

Metadata

NELSON CITY COUNCIL

TASMAN NELSON FLOODS – 2022 CIVIL DEFENCE EMERGENCY MANAGEMENT (CDEM) LiDAR & ORTHOS

Delivery 1: Abel Tasman Drive

AERIAL SURVEYS PROJECT No: PGRM3074

Summary

Project

An Airborne Laser Scanner survey was conducted over five flood areas totalling approximately 679 km². The areas of capture are located in the Nelson and Marlborough Regions of the South Island.

This delivery covers the **Abel Tasman Drive** area.

Data

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

- AOI
- Unclassified Raw Point Cloud
- Classified Point Cloud
- Gridded DEM
- Gridded DSM
- Hydro Flattening Breaklines
- Tile Layout
- File Listing
- Metadata Report (this report)

Project Report

Safety: No safety incidents were reported during the project.

Acquisition: Airborne Laser Scanner (ALS) data was acquired from a fixed wing aircraft.

Ground Support: GPS base station data was provided by Global Surveys Ltd and LINZ base stations. The ground check points were 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 Nelson City Council (on behalf of Nelson Tasman CDEM).

Project Contacts:

LINZ Response Manager: Susan Shaw (Ph. 027 777 6222)
 Aerial Surveys Technical & Sales: Dave Froggatt (Ph. (09) 547 0099)

Data Acquisition

The project area is that shown in the shapefile 'LiDARMetadata_TasmanFloods2022_CDEM_Pgrm3074.shp' that accompanies the dataset. A map showing this area of interest is included in Appendix A.

Capture Dates

The LiDAR survey was captured on the following dates:
 23 August 2022

LiDAR survey was collected using Aerial Surveys Optech Galaxy PRIME system.

Survey Specification:

- Scanner: Optech Galaxy PRIME
- Flying Height: 1,950 m AMGL
- Scan Angle FOV: 56 degrees
- Scan Frequency: 53 Hz
- Pulse Rate: 400 kHz
- Swath Overlap: 45%
- Swath Points Per M²: 2.8

Sounds Surveying Ltd field surveyed check sites that were used to verify the accuracy of the processed ground dataset.

Data Processing

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

Base Station : PPRTX

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.

StDev_DZ	Mean_DZ	RMSE_DZ	CI95_DZ
0.042	0.001	0.042	0.082

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 land cover and terrain.

Product Deliverables

All spatial data for this project provided in terms of New Zealand Transverse Mercator 2000 (NZTM2000) horizontal and New Zealand Vertical Datum (NZVD2016). The data was converted from NZGD2000 ellipsoidal heights into the orthometric height system using the LINZ NZGeoid16 separation model. The products are tiled into NZTopo50 map sheet tiles as noted below.

The following details the folder contents:

- AOI: Extent is the limit of the project area
This dataset is supplied in SHP format.
- Unclassified Raw Point Cloud: Contains the unclassified LiDAR point cloud points as they were prior to being classified
This dataset is supplied in ASPRS LAS 1.4 format
- Classified Point Cloud: Contains the LiDAR point cloud points that have been classified
This dataset is supplied in ASPRS LAS 1.4 format

Surface Type	Classification	Point Class
Raw	1	Unclassified
Ground	2	Ground
Above Ground	3	Low Vegetation
Above Ground	4	Medium Vegetation
Above Ground	5	High Vegetation
Above Ground	6	Buildings
Above Ground	7	Low Noise
Above Ground	9	Water
Above Ground	18	High Noise

- Gridded DEM: Contains the gridded ground surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Gridded DSM: Contains the gridded top of surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Tile Layout: Tiles is the tile layout for the project area
Tile size 1:1,000 sheet layout (480 m x 720 m)
Tile dataset is supplied in SHP format.
- File Listing: Supplied in TXT format
- Metadata Report: Supplied in PDF format
- Hydro Breaklines: Breaklines representing all hydro-flattened features

This dataset is supplied in SHP format.

