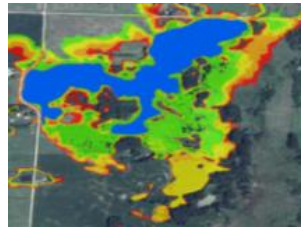
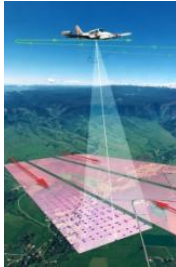


LiDAR Applications Workshop

Ramada in Grand Forks, North Dakota

January 26, 2010

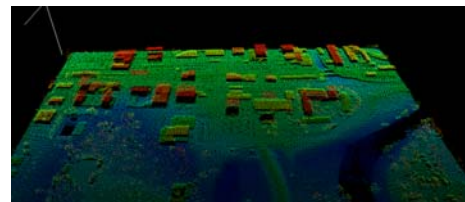
9:30 am – 3:45 pm



In 2008 the International Water Institute initiated the Red River Basin Mapping Initiative – a \$5,000,000 project to acquire and make publically available highly accurate elevation data for the US portion of the Red River Basin. An established but evolving technology called Light Detection and Ranging (LiDAR) was used to acquire elevation data over approximately 50,000 square miles in North Dakota, Minnesota, and South Dakota. LiDAR data collection platforms include lasers, computers, global positions systems, inertial measurement units, and aircraft to collect very accurate elevation data over large land surfaces.

LiDAR data have many applications including precision agriculture, flood plain delineation, flood damage reduction, natural resources enhancement, and soil mapping. This workshop will include opportunities to ask questions to seasoned LiDAR users and network with other resource professionals who are using LiDAR data in their work. Presentation topics include:

- Soil Survey
- Watershed and Floodplain Management
- Precision Agriculture
- Soil Conservation & Water Quality
- Hydrology and Hydraulics Modeling



The workshop is intended and recommended for interested local, state, tribal, and federal resources management professionals, landowners, researchers, students, and elected officials in the Red River of the North Basin (North Dakota, Minnesota, and Manitoba).

The workshop is scheduled for January 26, 2010 at the Ramada Hotel in Grand Forks, ND (1205 North 43rd Street). If you have questions, please email Grit May, IWI Project Specialist, at grit.may@ndsu.edu.

For more information, contact:

Chuck Fritz
Director, International Water Institute
Charles.fritz@ndsu.edu or 701 231 9747

LiDAR Applications Workshop

Preliminary Agenda

9:30 am **Welcome and Introduction**
Chuck Fritz, International Water Institute

9:45 am **Red River Basin Mapping Initiative – LiDAR for the Red River Basin**
Chuck Fritz, International Water Institute

The International Water Institute worked with 15 state, local, and federal partners over a two year period to develop the Red River Basin Mapping Initiative. The project will collect highly accurate elevation data using Light Detection and Ranging (LiDAR) technologies. When completed, the project will serve LiDAR data and elevation products to the general public and land and water managers via the Red River Basin Decision Information Network.

10:00 am **Extracting contours from LiDAR data**
Grit May, International Water Institute

LiDAR data are represented as point clouds, triangulated irregular networks (TIN), or rasters. The presentation will demonstrate how LiDAR products such as digital elevation models and contour lines can be derived -- using ESRI software -- from the original LiDAR information given in the binary LAS format. Common problems related to the visual appearance, accuracy and alignment of contour lines will also be addressed.

10:30 am **Advanced Conservation Planning Tools**
Tom Buman, Agren, Inc.

Agren, Inc. is developing software to increase the speed and accuracy of conservation planning. The new software has tremendous application for conservation planners who work one-on-one with landowners. Within a matter of minutes, the conservation planner and landowner can consider various "what if" scenarios, for practices like ponds and wetlands and discuss suitable alternatives.

11:00 am **Break**

11:15 am **Using LiDAR for Engineering Support**
Dave Kirkpatrick, Houston Engineering, Inc.

Now that LiDAR data has become more readily available we will review basic engineering applications that can be streamlined using derived LiDAR products. The focus will be on water resources, including floodplain mapping, development of hydraulic models and determining potential dam site locations. Amongst others Arc Hydro tools are used to create and manipulate hydro features within the ArcGIS environment.

11:45 am **Identifying Critical Portions of the Landscape for Water Quality Protection Using Terrain Analysis**
Adam Birr, MN Department of Agriculture

The Minnesota Department of Agriculture recently funded a project developing tools for natural resource managers utilizing terrain analysis. These tools assist with spatially identifying critical areas within a watershed that are hydrologically connected to surface waters. An overview of these tools and case studies showing their application in the field will be provided.

12:15 pm **Lunch (on your own)**

1:15 pm

Soil Survey Applications of LiDAR Data

Joe Brennan, ND Natural Resources Conservation Service

Historically topography has played a critical role in defining the soil-landscape relationships necessary to perform Soil Survey. LiDAR precisely captures the subtle topographic expression common to the Red River Basin. Using Bare-Earth LiDAR as a base we can better quantify our defined soil-landscape relationships, and more precisely evaluate our existing soil mapping.

1:45 pm

Hydrologically-Conditioned LiDAR Data: Challenges & Opportunities

Sean Vaughn, MN Department of Natural Resources

"Digital dams" primarily created by elevated roads cause problems when using LiDAR data to identify flow connectivity within a watershed. A method will be presented using commands within ArcMap to address this issue at the field or catchment scales with LiDAR data. Future prototyping of methods to address flow connectivity at a watershed scale will also be discussed.

2:15 pm

Break

2:30 pm

LiDAR Application in Precision Agriculture

Shawn Kasprick, J.R. Simplot Co.

Water movement, or lack thereof, can create poor growing conditions. These conditions affect crop growth through saturation and potential nutrient loss. LiDAR allows for mapping of the field surface to correctly identify and manage the locations.

3:00 pm

Strategies for Disseminating LiDAR Data to Different Audiences

Brian Fischer, Houston Engineering, Inc.

LiDAR data is only as useful as the tools available to access the information. This presentation will discuss a range of strategies for developing web based dissemination tools to different users groups such as the public, managers, engineers, and GIS professionals. We will present examples of how the LiDAR is being distributed in other regions. Finally we will pose questions to the workshop audience to drive user feedback on what dissemination tools are needed to help use the data to its full potential.

3:30 pm

Closing Comments/Observations/Discussion

Adjourn