Issue 717

K-STATE Research and Extension

Extension Agronomy

eUpdate

10/26/2018

These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, Agronomy eUpdate Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Kathy Gehl, 785-532-3354 kgehl@ksu.edu, or Dalas Peterson, Extension Agronomy State Leader and Weed Management Specialist 785-532-0405 dpeterso@ksu.edu.

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1. Fall soil testing of hay fields and pasture

Soil testing can be done in either spring or fall on hay fields and pasture. Given a choice, fall would be the preferred time because it allows more time for any needed lime applications to have an effect before the main growing season begins, and it gives the producer some flexibility for planning nutrient applications.

Figure 1. Grazing pasture in the fall. Photo by Doo-Hong Min, K-State Research and Extension.

Soil sampling on a regular basis (every 3 – 4 years) can keep you from applying excessive and unnecessary amounts of fertilizer or manure, and can increase yields by revealing exactly which soil nutrients are too low for optimum productivity. By doing this practice properly, producers can save money and reduce the environmental impacts.

To take accurate soil samples, it is best to use a soil probe. You can borrow a probe from many county extension or NRCS offices. A shovel or spade can be used, but make sure to dig a hole first and then take a nice even slice to the correct depth. A shovel or spade that angles to a point at the bottom can easily result in misleading soil test results because the sample is biased by having more soil from the surface and less from lower depths.

When taking soil samples, it is important to have a representative composite soil sample from the field by combining several soil cores and mixing thoroughly. The ideal sampling technique is to take at least one composite soil sample every 10 acres. On these 10-acre areas, take 15 to 20 cores or subsamples to make up your representative composite sample.

If the field has areas where different forages or crops have been grown, or has different soil types, then soil sampling from these areas should be done separately. Sampling depth for pastures and hayfields should be 3 to 4 inches for pH evaluation. For phosphorus and potassium, a 6-inch depth is preferred when submitting samples to the K-State Soil Testing Laboratory since that is the depth we have used to calibrate recommendations.

One important soil property for forage production, especially with legumes, is soil pH. The optimal pH level is 6 to 7, depending on the forage species. Grasses such as brome or fescue do well at a lower pH. But legumes, especially alfalfa, require a near-neutral pH (~pH 7). If the soil pH is too low or too high, nutrient uptake of macro- and micronutrients can be reduced. Especially important for legumes such as alfalfa and clover is the impact of pH on nodulation and nitrogen fixation. At low soil pH, aluminum toxicity can also be an issue.

When you lime a new pasture, it is important to apply the lime 6 to 12 months before planting legumes. If you want to get a more rapid response from liming, use fine-ground liming materials with a high effective calcium carbonate (ECC). Fields that will be planted to alfalfa next spring should also be evaluated for phosphorus and potassium levels and make corrections before planting.

For more information on soil sampling and submitting samples to the K-State Soil Testing Laboratory, visit their website at http://www.agronomy.k-state.edu/services/soiltesting/. You can also access two previous eUpdate articles discussing fall soil sampling and collecting a representative soil sample in Issue 712, September 28, 2018.

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2. Winter weather outlook for Kansas: Looking ahead to December - February

Winter is approaching and Kansans are interested in what they should expect this winter. The NOAA Climate Prediction Center has released outlooks for temperature and precipitation during the winter season -- December through February.

The temperature outlook calls for a slight increase in the chance for warmer-than-normal temperatures statewide (Figure 1). That tendency increases as you move further north and west in the Plains. It is important to remember that this is the 3-month average. There could be significant cold periods and still have an overall warmer-than-normal winter. One difficulty with that pattern is that crops and livestock are not able to develop strong winter hardiness. This makes them more susceptible to severe conditions during the occasional extreme cold snap.

