Geological Society of America
Short course 507

Saturday, 27 October, 9 a.m.-5 p.m.

Processing and Analysis of GeoEarthScope and Other Community LiDAR Topography Datasets

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Summary
LiDAR—Light, Distance, and Ranging (also Airborne Laser Swath Mapping-ALSM) topographic data are of broad interest to earth scientists. Many datasets are or will be available freely to the scientific community, especially for fault systems in the western United States via the GeoEarthScope project. These data have exciting and powerful applications in geomorphology, active tectonics, and geoscience education. Participants in this course will learn about LiDAR technology, access to publicly available datasets, software and hardware considerations for working with the data, data processing (raw or classified point clouds, digital elevation models, other derived products), and approaches for analyzing the data to answer their research questions.

Related web sites

http://lidar.asu.edu ASU managed site includes information related to this short course, our GEON LiDAR Workflow, and related research.

http://facility.unavco.org/project_support/es/geoearthscope/ UNAVCO site for management of GeoEarthScope Project.

http://www.geongrid.org/ GEON site including portal access to the GEON LiDAR Workflow

http://www.ncalm.ufl.edu/ National Center for Airborne Laser Mapping

http://arrowsmith410-598.asu.edu/Lectures/Lecture9/DEM_data.html Tutorial to acquire Digital Elevation Data from USGS site and process them in ArcGIS

http://arrowsmith410-598.asu.edu/Lectures/Lecture9/ARC_scene.html Small tutorial on ArcSCENE to merge elevation data and air photos for 3D visualization

Acknowledgements

Agenda

8 am   Board Bus at Denver Convention Center. Drive to UNAVCO Facility in Boulder.

9 am   Welcome and introductions--team and participants
            Acknowledgements (Arrowsmith)
            Goals of course and agenda review (Arrowsmith)
            Overview of GeoEarthscope (Phillips)

9:30 am   General overview of applications of LiDAR (Arrowsmith)

10 am   Review of LiDAR technology and data acquisition considerations
    -   Sensor types and pulse rates (Phillips)
    -   GPS control and dataset accuracy (including "corduroy" issues) (Phillips)
    -   The role of vegetation in determining "quality" of the data (Crosby)

10:30 am   Break

10:45 am   Overall LiDAR processing workflow - what happens at each step, who typically does it, what is the processing parameter space that geoscience users should be thinking about exploring
        B4 (OSU/USGS/NCALM) and NCAL (GeoEarthscope) experience (Phillips)
        Data volumes, considerations for managing these datasets and point cloud inclusion in the GLW (Crosby)

11:15 am   Accessing LiDAR data –NOAA LDART, USGS CLICK, NCALM data center, GEON LiDAR Workflow (Arrowsmith, Crosby)

11:45 am   Exercise: An introduction to point cloud data using LVIZ for visualization (Arrowsmith, Crosby)

12:15 pm   Lunch

1:15 pm   UNAVCO tour (Phillips)

1:45 pm   DEMO: GeoEarthScope data tutorial

DEMO and Exercise: Getting terrain models into ArcGIS and then constructing useful derivatives and visualizations (Arrowsmith, Crosby)

DEMO: Using the GEON LiDAR Workflow to access data and produce custom DEMs (Arrowsmith, Crosby)

Additional ArcGIS exploration (Arrowsmith) OR working with GEON Points2Grid and Globbal Mapper (Crosby)

4:30 pm   Final discussion

5 pm   Board bus to return to Convention Center, arriving before 6 pm.