

Using Climate Data in the WEPP Windows Interface

September 25, 2003 (Updated May 19, 2006)

This version (September 2003) of the WEPP Windows interface allows actual daily data and 15 minute precipitation data to be used in building a WEPP climate file. In addition new CLIGEN stations can be setup. This tutorial will explain how to do the following tasks related to climate data for WEPP:

- Adding a new international station using observed daily data from the ARS Hydrology Lab
- Adding a new international station using other observed data
- Adding a new station in the continental United States using existing stations
- Adding a new station in the United States using observed daily data from NOAA
- Adding a new station in the United States using other observed data
- Importing observed daily data into a WEPP CLIGEN weather file
- Importing 15 minute precipitation data from NOAA into a breakpoint climate file.
- Importing other breakpoint data into a WEPP breakpoint climate file

CLIGEN Overview

Cligen is a stochastic weather generator that produces daily time series estimates of precipitation, temperature, dewpoint, wind, and solar radiation for a single geographic point, based on average monthly measurements for the period of climatic record, like means, standard deviations, and skewness. The estimates for each parameter are generated *independently* of the others.

The WEPP Windows install contains about 2600 CLIGEN parameter files for locations within the US. Using a CLIGEN parameter file the CLIGEN program can generate a daily weather file that can be used when running WEPP.

To run CLIGEN for location outside the US a suitable CLIGEN parameter file must be developed. This is typically done using observed data from a fairly long period of record (at least 15-40 years) in order to gather the statistics about the weather patterns at that location.

The first 5 topics describe how to setup a new CLIGEN station.

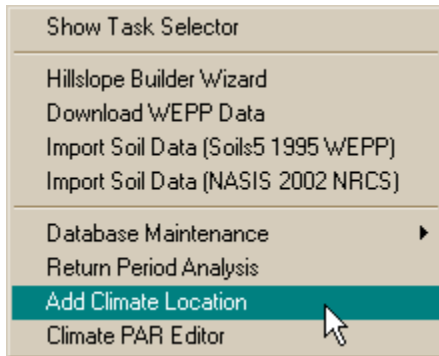
Adding a new international station using observed daily data from the ARS Hydrology Lab

The process of adding a new international station for Cligen to use involves creating a Cligen parameter from the long term climate data. This outlines how to use existing international precipitation and temperature data from the ARS Hydrology Lab. This data is typically from the late 1970's to the early 1990's.

The data can be downloaded from: <http://hydrolab.arsusda.gov/nicks/nicks.htm>
Instructions for downloading the data can be found in the section “Downloading International Climate Data”.

In this example we have already downloaded a file and saved in the climates/observed subdirectory. The climate data is for Granada Spain.

To add a new international Cligen station to the WEPP interface from the main WEPP Windows menu choose the **Tools** menu and select **Add Climate Location**.



The first step is to choose a name for your new location. In this example I chose Granada Spain. Choose the ‘No’ item when for the question if you already have a CLIGEN PAR file. The default is that a CLIGEN PAR file will be created for your new station.

Step 1: Choose a name for the new climate location

Country: SPAIN

State (US Only): Alabama

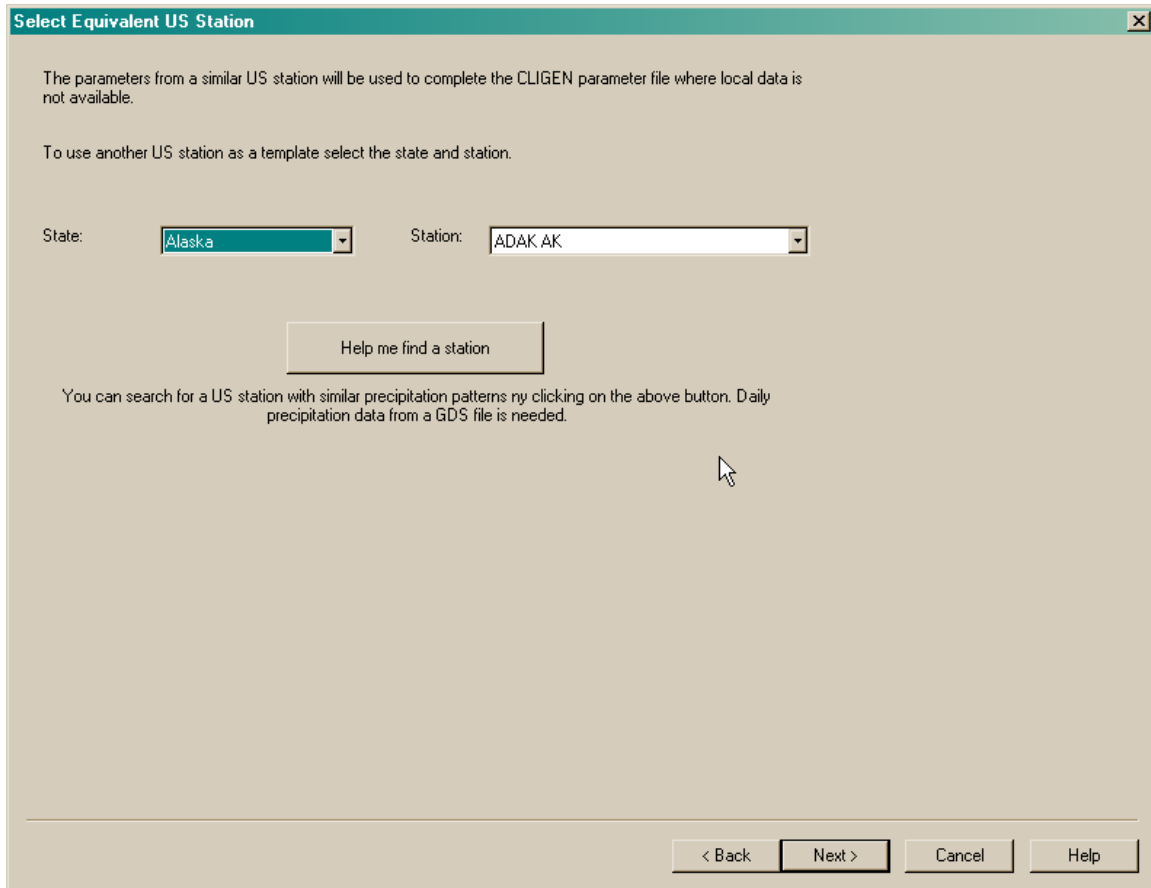
New Station Name: Granada

Do you already have a CLIGEN PAR file for this location?

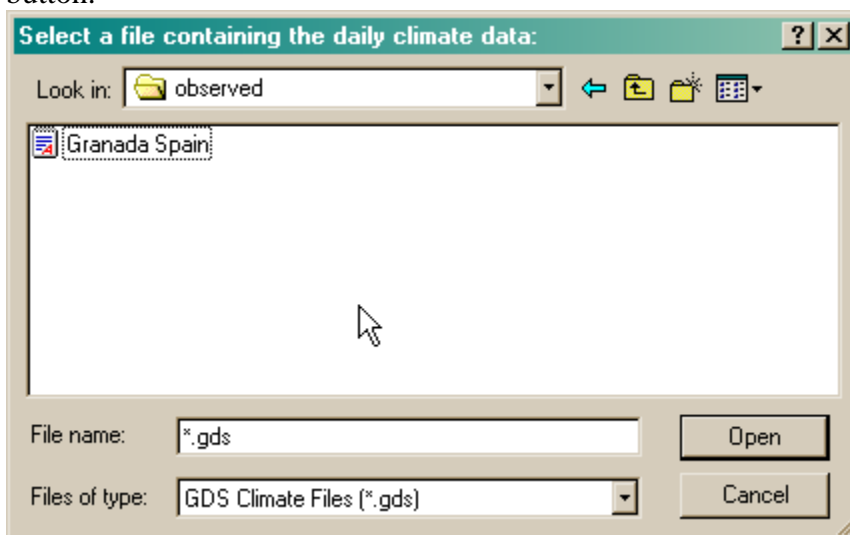
Yes No

< Back Next > Cancel Help

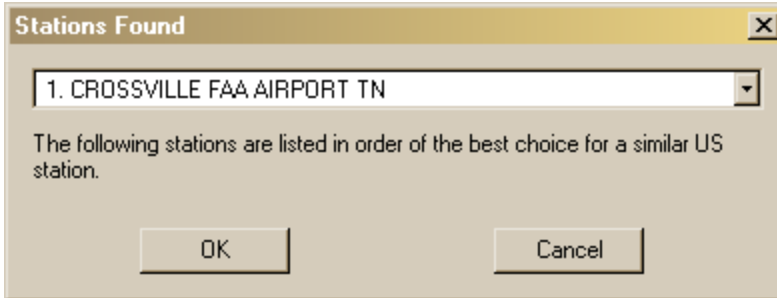
The next screen will ask to choose a station similar in the United States. This is done to approximate other climate parameters that may not be present in the observed data for that location. The data files from the ARS hydrology lab only contain precipitation, minimum and maximum temperature. Other data used by WEPP are related to intensity, solar radiation, dew point.



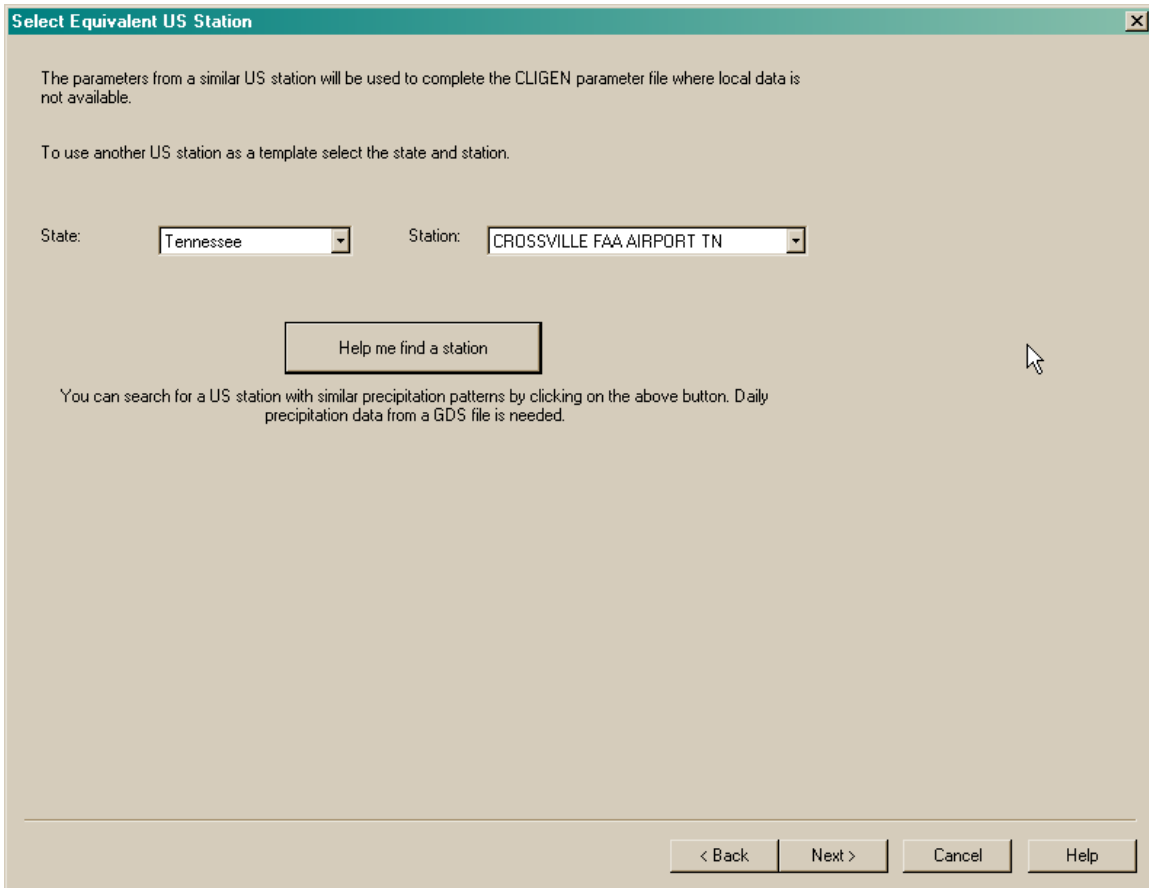
If you know a particular US station to use you can select it directly. For most cases the best choice is to search for a similar US station by clicking on the **Help me find a station** button.



After searching the program will display a list of the upto 10 US stations. The closest match is displayed first. Click the Ok button to select the station.



After searching for a similar station the following should be displayed indicating that a similar US station is in Tennessee.



Click the Next button to display the details about the Cligen parameter file that will be created.

Verify Parameter File

Name: Data File:

Latitude: Longitude: Elevation(ft): Max 30 minute rate(in): Max 6 hour rate (in):

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Monthly Precip (in)	1.44	1.71	1.19	1.44	0.90	0.60	0.00	0.07	0.51	1.32	1.92	1.62
Number of Wet Days	8	9	7	9	6	3	0	1	3	6	8	9
Average Monthly Max Temp(F)	54.73	58.62	64.90	67.42	75.45	86.20	94.00	93.07	86.56	73.30	62.35	55.78
Average Monthly Min Temp(F)	34.20	36.75	38.92	42.85	47.64	55.32	59.10	59.25	56.27	48.09	41.18	36.73
Average Precip on Wet Days(in)	0.18	0.19	0.17	0.16	0.15	0.20	0.31	0.07	0.17	0.22	0.24	0.18
Probability of wet day following wet day	0.63	0.53	0.56	0.56	0.53	0.32	0.10	0.33	0.29	0.48	0.62	0.58
Probability of wet day following dry day	0.14	0.23	0.14	0.21	0.12	0.09	0.03	0.03	0.08	0.13	0.16	0.18
Solar Radiation (Langley/Day)*	160.00	238.00	330.00	447.00	516.00	553.00	529.00	479.00	414.00	317.00	214.00	161.00
Maximum 30 minute Intensity(in/hr)*	0.49	0.51	0.74	0.98	1.42	1.16	1.72	1.13	0.98	0.60	0.61	0.61

Monthly Averages PAR File

English Units Refresh Predicted Values Undo All Changes Predicted Yearly Precip(in)

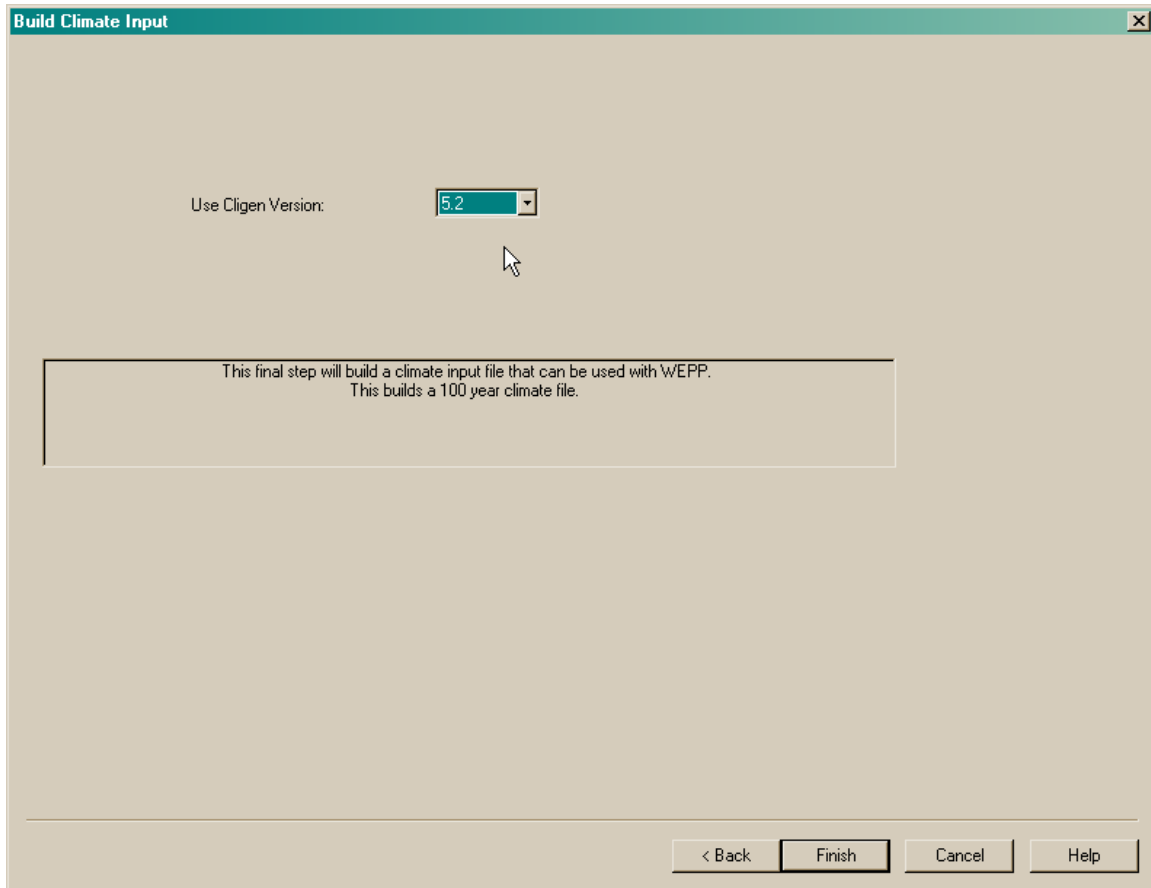
* = Values are from template PAR file, may need to be changed to match local conditions.

The average monthly precipitation and number of wet days are calculated from the probabilities for a wet day following a wet day and for a wet day following a dry day. To adjust approximate average monthly precipitation change the probabilities fields and click the Refresh button.

< Back Next > Cancel Help

The monthly averages can be changed to match your actual data. The first two lines in gray are for reference only and are based on the probability of wet day following a wet day and a wet day following a dry day and the precipitation amount on wet days. The field for predicted yearly amount is also for reference only. Changing the percentages for wet days or precipitation amounts will change the predicted values. If values are changed click the Refresh button to update the reference values.