All digital data supplied via digital upload. Data was supplied to Susan Shaw, LINZ on 12/10/2022

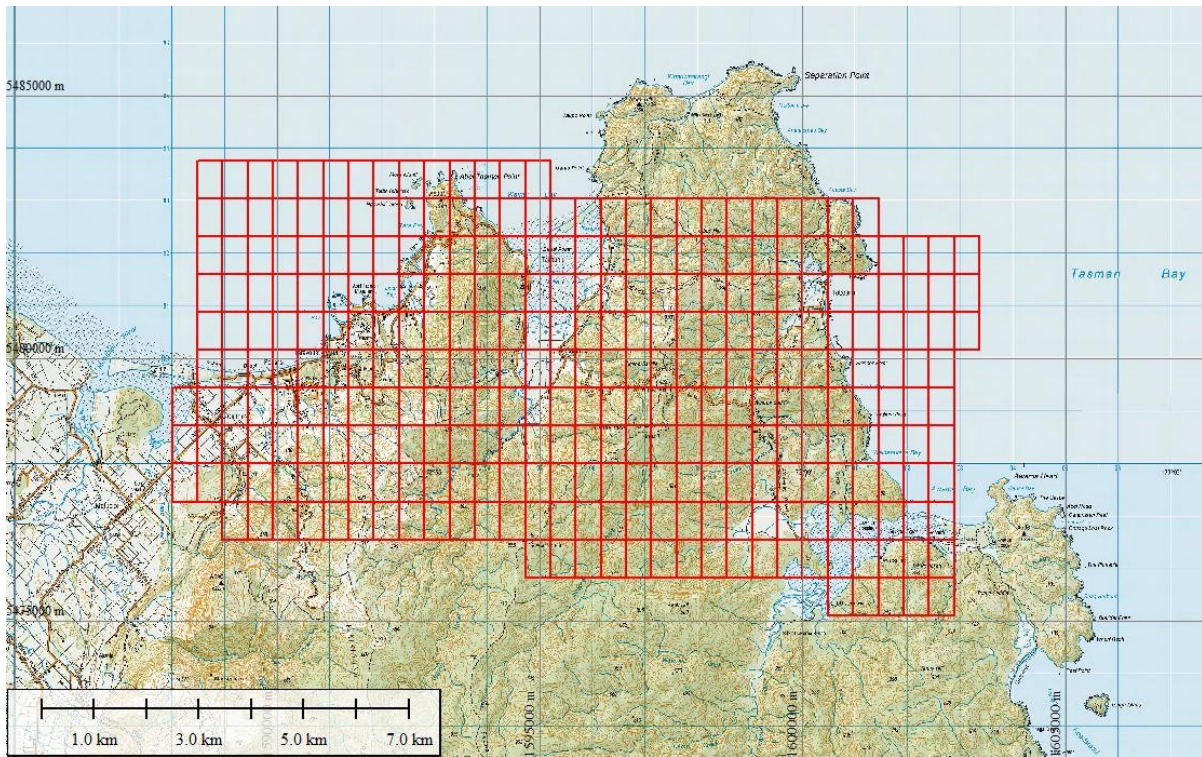
If you have requirements for the data in other file formats, map projections please contact Aerial Surveys.

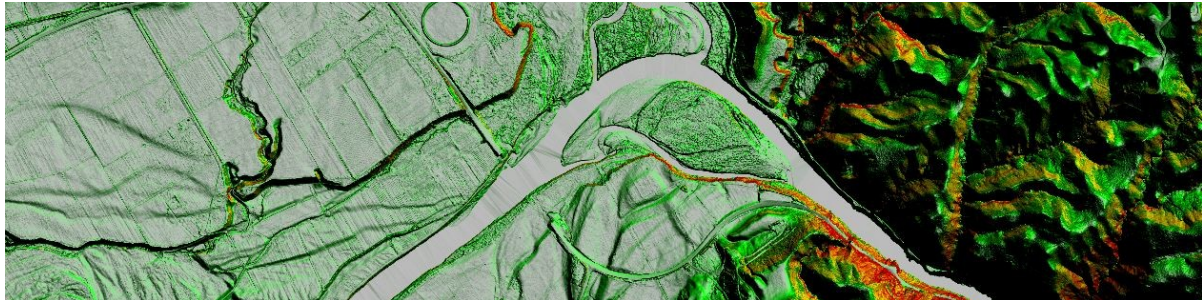
License/Copyright

All copyright and other intellectual property rights ('Rights') in the products delivered to Nelson City Council are jointly owned. Nelson City Council and Aerial Surveys Ltd grant each other an unrestricted royalty free license to use the Rights in such products for any purpose. 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.





