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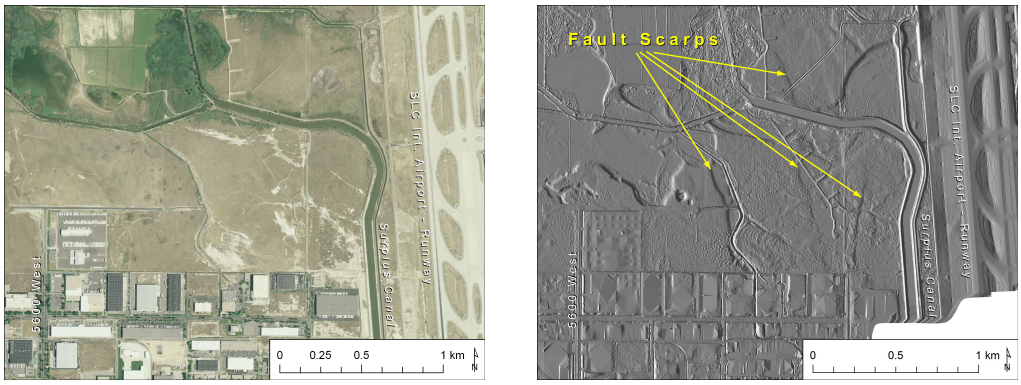
LiDAR Elevation Data

Light detection and ranging (LiDAR) is a technique of transmitting laser pulses and measuring the reflected returns to measure the distance to an object or surface. LiDAR is commonly used to determine ground surface elevations to create highly accurate, bare-earth digital elevation models (DEM).

As a LiDAR instrument can send pulses at a rapid rate, a high-point spacing density (e.g. several returns per square meter) is possible; much greater than would be possible by traditional surveying methods. Landslides, fault scarps, and other features that are difficult to detect visually because of vegetation, access, or other issues, may often be clearly shown in LiDAR data.



Comparison of 2009 High-Resolution Orthophotography (HRO) 1-foot color imagery (left) and 2011 UGS 1-meter airborne LiDAR imagery (right) near the International Center area, Salt Lake City, Utah; Salt Lake International Airport visible to the right on each image. Yellow arrows indicate east-facing fault scarps on the Grainger fault, West Valley fault zone that are clearly visible in the LiDAR imagery, but barely visible to undetectable in the HRO imagery.

The Utah Geological Survey (UGS) acquires LiDAR data with its partners in support of various geologic mapping and research projects. In 2011, approximately 1902 square miles (4927 km2) of 1 meter LiDAR data was acquired for the Cedar and Parowan Valleys, Great Salt Lake shoreline/wetland areas, Hurricane fault zone, Lowry Water, Ogden Valley, and North Ogden, Utah.

The datasets include raw LAS (industry standard LiDAR format), LAS, DEM, digital surface model (DSM), and metadata (XML metadata, project tile indexes, and area completion reports) files.

These datasets were funded by the UGS, with the exception of the Great Salt Lake area, which was funded by the U.S. Environmental Protection Agency and the UGS, and the North Ogden area, which was funded by the Utah Division of Emergency Management, Floodplain Management Program.

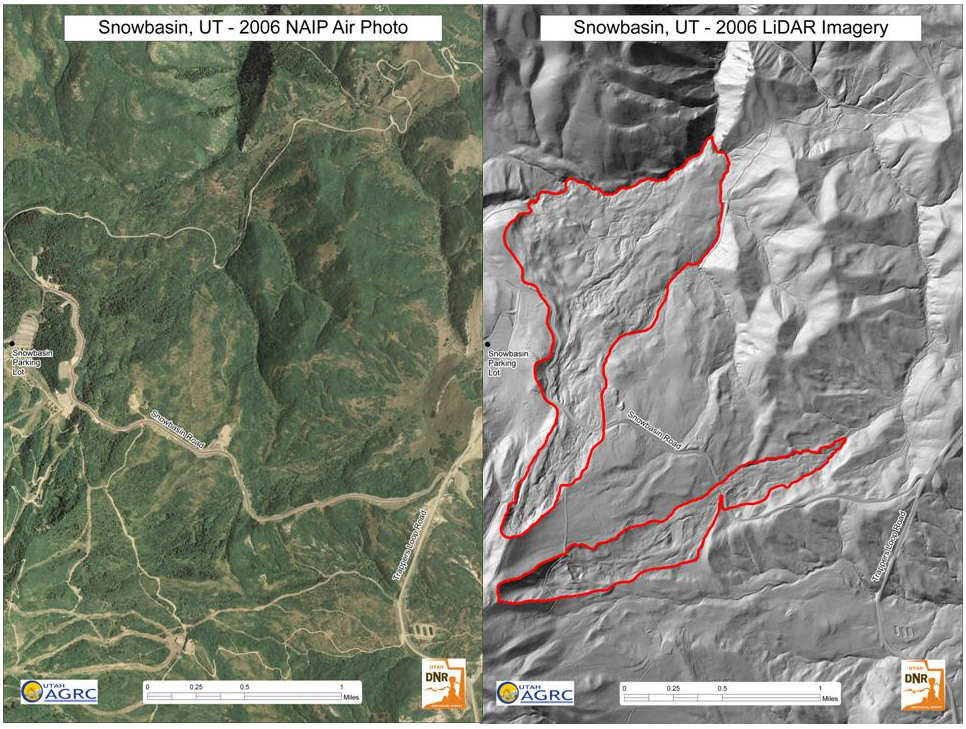
LiDAR acquisition was performed by Utah State University, LASSI Service Center through a partnership with the Utah Automated Geographic Reference Center (AGRC) and the UGS.

Available UGS LiDAR Data

This LiDAR data is available from the AGRC Raster Data Discovery Application (DEM data and metadata only), is included in the U.S. Geological Survey National Elevation Dataset that is part of The National Map (DEM data and metadata only), and OpenTopography (all data and metadata), a National Science Foundation supported portal to high-resolution topography data and tools. LiDAR data is not directly viewable without suitable software, such as Global Mapper, 3DEM, and ESRI ArcGIS.

The datasets acquired by the UGS and its partners are in the public domain and can be freely distributed with proper credit to the UGS and its partners.

2011 Acquisition	Area mi^2	Extent/Tile Index (pdf)	Report (pdf)	Metadata (zip)
Cedar and Parowan Valleys	498	CV_TileIndex.pdf	LiDAR_Report.pdf	CV_Metadata.zip
Great Salt Lake Shoreline/Wetlands (Bear River, Middle, North, South, and Tooele areas)	1147	GSL_TileIndex.pdf	GSL_Report.pdf	GSL_Metadata.zip
Hurricane Fault Zone	36	HFZ_TileIndex.pdf	LiDAR_Report.pdf	HFZ_Metadata.zip
Lowry Water	59	LW_TileIndex.pdf	LiDAR_Report.pdf	LW_Metadata.zip
North Ogden	103	NO_TileIndex.pdf	NO_Report.pdf	NO_Metadata.zip
Ogden Valley	59	OV_TileIndex.pdf	LiDAR_Report.pdf	OV_Metadata.zip



Comparison of 2006 National Agriculture Imagery Program (NAIP) 1-meter color orthophoto imagery (left) and 2006 2-meter airborne LiDAR imagery (right) in the Snowbasin area, Weber County, Utah. Red lines outline the Green Pond and Bear Wallow landslides that are clearly visible in the LiDAR imagery, but barely visible to undetectable in the NAIP imagery.