INNOVATIONS

Tools in development leverage data for decision-making

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Noble Foundation consultants and researchers are identifying opportunities for sensors and drones to help meet producer goals.

What could your ranch be? How will data and information drive your decisions in the future? How will big data, algorithms, smart devices, sensors, unmanned aerial vehicles (UAVs) and any of the other techy buzzwords actually benefit your operations? All of this technology can be overwhelming at times, which makes it tempting to avoid. However, understanding the difference between useful and useless technology will become increasingly important for producers to differentiate themselves and maximize economic productivity into the future.

Grazing land management has always and will continue to be an art on some level. The most effective grazing land managers are in tune with the plant communities, weather and climate, as well as what this means for management solutions. This information is usually acquired over time with experience, but what about the new producers with little experience in an area or producers in new areas? What about the producer who is search-

ing for a way to compile data quickly and efficiently? These producers are at odds with success unless they can rapidly assess and act effectively.

Right now, the Noble Foundation is working to develop and incorporate new data-rich tools to help determine stocking rates and carrying capacities, and to support the development of grazing programs for producers in our consultation program. These tools will not take decision-making out of producers' hands; rather, it will provide them with consistent data and information to make effective decisions quicker. Timely decision-making is a

trait of the most successful producers. We should look to embrace technologies that encourage this.

These tools leverage large databases focused on soils, ecological sites and climate to provide baselines for understanding the production potential of a property or pasture. The soil and ecological data was developed for use on a landscape view. However, the information acquired from these databases is extremely important to give producers and consultants a frame of reference for the production potentials and ecological processes that are at play on the ▶

producer's property.

Producers will know their grazing land better than anyone or any database, and technology needs to utilize that input to provide maximum benefit. For example, something as simple as digging a hole can be a tool that can confirms the soil type for a pasture to adjust calculations for forage potential. Furthermore, producers understand current status of range. This information is vital for determining stocking rates, carrying capacities and strategies for grazing rotations. Knowing where they are will allow them to make management decisions to maximize the ecological and economical potential of their properties. Ultimately, this will help producers understand what their properties are relative to what they could be.

When thinking about a property's potential from a data perspective, it starts by understanding where boundaries and pastures exist. This information needs to be created and stored in a digital form in order to be useful; this information is collected through GPS or drawing on a digital map. The information provides the ability to cut information from databases specific to each pasture or property, and. This information gives consistent baseline information for thinking about a property and what it could be.

Looking at information even further on a pasture level, we can determine the utility of pastures for grazing. Elevation and contour data tell us information about grazeability of each pasture. Combining this information with plant community data, road area, energy production sites and/or any other areas that are not grazeable or will not be grazed, will give producers the total grazeable acres in each pasture. Forage production estimates and grazeable acres will help producers and consultants frame an idea of carrying capacity.
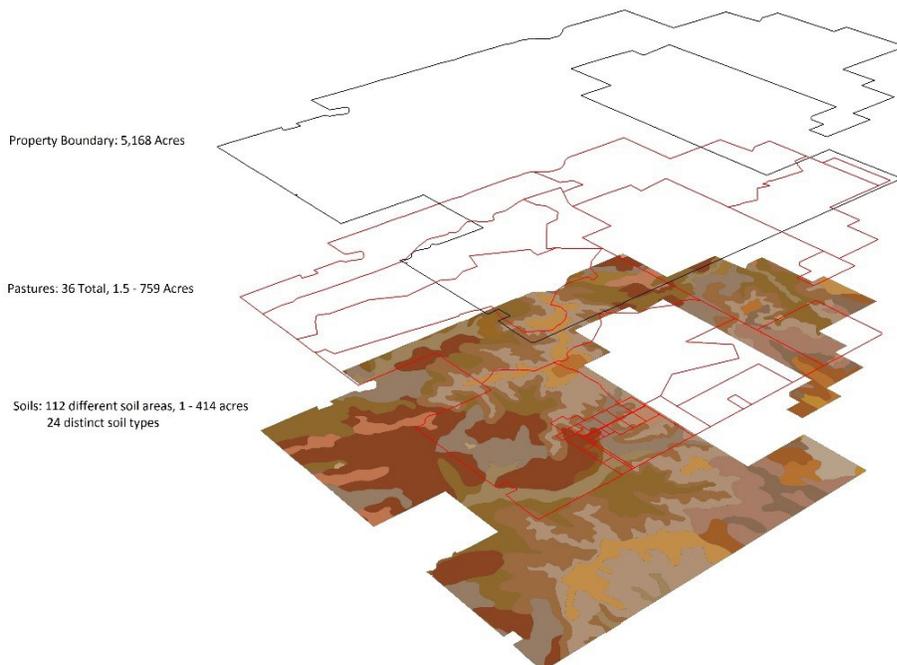
Together, information about boundaries, pastures and soils provides producers with a sense of production potential.
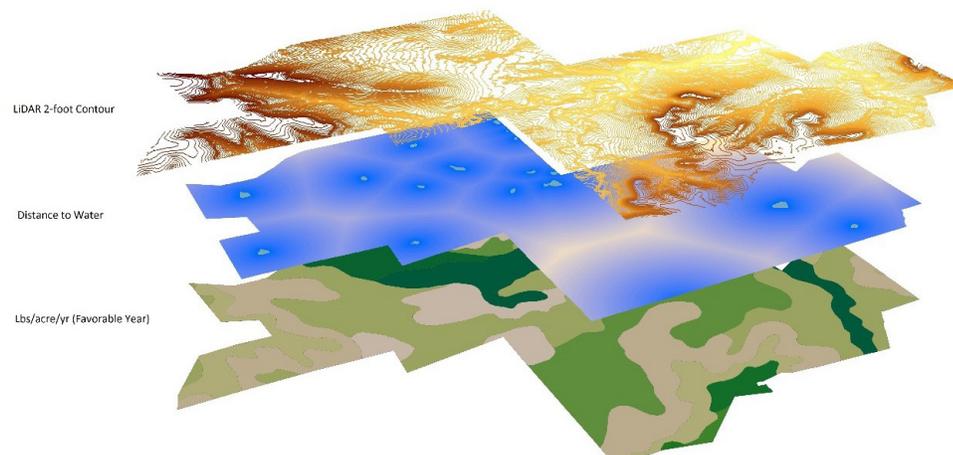
Elevation, distance to water, and pounds/acre/year production provide insight into true grazeable locations in pastures, depending on weather and time of year.

Distance to surface water helps us understand pasture utilization and improve grazing distribution. Utilizing this information will allow a producer to make management decisions to ensure the health of the grazing land is maintained or improved.

Historically, extracting data by location has been difficult as it requires expert knowledge, extensive software and specific training. However, new technologies make these tasks easier to repeat. User interfaces provide opportunities for this data to be created, visualized, and interpreted like never before by novice and expert users alike. When you include data from sensor grids like the Oklahoma Mesonet, imagery collected at higher frequency and clarity, and LiDAR, the possibilities for agricultural benefit become extremely exciting. ■