Data Supply Metadata s1

Project	Alpine Fault Franz LiDAR	10.074
Client	GNS Science	
Client Contact	Rob Langridge	

Summary of Data	NZ Aerial Mapping (NZAM) collected LiDAR sensor data over the Franz area of interest totalling approx 66 sq km. The data was processed into various digital map data products. The products included in this data supply are: • Project extent data • DTM point cloud • Above ground point cloud • Unclassified point cloud • Contours • Orthophotos • Metadata file Please refer to the report section *Product Generation and Data Supply* for details on these products.

Data Acquisition	The project area is that shown in the ESRI Shape file *"Extents"* that accompanies the dataset. A map showing this area of interest is included in Appendix A. LiDAR and digital imagery was collected on 07th and 08th July 2010, using NZ Aerial Mapping's Optech ALTM 3100EA LiDAR system and Rollei AIC medium format digital camera. The data was collected flying 1,200 metres above the ground, and using a field of view of 19.5 degrees either side of nadir. The system PRF was set at 70kHZ. The LINZ geodetic reference mark B8C9 was used for the collection of GPS receiver station data during the aerial data acquisition. Independent of the aerial survey work, GNS provided field survey data, to be later 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. This work was all undertaken in NZGD2000 coordinate system using the data collected at the geodetic reference mark for the DGPS processing. The POS data was combined with the LiDAR range files and used to generate LiDAR point clouds in New Zealand Transverse Mercator (NZTM) map projection but NZGD2000 ellipsoidal heights. This process was undertaken using Optech DASHMap 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 point cloud data was then classified into ground, first and, intermediate returns using automated routines tailored to the project landcover and terrain. At the outset of the project it was discussed that we would classify the ground points on a strip by strip basis so the impact of point density on modelling accuracy could be studied. However, we found that the individual strips had an inadequate number of points on the ground for the algorithms to work successfully. So, the entire dataset was processed through the automated routine. These, and subsequent steps were undertaken using TerraSolid LiDAR processing software modules TerraScan, TerraPhoto and TerraModeler. The Rollei camera images were developed into 8 bit per channel uncompressed TIFF format images. The LiDAR POS data was transformed for use with the camera, and this data was used with the automated classified ground LiDAR point cloud data to produce orthophotos with a ground sample distance of 0.2m. Comprehensive manual editing of the LiDAR point cloud data was undertaken to increase the quality of the automatically classified ground point dataset. This editing involved visually checking over the data and changing the classification of points into and out of the ground point dataset. Attention was particularly focused on areas of vegetation. The Rollei orthophotos were used as a backdrop when undertaking the manual editing. The height accuracy of the ground classified LiDAR points was checked using the field survey data provided by GNS. This was done by calculating height difference statistics between a TIN of the LIDAR ground points and the survey data. The standard deviation statistic is +/-0.10 m. The positional accuracy of the LiDAR data has been checked by overlaying the GNS surveyed data over the LIDAR data displayed coded by intensity. The data was found to fit well in position.

Product Generation & Data Supply	The supplied products are all in terms of NZTM, and Lyttleton 1937 vertical datum. The dataset has been tiled in 1:2000 NZ Topo50 map sheets The folder *Ground* contains the LiDAR point cloud points that have been classified as ground returns as well as supplementary points added to the dataset. This dataset is in ASCII XYZ (mE mN O) file format. The folder *Above Ground* contains the LiDAR point cloud points that have been identified as having elevations greater than the points in the DTM dataset. This dataset is in ASCII XYZ (mE mN O) file format. The folder *Unclassified* contains all the LiDAR point cloud points that were collected by the LiDAR sensor. This dataset is in LAS 1.1 file format. Every point is in class 0, unclassified. The folder *Othophotos* contains the 0.2m GSD orthophotos. The Rollei AIC camera is a semi-metric camera and so the orthophotos are subject to mismatches at photo stitch seam lines. The quality of the photography varies with some of the data acquisition having taken place under very low light conditions. This is evident in the orthophotos where sections of the imagery have a blurred appearance. The folder *Contours* contains 0.5m contour interval contours. The contours were interpolated from a TIN created using LiDAR point cloud dataset. The 2.5m interval contours have been assigned to level INDEX. The rest of the contours in level INTERMEDIATE. This data is provided in ESRI Shape file format. If you have requirements for the data in other file formats, map projections please contact NZAM. Our contact details are provided below.

Exceptions	No exceptions with the dataset have been noted.

Supplier	NZ Aerial Mapping Ltd
Address	208 Warren Street PO Box 6 Hastings 4158 New Zealand
Phone	64-6-873 7550
Supplier Contact	Tim Farrier (tim.farrier@nzam.com)

Date of Metadata Creation	26 August 2010
Author	George Jacob

Appendix A: Project Area and data tile layouts

Area of interest shown as red outline.

Alpine Fault Franz LiDAR