Metadata

NELSON CITY COUNCIL

TASMAN NELSON FLOODS – 2022 CIVIL DEFENCE EMERGENCY MANAGEMENT (CDEM) LiDAR & ORTHOS

Waimea, Richmond, Nelson City, Kokorua road

AERIAL SURVEYS PROJECT No: PGRM3074

Summary

Project

An Airborne Laser Scanner survey was conducted over five flood areas totalling approximately 679 km². The areas of capture are located in the Nelson and Marlborough Regions of the South Island.

This delivery covers the **Waimea, Richmond, Nelson City, Kokorua Road** areas.

Data

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

- AOI
- Unclassified Raw Point Cloud
- Classified Point Cloud
- Gridded DEM
- Gridded DSM
- Hydro Flattening Breaklines
- Tile Layout
- File Listing
- Metadata Report (this report)

Project Report

Safety: No safety incidents were reported during the project.

Acquisition: Airborne Laser Scanner (ALS) data was acquired from a fixed wing aircraft.

Ground Support: GPS base station data was provided by Global Surveys Ltd and LINZ base stations. The ground check points were 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 Nelson City Council (on behalf of Nelson Tasman CDEM).

Project Contacts:

LINZ Response Manager: Susan Shaw (Ph. 027 777 6222)
 Aerial Surveys Technical & Sales: Dave Froggatt (Ph. (09) 547 0099)

Data Acquisition

The project area is that shown in the shapefile 'LiDARMetadata_TasmanFloods2022_CDEM_Block2_Pgrm3074.shp' that accompanies the dataset. A map showing this area of interest is included in Appendix A.

Capture Dates

The LiDAR survey was captured on the following dates:
 23-24, 27 August 2022, 1, 6 September 2022

LiDAR survey was collected using Aerial Surveys Optech Galaxy PRIME system.

Survey Specification:

- Scanner: Optech Galaxy PRIME
- Flying Height: 1,950 m AMGL
- Scan Angle FOV: 56 degrees
- Scan Frequency: 53 Hz
- Pulse Rate: 400 kHz
- Swath Overlap: 45%
- Swath Points Per M²: 2.8

Sounds Surveying Ltd field surveyed check sites that were used to verify the accuracy of the processed ground dataset.

Data Processing

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

Base Station : PPRTX

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.

StDev_DZ	Mean_DZ	RMSE_DZ	CI95_DZ
0.041	0.003	0.041	0.08

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 land cover and terrain.

Product Deliverables

All spatial data for this project provided in terms of New Zealand Transverse Mercator 2000 (NZTM2000) horizontal and New Zealand Vertical Datum (NZVD2016). The data was converted from NZGD2000 ellipsoidal heights into the orthometric height system using the LINZ NZGeoid16 separation model. The products are tiled into NZTopo50 map sheet tiles as noted below.

The following details the folder contents:

- AOI: Extent is the limit of the project area
This dataset is supplied in SHP format.
- Unclassified Raw Point Cloud: Contains the unclassified LiDAR point cloud points as they were prior to being classified
This dataset is supplied in ASPRS LAS 1.4 format
- Classified Point Cloud: Contains the LiDAR point cloud points that have been classified
This dataset is supplied in ASPRS LAS 1.4 format

Surface Type	Classification	Point Class
Raw	1	Unclassified
Ground	2	Ground
Above Ground	3	Low Vegetation
Above Ground	4	Medium Vegetation
Above Ground	5	High Vegetation
Above Ground	6	Buildings
Above Ground	7	Low Noise
Above Ground	9	Water
Above Ground	18	High Noise

- Gridded DEM: Contains the gridded ground surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Gridded DSM: Contains the gridded top of surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Tile Layout: Tiles is the tile layout for the project area
Tile size 1:1,000 sheet layout (480 m x 720 m)
Tile dataset is supplied in SHP format.
- File Listing: Supplied in TXT format
- Metadata Report: Supplied in PDF format
- Hydro Breaklines: Breaklines representing all hydro-flattened features

This dataset is supplied in SHP format.

