

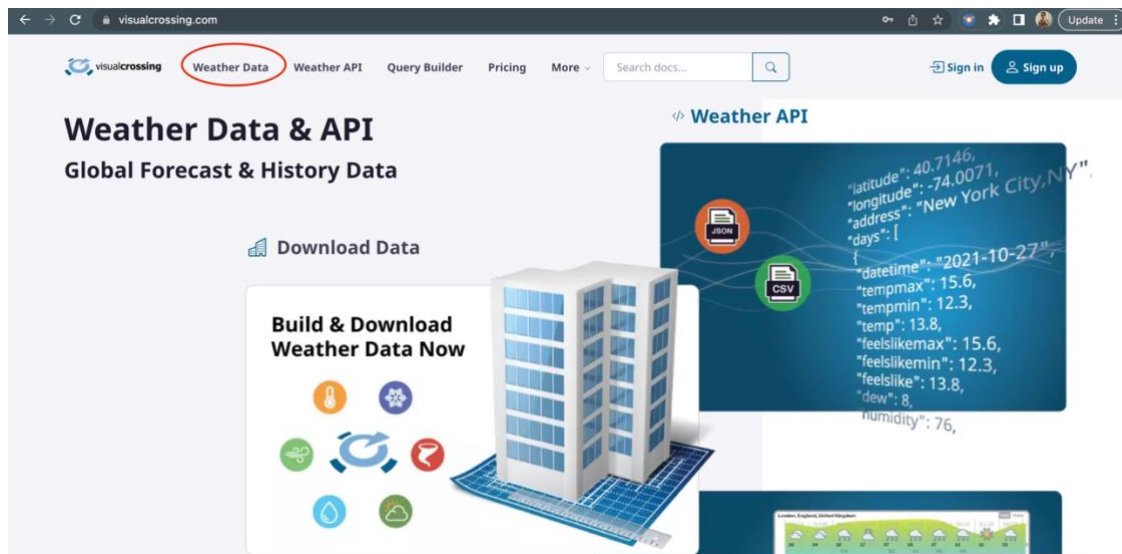
# Additional Dataset

## Description of the data

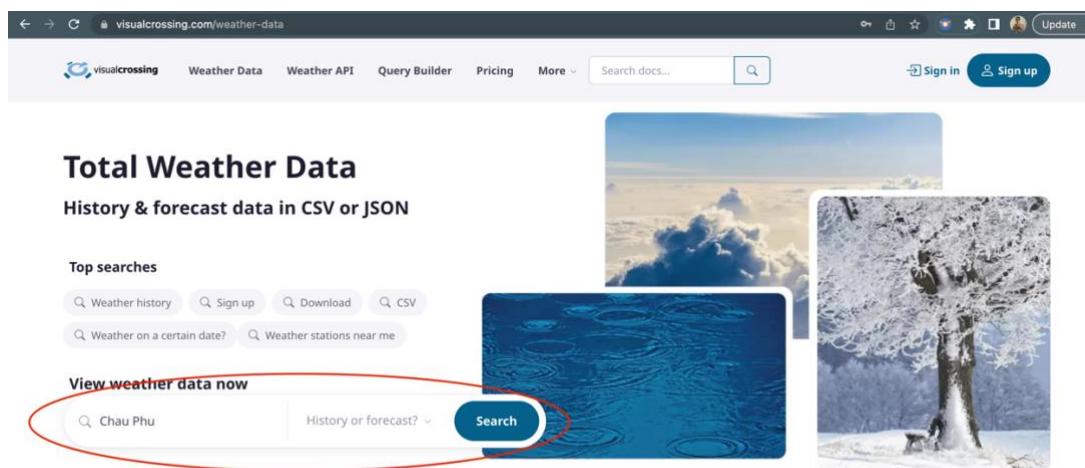
We utilized a weather data extraction website, called Visual Crossing, to gather meteorological information for our regions of interest - Chau Phu, Chau Thanh, and Thoai Son. The data was collected within a defined timeframe, encompassing various features such as precipitation, temperature, and humidity daily from the beginning of the timeframe to the end. Our primary focus was on obtaining rainfall data for an entire crop cycle before the harvest date indicated in the provide Crop Yield data.

