Assessing Forage Dynamics and Stocking Rates with the Rangeland Analysis Platform

Learning Objectives:

1. Navigate the RAP Production Explorer website.
2. Assess the impact of climate variability on forage production.
3. Calculate and justify a sustainable stocking rate based on satellite data.

Part 1: Site Selection and Data Retrieval

1. **Launch the Tool:** Go to the RAP Production Explorer (https://jornada-data.shinyapps.io/production-explorer/).
2. **Locate Your Study Area:** Use the map to zoom into a rangeland area of your choice.
    - Use the **"Draw Polygon"** tool to outline a pasture/rangeland (you need at least 750 acres for meaningful results).
3. **Define Your Baseline:** In the sidebar, set your **Long-term average period** (e.g., 2001–2020). This sets the benchmark for your analysis.
4. **Click**: “Calculate Time-Series”
5. **Navigate** to the **“Stocking Rate”** tab. What is the Land unit area (i.e., how big of an area did you select)? _____

Part 2: Analyzing Current vs. Historical Production

Navigate to the **"Current Year Production"** tab.

- Change the date on the right to 2025.
- Look at the **Current Year Production** chart. How does the 2025 biomass (lbs/acre) compare to the long-term average?

- Look at the **16-day production plot**: Did the peak of the growing season in 2025 shift earlier or later than normal? What does this result mean?

- Look at the slope leading up to the peak production. What does a steeper slope indicate? What does a more gradual slope indicate? (Hint: how does current year's weather influence production?) How does the slope for 2025 compare with the long term average?

- Change the date near the top right to "2026". What does the slope of the line indicate about production so far this year?

Navigate to the **"Historical Production"** tab.

- What is the long-term average production? _____
- Identify the lowest production year during the long-term average you chose.
    - *Year:* _____
    - *Production (lbs/acre):* _____
    - *Percent of Average:* _____%

- What might explain the highs and lows in historical production?

Part 3: The Stocking Rate

Navigate to the **"Stocking Rate"** tab. The RAP Production Explorer translates biomass into "Animal Unit Months" (AUMs).

1. Input the following:
    - **Average size of the animal:** 1,000lb cow = 1 standard AUE
    - **Number of days livestock will be grazing:** Pick a realistic number (30-365)
    - **Average intake that the animal consumes each day**: Set to **2.6%**
    - **Expected harvest efficiency:** Set to **25%** (this is a very conservative "take half, leave half" approach where only half is forage, and half of that is actually consumed).
    - **Adjustment factor for slope and distance to water:** click the “i" to see suggestions. Feel free to choose your setting. Try to be realistic based on the area you selected.
2. **Click “Calculate Stocking Rate”:** Look at the estimated **Production and Stocking Rate Summary** table for the years you chose.
    - What is the **Maximum** suggested stocking rate? _____
    - What is the **Minimum** suggested stocking rate? _____
3. Look at the **“Stocking Rate Time-series Plot”**:
    - What year had the highest suggested stocking rate? _____
    - What year had the lowest suggested stocking rate? _____

If you were the range manager, would you stock based on the Average production, the Minimum production, or something else? Why?

Part 4: Think About It

Describe how this tool might change the way a rancher would plan for a drought compared to traditional "boots on the ground" methods. What are advantages and disadvantages of using satellite data for management/stocking rate decisions?