Metadata

LAND INFORMATION NZ

AUCKLAND REGION – 2016/17 LiDAR SURVEY

Aerial Surveys Project №: FPFA1135

Summary

Project

An Airborne Laser Scanner survey was conducted over the Auckland Region areas of interest totalling approximately 5154 km^2. Areas are located in the Auckland Region of the North Island.

Data

The data was processed into various digital map data products. The products included for this dispatch contain:

- AOI
- Raw Point Cloud
- Bare Earth
- Above Ground Data
- Gridded DEM
- Gridded DSM
- Contours
- Tile Layout

Project Report

Safety: No safety Incidents were reported during the project.

Acquisition: Airborne Laser Scanner (ALS) data was acquired from a fixed wing aircraft between: 16,17 August; 10,11,12 Sept; 1,22,23,24,30 Nov; 6,17,18,20,30 Dec 2016 ; 5,13,28,30 Jan; 4,5,6 Feb; 2,3 March; 25,26,27 April; 1,2,3,6,22 May; 8,9,28,29 June; 30 July; 23 Aug; 20,23 Sept; 19 Oct ; 20,21,23 Nov; 8 Dec 2017; 15,25 Feb; 29 June; 4 July; 2, 9 Aug 2018;

Ground Support: GPS base station data was provided by Global Surveys Ltd and LINZ base stations. The ground check points acquired by Sounds Surveying Ltd.

Data Processing: Reduction of the ALS data proceeded without any significant problems. Laser strikes were classified into ground and non-ground points using auto algorithms across the project area.

Data Presentation: The data provided on this volume has been supplied in accordance with a specification agreed with Auckland Council.

Project Contacts:
LINZ Senior Technical Leader Geospatial: Bjorn Johns (Ph. (04) 460 0580 x DDI)
Aerial Surveys Business Development Manager: Steve Smith (Ph. (09) 415 3101)

Data Acquisition

A map showing this area of interest is included in Appendix A.

LiDAR survey was collected using Aerial Surveys Optech Orion H300 LiDAR and Optech Galaxy system.

Survey Specification:

Outer Islands (Great Barrier) Inner Islands, North Sector 1, 2, 3

- Scanner: Optech Galaxy
- Flying Height: 1975 m AGL
- Scan Angle: ±34.0 degrees
- Scan Frequency: 67.0 Hz
- Pulse Rate: 450 kHz
- Swath Overlap: 30%
- Points Per M^2:   4
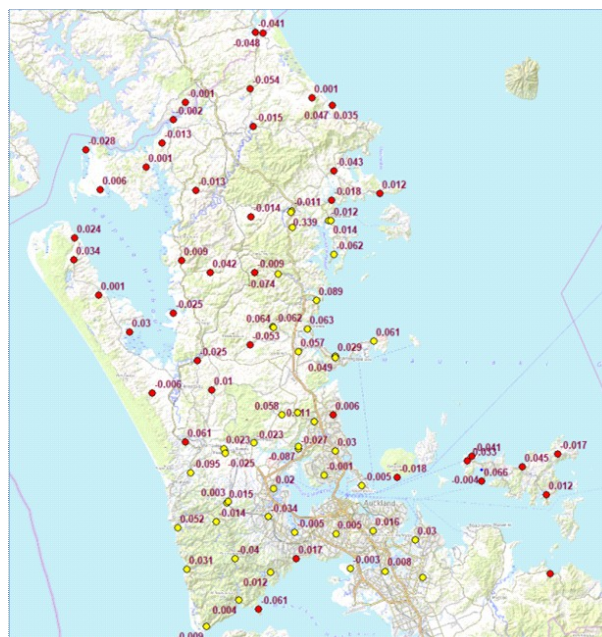
Outer Island (Little Barrier) Inner Islands, North Sector 1, 2, 3

- Scanner: Optech Orion H300
- Flying Height: 1639.7m AGL
- Scan Angle: ±18.0 degrees
- Scan Frequency: 42 Hz
- Pulse Rate: 70 kHz
- Swath Overlap: 50%
- Points Per M^2:   4

Sounds Surveying Ltd field surveyed check sites that were used to verify the accuracy of the processed ground dataset.
A ground survey check site programme was designed and used to collect sufficient data to test the fundamental accuracies of the point cloud dataset on the project.