## Process to extract and download the Data

Simply go into this website at this link [www.visualcrossing.com](http://www.visualcrossing.com) and it will prompt you to this page shown below. Click on to the *Weather Data* section (highlighted as red oval) of this page to begin downloading the data.

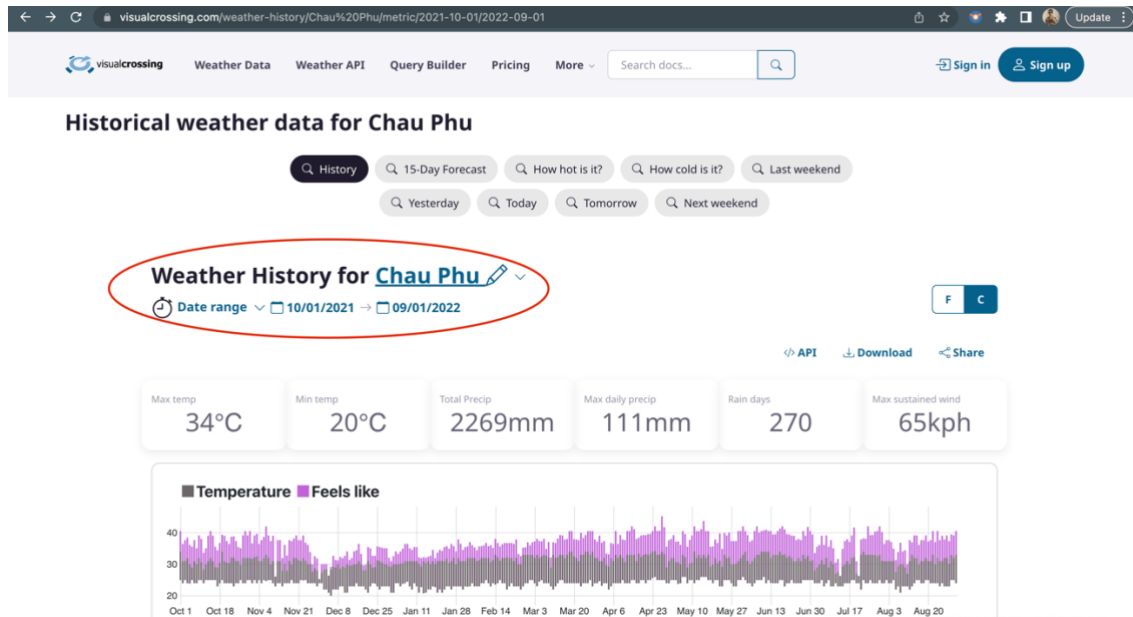


For our dataset, we collected data according to the region of interest and you can start by searching for the region in the search bar and as an example we are showing how we get data for the Chau Phu region below.

