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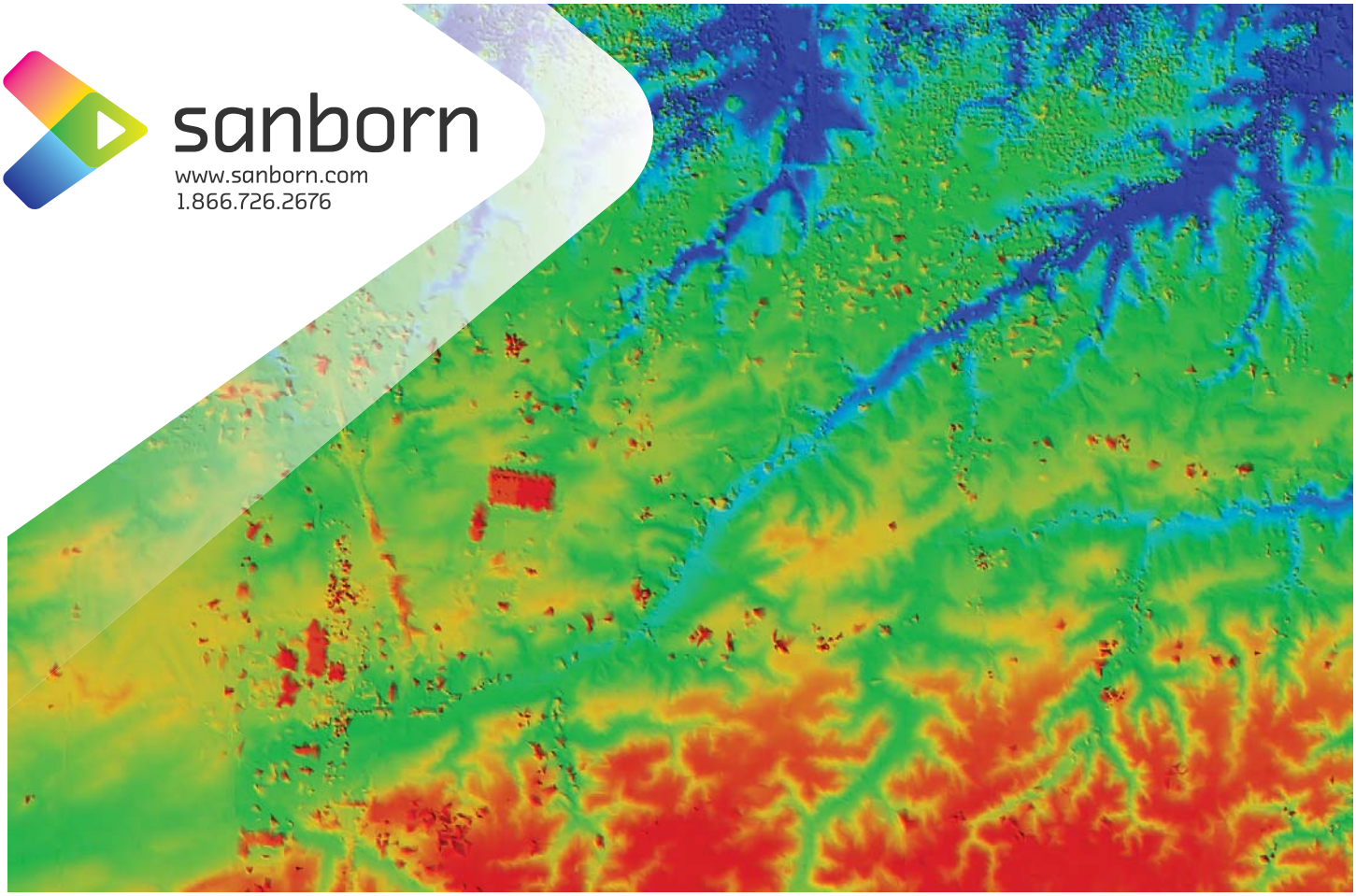

LiDAR Products and Services

USGS Compliant LiDAR Products and Services

Aerial LiDAR (Light Detection and Ranging) is a mapping technology which uses reflected laser returns from the earth's surface to an aircraft with on-board laser scanner, GPS and IMU sensors to determine the precise elevation and geospatial location of the terrain, vegetation, and features. With innovations such as Multiple-Pulse in Air (MPiA) technology and increased pulse repetition rates, LiDAR is an accurate and cost-effective method for creating three-dimensional topographical aerial maps and highly accurate surveys of both surface terrain elements and man made structures.

Aerial LiDAR is used in a variety of industries, including geography, forestry, oceanography, and emergency management. Sanborn delivers LiDAR data that complies with USGS LiDAR Base Specification Version 1.0. Options are available for varying densities, from 1.4m to 0.35m (USGS Quality Level 1) Nominal Point Spacing (NPS). In addition, Sanborn LiDAR data can be further enhanced with breaklines to create hydro enforced Digital Terrain Models (DTMs).

Sanborn LiDAR systems are calibrated and accuracy is verified before commencing any project. In addition, a calibration flight is conducted at the beginning and end of every mission.

