

Sand Hill River Watershed District enters contract for LiDAR data

Three year, \$65,000 contract approved with RRV Watershed Board

On August 3, the Sand Hill River Watershed District approved a contract with the Red River Watershed Management Board to acquire Light Detecting and Ranging (LiDAR) data and develop LiDAR derived products for the Sand Hill River Watershed District.

The Red River Watershed Management Board will facilitate collection with the LiDAR vendor and the International Water Institute of the entire 480.3 square miles within the Sand Hill River Watershed District's jurisdiction.

LiDAR system

According to the United States Geological Survey, LiDAR is used to create high-resolution models of the earth's surface using quality level 1 (QL1) LiDAR data that results in a vertical accuracy of roughly four inches.

The LiDAR system, which includes a laser scanner, a global positioning system, and an inertial navigation system, is typically mounted on a small aircraft.

The laser scanner transmits brief pulses of light to the ground surface. Light pulses reflect or are scattered back and their travel time is used to calculate the distance between the airborne laser scanner and the ground.

LiDAR contract

The contract includes a total payment of \$64,840.50 corresponding to a price of \$135 per square mile.

The pricing includes data hosting and dissemination (using the selected vendor's web platform) for a period of three years.

The Sand Hill River Watershed District will have a perpetual, nonexclusive

license to hold, use and distribute the LiDAR data and derived products.

The Red River Watershed Management Board asserts no ownership in any such derivative works.

This opportunity to acquire LiDAR data is at a considerable cost savings when compared to state or federal procurement processes.

A recent Minnesota State Agency-led effort to similar (QL1) LiDAR data in Northeast Minnesota cost about \$400 per square mile

The LiDAR vendor will provide raw DEM's (1,000 x 1,000-meter tiles).

The International Water Institute will mosaic the DEM tiles together to create a continuous surface for the Sand Hill River Watershed.

"Improved accuracy"

"Technology advancements highlight improved accuracy and added data layers," said Stuart Christian of Erskine. He is the chairman of the Sand Hill River Watershed Board of Directors.

"Hydrological modeling is based from LiDAR. From an administrative and engineering stand point, preliminary findings from LiDAR facilitate technical logistics as a basis for small- and large-scale projects – state, federal and international included," Christian said.

The expected delivery date of the LiDAR data is the fall of 2022 with the additional derived products (e.g. 1 – foot elevation contours) by the spring of 2023.

LiDAR data uses

"The watershed regularly uses LiDAR data to address resource management issues in the district," said April Swenby of Fertile. She is the administrator of the Sand Hill River Watershed District.

"The current LiDAR data was collected in 2009 and needs updating. The District uses this data extensively to deliver services to our landowners," Swenby said.

"For example, we can quickly and accurately determine the area draining to culverts which helps us understand the volume of water potentially delivered during a given rain event," Swenby said.

The current LiDAR data products for the Sand Hill River Watershed District can be found here <https://gisapps.iwinst.org/map-portal/> and is accessible to the public.

Watching water

"LiDAR data are used to understand water movement and effectively manage water resources," said Chuck Fritz of Fargo, N.D. He is the executive director of the International Water Institute.

He said common applications include flood mitigation/protection/forecasting, understanding where and why water pools on farm fields, exploring potential upstream/downstream impacts – and benefits – of drainage (e.g. tiling) strategies and culvert sizing.

Fritz led the first data collection and he is now leading the second.

The IWI will update these products once the project is completed.