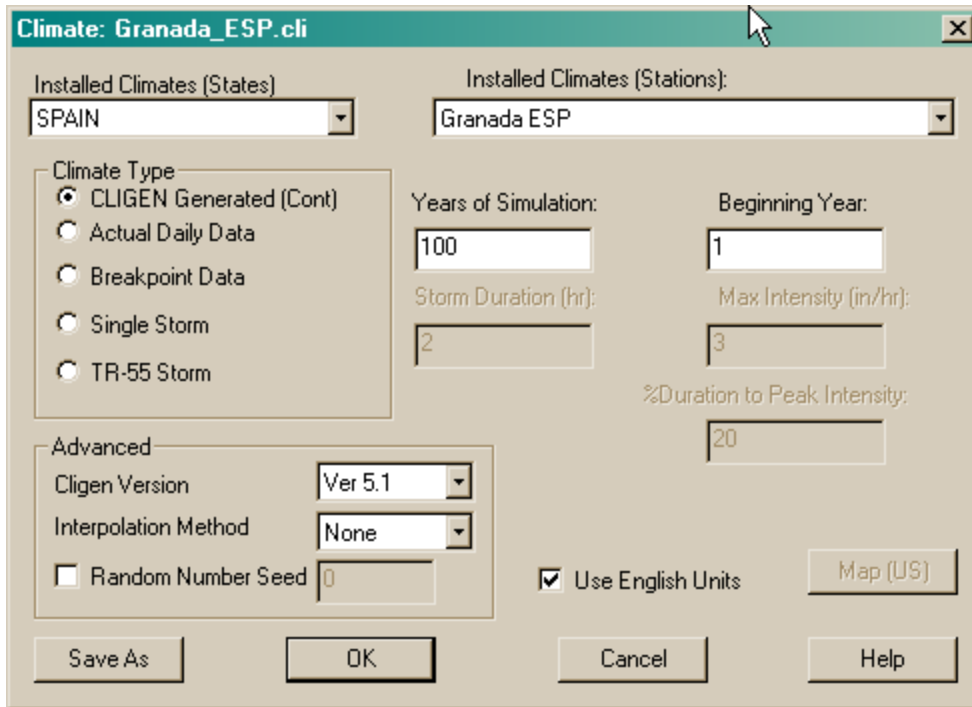
After the values are finalized click the Next button to select which version of CLIGEN to use to generate the WEPP climate file. This step also produces a new CLIGEN parameter file that can be used in running CLIGEN in the future for this station.



After selecting the version of CLIGEN to use click the Finish button to generate the climate file.

To use the new climate file in a simulation right-click on the climate icon (the sun) and choose the Import menu item. The new climate file created will be named 'Granada_ESP.cli', double click on this file from the import menu to bring it into the current project and then click the 'Run' button on the main screen.

If you now double click on the climate icon (the sun) climate builder window will show the new Granada location in the list of available stations for Spain along with all the other CLIGEN stations for the United States.



[Adding a new international station using other observed data](#)

This process is very similar to adding a station using data from the ARS Hydrology Lab. The difference is that your data probably will not be in the GDS file format and therefore you won't have the ability to search for a similar US station. One solution to this would be to find a station from the ARS Hydrology Lab that is somewhat close to your location and use it to search for a similar US station. Once this station is known you can proceed to use your observed data to develop the cligen parameter file.

The data we will use for this example is found in the climates/observed subdirectory and has the name 'Granada – Custom Recorded.txt'. The top few lines of the observed data file looks like the following:

```

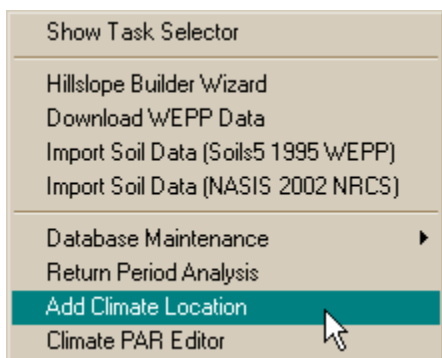
10 1 77 0.00 30.00 10.00
10 2 77 0.00 30.00 10.00
10 3 77 0.00 29.00 10.00
10 4 77 0.00 29.00 9.00
10 5 77 0.00 29.00 9.00
10 6 77 0.00 12.00 12.00
10 7 77 1.00 15.00 8.00
10 8 77 0.00 16.00 8.00
10 9 77 0.40 20.00 13.00
10 10 77 4.00 23.00 13.00
10 11 77 0.00 24.00 8.00
10 12 77 0.00 26.00 8.00
10 13 77 0.00 26.00 8.00
10 14 77 0.00 22.00 10.00

```


10	15	77	0.00	23.00	12.00
10	16	77	0.00	23.00	12.00
10	17	77	0.00	27.00	10.00
10	18	77	3.00	22.00	12.00
10	19	77	0.00	24.00	11.00
10	20	77	0.00	23.00	13.00
10	21	77	0.00	21.00	10.00
10	22	77	3.00	15.00	8.00
10	23	77	0.00	20.00	8.00
10	24	77	0.00	22.00	10.00
10	25	77	1.30	17.00	13.00
10	26	77	3.00	19.00	15.00
10	27	77	0.00	22.00	6.00
10	28	77	0.00	23.00	6.00
10	29	77	0.00	22.00	7.00
10	30	77	0.00	22.00	7.00

The WEPP interface can process data that has one line of climate data per day which some type of delimiters between the columns. In this case the precipitation data is in column 4 and the maximum temperature in column 5, the minimum temperature in column 6. The temperatures are in C.

To add a new international Cligen station to the WEPP interface from the main WEPP Windows menu choose the **Tools** menu and select **Add Climate Location**.



When the window is displayed choose Spain as the country and type in the station name 'Granada – Recorded'.

Step 1: Choose a name for the new climate location

Country: SPAIN

State (US Only): Alabama

New Station Name: Granada - Recorded

Do you already have a CLIGEN PAR file for this location?

Yes No

< Back Next > Cancel Help

In the next window choose a similar US station directly in the state of Tennessee and the station as Crossville FAA Airport TN. The Help Find a Station requires a GDS format file, since our data is in a different format we must choose the station.

Select Equivalent US Station [X]

The parameters from a similar US station will be used to complete the CLIGEN parameter file where local data is not available.

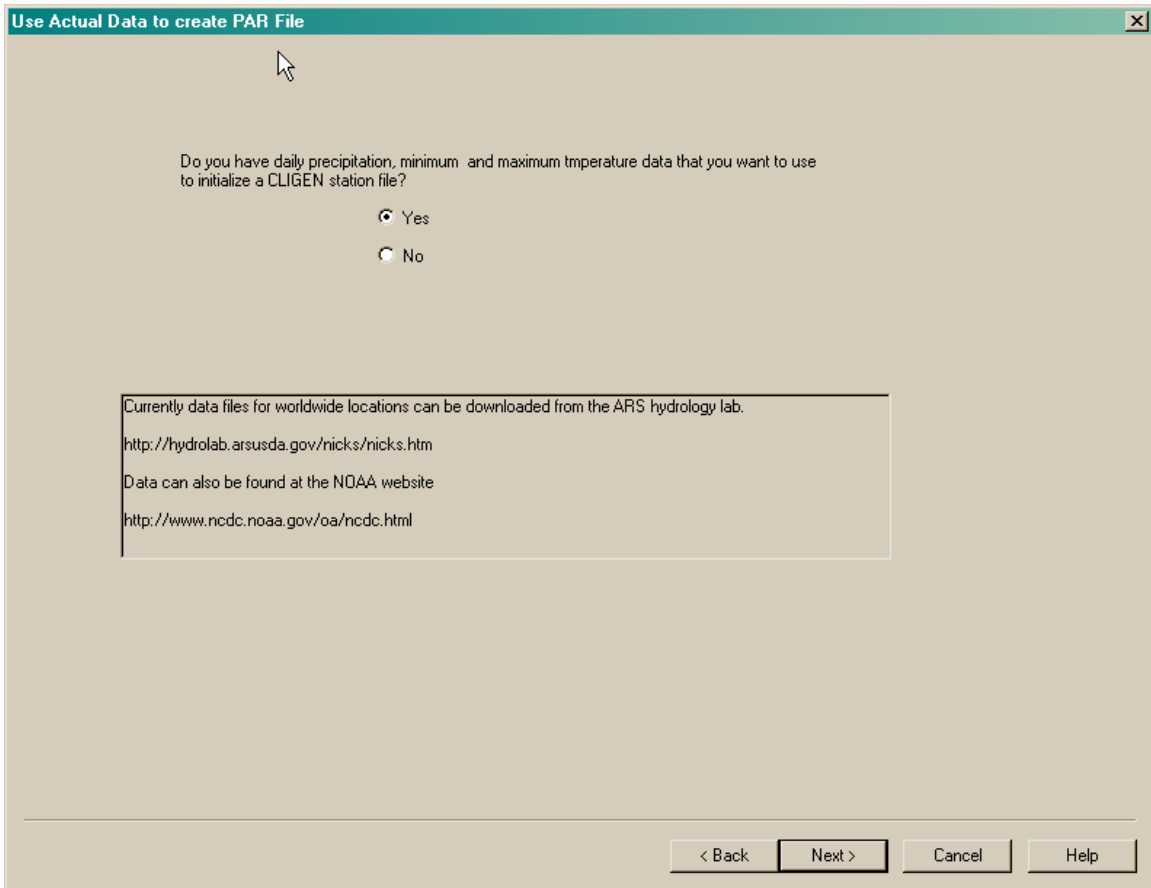
To use another US station as a template select the state and station.

State: Station:

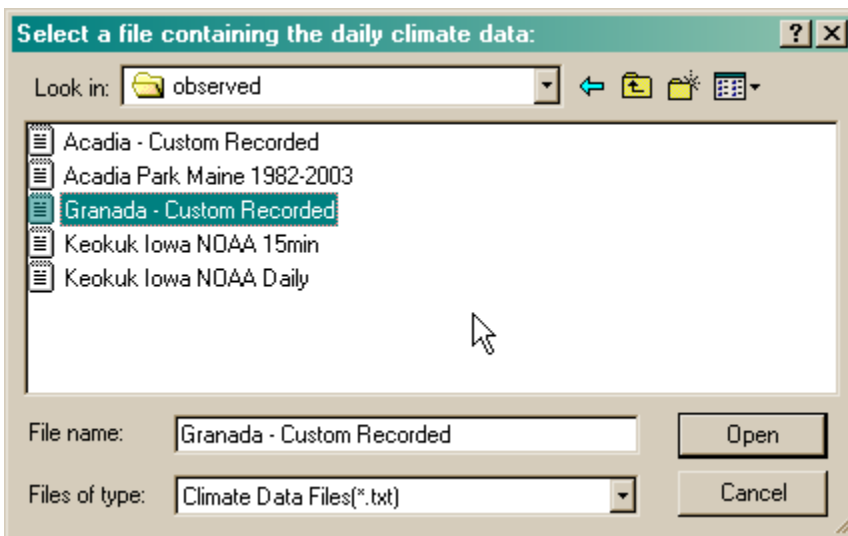
You can search for a US station with similar precipitation patterns by clicking on the above button. Daily precipitation data from a GDS file is needed.

< Back Cancel Help

The next window will ask if we have daily data to use to initialize the CLIGEN parameter file – Click Yes and then select the ‘Granada – Custom Recorded’ file.



When searching for the file be sure to change the file type to Climate Data Files (*.txt). The default is to only show GDS files from the ARS Hydrology lab.



The next step is to use the weather importer window to describe the contents of the file, including what units the precipitation and temperature are recorded in. Adjust the selections so that they are the same as the following window. This includes changing the

units on the left side of the window and setting the correct columns where the data is found. When the selections are set click the Refresh button.

Weather Data Importer

Graph Temperature Graph Precip Refresh Data View

Custom Data Format Worldwide Stations from ARS Hydrology Lab US Stations from ARS Hydrology Lab

Custom Data Format

Column Delimiter: spaces or tabs ; | / .

Precipitation in: Column:

Max Temp in: Column:

Min Temp in: Column:

Year / Month / Day Columns:

Handling Missing Data

When Missing a Precipitation Value:

When Missing a Temperature Value:

Missing Data Value:

Date	Max Temp (C)	Min Temp (C)	Precip (mm)
10-01-1977	30.0	10.0	0.00
10-02-1977	30.0	10.0	0.00
10-03-1977	29.0	10.0	0.00
10-04-1977	29.0	9.0	0.00
10-05-1977	29.0	9.0	0.00
10-06-1977	12.0	12.0	0.00
10-07-1977	15.0	8.0	1.00
10-08-1977	16.0	8.0	0.00
10-09-1977	20.0	13.0	0.40
10-10-1977	23.0	13.0	4.00
10-11-1977	24.0	8.0	0.00

< Back Next > Cancel Help

Click the Next button to display the Cligen parameter file contents.

Verify Parameter File

Name: Data File:

Latitude: Longitude: Elevation(ft): Max 30 minute rate(in): Max 6 hour rate (in):

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Monthly Precip (in)	1.44	1.71	1.19	1.44	0.90	0.60	0.31	0.07	0.34	1.32	1.92	1.62
Number of Wet Days	8	9	7	9	6	3	1	1	2	6	8	9
Average Monthly Max Temp(F)	55.00	58.96	65.29	67.85	76.37	87.26	94.15	93.50	87.49	73.93	63.05	56.36
Average Monthly Min Temp(F)	34.22	36.78	39.00	42.93	47.97	55.72	59.10	59.32	56.57	48.23	41.35	36.81
Average Precip on Wet Days(in)	0.18	0.19	0.17	0.16	0.15	0.20	0.31	0.07	0.17	0.22	0.24	0.18
Probability of wet day following wet day	0.62	0.53	0.57	0.55	0.55	0.24	0.13	0.32	0.28	0.49	0.59	0.53
Probability of wet day following dry day	0.15	0.23	0.14	0.22	0.12	0.09	0.03	0.03	0.08	0.13	0.17	0.20
Solar Radiation (Langley/Day)*	160.00	238.00	330.00	447.00	516.00	553.00	529.00	479.00	414.00	317.00	214.00	161.00
Maximum 30 minute Intensity(in/hr)*	0.49	0.51	0.74	0.98	1.42	1.16	1.72	1.13	0.98	0.60	0.61	0.61

Monthly Averages PAR File

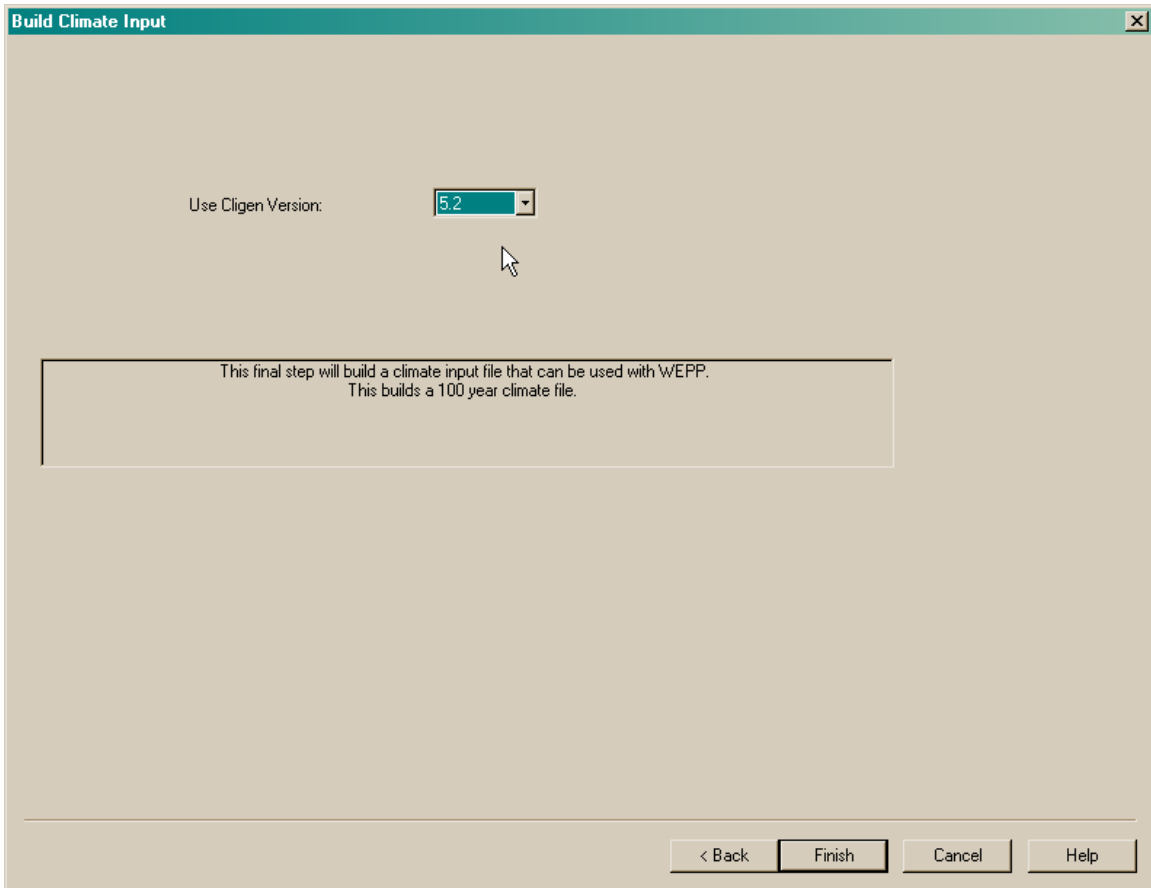
English Units Refresh Predicted Values Undo All Changes Predicted Yearly Precip(in):

* = Values are from template PAR file, may need to be changed to match local conditions.

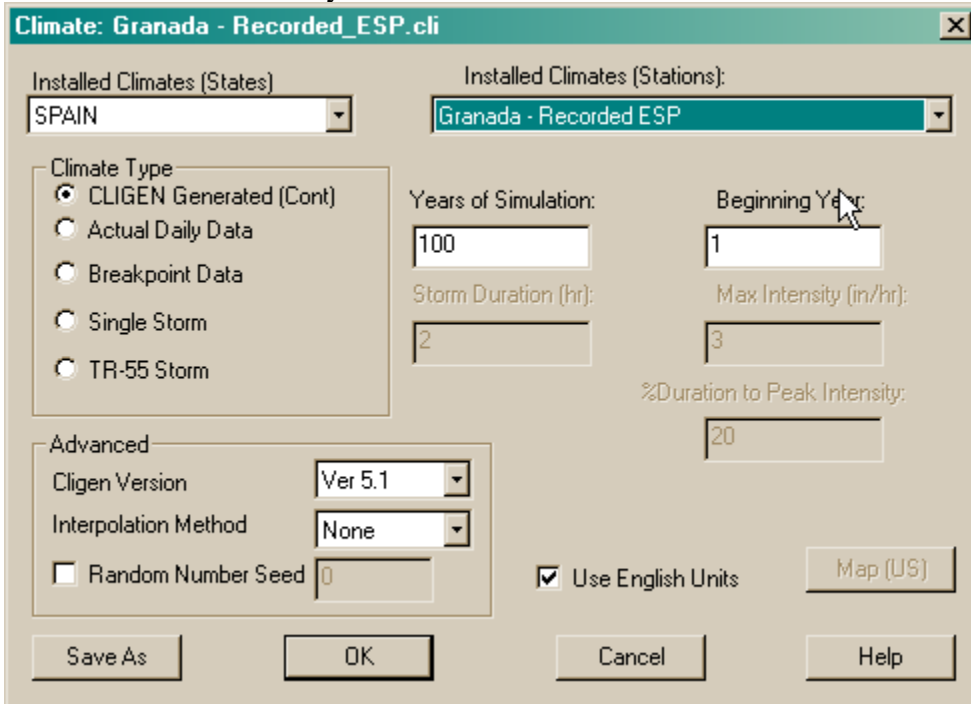
The average monthly precipitation and number of wet days are calculated from the probabilities for a wet day following a wet day and for a wet day following a dry day. To adjust approximate average monthly precipitation change the probabilities fields and click the Refresh button.

