GeoPositions: Aerial Survey Pilot Talks All Things Geospatial

David Sandilands

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David Sandilands is an aerial survey pilot and remote sensing technician with The Barbara Wheatland Geospatial Analysis Laboratory – School of Forest Resources, at the University of Maine in Orono, Maine.

After six years as a Master of Science graduate student, he's been a professional staff member of the university for a little over six months.

"I took my first GIS, surveying, and remote sensing courses in 2010 and now work full-time with geospatial data, with a concentration on the collection and analysis of aerial imagery," he says.

GeoDataPoint was lucky enough to speak with Sandilands about his work, the lessons he's learned and his keys to success that have helped him get to where he is today.

Q: What do you do for a living?

A: I am an aerial survey pilot and remote sensing technician for the Wheatland Lab at the University of Maine's School of Forest Resources. I am responsible for the coordination, planning, and implementation of aerial survey flight missions and associated image processing workflows. I operate both manned aircraft (a University-owned Cessna 172) and sUAS platforms, covering a wide range of spatial footprints. I also assist with the development of materials for technical instruction of remote sensing applications, and collaborate with members of the campus community and external stakeholders on geospatial-related R&D projects.

My work supports the three primary focus areas of the Wheatland Lab: research and teaching, professional engagement, and community outreach. Research and teaching programs focus on the integration of satellite and aerial-based remote sensing and geographic information systems. Specific research activities include forest health assessments and mapping, conservation easement monitoring, carbon and climate modeling, discrete and single-photon LiDAR, photogrammetric Structure from Motion (SfM), and true color and color-infrared aerial surveys. Professional engagement focuses on geospatial technology transfer and training for forestry professionals and landowners, and our community outreach program supports the geospatial data and technology needs of local conservation, educational and environmental organizations. Additionally, the lab ensures that current and future students have access to state-of-the-art remote sensing and geospatial analysis research and teaching facilities.

Previous to my involvement with the Wheatland Lab, I worked as a commercial airline pilot and certified flight instructor.

Q: What value does geospatial technology bring to the work you do?

A: Sustainably and profitably managing forestlands requires that forest managers monitor and predict changes to many aspects of forested landscapes over long periods of time. Significant advancements to geospatial technology and methods of analysis have revolutionized forest management and will continue to do so well into the future. Geospatial technology has become a new "cornerstone" for forestry professionals to effectively manage forest resources. The overarching goal of my work is to support the advancement of essential geospatial skills for forestry students and industry professionals to help them achieve their resource management objectives.

Q: What do you most enjoy about what you do?

A: Every day has the potential for unique learning experiences. Each project comes with its own questions to be answered and challenges to overcome, and no two are ever the same. Everything from airspace considerations to unpredictable weather to objectives that stretch the limits of how the technology has been used before continually help to keep my work exciting and engaging.

Q: What is your favorite tool to work with?

A: The powerful SfM algorithms and software packages available for use today have brought photogrammetry and 3D surface modeling capabilities to the average geospatial data user who could not have afforded the expenses associated with "traditional" aerial survey equipment. Due to the development of SfM technology, it is now possible to combine consumer-grade cameras with relatively inexpensive aerial platforms to produce geospatial data with a high level of automation and accuracy in a remarkably short amount of time.

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>
> – David Sandilands

Q: What is the toughest challenge you face?

A: Maintaining pace with the rapid advancements in geospatial technology can be a daunting task. The list of "latest and greatest" algorithms, apps and tools is constantly growing. As a member of the research community in the School of Forest Resources, it is imperative to be at the forefront of the development of these technologies in order to provide current and future forestry and natural resource professionals the knowledge they will need to be successful.

Q: What is the biggest lesson you've learned?

A: The need to practice effective time management. In a fast-paced environment where multiple projects are ongoing simultaneously, it can be easy to get overwhelmed. For me, prioritized lists are a must, along with minimizing multitasking. There is nothing worse than having to spend time recreating the steps I've already taken on a project simply because I felt compelled to do too many unrelated tasks at once and lost my place in a processing workflow.

Q: What advancements would you like to see made?

A: I am eager to see the widespread integration of sense and avoid technologies for consumer-level UAVs to enable their safe and legal operation beyond visual line of sight (BVLOS). A major limitation of utilizing sUAS platforms in a forested environment is that trees simply "get in the way," which limits their usefulness to a specific set of conditions. Effective, yet affordable solutions that provide the autonomous flight capabilities necessary would open the doors to a wide range of research opportunities and benefits that we currently cannot consider.

Q: What are your keys to success?

A: Here at UMaine, I've had the privilege of working with extremely talented and knowledgeable professionals. In order to be successful, I've found that you can never be afraid to ask for guidance from those around you who may have already been through what you are up against or can point you toward proper resources.

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