**Downloading weather from NOAA website**

(If not generating daily weather)

1. Go to <http://www.ncdc.noaa.gov/cdo-web/>
2. Click on the Search Tool.
3. Select Weather Observation Type/Dataset and select **Daily Summaries.**
4. Select Date Range using the calendar button (*Be sure to get daily weather data for 365/366 days of the year*).
5. Search for and choose the appropriate search type you will be using (typically we select **Stations).**
6. Enter a Search Term.
7. Click the **Search** button.

Now you should see a map of possible stations. You can navigate this just like Google Maps. Click on a square blue radio tower to see a summary of the station’s available data. The details show the **Latitude/Longitude** and the time **Period** they have weather data. Choose a site with as close to 100% **Coverage** to have the least amount of holes in your data. You can also click on the Full Details button or the station name on the left site of the screen to connect you to additional details of the station’s data.

1. Select a specific weather station by clicking on the orange **Add** or **Add to Cart** button depending on which method you used to find the station.
2. Click the orange **Cart** when you have added the station you want.
3. Review your Cart to make sure that the date range and stations name are what you selected.
4. Select the Output Format click on **Custom GHCN-Daily CSV.**
5. Click **Continue.**
6. Select the features you wish to receive.
7. Click **Continue.**
8. Enter email address and verify email address.
9. Click **Submit Order**.
10. You will receive an email saying that you requested data and another one saying the request is complete.
11. Click on the link at the top in the green box or the download data link, and save.
12. Open with EXCEL and format the data as shown below.

**Formatting NOAA Weather files for ALMANAC**

1. Open the file in EXCEL.
2. Delete the extra columns that aren’t utilized by ALMANAC. Keep **date, solar radiation, maximum temperature, minimum temperature, precipitation, snow, humidity,** and **wind** if they were downloaded and format accordingly.
3. Insert two columns after the date. Highlight the date column, and click the data tab, then text to columns. Select fixed width, next, click between the year and the month, the month and the day, and then click finish.
4. Check the NOAA email for the units your data is in. Change the values of **maximum** and **minimum temperatures** to Cº, **precipitation** and **snow** to mm, **solar radiation** to Megajoules/m2, and **wind** to m/s. Typically NOAA sends the data in tenths of a unit, so you will multiply entire sheet by 0.1 (except for **SNOW**).
5. If applicable, check the data for these anomalies:
	1. Highlight **precipitation** column and change T to 0.005
	2. Highlight **snow** column and change T to 0.5
	3. The value of **snow** needs to be added to **precipitation**. If snow is -9999, change it to 0 before adding.
6. *Check for missing values and days of the year.* Missing values within a dataset are usually reported as -999.9 or -9999. Check for variations, and change all missing values to **999**
7. Rearrange columns into their proper order.

**All of the remaining steps are required for an ALMANAC weather file even if not using data from NOAA.**

For the following steps, set each column width to equal the number of characters allowed for that column. Even if you don’t have values for the columns, you must format the characters spaces as follows.

* 1. **First 2 characters: Must be blank.**
	2. **Next 4 characters: Year. Must be four digits.**
	3. **Next 4 characters: Month. 2 or 3 characters will be blank so the total number of characters will equal 4.**
	4. **Next 4 characters: Day. Same as above.**
	5. **Next 6 characters: Solar Radiation in Megajoules/meter2 with or without a decimal.**
	6. **Next 6 characters: Max temperature in centigrade. Whole number with 2 decimal places possible.**
	7. **Next 6 characters: Minimum temperature in centigrade. Same as above.**
	8. **Next 6 characters: Precipitation in millimeters. Same as above.**
	9. **Next 6 characters: Humidity in percent. Whole number with 3 decimal places possible.**
	10. **Next 6 characters: Wind in meters/second. Same as above.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | Blank | Year | Month | Day | RAD | TMAX | TMIN | RAIN | RHUM | WVL |
| Characters | 2 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 |
| Units |   |   |   |   | MJ/m2 | C° | C° | mm |   | m/sec |
| Max Decimals Allowed |   |   |   |   | 1 | 2 | 2 | 2 | 3 | 3 |

1. At a minimum, a file must have year, month, day, and rain entered, and any of the other variables wanted. If you have no data for an entire column, leave the column empty with the proper amount of characters. If a day is missing data, enter a **999** in that spot. Be sure and have **365/366** days of weather for each year simulated. Also, snow in rain-equivalent amount must be **added** to the rain column.

HINT: DO ONLY TWO OR THREE YEARS AT FIRST. Check total number of lines in file. Must have a complete yearly record for each year, or else ALMANAC will have an error.

1. Now delete the first row containing column headings.
2. Then **save as formatted text (space delimited).** This is an option in the Excel ‘save as’ command. The extension for your weather file will now be .prn.

*Note: Be sure that the* ***name is eight characters or less****- if it is more ALMANAC will not pick up the file!*

1. Check formatting by opening your new file with notepad and counting the spaces.
2. Now save the **.prn** file as a **.wth** file.

Example rows of .wth file, color-coded to show formatting (use keyboard or ¶ button to count spaces):

 2010 01 01 10.8 -8.3 0

 2010 01 02 6.1 -7.8 999

 2010 01 03 1.1 -4.4 0.3

 2010 01 04 4.6 -2.7 0

14 spaces of date, first 2 blank, next 4 year, next 4 month, next 4 day

6 spaces of solar radiation, this example never had SR data so the entire column is left blank

6 spaces of max temperature, 6 spaces of min temperature,

6 spaces of rain, 999 is used because some data exists but there was a day missing in this column only

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