

The Bakken from the eyes of the Matrix in the sky

One of the cool things about the Bakken is the new technology and innovations. It's really a backyard inventor's paradise. Much like the Oscars or some awards ceremony, there are so many peo-



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ple and products to mention, but one I'd like to highlight one that is pretty neat. It's called LiDAR (Light Detection and Ranging) and has been being used in the region for quite some time.

The annual eastern floods were the motivation for bringing LiDAR to the area. More specifically, the 1997 Flood was the incident that got the Army Corps of Engineers and other agencies involved.

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— Terry Keeton of KBM, Inc.

Through my media work over the years, covering floods in Fargo, Moorhead, Grand Forks, Minot and Bismarck, I have gotten familiar with LiDAR and its importance with water management, but not how it plays in oil and gas. So I sat down with Terry Keeton of KBM, Inc., Grand Forks, to talk about LiDAR and how it is being used in the oil and gas world.

First, a little more on LiDAR. According to the Louisiana State University CADGIS Research Laboratory, "LiDAR

stands for Light Detection and Ranging. It uses the same principle as RADAR except that it uses a laser instead of radio waves. One of the principle uses for LiDAR is for the measurement of elevation."

OK great. Now what does all that mean. Keeton?

"It's a laser return that hits the ground and bounces back up to the aircraft and is recorded horizontally and vertically," Keeton said. "What it's doing is scanning the ground like a scanner or a photocopy machine."

Keeton transitioned into more technical talk with the number of points per meter on the ground ranging from 4 to 34. These focus points create a "point cloud" which allows for an image or visual to appear.

"It'll cut through tree canopy," Keeton said. "A good way to describe LiDAR and how it would look in trees is if you can look up and see the sky, the LiDAR can see the ground."

After hearing his dumbed down explanation of LiDAR, I sunk the analogy to a new low when I compared it to a "pretty cool advanced fish finder."

"Ah, it's a lot more advanced," Keeton paused and chuckled. "And a lot more expensive than a fish finder."

Keeton elaborated further on the laser returns and how often the light will bounce around.

"You'll get four to five returns," Keeton said. "The first return is usually the ground. Then the trees, the buildings, rocks. There's some work that occurs in cleaning all that data up."

That clean up work is called "classification," according to Keeton. That allows a filing system to be installed and customized to the project.

"You can classify building structures and bring them out in 3-D," Keeton said. "Trees, the vegetation's high and lows, power poles, even the sag in lines."

Keeton transitioned enthusiastically from his string of examples to another

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gizmodic feature — heat sensory. The power poles with the sagging lines must have triggered his transition thought because he claims it can tell you the temperature degree inside the power lines. Think this technology is useful in the land of flaring?

"We got into LiDAR heavy last year," Keeton said. "The utility corridors use it a lot now because it cuts some time out in conventionally mapping when you have the LiDAR you include the topographic information. It cuts a lot of time out and is being used regularly now."

Last year, Keeton and KBM flew LiDAR over the entire city of Dickinson. According to Keeton, the LiDAR information will help the city deal with water drainage issues and investigate future concerns.

The company, KBM Inc, has been operating for approximately 60 years within the industries of civil & electrical engineering, aerial photography, photogrammetric mapping and geographic information systems (GIS). Their portfolio is vast with experience as well. Everything from federal and state governments to municipal utilities to mining companies, and energy utility companies. Even though the company is located near the center of continent, KBM has done business in northern Canada, U.S. Virgin Islands, Montana and Indiana.

Keeton moved to North Dakota three years ago from Texas. His understanding

of topography and the oil culture has not only created successes in the Bakken, but keeps him connected to his friends and colleagues in Texas.

"Actually we are now doing some flying in Texas with our aircrafts during the winter months," Keeton said. "When the snow hits the ground in the Bakken we are grounded and they started fracking last year in Texas so we looked at our options."

Keeton continued saying one obstacle with LiDAR-type technologies is snow. Yet another element of winter that can slow down the oil and gas machine. Keeton added their Grand Forks-based company has a few other cameras and sensory software on their aircrafts so the Texas market has other potentials for growth.

Keeton said he hasn't heard much about the other Texas plays like the Permian or the Wolf Camp, but acknowledges it may be because of his location.

"Up here all you here about is the Bakken," Keeton said. "You hear a little every now and again about the south Texas region because they are fracking there now, but for some reason you don't hear it as much as North Dakota."

According to Keeton he does see some parallels with the economic trends from that past five years in North Dakota and the Lone Star state.

"It's starting to come back," Keeton said. "You can start to see the economy down there (south Texas) pick up."

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