All digital data supplied via digital upload. Data was supplied to Susan Shaw, LINZ on 27/10/2022

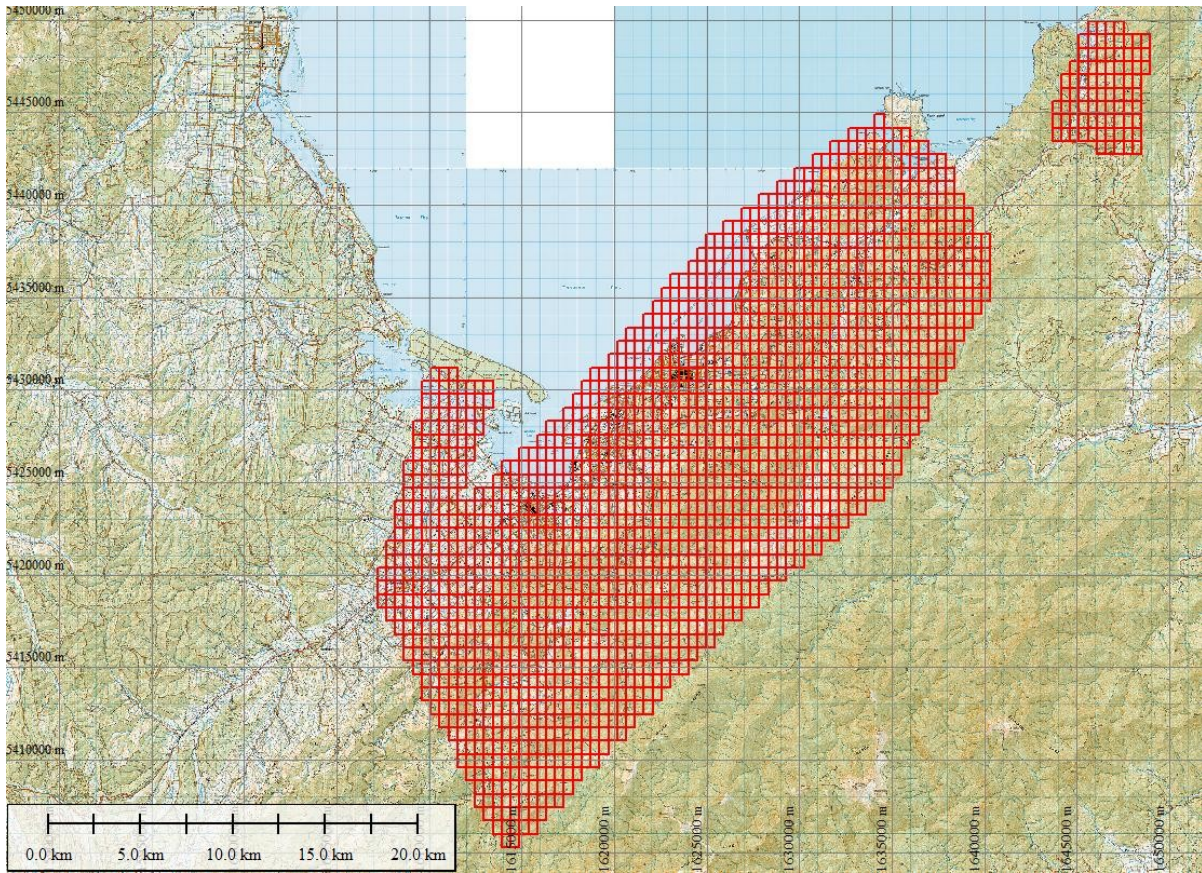
If you have requirements for the data in other file formats, map projections please contact Aerial Surveys.

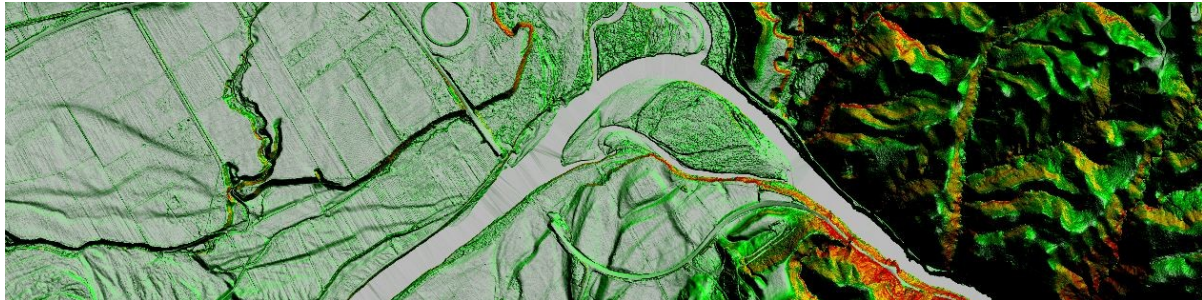
License/Copyright

All copyright and other intellectual property rights ('Rights') in the products delivered to Nelson City Council are jointly owned. Nelson City Council and Aerial Surveys Ltd grant each other an unrestricted royalty free license to use the Rights in such products for any purpose. 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.





