Degree-day estimates for wild parsnip & Japanese knotweed phenology in Minnesota

A brief guide for getting location-specific estimates using USPest.org

University of Minnesota | CFANS College of Food, Agricultural and Natural Resource Sciences | Minnesota Invasive Terrestrial Plants & Pests Center

USPEST.org

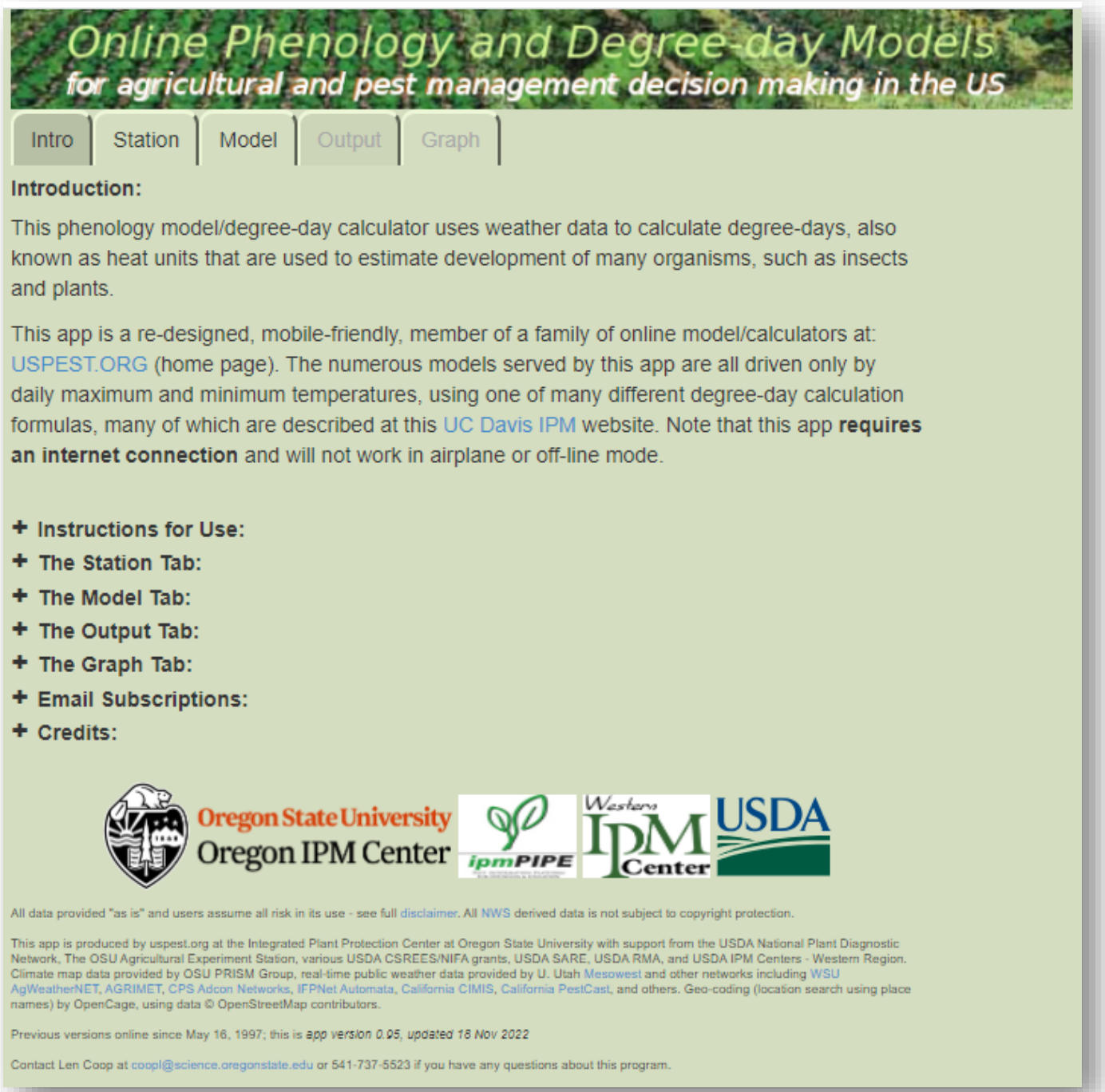
- The USPest.org site has many features.

