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A Look at the MRCC's Soil Temperature Climatology

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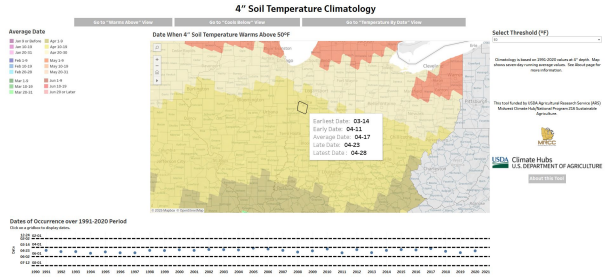
Spring field operations have already begun across the state, including tillage, anhydrous ammonia applications, and even some planting. Temperatures look up from here, but we cannot rule out periods of cooler conditions between now and May that could impact crop emergence. As of March 18, 2025, the 7-day average 4-inch soil temperature at the Purdue Agronomy Farm (ACRE) was 40.5°F, according to data derived from the **Purdue Mesonet Data Hub**. Daily soil temperature data can be accessed through the Data Hub, which can be downloaded to compute 7-day running average temperatures. A future update will allow 7-day soil temperatures to be readily accessible.

How does the current soil temperature compare to those of previous years? A collaboration between the **Midwestern Regional Climate Center (MRCC)** and the **USDA Midwest Climate Hub** has resulted in the **Soil Temperature Climatology Tool**, which can provide that answer. This tool offers historical statistics for 4-inch soil temperatures across the North Central United States from 1991 to 2020. It supports management decisions by answering key questions such as:

- ***Average Crossing Dates:*** On which day of the year does a location's 7-day average soil temperature typically rise above or fall below a specific threshold, such as 50°F?
- ***Early or Late Events:*** What constitutes an early or late date for 7-day average soil temperatures to cross the 50°F threshold?
- ***Record Dates:*** What are the earliest and latest recorded dates for 7-day average soil temperatures to cross the 50°F threshold?
- ***Date Distribution:*** How are the dates distributed when 7-day average soil temperatures rise above 50°F?



The tool utilizes daily average 4-inch soil temperature data from the **North American Regional Reanalysis (NARR)**, available at approximately 20-mile grid spacing from 1991 to 2020. The MRCC has recently added features to the tool, including a time series of all occurrences over the 1991-2020 period and another feature that allows users to select a date and see the historical range of temperatures on that chosen date.

To revisit the original question, the 7-day average soil temperature at ACRE on March 18, 2025, was 40.5°F. This temperature is considered climatologically normal, as it aligns with the 1991-2020 average displayed in the Soil Temperature Climatology tool. You can verify this information by clicking on "Go to 'Temperature by Date' View" and selecting March 18. In comparison, the 7-day average soil temperature at a depth of 4 inches reached 60°F in 2012, while the lowest recorded temperature was 33°F in 2014. That's quite the spread!