

Grass-Cast: A New, Experimental Grassland Productivity Forecast for the Northern Great Plains

Every spring, ranchers face the same difficult challenge—trying to guess how much grass will be available for livestock to graze during the upcoming summer. An innovative new **Grassland Productivity Forecast** or “**Grass-Cast**” can help producers in the northern Great Plains reduce this economically important source of uncertainty.

This new *experimental* grassland forecast is the result of a collaboration between Colorado State University, U.S. Department of Agriculture (USDA), National Drought Mitigation Center, and the University of Arizona. Funding for this project was provided by the USDA Natural Resources Conservation Service (NRCS), USDA Agricultural Research Service (ARS), and the National Drought Mitigation Center.

Grass-Cast uses over 30 years of historical data on weather and vegetation growth—combined with seasonal precipitation forecasts—to predict if rangelands in individual counties are likely to produce above-normal, near-normal, or below-normal amounts of vegetation.

As with any forecast, Grass-Cast’s accuracy depends on how far into the future we try to look, according to ARS economist Dannele Peck, Director of the USDA Northern Plains Climate Hub. Its accuracy improves with time as the growing season unfolds, so it should be consulted more than just once during the growing season. Grass-Cast is updated every

two weeks to incorporate newly observed weather data and emerging trends in the forecast, such as the flash drought in the western Dakotas and eastern Montana in 2017.

Grass-Cast also provides a view of rangeland productivity in the broader region, to assist in larger-scale decision making—such as where grazing resources might be more plentiful if a rancher's own region is at risk of drought.

Grass-Cast provides ranchers and land managers with an indication of productivity in the upcoming growing season relative to their county's more than 30-year history. Ranchers and land managers should use this information in combination with their local knowledge of soils, plant communities, topography, and management to help with decision-making.

It should be noted that Grass-Cast cannot tell the difference between desirable forage species and undesirable species. So it is important for producers to know what proportion of a pasture is occupied by weeds, and how well those weeds respond to rain (or lack of rain) compared to the desirable species. Producers should monitor these different vegetation types to see if one is responding to the weather better than the other. Furthermore, Grass-Cast does not directly account for local management practices, such as grazing intensity in previous years. Producers should therefore adjust Grass-Cast's county-level productivity estimates accordingly.

Producers should not rely on Grass-Cast as a sole source for making management decisions. Similarly, public land managers should not use Grass-Cast as a sole source of information for setting stocking rates, determining turnout dates, or other aspects of lease agreements, allotments or permits.

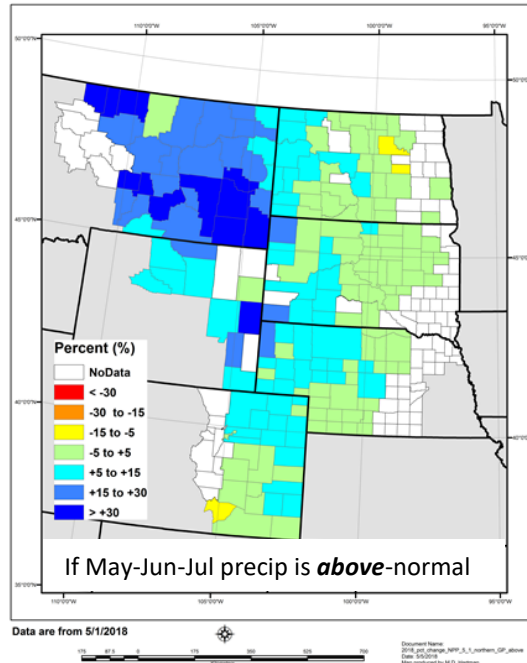
Watch for updates on the Grass-Cast [website](#), or the USDA Northern Plains Climate Hub's [website](#), or on [Twitter](#) (@PeckAgEc).

Project Contact: Dannele Peck, Director of the USDA Northern Plains Climate Hub, at dannele.peck@ars.usda.gov or 970-744-9043.

