



# Summer 2019 Outlook for Southeast Michigan

Michigan, Average Temperature, September  
1901-2000  
Avg. 58.5°F



## June, July and August

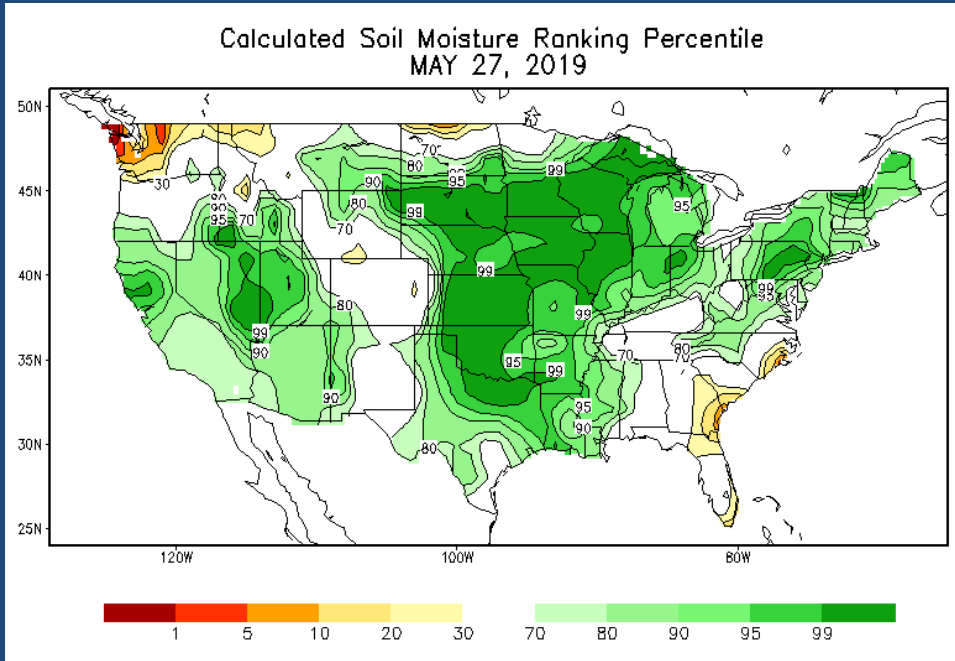




# Current Conditions

## Soil moisture (left) and drought (right)

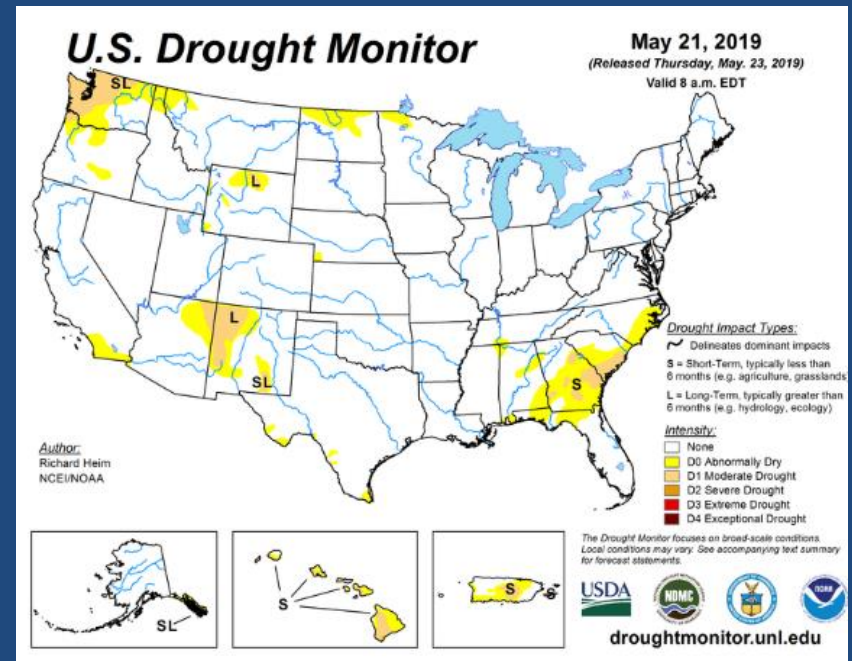
### Soil Moisture



A significant portion of the central US is experiencing 90 to 99 percentile soil moisture conditions.

