Case Studies

Interview with Karen Schuckman, CP, PLS, MGIS

LP360

BSAU | AWG

Nancy Graham

July 2013

Revision 1.0

Tell us a little about your career path and how you moved from industry to academia.

I entered the industry in 1990 after attending the Surveying and Photogrammetry program at Cal State Fresno that was part of their Civil Engineering Department. My first job was with USGS, so I got exposure to the government side of the profession. I then moved into the private sector when an opportunity developed that allowed me to work in data acquisition, primarily GPS Control aerial triangulation which was what I was interested in. In 2006, having spent 16 years in the profession, I was looking for a way to concentrate more on my private life. As I was an external advisor for the PENN State online learning program and there was a need at this time to add some remote sensing, particularly LIDAR, to their course offerings, I joined Penn State Geospatial Program faculty. This gave me the opportunity to focus on my personal goals while allowing me to continue contributing to the mapping profession. So after having been fortunate to have had a very fulfilling career in industry getting to work on such projects as the North Carolina flood plain mapping after Hurricane Floyd, and then being very involved in the Katrina response while at URS, I am still able to contribute to the profession through education.

However, I sometimes have mixed feelings about leaving the private sector where there is a lot of focus on using the latest and greatest in technology, but even as technology moves forward, the basic fundamentals of photogrammetry and mapping still need to be taught and I feel this is what my mission needs to be. Moving into academia allows me to use my knowledge and skills to seed the futures and careers of those younger and newer to the profession.

Please tell us about your online LIDAR program.

Mike Renslow and I developed the LIDAR course “LIDAR Technology and Application” in 2010. The course is taught 3 times a year and is a 10 week course.

We designed the course around the state-of-the-art airborne topographic LIDAR data processing. Basically, how the LIDAR data is acquired, processed and turned into usable products. The course includes an overview of how LIDAR sensors work and mission planning principles. We start with raw LIDAR data, extract bare earth and develop terrain products and then integrate with other geospatial data within Arc. We focus on topographic mapping but also touch on forestry and corridor mapping to give an overall flavor for what LIDAR can be used for.

QCoherent Software LLC
www.LP360.com
256-461-8289 (phone)
256-461-8249 (fax)

The goals of the course are to give enough information about LIDAR so that someone understands project specification, project execution, accuracy assessment and quality control procedures well enough to converse intelligently, ask good questions and to know where to go for accurate information. Another goal is work force development, in that students acquire a skill set that allows them to seek entry-level LIDAR data processing positions.

How is the course valuable to current LIDAR practitioners?

It increases a LIDAR practitioner's knowledge by providing mapping and LIDAR fundamentals plus hands-on experience with LIDAR data. It gives them the bigger picture of what LIDAR can be used for, that in turn expands the LIDAR user base and hopefully the LIDAR industry as a whole. The course adds general value for practitioners by enhancing their LIDAR knowledge so that they can better leverage LIDAR data in their work.

From the perspective of consumers of elevation data, what sort of impact has LIDAR had?

LIDAR exposes the GIS user and the Engineering community to more accurate and current elevation data. These communities were used to traditional elevation data derived from photogrammetric processes that were more expensive, took longer to produce, and were, in some cases, less accurate. Historically, a lot of money was spent on products and information based on the elevation data (that was not very accurate) but not on acquiring better elevation data. Now that LIDAR has shortened the time it takes to get an elevation product, users can expect to get more accurate data more quickly, and they don't have to work on source material that is 10-20 years old.

Also, before LIDAR, all a user would get as a product was a bare earth DTM or DEM. Now, with LIDAR, they get the above-ground feature information such as structures and vegetation, which has a huge impact for visualization in terms of urban modeling, structure inventory and forestry. LIDAR brings a new element to what users can do in GIS now that they have a whole new layer of information to work with.

In summary, with LIDAR you get better bare earth, but also above ground products that you didn't get with photogrammetric means. Consumers can now expect more than just a DEM.

What are the difficult concepts for your students to grasp?

I find my students have trouble with mapping fundamentals such as geo referencing principles, (including geodesy, GPS, and coordinate systems). In the course we do touch on these subjects because they need to have a basic understanding of these principles to grasp other aspects of the course. Likewise, they have trouble with some of the photogrammetry concepts such as stereo image, aerial triangulation and network adjustments. It is hard for them to get their heads around these concepts because they have had limited exposure to them. They are good at using the data and the software tools but struggle some with geodesy, surveying and photogrammetric fundamentals.

What background do you expect your students to have and how does someone enroll in your LIDAR course?

PENN State has a GIS Certificate Program in which we offer the online LIDAR course "LIDAR Technology and Application." In order to take the online LIDAR course you must a complete short application to become a non-degree graduate student at Penn State. The basic entrance requirement is a bachelor's degree. However, there can be exceptions for individuals that have relative industry experience. To qualify for the GIS certificate there is no prior knowledge of GIS or Surveying required.

That said, for the actual LIDAR course, we like students to have a basic knowledge of geospatial coordinate systems and datums, mapping principles, and some basic level of GIS or CAD data processing experience. There is a self- assessment quiz available on the website so that you can to determine if you have the necessary skills for the class. The next class starts October 9, 2013. To Register.

You've recently selected LP360 as the main software for your program. What led you to this choice?

Initially, we wanted to expose students to as many software packages as possible, but with our limited resources we couldn't logistically maintain our teaching materials based on so many different products and keep them up to date. We selected LP360 because it has the breadth of functionality to do everything we needed to demonstrate about LIDAR. Also, LP360 is an extension to Arc that most GIS practitioners are familiar with, so it makes the learning curve much shorter and has enough of the filtering capabilities so that we can demonstrate the automatic processing concepts. LP360 has the best end-to-end solution that we could find with easy and user-friendly interfaces for the GIS user. Even now that ESRI has some capability for LIDAR data in ARC, it is still limited and does not cover all the things we need to teach.

Karen Schuckman is Senior Lecturer in Geography at Penn State University, teaching remote sensing and geospatial technology in the online programs offered by the John A. Dutton e-Education Institute. She also serves as a consultant to URS Corporation in Gaithersburg, Maryland, where she provides expert knowledge in remote sensing and photogrammetry to engineering practice groups, including floodplain mapping, disaster response and preparedness, critical infrastructure, and transportation. As the Geospatial Technology Leader at URS from 2005 - 2006, Karen supported response, recovery and mitigation projects following Hurricanes Katrina, Rita, and Wilma. From 1995 - 2005, she was with the EarthData group (now Fugro EarthData), where she held several positions including geospatial applications director for EarthData Solutions, senior vice-president of EarthData Technologies, and president and general manager of EarthData International of North Carolina. Notable projects led by Ms. Schuckman for EarthData include LIDAR acquisition for the North Carolina Floodplain Mapping Program, numerous transportation mapping projects for state DOT's, and technology demonstration projects for NOAA, NASA and the US Department of Transportation.