Metadata

WAKA KOTAHI NZ TRANSPORT AGENCY

TASMAN NELSON FLOODS – 2022 NZTA LiDAR & ORTHOS

Delivery 1: Bird Hill & Takaka Hill

AERIAL SURVEYS PROJECT No: PGRM3075

Summary

Project

An Airborne Laser Scanner survey was conducted over four flood areas totalling approximately 140 km². The areas of capture are located in the Nelson and Marlborough Regions of the South Island.

This delivery covers the **Bird Hill & Takaka Hill** areas.

Data

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

- AOI
- Unclassified Raw Point Cloud
- Classified Point Cloud
- Gridded DEM
- Gridded DSM
- Hydro flattening breaklines
- Tile Layout
- File Listing
- Metadata Report (this report)

Project Report

Safety: No safety Incidents were reported during the project.

Acquisition: Airborne Laser Scanner (ALS) data was acquired from a fixed wing aircraft.

Ground Support: GPS base station data was provided by Global Surveys Ltd and LINZ base stations. The ground check points were 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 Waka Kotahi NZ Transport Agency.

Project Contacts:

LINZ Response Manager: Susan Shaw (Ph. 027 777 6222)
 Aerial Surveys Technical & Sales: Dave Froggatt (Ph. (09) 547 0099)

Data Acquisition

The project area is that shown in the shapefile 'LiDARMetadata_TasmanFloods2022_WakaKotahi_BirdHill_Pgrm3075.shp' & 'LiDARMetadata_TasmanFloods2022_WakaKotahi_TakakaHill_Pgrm3075.shp' that accompanies the dataset. A map showing this area of interest is included in Appendix A.

Capture Dates

The LiDAR survey was captured on the following dates:
 23 August 2022.

LiDAR survey was collected using Aerial Surveys Optech Galaxy PRIME system.

Survey Specification:

- Scanner: Optech Galaxy PRIME
- Flying Height: 1,950 m AMGL
- Scan Angle FOV: 56 degrees
- Scan Frequency: 53 Hz
- Pulse Rate: 400 kHz
- Swath Overlap: 45%
- Swath Points Per M²: 2.8

Sounds Surveying Ltd field surveyed check sites that were used to verify the accuracy of the processed ground dataset.

Data Processing

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

Base Station : PPRTX

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.

StDev_DZ	Mean_DZ	RMSE_DZ	CI95_DZ
0.035	0.003	0.035	0.069

LiDAR is relative to the control check points.

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 land cover and terrain.

Product Deliverables

All spatial data for this project provided in terms of New Zealand Transverse Mercator 2000 (NZTM2000) horizontal and New Zealand Vertical Datum (NZVD2016). The data was converted from NZGD2000 ellipsoidal heights into the orthometric height system using the LINZ NZGeoid16 separation model. The products are tiled into NZTopo50 map sheet tiles as noted below.

The following details the folder contents:

- AOI: Extent is the limit of the project area
This dataset is supplied in SHP format and DXF
- Unclassified Raw Point Cloud: Contains the unclassified LiDAR point cloud points as they were prior to being classified
This dataset is supplied in ASPRS LAS format
- Classified Point Cloud: Contains the LiDAR point cloud points that have been classified
This dataset is supplied in ASPRS LAS format

Surface Type	Classification	Point Class
Raw	1	Unclassified
Ground	2	Ground
Above Ground	3	Low Vegetation
Above Ground	4	Medium Vegetation
Above Ground	5	High Vegetation
Above Ground	6	Buildings
Above Ground	7	Low Noise
Above Ground	9	Water
Above Ground	18	High Noise

- Gridded DEM: Contains the gridded ground surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Gridded DSM: Contains the gridded top of surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Tile Layout: Tiles is the tile layout for the project area
Tile size 1:1,000 sheet layout (480 m x 720 m)
Tile dataset is supplied in SHP format and DXF
- File Listing: Supplied in TXT format
- Metadata Report: Supplied in PDF format