This is a simple guide for using the **phenology model/degree day calculator** in order to access phenology data for **Japanese knotweed** or **wild parsnip** that resulted from the MITPPC-funded project, *Improve invasive plant management using climate based phenology models*

The model will show you the number of growing degree days that have accumulated for an area on a given date, relative to certain phenological events of each species.

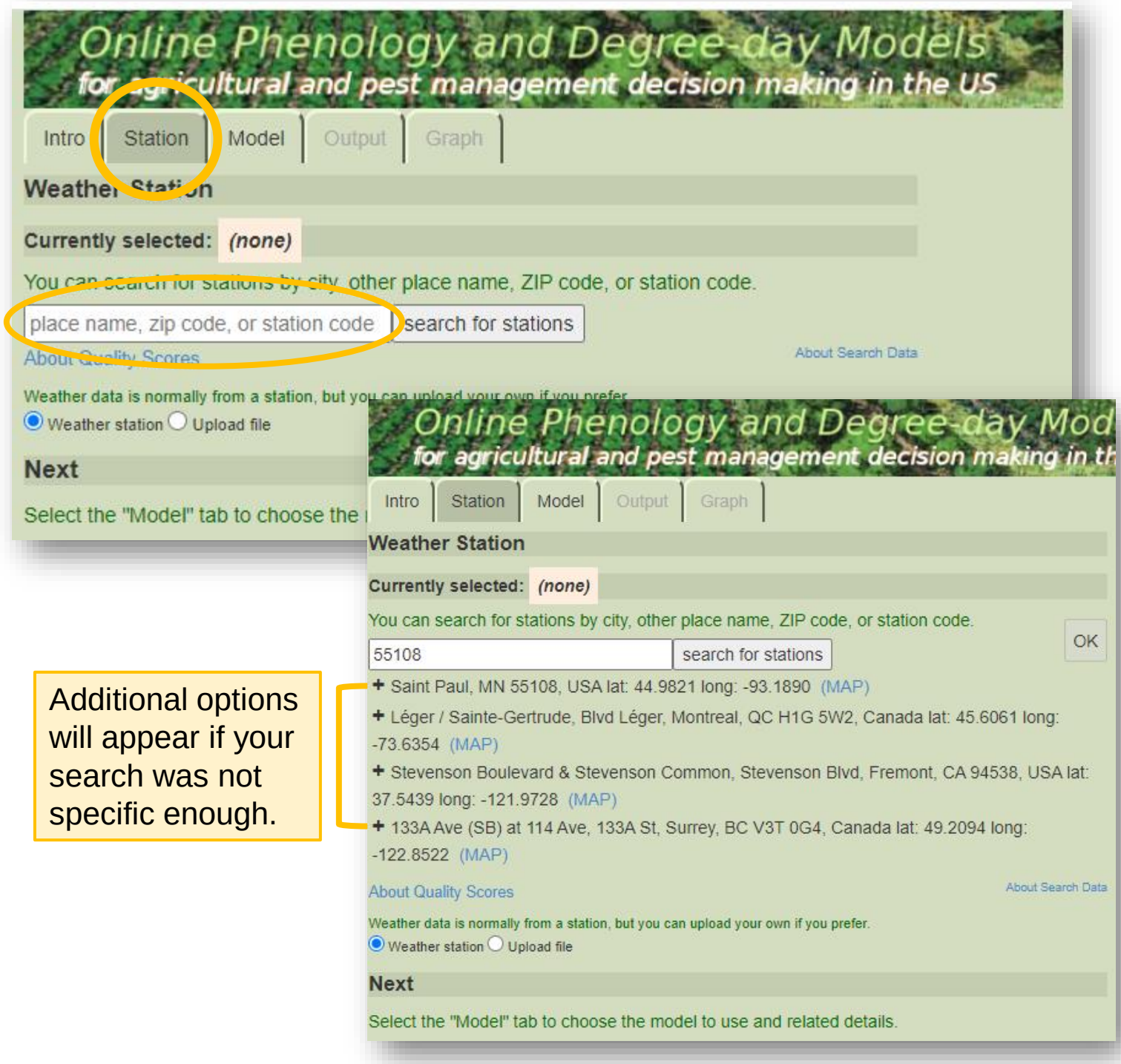
The data informing these models came from only Minnesota sites. Estimates for other regions should be interpreted with caution.

