

Compiling Precipitation Data

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Introduction

Questions about precipitation – how much rain falls over a given period of time, where in the county or state the most or least amount of rainfall occurs, and how current precipitation values compare to historical averages – can be answered easily in this digital era through accessible online precipitation data. The National Centers for Environmental Information (NCEI), part of the National Oceanic Atmospheric Administration (NOAA), have a vast online database of climate data, including daily precipitation totals, temperatures, dew points, sea level pressure, snowfall, seasonal climate, and more.

Precipitation amounts for a specified time frame can be obtained from weather stations across each state. Precipitation datasets include daily, hourly, and 15-minute summaries, as well as Climate Normals (30- year averages). The amount of this information available from each weather station varies.

The goal of this fact sheet is to provide instructions on how to obtain precipitation data for a particular location. This data can be useful if trying to determine how much rainfall occurred annually, or over any user defined time frame. Comparing these readings to Climate Normals can help shed light as to whether a particular year, or month, had above, average, or below average rainfall. This precipitation information can aid farmers and ranchers in planning crops and grazing rotations.

Daily Summary Search

Begin by visiting the NCEI's Climate Data Online Search website (<https://www.ncdc.noaa.gov/cdo-web/search>). Here, you can define the search parameters and after clicking Search, view a map of the results from which to choose. Under *Weather Observation Type / Dataset*, click the drop down arrow and select "Daily Summaries." In selecting the *Date Range*, use the calendar tool to highlight a start and end date. For example, for a year's worth of data, select January 1st of that particular year as the start date and December 31st of the same year as the end date.

The *Search For* drop down box allows for limiting the search results to a specific geographic range (i.e., e.g., zip code, county, state, hydrologic region). The *Search Term* box defines the location descriptor that the search will be directed. By default, an unlimited search would result from selecting "Stations" as the *Search For* parameter, displaying all available stations applicable to the search term. Conversely, if "States" is selected in the *Search For* box and "Arkansas" is again entered into the *Search Term* box, the results will group all of the stations within the state of Arkansas together as a single entry. This option is useful if you need a particular geographic boundary defined in order to select stations within it. Searching for stations within particular county boundaries is the recommended method to ensure no stations are left out of the search. For this fact sheet, Desha County

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in Arkansas will be used as an example (Fig. 1). After the desired parameters are defined, click *Search* to display the map of results.

The screenshot shows the NOAA Climate Data Online Search interface. At the top, there is a navigation bar with links for Home, Climate Information, Data Access, Customer Support, Contact, and About. Below this is a breadcrumb trail: Home > Climate Data Online > Search. The main heading is "Climate Data Online Search".

The search parameters are as follows:

- Start searching here to find past weather and climate data.** Search within a date range and select specific type of search. All fields are required.
- Select Weather Observation Type/Dataset:** Daily Summaries
- Select Date Range:** 2020-01-01 to 2020-12-31
- Search For:** Counties
- Enter a Search Term:** Desha

Figure 1. Search parameters of daily summaries for the year 2020 for stations within Desha County.

The search results will display a map with selectable geographic locations highlighted in gray, and a list of the search results in a box to the left (Fig. 2). The gray areas can be clicked on the map to display the same location information that is in the list (Fig. 3).

Click on *Full Details* in either the map or list to show the “Location Details” page. Information displayed here includes the period of record, coverage, available data types, station list, and documentation. Click on *Station*

