

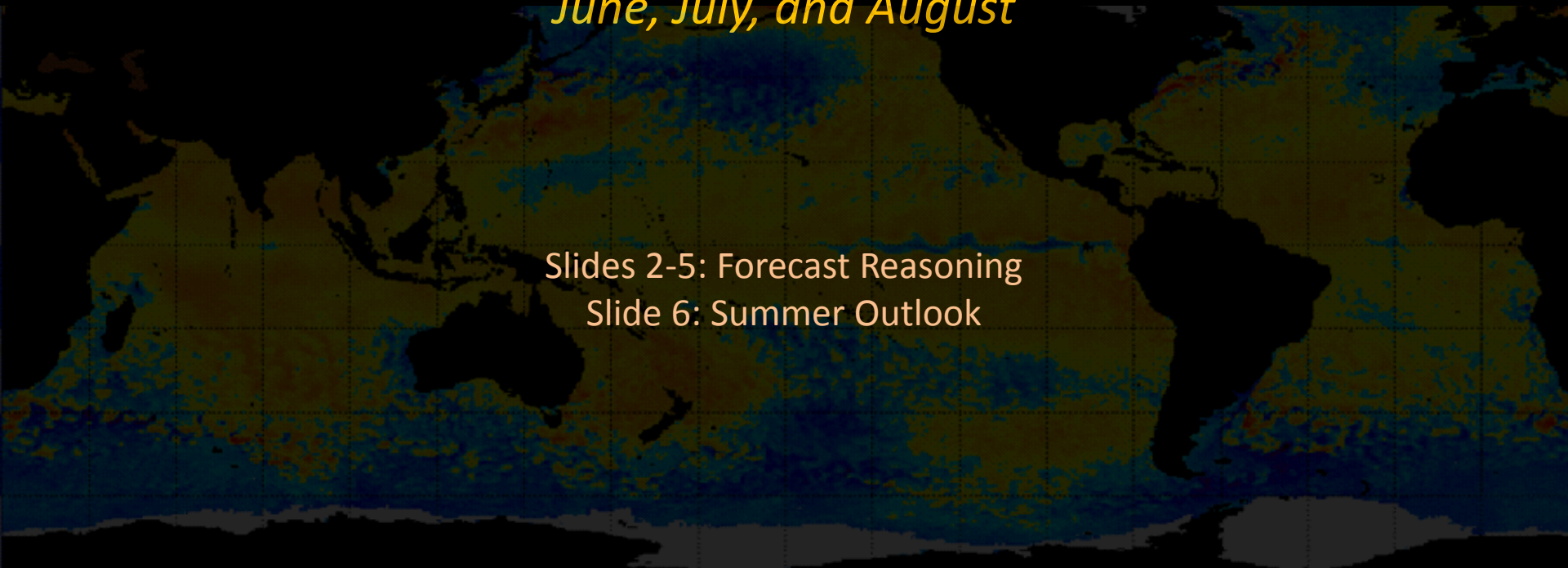
Summer Outlook 2018

Southeast Lower Michigan

June, July, and August

Slides 2-5: Forecast Reasoning

Slide 6: Summer Outlook



Current Conditions

Current Soil Moisture

Summary

Soil moisture is locally high after a wet May, but upstream moisture from Texas into the Lower Missouri and Middle Mississippi Valleys is low as a result of expanding drought.