The warm season is particularly sensitive to antecedent conditions, particularly soil moisture and drought. As of late spring, drought is largely absent east of the Rockies and ground conditions are extremely wet over large swath of the central and eastern US.

### Drought

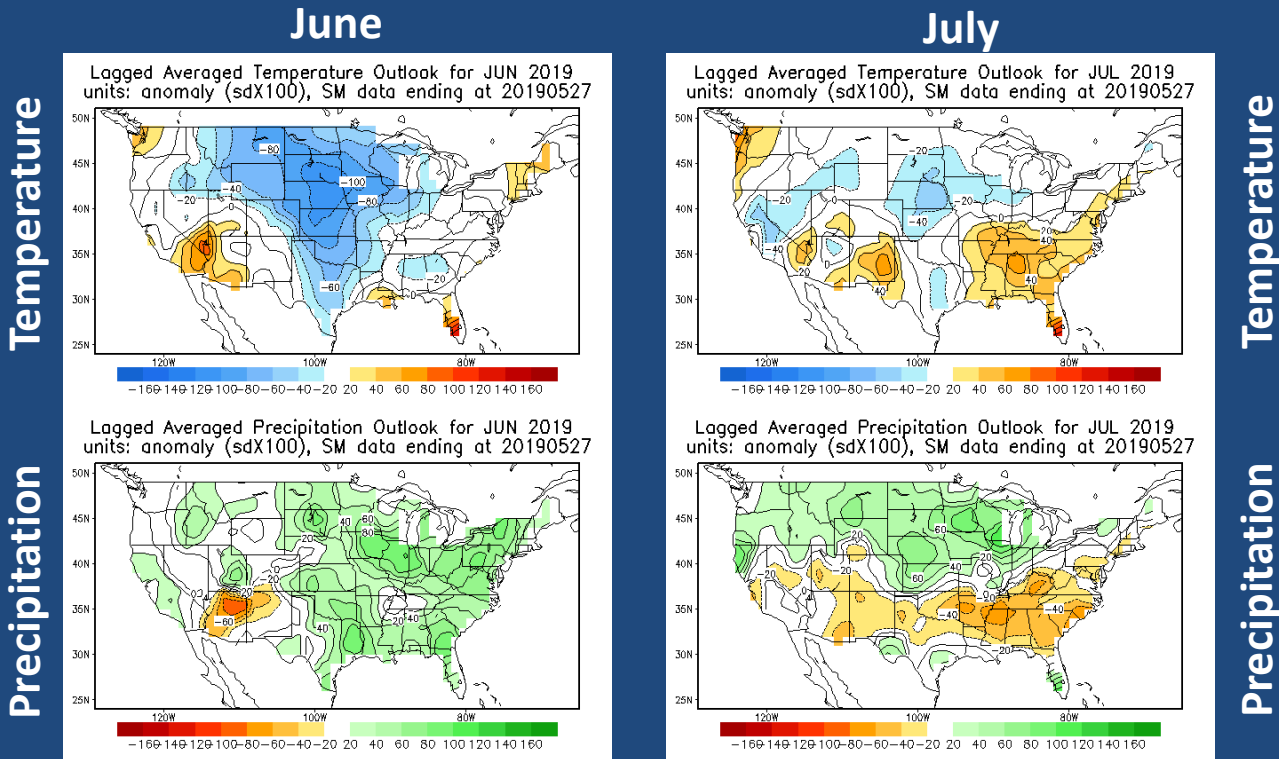


The drought signal is minimal across the CONUS.



# CPC Soil Moisture Analogs

June output (left) and July output (right)



The soil moisture analogs support an initial cool/wet signal in June that diminishes with time heading into July.

Constructed soil moisture analogs produced by CPC are not themselves a valid forecast. Their purpose is to leverage the fact that soil moisture has predictive value in the warm season, by providing a depiction of how similarly wet/dry years evolved. Their usefulness is usually limited to short lead times, so only June and July are shown above.

