

26th Annual New York State Geographic Information Systems Conference Saratoga Springs, NY

Sunday, October 24, 2010

Time: 12:00- 4:00pm

Pre-Conference LiDAR Seminar: Now that I have it, what can I do with it?

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Aim: To provide both GIS practitioners and managers a detailed understanding of the challenges and the potential for integrating LiDAR data into GIS projects. This seminar will focus on three specific types of GIS analysis: drainage analysis, impervious surface analysis, and tree canopy analysis.

Learning objectives: By the end of the workshop, you will:

- know the steps necessary to process a LiDAR point cloud for drainage analysis
- know the key derivative datasets necessary to support successful drainage analysis
- anticipate the key challenges in using LiDAR for drainage analysis at varying scales
- articulate the role of LiDAR in impervious surface and tree canopy analysis
- articulate the return on investment for using LiDAR in impervious surface and tree canopy analysis
- understand what software tools are needed to process and analyze LiDAR data

Who the course is intended for:

If you are interested in LiDAR data, you should register for this seminar. The content is designed for an audience of all skill levels, and no previous experience using LiDAR data is necessary. Highly technical and skilled analysts will be able to better assess their needs in order to accomplish the types of analysis presented, and managers or casual/novice GIS users will better understand how advanced analysis using LiDAR can support their project goals.

Software and Equipment:

This seminar will give case study examples using a number of different software packages, both commercial and open source. This is NOT designed to teach specific skills in any one software package but to help you make sound decisions about tool and training investments. Handouts, along with a DVD of sample software and data will be provided.

Teaching time:

Approximately 4 hours consisting of lecture, discussion and computer based demonstration.

Course outline: The course will cover:

Review of LiDAR

- Brief review of airborne LiDAR systems

 - Collection and Sensor parameter

 - Standard processing and deliverables

- Data Quality - issues that affect the point cloud and the bare earth surface

Processing LiDAR points into a drainage surface

- Hydro-enforcement vs. hydro-conditioning

- FEMA Standards review

- USGS Standards review

- Point classification

- Breaklines and breakline development techniques

- Drainage enforcement techniques- the “New England” method

- Quiz

Drainage analysis

- Survey of commands and functions using ESRI Spatial Analyst and TauDEM

- Catchment level mapping and NHDPlus

- Impact of roads and culverts

- Applications Discussion and Examples

 - Stormwater program management requirements

 - (i.e., sewershed Mapping, IDDE, BMP siting and design, etc.)

 - Screening level water quality modeling and analysis

 - (i.e., RBDE, VSA, ECM, etc.)

 - Environmental emergency response

 - (i.e., spills, floods, etc.)

- Quiz

Impervious Surface Analysis

- Review of pixel based classification

- Impact of scale and resolution on data integration

- Object Based Image Analysis (OBIA) with LiDAR and Color InfraRed (CIR) imagery

- Impervious surface mapping example

- Quiz

Tree Canopy Analysis

- Comparison of three different approaches:

 - LiDAR only

 - Pixel based integration of LiDAR and CIR

 - OBIA based analysis

- Tree Canopy Mapping example(s)

- Quiz