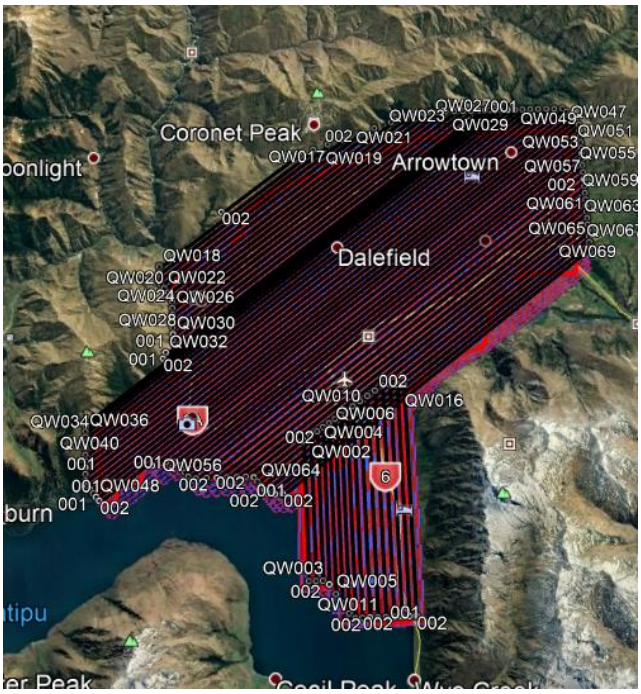
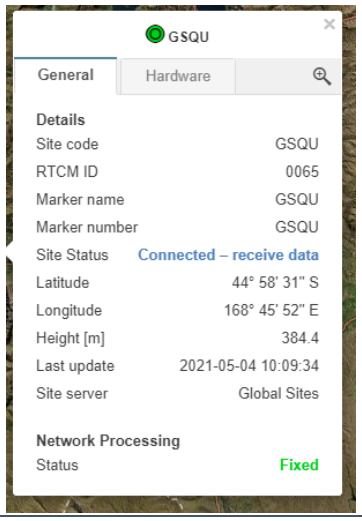
LANDPRO

Make the most of your land

Wakatipu LiDAR and Imagery Metadata

Project	Wakatipu
Client	Queenstown Lakes District Council
Contact	Tim White

Summary of Data	Landpro completed data capture including LiDAR and Medium Format Digital Camera Imagery of the requested area on the 13 & 14 March 2021 The data has been processed into a variety of digital map and data products, the data includes a 20m buffer. The supplied dataset includes the following items: • LiDAR in LAS 1.4 • 1m Digital Surface Model in Geotiff format • 1m Digital Elevation Model in Geotiff format • DTM Mesh in DXF format • Tiled RGBN Ortho in Tiff format • Tiled RGB Ortho in ECW format • Grid and AOI • Survey metadata report

Data Acquisition	The image below outlines the area surveyed. The aerial survey data was captured using the Reims Cessna Skymaster, ZK-SVY, from a variety of altitudes between 5000ft and 8500ft AMSL.  Data was captured using the following systems: Leica RCD30 80MP RGBN Image Sensor (SN:82552) Leica ALS60 LiDAR Sensor (SN: 6129) Ground control has been surveyed by Landpro Ltd.
Reference Systems	Projection: NZTM2000 NZGD2000 Vertical Datum: NZVD16 Reference Station: GSQU 

Data Processing

LiDAR Point Processing

Data processing has been in accordance with our standard policies and procedures surrounding acceptable tolerances, therefore ensuring optimal accuracies of deliverables.

GNSS/IMU data is processed utilising GSQU Base Station and precise ephemeris data.

The GNSS and IMU are processed in a tightly coupled loop to give an optimum trajectory. This data is then applied to the LiDAR and Image exterior orientations for prior to LAS and ortho creation.
Image data is created using Leica Framepro and any radiometric adjustment applied as required. LiDAR data is generated via CloudPro.

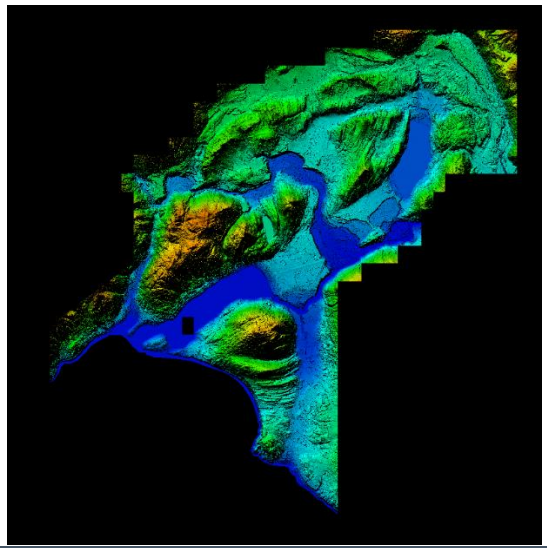
LiDAR Calibration

Overlapping LiDAR points from adjacent aircraft trajectories were used to check the LiDAR calibration for heading, roll, pitch and scale.

These values were then used to make small flight-specific adjustments to the LiDAR data.

LiDAR Point Editing

A "1st run" automatic classification was carried out on the raw LiDAR points using *TerraSolid's TerraScan* software to separate the LiDAR points into ground hits and non-ground hits. This results in a greater than 90% correct classification. After this, a manual classification was done over the required area to edit the points with gross classification errors that may have occurred in the automatic classification process. Scanner edges were cut by 2 degrees to ensure maximum point density.



Vertical Accuracy

The check points have been compared with the LiDAR ground surface and used as a vertical check on the data.
The results are as follows:

Average Dz	0.00
Minimum Dz	-0.08
Maximum Dz	0.06
Average magnitude	0.02
Root mean square	0.03
Std deviation	0.03

Horizontal Accuracy

The positional accuracy of the LiDAR data has been checked by plotting the Landpro Ltd. check points and displaying the LiDAR by intensity. The LiDAR was in position.

Orthophoto Rectification Procedure

The imagery was developed into tiffs using Leica FramePro. The exterior orientation was obtained by using IPAS CO+, this uses the trajectory and event file to determine an accurate orientation of every image.

The imagery was then run using Pix4D. Keypoints were computed on the images and matches were then determined. From these matches, Automatic Aerial Triangulation (AAT) is run. This results in the creation of an Orthomosaic based on orthorectification.

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