Some Long Range Forecasts

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Our forecast – Summer – 2018 (mid-MO flashback)

- Near normal temperatures (about +/- 0.0 - 0.25 sigma above normal - about 0.5 F), possibly warmer in mid-August. Good news for cooling bills. The outcome was warmer than normal by 3.5 °F (worst outcome in awhile).

- Near normal amounts of precipitation (about +/- 0.5 sigma), this is good news for agriculture. We were -4.00 inches, which is dry!!! (worst outcome in awhile)

- Reasoning: We were to come out of La Nina (cold neutral) conditions moving toward warm neutral by fall. Newberry et al. (2016) suggests these patterns are favorable for summer. Unfortunately – La Nina stayed around too long. It was a true bust.
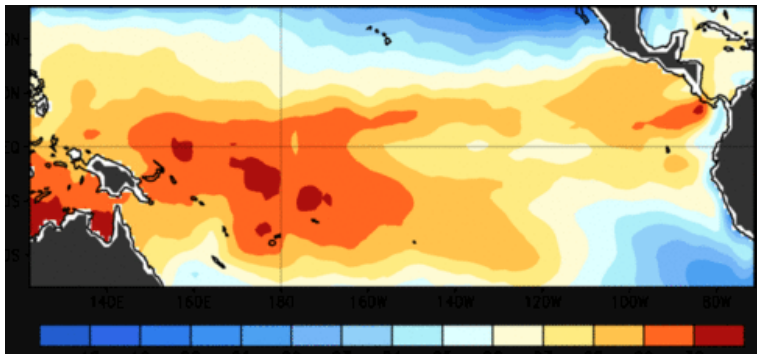
Our winter 2018-2019 forecast

▶ We forecast temperatures to be close to normal, which of course means +/- 0.5 sigma or about +/- 1.7° F. We were +1.2° F. Give ourselves 2 points! (2 straight winters)

▶ We forecast above normal precipitation by 1 inch. We were actually about +2.8 inches. We'll award could award 1 point since precipitation was actually more than 1 sigma above normal.

▶ Reasoning: We went full El Nino (Modaki), this typically augurs for more Pacific blocking. That has happened. We went for about 15 inches of snow for winter, but we're just above 28 inches (20 in winter).
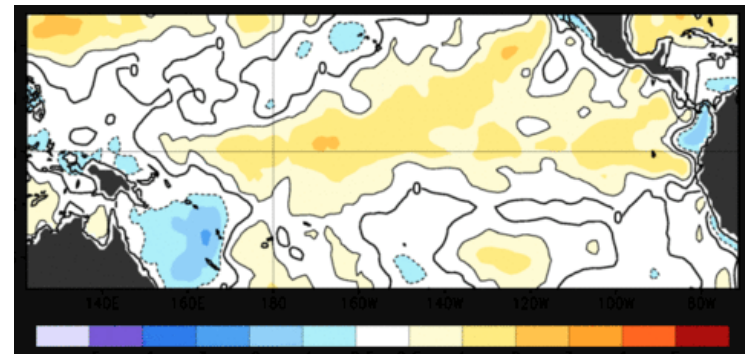
Summer Forecast 2019 (mid-MO)