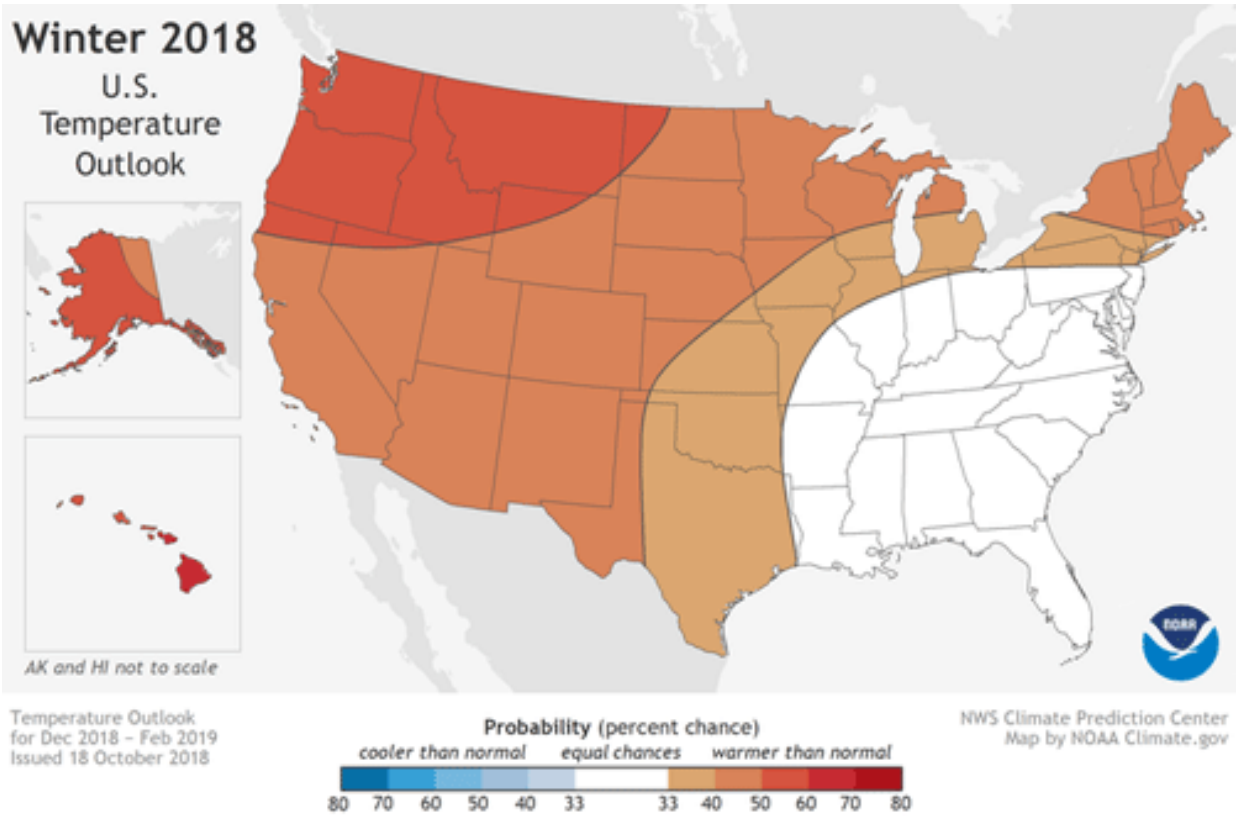

Figure 1. 2018-2019 Winter outlook map for temperature. Source: www.NOAA.gov

The precipitation outlook is neutral, meaning there is an equal chance to have above-, near-, or below-average precipitation this winter (Figure 2). Winter is normally the driest time of the year for most of the Plains. Southeast Kansas is an exception, with a more even distribution of precipitation across the year.

