



Idaho State
University

IDAHO
GEOLOGICAL SURVEY

Geohazard assessment of mass movements along railroad corridors with UAV LiDAR

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Train derailments along river corridors in Northern Idaho, USA.



The Spokesman Review Wed., March 15, 2017

<https://www.spokesman.com/stories/2017/mar/15/mudslide-causes-train-to-derail-in-boundary-county/>



KHQ News Jan 2, 2020

https://www.khq.com/news/crews-working-to-remove-derailed-bnsf-train-leaking-fuel-into/article_52f9ee6a-2d23-11ea-8263-27accd039299.html

UAV LiDAR Platform



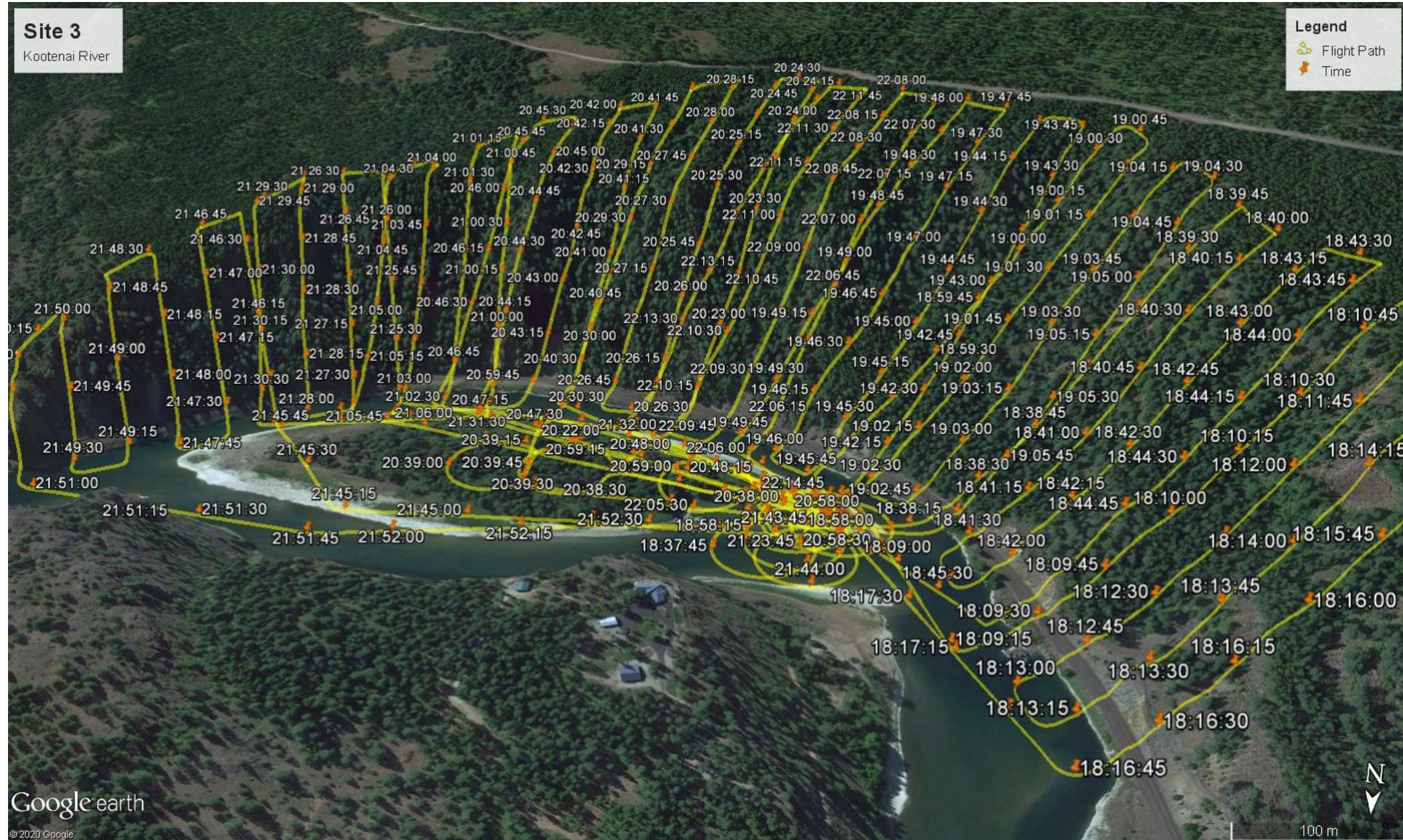
Geodetics Geo MMS LiDAR System

- DJI Matrice 600 Pro
- Payload weight of ~ 2.7 kg
- Velodyne LiDAR VLP-16
- Dual-Antenna Configuration on 2 m GPS boom
- High-Performance Quartz MEMS IMU
- Internal High-Performance GNSS Receiver
- Internal Data Recorder
- 15 min Flight time
- Proprietary Georeferencing Software
- Includes VYO Real-Time Viewer

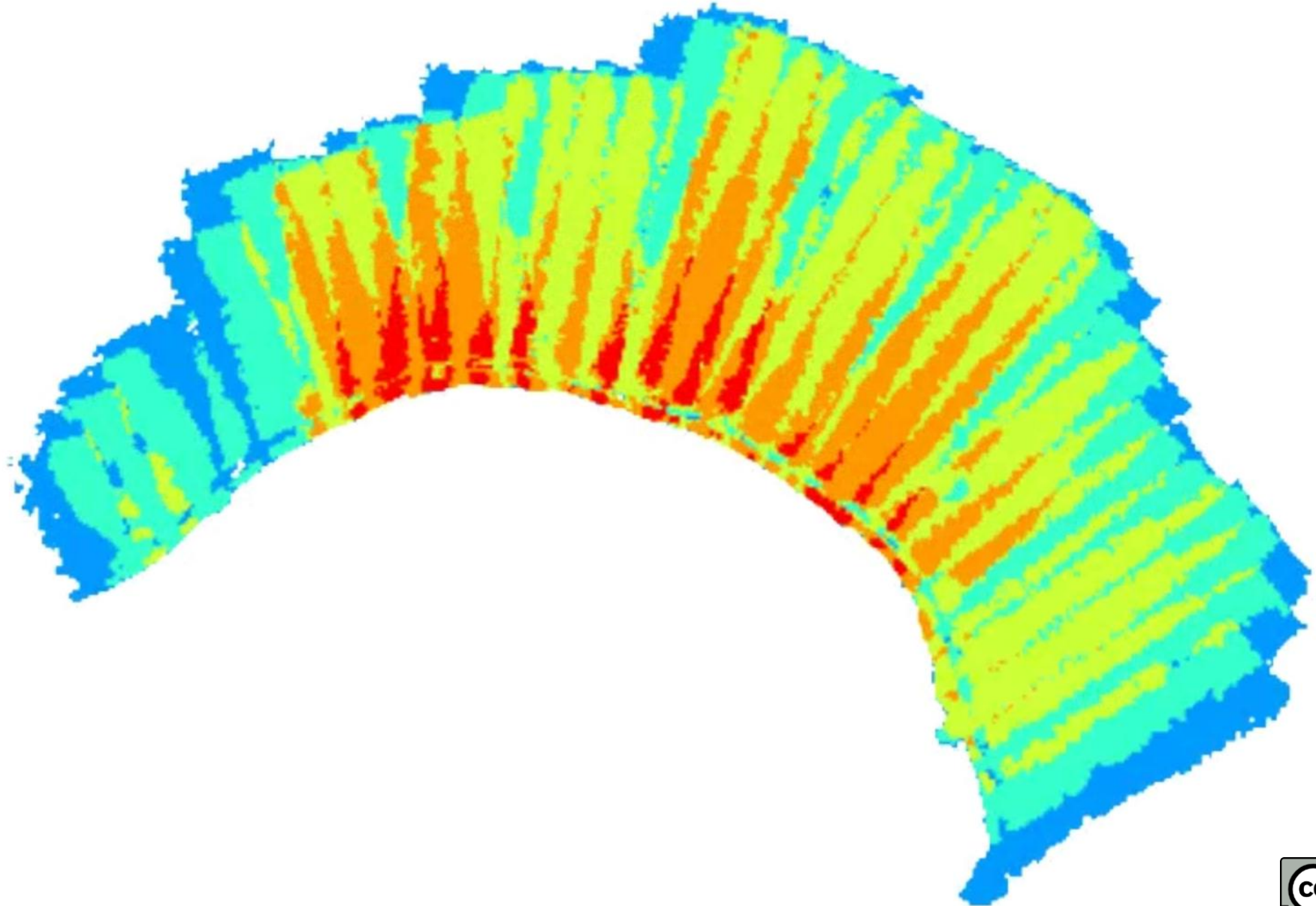
<https://geodetics.com/product/geo-mms/>