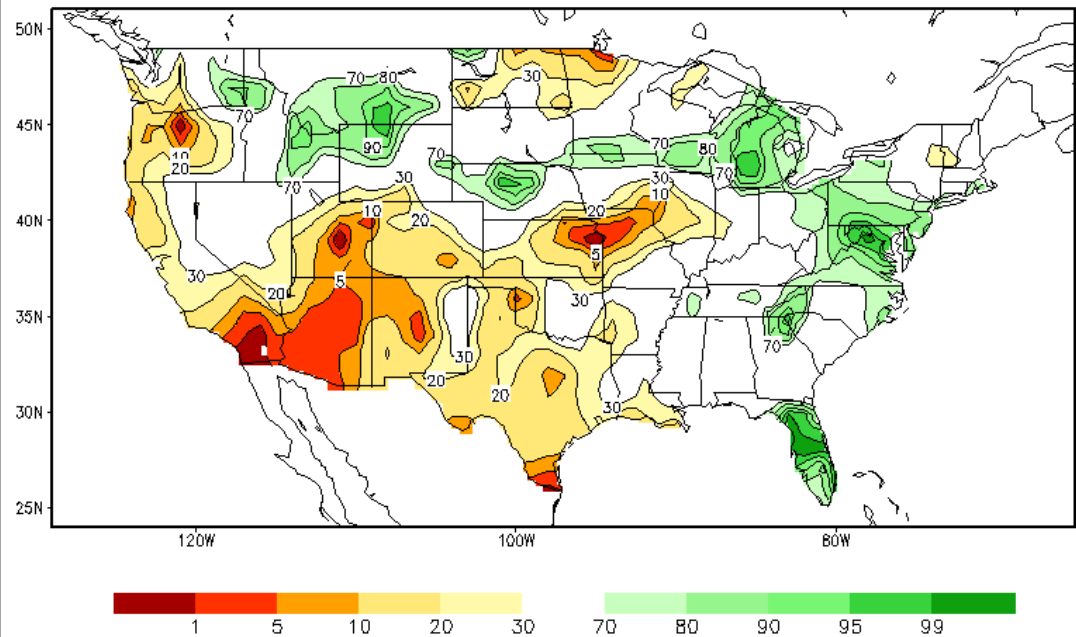
Why it matters

Exceptionally dry conditions can beget heat and/or drought, while wet ground conditions can be a harbinger of cooler temperatures.

Implication

Our source regions for heat are mainly dry or near-normal, which is favorable for warmer or near-normal upstream airmass temperatures.

Calculated Soil Moisture Ranking Percentile
JUN 08, 2018



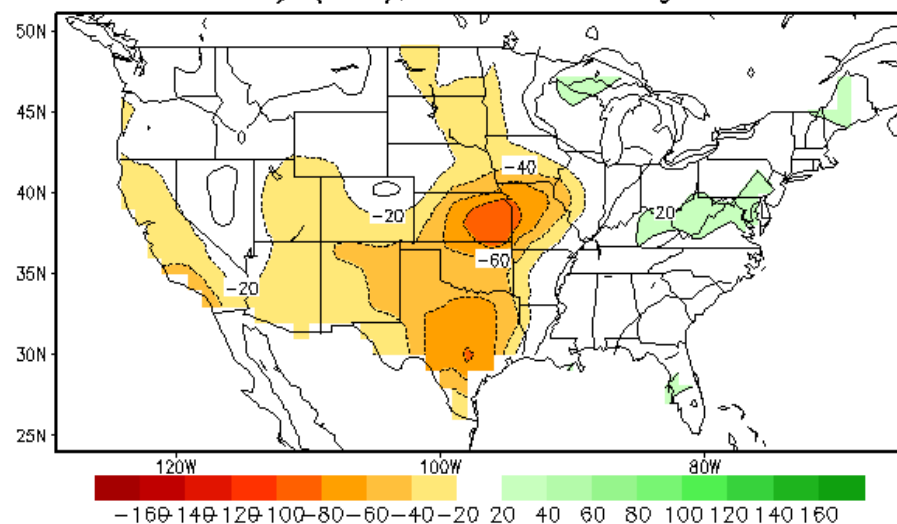
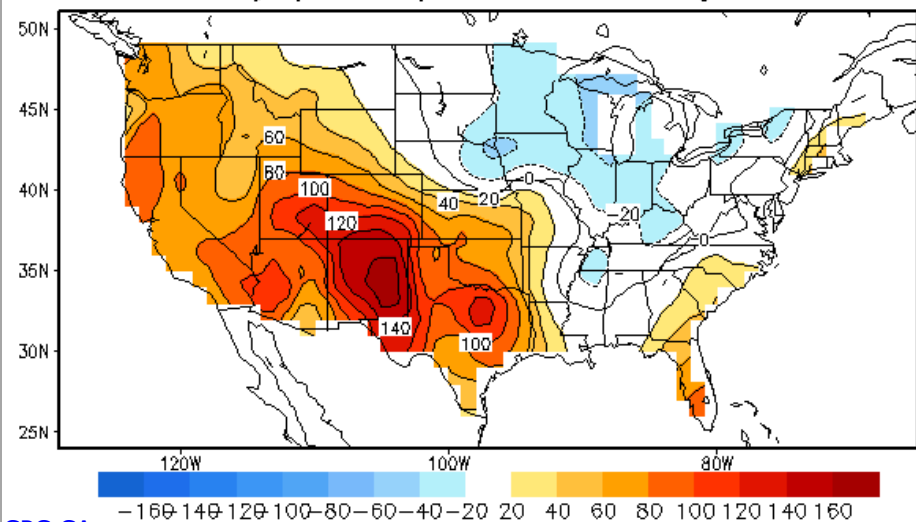
[CPC SM page](#)