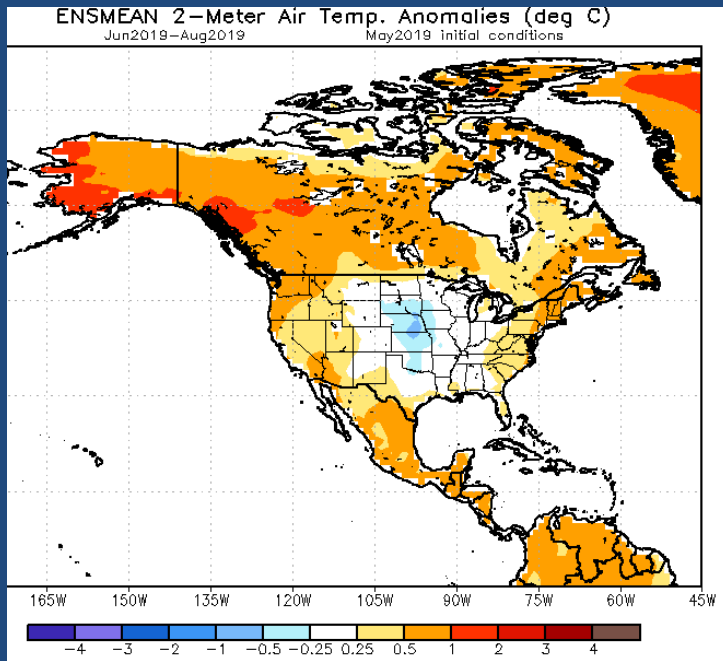




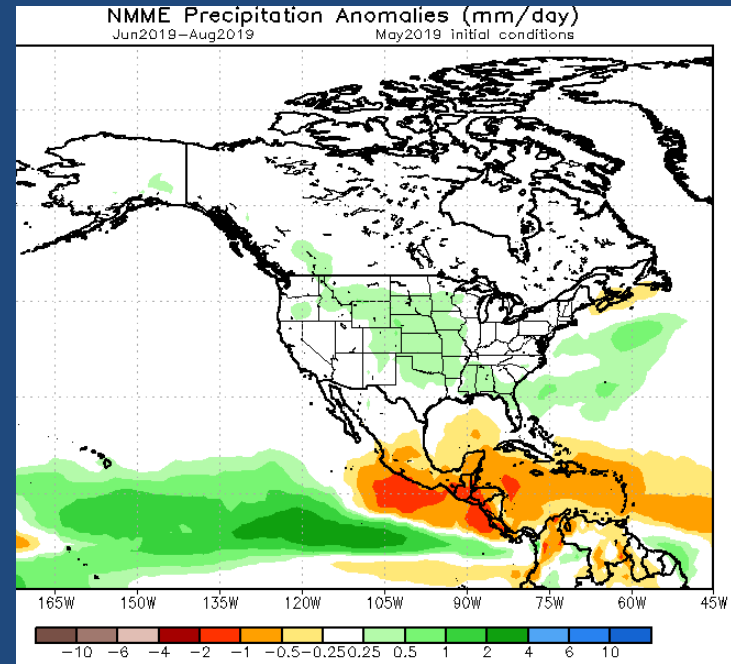
# Climate Model Output

## North American Multi-model Ensemble (NMME)

### Summer 2019 Temperature



### Summer 2019 Rainfall



Climate models favor warmer-than-normal conditions on the East Coast with a definitive high-moisture feedback signal (cooler and wetter) over the Great Plains. Michigan resides along the gradient between the two with no strong signal either way.

