Health Impacts of Climate Change](#)
- [CDC Climate and Health](#)
- [CDC Extreme Heat and Your Health](#)

Questions?

- Email: healthdata@la.gov
- Website: <http://ldh.la.gov/tracking>
- Toll free Phone: 1-888-293-7020

Metadata