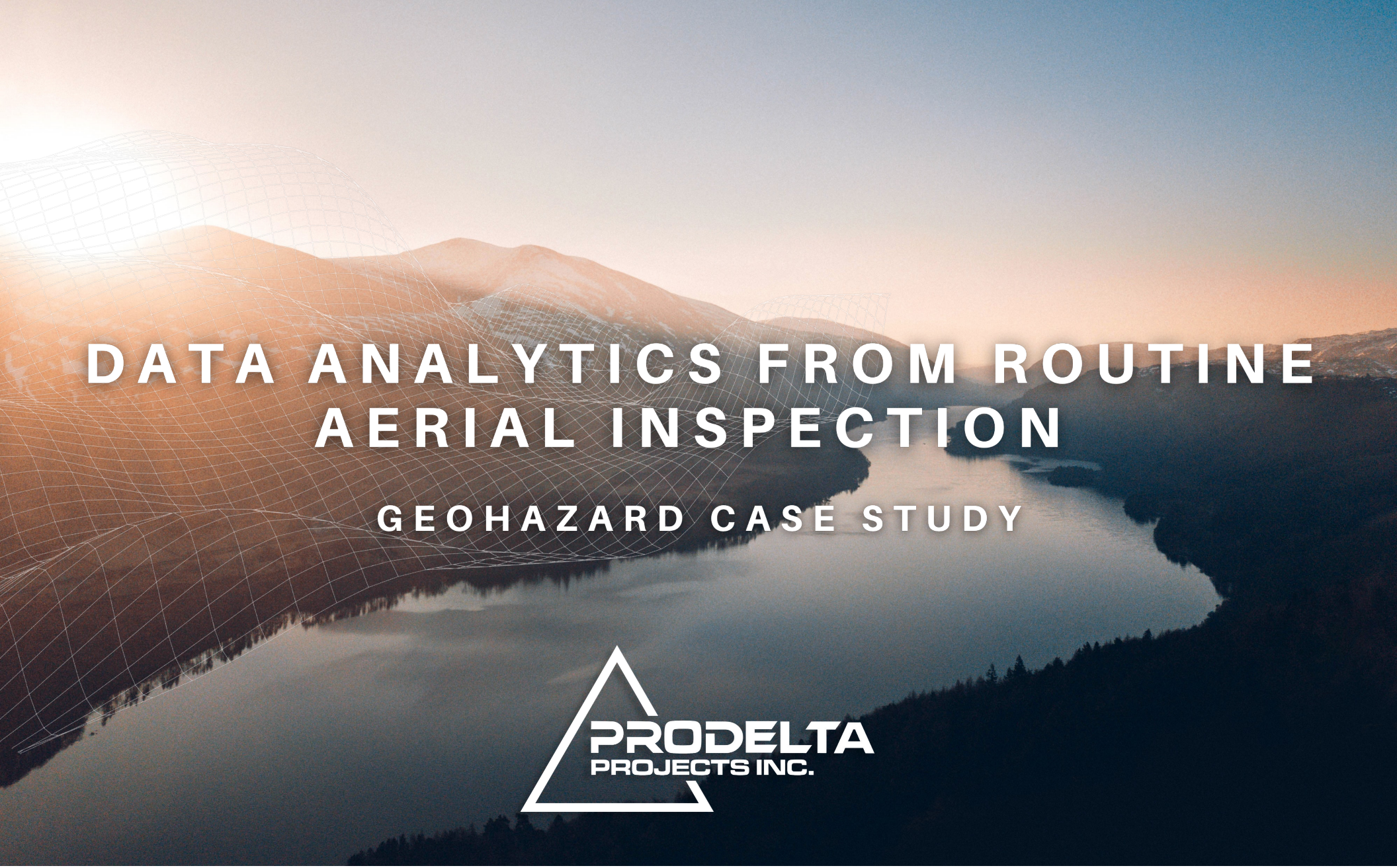


DATA ANALYTICS FROM ROUTINE AERIAL INSPECTION

GEOHAZARD CASE STUDY

PRODELTA
PROJECTS INC.

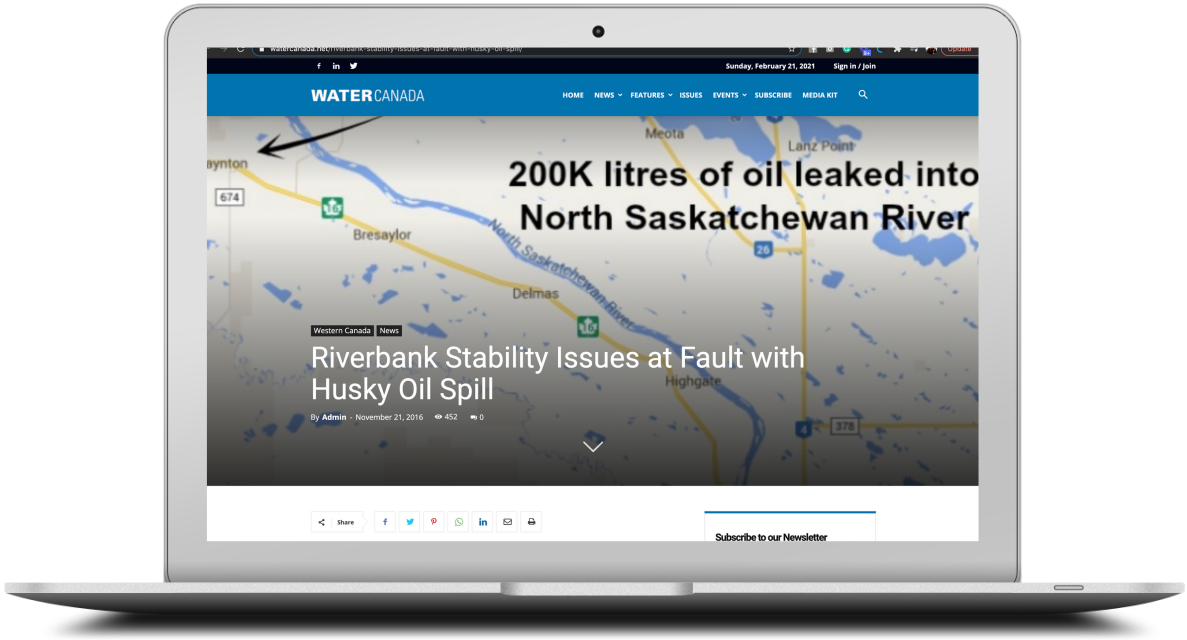
PRODELTA.CA

TABLE OF CONTENTS

THE PROBLEM

Geohazards impose a significant threat to oil companies across the globe. These unstable sites can expose pipelines, leak, spill, or cause explosions. Not only are these hazards detrimental to the environment, the implications for the companies include insurance increases, production losses and clean-up costs.

An unfortunate example of the impact of such a geohazard failure is a report released in 2016 by Husky Oil that would suggest the cause of a pipeline leak that spilled 90,000 litres of crude oil into the North Saskatchewan River was related to slope instability and ground movement due to heavy rain.



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THE OLD WAY

HIGH COST LiDAR

The process to resolve hazards used to look like this:

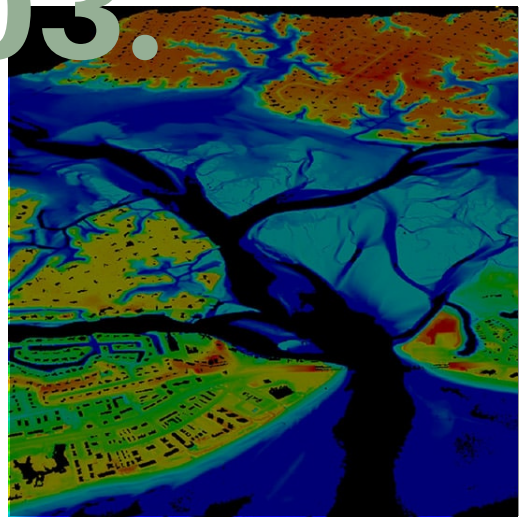
01.

Aerial inspections conducted via helicopter to visually identify an area as a low, medium or high risk hazard. Many low-risk hazards go unnoticed until they become medium to high risk.

02.

An engineering firm is hired to survey, rate and confirm risk level.

03.



Conduct a secondary helicopter flight using LiDAR to obtain accurate geo data on the site.

OUR SOLUTION

IDENTIFYING RISK WITH ROUTINE INSPECTIONS

01.

By using integrated photogrammetry sensor data into routine aerial patrols , we reduce the cost while improving efficiency

02.

Collect imaging during the inspection process and use photogrammetry and point cloud comparisons to identity elevations and help classify risk

03.

Analyze elevation data and compare against risk matrix for client-specific sites and identify highest risk sites with our client.

04.