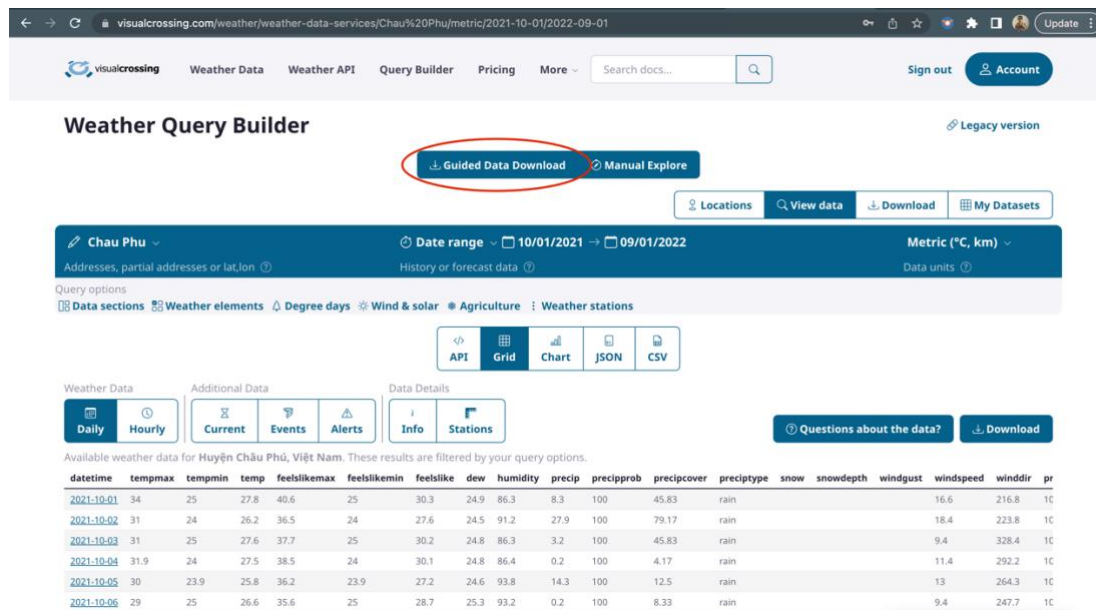


Upon typing in the region, you can further add filters to isolate the timeframe for which you want the weather data for the Chau Phu region using the built in Date range function.

The data can then be downloaded using the download icon shown in the picture and it will take you to the next window.



Upon reaching this page, click on the Guided Data Download option in the screen shown below.



You will then have to repeat the process of typing in the region of interest in the guided data download option. Click on *Next* to proceed from here.

The screenshot shows the 'Weather Query Builder' interface at visualcrossing.com. The top navigation bar includes 'Weather Data', 'Weather API', 'Query Builder', 'Pricing', and 'More'. The main header 'Weather Query Builder' has a 'Legacy version' link. Below the header, there are two tabs: 'Guided Data Download' (active) and 'Manual Explore'. A progress bar shows five steps: 1. Enter locations, 2. Choose data, 3. Explore data, 4. Download & Schedule, and 5. View your datasets. The 'Enter locations' section is active, showing 'You currently have one location' with a search bar containing 'Chau Phu'. There is a 'Clear All' button and an 'Add a location' button. A note states: 'Locations can be addresses, partial addresses or latitude,longitude values.' At the bottom, there are '< Previous' and 'Next >' buttons.

Similarly repeat with the time frame and click on *Next* to proceed.

The screenshot shows the 'Configure weather data query' section of the 'Weather Query Builder'. It prompts the user to 'Please select a date or date range' with a note: 'You can a single date, or a date range, in the past or future. You can also use the dynamic date values such as 'yesterday' and 'next7days' to create a dynamic date range.' The 'Date range' is set to '10/01/2021' to '09/01/2022'. Below this, the 'Units' section asks to 'Choose the unit group that you prefer' with 'Metric (°C, km)' selected. There is an 'Advanced options' section with a note: 'Advanced options allow you to customize the columns, data sources and other items.' and a link to 'Open advanced options'. At the bottom, there are '< Previous' and 'Next >' buttons.

Finally, you will be prompted to ask to download the data a second time and click on *Next* to proceed and move forward.

The screenshot shows the 'Download & Schedule' section of the 'Weather Query Builder'. It displays the configured query: 'Chau Phu', 'Date range: 10/01/2021 - 09/01/2022', and 'Metric (°C, km)'. Below this, there are buttons for 'Grid', 'JSON', and 'CSV'. The 'Weather Data' section shows 'Daily' and 'Hourly' tabs, with 'Daily' selected. The 'Additional Data' section shows 'Current', 'Events', and 'Alerts' tabs, with 'Current' selected. The 'Data Details' section shows 'Info' and 'Stations' tabs, with 'Info' selected. A 'Questions about the data?' link is present. A red circle highlights the 'Download' button. Below this, there is a table of weather data for 'Huyện Châu Phú, Việt Nam' from 2021-10-01 to 2021-10-19. The table has columns: datetime, tempmax, tempmin, temp, feelshikemax, feelshikemin, feelshike, dew, humidity, precip, precipprob, precipcover, preciptype, snow, snowdepth, windgust, windgeed, winddir, pr. The table shows data for each day, including temperature ranges, feelshike values, dew, humidity, precipitation, and wind speed/direction. At the bottom, there are '< Previous' and 'Next >' buttons.

For our specific purpose, we used the csv format so that it can be incorporated with our code efficiently and match our submission template format. Click on **Continue** to check the data format, and specifics one last time and the percentage completion bar will show your progress to downloading the data.