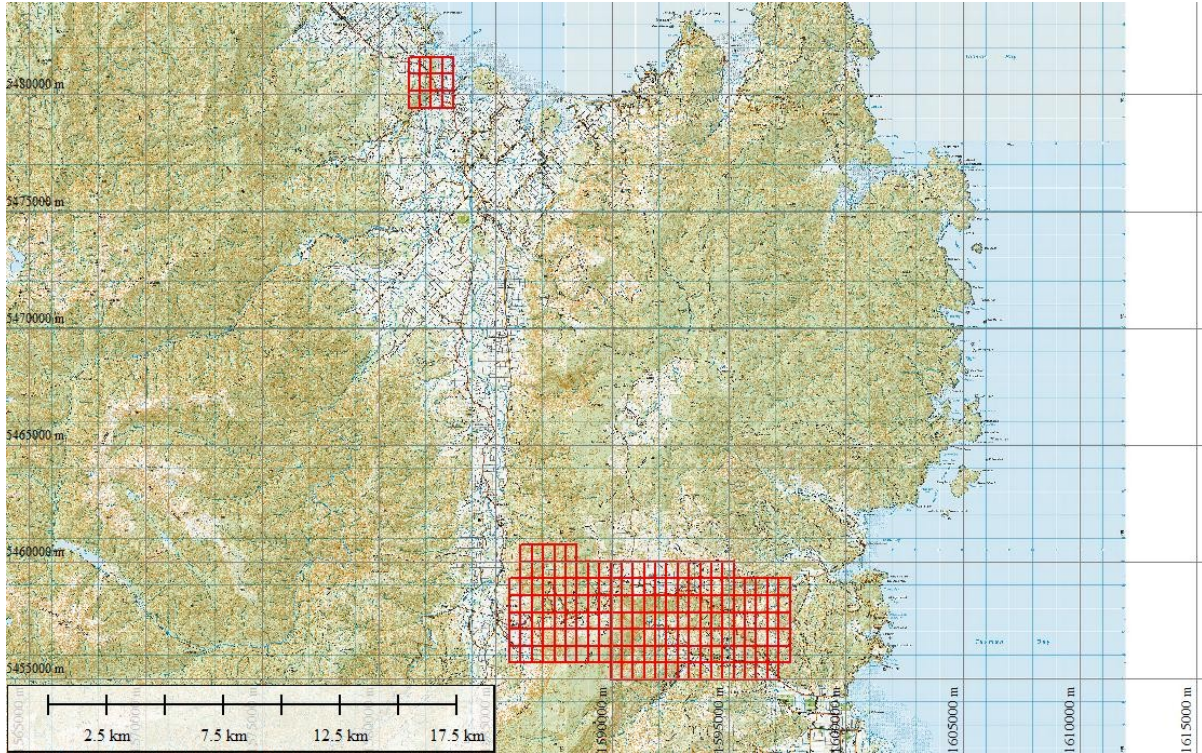
All digital data supplied via digital upload. Data was supplied to Susan Shaw, LINZ on 12/10/2022. If you have requirements for the data in other file formats, map projections please contact Aerial Surveys.

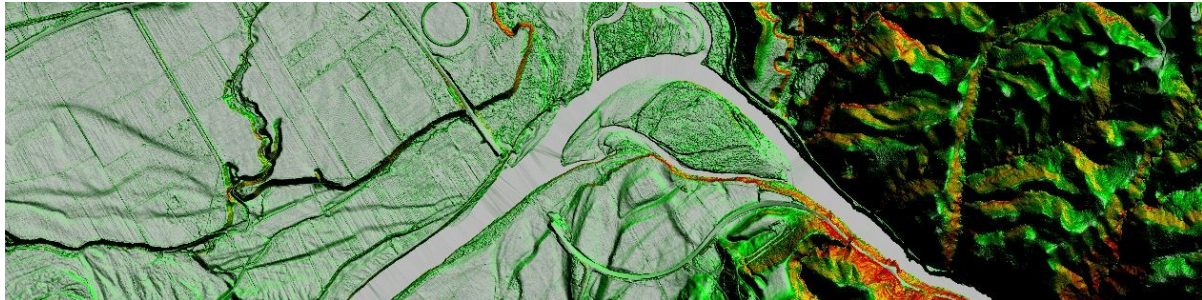
License/Copyright

All copyright and other intellectual property rights ('Rights') in the products delivered to Waka Kotahi NZ Transport Agency are jointly owned. Waka Kotahi NZ Transport Agency and Aerial Surveys Ltd grant each other an unrestricted royalty free license to use the Rights in such products for any purpose. 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.