▶ El Nino (fading) conditions currently.
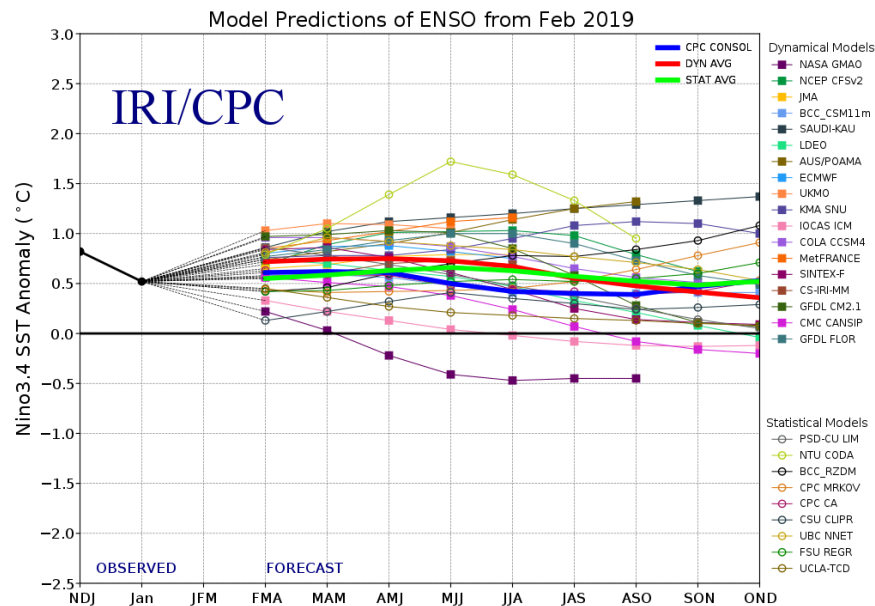
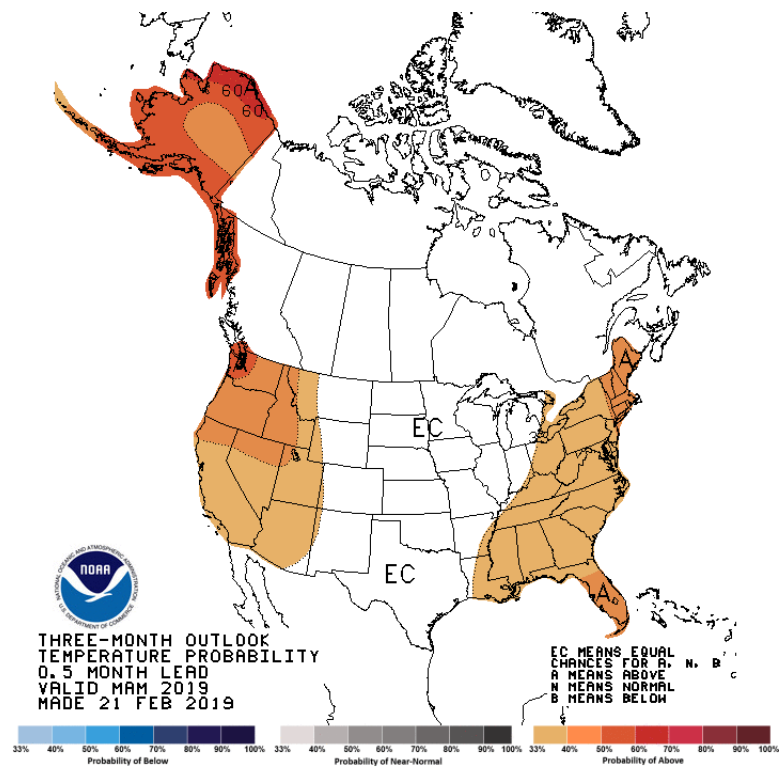▶ 27 February 2019 (SST)   Anomaly

Summer Forecast 2019

- Models looking to slowly decay the current weak El Nino pushing into warm neutral conditions…...

