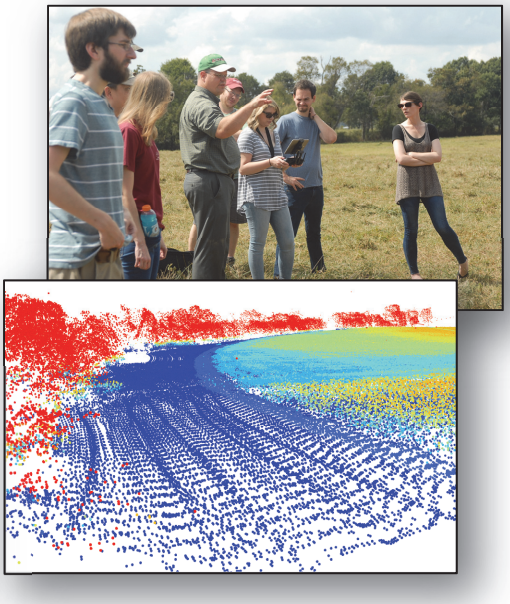
ARKANSASVIEW 2018 - 2019

ARKANSASVIEW HISTORY AND SUCCESSES

Established in 2002 by University of Arkansas' Center for Advanced Spatial Technologies (CAST), ArkansasView has contributed to remote sensing successes within the Center, the campus community, and the state. Highlights are a) the development of new degree and certificate programs including PhD Geosciences, MS Geography, and online certificates in geographic information systems (GIS) aligned with remote sensing, b) support for graduate students and faculty in Arkansas seeking to apply remote sensing in their research, c) research on geospatial provenance to support replicability and reproducibility in remote sensing workflows, and d) research and educational progress in geospatial unmanned aircraft systems (UAS).

ASA Hazard Map, an ArkansasView-supported spatial decision support system (SDSS) completed in 2012, based on Landsat and airborne LIDAR, for forest land owners experiencing drought-induced red oak borer infestation (asa.cast.uark.edu).



ArkansasView enabled "Geospatial Unmanned Aircraft Systems", the first drone-based class at University of Arkansas, every Fall since 2016.

In a partnership with Communities Unlimited that began in 2014, a nonprofit organization serving communities in seven states, ArkansasView sponsored a new geospatial internship for developing remote sensing-assisted workflows that address persistently poor rural communities' access to basic water infrastructure. Also, beginning in 2015, ArkansasView played a key role in the creation of the first two UAS-based courses at University of Arkansas. Students trained in these courses are supporting new agricultural, environmental, and industrial UAS applications in Arkansas.

ArkansasView funds have supported research on provenance that was published in Remote Sensing Handbook (left) and has produced short YouTube educational videos (right) on UAS techniques such as processing data from a thermal sensor.

Online undergraduate "Certificate of Proficiency in Geospatial Technologies", the first undergraduate certificate at University of Arkansas launched with co-leadership from ArkansasView in Fall 2014. A graduate version was later launched in Fall 2016.

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. AmericaView is funded by USGS grant agreement G18AP00077.

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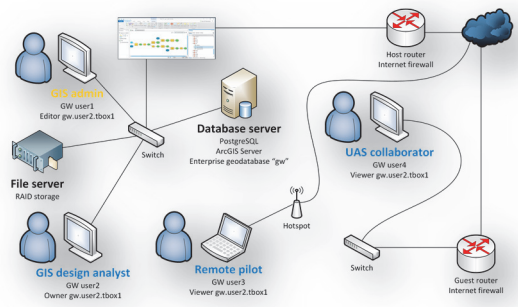
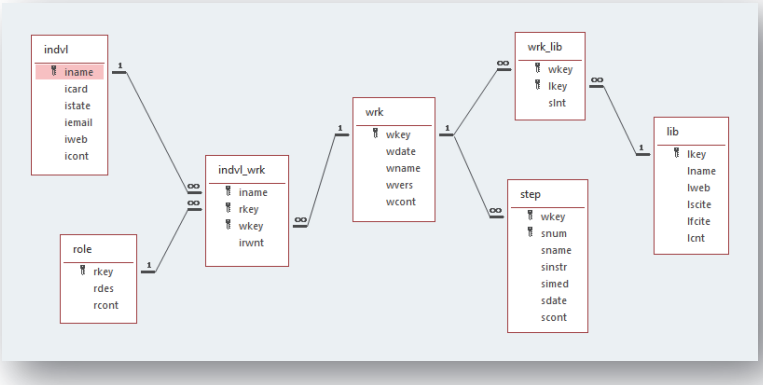
ARKANSASVIEW 2018 - 2019 ACTIVITIES

Replicability and interchange of remote sensing workflows is rarely efficient, even within highly collaborative research and educational settings dedicated to internal transparency. In Year 1 (2018-2019) ArkansasView began development of a multiuser "remote sensing usability" database to bridge publicly available remote sensing data (e.g., federally-sponsored UAS collections, Landsat, National Agricultural Imagery Program, etc.) with specific local applications in Arkansas and collaborating states. During Year 1, ArkansasView produced a concept for a database as well as an online prototype called “Gigawatt” (GW; https://gw.cast.uark.edu/) using the popular MySQL database management system This progress set the stage for initial linkages (Year 2 and beyond) to be developed based on the wealth of remote sensing theory and experience available within AmericaView network and the practical needs referenced by consortium partners (e.g., Communities Unlimited which is headquartered in Fayetteville, AR).



Prior to Year 1, ArkansasView sponsored a project called “Gigawatt”, intended for use in a local area network (GW-LAN), to accelerate multiuser development of remote sensing and UAS workflows. GW-LAN increases multiuser access and replicability for teams using commercial geospatial data processing tools such as ArcGIS Desktop/Pro, Agisoft Metashape, Pix4Dmapper, and other LAN-based tools. GW-LAN itself will become one of the “workflows” conveyed by ArkansasView in the “remote sensing usability” database started in Year 1.



This initial database schema for Gigawatt (GW) represents suggested tables needed to store streamlined but powerful information about remote sensing workflows created by participating online users. The concept of the schema can be stated as follows: “individuals with specific roles publish online versions of workflows, each accompanied by specific steps and citable resources”. It should be emphasized that GW will be able to convey newer versions of a given remote sensing methodology that may involve a different team. The citable resources will point to actual input data sources (e.g., USGS), explanatory works (e.g., refereed publications), and specific versions of open source and commercial software.

Expansion of GW and its content will focus on conveying the practical local value of remote sensing to students, colleagues, rural communities, farmers, ranchers, etc. Year 1 progress has demonstrated that in effect, GW users will be able to search for applications, sensors, platforms, etc. and to contribute their own workflow information or "recipe" that is replicable using widely available resources. The software tools featured in GW can be any that are widely available (e.g., Google Earth Engine, Jupyter Notebook, etc.). However, as shown in the above schema, GW specifies the precise version of the software being incorporated. To ensure basic replicability, publication of the workflows in GW will first require that all steps can be successfully followed by someone with a “publisher” role. While the complexity of the database schema created in Year 1 is limited to ensure rapid and reliable online access, one possible future direction is to incorporate machine-readable provenance standards from such organizations as World Wide Web Consortium (W3C). Beginning in Year 2, a landing page and instructions for using GW will be made available via http://arkansasview.org/.

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