Prioritize labour assets for detailed land analysis and measurement, design revetment strategy, and execute

*With the entry point of LiDAR being 1.2 Million USD and typical data collection and processing at $1000-1200/km, our **Start to Finish Closure**™ system, we integrate photogrammetry sensors into routine patrols with advanced analytics which optimizes and prioritizes geohazard risks for a fraction of the cost.*

ANALTYICS EXAMPLE

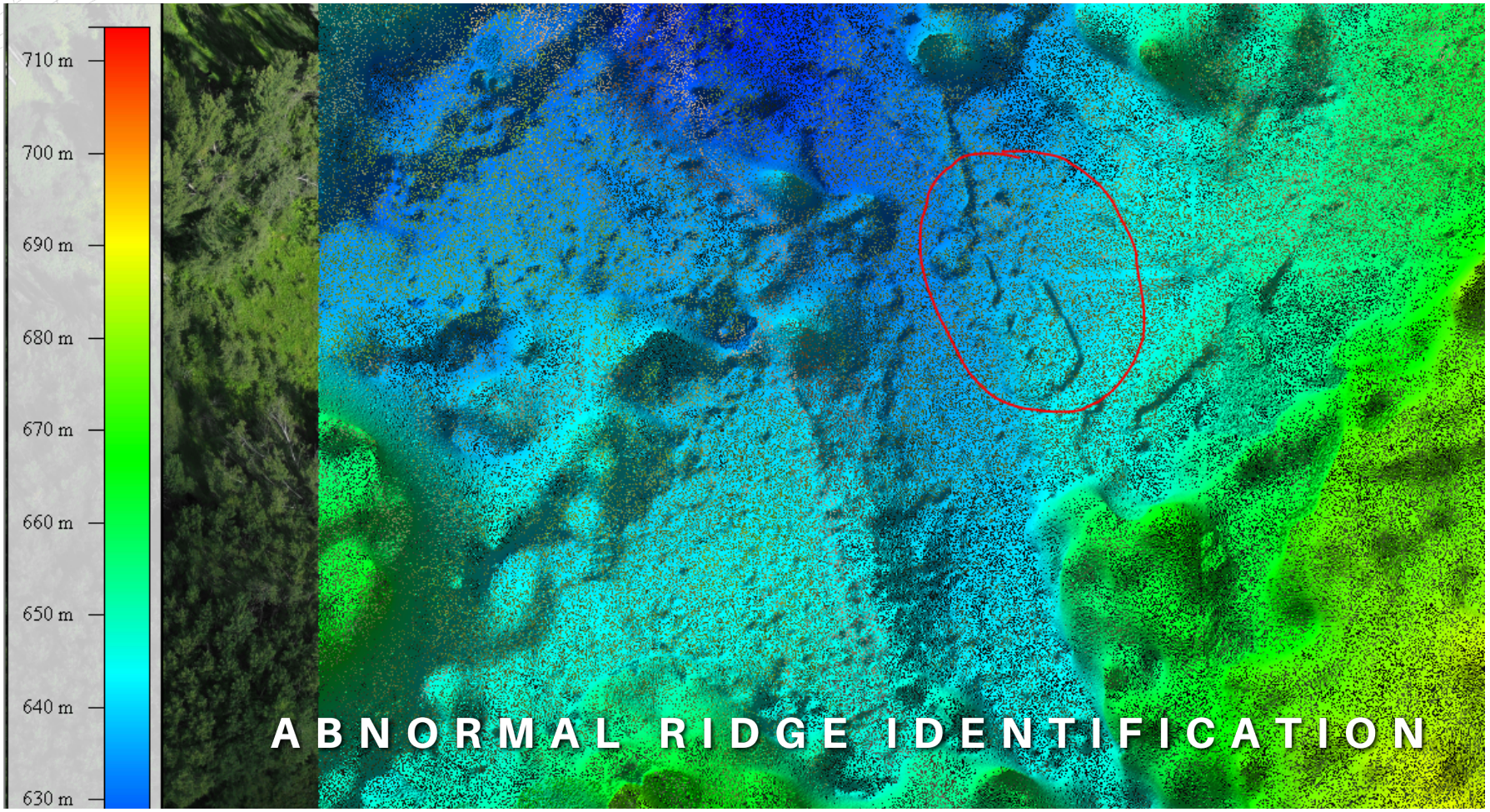
CREEK SLOPE MONITORING

AS MARKED BY RED DOTTED LINES

AS MARKED BY YELLOW DOTTED LINES

HIGH WATER IDENTIFICATION

AS MARKED BY PINK LINES



AS MARKED BY RED CIRCLE

SUMMARY

ALTHOUGH THERE ARE LIMITATIONS WITH PHOTOGRAMMETRY, HAVING A SENSOR INTEGRATED INTO A ROUTINE PIPELINE INSPECTION WITH ADDITIONAL ANALYTICS CAN BE A COST EFFECTIVE SOLUTION TO GEOHAZARD MANAGEMENT