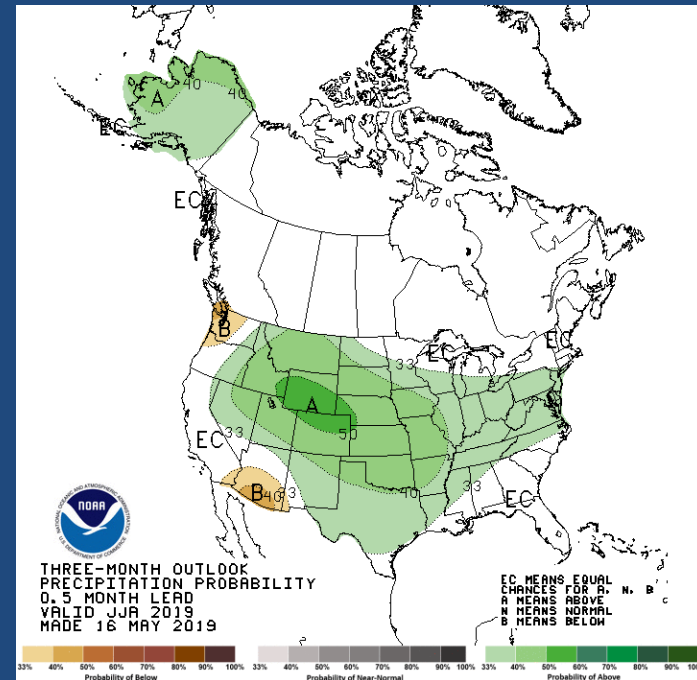
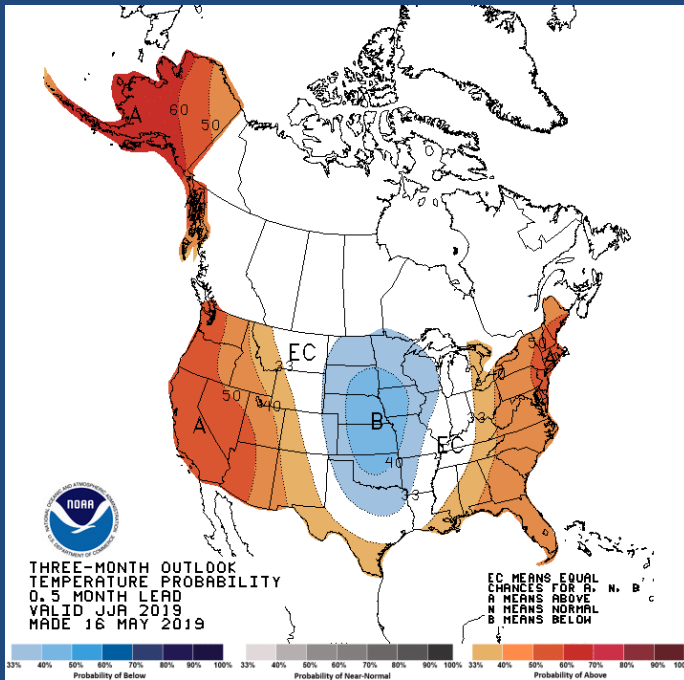
The NMME is the averaged output of several different climate models, but is not itself a valid forecast. The NMME reinforces the importance of this year's antecedent wet conditions, but it also evolves away from that signal (not shown) by the latter half of the summer resulting in a 90-day mean that is nearer normal.





# Official CPC Summer Outlook

Temperature (left) and Rainfall (right)



CPC favors Southeast Michigan to have a slightly elevated probability of being warmer and wetter than normal by the end of the 90-day June-July-August summer period.

