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## Successfully Speculating on LiDAR

Imagine this business proposition: Acquire an 800,000-square-kilometer LiDAR survey purely on spec. Most aerial survey companies probably would move on to other new business ideas, but not North West Geomatics ([www.nwgeo.com](http://www.nwgeo.com)). The Calgary-based aerial photography and remote sensing company already has begun such a campaign for western Canada—the largest privately funded LiDAR survey project in North America.

The acquisition campaign will collect high-accuracy LiDAR data of nearly 800,000 square kilometers of remote, rugged terrain from northwest Alberta to northeast British Columbia. How is this financially feasible? Through ingenuity, foresight and, most importantly, enabling LiDAR technology from Leica Geosystems ([www.leica-geosystems.com](http://www.leica-geosystems.com)).

"Our past LiDAR acquisition campaigns have focused on smaller regional operations, but it became clear the market demanded a much larger-scale program that addressed high-accuracy and coverage requirements in a more complete manner," said John Welter, North West Geomatics' vice president of technology. "We wanted to answer that need, so we sought a solution that would enable us to collect as cost effectively as possible a high-quality, uniform dataset of the entire project area as quickly as possible. Leica's ALS50-II LiDAR sensor, with its Multiple Pulses in Air (MPiA) technology, rendered this massive project financially and technically feasible."

### Day and Night Sensing

In addition to resolving the project's technological and economic challenges, North West Geomatics had to devise strategies to triumph over challenging terrain and complex logistical issues—some areas are so remote that fuel for the aircrafts has to be trucked in.

Focusing on active oil and gas regions first, crews began the program in April 2007. Multiple crews fly three aircraft, each equipped with a Leica ALS50-II MPiA sensor, in nearly round-the-clock shifts, depending on weather conditions. To avoid the need for dedicated surveyors on site, North West Geomatics teams set up seven remote Global Positioning System (GPS) base stations equipped with large memory cards and powered them with car batteries, giving them up to a week of autonomous base station operation and ensuring data redundancy in case one station was knocked over by wildlife.

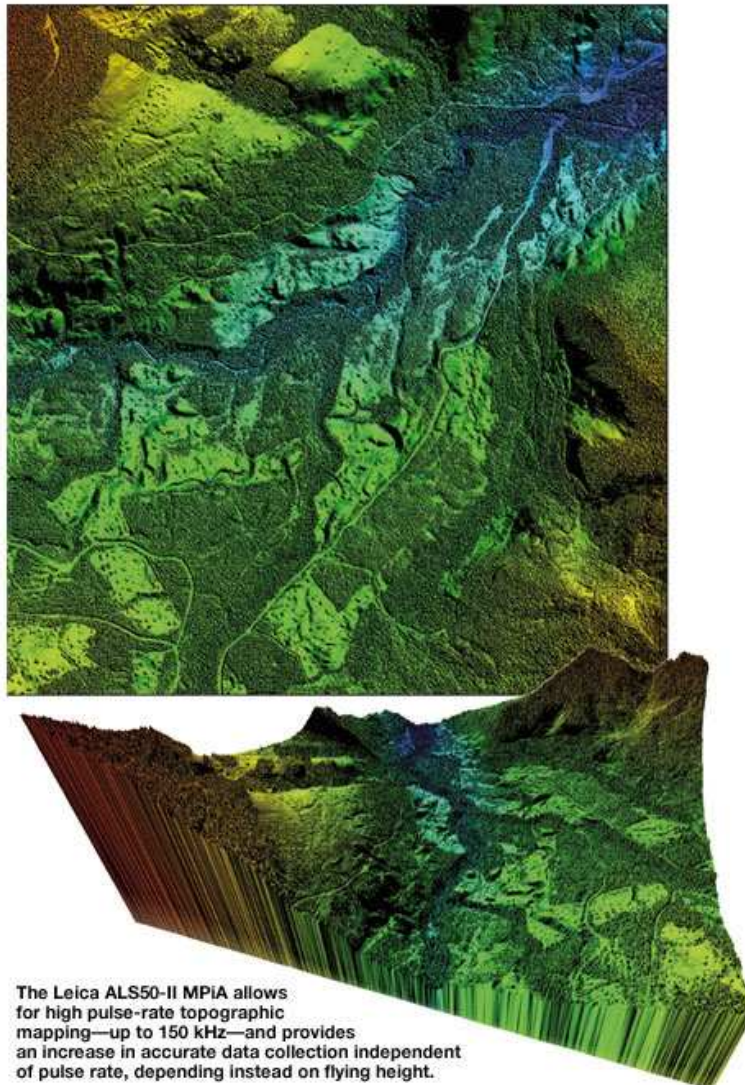
After 835 hours in the air, by mid-November, when the acquisition campaign had to end because of snowfall, teams had collected about 325,000 square kilometers of land at a data point density of one point per square meter, with virtually no down time due to sensor

failures. That imaging consistency, according to Welter, enabled them to acquire a much denser dataset more efficiently.

"Leica's MPiA technology provides double the number of measurements on the ground," he explained. "Without multipulse, we could achieve about a 50 to 60 kilohertz data-acquisition rate. With multipulse, we can double that rate to 120 kilohertz. With a higher and more efficient rate of collection, we can increase our flying speed and increase the coverage per flight line, enabling us to reduce our flight time by 50 percent and to reduce our acquisition costs."

North West Geomatics plans to return to the LiDAR project next April to collect the remaining 475,000 square kilometers. In the meantime, clients already are purchasing imagery from the first campaign through North West Geomatics' subsidiary, Valtus Imagery Services ([www.valtus.com](http://www.valtus.com)). Through the Valtus online portal and distribution service, users can choose an area of interest and their preferred data file format, and the system automatically prepares and delivers the data to the customer's desktop.

According to Welter, it's the first time LiDAR imagery is being delivered electronically.



## **Remote Intelligence**

Though there's still a wide swath of land to cover, clients such as those in the oil and gas sector can already benefit from the dense, unified LiDAR imagery available online.

"The LiDAR data will greatly help clients pre-planning operations," said Welter. "Now when planning exploration missions, they can readily download the LiDAR survey of their area of interest and perform a virtual survey from their desktop to determine how accessible the area is, assess the environmental impact of new construction and see if it's a viable position for new infrastructure. In short, they can use the LiDAR to plan the least invasive approach."

Welter is confident the benefits of this ambitious flying campaign will far outweigh North West Geomatics' internal investment. On "spec," most would agree, that's good business.