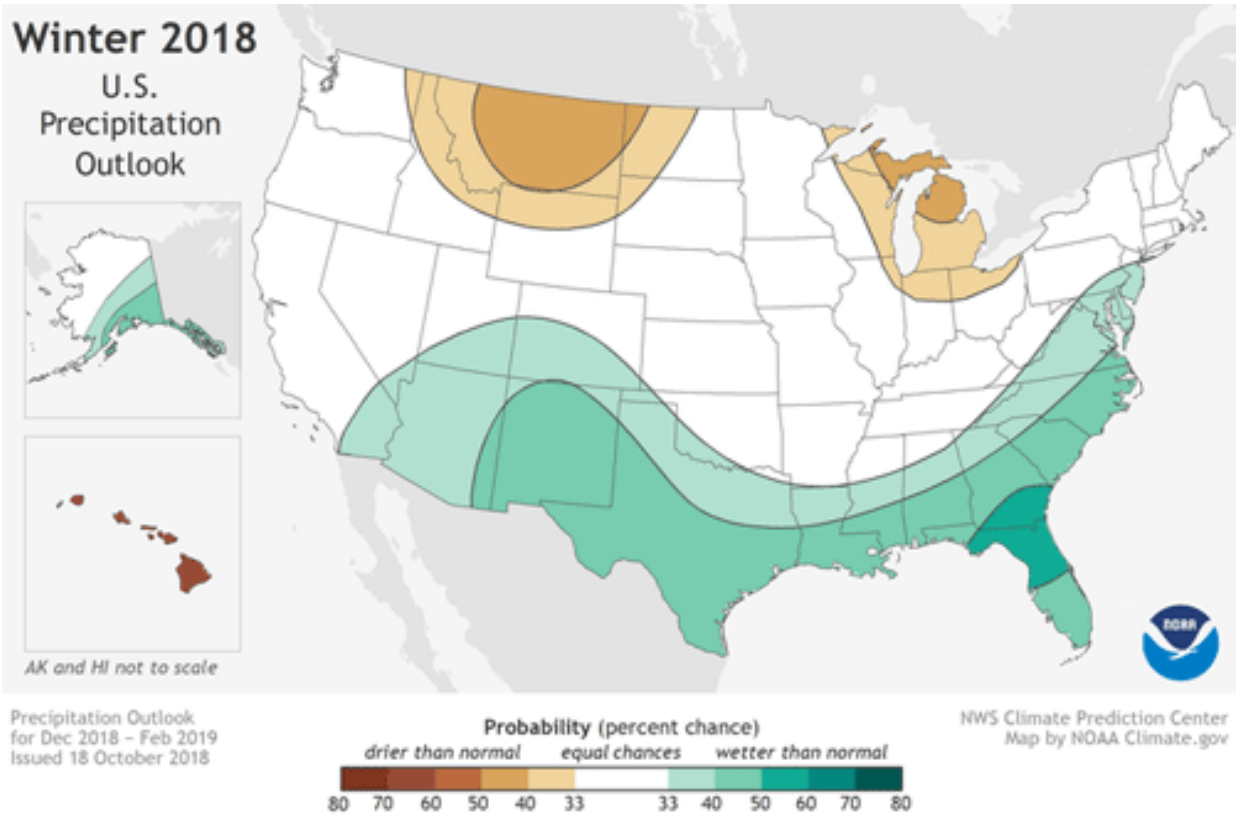

Figure 2. 2017-2018 Winter outlook map for precipitation. Source: www.NOAA.gov

It is worth noting that neither the temperature nor the precipitation outlook predicts the degree to which conditions will vary. Instead, these outlooks provide confidence that warmer- or wetter-than-normal conditions may occur as a percent. A tenth of a degree (0.1) warmer-than-normal average temperature would validate the outlook to a similar extent as an increase of 10 degrees. A hundredth of an inch (0.01) greater-than-normal average would have a similar result in the precipitation outlook. Significant wetter-than-normal conditions would be needed to improve the drought conditions in the Northern Plains. In Kansas, only 1% of the state is in moderate drought with approximately 7% of the state abnormally dry. With the equal opportunity for a wetter/drier than normal winter, anything is possible. More information about the outlooks and how to interpret them can be in found in the KSRE publication "Climate Outlooks Serving Agriculture" (MF3432, https://www.bookstore.ksre.ksu.edu/pubs/MF3432.pdf)

What factors are considered to produce winter outlooks?