- To go directly to this feature, use: https://uspest.org/dd/model_app



Enter Your Location

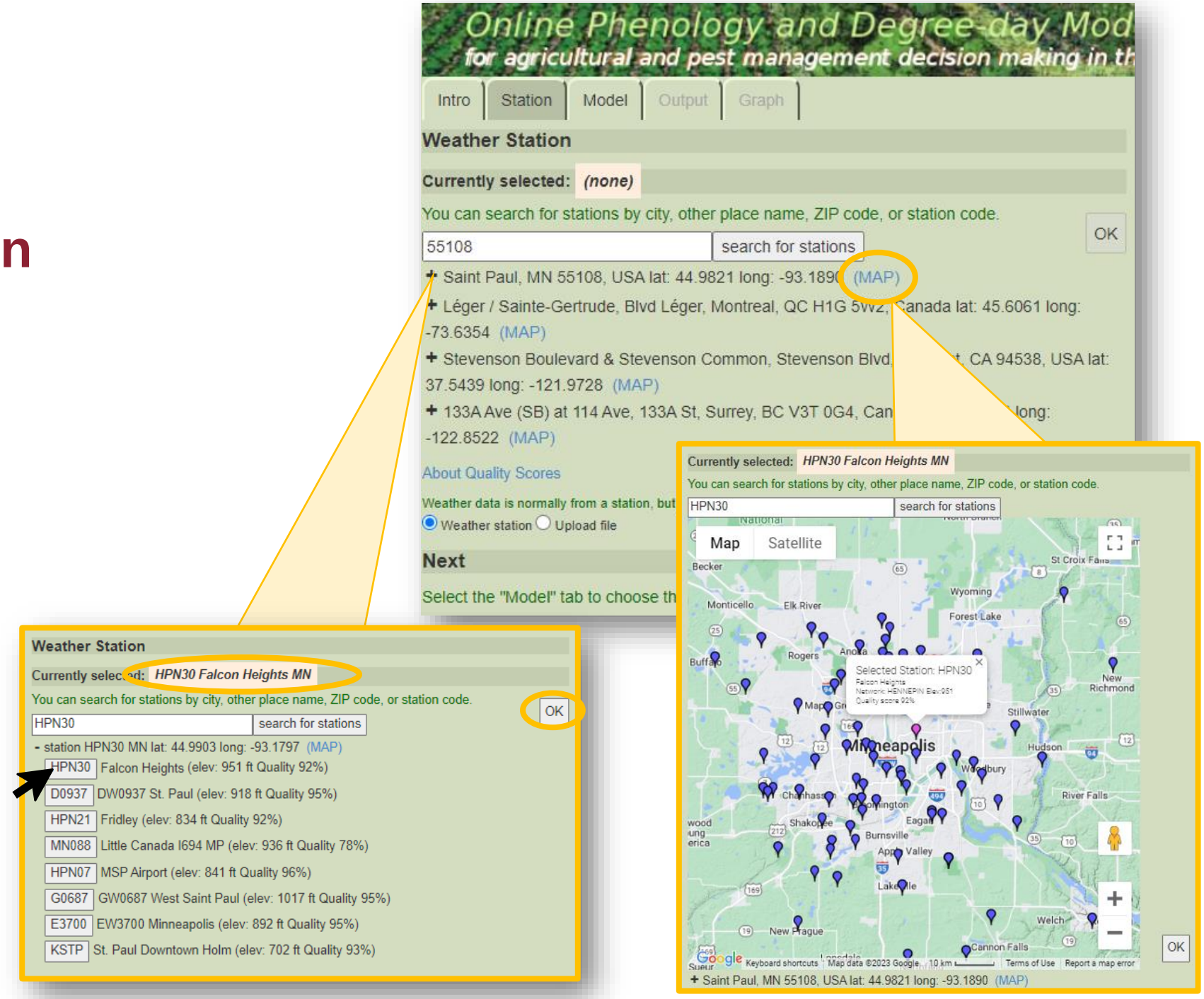
- Click the *Station* tab.
- Here, you will select the area for which you are interested in seeing the phenology estimates for the plant.
- The degree-day tool gives phenology estimates based on individual weather station data. *Only one station* can be selected at a time.
  - If you don't know the weather station code, enter a zip code or place name
- Once your location is entered (e.g., 55108), click "search for stations"
  - This allows you to search the large database of weather stations within USPest.org for the location nearest your area of interest.
- Based on your search, you may need to refine your selection.
  - **See next slide**



Additional options will appear if your search was not specific enough.

Enter Your Location

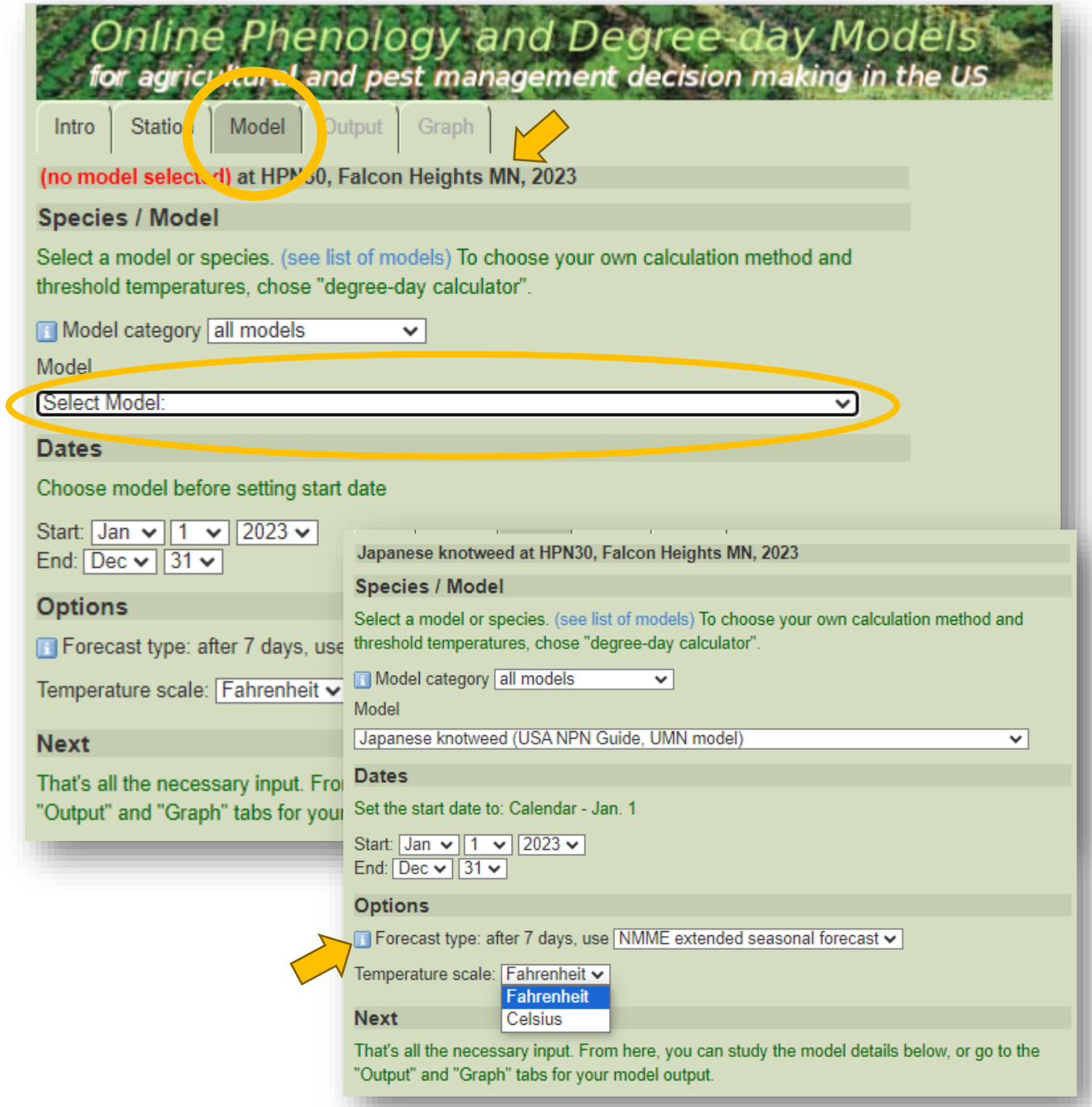
- Click the plus sign (**+**) to see a list of weather stations nearby a region (here, Saint Paul, MN).
- Click the **MAP** link to view an interactive map displaying all weather stations within the viewing area.
  - Clicking any of the station pins will provide information on that station and automatically enter the station code into the search field.
  - Zooming out will display additional stations.
- Select your desired station. Ensure it appears in the *currently selected* field.
- Click **OK.**