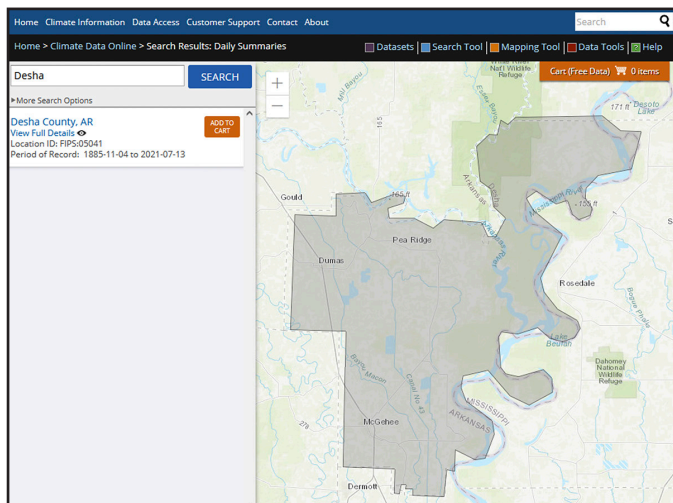


Figure 2. Search results map showing Desha County, Arkansas highlighted in gray.

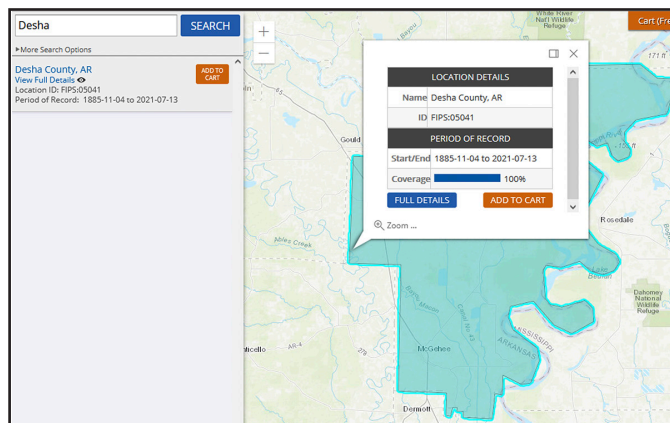


Figure 3. Selection of Desha County on the search results map.

List to view all of the stations available in the selected geographic area (in this case, Desha County) (Fig. 4). Note that you can click on a station name to go to that station’s details page and see its location on the map. Press the *Add* (ADD) button next to one or more stations in the list to add that particular station(s) to the cart. Alternatively, you can click the *Add to Cart* (ADD TO CART) button that is under the “Period of Record” box to add all stations in the list to the cart.

Cart Options

Click on the *Cart (Free Data)* (Cart (Free Data)) button to open the “Select Cart Options” page. From here, you can select the file *Output Format* of the data as either PDF, CSV (Comma Separated Value), or text. The PDF format includes some minimal graphic formatting to allow for easy, visual reviewing of the data. Additionally, the PDF format has a box to check if you would like include documentation such as format/observation definitions and measurement flag/attribute key to help decipher anomalies noted among the observations. The CSV format can be opened and edited in a spreadsheet software such as Microsoft Excel.

The screenshot shows the "Location Station List & Summarized Data Inventory" table. The table has the following columns: Available Data Types, STATION NAME & ID, START, END, COVERAGE, and an ADD button. The data is as follows:

Available Data Types	STATION NAME & ID	START	END	COVERAGE	ADD
Air Temperature	ARKANSAS CITY, AR US GHCND:USC0030234	1885-11-04	2019-04-30	91%	ADD
Land	DUMAS, AR US GHCND:USC0032148	1912-05-01	2019-10-31	97%	ADD
Precipitation	DUMAS, AR US GHCND:USC0032150	1948-06-01	1951-07-02	92%	ADD
Weather Type	KELSO, AR US GHCND:USC0033831	1985-05-01	2021-07-13	97%	ADD
Included Stations	MCGHEE 0.6 N, AR US GHCND:US1ARD50001	2012-06-11	2018-05-11	43%	ADD
Station List	MCGHEE 1 NE, AR US GHCND:USC0034708	1985-11-14	2020-12-31	76%	ADD
Additional Information	ROHWER 2 NNE, AR US GHCND:USC0036253	1959-12-01	2021-07-13	99%	ADD
Documents	WATSON, AR US GHCND:USC0037603	1985-12-01	1988-06-30	22%	ADD

Figure 4. List of stations available in the selected geographic area.

Figure 5. Custom Options page when choosing a CSV or text data format.