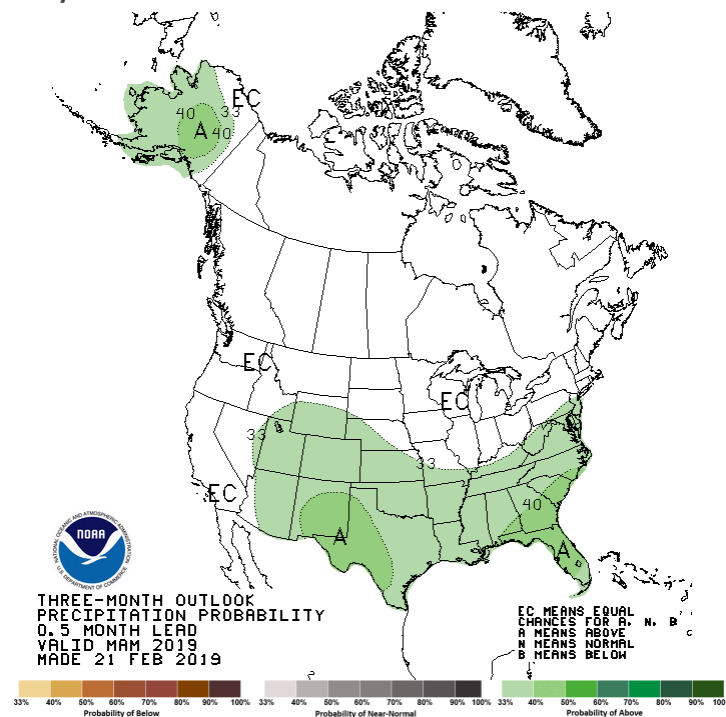Model Predictions of ENSO from Feb 2019

Spring 2019

▶ Spring Temps – MAM (near normal temperatures here – See Newberry et al. 2016.)

Spring 2019

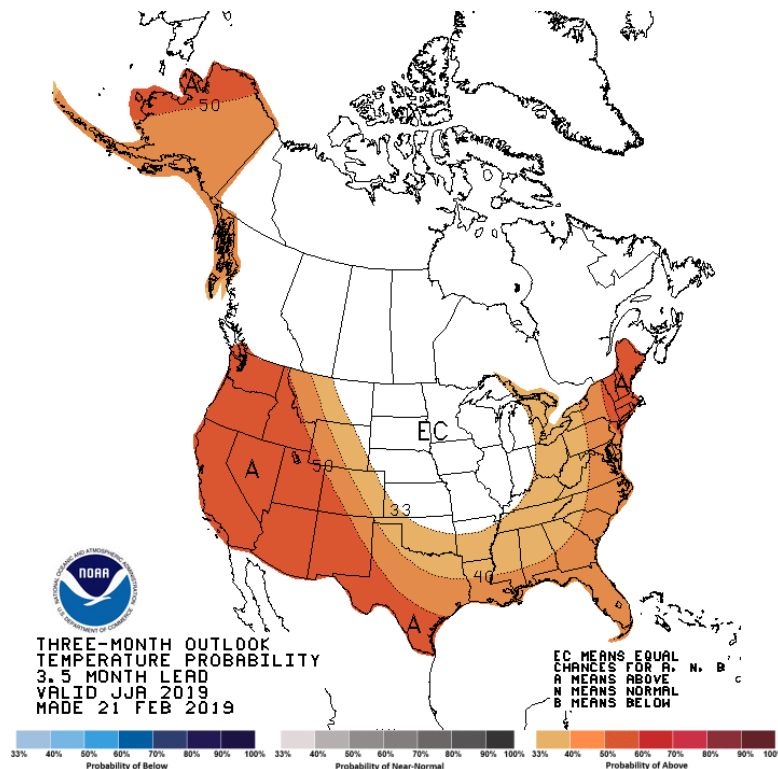▶ Spring Precipitation: MAM(should be near normal to continued wet here)

Summer - 2019

▶ CPC Summer temps – JJA (a bit above normal? Hot in the Southwest)

THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
3.5 MONTH LEAD
VALID JJA 2019
MADE 21 FEB 2019

EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

Probability of Below   Probability of Near-Normal   Probability of Above

Summer - 2019

► CPC Summer Precipitation JJA (Maybe continued wet here?)

THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
3.5 MONTH LEAD
VALID JJA 2019
MADE 21 FEB 2019

EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW
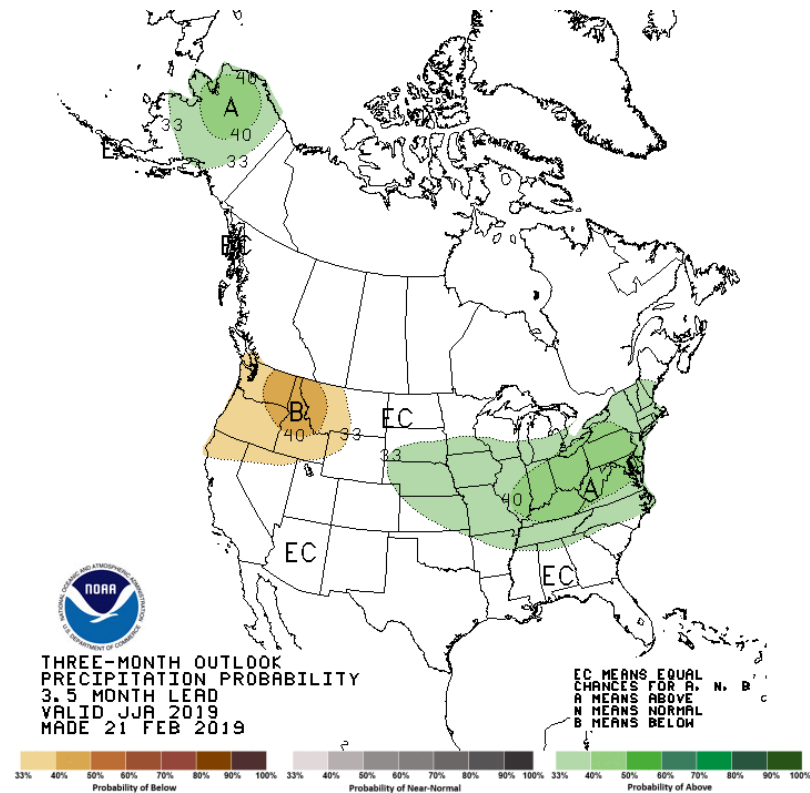
Summer - 2019

▶ CPC forecast is for a near normal summer temperature-wise, but with a slight hint that things may be like last year. The CPC forecast leans on the side of wet precipitation-wise.

▶ In the Spring and Summer 2019, ENSO is predicted to slowly move from warm to warm neutral by fall. This kind of forecast tends to show near normal summers temperature-wise, but leading toward moister humid conditions.
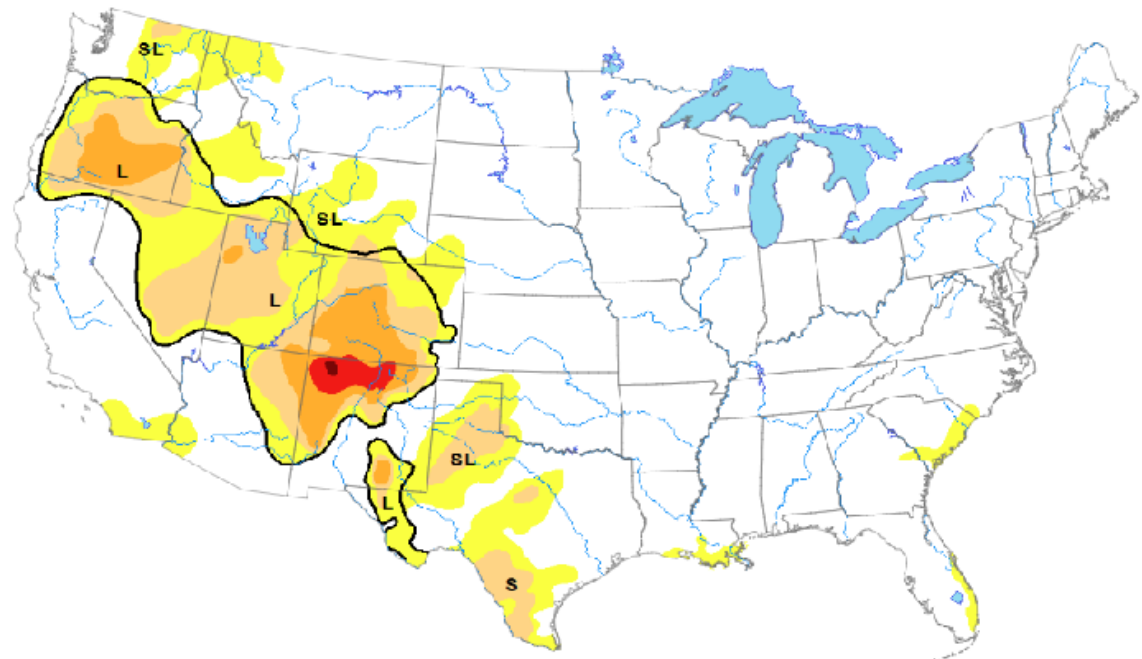
Our forecast – Summer - 2019

- Near normal temperatures (about +/- 0.25 sigma from normal - about 0.5 F), with more humid conditions. Bad news for human comfort!

