

Metadata Summary Report



Imagery and LiDAR capture by Remotely Piloted Aircraft System (RPAS)

Project Sites: (5) MFLNRORD Research Plot Sites in Lake Cowichan & Jordan River, BC

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1. Data Capture Summary

On August 31st and September 1st, 2021 Strategic Natural Resource Consultants (crew members Mike Morellato and Jennifer Hutt) captured LiDAR and high-resolution imagery using 2 different RPAS units (drones) on 5 separate sites selected by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD). The total area of interest over all sites was approximately 45.1 acres (18.2 ha), with an additional buffer captured through conservative flight planning to reduce possible edge effects. The sites for data capture were the following:

MFLNRORD Site Name	Region	Centroid Coordinate (UTM zone 10U)	Area Size (acres)
EP708.22.03 Hillcrest	South Cowichan	417311, 5402487	7.6
EP513.99 CLRS	Mesachie Lake	417086, 5407962	2.8
EP708.22.05 Jordan River	Jordan River	423530, 5364663	7.8
EP708.05.15 Jordan River	Jordan River	424916, 5363170	16
EP708.13.66 Jordan River	Jordan River	426523, 5362223	10.8

2. LiDAR Sensor Specifications

Yellowscan's Mapper LiDAR sensor was used for the data capture, mounted to a DJI Matrice 300 drone. The manufacturer specs of this system and other details are listed below.

Specification	Value	Comments
Scanner	Livox Horizon	
System Accuracy	3 cm	
System Precision	2 cm	
Weight (battery excl).	1.3 kg	
Optimal flight speed for data capture	10 m/s	Value used during our flights
Optimal flight altitude	70m AGL	Value used during our flights
Point rate	240,000/s	
Horizontal Field of View	81.7 °	
GNSS-Inertial solution	Applanix APX-15 UAV	

3. Ground Control Setup

As a best practice for LiDAR capture and spatial referencing during data processing, Strategic utilized a survey grade Trimble R8 RTK GNSS on site and set up base stations at each of the project sites prior to the drone flights. Base station files were corrected using Natural Resources Canada's Precise Point Positioning (PPP) online service using specs described in section 5.

The corrected base station coordinates were dual-purpose – they were used to tie-in the known point as a component of LiDAR processing (Applanix POSPac), and the points were also used for quality assurance purposes to compare the Z values in the produced Digital Elevation Model outputs to the points recorded on site.

4. Data Deliverables: File Formats, Units and Projection

The table below details the final data products that have been processed and delivered to Ministry staff in September of 2021. There are 5 sets of these deliverables, one for each study area.

Data Product	File Format	Resolution	Details
LiDAR point cloud	LAS	201.2 ppm ³	Calculated volume density mean on Jordan River site 2205. Will vary slightly by site.
True color orthophotos	TIFF	2.5 cm/pixel GSD	Imagery captured at 100m AGL. Included TIFF world georeference files as well (.tfw)
Digital Elevation Model (DEM)	TIFF	0.5m	Bare earth terrain data (trees and surface features removed).
DEM Hillshade	TIFF & PNG	0.5m	A hillshade effect applied to the DEM output.
Digital Surface Model (DSM)	TIFF	0.5m	Terrain data with surface features (e.g. trees) included.
Canopy Height Model (CHM)	TIFF	0.5m	Produced by subtracting the DEM (bare earth) from the DSM so that only vegetation (trees) are retained and heights are reported.

5. Projection Details

When assigning projections and datums to the imagery, base points recorded and during the processing of the LiDAR, we made efforts to maintain consistent specs. The following projection information was used when applicable to a delivered dataset.

Projection Information	
Projection	UTM Zone 10U
Horizontal Datum	NAD83 (CSRS)
Vertical Datum	CGVD28
Geoid	HTv2.0
Units	Meters
EPSG Code	32610

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