< Back **Next >** Cancel Help

Click the Next button to indicate which version of Cligen to run to generate the output file.



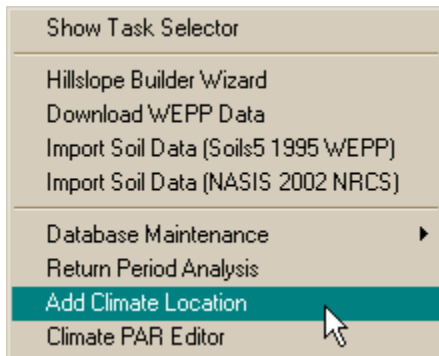
After the climate file is produced it can be imported into WEPP projects by right-clicking on the climate icon (sun) and choosing the 'Granada- Recorded_ESP' file. If you double click on the climate icon you will see that this is now an installed station in Spain.



[Add a new CLIGEN station in the continental US using existing stations](#)

This option would be chosen if none of the existing CLIGEN stations closely matched your location where you want to run WEPP. This may be because of long distances to existing stations or because of elevation differences. In this example we will pick an approximate location from a map and then customize the CLIGEN parameter file.

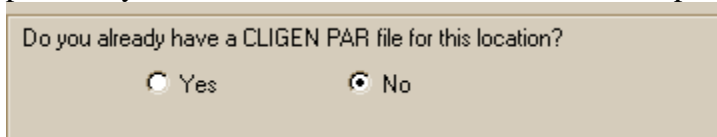
From the main WEPP Windows menu choose the **Tools** menu and select **Add Climate Location**.



The first step is to choose a name for your new location. In this example I choose Buffalo Center which is in the state of Iowa.

The first step is to select the state of Iowa and then type in Buffalo Center in the station name field.

Choose the 'No' item when for the question "Do you have already have a CLIGEN PAR file for this location?" You would only choose 'Yes' if you had developed the CLIGEN par file by hand outside the interface and want to import it into the WEPP directory.



Your window should look like the following:

Step 1: Choose a name for the new climate location

Country: UNITED STATES

State (US Only): Iowa

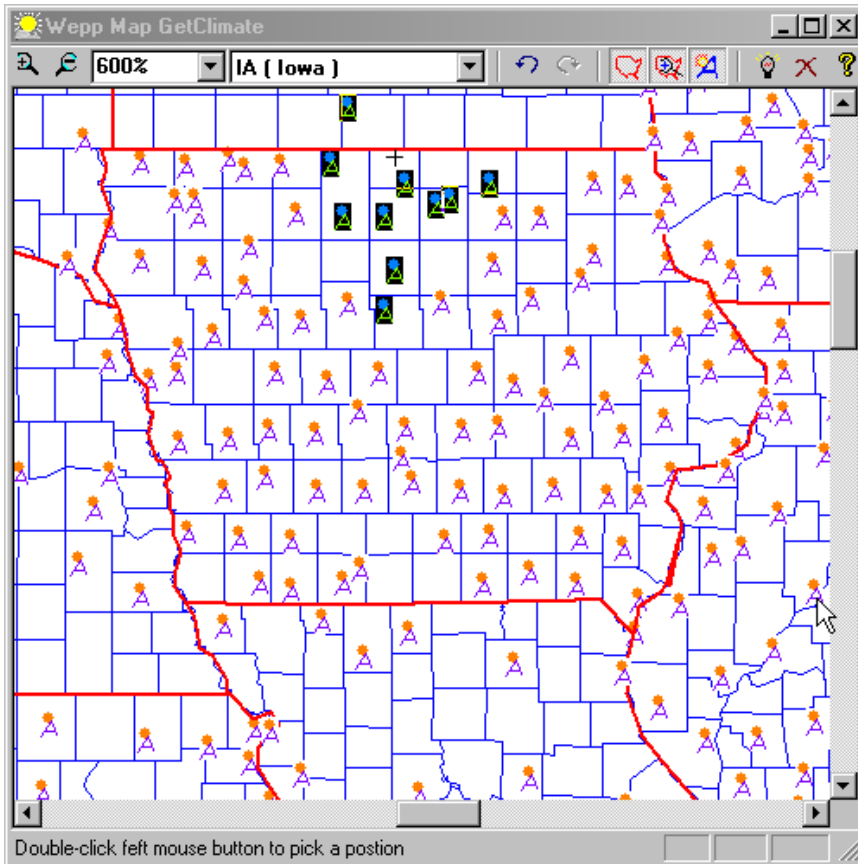
New Station Name: Buffalo Center

Do you already have a CLIGEN PAR file for this location?

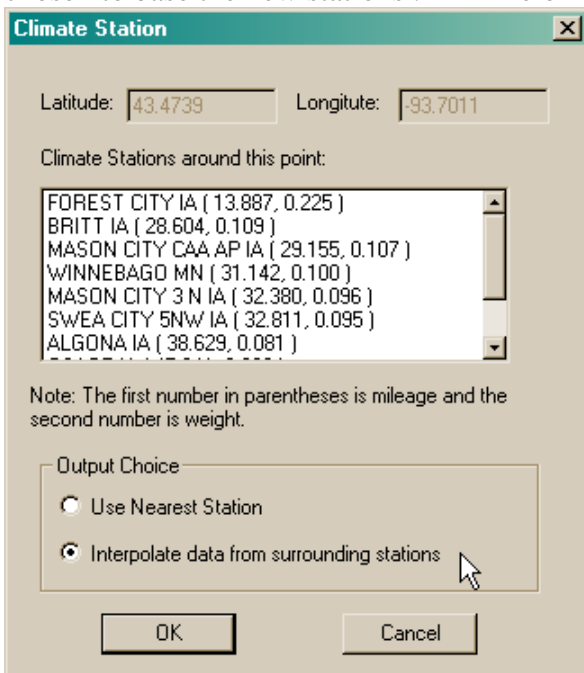
Yes No

< Back Next > Cancel Help

If the location is within the continental US the user is prompted to select the location from a map which will display the Climate map program screen. After double-clicking on the approximate location of the new station the list of surrounding cligen stations is displayed.



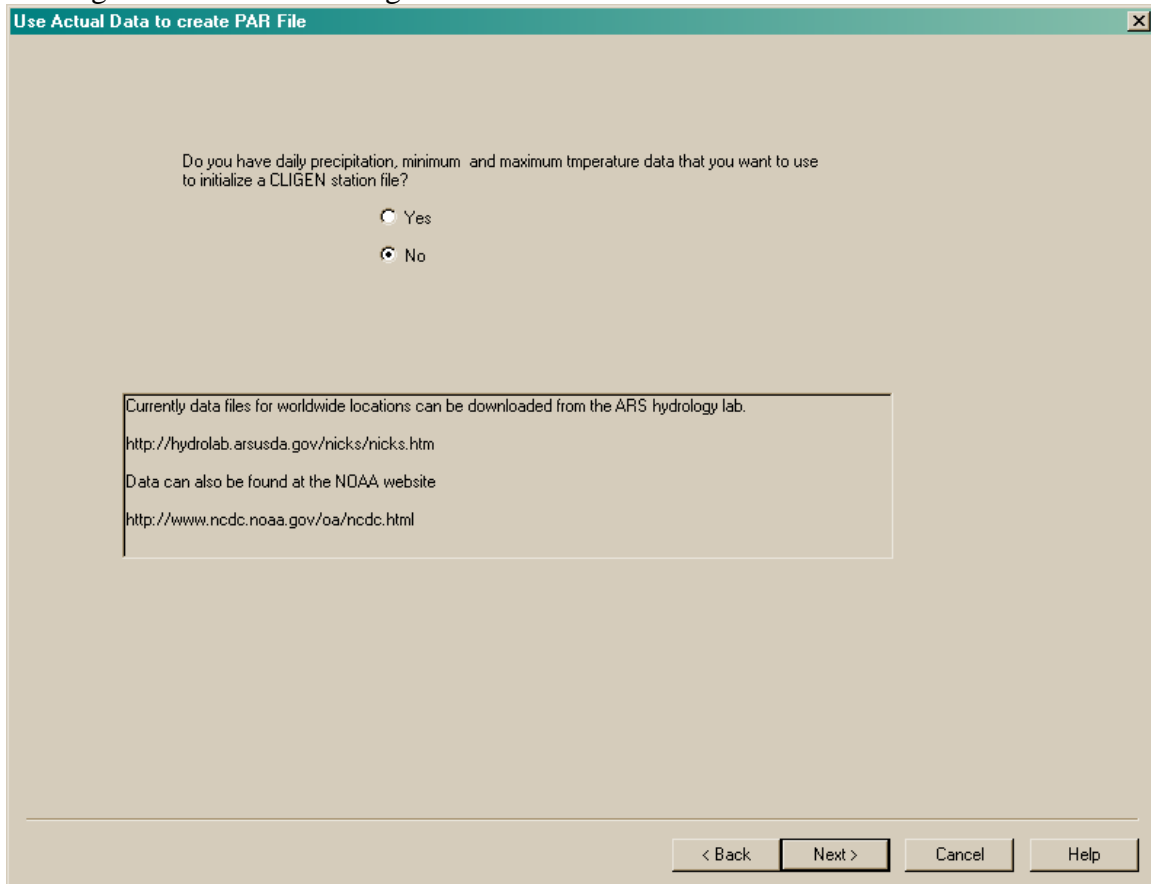
The cligen .PAR file produced can be based on the nearest station or it can be derived by interpolating the .PAR files from the surrounding stations. In the figure below we have chosen to base the new stations .PAR file on the interpolation of the surrounding stations.



Choose the 'Interpolate data from surrounding stations and then click OK.

After a base PAR file is created using the nearby stations the option of using daily data to create the PAR file is available.

The next screen asks if we have any daily precipitation data to use in creating the CLIGEN parameter file. Choose 'No' for this option because we are basing our data on existing data from surrounding stations. Click the 'Next' button.



The next screen that is displayed is a summary of the CLIGEN .PAR file data for the new station. *Note that your numbers may not exactly match those of the Buffalo Center parameter file shown below. This is because when basing the new station on the interpolation of several nearby stations the distances from the existing stations to the new station are used in weighting the parameters. This depends on the exact point selected on the map, a slightly different location selected will change the values.*

Verify Parameter File

Name: Buffalo Center Data File: Iowa\Buffalo Center IA.par

Latitude: -43.474 Longitude: -93.701 Elevation(ft): 1280 Max 30 minute rate(in): 2.49 Max 6 hour rate (in): 4.59

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Monthly Precip (in)	0.64	0.72	1.56	2.56	3.51	4.23	3.68	3.84	2.87	1.92	1.35	1.00
Number of Wet Days	4	4	6	8	9	9	8	8	7	6	5	5
Average Monthly Max Temp(F)	23.82	29.03	40.38	57.76	71.11	80.20	83.90	81.69	73.36	61.88	42.97	28.56
Average Monthly Min Temp(F)	10.07	12.99	22.30	35.58	47.49	57.14	61.49	59.00	49.78	38.70	24.91	13.95
Average Precip on Wet Days(in)	0.16	0.18	0.26	0.32	0.39	0.47	0.46	0.48	0.41	0.32	0.27	0.20
Probability of wet day following wet day	0.26	0.28	0.37	0.43	0.46	0.41	0.35	0.36	0.39	0.39	0.35	0.29
Probability of wet day following dry day	0.14	0.14	0.18	0.23	0.25	0.27	0.24	0.23	0.20	0.15	0.15	0.15
Solar Radiation (Langley/Day)*	170.50	257.40	351.60	421.90	492.30	543.00	542.50	480.60	374.70	263.20	170.90	135.40
Maximum 30 minute Intensity(in/hr)*	0.11	0.18	0.26	0.83	1.11	1.66	1.21	1.67	0.65	0.52	0.26	0.17

Monthly Averages PAR File

English Units Refresh Predicted Values Undo All Changes Predicted Yearly Precip(in) 27.88

* = Values are from template PAR file, may need to be changed to match local conditions.

The average monthly precipitation and number of wet days are calculated from the probabilities for a wet day following a wet day and for a wet day following a dry day. To adjust approximate average monthly precipitation change the probabilities fields and click the Refresh button.

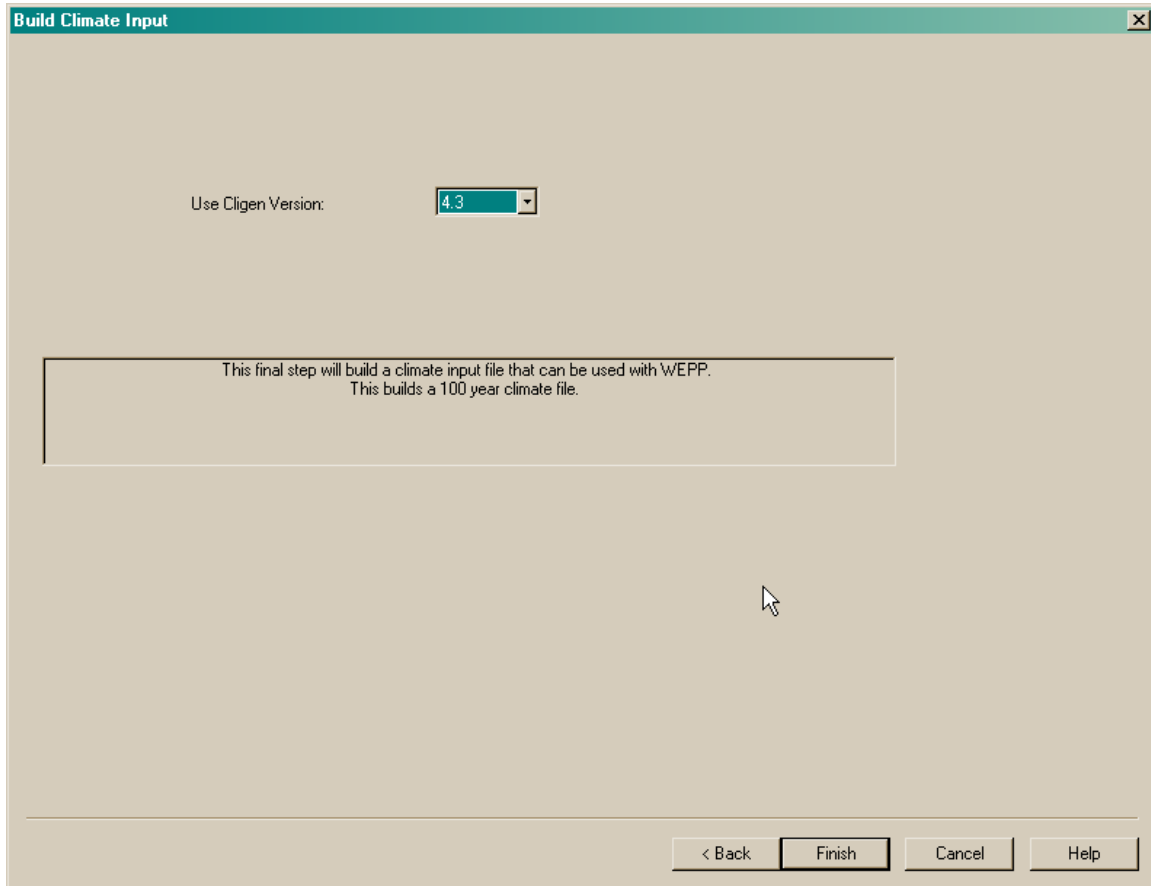
< Back Next > Cancel Help

The monthly averages can be changed to match your actual data. The first two lines in gray are for reference only and are based on the probability of wet day following a wet day and a wet day following a dry day and the precipitation amount on wet days. The field for predicted yearly amount is also for reference only. Changing the percentages for wet days or precipitation amounts will change the predicted values. If values are changed click the Refresh button to update the reference values.

For example, assume that for March and April you observe on the average 10 rainy days at Buffalo Center. Increase the wet day probabilities slightly and click the refresh button to see the effect. This will increase the predicted number of wet days and also increase the predicted annual precipitation. The number of wet days and predicted annual precipitation are for reference only and can't be changed directly because they are computed based on the average daily precipitation and the wet day probabilities. The average monthly precipitation and number of wet days provide a good indication of how CLIGEN will simulate daily weather data.

After the values are finalized click the Next button to select which version of CLIGEN to use to generate the WEPP climate file. This step also produces a new CLIGEN parameter file that can be used in running CLIGEN in the future for this station.

In addition to the monthly averages for precipitation, and temperature all the details of the .PAR file can be viewed (but not changed) by clicking on the PAR file tab.



After selecting the version of CLIGEN to use click the Finish button to generate the climate file.

To use the new climate file in a simulation right-click on the climate icon (the sun) and choose the Import menu item. The new climate file created will be named 'Buffalo Center_IA', double click on this file from the import menu to bring it into the current project and then click the 'Run' button on the main screen.

If you now double click on the climate icon (the sun) climate builder window will show the new Buffalo Center location in the list of available stations along with all the other CLIGEN stations.

Climate: Buffalo Center_IA.cli [X]

Installed Climates (States): Iowa [v]
 Installed Climates (Stations): Buffalo Center IA [v]

Climate Type:
 CLIGEN Generated (Cont)
 Actual Daily Data
 Breakpoint Data
 Single Storm
 TR-55 Storm

Years of Simulation: 100
 Beginning Year: 1
 Storm Duration (hr): 2
 Max Intensity (in/hr): 3
 %Duration to Peak Intensity: 20

Advanced:
 Cligen Version: Ver 4.3 [v]
 Interpolation Method: None [v]
 Random Number Seed: 0

Use English Units Map (US)

Save As OK Cancel Help

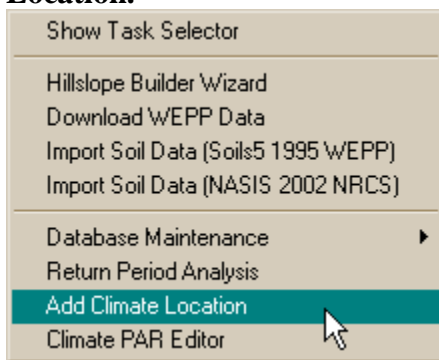
[Add a new station in the United States using observed daily data from NOAA](#)

Statistics for a new CLIGEN parameter input file can be determined from historical daily data that includes precipitation along with minimum and maximum temperature. In this example we will use daily data from the US NOAA website to assist in creating a new US CLIGEN station.

For US stations current data can be downloaded from NOAA at the following address:
<http://hurricane.ncdc.noaa.gov/pls/plclimprod/poemain.accessrouter?datasetabbv=SOD>

In this example the data for an example station has already been downloaded to the climates/observed subdirectory. For the steps taken to download the daily data from NOAA see the topic [“Downloading NOAA US Daily Data for use in WEPP”](#)

From the main WEPP Windows menu choose the **Tools** menu and select **Add Climate Location**.