Location of Survey Check Sites with LiDAR vertical offsets
Mainland and Inner Islands

Outer Islands – Great Barrier/Little Barrier
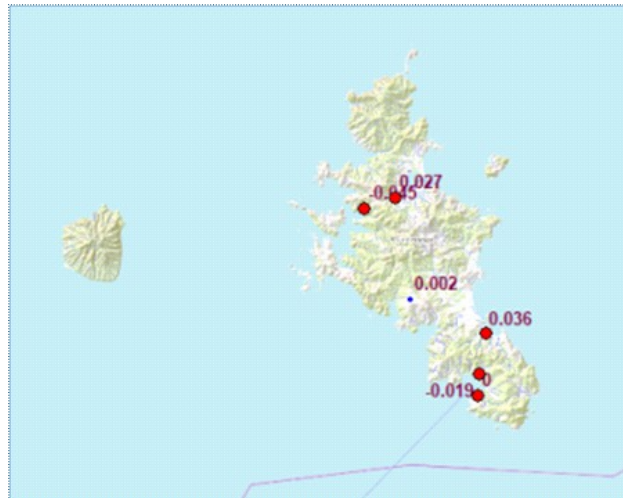
Data Processing

The LiDAR sensor positioning and orientation (POS) was determined using the collected GPS/IMU datasets and Applanix POSPac software.

BASESTATIONS:
VPRK, VRS, VWHK owned by Geosystems -36 39 04.199186 S 174 25 51.474337 E 40.922
Antenna height: BOT   0.085

GSWC, GSUT owned by Global Systems-36 52 58.16567 S 174 38 39.56086 E 100.145
Antenna height: BOT 0.000

WARK owned by LINZ -36 26 3.89148 S 174 39 46.00584 E 111.277
Antenna height: BOT 0.085

GBI owned by ASL -36 14 32.95837 S 175 28 03.01566 E 42.654
Antenna height: BOT 0.000

PP-RTX owned by Trimble

The POS data was combined with the LiDAR range files and used to generate LIDAR point clouds in NZTM and ellipsoidal heights. This process was undertaken using Optech LMS LiDAR processing software. The data was checked for completeness of coverage. The relative fit of data in the overlap between strips was also checked.

The height accuracy of the ground classified LiDAR points was checked using open land-cover survey check site data collected by Sounds Surveying Ltd. This was done by calculating height differences statistics between a TIN of the LiDAR ground points and the checkpoints. The standard deviation statistic is 0.057 m; a RMS of 0.057 m and the average difference is -0.003 m.
LiDAR is relative to the control check points.

Mean_DZ	StdDev_DZ	RMSE_DZ	CI95_DZ
-0.003	0.057	0.057	0.112

The positional accuracy of the LiDAR data has been checked by overlaying Sounds Surveying Ltd surveyed data over the LiDAR data displayed coded by intensity. The data was found to fit well in position.

The point cloud data was then classified with TerraSolid LiDAR processing software into ground and above ground returns using automated routines tailored to the project landcover and terrain.

Spacial Accuracy:

Vertical accuracy +/-0.1m at 68% confidence (1 sigma)
Horizontal accuracy +/-0.3m @ 68% confidence (1 sigma)

Product Deliverables

All product deliverables supplied in terms of NZTM map projection and NZVD2016 vertical datums. The data was converted from NZGD2000 ellipsoidal heights into the local height system using the LINZ NZGeoid16.

The following details the folder contents:

AOI:	Extent is the limit of the project area
	Extent data is provided in SHP format and DXF
Raw Point Cloud:	Contains the unclassified LiDAR point cloud points as they were prior to being classified
	This dataset is in ASPRS.LASv1.2 and SHP (PointZ) format
Bare Earth:	Contains the LiDAR point cloud points that have been classified as ground returns
	This dataset is in ASPRS.LASv1.2 and SHP (PointZ) format
Above Ground:	Contains the LiDAR point cloud points that have been classified as Above Ground returns
	This dataset is in ASPRS.LASv1.2 and SHP (PointZ) format
Gridded DEM:	Contains the gridded ground surface (1 m separation grid)
	This dataset is in Geotiff format
Gridded DEM:	Contains the gridded ground and above ground surface (1 m separation grid)
	This dataset is in Geotiff format
Contours:	Contains 0.25 m contours. The contours were interpolated from a smoothed TIN created using the LiDAR point cloud dataset. The contours are classified into majors and minors. Four minors to every major and shown on different levels. Supplied Auckland 1946VD.
	This data is provided in SHP (Polyline Z) and DXF format
Tile Layout	Tiles is the tile layout for the project area
	Tile size 1:1000 sheet layout (420 x 720 m)
	Tile data is provided in SHP format and DXF

