

Geospatial Modeling & Visualization

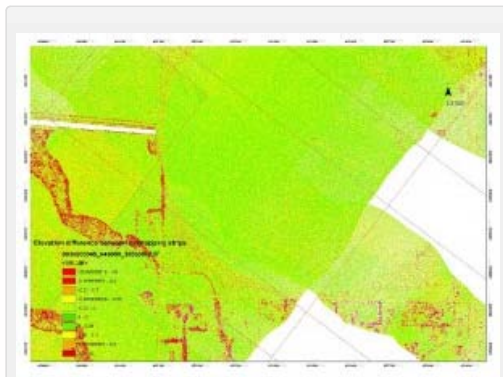
A Method Store for Advanced Survey and Modeling Technologies

GMV Geophysics GPS Modeling Digital Photogrammetry 3D Scanning Equipment Data and Projects by Region

ALS Processing: Data Management

ALS data

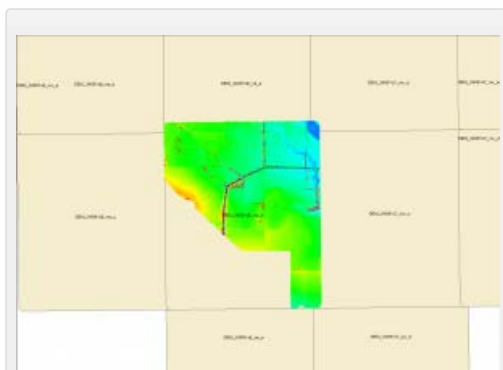
ALS data is often collected in strips, with each strip representing an individual flightline. Typical ALS surveys have at least 20% overlap between adjacent flightlines and a few cross-strips where data is collected at an orientation perpendicular to that used for the main survey, improving accuracy.



A tie strip can be seen here overlapping with two flightlines.

Tile Schemes

Because ALS datasets are usually very large, they are often divided into regularly sized tiles. These tiling schemes can help with the speed of data loading, and allow users to load areas of the dataset selectively for processing or analysis.



Tiles represent .las file locations, one file is loaded. Note that the tiles are regular rectangles, and don't always exactly match the extents of the .las file.

LP360 tiling tools

LP360, like most ALS software, provides tools to perform the tiling task. Typical tile sizes include 0.5x0.5km or 1x1km tiles. The naming convention for the tiles should follow a sensible progression, for example reflecting official map grid designations for the area, or following an east to west progressive sequence across the survey area.



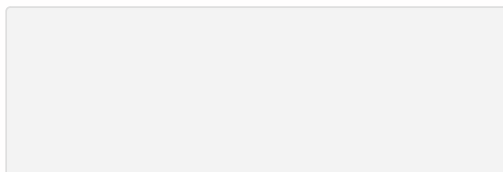
Creating Footprints

A vector file containing the footprints for each tile, designating the area covered and linking to the .las file or derived terrain models, are a common way of efficiently representing the ALS dataset in a GIS environment. Using LP360, individual files or groups of files can be loaded by selecting their footprints.



Metadata

Metadata for ALS is typically generated for the entire survey, rather than per tile. This project level metadata is usually stored in a long form report. That said, some metadata will be stored in the .las header for each tile. Attributes including the total number of points in the file, whether or not it has been classified, and the software used to process the data are typical items found in the header. Further, non-standard, metadata can be stored as a series of attributes in the vector footprint for each .las tile.



2 GROUND CONTROL SURVEY

2.1 GPS Control Network

The GPS control network consists of six (6) NGS monuments (CABELPORT, R.124, M.110, M.111, P.100 & S.177), five (4) NGS CORRS (ARST, ARSP, ARSL & M205), and one (1) set point (TA.1) established within the south west project boundary. The network occupations ran from from 17 December 2010 through 26 January 2011.

Table 1 below shows the control network point information.

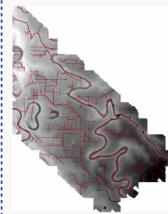
PG#	Name	Latitude (m)	Longitude (m)	Elev. (m)	Proj_Order	Elev_Order	Elev_Class
040993	ARST	32 42 25.2200	91 37 42.7200		A		
040995	ARSP	32 41 42.7700	91 38 01.9200		A		
040997	ARSL	34 40 21.4400	92 22 37.1800		A		
E40112	CABELPORT	34 40 36.7200	91 40 40.0000	79.8	1		
E40106	R.124	34 36 45.0000	91 38 16.0000	82.17	8	2	3
E40102	M.110	34 39 27.0000	91 38 51.0000	84.878		1	2
E40104	M.111	34 39 14	91 31 48	85.930		1	2
D10007	M205	34 38 32.0000	90 41 24.0000		A		
E40107	P.100	34 38 06	91 22 03	85.336		1	2
E40105	S.177	34 35 22	91 28 25	83.282		1	2
NA	TA.1	34 24 23.5	91 54 54.4				

Figure 1: University of Arkansas Control Network Point Information.
 A graphical representation of the Control Network is provided below in Figure 1.

Project level metadata provided by the vendor, Aeroquest, provides important information about the survey.

laz compression

The ASPRS standard .las format is commonly used for storing ALS data. The compressed .laz format is also useful, particularly for the datasets which are being archived. Data can be converted from .las to .laz (and back) using [LASzip](#).



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Please cite this document as: **Opitz, Rachel. 2013. ALS Processing: Data Management.** CAST Technical Publications Series. Number 11903. <http://gm.v.cast.uark.edu/scanning/airborne-laser-scanning/als-software/als-processing-data-management/>. [Date accessed: 27 April 2013]. [Last Updated: 18 January 2013]. *Disclaimer: All logos and trademarks remain the property of their respective owners.*