The text format is the bare bones of the data, listed in rows of unformatted text. The Date Range should already be populated based on the original search parameters, so verify that it is correct. After selecting the desired cart options, press the *Continue* (**CONTINUE**) button.

If ordering the PDF format, the next page will allow you to review the order. However, if ordering the CSV or text format, the next page shows additional output options and data types that can be included (Fig. 5). (All of these options are included in the PDF format automatically.)

After making the desired selections from the Custom Options page, press *Continue*. Review that the data you have requested is correct, then enter an email address for the data to be sent. If you need to make changes, press *Edit Order* to go back; otherwise, press the *Submit Order* (**SUBMIT ORDER**) button.

You will receive two emails: the first is a notification that the order was submitted and the second is when the order is complete. Click the “Download” link in the email you receive when the order is complete to view the data. The link will only be good for one week from time of submission so make sure and save the data file.

Climate Normals Search

Climate Normals are 30-year averages of temperature and precipitation compiled as a data tool from the NCEI. The latest range dates from 1981-2010.

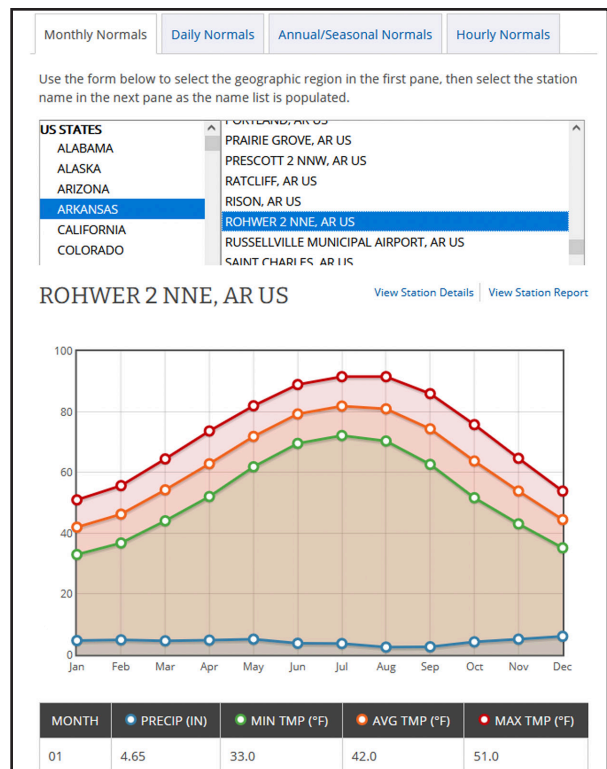


Figure 6. Selection of Monthly Normals from the Arkansas, Rowher 2 NNE station.

The Climate Normals website (<https://www.ncdc.noaa.gov/cdo-web/datatools/normals>) is listed on the NCEI Climate Data Online > Data Tools page.

Select the desired time frame from the appropriate tab (monthly, daily, annual/seasonal, or hourly). In this example, we will use monthly. Next, select the state on the left pane. The list of available stations is populated alphabetically to the right, commonly described by the city or town name. After selecting a station from the list, you can press *View Station Details* to see the exact location of that station. A graph and table of the available datasets for that location (i.e., precipitation, minimum, average, and maximum temperatures) for each month of the year is displayed (Fig. 6).

To generate a PDF report of this data, you can click *View Station Report*. To view the data in a CSV or text format, click *View Station Details* and follow the same instructions as with the Daily Summary Search for adding the data to the cart, ordering, and downloading. However, with Climate Normals, there is no need to alter the date range.

Conclusion

The customizable selection options for viewing and downloading precipitation data and the extensive range of data available make the NCEI’s Climate Database and

Data Tools a valuable resource. Additionally, the CSV format allows for individuals to perform any number of precipitation calculations in a spreadsheet software, such as annual or monthly totals and averages. Whether you are needing to know how much rain was received over the last week, month, or year, or if you would like to compare this growing season's temperature and precipitation to longer term trends using the Climate Normals, the NCEI's Climate Database has you covered.

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