



## **Rangeland Analysis Platform to Assist Producers with Vegetation Management**

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As the summer monsoons wain and we begin the transition into the dormant season, it's time to sharpen the shears and begin measuring how much forage has been produced. Grass production is critical for planning stocking rates, preparing a grazing strategy (timing, intensity, duration), and possibly estimating extra feed needs. Any range manger will tell you that taking time to clip and weigh samples is tedious. No one likes to spend hours on their knees filling forage bags. As such, technologies have been developed to save producers time and money with monitoring.

Technology in general has been moving at breakneck speeds with rangeland management consistently trying to catch up. Some technologies, such as drones, are being implemented but are not practical for producers yet. One technology that has shown to be practical is the Rangeland Analysis Platform (RAP). It is a website-based application, developed by University of Montana, which uses satellite imagery to produce detailed reports of rangeland production and cover estimates. Every 16 days, RAP estimates aboveground biomass using a process-based computer-model that can be compared to historic averages dating back to 1986. Using the same time span and similar computer modeling, it also estimates vegetation cover using 98 foot (30 meter) satellite image resolution. This resolution is good for large landscape assessments but is limiting when applied to small, localized scales. Vegetation cover is then categorized into functional plant groups of annual forbs and grasses, perennial forbs and grasses, shrubs, trees, and bare ground. Being a computer model, it has limitation but gives a general idea of both current and historical rangeland conditions.

The Production Explorer in RAP is one of the most useful tools for rangeland management. Production summaries can be developed at large pasture to state levels, while the same summary reports can be download for personal or agency filing. The technology is fairly intuitive but takes some time to get used to. Overall, RAP can serve as a rapid rangeland conditions assessment method and save land managers time and money. However, it should always be compared to on-the-ground observations (ocular or clipped forage sample weights) when making management decisions.

To assist in navigating RAP, the rest of the article will be dedicated to using Production Explorer. There are other features that can be explored in RAP but Production Explorer will be the focus.

1. Open your browser and go to the websites homepage (<https://rangelands.app/>).

2. There will be three icons (RAP, Production Explorer, and Partner Tools) on the homepage. Click 'Launch Production Explorer'. A new window will open.
3. On the left side you will see 'Instructions' with two steps. Under 'Import data' there will be a dropdown menu (Select import method). For simplicity, select 'Draw a feature' (pre-drawn areas can be imported if made previously from a mapping program).
4. A map of the continental U.S. should appear in the right window. Zoom to the area of interest on the map. Use the icons on the left side of the map to zoom and draw. The pentagon icon (polygon) allows drawing borders around a specific area whereas the square icon only allows drawing of a rectangular border. If using the polygon draw tool click on the first point to finish drawing.
5. Go back to the 'Instructions' pane and select the date range you wish to compare by using the slider bar. You can also choose to include or exclude croplands, development, and water by selecting or deselecting the icon under 'Optional'.
6. After completing the 'Instructions', select 'Calculate Time-Series' under the map. This may take some time depending on internet speed. Be patient.
7. A 'Congratulations' pop-up should appear indicating that the time-series has been calculated. Close the pop-up and click on the top tab 'Current Year Production'. This will give you a report of the drawn area for the current year. There should be a site summary on the right with current year production and the long-term average for the date range you selected. In the middle should be a map of the area you drew and on the right are options to see different years and name the report. Once a land unit name has been entered a download option will appear. Below should be two graphical summaries. The first is an estimate of current production for each 16 day period over the year. The second is a cumulative production as the year progresses. You can also compare the summary year to different years by selecting the 'Add another year to plots' drop down menu.
8. Click on the top tab 'Historical Production' to see a historical production report. Similar to the current year production report you can see long-term averages, name the report, download, and see graphical representations of production. Additionally, a historical table is present that tabulates year, production, and present of average.
9. Finally, click on the top 'Stocking Rate' to calculate a stocking rate of the drawn area. Set your values and an estimation report will be produced with comparative information across the date range.

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