The major force responsible for the current winter weather outlook is the ENSO (El Niño-Southern Oscillation) signal. At this time, a weak El Niño pattern (warmer-than-normal waters in the Pacific along the Equator) is expected through the majority of winter. Storm tracks during El Niño winters typically have a southern track across the continental U.S.

Given the uncertainty of the El Niño, other factors may have a stronger influence. Two patterns that deserve attention are the North Atlantic Oscillation (NAO) and the Madden-Julian Oscillation (MJO).

The NAO is a comparison of high and low pressure in the Atlantic basins. When the NAO is negative (with a weak gradient between high pressure in the subtropics and low pressure over Iceland), the east coast of the United States tends to have stronger cold outbreaks with more snow (Figure 3). Some of that can clip the eastern Plains region. However, it most often positions the Central Plains in the transition area between a warmer/drier air mass to the west/north and a cooler/wetter in south/east. Often this means quick surges of moisture with storm systems and a prolonged period of drier, slightly warmer, and windier conditions afterwards. A positive Pacific/North American Oscillation that further emphasizes the increase in windy periods and dry spells is also reinforcing this NAO pattern.

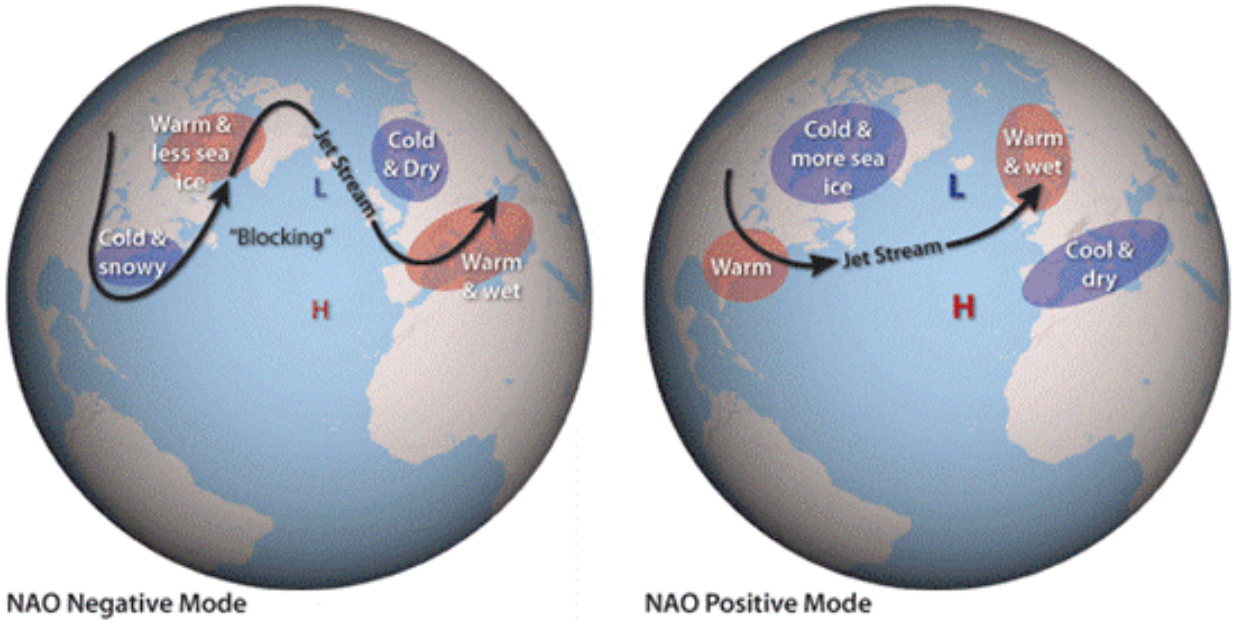

Figure 3. Negative NAO. Source: www.NOAA.gov

The MJO is an eastward moving 'pulse' of cloud and rainfall near the equator that typically recurs every 30 to 60 days (Figure 4). The position or state of the MJO influences storm generation across the United States. Unfortunately, both the NAO and MJO conditions can change rapidly, and forecasts for these patterns are not as well developed as for the ENSO. That makes it difficult to gauge their impacts on an extended basis.