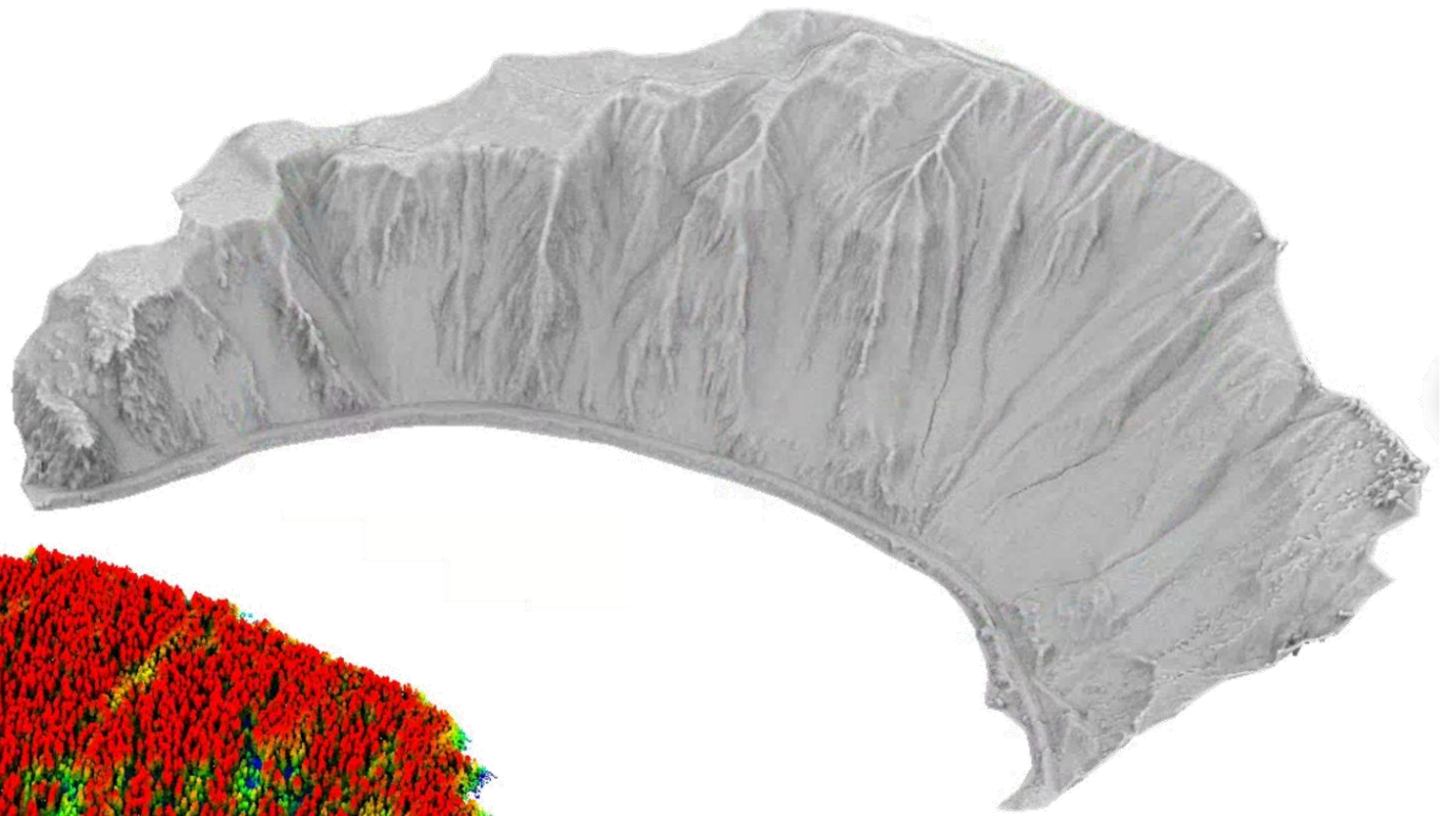
Mission Planning and Flight Path Tracking



