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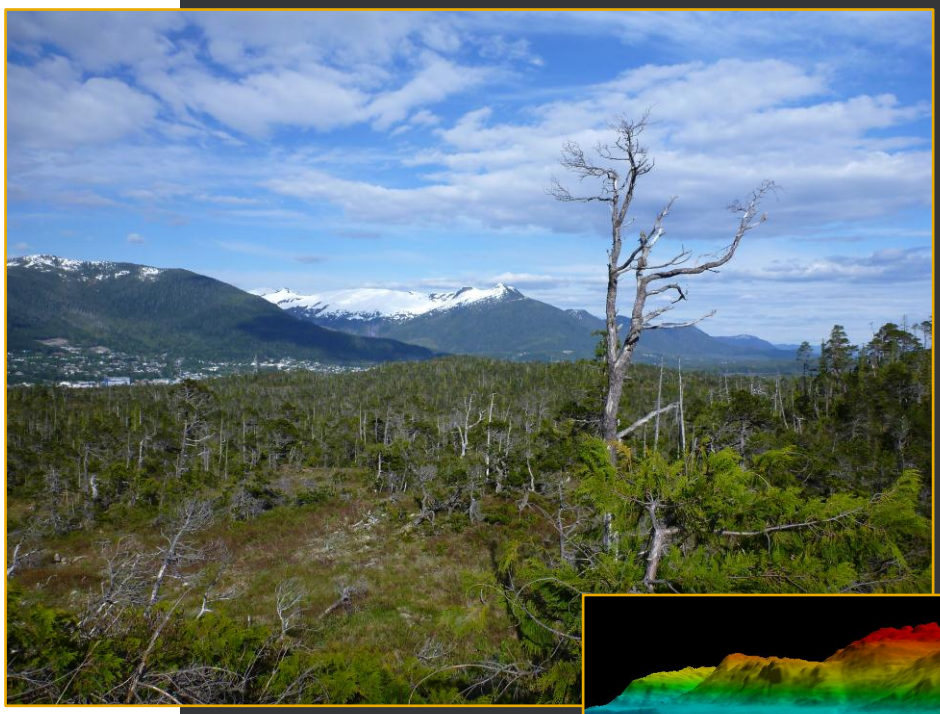

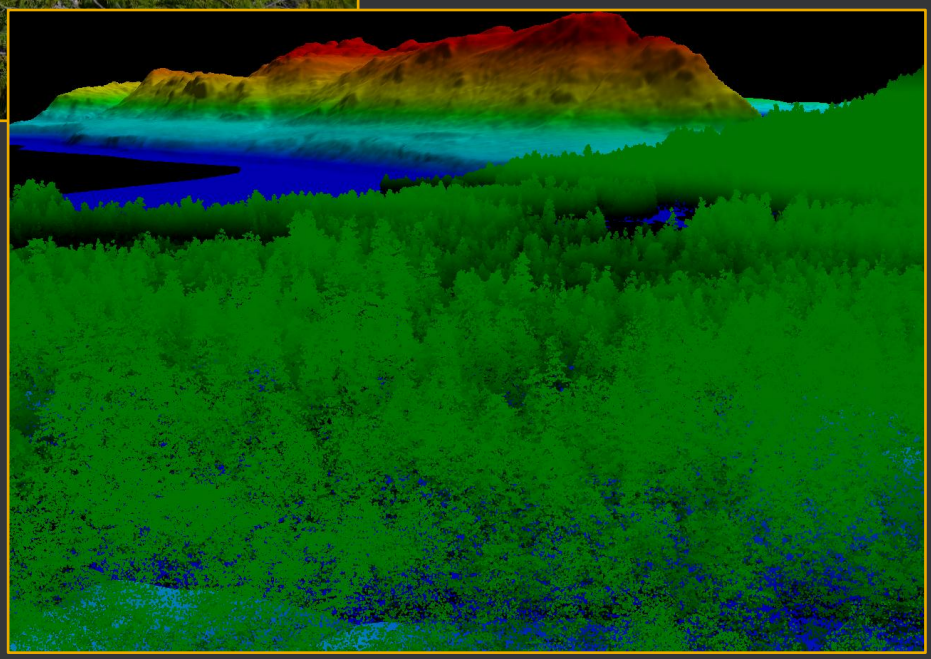

6130410 Vallenar Bay LiDAR

Airborne Data Acquisition Report

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Introduction

In April of 2013 Aero-Metric, Inc. (AeroMetric) teamed with Watershed Sciences, Inc. (WSI) to collect high density airborne LiDAR data for the Vallenar Bay area of interest. This project was undertaken for the Alaska Department of Transportation and Public Facilities (DOT&PF), working through the University of Alaska Fairbanks, Geographic Information Network of Alaska (UAF/GINA).

Final products will be used for utility and transportation planning and construction. Acquired swaths and the area of interest provided by UAF / GINA are illustrated in Figure 1 below.

