River Basin LIDAR – Note on datasets

River Basin LIDAR

The data was acquired over a ten year period to aid studies on flooding. Approximately 14% of Northern Ireland is covered. The data is provided "as is" as per the Opendata licence and is not supported.

LIDAR

LIDAR (**LI**ght **D**etection **A**nd **R**anging) is a system which uses lasers to measure the distance between (in this case) an aircraft and the ground. The resultant cloud of distances is processed to produce a regular grid of cells (typically 1m x1m), each with a mean sea level elevation at the centre. Further processing removes, if required, vegetation cover, vehicles and buildings to produce a grid of heights which represent 'terrain'. This is 'stripped' LIDAR which is known as a Digital Terrain Model (DTM). When the data is 'unstripped', a Digital Surface Model (DSM) is created which includes the tops of vegetation cover, vehicles and buildings.

LIDAR Coverage

The 69 areas covered are shown in the following (accompanying) files.

- River Basin LIDAR-Coverage Map.pdf - Areas by name and year
- River Basin_LIDAR-Coverage.shp - Areas by name and year
- River Basin_LIDAR_Grid Index Map.pdf – 1km square reference grid
- River Basin_LIDAR_Grid_Index.shp - 1km square reference grid

Note: No data is available for the city of Belfast due to copyright constraints.

LIDAR Currency

Datasets were collected between 2004 and 2014. **There are no plans to update the data.**

LIDAR Elevation Accuracy

The elevation accuracy quoted by the industry is +-0.15m RMSE (Root mean square error). A small sample of comparisons between LIDAR & GPS derived heights in hard standing (e.g. tarmac) open areas has yielded differences in the range of 0.05cm to 0.10cm. DTM accuracy is reduced in areas with tree cover and steep terrain. These figures provide a general guide. They do not define or represent the accuracy of the data provided.

LIDAR coordinate system

Position is expressed in Irish Grid coordinates. Elevations are w.r.t. Mean Sea Level Belfast.

LIDAR data formats

The majority of data, (DSM or DTM) is provided in **ASCII raster** file format.

ncols 1000 *(number of columns)*
nrows 1000 *(number of rows)*
xllcorner 282000 *(eastings in metres)*
yllcorner 398000 *(northings in metres)*
cellsize 1 *(in metres)*
NODATA_value -9999 *(the value in the file when there is no data)*
58.21 58.22 58.25 58.25 58.23 58.22 58.26 58.22 58.23 58.22 58.22 58.2 58.21 58.24 58.23 58.19 58.16 58.17 58.16 58.16 58.14 58.13 58.13 58.1 58.13 58.13 58.15 58.16 58.12 58.1 58.08 58.06
(list of elevations in metres)

Other formats provided include:
CSV – simple list of east, north, height as text.
GRD - format as ASCII raster.
XYZ - simple list of east, north height as text.

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LIDAR data ~ directory structure

Select the area you require from the index map '**River Basin LIDAR-Coverage Map.pdf'.**
Download the zip file covering the area. The file contains the following:

AreaName_ddmmyyy.zip (the date quoted is the day the data was collected)

DSM_1m – Contains all the ASCII raster files covering the area
DTM_1m - Contains all the ASCII raster files covering the area
***Point_Clouds** – DSM data (2009 also has DTM),), the 'raw' data.
Notes – Index maps in pdf, shp format, + these notes.

*The point cloud data is DSM (2009 also has DTM), pre formatting to 1m cells. It is a list of points with elevation at an irregular spacing, in some cases down to 0.2m. The data set is up to 20 times larger than the ASCII raster 1m sets, containing much more height information. This data is only available for the data acquired in 2009 & 2010 (27 of the 69 datasets).
Note: If a subdirectory is not included then the data is not available.

LIDAR data ~ Notes on datasets.

2004 6 datasets. All in ASCII raster format. 1m cells. No point clouds available.

2007 6 datasets. DSM = GRD, DTM = ASCII format. 0.5m cells. No point clouds available.

2008 1 dataset. All in ASCII raster format. 1m cells. No point clouds available.

2009 7 datasets. DSM/DTM in ASCII raster format. 1m cells. Point clouds .csv (DEM/DTM).

2010 20 datasets. DSM 1m not available. DTM in ASCII raster format. 1m cells. Point cloud data in .xyz format.

2012 22 datasets. All in ASCII raster format. 1m cells. No point clouds available.

2013 2 datasets. All in ASCII raster format. 1m cells. No point clouds available.

2014 5 datasets. All in ASCII raster format. 1m cells. No point clouds available.

END
April 2016