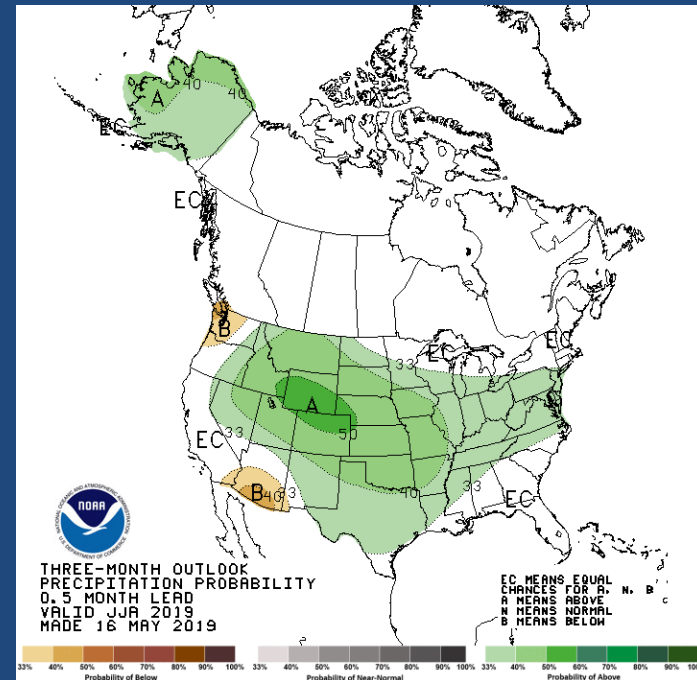
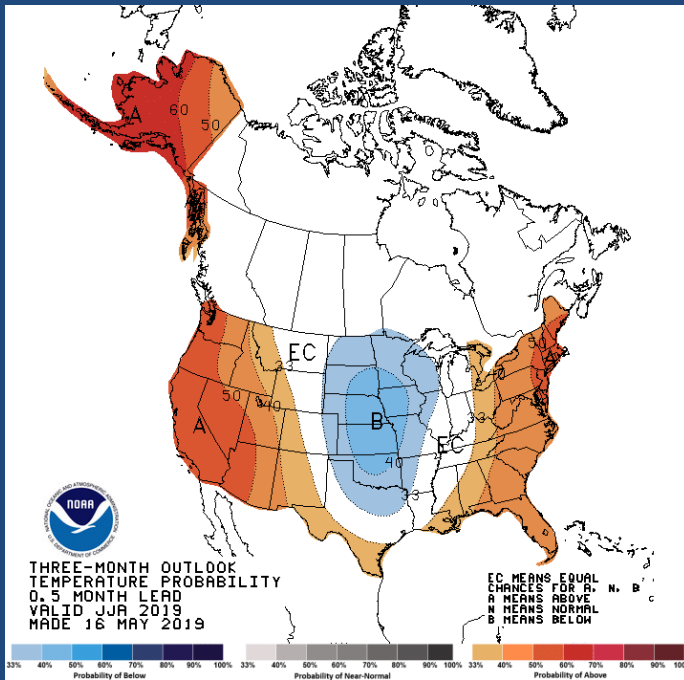
CPC's official outlook gave strong consideration to soil moisture, especially in early summer, along with climate model output. CPC also considers the influence of ENSO, which is forecast to be neutral this summer (ENSO is usually far less impactful in Michigan in the summer than winter, especially when neutral), intraseasonal variability, and long term climate trends.





# Southeast Michigan Discussion

## CPC outlook and local summary



CPC favors Southeast Michigan to have a slightly elevated probability of being warmer and wetter than normal by the end of the 90-day June-July-August summer period.

Recent medium-range modeling indicates cool and wet conditions (though not as wet as May) persisting into June. The signal for drier and warmer-than-normal becomes apparent by mid-summer and is the strongest in August. The greatest departure from average in SE Michigan is expected to be August (warmer than normal).

**Overall, summer is expected to feature slightly wetter-than-normal and slightly-warmer-than normal conditions.**





# Southeast Michigan Summer Records & Trivia

**Warmest temperature:** Tri-Cities: 111F (7/13/1936), Flint: 108F (7/13/1936), Detroit: 105F (7/24/1934)

**Warmest month:** Tri-Cities: 77.5F (Jul 1921), Flint: 78.0F (Jul 1921), Detroit: 79.3F (Jul 2011)

**Warmest summer:** Tri-Cities: 73.0F (1931), Flint: 74.2F (1933), Detroit: 74.9F (2016)

**Coldest temperature:** Tri-Cities: 33F (6/8/1949), Flint: 33F (6/4/1998), Detroit: 36F (6/11/1972)

**Coldest month:** Tri-Cities: 60.6F (Jun 1982), Flint: 60.1F (Jun 1969), Detroit: 62.8F (Jun 1985)

**Coldest summer:** Tri-Cities: 64.8F (1915), Flint: 65.4F (1992), Detroit: 66.5F (1915)

**Wettest month:** Tri-Cities: 9.43" (Aug 2012), Flint: 11.18" (Aug 1937), Detroit: 8.76" (Jul 1878)

**Wettest summer:** Tri-Cities: 16.28" (1928), Flint: 18.39" (1937), Detroit: 16.96" (1896)

**Driest month:** Tri-Cities: 0.27" (Aug 1927), Flint: 0.16" (Jul 1939), Detroit: 0.16" (Aug 1894)

**Driest summer:** Tri-Cities: 3.54" (1927), Flint: 3.76" (1930), Detroit: 3.58" (1911)

**Average first 90 degree temperature:** Tri-Cities: Jun 18th, Flint: Jun 18th, Detroit: Jun 19th

**Climatological chance of reaching 100 degrees:** Approx. 14%, or about 1 in every 7 years.