The Growing Degree Days Assistant calculates growing degree days based on temperature data spanning at least one full calendar day (midnight to midnight). Growing degree days are used for agricultural and turf management applications, such as estimating harvest time or pest growth.

One growing degree day (GDD) is equivalent to a one degree increase above a minimum threshold temperature for a period of one day. For example, assuming no horizontal cutoff, if the minimum threshold temperature is 70°F and the temperature was a constant 85°F for the day, the GDD for that day is 15 GDD.

A single GDD value is calculated for each full calendar day of temperature data, and plotted at noon for that day. GDD values are cumulative; that is, the GDD for each day adds to the previous days' GDD value.

Important: Time of day is a factor in the GDD computation. When you launch a logger, be sure that your computer's clock or the default time zone in Display preferences is set to the proper time zone for the area where the logger will be deployed. If you try to correct it later by entering a different offset in the Plot Setup window, you may get confusing or misleading results.

To create a series for growing degree days:

1. Read out a logger or open a datafile that contains data from a temperature sensor.

2. From the Plot Setup window, select Growing Degree Days Assistant and click the Process button.

3. In the Growing Degree Days Assistant window, choose the data series you want to convert from the Temperature Series drop-down list.
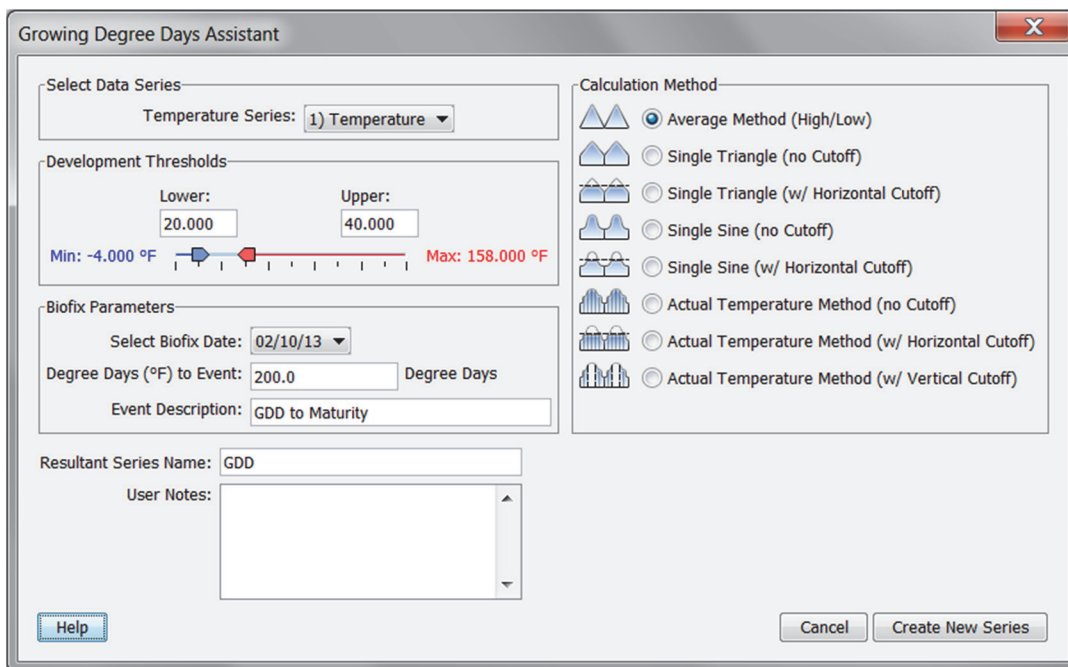
4. Select the Calculation Method you want to use.

    - **Average Method:** Calculates the average of the high and low temperatures for the day (adjusted to the lower and upper thresholds, if necessary), then subtracts the low threshold to compute the GDD.

    - **Single Triangle (no Cutoff):** Uses the low and high daily temperatures to compute a set of two linear equations to generate a triangle. The area between the curve and the low threshold is then used to compute the GDD.

    - **Single Triangle (with Horizontal Cutoff):** Uses the low and high daily temperatures to compute a set of two linear equations to generate a triangle. Then it adjusts any temperatures above the upper threshold to the upper threshold. The remaining area between the curve and the low threshold is then used to compute the GDD.

- **Single Sine (no Cutoff):** Uses the low and high daily temperatures to compute a sine wave that assumes the low temperature occurred at midnight and the high temperature occurred at noon. The area between the curve and the low threshold is then used to compute the GDD.

- **Single Sine (with Horizontal Cutoff):** Uses the low and high daily temperatures to compute a sine wave that assumes the low temperature occurred at midnight and the high temperature occurred at noon. Then it adjusts any temperatures above the upper threshold to the upper threshold. The remaining area between the curve and the low threshold is then used to compute the GDD.

- **Actual Temperature Method (no Cutoff):** Uses the logging interval of the temperature data to perform a numerical integration. The area between the curve and the low threshold is used to compute the GDD.

- **Actual Temperature Method (with Horizontal Cutoff):** Adjusts any temperatures above the upper threshold to the upper threshold. Then it uses the logging interval of the temperature data to perform a numerical integration. The area between the curve and the low threshold is then used to compute the GDD.

- **Actual Temperature Method (with Vertical Cutoff):** Uses the logging interval of the temperature data to perform a numerical integration. Any interval in which the temperature exceeds the upper threshold is excluded from the calculation. The remaining area between the actual curve and the low threshold is then used to compute the GDD.

5. Select lower and upper Development Threshold values. These are the minimum and maximum thresholds that will be used in the GDD calculation. Use the sliders to set these thresholds, or enter the values manually. If the calculation method you chose does not use an upper threshold, the upper threshold option will be disabled. Temperatures are in degrees Fahrenheit if your default unit preference is US, and in degrees Celsius if your default unit preference is SI.

6. In the Biofix Parameters panel, choose a date that marks the beginning of the development phase for the Biofix date. The dates in this list are the full days contained in the datafile.

7. In the Degree Days to Event, enter the number of degree days needed to reach an event of interest (harvest time, pest emergence, etc.). This will create an alarm line on the graph to indicate when the event took place. Degree days are in Fahrenheit (DDf) if your default unit preference is US, and in Celsius (DDc) if your default unit preference is SI.

8. In the Event Description field, type any text to identify the event (optional).

9. In the Resultant Series Name field, keep the default name or type a new one.

10. Type any User Notes concerning the series you are creating (optional).

11. Click the Create New Series button.

12. The new series is listed and selected in the Plot Setup window. Click the Plot button.

The scaled series will appear in the plot and the settings for the scaled series are listed in the Details pane: