New Ag-Climate Tools Put Soil Temperature and Chilling Hours Accumulations Into a Historical Perspective

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Soil Temperature Climatology: Demand for this information has grown in recent years.

- Soil temperature climatological information benefits a range of on-farm decisions associated with field work, plant growth, and pest and disease management.
- However, there is a lack of user-friendly interfaces for this information that has a climatological perspective.

See the tool online here! →

https://mrcc.purdue.edu/clim/Soil-T

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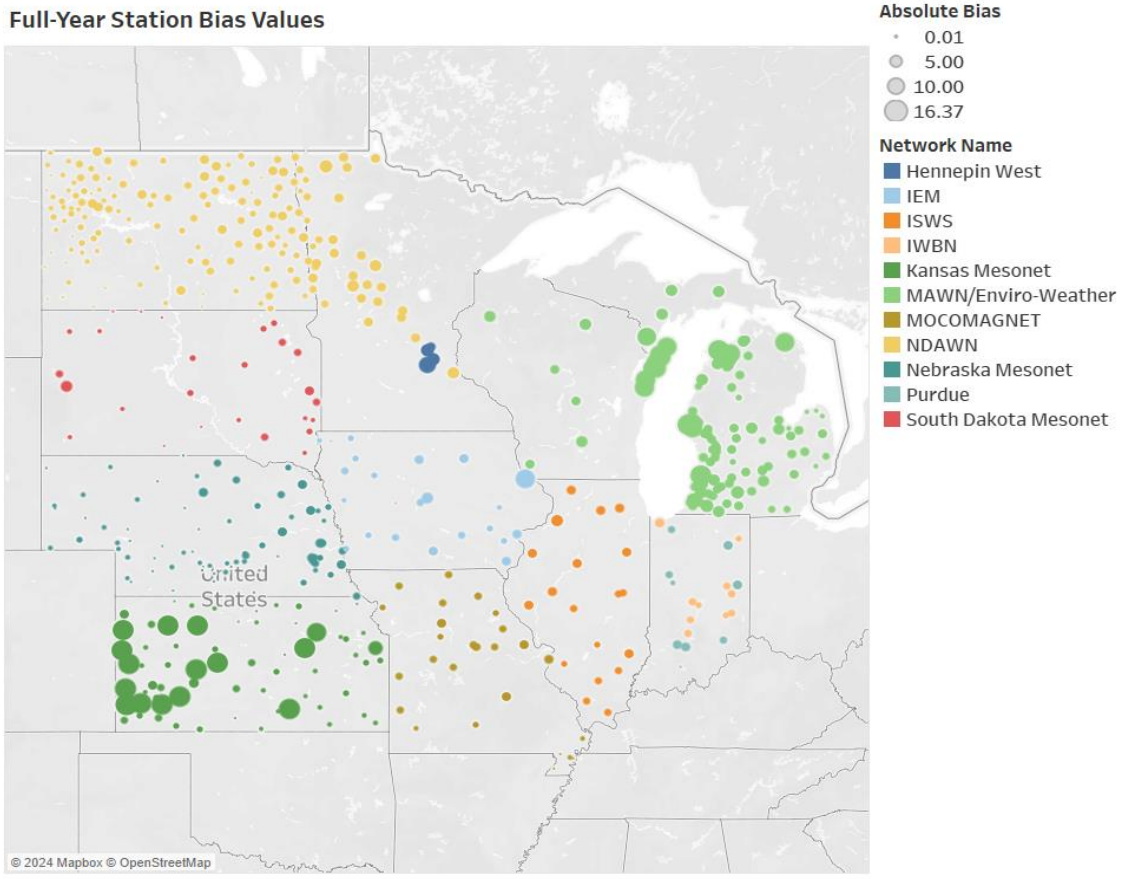
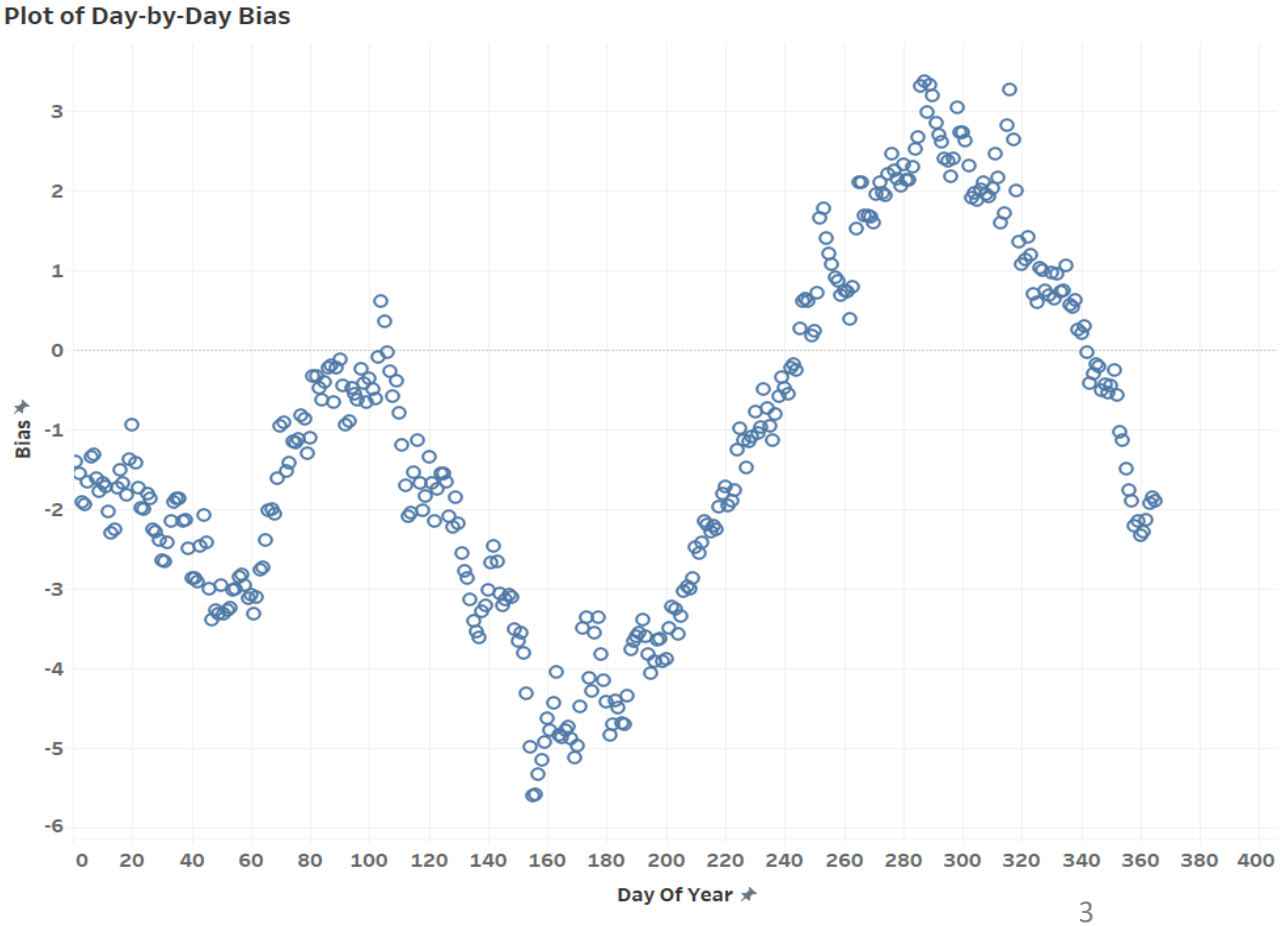
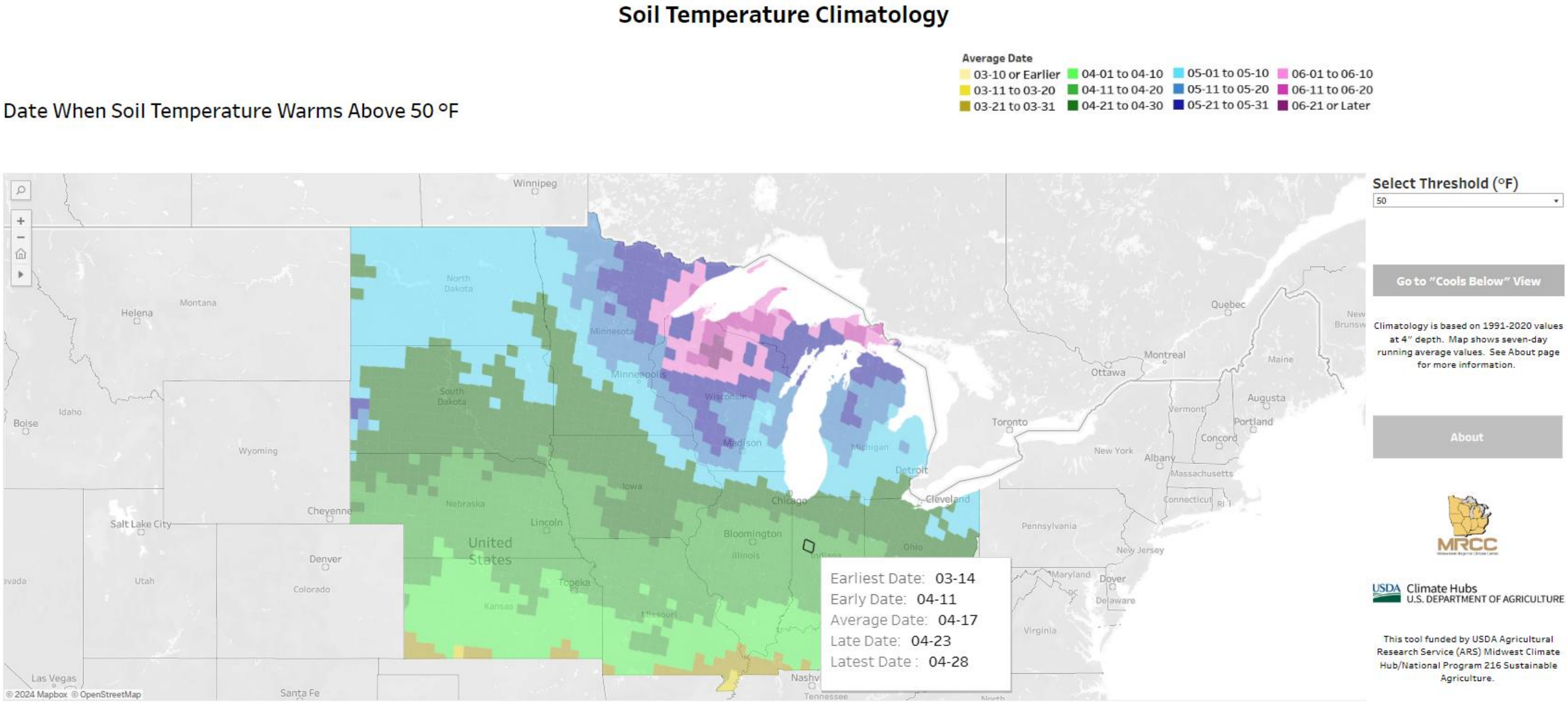
Soil Temperature Climatology: It is based on data from the North America Regional Reanalysis.

- Daily-resolution 4” soil temperature values from the NARR were obtained for the 1991 to 2020 period for much of the north-central U.S. and then bias-corrected.

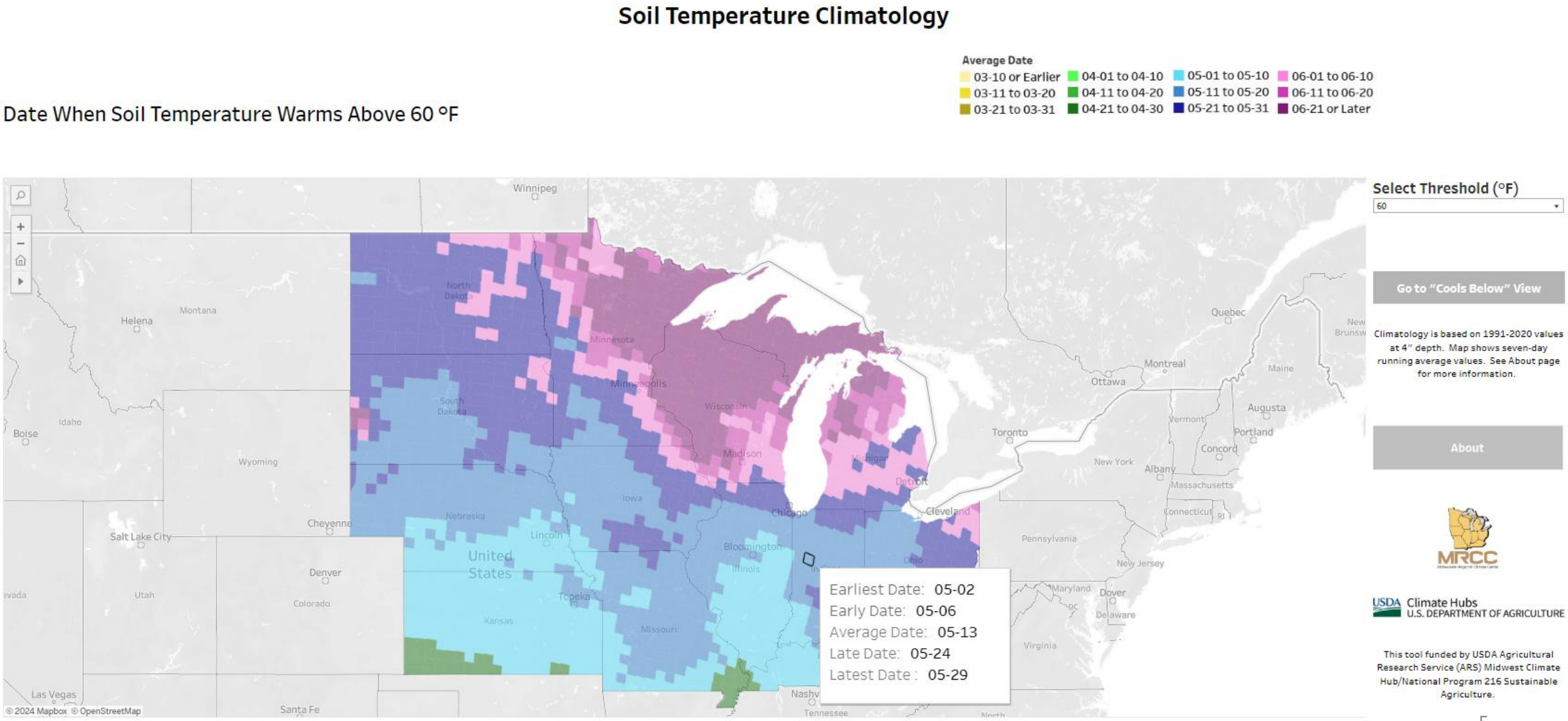




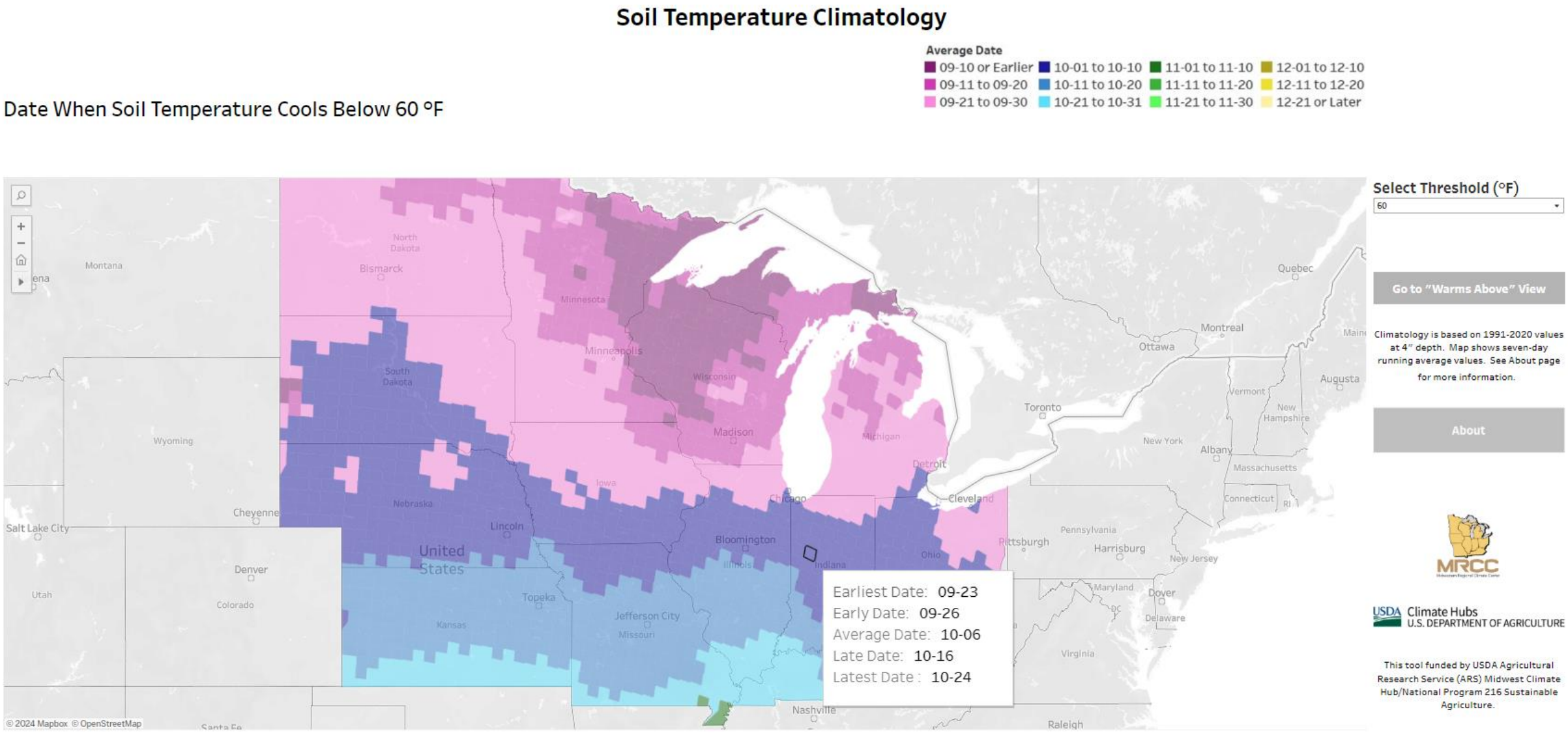
Soil Temperature Climatology: Users can view “warms above” dates.



Soil Temperature Climatology: Users can view these dates at various temperature thresholds.



Soil Temperature Climatology: Users also can view “cools below” dates.



COMING SOON: There has been a desire from the ag community for a customizable chilling hours monitoring tool with climatological perspective.

- Almond, 500-60
- Apple, 400-1000 (low-chill varieties are less)
- Apricot, 500-600
- Blackberry, 200-500
- Blueberry, Northern, 800
- Cherry, 700-800
- Chestnut, 400-500
- Citrus, 0
- Currant, 800-1000
- Fig, 100-200
- Filbert, 800
- Gooseberry, 800-1000
- Grape, 100+
- Kiwi, 600-800
- Mulberry, 400
- Peach, 600-800
- Pear, European, 600-800
- Pear, Japanese, 400-500
- Persimmon, 200-400
- Plum Cot,400
- Plum, European, 800-900
- Plum, Japanese, 300-500
- Pomegranate, 100-200
- Quince, 300-500
- Raspberries, 700-800
- Strawberry, 200-300
- Walnut, 600-700

- Accumulated chilling hours offer a way to track the length of exposure to optimum dormancy temperatures that are required for many fruit-producing plants to produce a successful and quality crop the following growing season.
- Since each type of fruit plant requires a specific range of accumulated chilling hours, we have begun development of a fully customizable tool that offers a unique opportunity for enhanced specialty crop monitoring and management.

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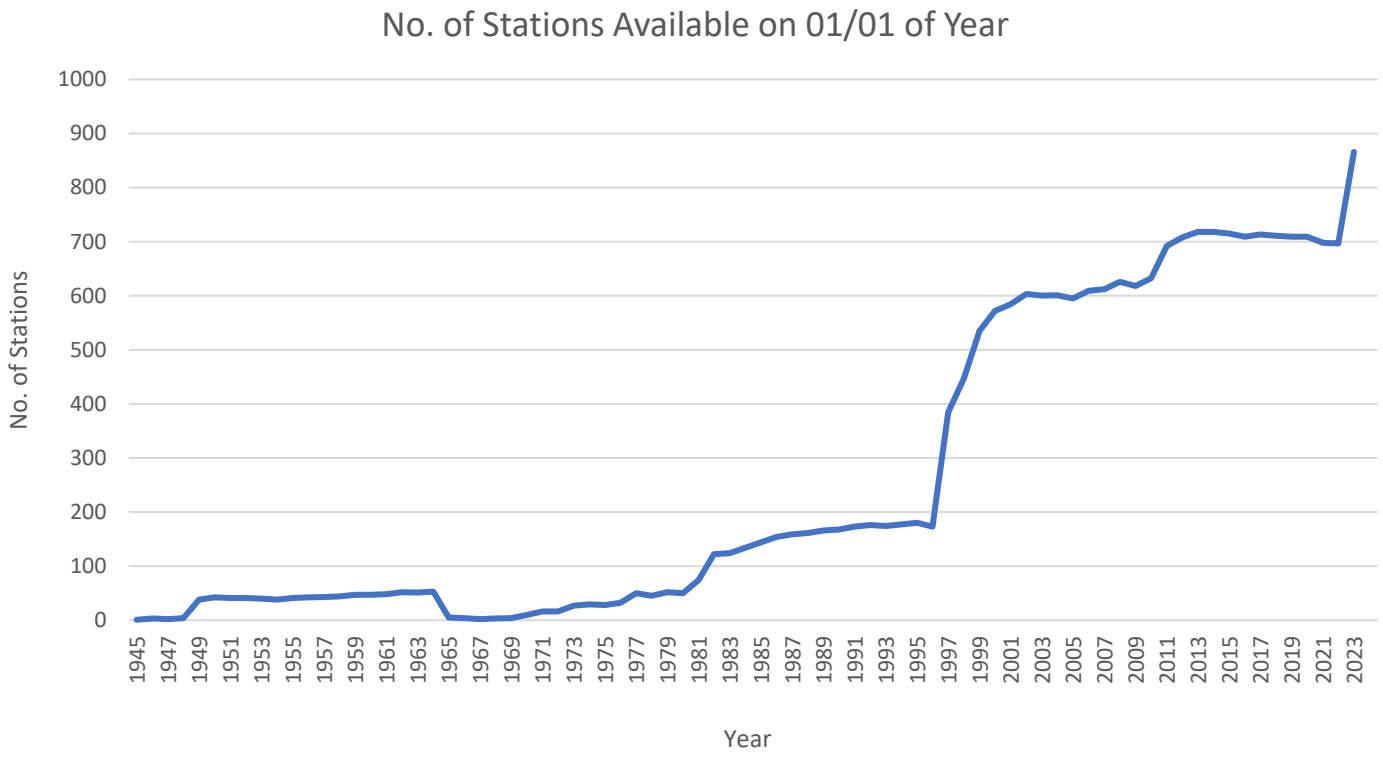
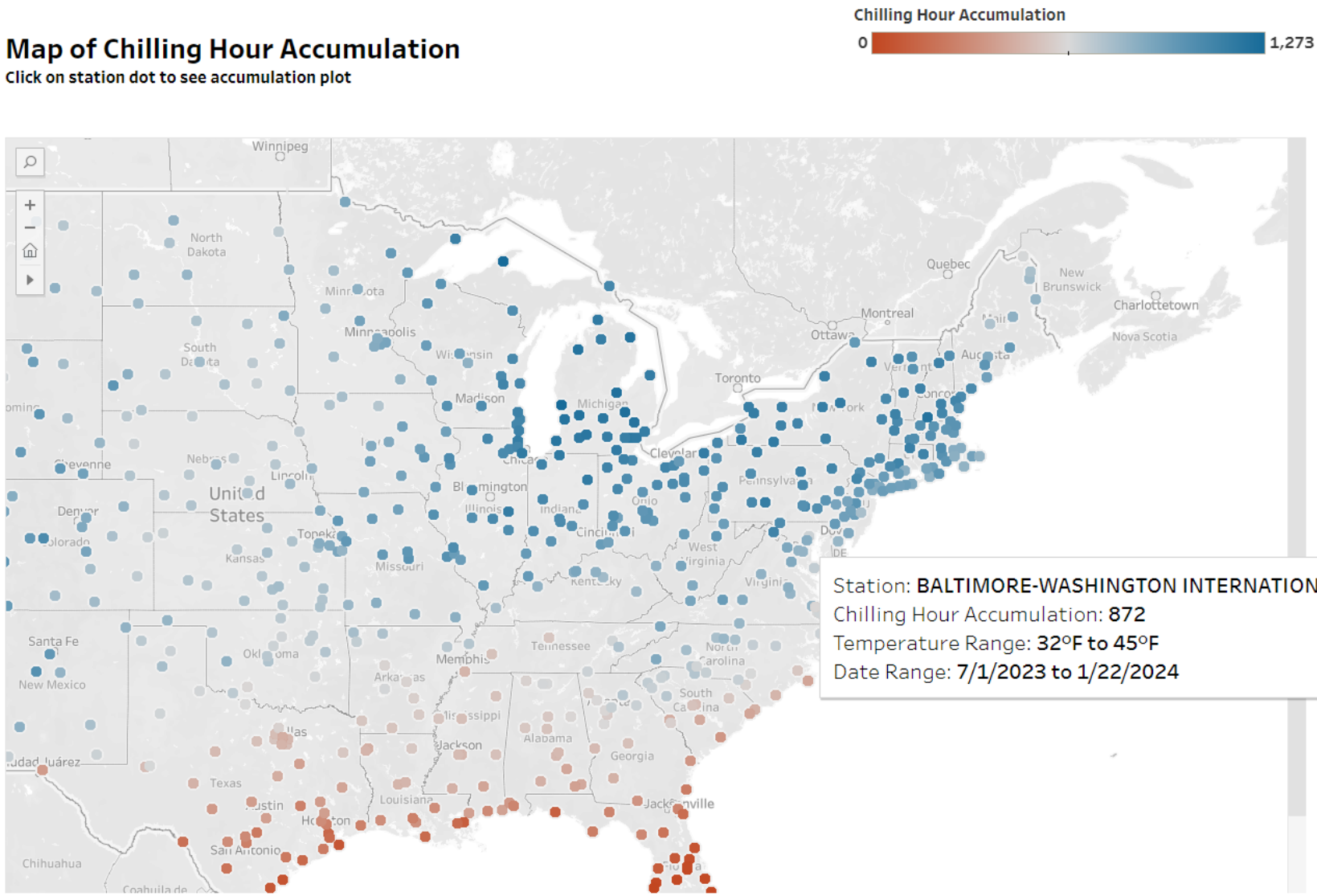
Chilling Hours Tool: Hourly temperature data come from ASOS/AWOS stations and are filtered.



- Hourly temperature values from ASOS and AWOS stations across the U.S. as far back as 1944 are obtained through a custom-designed data feed from the API of the ACIS hourly data-set. The database is updated daily to provide a real-time monitoring product.
- Three filtering criteria are used to ensure that stations with too many missing values are excluded, helping ensure high-quality information.
- True hourly data were sparse prior to the early 1980's.

Chilling Hours Tool: Map view shows accumulations for user-specified temperature thresholds and date ranges.



First, select state(s).

(All)

Then, select lower-bound and upper-bound temperatures and start and end dates.
Please allow a few moments after each selection.

Lower-Bound Temperature (°F)
Must be less than Upper-Bound Temperature
32

Upper-Bound Temperature (°F)
Must be greater than Lower-Bound Temperature
45

Start Date
Must be on or after July 1st in a July 1st to June 30th year
7/1/2023

End Date
Must be on or before the next June 30th after the Start Date
1/22/2024

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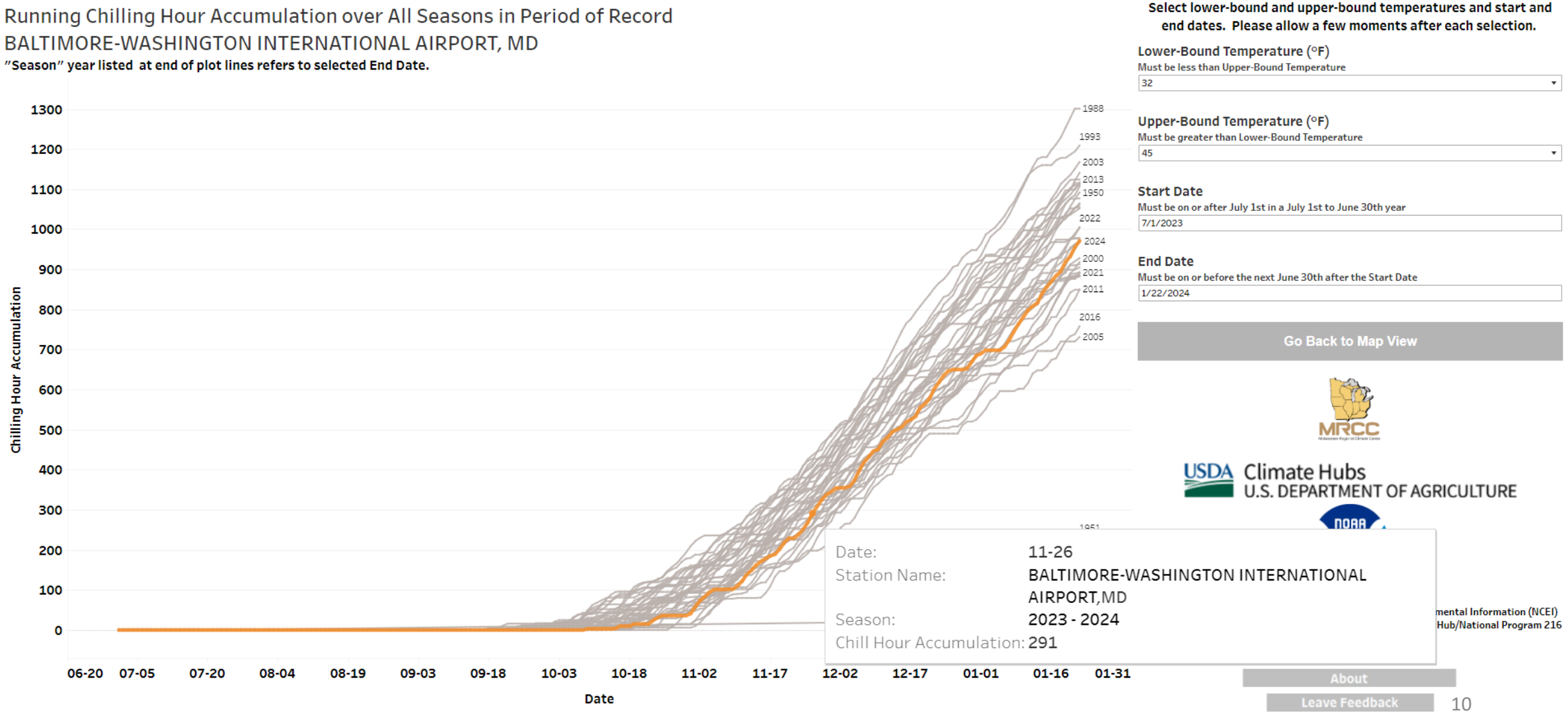
This tool was funded by the NOAA National Centers for Environmental Information (NCEI) and USDA-Agricultural Research Service (ARS) Midwest Climate Hub/National Program 216 Sustainable Agriculture

About

Leave Feedback

Chilling Hours Tool: Plot view gives a seasonal and climatological perspective of accumulations at a user-specified station.



Looking ahead…

- For the Soil Temperature Climatology, we plan to investigate adding the capability to see soil temperature information given a user-specified date, real-time station data, and more based on user feedback.
- For the Chilling Hours Tool, we hope to launch it in the coming weeks and, later, add features that provide more inter-seasonal and intra-seasonal climatological perspective, investigating interpolating hourly data in the more distant past, and (again) more based on user feedback.
- **Feel free to contact me at dbrouill@purdue.edu or any other personnel at the MRCC or USDA Midwest Climate Hub with questions and feedback.**

See the Soil Temperature Climatology online here! → → → →
https://mrcc.purdue.edu/clim/Soil-T