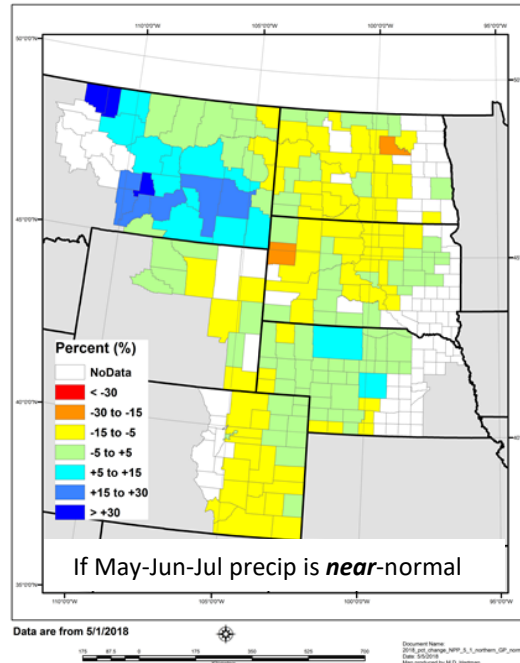
BELOW:

An example set of Grass-Cast maps, produced on May 1st for the summer of 2018, are shown below. The left map shows, for each county, how much vegetation is expected to grow (compared to the county's 34-year average) if precipitation in May-June-July (MJJ) is above-normal. A county in dark blue, for example, is expected to have 30% more pounds per acre than its average. A county in green is expected to have near-average (5% less or more) pounds per acre. The middle map shows how much vegetation is expected to grow if MJJ precipitation is near-normal. A county in yellow, for example, is expected to have 5% to 15% less vegetation than its average. The right map shows expected vegetation if MJJ precipitation is below-normal. A county in red, for example, is expected to have 30% less vegetation (or worse) than its average. For counties in white, no forecast is available due to insufficient data or weak statistical relationships.

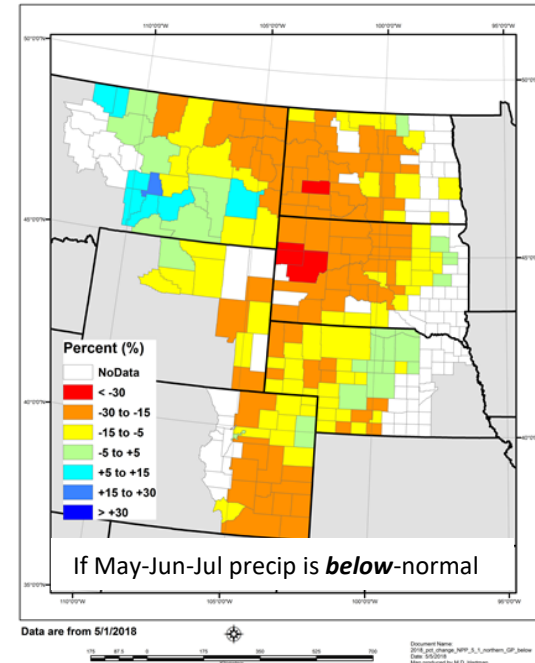
Percent Change in 2018 Predicted ANPP Compared to 1982-2017 Mean ANPP
Assuming Above Normal May-July Precipitation



Percent Change in 2018 Predicted ANPP Compared to 1982-2017 Mean ANPP
Assuming Normal May-July Precipitation



Percent Change in 2018 Predicted ANPP Compared to 1982-2017 Mean ANPP
Assuming Below Normal May-July Precipitation



Example Grassland Productivity Forecast (“Grass-Cast”) maps for summer 2018, produced on May 1, 2018 (see Grass-Cast website for the most up-to-date maps). These three maps show the forecasted percent change in grassland production compared to a county’s 34-year average. **Left map:** percent change in pounds per acre if precipitation in May-June-July of 2018 is **above**-normal. **Middle map:** percent change in production if MJJ precipitation is **near**-normal. **Right map:** percent change in production if MJJ precipitation is **below**-normal. As of late-April, 2018, NOAA Climate Prediction Center reported “equal chances” of MJJ precipitation being above, near, or below normal for the northern Great Plains (see Grass-Cast website for the most up-to-date chances).

For Example: Bowman County, North Dakota (most southwestern county in ND) is turquoise (left), green (middle), and orange (right). If May-Jun-Jul precipitation is above-normal (left), Bowman County rangelands are expected to have 5 to 15% more pounds per acre of vegetation than its 34-year average. If MJJ precipitation is near-normal (middle), Bowman County is expected to have near-normal production, anywhere from 5% less to 5% more than its 34-year average. If MJJ precipitation is below-normal (left), Bowman County is expected to have 15 to 30% less production than its 34-year average. For counties in white, Grass-Cast is not available due to insufficient data or weak statistical relationships.