

LiDAR Applications Workshop - March 31, 2010, Fargo, ND

North Dakota State University, Memorial Union, Plains Room

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**
Stan 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.

11:15 am **Break**

11:30 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.

12:00 pm **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.

12:30 pm **Lunch (on your own)**

1:30 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.

2:00 pm **Hydrologically-Conditioned LiDAR Data for Watershed Delineation and Modeling:
Tomorrow's Data / Yesterday's Methods**
Sean Vaughn, MN Department of Natural Resources

Watershed delineation and the hydrologic and hydraulic modeling that occurs within their confines are dependent on proper flow routing within digital elevation models (DEM). However, the elevation of roads and other features captured within LiDAR mass points create "Digital Dams" at intersections with flow paths within LiDAR derived DEMs. We will discuss currently available watershed data and two methods of hydrologically conditioning LiDAR derived DEMs using traditional techniques to establish flow connectivity within DEMs.

2:45 pm **Break**

3:00 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.

3:30 pm **Disseminating the IWI LiDAR Data through Web Applications**
Jeremy Moore, Houston Engineering, Inc.

This presentation will discuss and demonstrate how to use three new options for accessing, downloading and using the LiDAR data. The first demonstration will show users how to download the various available LiDAR products. The second demonstration will show users how to use a web based MapViewer to make your own maps with LiDAR. Finally a demonstration will show you how to add the LiDAR data map services into your own software such as ArcView, AutoCAD and Google Earth.

4:00 pm **Closing Comments/Observations/Discussion**

Adjourn