In this tutorial you will learn how to interpret the three Grass-Cast maps.

Grass-Cast offers a forecast of how well grassland vegetation is expected to grow over the entire growing season, or how many pounds per acre you would expect to find if you went out and clipped it at its peak biomass. Grass-Cast combines almost 40 years of historical weather and vegetation clippings data with seasonal precipitation forecasts for the upcoming growing season. With Grass-Cast, users can zoom in on an area that's roughly 6 by 6 square miles in size to see if it is likely to produce higher, lower, or normal amounts of vegetation compared to its 38-year average.

Let's walk through an example using maps that were made on April 2, 2019. We want to find the possible scenarios for a grassland area in northeast Colorado, which happens to be where the Northern Plains Climate Hub calls home. This area is outlined in black on all three maps. The map on the left shows how many pounds per acre could be expected to grow compared to the area's 38-year historic average if precipitation totals are above normal from April through the end of August. Notice the medium-blue coloring in that area and look at the legend on the left-hand side. It tells us that, if precipitation in this area is above-normal for the rest of the growing season, you could expect 15 to 30% more pounds per acre than the area's 38-year average.

What if precipitation over the rest of the growing season is near-normal? Then look at the middle map, which shows the same location, near Nunn, Colorado, circled in black, but shaded a different color than it was in the previous map. Now the area is shaded green, which the legend tells us means that you could expect anywhere from 5% less to 5% more pounds per acre this season, or near-average amounts of grass.

Lastly, what if the spigot suddenly turns off and precipitation for this area is below-normal for the rest of the growing season? Then you would look at the map on the right. On this map, the Nunn, Colorado, area is shaded yellow, meaning that you would expect 5 to 15% less pounds per acre then the area's 38-year average.

Next, you should compare the Grass-Cast maps with another source of information to find out which scenario is most likely to occur—NOAA's three-month precipitation outlook. Using the same location and timeframe as we did with the Grass-Cast maps—northeast Colorado from April through August—NOAA's outlook is leaning towards having above-normal precipitation in this area. How strongly is it leaning? There is a 54% chance of above-normal precipitation, compared to a 33% chance that near-normal precipitation could occur, or a 13% chance for below-normal precipitation. Any of these three scenarios are possible, but at the time the Grass-Cast maps were made, NOAA was leaning towards above-normal precipitation.

NOAA's three-month precipitation outlook showed us there is a 54% percent chance that above-normal precipitation will fall in the Nunn, Colorado, area during the April through August timeframe. With that in mind, let's revisit the Grass-Cast maps and look closer at the above-normal map. This is the most likely scenario for the growing season, and it says—if the area really does get above-average precipitation from now through August—there should be 15 to

30% more pounds per acre than the area's long-term average. But remember that the second most-likely scenario is that precipitation will be near-normal. If this happens, then there should be 5% less to 5% more forage in the area, or close-to-average pounds per acre.

So, for the Nunn, Colorado, area, the Grass-Cast maps produced on April 2nd of 2019 suggested it could be a promising growing season. Of course, as rangeland managers or ranchers, you always want to be prepared for the worst-case scenario. In this case, it was a 13% chance of having 5% to 15% percent less forage than usual. There are a number of ways to get ready for below-average grassland production – for example, by being ready to wean calves early or to reduce your herd by up to 15% to match the 15% reduction in forage. If you are a cow-calf operation, one possibility would be identifying ahead of time the less-productive cows you should cull first. If you are a cow-calf-yearling operation, then you could be ready to sell some short-yearlings in the spring if needed. In a worst-case scenario, you could move the cows to croplands or a dry lot. Even if things are looking positive based on the Grass-Cast maps, you should always have a drought plan in place just in case the roll of the dice does reveal the worst-case scenario.

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