Metadata

WAKA KOTAHI NZ TRANSPORT AGENCY

TASMAN NELSON FLOODS – 2022 NZTA LiDAR & ORTHOS

State Highway Hira to Rai Valley, SH6 to Okiwi Bay

AERIAL SURVEYS PROJECT No: PGRM3075

Summary

Project

An Airborne Laser Scanner survey was conducted over four flood areas totalling approximately 140 km². The areas of capture are located in the Nelson and Marlborough Regions of the South Island.

This delivery covers the **State Highway Hira to Rai valley, SH6 to Okiwi Bay** areas.

Data

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

- AOI
- Unclassified Raw Point Cloud
- Classified Point Cloud
- Gridded DEM
- Gridded DSM
- Hydro flattening breaklines
- Tile Layout
- File Listing
- Metadata Report (this report)

Project Report

Safety: No safety Incidents were reported during the project.

Acquisition: Airborne Laser Scanner (ALS) data was acquired from a fixed wing aircraft.

Ground Support: GPS base station data was provided by Global Surveys Ltd and LINZ base stations. The ground check points were 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 Waka Kotahi NZ Transport Agency.

Project Contacts:

LINZ Response Manager: Susan Shaw (Ph. 027 777 6222)
 Aerial Surveys Technical & Sales: Dave Froggatt (Ph. (09) 547 0099)

Data Acquisition

The project area is that shown in the shapefile 'LiDARMetadata_TasmanFloods2022_SH Hira-RaiValley_SH6-OkiwiBay_Pgrm3075.shp' that accompanies the dataset. A map showing this area of interest is included in Appendix A.

Capture Dates

The LiDAR survey was captured on the following dates:
 23-24 August 2022, 6 September 2022

LiDAR survey was collected using Aerial Surveys Optech Galaxy PRIME system.

Survey Specification:

- Scanner: Optech Galaxy PRIME
- Flying Height: 1,950 m AMGL
- Scan Angle FOV: 56 degrees
- Scan Frequency: 53 Hz
- Pulse Rate: 400 kHz
- Swath Overlap: 45%
- Swath Points Per M²: 2.8

Sounds Surveying Ltd field surveyed check sites that were used to verify the accuracy of the processed ground dataset.

Data Processing

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

Base Station : PPRTX

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.

StDev_DZ	Mean_DZ	RMSE_DZ	CI95_DZ
0.041	0.003	0.041	0.08

LiDAR is relative to the control check points.

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 land cover and terrain.

Product Deliverables

All spatial data for this project provided in terms of New Zealand Transverse Mercator 2000 (NZTM2000) horizontal and New Zealand Vertical Datum (NZVD2016). The data was converted from NZGD2000 ellipsoidal heights into the orthometric height system using the LINZ NZGeoid16 separation model. The products are tiled into NZTopo50 map sheet tiles as noted below.

The following details the folder contents:

- AOI: Extent is the limit of the project area
This dataset is supplied in SHP format
- Unclassified Raw Point Cloud: Contains the unclassified LiDAR point cloud points as they were prior to being classified
This dataset is supplied in ASPRS LAS v1.4 format
- Classified Point Cloud: Contains the LiDAR point cloud points that have been classified
This dataset is supplied in ASPRS LAS v1.4 format

Surface Type	Classification	Point Class
Raw	1	Unclassified
Ground	2	Ground
Above Ground	3	Low Vegetation
Above Ground	4	Medium Vegetation
Above Ground	5	High Vegetation
Above Ground	6	Buildings
Above Ground	7	Low Noise
Above Ground	9	Water
Above Ground	18	High Noise

- Gridded DEM: Contains the gridded ground surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Gridded DSM: Contains the gridded top of surface (1 m separation grid)
This dataset is supplied in GeoTIFF format
- Tile Layout: Tiles is the tile layout for the project area
Tile size 1:1,000 sheet layout (480 m x 720 m)
Tile dataset is supplied in SHP format and DXF
- File Listing: Supplied in TXT format
- Metadata Report: Supplied in PDF format

All digital data supplied via digital upload. Data was supplied to Susan Shaw, LINZ on 17/10/2022. If you have requirements for the data in other file formats, map projections please contact Aerial Surveys.

License/Copyright

All copyright and other intellectual property rights ('Rights') in the products delivered to Waka Kotahi NZ Transport Agency are jointly owned. Waka Kotahi NZ Transport Agency and Aerial Surveys Ltd grant each other an unrestricted royalty free license to use the Rights in such products for any purpose. 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.