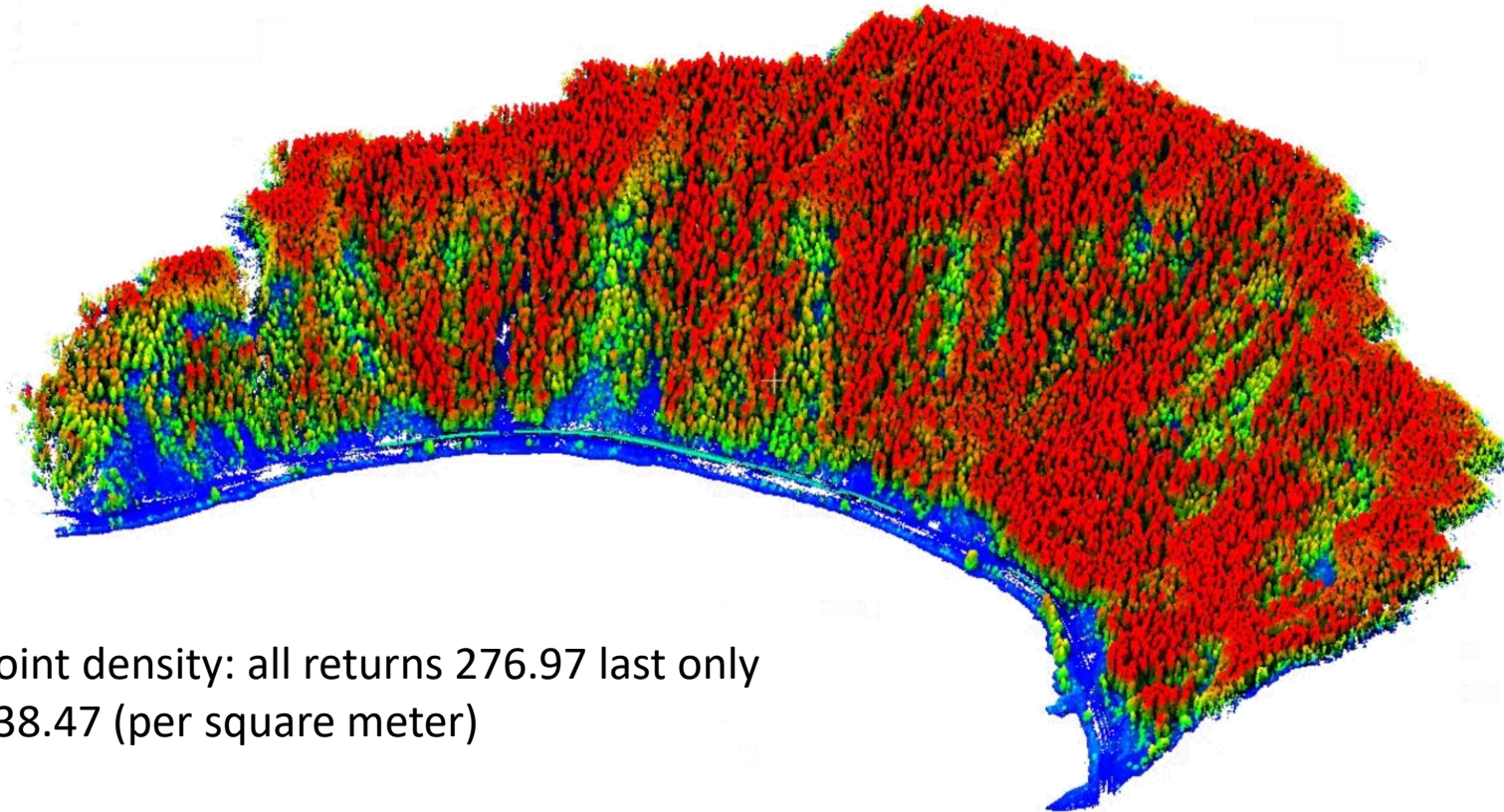
LiDAR Strip Alignment



Vegetation and Bare Earth Model

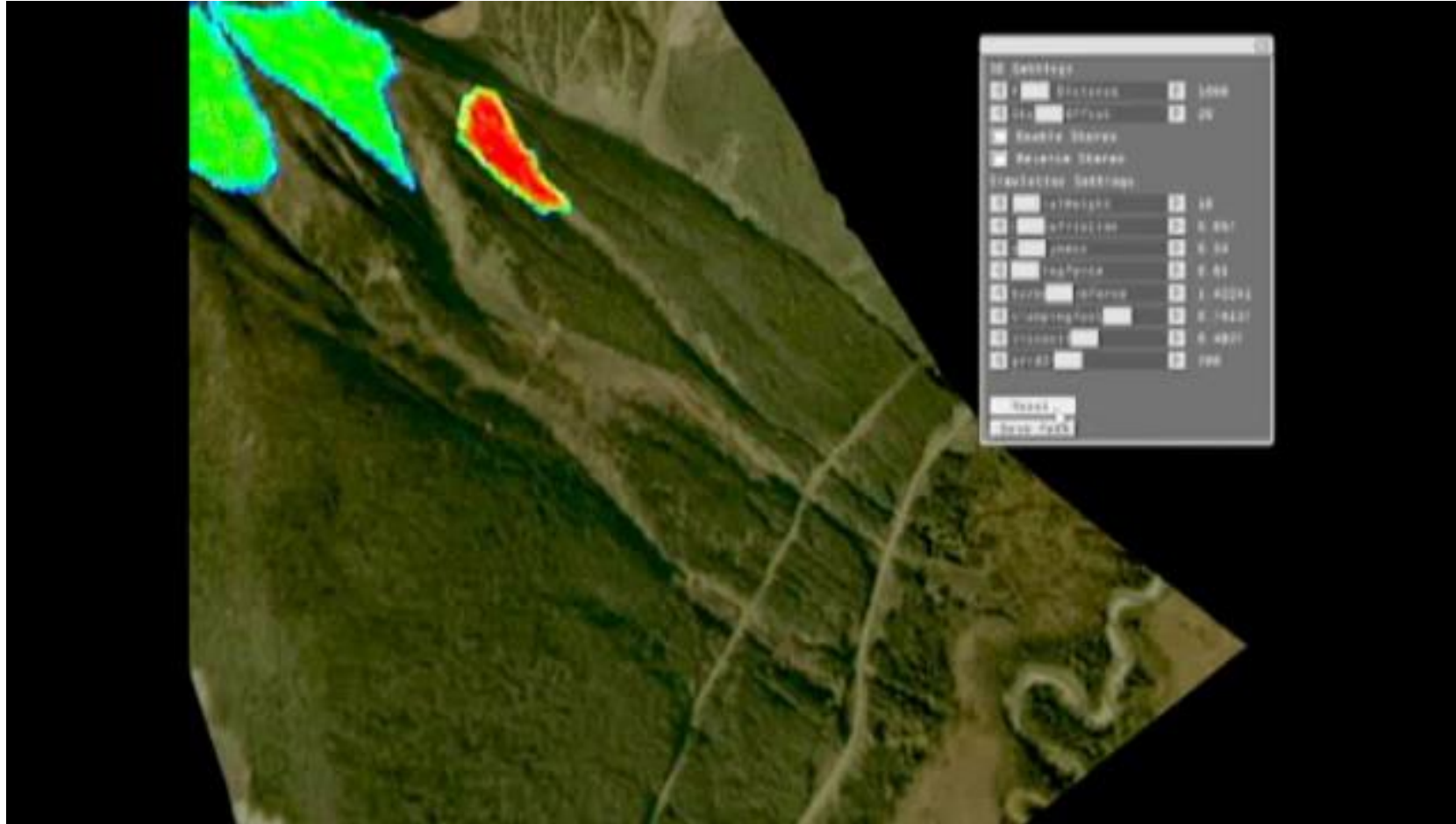


point density: all returns 8.94 last only
8.85 (per square meter)



point density: all returns 276.97 last only
138.47 (per square meter)

Modeling Applications



<https://vimeo.com/68069006>

Case study for geohazard assessment

- Cost efficiency
- Resolution vs. other platforms
- GPS basestation proximity during flights
- Mission planning - flight path orientation across slopes
- Limitations of dual returns in dense canopy
- Strip alignment practices
- Strategies for generating bare earth models

Thank you

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Photo: Matt Belt