Select Model

- Click the *Model* tab.
- Verify your weather station of interest is still selected.
- Use the **Select Model** dropdown menu to go directly to the Japanese knotweed or wild parsnip model

- You can also adjust:
  1. the dates of interest (e.g., do you want phenological data from last year? Do you want a forecast of the coming season?)
  2. the temperature units
  3. the dataset used for forecasting dates in the future (if applicable)
     - For more information on the forecast datasets, click the icon



Select Model

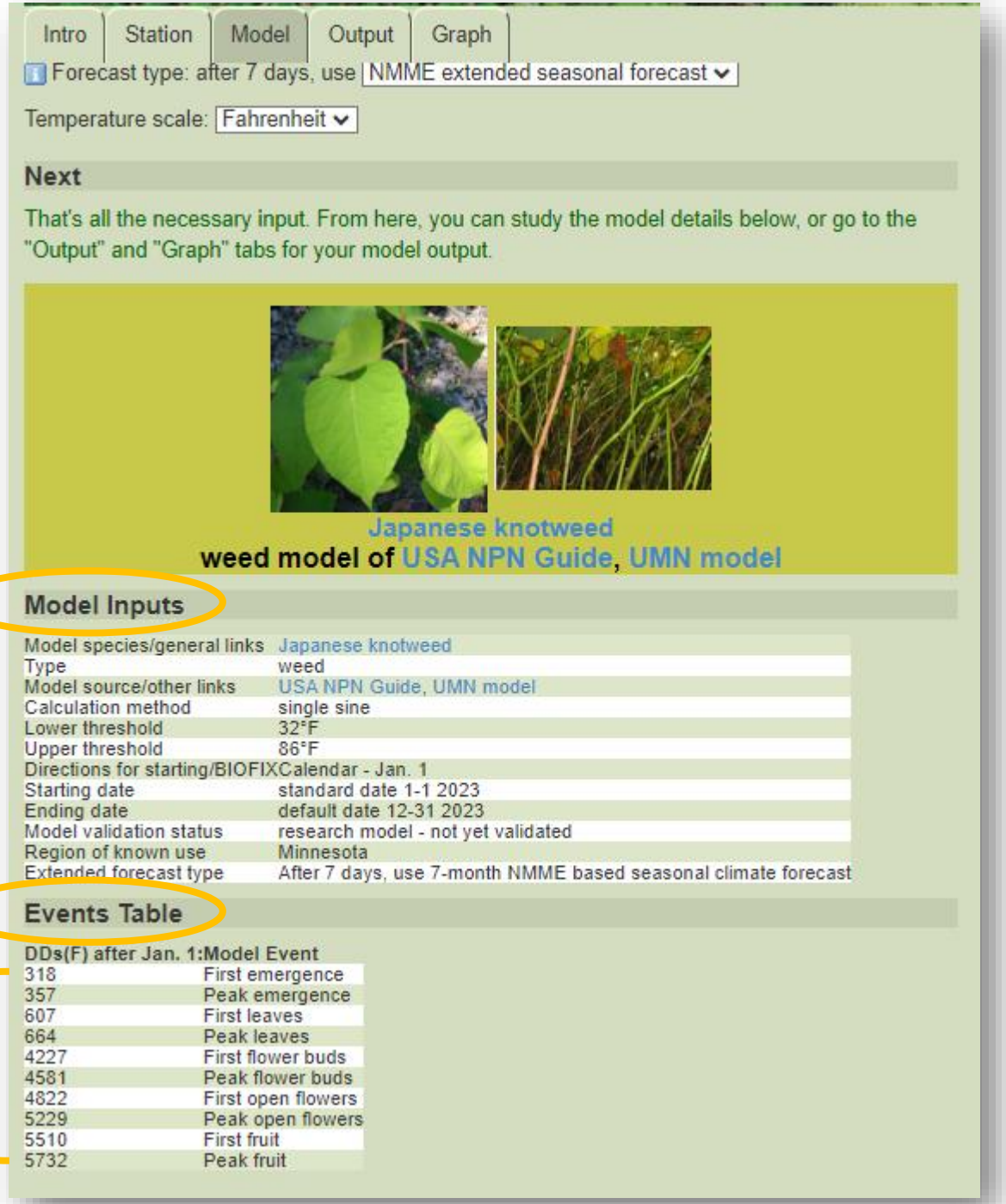
- Scroll down the page to view the *Model Inputs* and *Events Table*

The **Model Inputs** summarizes details of the model. Some inputs can be modified in the dropdown menus above. Others are specifications of the model/research.

The **Events Table** gives a summary of the phenological events that will be highlighted for this species' model.

- Text in **bolded blue** indicate hyperlinks to other information, which typically take you to a site external to the USPest.org.