The first step is to choose a name for your new location. In this example I choose Acadia National Park which is in Maine. After filling in the station name click the 'Next' button.

Step 1: Choose a name for the new climate location

Country: UNITED STATES

State (US Only): Maine

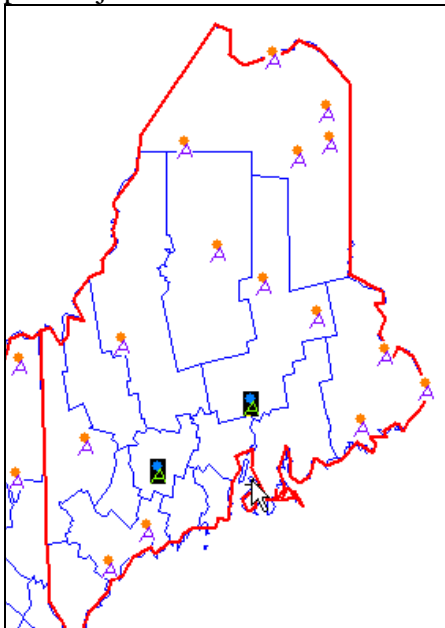
New Station Name: Acadia National Park

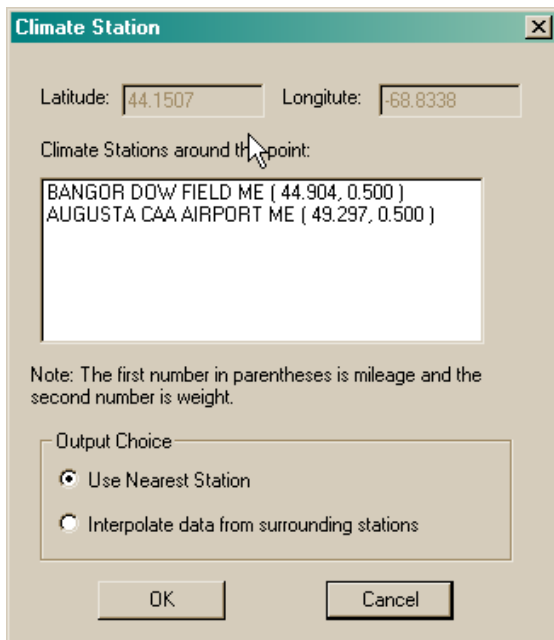
Do you already have a CLIGEN PAR file for this location?

Yes No

< Back Next > Cancel Help

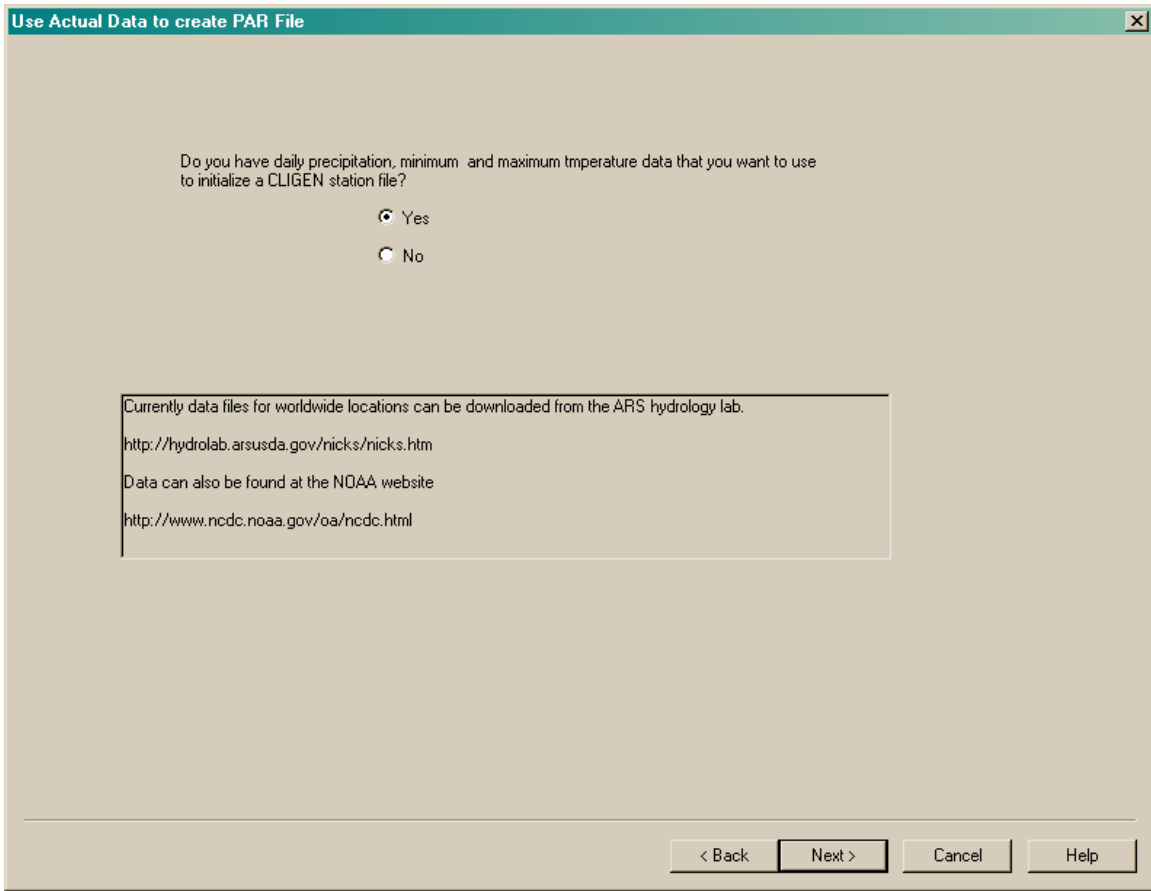
In this case when we click on the map the closest station is Bangor Maine because the park is just off the coast.



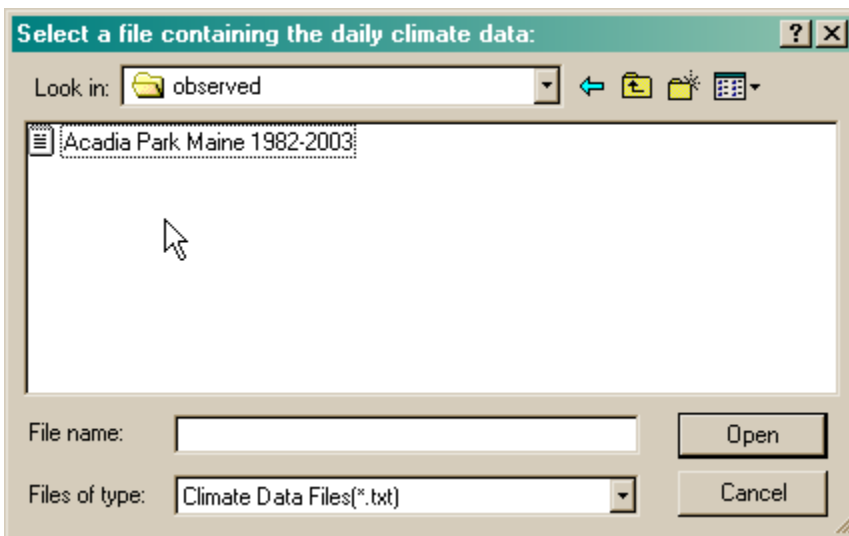


Choose the output option for Use Nearest Station and then click the OK button. This will use the Bangor station as the base for customizing the new station.

After the map closes the next screen asks if we have daily data that we want to use to initialize the CLIGEN station file. Click 'Yes' and then click the 'Next' button which will allow the daily data from NOAA to be used.



The next window allows you to choose the file containing the daily climate data. Change the file type to **Climate Data Files (*.txt)** and double click on the **observed** subdirectory.



Double click on the Acadia climate file to load it. The next window shows the climate import window which displays a table of the temperatures and precipitation read along

with some information about the columns the data was found in and also how to interpret missing data.

Weather Data Importer

Graph Temperature Graph Precip Refresh Data View

Custom Data Format Worldwide Stations from ARS Hydrology Lab US Stations from ARS Hydrology Lab

Custom Data Format

Column Delimiter: spaces or tabs ; | / ,

Precipitation in: inches Column: 13

Max Temp in: F Column: 7

Min Temp in: F Column: 8

Year / Month / Day Columns: 4 5 6

Handling Missing Data

When Missing a Precipitation Value: Mark as Missing

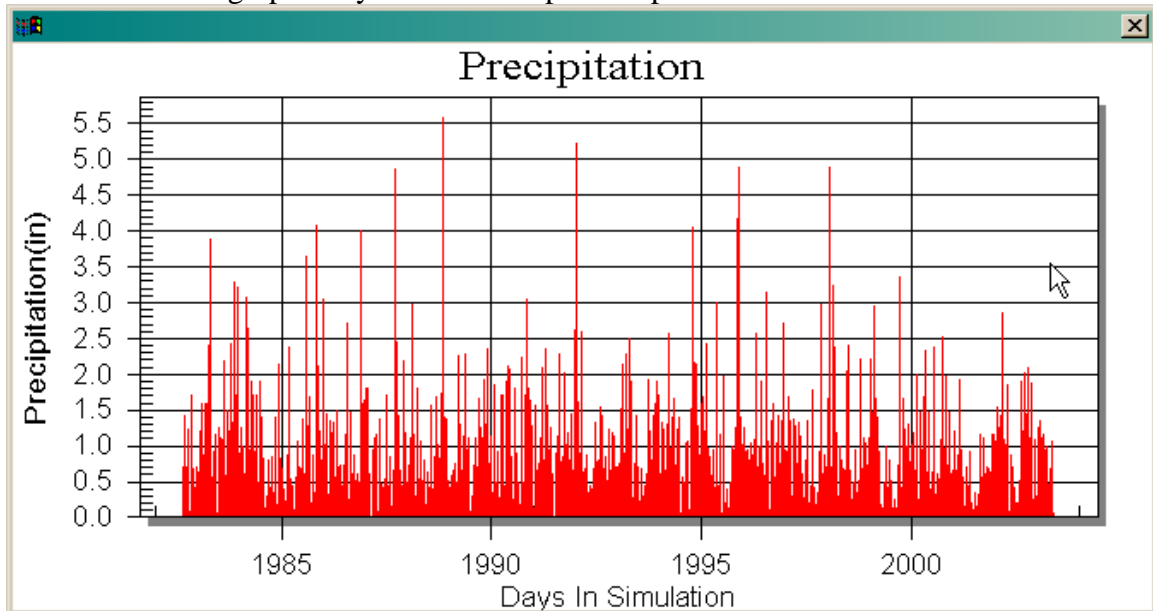
When Missing a Temperature Value: Mark as Missing

Missing Data Value: 99999

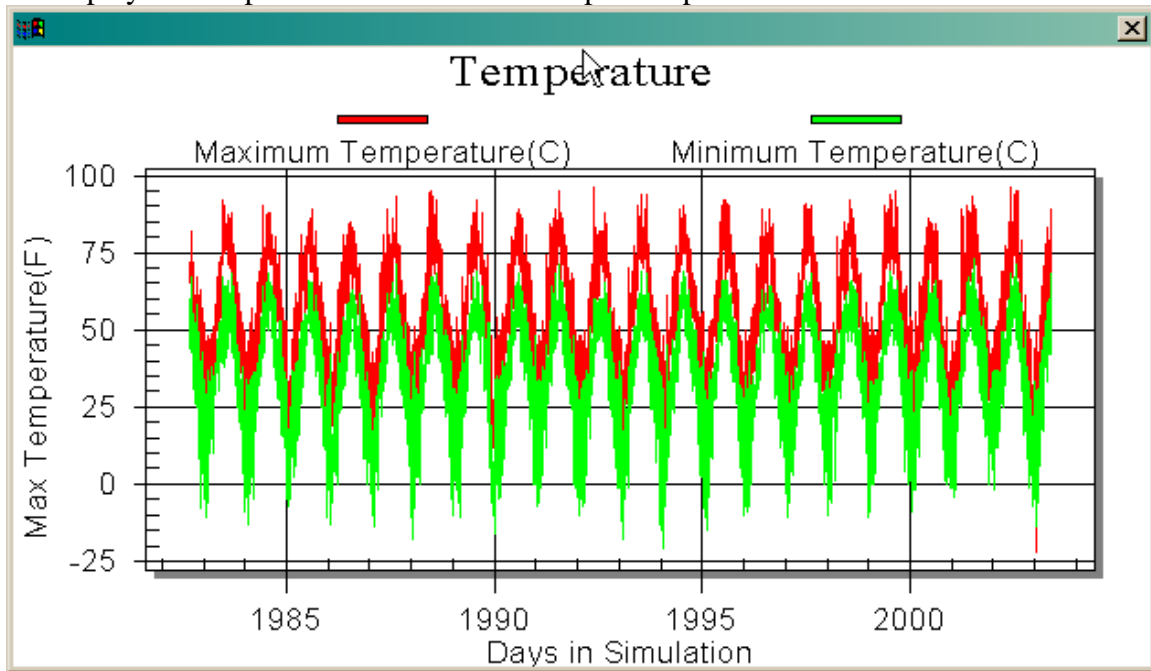
Date	Max Temp (F)	Min Temp (F)	Precip (in)
09-01-1982	70.0	51.0	0.00
09-02-1982	66.0	55.0	0.70
09-03-1982	68.0	60.0	0.15
09-04-1982	72.0	52.0	0.00
09-05-1982	69.0	47.0	0.00
09-06-1982	72.0	54.0	0.00
09-07-1982	71.0	47.0	0.00
09-08-1982	65.0	48.0	0.00
09-09-1982	65.0	44.0	0.00
09-10-1982	77.0	45.0	0.00
09-11-1982	82.0	48.0	0.00

< Back Next > Cancel Help

To view the data graphically click the Graph Precip button.



To display the temperature data click the Graph Temperature button.



Using the graphs and table is a good way to check the data to see if it is reasonable.

Click the Next button to generate a CLIGEN parameter file. The following screen will be displayed.

Verify Parameter File

Name: Data File:

Latitude: Longitude: Elevation(ft): Max 30 minute rate(in): Max 6 hour rate (in):

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Monthly Precip (in)	5.06	4.20	5.17	4.62	4.42	3.63	3.10	2.79	4.10	4.20	6.60	4.95
Number of Wet Days	11	10	11	11	13	11	10	9	10	10	12	11
Average Monthly Max Temp(F)	32.67	34.81	41.50	52.89	65.37	74.44	79.96	78.95	70.10	58.81	47.97	38.00
Average Monthly Min Temp(F)	11.97	14.27	22.51	32.57	42.36	51.64	56.90	56.55	49.26	39.38	30.37	19.00
Average Precip on Wet Days(in)	0.46	0.42	0.47	0.42	0.34	0.33	0.31	0.31	0.41	0.42	0.55	0.45
Probability of wet day following wet day	0.43	0.45	0.48	0.53	0.55	0.53	0.45	0.40	0.46	0.49	0.50	0.41
Probability of wet day following dry day	0.35	0.32	0.32	0.29	0.34	0.28	0.30	0.25	0.29	0.27	0.35	0.35
Solar Radiation (Langley/Day)*	143.00	230.00	347.00	401.00	489.00	509.00	530.00	464.00	363.00	252.00	143.00	127.00
Maximum 30 minute rainfall (in)*	0.51	0.27	0.28	0.39	0.56	0.89	1.18	1.06	0.52	0.69	0.35	0.30

Monthly Averages PAR File

English Units Refresh Predicted Values Undo All Changes Predicted Yearly Precip(in)

* = Values are from template PAR file, may need to be changed to match local conditions.

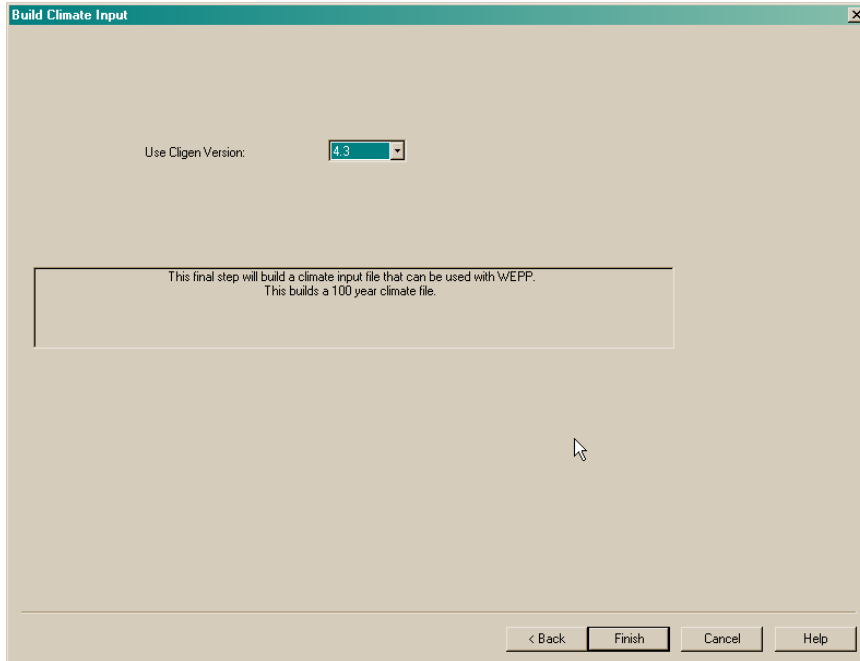
The average monthly precipitation and number of wet days are calculated from the probabilities for a wet day following a wet day and for a wet day following a dry day. To adjust approximate average monthly precipitation change the probabilities fields and click the Refresh button.

< Back Next > Cancel Help

The monthly averages can be changed to match your actual data. The first two lines in gray are for reference only and are based on the probability of wet day following a wet day and a wet day following a dry day and the precipitation amount on wet days. The field for predicted yearly amount is also for reference only. Changing the percentages for wet days or precipitation amounts will change the predicted values. If values are changed click the Refresh button to update the reference values.

Since the daily climate data only had precipitation, minimum and maximum temperature the other variables related to Solar Radiation, Maximum 30 rainfall, dewpoint and Time-to-Peak are from the closest station – in this example Bangor Maine. If more information is known about these parameters and they are different from the closest station they can be changed on this screen. The Cligen parameter file also contains additional information for wind data such as speed and direction. To change other Cligen parameters not listed use a text editor after the parameter file is created.

The last step in the process is to use the parameter file to create a WEPP climate input file using Cligen. Click the Next button on the parameter screen.



After selecting the version of CLIGEN to use click the Finish button to generate the climate file.

To use the new climate file in a simulation right-click on the climate icon (the sun) and choose the Import menu item. The new climate file created will be named 'Acadia National Park_ME', double click on this file from the import menu to bring it into the current project and then click the 'Run' button on the main screen.

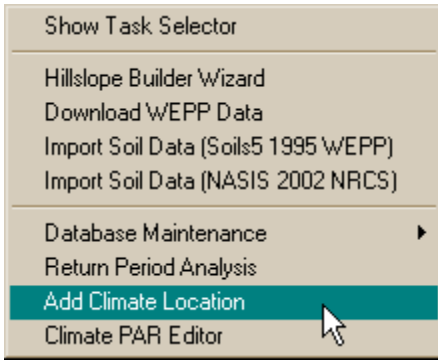
If you now double click on the climate icon (the sun) climate builder window will show the new Acadia National Park location in the list of available stations along with all the other CLIGEN stations for Maine.

Add a new station in the United States using other observed data

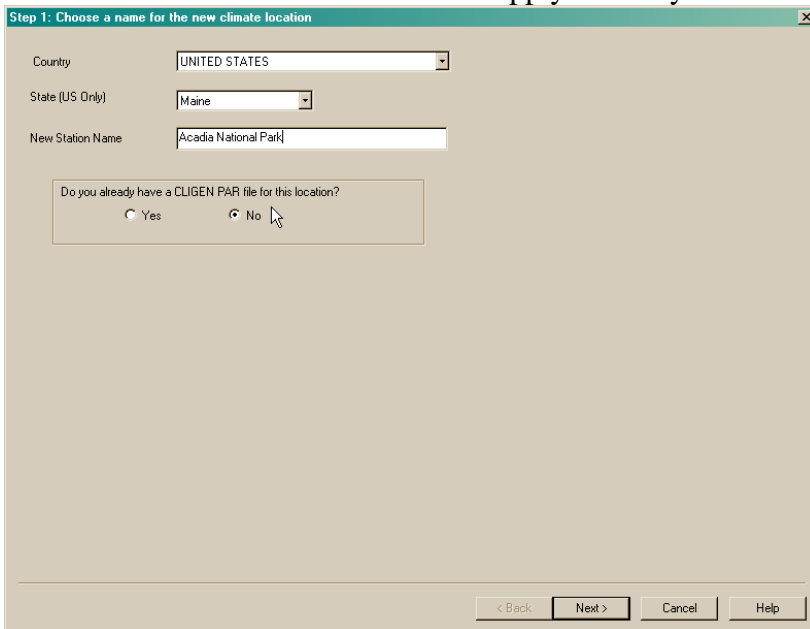
The steps to use your own observed data as the basis for a Cligen station are similar to using the NOAA daily data. What is required is a file that has an optional header line and then one line of data for each day in the period or record. The data must have precipitation, minimum and maximum temperatures. The following is an example of the first few lines from the 'Acadia – Custom Recorded.txt' file. The WEPP interface will process the first line and determine the columns for the data and how to interpret it.

```
MONTH , DAY , YEAR , PRCP , TMAX , TMIN
 9  1  1982  0.00  70.00  51.00
 9  2  1982  0.70  66.00  55.00
 9  3  1982  0.15  68.00  60.00
 9  4  1982  0.00  72.00  52.00
 9  5  1982  0.00  69.00  47.00
 9  6  1982  0.00  72.00  54.00
 9  7  1982  0.00  71.00  47.00
 9  8  1982  0.00  65.00  48.00
 9  9  1982  0.00  65.00  44.00
 9 10  1982  0.00  77.00  45.00
 9 11  1982  0.00  82.00  48.00
 9 12  1982  1.42  80.00  48.00
 9 13  1982  0.00  77.00  52.00
 9 14  1982  0.00  73.00  67.00
 9 15  1982  0.00  73.00  53.00
 9 16  1982  0.03  65.00  51.00
 9 17  1982  0.03  68.00  52.00
 9 18  1982  0.00  64.00  48.00
 9 19  1982  0.00  63.00  46.00
 9 20  1982  0.00  64.00  43.00
 9 21  1982  0.33  64.00  47.00
 9 22  1982  0.70  60.00  51.00
 9 23  1982  0.10  55.00  44.00
 9 24  1982  0.27  69.00  48.00
 9 25  1982  0.00  70.00  51.00
 9 26  1982  0.00  68.00  44.00
 9 27  1982  0.00  67.00  51.00
 9 28  1982  0.11  68.00  55.00
 9 29  1982  0.01  70.00  49.00
```

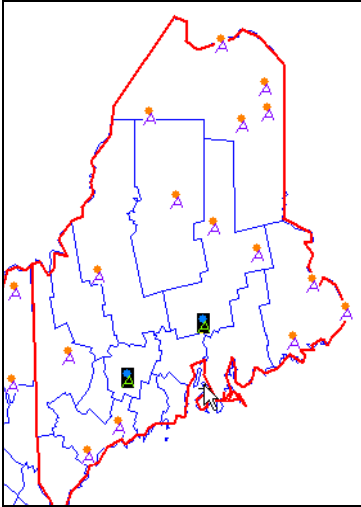
From the main WEPP Windows menu choose the **Tools** menu and select **Add Climate Location**.



The steps to setup the station are the same as when using NOAA daily data. The only difference is which file is selected to supply the daily data and how the data is formatted.



Choose a name for the station



Select the station location on a map

Climate Station [X]

Latitude: Longitude:

Climate Stations around this point:

BANGOR DOW FIELD ME (44.904, 0.500)
AUGUSTA CAA AIRPORT ME (49.297, 0.500)

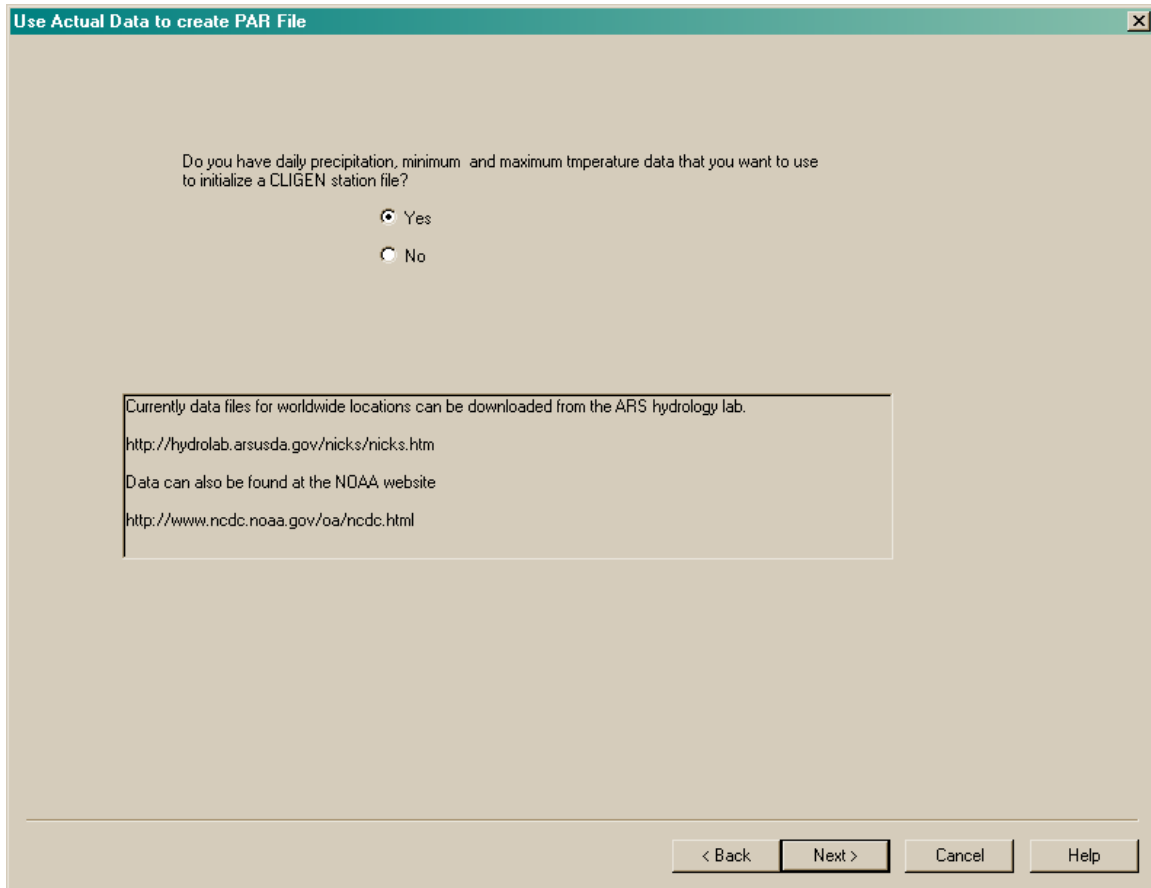
Note: The first number in parentheses is mileage and the second number is weight.

Output Choice

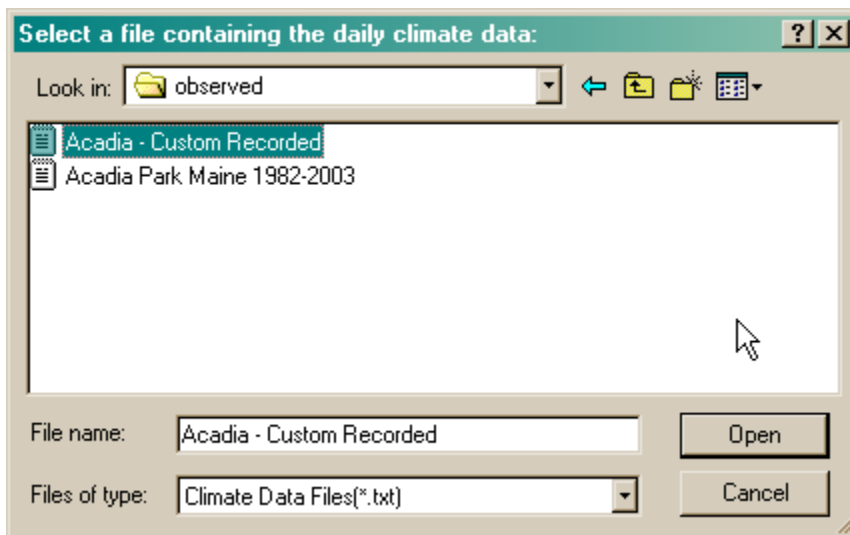
Use Nearest Station

Interpolate data from surrounding stations

Choose a similar station



Indicate that the station parameters will be determined from actual data.



After choosing the file import window shows how the data was understood by the interface. If this is not correct for your data change the selections for column numbers or units and click the Refresh button. Note that if your data file has no header line you can still import it but will have to select where each column of data is located.

Weather Data Importer

Graph Temperature Graph Precip Refresh Data View

Custom Data Format
 Worldwide Stations from ARS Hydrology Lab
 US Stations from ARS Hydrology Lab

Custom Data Format

Column Delimiter: spaces or tabs ; | / ,

Precipitation in: inches Column: 4

Max Temp in: F Column: 5

Min Temp in: F Column: 6

Year / Month / Day Columns: 3 1 2

Handling Missing Data

When Missing a Precipitation Value: Assume zero

When Missing a Temperature Value: Use monthly average

Missing Data Value: 99999

Date	Max Temp (F)	Min Temp (F)	Precip (in)
09-01-1982	70.0	51.0	0.00
09-02-1982	66.0	55.0	0.70
09-03-1982	68.0	60.0	0.15
09-04-1982	72.0	52.0	0.00
09-05-1982	69.0	47.0	0.00
09-06-1982	72.0	54.0	0.00
09-07-1982	71.0	47.0	0.00
09-08-1982	65.0	48.0	0.00
09-09-1982	65.0	44.0	0.00
09-10-1982	77.0	45.0	0.00
09-11-1982	82.0	48.0	0.00

< Back Next > Cancel Help

Click the Next button to generate a CLIGEN parameter file. The following screen will be displayed.

Verify Parameter File

Name: Data File:

Latitude: Longitude: Elevation(ft): Max 30 minute rate(in): Max 6 hour rate (in):

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Monthly Precip (in)	5.06	4.20	5.17	4.62	4.42	3.63	3.10	2.79	4.10	4.20	6.60	4.95
Number of Wet Days	11	10	11	11	13	11	10	9	10	10	12	11
Average Monthly Max Temp(F)	32.67	34.81	41.50	52.89	65.37	74.44	79.96	78.95	70.10	58.81	47.97	38.00
Average Monthly Min Temp(F)	11.97	14.27	22.51	32.57	42.36	51.64	56.90	56.55	49.26	39.38	30.37	19.00
Average Precip on Wet Days(in)	0.46	0.42	0.47	0.42	0.34	0.33	0.31	0.31	0.41	0.42	0.55	0.45
Probability of wet day following wet day	0.43	0.45	0.48	0.53	0.55	0.53	0.45	0.40	0.46	0.49	0.50	0.41
Probability of wet day following dry day	0.35	0.32	0.32	0.29	0.34	0.28	0.30	0.25	0.29	0.27	0.35	0.35
Solar Radiation (Langley/Day)*	143.00	230.00	347.00	401.00	489.00	509.00	530.00	464.00	363.00	252.00	143.00	127.00
Maximum 30 minute Intensity(in/hr)*	0.51	0.27	0.28	0.39	0.56	0.89	1.18	1.06	0.52	0.69	0.35	0.30

Monthly Averages PAR File

English Units Refresh Predicted Values Undo All Changes Predicted Yearly Precip(in)

* = Values are from template PAR file, may need to be changed to match local conditions.

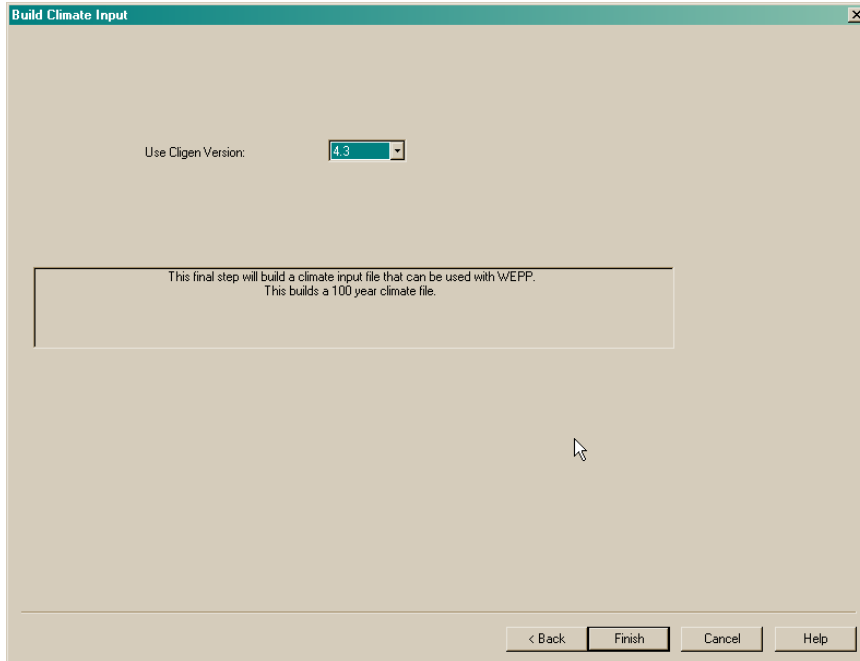
The average monthly precipitation and number of wet days are calculated from the probabilities for a wet day following a wet day and for a wet day following a dry day. To adjust approximate average monthly precipitation change the probabilities fields and click the Refresh button.

< Back Next > Cancel Help

The monthly averages can be changed to match your actual data. The first two lines in gray are for reference only and are based on the probability of wet day following a wet day and a wet day following a dry day and the precipitation amount on wet days. The field for predicted yearly amount is also for reference only. Changing the percentages for wet days or precipitation amounts will change the predicted values. If values are changed click the Refresh button to update the reference values.

Since the daily climate data only had precipitation, minimum and maximum temperature the other variables related to Solar Radiation, Maximum 30 intensity (in/hr) rainfall, dewpoint and Time-to-Peak are from the closest station – in this example Bangor Maine. If more information is known about these parameters and they are different from the closest station they can be changed on this screen. The Cligen parameter file also contains additional information for wind data such as speed and direction. To change other Cligen parameters not listed use a text editor after the parameter file is created.

The last step in the process is to use the parameter file to create a WEPP climate input file using Cligen. Click the Next button on the parameter screen.



After selecting the version of CLIGEN to use click the Finish button to generate the climate file.

To use the new climate file in a simulation right-click on the climate icon (the sun) and choose the Import menu item. The new climate file created will be named 'Acadia National Park_ME', double click on this file from the import menu to bring it into the current project and then click the 'Run' button on the main screen.

If you now double click on the climate icon (the sun) climate builder window will show the new Acadia National Park location in the list of available stations along with all the other CLIGEN stations for Maine.

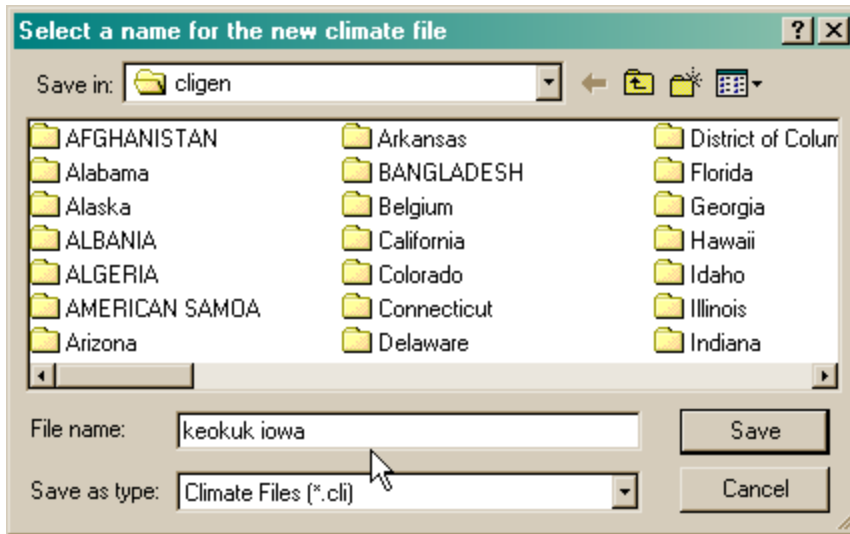
[Importing observed daily data into a WEPP CLIGEN weather file](#)

Import the weppdemo.cli file into the WEPP project by right-clicking on the climate icon and selecting import. From the list of files choose 'weppdemo'. This climate is for Des Moines Iowa. After importing double click on the climate icon to display the climate builder dialog.

