



Celebrating excellence in the field of geomatics in Canada



THE DAVID THOMPSON NATIONAL GEOMATICS AWARDS

Why National Awards?

1. Promote excellence in Geomatics
2. Promote unique cadastral and non cadastral applications
3. Raise public awareness of Geomatics

Deadline for submission: March 1st, 2024.

There were 3 submissions for non cadastral and 4 submissions for cadastral.

Candidates this year consisted of:

- Chris de Haan, Underhill
- Dan Boyle, Underhill
- Arthur Cooke, Underhill
- Andrew Healy, Measurement Sciences Inc.
- Kent Watson, Underhill
- Michael A Thompson, GeoVerra
- Veronica Meister, Exton & Dodge Land Surveying Inc.

THE 2024 DAVID THOMPSON AWARD FOR CHALLENGING NON CADASTRAL SURVEY PROJECT WAS GRANTED TO ANDREW HEALY, MEASUREMENT SCIENCE INC., CONGRATULATIONS ANDREW!

KHCP4 HIGH DENSITY LIDAR SLOPE MONITORING

Located east of Golden, BC, the Kicking Horse Canyon stands out as one of the most rugged and picturesque stretches along the Trans-Canada Highway. Initiated in early 2021, the fourth and final phase of major construction endeavors to cover the final 4.8 kilometers of the canyon. This ambitious project aims to enhance safety by upgrading the highway through its most challenging segments. Plans include realigning thirteen curves, widening the highway to four lanes, installing median barriers and expanding shoulders to accommodate cyclists. Additionally, measures to mitigate hazards such as rock falls and avalanches will be implemented through the construction of bridges and rock catchment ditches.

Measurement Sciences Inc (MSI) was engaged to conduct weekly aerial LiDAR and photogrammetry services for slope monitoring from March 2021 to November 2023. The objective was to monitor the rock formations both upslope and downslope within the construction zone, aiming to promptly identify any movements that could pose risks to the construction activities or the adjacent downslope railroad. Given the high-risk nature of the area, the delivery turnaround time was set at less than 24 hours from data collection. With a six-hour mobilization for each epoch, establishing efficient flight plans, workflows, and processes to efficiently analyze and deliver observed changes was critical.

Over the span of three years, a total of 112 independent flights were conducted and full deliverables processed by MSI. To effectively manage the substantial volume of data, MSI developed a comprehensive GIS web database to centralize all data and deliverables. Each weekly deliverable encompassed the following specifications and had to be met within the



designated deadline:

- 100 points per m2 bare earth LiDAR (surfaced and uploaded to GIS).
- Vertical Root Mean Square Error (RMSE) of 5 cm, which averaged 3.8 cm across the 112 epochs.
- epochs.
- Horizontal accuracy of 15 cm, with an average deviation of 11.5 cm over the 112 epochs.
- Orthophoto with a resolution of 10 cm, typically delivered at 4-6 cm resolution
- depending on elevation.
- Interactive change detection layer showing any differences within +/- 10 cm between
- epochs.
- Detailed report containing flight metadata, control report, and details of any detected changes.



To accomplish the above, a LiDAR sensor was mounted to a helicopter that terrain followed through the mountains to maintain a consistent point density and accuracy. Data processing commenced as soon as the mission finished, in a mobile office vehicle, and proceeded through the night of each epoch for data delivery the following morning. With active construction, control was constantly updated to maintain quality throughout all epochs. From the initial scope, the area of interest tripled after stakeholders were able to see how this data could be leveraged and utilized throughout the lifespan of the project.

THE 2024 DAVID THOMPSON AWARD FOR CHALLENGING CADASTRAL SURVEY PROJECT WAS GRANTED TO MICHEAL A. THOMPSON, GEOVERRA, CONGRATULATIONS MICHAEL!

Survey of the Exterior Boundaries of Blood Indian Reserve No. 148 – Alberta

A portion of the exterior boundary of Blood Indian Reserve No. 148 is defined by the St. Mary River. The river course has been significantly altered by flood events, upstream dam construction, and ammonite mining operations. A significant area of the Reserve currently lies across the St. Mary River from the remainder due to avulsive events. The survey involved research of flood records dating back to the early 1900's and aerial photography dating back to 1922. The Reserve boundary location was determined through matching flooding events and mining activities to photographic records. The boundary is a combination of the present ordinary high-water mark, thalweg of dry channels, former riverbank determined from photographs and ground conditions, and lines of excavation from ammonite mining.



The plan of survey prepared for registration in the CLSR is a multi-layered PDF that allows the user to apply multiple orthophoto backgrounds, depicting the change in the river course and landscape over time. This version of the plan was not registered due to ongoing uncertainty of the application of *ad medium filum aquae* to the boundary. A plan of field notes for the project is registered as Plan 110685CLSR, and a survey report is registered as FB43695CLSR.