Data resulting from the UMN-MITPPC study



View Output

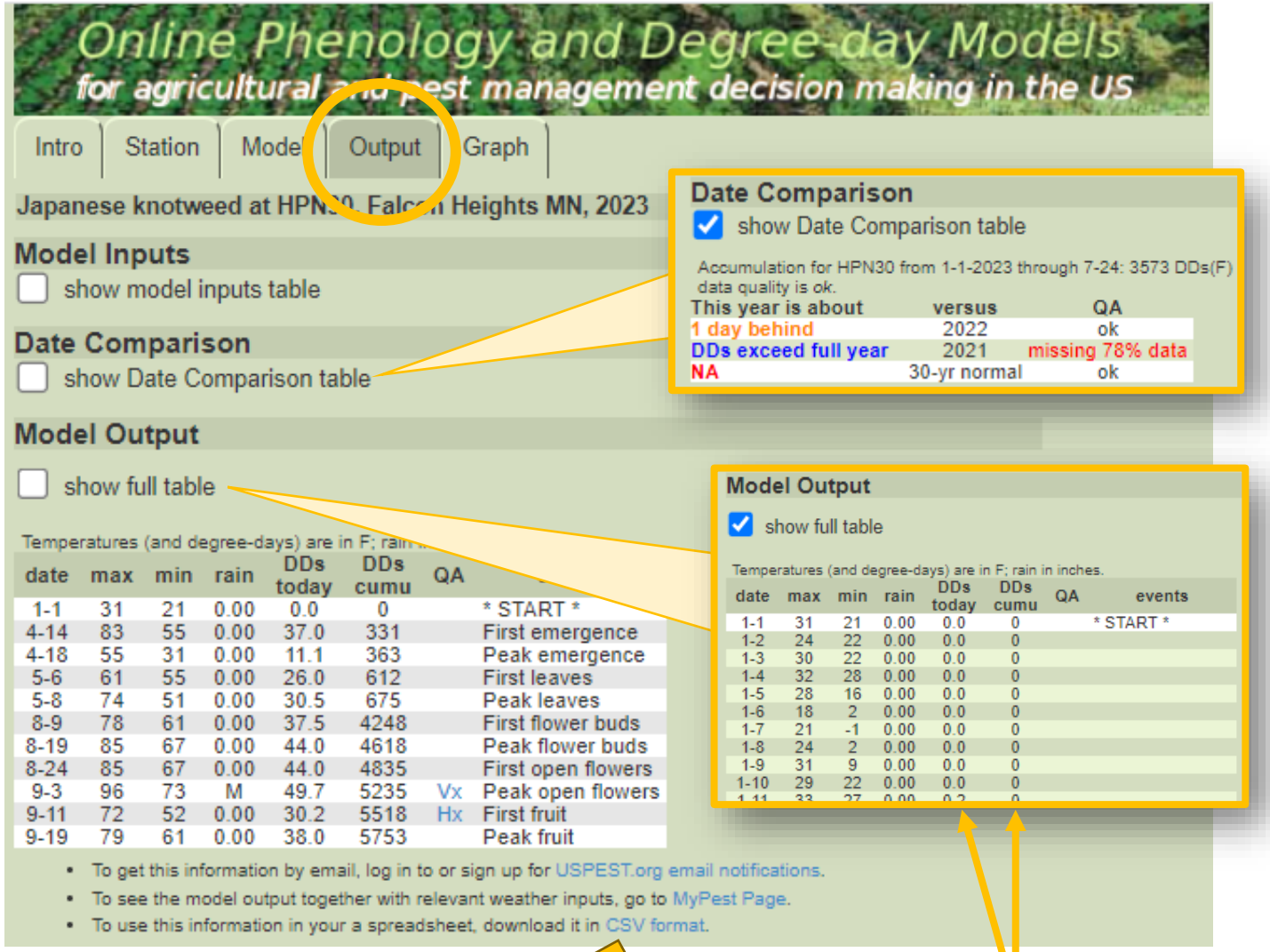
- Click the *Output* tab.
- The default view provides a summary table of the dates when the modeled phenological events occurred or are forecasted to occur at the selected site.
- Three other data tables can be toggled to display:

  The **Model Inputs** table is the same summary information seen in the *Model* tab.

  The **Data Comparison** table shows a comparison between the total degree-days in current year versus past years *This will only show if the current year is selected for the model.*

  The **Model Output** table shows the weather data, degree-days, and phenological events for each day of the time period selected in the model.