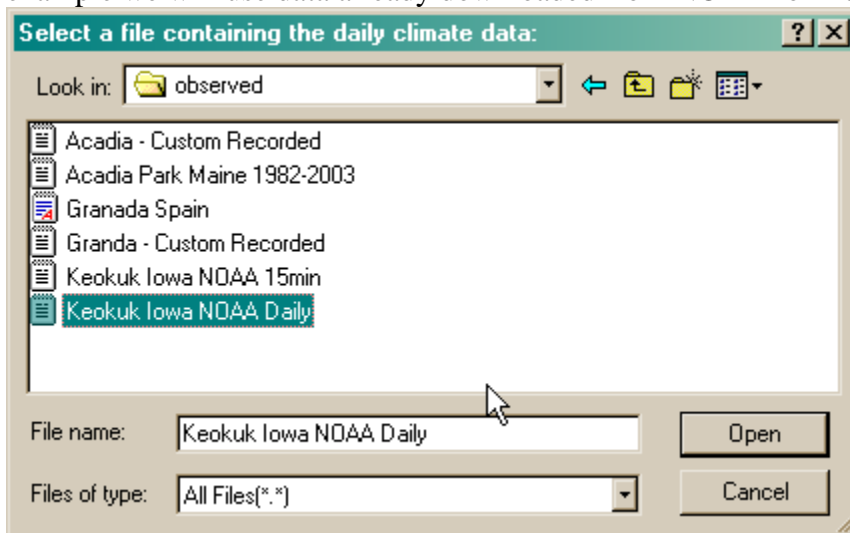
Next change the station to Keokuk Iowa, this is where we have daily data from 1990 till 2002.

The screenshot shows the 'Climate: weppdemo.cli' dialog box. It has two dropdown menus at the top: 'Installed Climates (States)' set to 'Iowa' and 'Installed Climates (Stations)' set to 'KEOKUK IA'. Below these are radio buttons for 'Climate Type': 'CLIGEN Generated (Cont)', 'Actual Daily Data' (selected), 'Breakpoint Data', 'Single Storm', and 'TR-55 Storm'. To the right are input fields for 'Years of Simulation' (100), 'Beginning Year' (1), 'Storm Duration (hr)' (2), 'Max Intensity (in/hr)' (3), and '%Duration to Peak Intensity' (20). An 'Advanced' section contains 'Cligen Version' (Ver 4.3), 'Interpolation Method' (None), and a 'Random Number Seed' field (0). There is a checked 'Use English Units' checkbox and a 'Map (US)' button. At the bottom are 'Save As', 'OK', 'Cancel', and 'Help' buttons.

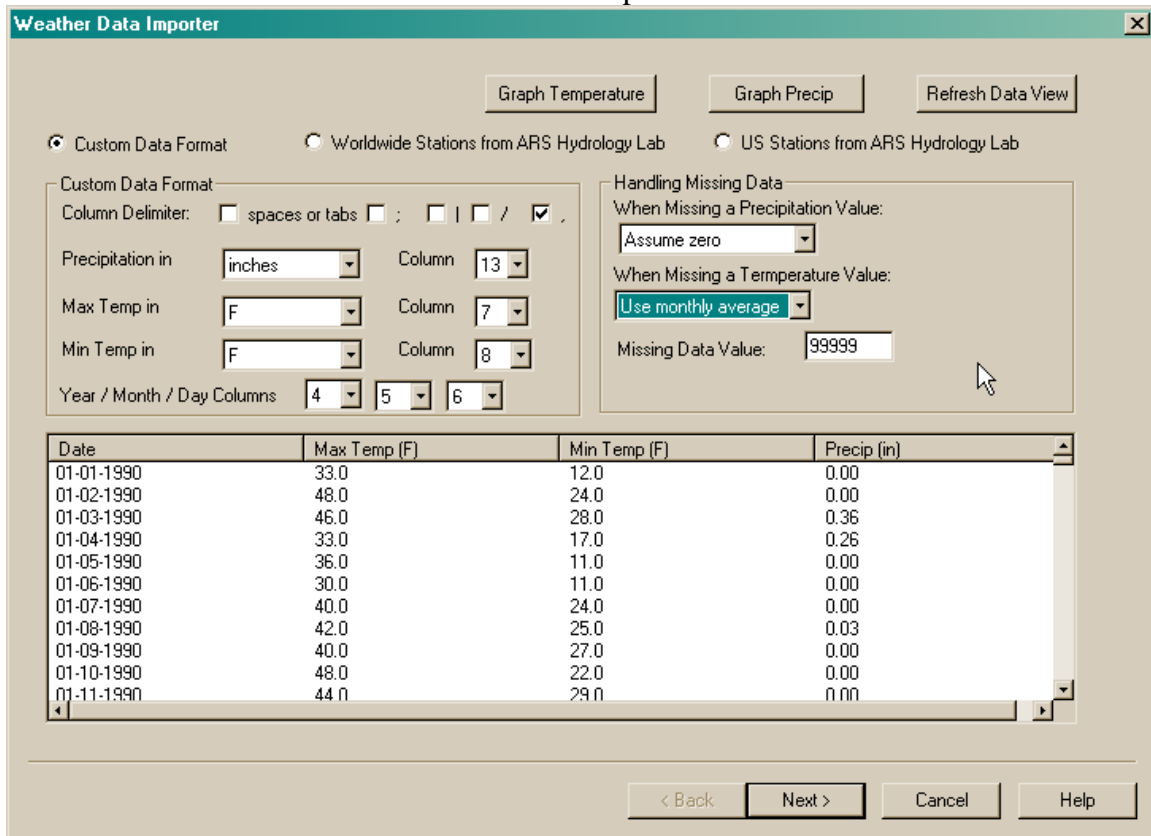
The climate dialog has a two new items on the left side that allow actual daily data or breakpoint data to be used. In this example click on the 'Actual Daily Data' item and then click on the 'Save As' button. Choose a new name for the climate file.



The next window will ask for the name of a file containing the daily climate data. In this example we will use data already downloaded from NOAA for Keokuk.



The next window will show the weather data importer.



The Weather Data Importer dialog box features a title bar with a close button. It contains three buttons at the top: "Graph Temperature", "Graph Precip", and "Refresh Data View". Below these are three radio buttons: "Custom Data Format" (selected), "Worldwide Stations from ARS Hydrology Lab", and "US Stations from ARS Hydrology Lab".

The "Custom Data Format" section includes a "Column Delimiter" field with checkboxes for "spaces or tabs", ":", "|", "/", and ",". Below this are three rows of settings: "Precipitation in" (set to "inches", Column 13), "Max Temp in" (set to "F", Column 7), and "Min Temp in" (set to "F", Column 8). At the bottom of this section are "Year / Month / Day Columns" set to 4, 5, and 6.

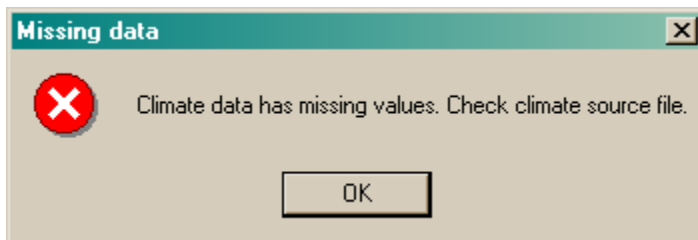
The "Handling Missing Data" section has two dropdown menus: "When Missing a Precipitation Value" (set to "Assume zero") and "When Missing a Temperature Value" (set to "Use monthly average"). A text field for "Missing Data Value" contains "99999".

A table displays the following data:

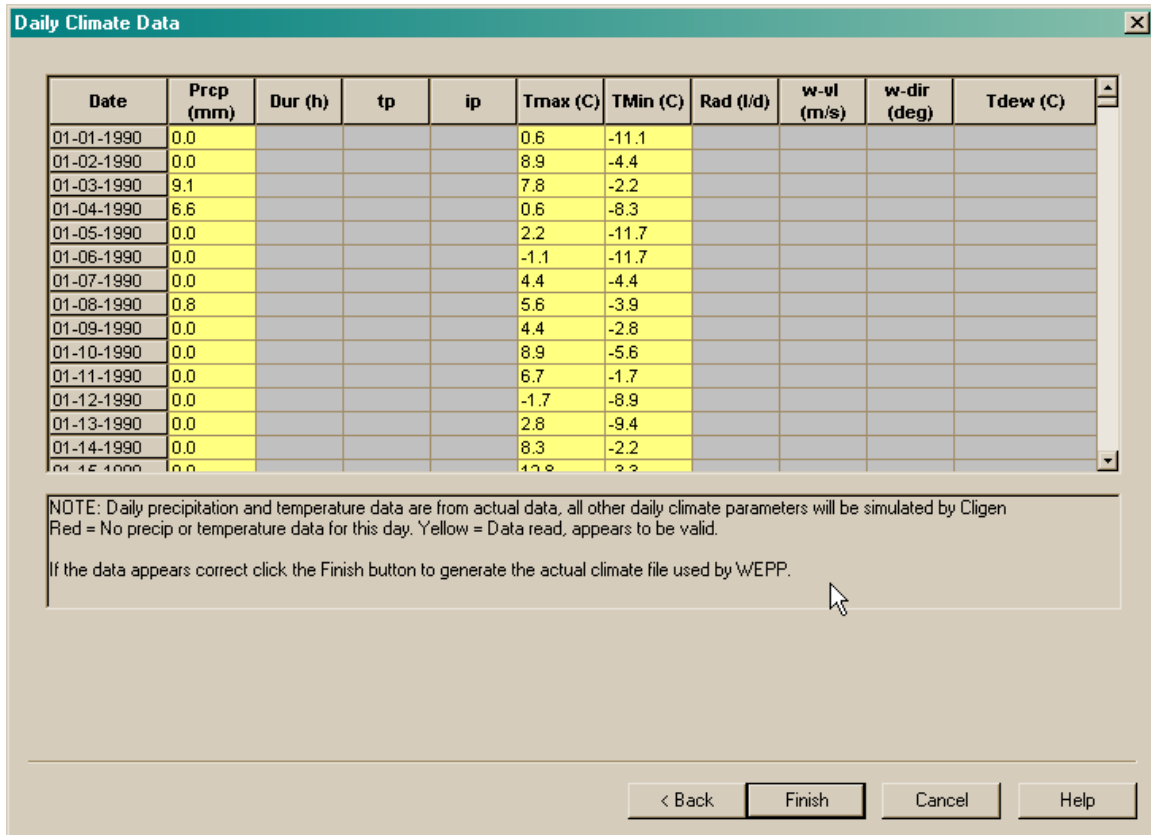
Date	Max Temp (F)	Min Temp (F)	Precip (in)
01-01-1990	33.0	12.0	0.00
01-02-1990	48.0	24.0	0.00
01-03-1990	46.0	28.0	0.36
01-04-1990	33.0	17.0	0.26
01-05-1990	36.0	11.0	0.00
01-06-1990	30.0	11.0	0.00
01-07-1990	40.0	24.0	0.00
01-08-1990	42.0	25.0	0.03
01-09-1990	40.0	27.0	0.00
01-10-1990	48.0	22.0	0.00
01-11-1990	44.0	29.0	0.00

At the bottom are four buttons: "< Back", "Next >", "Cancel", and "Help".

Click the Next button. There will probably be a warning message about the data containing some missing values, most of the NOAA daily data has a least a few days of missing data.



The next screen will show the data values and can be used to identify what days have missing data.



For international data a similar approach is used to select the file with the daily data from the climate builder window.

This window shows which values of daily data will be generated by CLIGEN (those in gray) and which values are being used from the actual data (those in yellow). Items that are displayed in red indicate that there was missing data on that day.

Click the Finish button to run Cligen and generate a WEPP data file. The new file is automatically imported into the current project.

This method of using daily data to make WEPP runs still uses simulated values for the storm duration and intensities which may not actually match what occurred. To correctly set the storm duration and intensities breakpoint data must be used.

For US stations current daily data can be downloaded from NOAA:

<http://hurricane.ncdc.noaa.gov/pls/plclimprod/poemain.accessrouter?datasetabbv=SOD>

The WEPP Windows interface is able to import daily climate data in several formats:

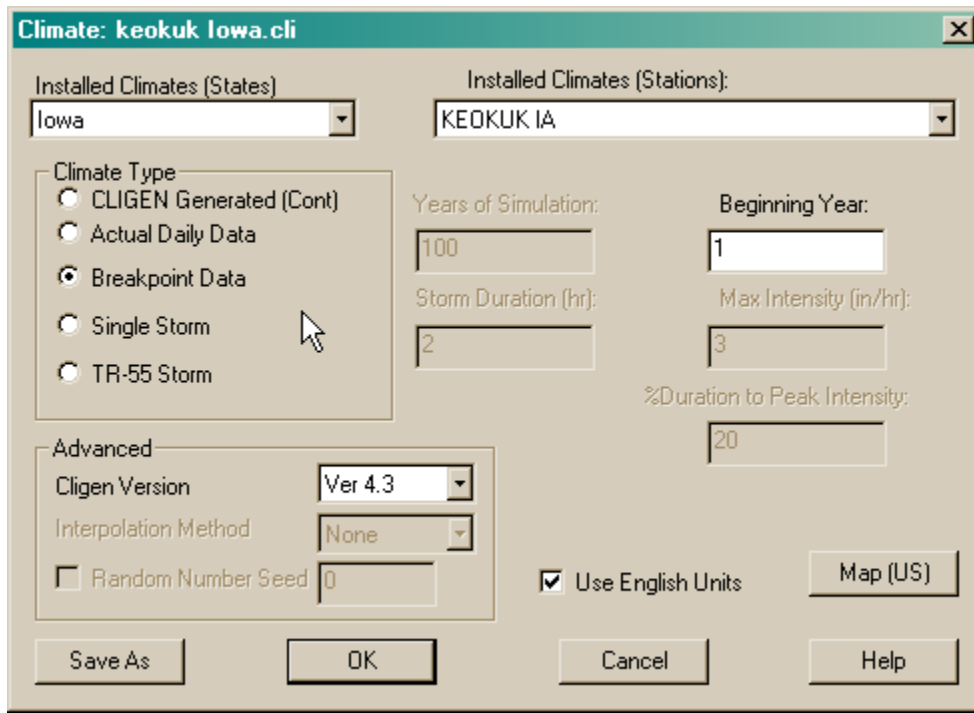
1. **Custom Format** – Assumes a text file with one line of data for each day of record. The first line of the file may contain the keywords PRCP,TMAX,TMIN to

indicate in which columns the precipitation, max temperature and min temperature are found in. Columns in the file can be separated by tabs, semi-colon(;), pipe(|), comma(,).

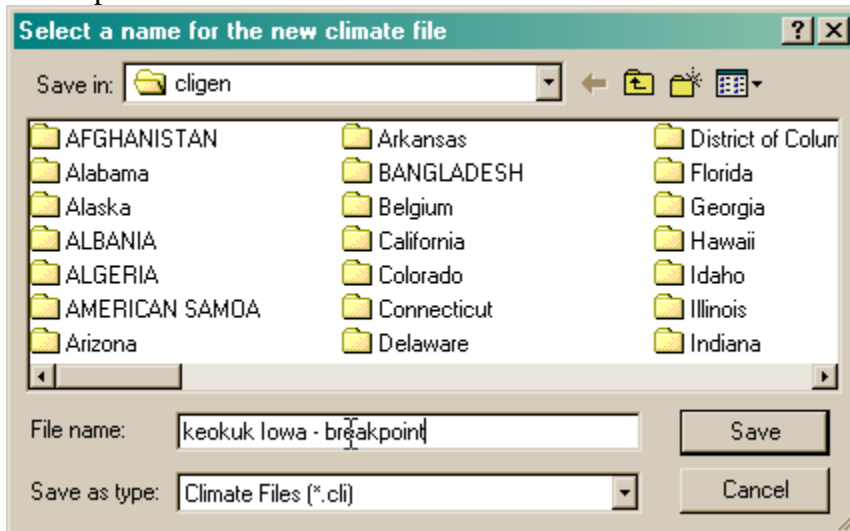
2. **Worldwide Stations from ARS Hydrology Lab** – There are many worldwide stations available at: <http://hydrolab.arsusda.gov/nicks/nicks.htm> The file format is also described. These mostly have a period of record of about 15 years ending in the early 1990's.
3. **US Stations from ARS Hydrology Lab** – The format for these files is also described at: <http://hydrolab.arsusda.gov/nicks/nicks.htm>

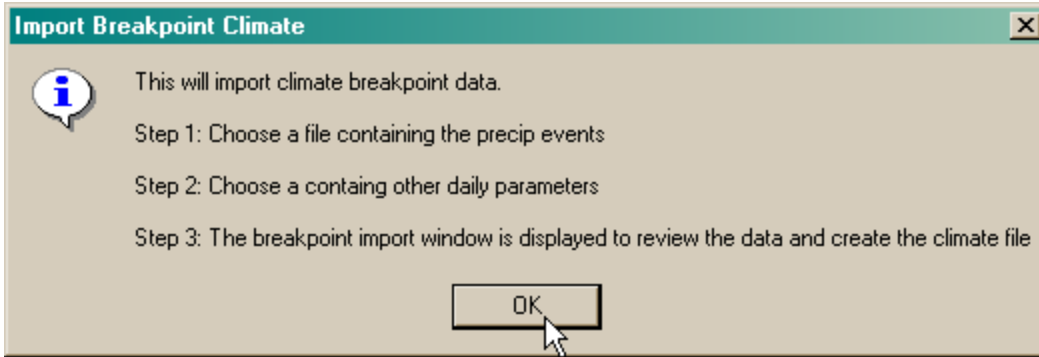
[Importing 15 minute precipitation data from NOAA into a breakpoint climate file.](#)

Double click on the climate icon on the main screen and set the selections to Keokuk Iowa and select the Breakpoint Data option on the left side of the window.



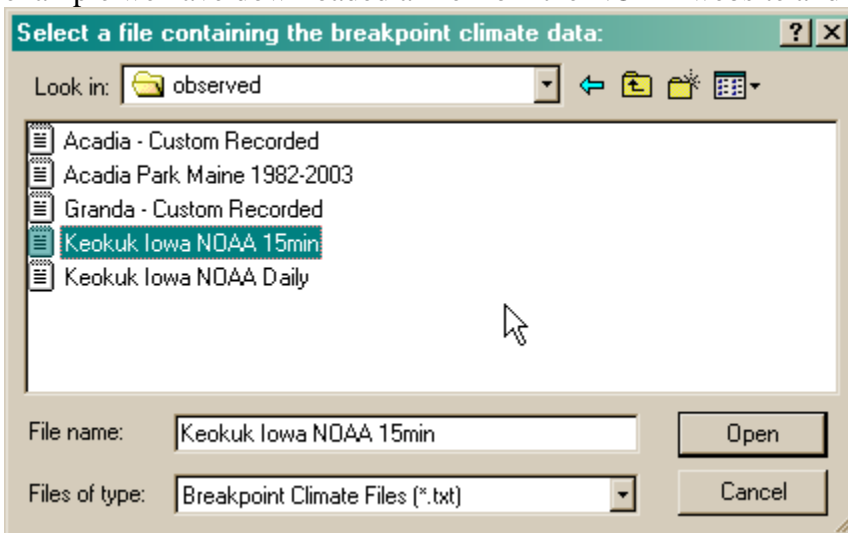
Click the Save As button and name the file 'Keokuk Iowa – breakpoint' which is where the output climate will be stored.



