ArkansasView Remote Sensing Activities 2014 - 2015

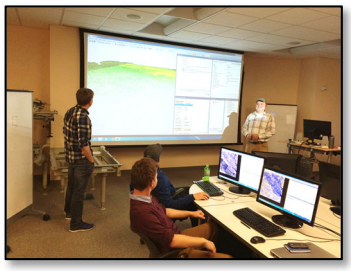
Geospatial Internship for Underbuilt Community Decision Support

Communities Unlimited (CU; https://www.communitiesu.org), formerly Community Resource Group, Inc., is a 501(c)(3) nonprofit organization based in Fayetteville, AR, with activities in seven states. CU works to ensure that underbuilt rural communities receive critical water system infrastructure. In summer 2014 ArkansasView set a goal to partner with CU to develop a framework for a funded geospatial internship.

CU joined ArkansasView in late 2014 with a key goal of providing support for a new internship that would build geospatial and remote sensing capacity within CU (and its on-the-ground team working with underbuilt rural communities). CU contributed a "Geospatial Internship for Underbuilt Community Decision Support" and Benjamin Tracy, a geologist from Fugro (Hong Kong) Limited joined ArkansasView as CU's first geospatial intern beginning in January 2015. As a result of the internship and additional CU capacity-building activities supported by Dr. Jason Tullis and Adam Barnes from the Center for Advanced Spatial Technologies (CAST; ArkansasView's host organization), a strong partnership developed to expand the impact of ArkansasView in areas such as remote sensing-assisted dual cropping with biofuels, rural community water system mapping, and geospatial capacity for small business entrepreneurship. This partnership also helped leverage collaborative proposal activities within several other AmericaView states in which CU operates (Texas, New Mexico, Oklahoma, and Louisiana).

Benjamin Tracy, ArkansasView-sponsored graduate student and geospatial intern at Communities Unlimited, assisting farmers with dual cropping strategies for camelina (used for biofuel) and regular crops such as soybean in the Arkansas Delta.

Object-based Image Analysis Training



MS Geography student Weston Murch participating in Bruce Gorham's object-based image analysis (OBIA) workshop held in late Apr 2015 in Fayetteville, AR.

For more than a decade, ArkansasView's Bruce Gorham (from CAST) developed an expertise in object-based image analysis (OBIA), a relatively new image processing paradigm especially applicable to high spatial resolution imagery from aircraft including small unmanned aircraft systems (sUAS). In April 2015, Bruce Gorham conducted a workshop on intermediate OBIA concepts that incorporated high density airborne light detection and ranging (LIDAR) data and high resolution aerial photography. A focus of the workshop was on strategies for extracting valuable forest life cycle information (including "old growth" areas) difficult to identify with traditional remote sensing techniques.

Benefits to Arkansas

According to the Department of Labor's Employment and Training Administration (ETA), while overall geospatial technology (including remote sensing) is growing very rapidly, there is a real deficit of skills and training, and there are misconceptions about what skills are required.

ArkansasView's 2014-2015 a) geospatial internship through CU, and b) OBIA workshop, provided innovative training to graduate students at University of Arkansas and non-profit employees working throughout the state. The following are key benefits from these efforts:

- Increased management effectiveness of persistently poor rural community water systems through application of geospatial mapping tools
- Helped farmers in the Arkansas Delta more effectively combine camelina (used for biofuel) with existing crops such as soybean
- Trained graduate students in image processing techniques directly applicable to the emerging field of sUAS, an important growth area for Arkansas

ArkansasView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state.

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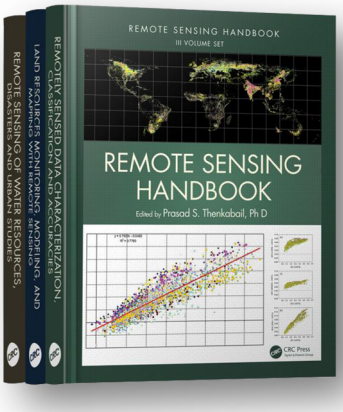
Additional ArkansasView Activities

With support from AmericaView, ArkansasView's Dr. Jason Tullis presented "The Integrated Geoprocessing, Workflows, and Provenance Cycle" at the ASPRS annual conference (Imaging & Geospatial Technology Forum or IGTF) in Tampa, FL, in May 2015. The topic presented was of interest to members of the Open Geospatial Consortium, an organization responsible for standards and specifications that advance remote sensing nationally and beyond. A chapter related to this talk was later published in the three-volume new *Remote Sensing Handbook* in November 2015 (see right).

A variety of other 2014-2015 activities included a) extra remote sensing collaboration with faculty in Biological Sciences, Geosciences, and Civil Engineering, b) development of a proposal for a graduate certificate in geospatial technologies (to complement the current undergraduate certificate), and c) extra graduate committee support for 15 MS and PhD students, each with a remote sensing research component.

"AmericaView has supported so many students and the strength of the curriculum at the University of Arkansas. Remote sensing, [global navigation satellite systems (GNSS)], and geospatial technologies classes provide valuable skills that make our undergraduate and graduate students highly sought after in the industry. Companies like ESRI and organizations like FEMA recognize the knowledge and experience that AmericaView cultivates at the University of Arkansas. Students find jobs and internships at these and many other prestigious organizations across the country. Students also have the opportunity through AmericaView's donations to visit and present at conferences that foster geospatial technologies and services. I am so grateful for this continued guidance from AmericaView." (17 December 2015 letter from Weston Murch, MS Geography student trained with support from ArkansasView. In summer 2015, Weston completed a competitive ESRI internship in Redlands, California.)



Tullis, J.A., J.D. Cothren, D.P. Lanter, X. Shi, W.F. Limp, R.F. Linck, S.G. Young and T. Alsumaiti, 2015, "Geoprocessing, Workflows, and Provenance," in Remote Sensing Handbook: Remotely Sensed Data Characterization, Classification, and Accuracies, edited by P. Thenkabail, 401-421, Vol. 1., Boca Raton, FL: CRC Press.

ArkansasView Consortium Membership

ArkansasView activities are led by Dr. Jason Tullis and Dr. Mohamed Aly from the Center for Advanced Spatial Technologies (CAST) at University of Arkansas. The Center is under the direction of Dr. Jack Cothren. Since 2002, a number of organizations and individuals have contributed directly to realizing ArkansasView goals and initiatives. For example, the Arkansas GIS Office provides access to statewide remote sensor data; the EAST Initiative trains high school students in remote sensing techniques; and Communities Unlimited trains remote sensing students in applications that directly benefit underbuilt communities in Arkansas and six other states. In 2015, Dr. Lu Liang from University of Arkansas at Monticello (UAM) and Arkansas Forest Resource Center (AFRC) began contributing new remote sensing expertise to ArkansasView.

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