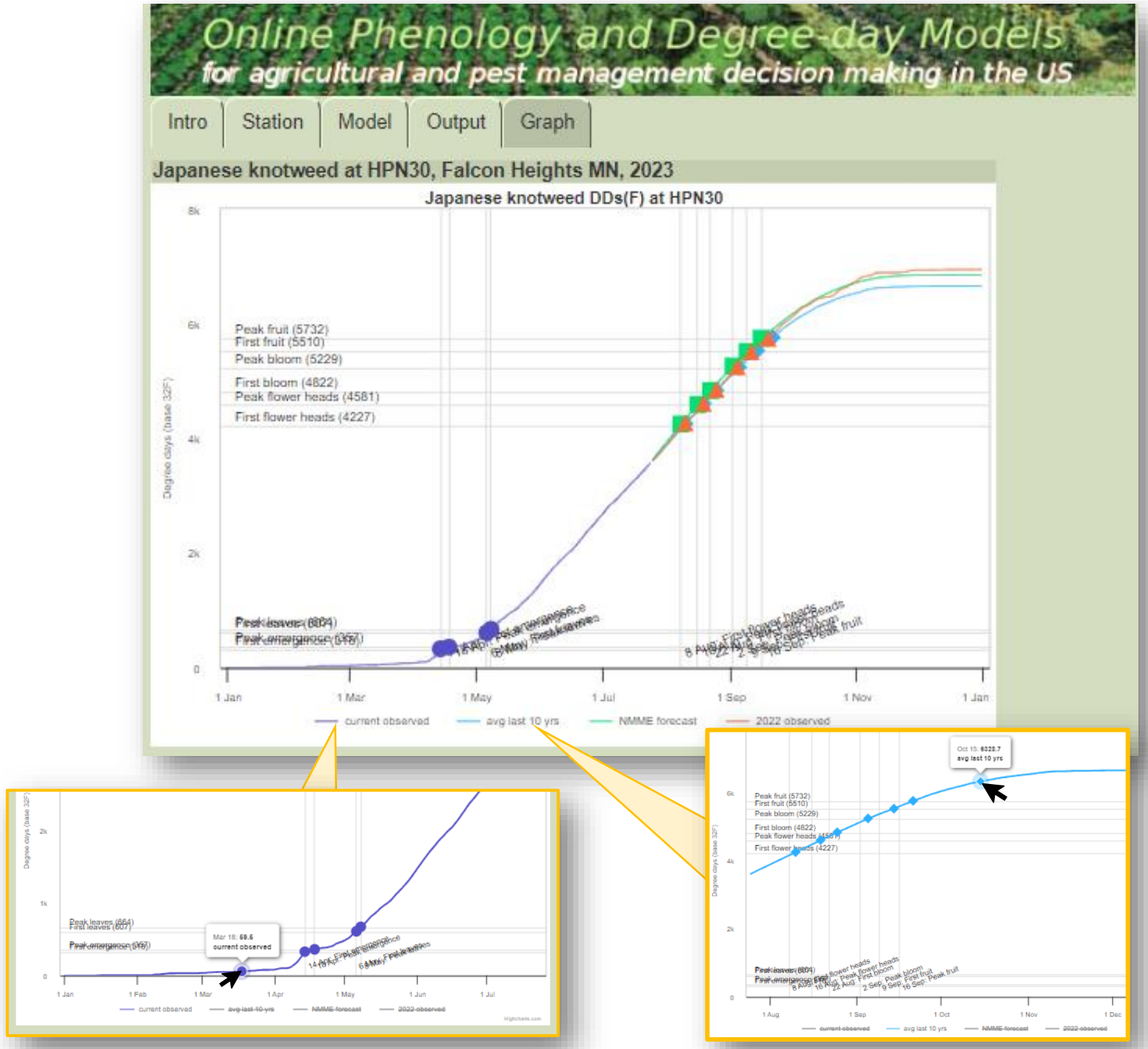
- Text in **blue** can be clicked for more options/information.



DDs today = degree-days accumulated for that day.
DDs cumu = the degree-days accumulated for that day plus all the days prior.

View Output

- Click the *Graph* tab.
- This interactive graph displays the accumulated degree-days (vertical axis) for over time (horizontal axis) for the model.
- Depending on the model time period you selected, additional lines and data points will be included that show when the phenological events would occur in the past (e.g., 10-year average) or future (e.g., NMME forecast).
  - Different lines can be toggled on/off by clicking them in legend
  - Hovering your pointer along a line will show the degree-days for a single date
- Phenological events are positioned near the corresponding degree-days (vertical axis) or date (horizontal axis).



For additional information or questions, contact Dr. Rebecca Montgomery (rebeccam@umn.edu)

Funding provided by the Minnesota Invasive Terrestrial Plants and Pests Center through the Minnesota Environment and Natural Resources Trust Fund.

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