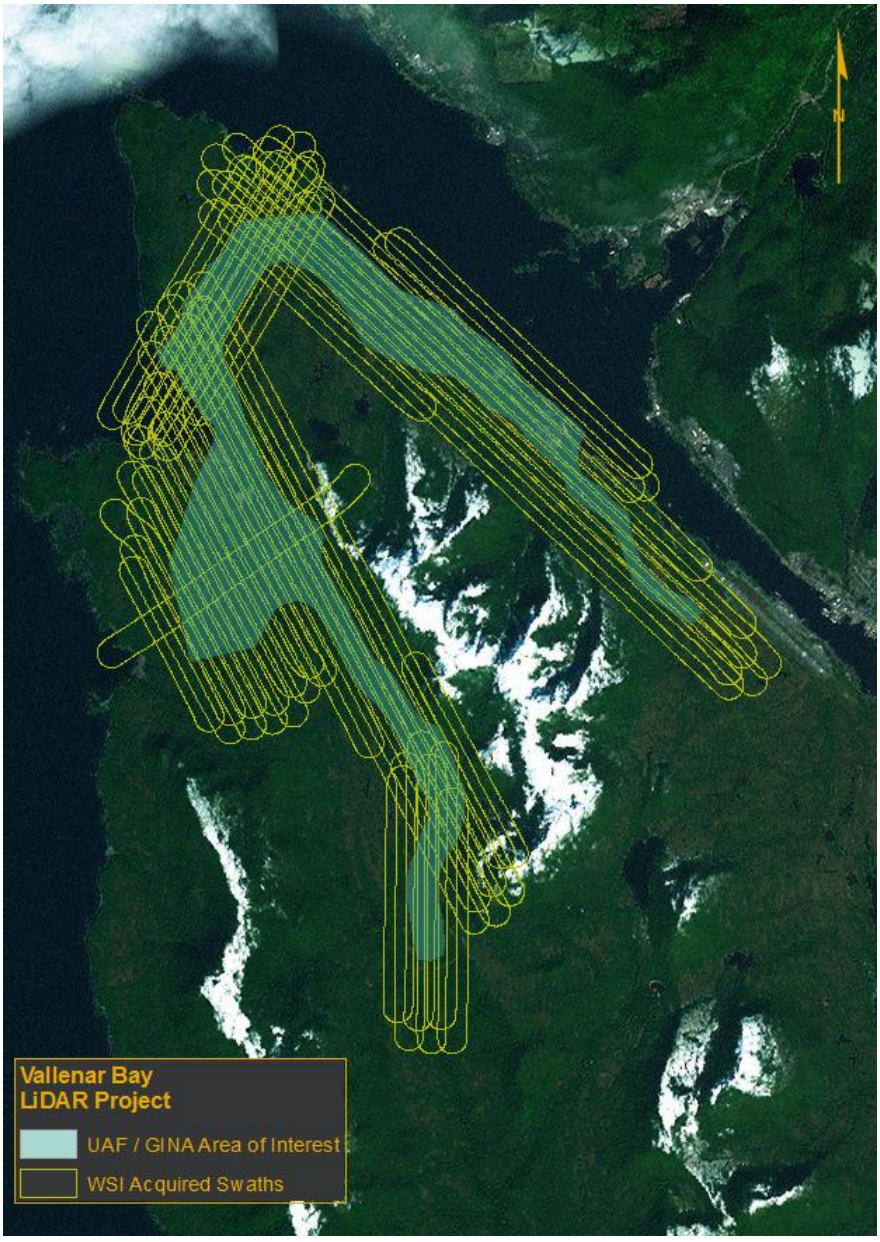

Figure 1 – Vallenar Bay LiDAR Acquisition

Planning

The staff of WSI evaluated the area of interest and considered terrain, project specifications, and various relevant logistical matters prior to acquisition. Efforts were made to choose optimum flight paths that ensured full coverage of the area of interest with at least the required 8 pulses per square meter. Table 1 outlines the LiDAR settings and specifications utilized for this project.

Table 1 – LiDAR Settings and Specifications

Sensor	Leica ALS60
Aircraft	Cessna Caravan N604MD
Altitude	900 m
Pulse Rate	~ 100 kHz
Pulse Diameter	21 cm
Field of View	26 degrees
GPS Baseline Length	≤ 13 nm
GPS PDOP	≤ 3.0
Maximum Laser Returns	4
Target Density	Average 8 pulses / square meter
Target Accuracy	≤ 15 cm

Pre-Flight Ground Survey

Prior to the collection of the airborne LiDAR data, control monumentation was established by WSI at each end of the project corridor. These stations were used to control the differential GPS of the LiDAR flight as well as the real-time kinematic (RTK) verification survey activities. Monument locations were selected taking into account factors such as satellite visibility and field crew safety.

Per this project's requirements, new monumentation was set using 5/8" x 30" rebar topped with stamped 2" aluminum caps. Monument positions were established using the Online Positioning User Service (OPUS) made available through the National Geodetic Survey (NGS). Multiple independent sessions were used for each monument to verify antenna height measurements and refine position accuracy. Table 2 contains final established positions for the control monuments.

Table 2 – Base Station Positions Referencing NAD83 (2011) Epoch 2010.0

Monument	Latitude	Longitude	Ellipsoid Height (m)
VB_AK_01	55 21 20.75601	-131 43 50.45148	46.428
VB_AK_02	55 18 38.66977	-131 47 19.05545	67.020

Acquisition

The airborne LiDAR survey was carried out on May 7, 2013. Prior to the flight consequential factors such as weather conditions and predicted GPS positional dilution of precision (PDOP) values for the region were evaluated to ensure that high quality data acquisition was possible.

A total of 47 flight lines were flown as part of a single lift (see Figure 1). A shapefile of the collected swaths, SBET trajectory, and the Leica ALS60 flight log are included in this delivery under the 'Supplemental_Files' directory.

Following acquisition the data was calibrated and classified by WSI, and then provided to AeroMetric for final evaluation and production. Please refer to the Processing and QA/QC Report included in this delivery for further information.