Suface_Type	Classification	Point_Class
BareEarth	2	Ground
Raw_Point_Cloud	1	Unclassified
Raw_Point_Cloud	12	Overlap
Above_Ground_Data	3	Low Vegetation
Above_Ground_Data	4	Medium Vegetation
Above_Ground_Data	5	High Vegetation
Above_Ground_Data	6	Building

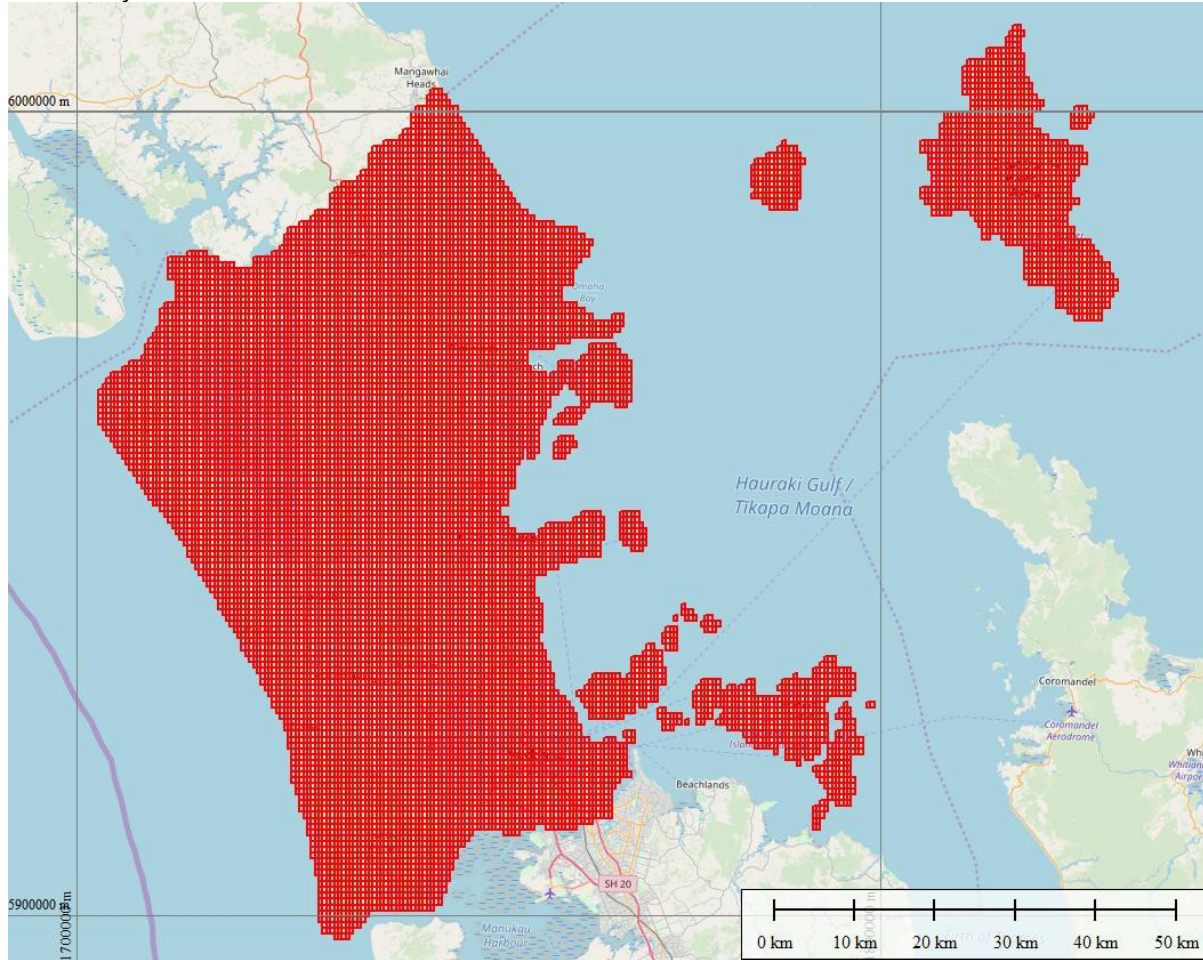If you have requirements for the data in other file formats, map projections please contact Aerial Surveys.

License/Copyright

The project has been supplied on the basis of a shared ownership structure in the end products delivered under this programme (LiDAR products) which provides Auckland Council with no restrictions in the use of these products. All raw data (raw LiDAR data, ground control, GNSS & IMU data) remain the sole property of Aerial Surveys, consistent with our standard terms of engagement.

Appendix A: Project Area

The tile layout is shown in red.

1:1000 map Tile Layout