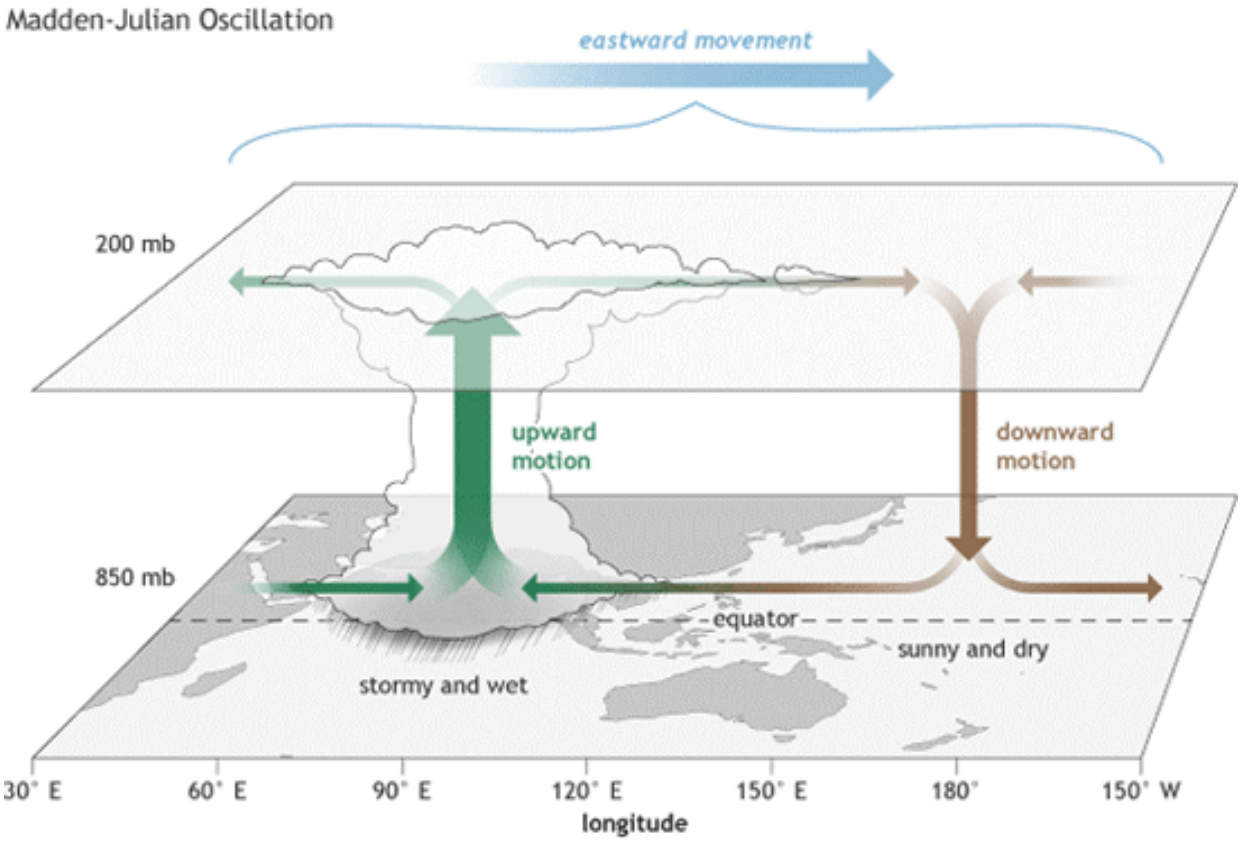

Figure 4. Madden Julian Oscillation. Source: www.NOAA.gov

For Kansas, average winter temperatures range from 28 degrees F in the northern regions to 37 degrees F in the southeast (Figure 5). Average total precipitation (Figure 6) ranges from less than an inch in the west to over six inches in the southeast.

