Data Supply Metadata s10

Project	5 September 2010 Earthquake	10.130
Sub Area	Christchurch City	
Client	Canterbury Regional Council	
Client Contact	Maurice Wills	

Summary of Data	This dataset is the tenth of a series that NZ Aerial Mapping (NZAM) has produced in response to the recent earthquake in Canterbury. This dataset contains 1-dimension difference models created by subtracting pre- and post-earthquake LiDAR based DEM from one another. The data supply includes the following products: • Project extent data • 1-dimension difference models Please refer to the report section *Data Supply* for details on these products.

Product Generation & Usage	The difference models have been created over the areas described in the ESRI shape file *"Differencing_AOIs"* that accompanies the dataset. A map showing these areas of interest is included in Appendix A. Three pre-earthquake LiDAR based datasets and the post-earthquake LiDAR dataset were used to create these products. The post-earthquake dataset has been described in earlier data supplies in this series. The three pre-earthquake datasets used are listed in the table below.

Title	Description
Christchurch City Council 2003 (CCC 2003)	Thinned ground classified LiDAR points, produced by AAMHatch. Data Courtesy of AAM. Copyright AAM.
Waimakariri District Council and Environment Canterbury 2005 (WDC & ECAN 2005)	2m GRID DEM, produced by AAMHatch. Data Courtesy of AAM. Copyright AAM.
Environment Canterbury 2010 (ECAN 2010)	Ground classified LiDAR points, produced by NZAM. Shared copyright Environment Canterbury	NZAM

Product Generation & Usage continued	The CCC 2003 and WDC & ECAN 2005 data were made available to NZAM. Metadata on the pre-earthquake datasets are available from the local government bodies and data suppliers.
	The same production processes were followed for all of the areas where differencing products have been created.
	As both the CCC 2003 and WDC & ECAN 2005 datasets were supplied in New Zealand Map Grid (NZMG) map projection this data was reprojected into New Zealand Transverse Mercator (NZTM) map projection. The LINZ distortion model was used for the datum transformation.
	1m GRID DEM were created by interpolating values from TIN produced using the input pre- and post-earthquake datasets. These DEM were created in NZTopo50 1:1,000 map tiles. For each tile the post-earthquake DEM was subtracted from the pre-earthquake DEM to create difference surfaces.
	All four datasets used in the processing have been converted into Lyttleton Vertical Datum 1937. The separation models used for the conversion of the datasets from ellipsoidal heights to orthometric heights varies from dataset to dataset. The three difference models used are listed in the table below.

Title	Description
Christchurch City Council 2003 (CCC 2003)	Project specific
Waimakariri District Council and Environment Canterbury 2005 (WDC & ECAN 2005)	Project specific.
Environment Canterbury 2010 (ECAN 2010)	LINZ NZGeiod09
5 September 2010 Earthquake LiDAR	LINZ NZGeiod09

Considerable professional judgement is required when using the difference products. Consideration needs to be made for landuse and landcover changes that have occurred between the pre- and post-earthquake datasets. Aerial photography was taken at the same time that the post-earthquake LiDAR dataset was collected and this can be used to view the current landuse and cover. Pre-earthquake photography, may also be available. Consideration also needs to be made for the accuracies of data and processing techniques used to create the input datasets. NZAM also consider that field validation of output is a prerequisite of use.

Product Generation & Usage continued	The post-earthquake datasets have been brought into terms of NZGD2000 and Lyttleton Vertical Datum 1937, using the best available definition of these in the post 5 September earthquake situation of continued earthquakes and earth deformations. The quality of the differencing models that make use of the CCC 2003 dataset could likely be improved if the full ground classified, rather than thinned ground classified dataset was made available. Differences in output would also be expected if the project specific separation models used for the CCC 2003 and WDC & ECAN 2005 were available. These could be applied in reverse and then NZGeiod09 applied to help minimise this error source in the difference models.

Data Supply	The supplied products are all in terms of New Zealand Transverse Mercator (NZTM) map projection. The products are in NZTopo50 1:1,000 tiles. The ESRI shape file *"Differencing_tiles"* that accompanies the dataset contains this tile layout.
	
	The data is loading into a number of folders. The products for each of the project areas are in a folder named with the areas. The area named are based on
	
	   ⊟ 📁 LIDAR DIFFERENCING
	      ⊞ 📁 CHRISTCHURCH
	      ⊞ 📁 HORNBY-HALSWELL
	      ⊞ 📁 KAIAPOI
	      ⊞ 📁 LAYOUT
	      ⊞ 📁 SELWYN HUTS
	
	The models are all in ESRI ASCII GRD file format. The grid spacing is 1m and the void data value -99.
	
	If you have requirements for the data in other file formats, map projections please contact NZAM.

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Appendix A: Project Area and data tile layouts

Areas of interest shown as purple outline. Areas labelled with pre earthquake data source.

Differencing models