

## Drones are Migrating into Prairie Grassland Research Projects

by Tara Mulhern Davidson

Drones have become a hot ticket item in the past few years for recreation, agriculture, and filmmaking. Producers are using unmanned aerial vehicles (UAVs), or drones, to understand more about plant growth or even to count cattle, because they can see what people on the ground cannot. Leila Benmerrouche from Saskatchewan Polytechnic recently explained the applications of UAV technology for natural resource management during a PCAP Speaker Series webinar.

UAVs have the potential to determine ecosystem health and identify areas of concern for rangeland, such as the spread of invasive weeds or fire recovery. Drones also have the potential to be used to understand grazing patterns and quantify wildlife and species at risk habitat. "Traditional satellite images can be quite spotty," said Benmerrouche, whereas UAVs can effectively collect dense images in real time, providing the user with very tangible results. "You can go out and collect data the day you need to collect data, and the images are very high resolution," she added.

### The Right Tool for the Right Job

There is a wide range of UAVs on the market right now, and Saskatchewan

Polytechnic currently has a fleet of four different vehicles. "This allows us to complete a multitude of different projects," Benmerrouche described, such as forestry, wetland or grassland work. "Different crafts all have a different niche when it comes to natural resources." Cost, ease of use, ability to operate in different weather conditions, and fixed wing versus helicopter-style design, all factor into the type of work to which the UAV is suited. For example, a fixed wing UAV requires a clear area for take-off and landing and, therefore, is not well-suited to forest ecosystem research.

Drones can be equipped with different types of sensors and cameras depending on the goals of the user. RGB colour sensors collect images in visible light, which means the photos appear similar to how they are viewed by the human eye. These types of sensors are useful for mapping forests and different habitat types. "There are also sensors that operate on the infrared spectrum, and see things that our eyes cannot," said Benmerrouche. Both Near Infrared (NIR) and thermal sensors are useful for detecting wildlife

movement, canopy cover, range management and vegetation indices, or other complex layers.

Yet another sensor, the multispectral sensor, or MSS, combines both visible and infrared technology, which means you can capture even more information with a single sensor. "With all these sensors, we have a huge capability to document almost any type of natural habitat," Benmerrouche explained.

Everything has limitations, however, and Benmerrouche explained that drones weighing less than 25 kg are currently limited in the area they can scan compared to traditional satellite imagery which collects data for larger areas. It was also noted that tilting has caused some discrepancies in data comparisons, and mentioned that some animals, such as birds and bison, do not always react favourably to flying objects.

In addition, individuals or organizations interested in using UAVs for research, business, or fun, need to ensure they meet Transport Canada's regulations. Depending on the size and weight of the UAV, location and purpose of use, different regulations apply.

# Stewardship

## Current Applications

Saskatchewan Polytechnic is collaborating with the University of Saskatchewan on an ongoing prairie project at Nature Conservancy of Canada's Old Man on His Back heritage site in southwest Saskatchewan, near Claydon. "It's a fantastic project, really bringing a lot of groups together," she said. They are assessing grazing patterns of cattle and bison, and that information will be of interest to ranchers in the area as well, she added. The project is incorporating existing vegetation points from the university. "With this information, we are able to tell the computer this is the vegetation that's here, now let us know what else is in this entire area," Benmerrouche explained.

Saskatchewan Polytechnic is also working with the Redberry Lake Biosphere Reserve,

near Hafford, Saskatchewan, on a riparian and habitat stewardship project. "We are looking at how well our sensors can pick up riparian health," she said, by comparing UAV images with known riparian health information to verify accuracy. Their collaboration also includes species at risk mapping, and they are also creating maps for other research projects in the area.

Invasive species management is yet another opportunity for drone technology. A recent project was initiated by a Saskatchewan Polytechnic student who looked at existing locations of European buckthorn, the invasive shrub, in Wanuskewin Heritage Park. By developing mosaic images of the infestations, the student predicted areas where the buckthorn could occur. This particular project was unique because they needed to notify the Saskatoon

Airport Tower prior to flying in such close proximity to their space.

UAVs are also seeing use in crime scene analysis and for conservation law as well. A drone was effectively used to implicate a poacher recently during an incident where a moose cow and calf had been illegally shot near Alvena, Saskatchewan.

"Since UAVs have become more streamlined, and more mainstream too, they have become much more cost effective," said Benmerrouche, adding that it will be interesting to see how far the technology goes. 🇩🇪

\*See more of this PCAP presentation: [https://youtube/AtFlgaNg\\_oc](https://youtube/AtFlgaNg_oc)

## Association News, Reports, and Events

### Frank Linthicum Inducted into CWA Hall of Fame

The Linthicum family attended the posthumous induction of Frank Linthicum into the Canadian Western Agribition (CWA) Hall of Fame. The presentation was made at the CWA's Volunteer Appreciation Night on April 5 in Regina. The Hall of Fame recognizes those deserving for their outstanding contribution to the success of CWA. Born in Rockglen, Sask., the late Malcolm (Frank) Linthicum began ranching full-time south of Glentworth in the 1940s. Over the years, Frank was very involved in showing commercial cattle and volunteering for over 40 years for CWA and its committees until he stepped away in 2010. 🇩🇪