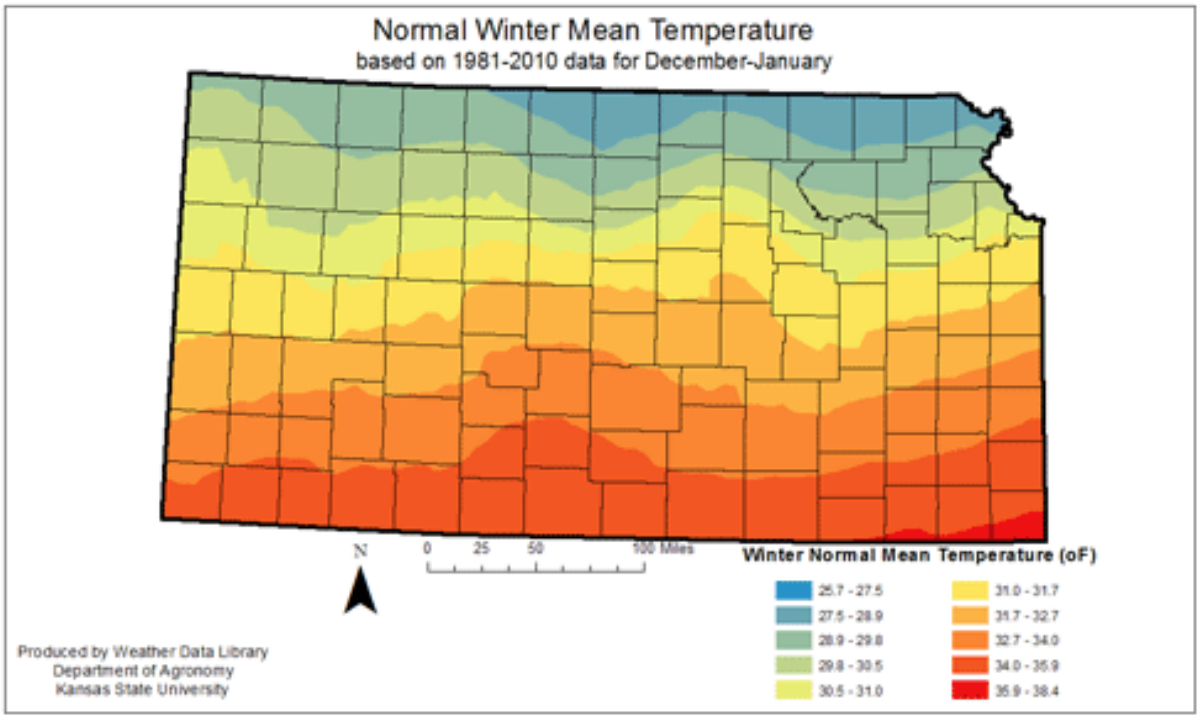

Figure 5. Normal winter mean temperatures for Kansas. Source: Weather Data Library.