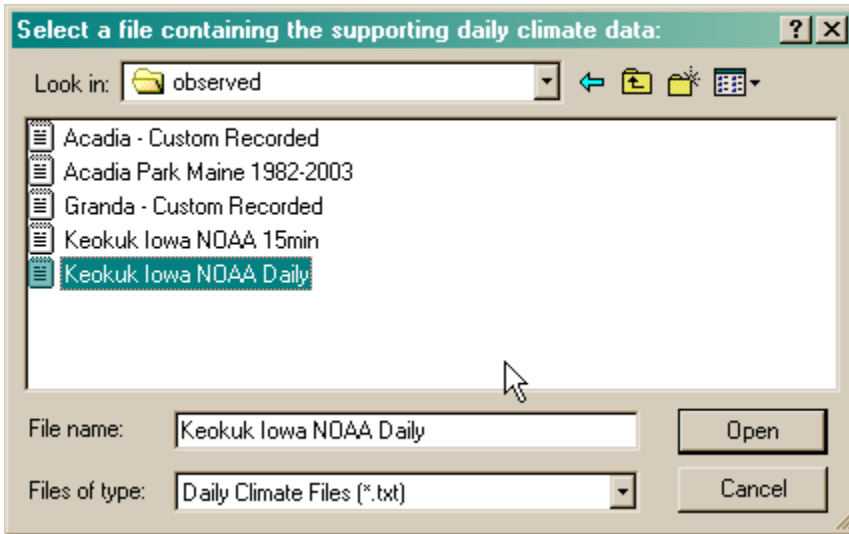


The next window gives a brief overview of the steps to follow. The information needed to build a WEPP breakpoint file is actually assumed to be in two files – one that has the precipitation and the other that has other daily parameters such as temperature. The precip file has more detailed information for the durations of rainfall events.

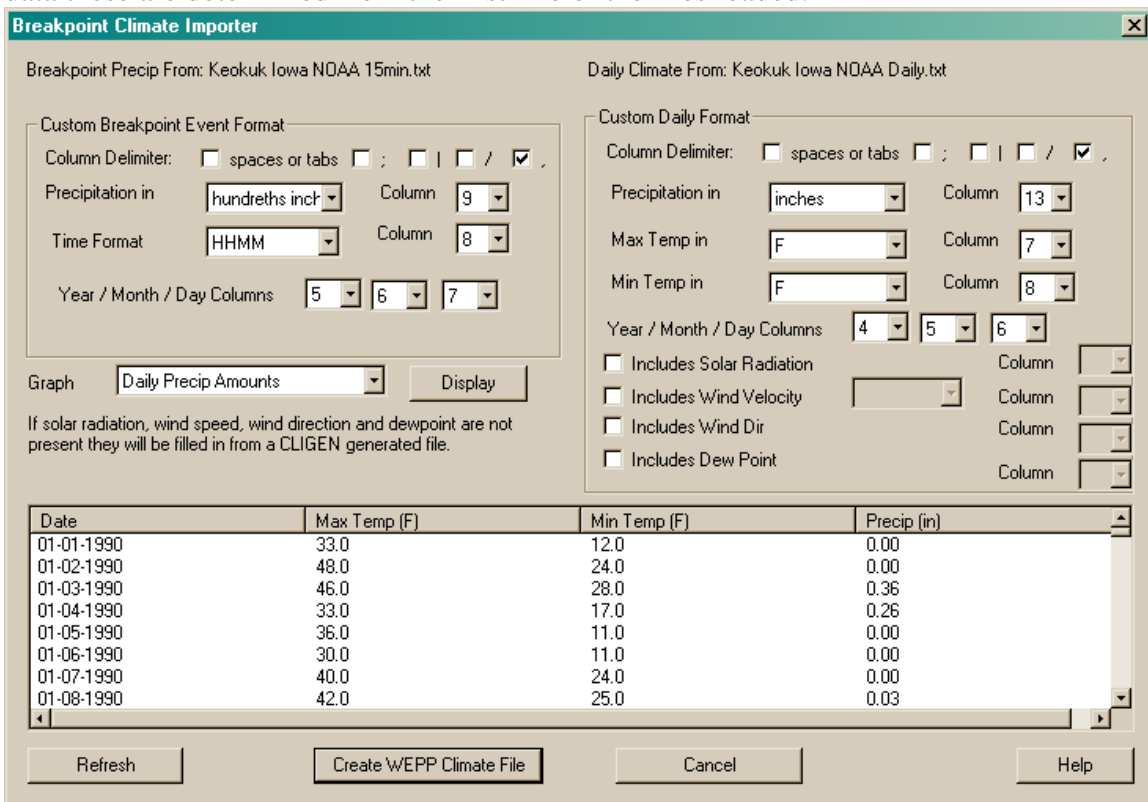
The first file to load is the file containing the 15 minute precipitation data. For this example we have downloaded a file from the NOAA website and renamed it



The next step is to load the daily data file which contains the other parameters that are used.



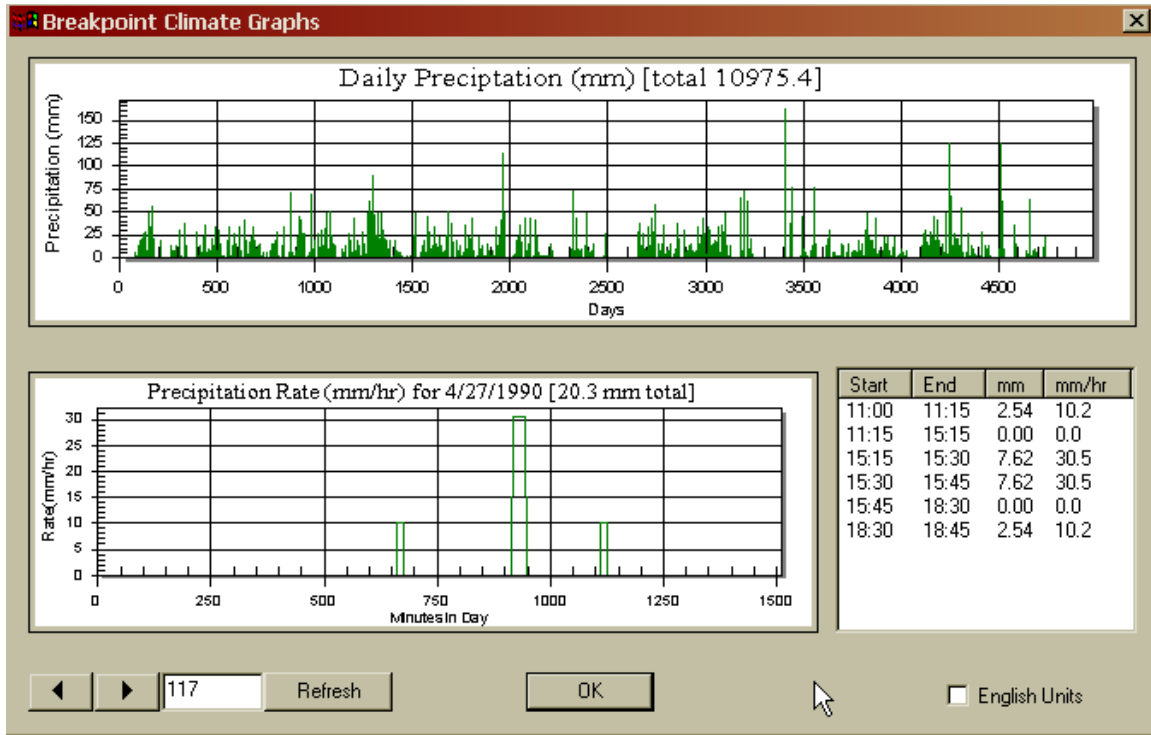
The next window that is displayed is the breakpoint climate data importer window. This summarizes the format of the 15 minute and daily data files that were loaded. For NOAA data these are determined from the first line of the files loaded.



For generating a correct WEPP climate file the timeframes of the two files should be the same, in this case they both start on 1/1/1990. In addition the weather data should begin a January 1 of a year.

Next click the 'Create WEPP Climate File' button to generate the climate file.

After creating a breakpoint climate file the precipitation patterns can be graphed. To do this select the Tools menu from the main toolbar and then choose 'Breakpoint Climate File Check'. The breakpoint climate file can then be loaded. There are several checks that are done to be sure the data is reasonable. If there are any problems details about the errors are displayed. The precipitation graphs look like the following:



The top graph shows the daily precipitation for the duration of the climate file. The lower graph shows the precipitation pattern for a particular day as mm/hour (or in/hour). The table shows the start and end times of the events. The arrows on the bottom left of the window can be used to jump forward or backward to the next day with precipitation.

Importing other breakpoint data into a WEPP breakpoint climate file

This is similar to using 15 minute precipitation data from the NOAA website. There are two files required:

1. Precipitation Data – Includes the time of rainfall and amount. The amounts in the file should not be cumulative. The WEPP interface will accumulate the precipitation during each day.
2. Other Daily Data – This includes minimum and maximum temperature and can optionally include, solar radiation, dewpoint, wind speed and direction on a daily basis.

A sample of a precipitation file is shown below:

```
COOPID,CD,ELEM,UN,YEAR,MO,DA,TIME, VALUE,F,F
-----,--,-----,--,-----,-----,-----,--
134381,00,QPCP,HT,1990,03,22,0515, 00010, ,
134381,00,QPCP,HT,1990,03,22,0600, 00010, ,
134381,00,QPCP,HT,1990,03,22,2500, 00020, ,
134381,00,QPCP,HT,1990,03,29,0130, 00010, ,
134381,00,QPCP,HT,1990,03,29,2500, 00010, ,
```

The WEPP interface only uses the YEAR,MO,DA,TIME and VALUE columns. Times greater than 2400 are ignored. In the NOAA file times of 2500 indicate the cumulative precip for the day. Blank lines in the file are also ignored. Only days that have precip need to have the data listed.

The breakpoint climate import window allows flexibility of which column the data is found in and the units for the precip. In this example the data is in hundredths of an inch.

The second file needed is a daily file with temperature and other parameters. There should be one line of data for each day in the simulation.

A sample of the daily file is shown below:

```
COOPID,WBANID,Prelim,year,month,day,Tmax,Tmin,Tobs,Tmean,Cdd,Hdd,Prctp
132203,14933, ,1990,01,1,33,12, ,23,0,42,T,T,T
132203,14933, ,1990,01,2,48,24, ,36,0,29,0,0,0
132203,14933, ,1990,01,3,46,28, ,37,0,28,0.36,2.8,0
132203,14933, ,1990,01,4,33,17, ,25,0,40,0.26,4.3,6
132203,14933, ,1990,01,5,36,11, ,24,0,41,0,0,6
132203,14933, ,1990,01,6,30,11, ,21,0,44,T,T,6
```

The WEPP interface only uses the YEAR,MONTH,DAY,TMAX,TMIN columns. The precipitation data is from the precipitation file, the daily precipitation if any is listed in this file is not used.

If other daily parameter data is available it can be included by specifying the following keywords on the first line to indicate the column the data appears in:

SOLAR - solar radiation in langley/day

WINDV - wind velocity m/s

WINDDIR - wind direction in degrees from N

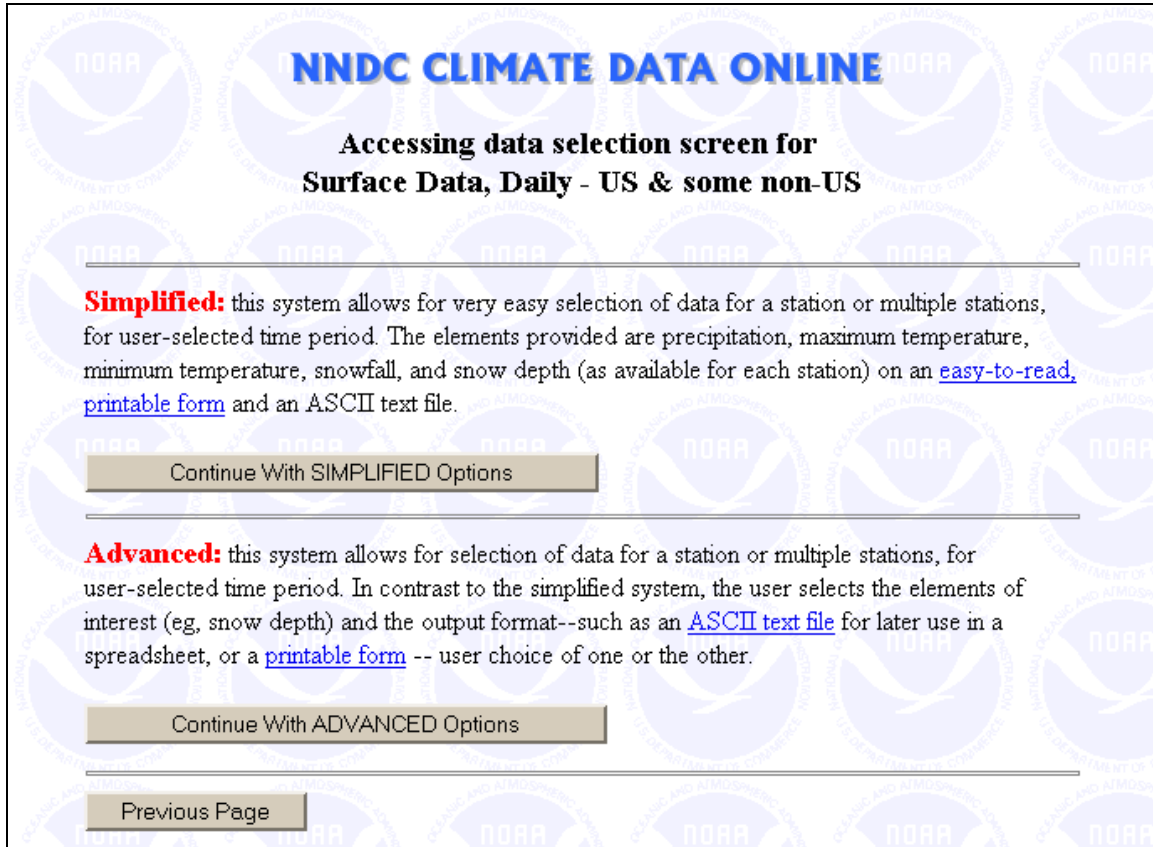
DEW - dewpoint temperature in C

[Downloading NOAA US Daily Data for use in WEPP](#)

This uses the NOAA dataset Surface Summary of Day TD3200/3210. This data can be downloaded from the following address:

<http://hurricane.ncdc.noaa.gov/pls/plclimprod/poemain.accessrouter?datasetabbv=SOD>

The following steps will download climate data for the Acadia National Park in Maine.



The screenshot displays the 'NNDC CLIMATE DATA ONLINE' interface. At the top, the title 'NNDC CLIMATE DATA ONLINE' is centered in blue. Below it, the subtitle 'Accessing data selection screen for Surface Data, Daily - US & some non-US' is centered in black. The page is divided into two main sections by horizontal lines. The first section, titled 'Simplified', describes a user-friendly system for selecting data for a station or multiple stations over a user-selected time period. It lists available elements: precipitation, maximum temperature, minimum temperature, snowfall, and snow depth. It offers two output options: an 'easy-to-read, printable form' and an 'ASCII text file'. A button labeled 'Continue With SIMPLIFIED Options' is positioned below this section. The second section, titled 'Advanced', describes a more complex system for selecting data for a station or multiple stations over a user-selected time period. It allows users to select specific elements of interest (e.g., snow depth) and choose the output format, such as an 'ASCII text file' for use in a spreadsheet or a 'printable form'. A button labeled 'Continue With ADVANCED Options' is positioned below this section. At the bottom of the page, a button labeled 'Previous Page' is visible.

Select the 'Continue With SIMPLIFIED Options' button.

NNDC CLIMATE DATA ONLINE

Daily Surface Data (TD3200/3210/3206) - Mostly US

Retrieve data by:

- All available stations (one month of data)
 - All available First-Order stations (one month of data)
- (See station lists below)

Subject to 100mb output limit.

State/Territory

For countries, select "Other Non-U.S."

- Specific Station(s)
- Specific Climate Division(s)
- Specific County(s)
- Entire State

Range of Stations (enter COOP IDs): through

Continue

Clear Selections

Previous Page

New Search

The next screen allows the station within Maine to be selected. We have chosen Acadia National Park which has a period of record of 21 years.

Daily Surface Data, Selected stations in Maine

Select Stations (maximum OF 100)

Station Name	CoopID	WBANID	Period of Record
Acadia National Park.....	170100	-----	09/1982 - 06/2003
Albion.....	170177	-----	08/1990 - 06/2003
Allagash.....	170200	-----	05/1986 - 06/2003
Andover 2.....	170217	-----	03/2002 - 06/2003
Augusta Airport.....	170275	(14605)	06/1948 - 04/2003
Bangor.....	170350	-----	10/1925 - 06/1953
Bangor International Ap.....	170355	(14606)	01/1953 - 04/2003
Bar Harbor 3 Nw.....	170371	-----	01/1893 - 08/1982
Barnard.....	170398	-----	05/1990 - 06/2003
Bath.....	170409	-----	12/1992 - 06/2003

Maine

[Sort by Coop ID](#)

Continue

Clear Selections

Previous Page

New Search

The next page allows you to select the period of record to download. In this example we will download all the daily data from 1982 to 2003.

[NCDC](#) / [Climate](#) / [Get/View](#) / [NNDC CDO](#) / [Search](#) / [Help](#)

NNDC CLIMATE DATA ONLINE

Daily data for Maine / Selected stations - 1 stations ([List appears below](#))

Selected Meteorological Element(s): PRCP, TMAX, TMIN, SNOW, SNWD, TOBS	Date Range (Year / Month): (See notes) From 1982 01 To 2003 06 Through 06/2003
Selected Output Format: Web Form	
Output via FTP	

The next page lists the download details and an email contact to notify when the data has been prepared for download. The NOAA site usually takes a few minutes to bundle the data for download.

[NCDC](#) / [Climate](#) / [Get/View](#) / [NNDC CDO](#) / [Search](#) / [Help](#)

NNDC CLIMATE DATA ONLINE

SOD - Surface Data, Daily - US & some non-US, Request Summary

Maine / Selected Stations - includes 1 stations ([See selected stations below](#))


Selected Meteorological Element(s): 'PRCP', 'TMAX', 'TMIN', 'SNOW', 'SNWD', 'TOBS'	Date Range (Year / Month): 1982/01 to 2003/06
Selected Output Format: Web Form	
Selected Output Media: FTP	
Total Data Rows Available: 1486 - View Inventory	
Output File Size Estimate (bytes): 2064000	

Please check the [Inventory File](#) to see if the elements/dates you desire are included before ordering.

IMPORTANT! Please enter a **valid** email address below so we can notify you when your request has finished processing.

E-mail Address:

After the file is ready, download and save it in the climates/observed subdirectory under the WEPP installation directory. There are several files that NOAA will prepare, the one that contains the climate data generally has the words “ASCII” as part of the description.