What it Could Mean

CPC Soil Moisture Constructed Analog Outlook for July

Lagged Averaged Temperature Outlook for JUL 2018
units: anomaly (sdX100), SM data ending at 20180608

Lagged Averaged Soil Moisture Outlook for End of JUL2018
units: anomaly (mm), SM data ending at 20180608



[CPC CA page](#)

Pictured above is output from the NWS Climate Prediction Center's *Soil Moisture Constructed Analog Outlook* for July. By analyzing years with similar soil moisture qualities as this year, it provides a statistically-based outlook for future temperatures and precipitation. The output for July is similar, if slightly cooler, than the output for the summer period (not shown).

Left
Soil moisture analogs favor locally cooler temperatures mid-summer. Overall (not shown), analogs produce near-normal output.

Right
The analogs also favor near-normal precipitation.

Current Conditions

ENSO

Summary

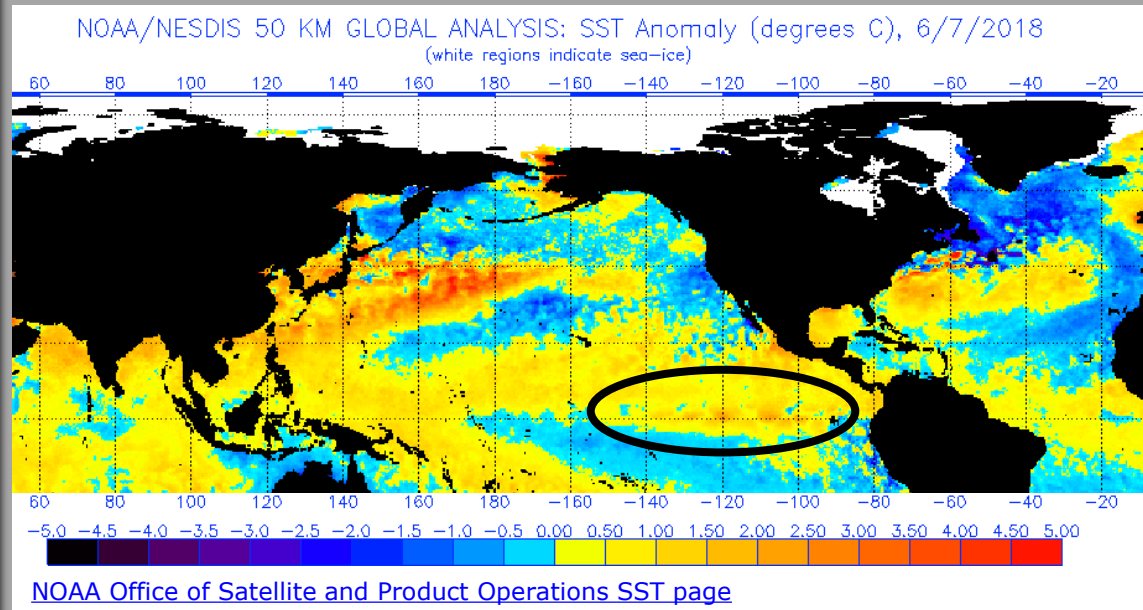
Highlighted in the black circle, anomalously warm temperatures have emerged in the eastern tropical Pacific.

Why it matters

Tropical water temperatures are a central fixture in seasonal weather patterns. This is especially true in the winter, but should not be ignored in summer. High and mid-latitude water temperatures can be important, but are generally less so. They are also more noisy and more difficult to predict.