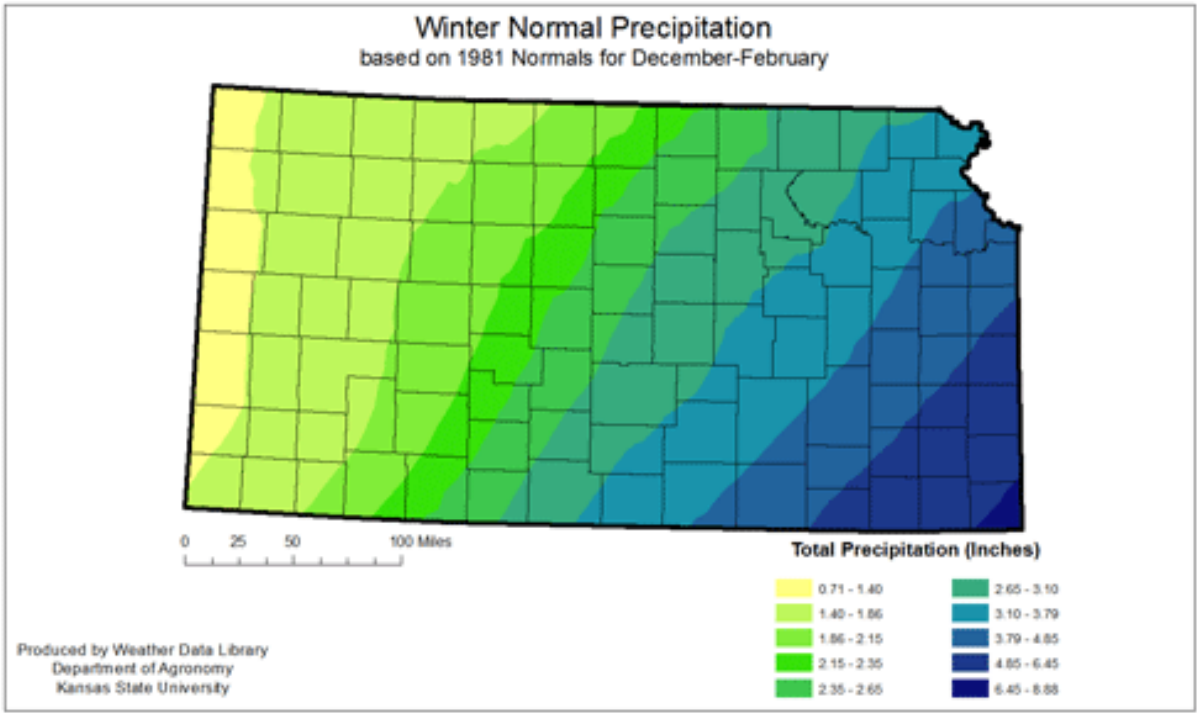

Figure 6. Normal winter precipitation for Kansas. Source: Weather Data Library.

Aside from the impact on fall-planted crops, such as wheat and canola, a big concern is how the

winter conditions set the stage for the spring fire season. Widespread killing frost occurred in mid-October, brought the end to the growing season, and introduced fine fuel availability. Large, above-average fuel loads were reported in southwest Kansas this growing season along with "surprisingly" high, but were actually around average, fuel loads in east despite a long period of drought.

With gradually increasing El Nino and coinciding negative North Atlantic Oscillation and positive Pacific/North American Oscillation, a favored storm track would take a majority of moisture south of Kansas. This would develop warmer-than-normal temperatures with slightly above-normal episodes of dry/windy conditions the next 30-60 days. Climate models trend persistence of this pattern into mid-late winter - through portions of February. With coinciding high fuel loads in southwest Kansas, this would begin to increase concerns for earlier than normal short duration large fire concerns in this region by mid-winter. This would especially be a concern should preceding dry conditions combine with lack of snow and result in the drying of heavier fuels and standing fine fuels.

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3. Save the date - 2019 K-State Corn Schools

The Department of Agronomy and K-State Research and Extension, in partnership with Kansas Corn, are planning to host three Corn Schools and three Pre-Plant Corn Schools in 2019. Please save the date for the location nearest you. Details on speakers and topics will be coming soon. Stay tuned to future eUpdates for more information!

Corn Schools

- **January 7 – Saline County**
- **January 9 – Thomas County**
- **January 11 – Douglas County**

Pre-Plant Corn Schools

- **February 11 – Labette County (Parsons)**
- **February 13 – Harvey County**
- **February 15 – Finney County**

Your input is requested to ensure the topics covered at these schools are the most pertinent to our Kansas producers. A short survey is available at this link: http://bit.ly/CornSchSurvey. The deadline to complete the survey is **October 31, 2018.**

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