[NCDC / Climate / Get/View / NNDC CDO / Search / Help](#)

NNDC CLIMATE DATA ONLINE

SOD - Surface Data, Daily - US & some non-US, Data Access

Request ID: CDO00432472

NOTICE!

From the time you submitted your request it may be several minutes (to several hours for larger volumes) before your **web form** is available. **For this reason it is recommended that you bookmark this web page for future reference and access to your web form.** You will also receive email notification when your web form is ready.

File Contents	Access URL	File Size Estimate (bytes)
SOD - Surface Data, Daily - US & some non-US - Web Form	http://www1.ncdc.noaa.gov/pub/orders/796319352616dat.html	1760000
SOD - Surface Data, Daily - US & some non-US - ASCII File	http://www1.ncdc.noaa.gov/pub/orders/796319352616.txt	281600
SOD - Surface Data, Daily - US & some non-US - Inventory	http://www1.ncdc.noaa.gov/pub/orders/796319352616inv.txt	7411
Station List	http://www1.ncdc.noaa.gov/pub/orders/796319352616stn.txt	503

In this example the second URL link with a file size of 281600 has the data the WEPP interface can use to build WEPP climate inputs.

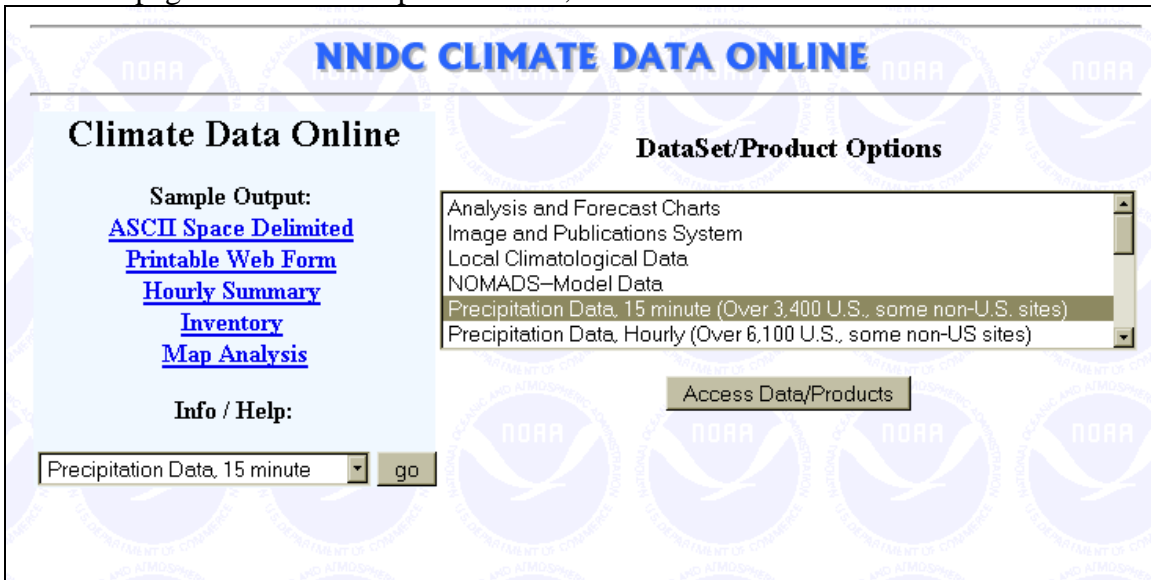
After downloading it is also a good idea to rename the file to something that resembles the location. The data can be used to build a new CLIGEN station or as daily precipitation and temperature in a CLIGEN file. See the other topics on how to import and work with the downloaded data.

[Downloading NOAA US 15 minute Data for use in WEPP](#)

This data can be downloaded from the NOAA website at the following address.

<http://cdo.ncdc.noaa.gov/CDO/dataproduct>

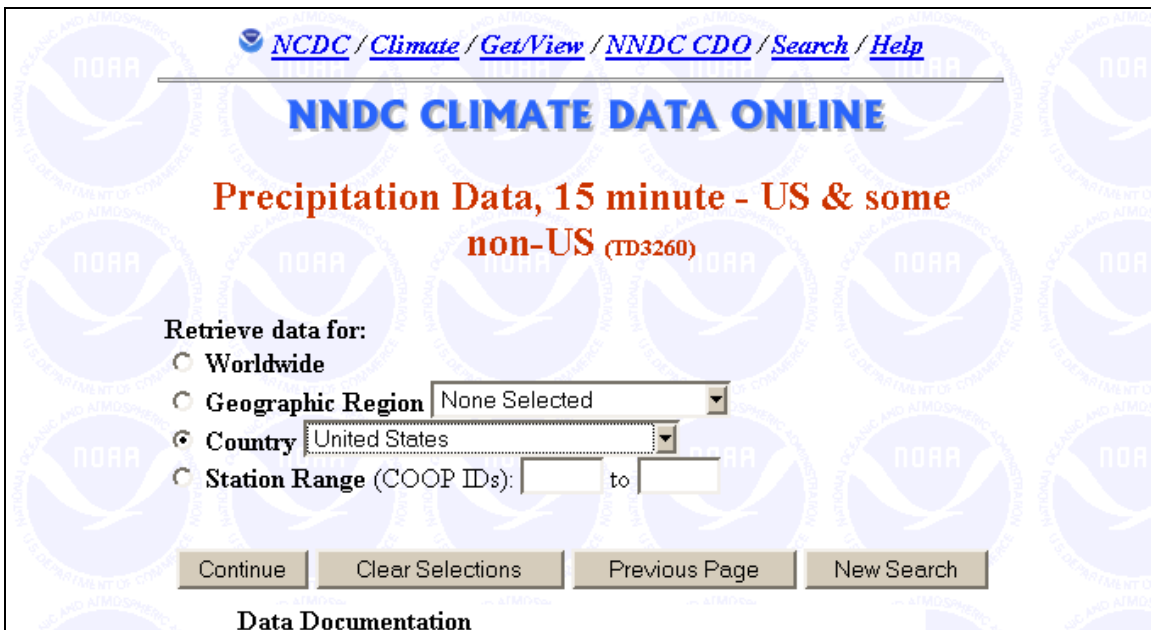
From this page chose the Precipitation Data, 15 minute item.



The screenshot shows the "NNDC CLIMATE DATA ONLINE" interface. On the left, under "Climate Data Online", there are links for "Sample Output": [ASCII Space Delimited](#), [Printable Web Form](#), [Hourly Summary](#), [Inventory](#), and [Map Analysis](#). Below these are "Info / Help:" links. A dropdown menu is set to "Precipitation Data, 15 minute" with a "go" button. On the right, under "DataSet/Product Options", a listbox contains: "Analysis and Forecast Charts", "Image and Publications System", "Local Climatological Data", "NOMADS-Model Data", "Precipitation Data, 15 minute (Over 3,400 U.S., some non-U.S. sites)", and "Precipitation Data, Hourly (Over 6,100 U.S., some non-US sites)". The 15-minute option is selected. Below the listbox is an "Access Data/Products" button.

To use the 15 minute data with wepp you will also have to download a corresponding daily file from NOAA which is described in the previous section.

The first step is to select the US as the Country and then click the Continue button.



The screenshot shows the "NNDC CLIMATE DATA ONLINE" interface with the title "Precipitation Data, 15 minute - US & some non-US (TD3260)". The breadcrumb trail is "NCDC / Climate / Get/View / NNDC CDO / Search / Help". Under "Retrieve data for:", there are radio buttons for "Worldwide", "Geographic Region", "Country", and "Station Range (COOP IDs)". The "Country" option is selected, and a dropdown menu shows "United States". Below the radio buttons are input fields for "Station Range (COOP IDs)" with "to" between them. At the bottom, there are buttons for "Continue", "Clear Selections", "Previous Page", and "New Search". A link for "Data Documentation" is at the very bottom.

The next step is to select the state. Since we are only interested in working with one station select the item to display stations in the state.

[NCDC](#) / [Climate](#) / [Get/View](#) / [NNDC CDO](#) / [Search](#) / [Help](#)

NNDC CLIMATE DATA ONLINE

Precipitation Data, 15 minute - US & some non-US (TD3260)

Retrieve data for:

Entire Country

Selected United States stations - Note: may be slow to load station list on next page

Or select a State / Province

and retrieve for

Entire State

Selected Climate Divisions

Selected Counties

Selected Stations in the state

The next window lists all the Iowa stations. Choose one and click the Continue button.

NNDC CLIMATE DATA ONLINE

Precipitation Data, 15 minute - US & some non-US (TD3260)

Select Iowa stations (maximum of 100)

Station Name	COOP ID	Period of Record
Greenfield.....	133438	05/1971 to 02/2003
Grinnell 3 Sw.....	133473	05/1971 to 02/2003
Hamburg 2.....	133562	05/1971 to 02/2003
Hornick 5 S.....	133944	01/1984 to 02/2003
Humboldt 3 W.....	133985	05/1971 to 05/1997
Humboldt Water Plant.....	133980	06/1997 to 02/2003
Ida Grove 5 Nw.....	134038	10/1977 to 02/2003
Iowa City.....	134101	09/1979 to 02/2003
Iowa Falls.....	134142	10/1974 to 02/2003
Irwin 3 Ese.....	134174	01/1984 to 02/2003
Keokuk.....	134381	05/1971 to 02/2003

[Sort by Station ID](#)

Continue

Clear Selections

Previous Page

New Search

The next window displays the period of record that will be extracted. For use with WEPP it is best to start with January 1 of a year and end on December 31. Click the continue button which will give a summary of the data.

[NCDC](#) / [Climate](#) / [Get/View](#) / [NNDCCDO](#) / [Search](#) / [Help](#)

NNDCC CLIMATE DATA ONLINE

Precipitation Data, 15 minute - US & some non-US (TD3260) for Iowa - 1 stations.

Select Date Restrictions:

Use Date Range = OR = Use Selected Dates ^{*}

	Year	Month	Day		Year	Month	Day
From	1990	01	01		2003	09	31
To	2002	12	31		2002	08	30
					2001	07	29
					2000	06	28
					1999	05	27
					1998	04	26
					1997	03	25
					1996	02	24

<p>Select Output Format:</p> <p>Delimited, without station name</p> <hr/> <p>Select Output Format Delimiter: (only if Delimited format selected above)</p> <p>Comma</p> <p>Space</p>	<p>Output via: FTP</p>
--	-------------------------------

After the data is available download the text file to the wepp climates/observed directory where it can be used in developing a wepp breakpoint climate file.

How the WEPP Interface finds PAR files

Within a WEPP climate file there is a field for the station name and station number. For the existing 2600+ US stations the PAR files are organized in archives with the state abbreviation and station number identifying each station. Each state is a subdirectory with its archive stored. The stations.db file is a list of all US stations including there state, name and number. Using the station name, state, and number in a CLI file the interface consults the stations.db file determines what PAR file was used to create the file.

New PAR files are stored in the state subdirectories outside the archive. These new stations have a station number of 999999. The names listed in the climate builder window are the station names inside the PAR file. A CLI file built with CLIGEN has a matching station name in the CLI file. Using the stations.db, countries.txt the abbreviation is mapped to the correct subdirectory and PAR file. For US states the last part of the station name in the PAR file should be the 2 letter state abbreviation. For international PAR files the last 3 letters of the station name should be the country abbreviation (as listed in countries.txt).

If the climate icon is clicked and the the PAR file used to generate the CLI file can't be determined a message is displayed. Only PAR files stored in correctly in subdirectories under cligen can be used.

Downloading International Climate Data from ARS

The data can be downloaded from: <http://hydrolab.arsusda.gov/nicks/nicks.htm> The data files are in the GDS file format. From the above web site click on the link for “List of World Stations”.

Stations in the United States (source: NWS)

[List of U.S. Stations](#)

[Daily values format \(.zip\)](#)

Worldwide Stations (source: GDS)

[GDS Daily values format \(.zip\)](#)

[List of World Stations](#)

[Wind data files format \(.dat\)](#)

Cligen Weather Generator

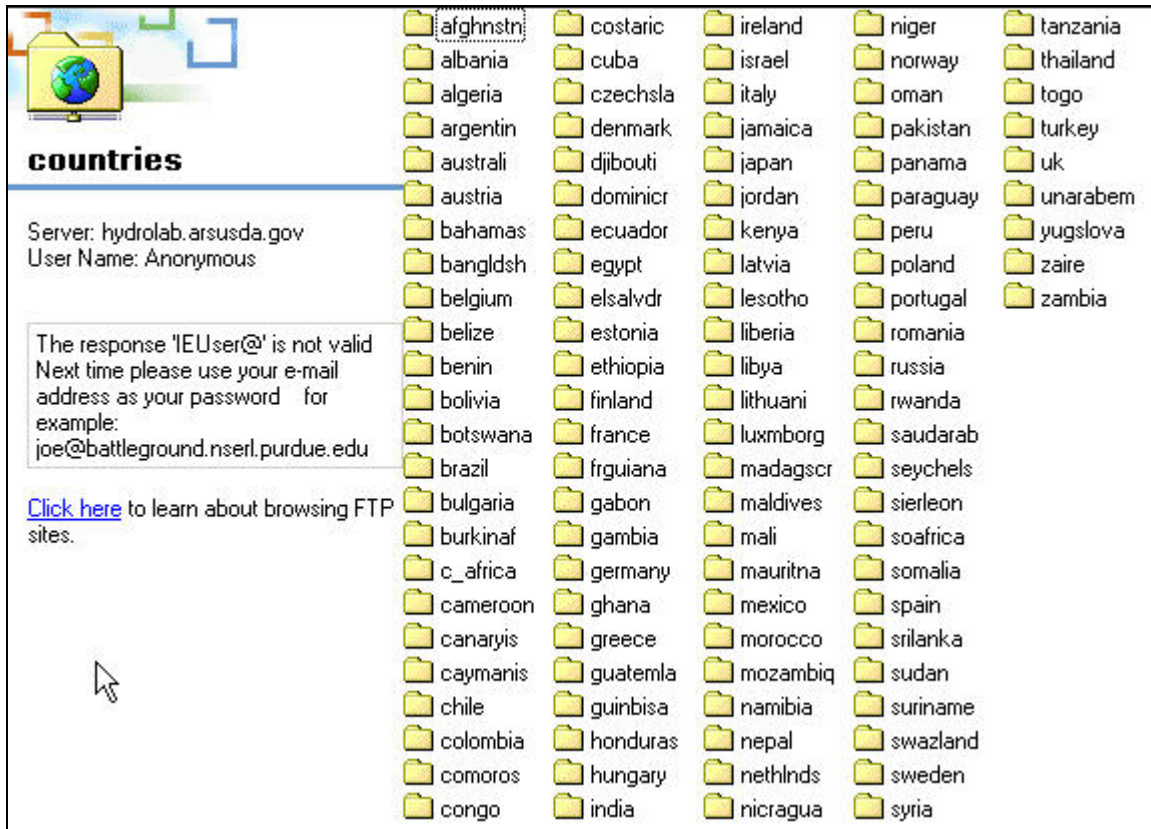
[Corrected and Extended Cligen Parameter files \(.par\) for U.S. Stations](#)

Note: Some stations listed do not have corresponding GDS data so another nearby station from the list will have to be chosen if this is the case. Also, there is no data available for any stations in China.

STN	DATA	FLAGS	START	END	#RPT	LAT	LON	ELEV	LOCATION	COUNTRY
01001	290080	19717	10/01/77	12/31/91	5180	7093	867	9	JAN MAYEN	NORWAY
01005	4760	709	11/28/77	04/21/84	85	7807	34637	5	ISFJORD RADIO	NORWAY
01006	110208	7981	10/01/77	04/29/87	1968	6907	34482	14	ANDA FYR	NORWAY
01008	289744	18949	10/01/77	12/31/91	5174	7825	34453	29	SVALBARD	NORWAY
01010	290136	17053	10/01/77	12/31/91	5181	6930	34388	14	ANDOYA	NORWAY
01014	32592	8701	10/01/77	04/20/80	582	6955	34208	9	LEIRKJOSEN	NORWAY
01017	214368	20209	10/01/77	08/31/91	3828	6935	34192	12	GIBOSTAD	NORWAY
01023	289968	16369	10/01/77	12/31/91	5178	6907	34147	79	BARDUFOSS	NORWAY

The important field to note is the **STN** column for the station, this will be the name of the data file to download.

After getting the station number from the station list return to the main page and click on the link “[Worldwide Stations \(source: GDS\)](#)” This will display a folders for each of the countries.



Double-Click on the country for which you are interested in downloading station data. This will display a list of files with the station number as the name. The data WEPP will use is found in the .zip files. If a station is not listed then there is no GDS data available.

Name	Size	Type	Modified
01001.zip	65.7 KB	WinZip File	3/5/1998 12:00 AM
01008.zip	60.7 KB	WinZip File	3/5/1998 12:00 AM
01010.dat	35.7 KB	DAT File	3/5/1998 12:00 AM
01010.zip	60.8 KB	WinZip File	3/5/1998 12:00 AM
01023.dat	35.7 KB	DAT File	3/5/1998 12:00 AM
01023.zip	61.9 KB	WinZip File	3/5/1998 12:00 AM
01025.dat	35.7 KB	DAT File	3/5/1998 12:00 AM
01025.zip	59.3 KB	WinZip File	3/5/1998 12:00 AM
01028.zip	64.9 KB	WinZip File	3/5/1998 12:00 AM
01033.zip	57.0 KB	WinZip File	3/5/1998 12:00 AM
01035.zip	49.2 KB	WinZip File	3/5/1998 12:00 AM
01041.zip	46.8 KB	WinZip File	3/5/1998 12:00 AM
01043.zip	48.8 KB	WinZip File	3/5/1998 12:00 AM
01047.zip	53.2 KB	WinZip File	3/5/1998 12:00 AM
01049.dat	35.7 KB	DAT File	3/5/1998 12:00 AM
01049.zip	58.0 KB	WinZip File	3/5/1998 12:00 AM
01055.zip	59.5 KB	WinZip File	3/5/1998 12:00 AM
01057.zip	48.6 KB	WinZip File	3/5/1998 12:00 AM
01059.zip	58.4 KB	WinZip File	3/5/1998 12:00 AM
01062.zip	63.6 KB	WinZip File	3/5/1998 12:00 AM
01066.zip	48.1 KB	WinZip File	3/5/1998 12:00 AM
01075.zip	52.9 KB	WinZip File	3/5/1998 12:00 AM
01078.zip	59.6 KB	WinZip File	3/5/1998 12:00 AM
01089.dat	35.7 KB	DAT File	3/5/1998 12:00 AM

For example, if we wanted to get data for “Jan Mayen, Norway” the station number is 01001 so the file to download is 01001.zip. This file should be downloaded and unzipped so that the 01001.gds file is stored in the in the wepp data directory under the climates or climates/observed subdirectory. Since the 01001.gds file is not very descriptive this file could be renamed to something like “Jan Mayen Norway.gds”. At this point the data can be used to develop WEPP climate inputs which is described in the section “Adding a new international station using observed daily data from the ARS Hydrology Lab”