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 <abstract>LIDAR data is remotely sensed high-resolution elevation data collected by an airborne collection platform. Using a combination of laser range finding, GPS positioning and inertial measurement technologies; LIDAR instruments are able to make highly detailed Digital Elevation Models (DEM) of the earth's terrain, man-made structures and vegetation. This data was collected at a resolution to aid in coastal management decisions including flood plain analysis and mapping.</abstract>

 <purpose>LIDAR data is used for 3D visualization, elevation based analysis and for feature extraction.</purpose>

 <supplinf>Reflective surface data represents the DEM created by laser energy reflected from the first surface encountered by the laser pulse. Some energy may continue beyond this initial surface to be reflected by a subsequent surface as represented by the Last Return data. Intensity information is captured from the Reflective Surface pulse and indicates the relative energy returned to the sensor as compared to the energy transmitted. The Intensity image is not calibrated or normalized but indicates differences in energy absorption due to the interaction of the surface materials with laser energy at the wavelength transmitted by the sensor. Points are classified as water, bare ground or not bare ground to support creation of a bare earth model from the data.</supplinf>

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 <useconst>Any conclusions drawn from analysis of this information are not the responsibility of Sanborn Map Company. Users should be aware that temporal changes may have occurred since this data set was collected and some parts of this data may no longer represent actual surface conditions. Users should not use this data for critical applications without a full awareness of its limitations.</useconst>

 <ptcontac>

 <cntinfo>

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 <logic>All LAS formatted LIDAR data are validated using commercial GIS software to ensure proper formatting and loading before delivery. This validation procedure ensures that data on delivery media is in correct physical format and is readable.</logic>

 <complete>LIDAR raster data is visually inspected for completeness to ensure that any gaps between flight lines or loss of signal represents less than 5% of required collection area. LIDAR is self-illuminating and has minimal cloud penetration capability. Water vapor in steam plumes or particulates in smoke may cause reflection of LIDAR signals and loss of elevation information beneath these plumes. Glass structures and roofs may appear transparent to the LIDAR signal and therefore may not register on the reflective surface. Some asphalt formulations have been shown to absorb topographic LIDAR wavelength energy resulting in "pitting" of roof surfaces using this material.</complete>

 <posacc>

 <horizpa>

 <horizpar>Data collected is at a horzontal accuracy of 1 meter (RMSE) or better.</horizpar>

 </horizpa>

 <vertacc>

 <vertaccr>LiDAR data accuracy determination shall employ the National Standard for Spatial Data Accuracy (NSSDA). Contracted to meet 18.5cm (RMSE) on open bare terrain and 37.0 cm (RMSE) in obscured "vetetative" areas at the 95 percent confidence level for data tested by an independent source of higher accuracy.</vertaccr>

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 <procdesc>Data Collection: Using an Leica Geosystems ALS50 Laser Systems, flight lines with a nominal point spacing = 1.4 meters (4.59 feet) were collected over Minnehaha County, SD (approximately 814 square miles). Multiple returns were recorded for each laser pulse along with an intensity value for each return. The data acquisition occurred in missions on May 13, 2008 and May 23, 2008. During the LIDAR campaign, the field crew conducted a GPS field survey to establish final coordinates of the ground base stations for final processing of the base-remote GPS solutions. Maximum baseline lengths was recorded at a distance of 54.5 km with the average differential baseline length was 23.0 km.</procdesc>

 <procdate>200805</procdate>

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 <procdesc>Airborne GPS Processing: Airborne GPS data was differentially processed and integrated with the post processed IMU data to derive a smoothed best estimate of trajectory (SBET). The SBET was used to reduce the LiDAR slant range measurements to a raw reflective surface for each flight line. The overlap between flight lines was removed to provide a homogeneous coverage, and the coverage was classified to extract a bare earth digital elevation model (DEM). Airborne GPS is differentially processed using the GrafNAV V7.50 software by Waypoint Consulting of Calgary, Alberta, Canada. The PDOP and distance separation is as follows: IMU data is processed using the PosPac V4.2 software by Applanix Corporation of Richmond Hill, Ontario, Canada. The reflective surface is derived using the ALS Post Processor software by Leica Geosystems GIS &amp; Mapping Division of Atlanta, Georgia. The classification and quality control (QC) of LiDAR data is carried out using TerraScan software by Terrasolid Limited of Helsinki, Finland.</procdesc>

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 <procdesc>LIDAR Ground Point Classification: The classification and quality control (QC) of LiDAR Ground point class is carried out using TerraScan software by Terrasolid Limited of Helsinki, Finland. In the filtering process points are classified as Default (1), Ground (2), or Water (9).</procdesc>

 <procdate>200808</procdate>

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 <procdesc>Output: LAS Files LIDAR points in 1.0 format</procdesc>

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 <resdesc> The data are being provided on an 'as is' basis. The USGS specifically

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 to, the implied warranties or merchantability and fitness for a particular

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 arising out of the use of these data even if the USGS has been advised of the

 possibility of such damages. All data are intended for resource management use.

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 <distliab> Translation of files to formats other than those described here is the sole responsibility

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 on a computer system at the USGS, no warranty expressed or implied is made by the USGS

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 <cntorg>U.S. Geological Survey</cntorg>

 <cntper>EROS Customer Services</cntper>

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 <address>U.S. Geological Survey</address>

 <address>EROS Data Center</address>

 <address>47914 252nd Street</address>

 <city>Sioux Falls</city>

 <state>SD</state>

 <postal>57198-0001</postal>

 <country>US</country>

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 <cntvoice>1-800-252-4547</cntvoice>

 <cnttdd>1-605-594-6933</cnttdd>

 <cntfax>1-605-594-6589</cntfax>

 <cntemail>custserv@usgs.gov</cntemail>

 <hours>Monday through Friday 8:00 AM to 4:00 PM (Central Time)</hours>

 <cntinst> The above is the contact information for EROS Data Center in

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 <cntorg>Sanborn Map Company</cntorg>

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