LiDAR Applications Include:

- 3-D modeling
- Floodplain mapping and planning
- Disaster management
- Coastal erosion and nautical charting
- Airport mapping / aviation safety
- Forestry
- Land use mapping and planning
- Volumetric studies
- Utilities / transmission line corridor mapping

LiDAR Deliverables Include:

- USGS LiDAR Base Specification Version 1.0. *Options available for varying densities, from 1.4m to 0.35m (USGS Quality Level 1) Nominal Point Spacing (NPS).*
- Metadata, raw point cloud
- Classified point cloud
- Bare earth DEM, and breaklines

Advantages of LiDAR data collection systems compared to aerial imagery/photogrammetry include:

- Rapid collection of elevation data
- Dense pattern of points
- Highly accurate elevation data points
- Less weather-dependent flight operations than aerial imagery
- Direct generation of Digital Surface Model elevation data

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LiDAR Products and Services, continued

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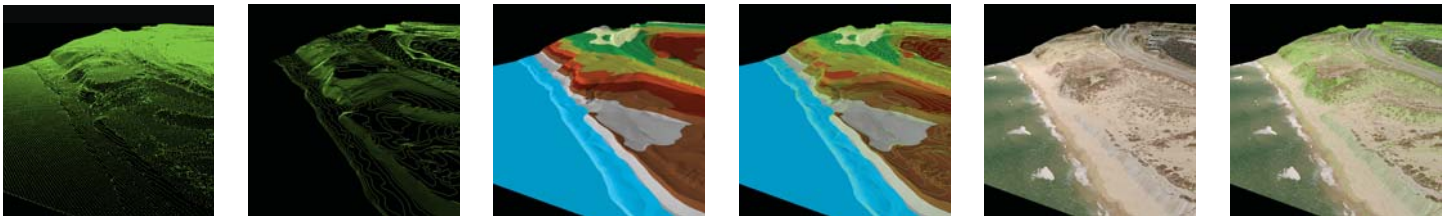


Above: Sanborn LiDAR data showing contours, TIN (Triangular Irregular Network) and 3D drape with orthophoto imagery.

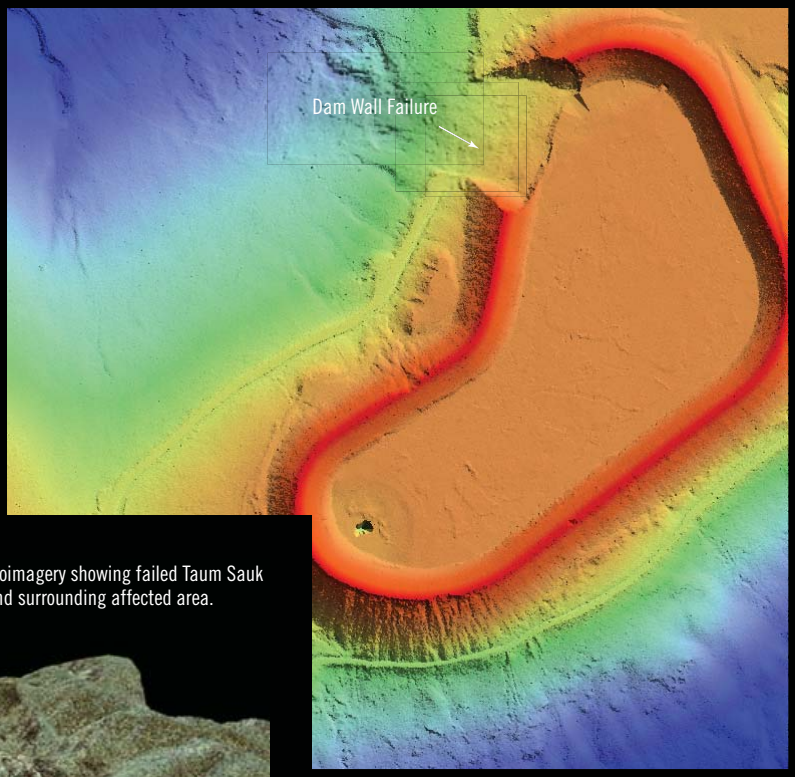
Sanborn LiDAR Case Study

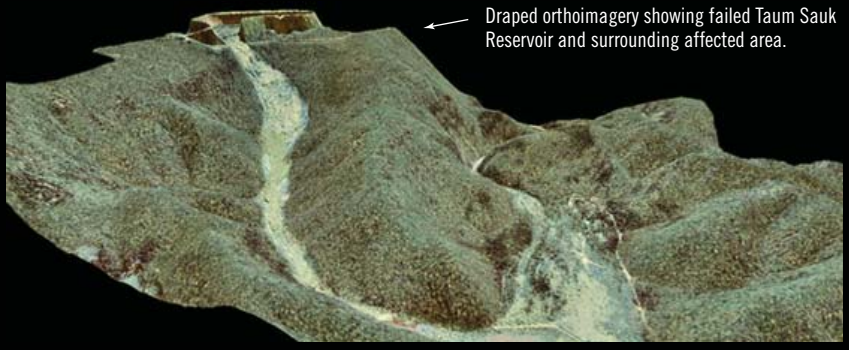
Cresting water at the AmerenUE's Taum Sauk Upper Storage Facility caused a massive dam failure during the pre-dawn hours of December 14th 2005. More than a billion gallons of water rushed down Proffit Mountain and overwhelmed the east fork of the Black River and the lower ground of Johnson's Shut-Ins State Park. The water swept the park superintendent's home, along with his family, a quarter-mile away and caused damage to several vehicles that were brushed off of a local highway into an adjacent field. According to calculations, the flow of water at the time would have been nearly 150,000 cubic feet per second, which is nearly equivalent to the rate water travels over Niagara Falls.

Taum Sauk Reservoir Dam Failure

Orthoimagery of failed Taum Sauk Reservoir

LiDAR imagery of failed Taum Sauk Reservoir





Draped orthoimagery showing failed Taum Sauk Reservoir and surrounding affected area.

About Sanborn

Sanborn is a 21st century industry leader in geospatial solutions and technology, offering superior services, program management, and customer support.

For our clients we provide a national presence, extensive resources, quick responses, and exceptional value. For over a century, we have been a leader in the rapidly growing geospatial industry, with successful projects delivered worldwide.

For more information, visit us online at **www.sanborn.com,** or call **1.866.726.2676** to speak with a representative.