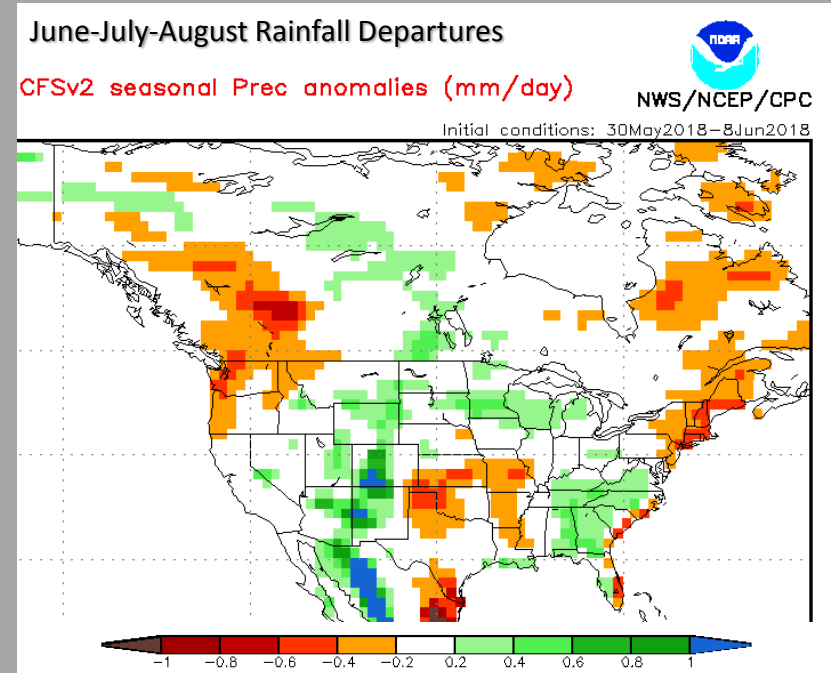
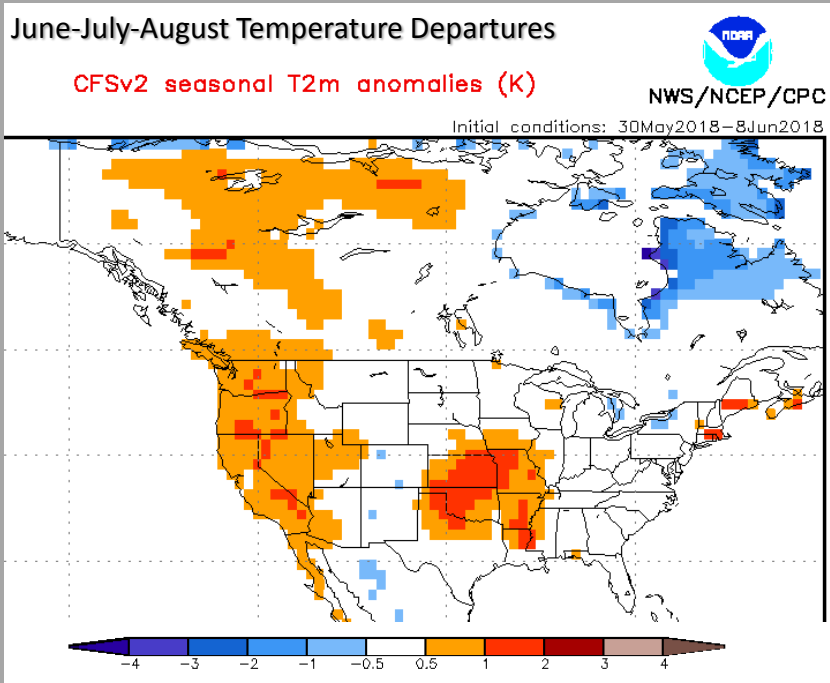
Implication

This data supports models that are predicting a neutral or weak el Nino condition emerging this summer. Such patterns tend to tip the balance **away** from both anomalous warmth and dryness in the Great Lakes.



Climate Model Output

CFS Model Simulation of Summer



[CPC CFS page](#)

Pictured above are modeled temperature anomalies (left) and rainfall anomalies (right) for the whole of Summer 2018.

The signal for some upstream heat, but near-normal temperatures across the northern tier into the Great Lakes is in line with the previous data. Likewise, so is the signal for near-to-slightly-above normal rainfall across the north and continued dry conditions in portions of the southern Great Plains and MS Valley.

Summer Outlook for Southeast Michigan

Temperature Outlook

No signal exists that points strongly either direction from normal, while soil moisture analogs, recent conditions in the first week of June, and climate model forecasts suggest near-normal temperatures overall. The upstream drought will be important factor, as it could serve as a source for occasional significant heat intrusions. It is forecast to expand in the coming weeks, but not necessarily into common source regions for Michigan temperatures.

June through August: Normal to slightly warmer than normal

Rainfall Outlook

Warm season precipitation is dominated by thunderstorm activity and is notoriously difficult to predict at seasonal time scales. Soil moisture analogs and ENSO prospects suggest either normal or slightly wetter-than-normal results.

June through August: Normal to slightly wetter than normal

Summer Trivia for Southeast Michigan

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.