- Above normal amounts of precipitation (about + 0.5 sigma – or zero to +2.5 inches), this is somewhat good news for agriculture, depending on how spring goes. The winter has been somewhat wet with good soil moisture conditions.

- Reasoning: We are coming out of El Nino (Modaki), ENSO conditions expected to remain warm Neutral by fall. Newberry et al. (2016) suggests these patterns are favorable for summer.

National drought map

Great news! For about a month there are no drought conditions found anywhere in Missouri! This is a bit unusual.

Map released: February 28, 2019

Data valid: February 26, 2019 | Author: Brad Rippey, U.S. Department of Agriculture

Summer 2019 Crop Forecast

▶ Summer 2019 – Crop Yield Projections

▶ IRI/CPC Ensemble Plume of ENSO Predictions for Fall 2019

▶ Jan. 2019: Dynamical and Statistical Model average NINO3.4 SST Anomaly is roughly +0.5°C.

Summer 2019 Crop Forecast

▶ Missouri Climate Divisions

Summer 2019 Crop Forecast

- Feb. 2019: Dynamical and Statistical Model average NINO3.4 SST Anomaly is roughly +0.5.

- The IRI/CPC outlook is leaning towards Neutral-El Niño for Fall 2019.

- (iri.columbia.edu/our-expertise/climate/forecasts/enso/current/)

Summer 2019 Crop Forecast

▶ According to the JMA definition of ENSO (used in my research), an anomaly above 0.5°C is considered an El Niño event. Therefore, projections for crop yields are based on the projection of ENSO being warm neutral by Fall 2019.

▶ Also according to the JMA, PDO has been near zero throughout 2018 (http://research.jisao.washington.edu/pdo/PDO.latest.txt) Therefore, crop yield projections will be based on the assumption that Fall 2019 will be a negative **PDO**.

Summer 2019 Crop Yield Forecasts

▶ Corn Yields: (1.0 sigma is 23 BU/Acre (1990-2013 data) for Div 1, and 26,26,23,19, and 17 BU / Acre for Divs 2,3,4,5,6)

▶ Climate Division 1: 0.2 – 0.4 sigma above average

▶   2:   0.1 – 0.3 sigma above average

▶   3:   0.0 – 0.2 sigma above average

▶   4:   0.1 – 0.3 sigma above average

▶   5:   0.1 - 0.3 sigma above average

▶   6:   0.1 sigma below – 0.1 sigma above average

Summer 2019 Crop Yield Forecasts

▶ Soybean Yields (1.0 Sigma is 5.5 BU / Acre (1990-2013 data) for Div 1, and 5, 6.5, 6.7, 4.1, and 5.3 BU/Acre for Divs 2,3,4,5,6)

▶ Climate Division 1: 0.2 – 0.3 sigma above average

▶ 2:   0.1 – 0.2 sigma above average

▶ 3:   0.0 – 0.2 sigma below average

▶ 4:   0.1 – 0.3 sigma above average

▶ 5:   0.1 – 0.3 sigma above average

▶ 6:   0.2 – 0.4 sigma above average

Summer 2019 Crop Yield Forecasts

- **For Summer 2019, Missouri corn and soybean yields are projected to be near average to 0.4 sigma above average. One exception: soybean yields for climate division 3 are projected to be near average to slightly below average. Also, for corn, climate division 6 will be close to normal.**

CoCoRaHs

▶ Please consider joining CoCoRaHs. This data will be used by agencies to decide crop loss information. It's worth it to you to join Missouri CoCoRaHs. (State Climatologist Patrick Guinan)

▶ http://www.cocorahs.org

▶ Email: lupoa@missouri.edu