For our purpose, we needed to access precipitation data for the target cities. Therefore, we were able to obtain free data from public datasets. However, we are aware that data extraction from this website is limited for everyone. To overcome this limitation, one can search for other free websites or use advanced satellites, like MODIS, to obtain precipitation data. It is worth mentioning that we chose this website due to its convenient table format and the fact that data preprocessing was unnecessary, saving us time.

visualcrossing Weather Data Weather API Query Builder Pricing More Search docs... Sign out Account

Enter locations Choose data Explore data Download & Schedule View your datasets

**Download or schedule data**  
Download your data as CSV, Excel or JSON files.

**Data format and section**  
Output content type: CSV Output section: Daily

**Dataset record cost information**  
Location count: 1, Estimated record cost: 336 (\$0.0336)  
Used record cost: 0. Free record cost remaining: 1000  
[What exactly is a weather record?](#)

Continue

0% completed

- X Data format and section
- X Dataset name
- X Submit or schedule
- X Processing
- X Download

Click on **Continue** and check the time frame of data to see if it matches with what you want.

visualcrossing Weather Data Weather API Query Builder Pricing More Search docs... Sign out Account

Enter locations Choose data Explore data Download & Schedule View your datasets

**Download or schedule data**  
Download your data as CSV, Excel or JSON files.

**Dataset name**  
Content type: csv, Output sections: days  
Location count: 1, Estimated record cost: 336 (\$0.0336)  
[Chau Phu 2021-10-01 to 2022-09-01](#)  
The name will be used in the **My Datasets** and for the file names.

Continue

20% completed

- ✓ Data format and section
- X Dataset name
- X Submit or schedule
- X Processing
- X Download

Click on the **Run Query** button to begin extraction of real time data for your region of interest and time frame.

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**Weather Query Builder** Legacy version

Guided Data Download Manual Explore

Enter locations Choose data Explore data Download & Schedule View your datasets

**Download or schedule data**  
Download your data as CSV, Excel or JSON files.

**Submit or schedule**  
Content type: csv, Output sections: days  
Location count: 1, Estimated record cost: 336 (\$0.0336)  
[Chau Phu 2021-10-01 to 2022-09-01](#)

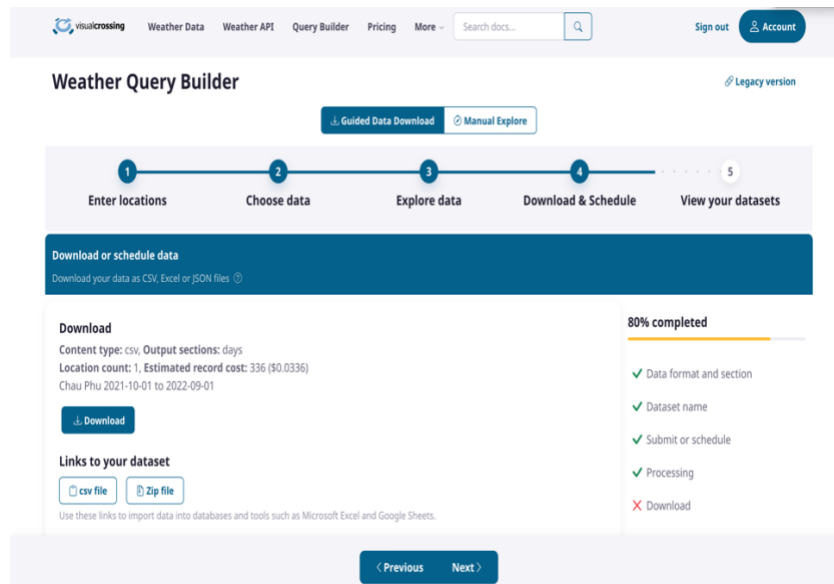
Run Query Set up schedule

Results are available for at least 24 hours. Click on **My Datasets** to access your recent datasets.

40% completed

- ✓ Data format and section
- ✓ Dataset name
- X Submit or schedule
- X Processing
- X Download

Finally, download the data by clicking on the **Download** button. This will initiate the data and we have our data ready for manipulation.



Similarly, we follow the same procedure for finding weather data for Chau Thanh and Thoai Son.

Side Note – We have attached the excel spreadsheet for Chau Phu city for reference. Chau Thanh and Thoai Son cities follow the exact same order.