



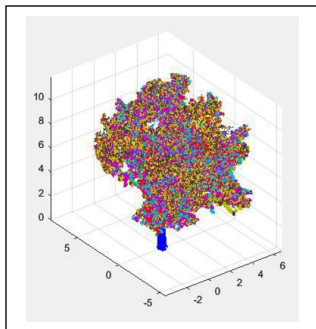
# TEXASVIEW 2023 - 2024

**AmericaView**<sup>SM</sup>  
Empowering Earth Observation Education  
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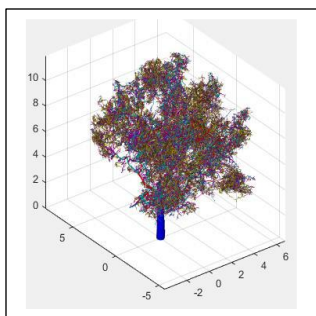
## TEXASVIEW 2023 - 2024 STUDENT RESEARCH ACTIVITIES

TexasView identifies the need to increase the number of undergraduate and graduate students who use remote sensing in an applied, project-oriented fashion. This High-Impact Activity (HIA) addresses grant **objective 3: Promote research and remote sensing experience at the university undergraduate and graduate level to increase numbers and visibility of graduating students with employment skills in remote sensing.** One institution participated this year:

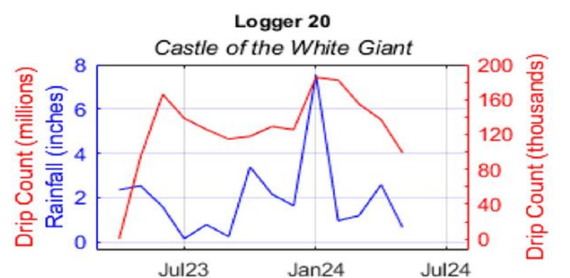
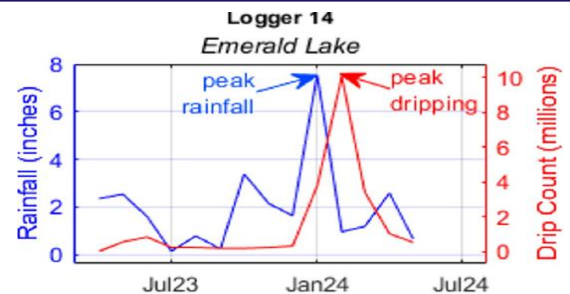
- **Estimating Urban Above-ground Biomass using an Automated Terrestrial Laser Scanning Algorithm.** *Midwestern State University (MSU) Kimbell School of Geosciences.*
- **Estimating Water Infiltration Using Drip Loggers and LiDAR at Natural Bridge Caverns, Texas.** *Midwestern State University (MSU) Kimbell School of Geosciences.*
- **The Impacts of Wildfire Smoke Aerosols on Surface Air Quality in California: A Multi-year Study using Geospatial Technologies.** *Midwestern State University (MSU) Kimbell School of Geosciences.*



Clean LiDAR point cloud of tree #2



3D model (QSM) of tree #2



Monthly drip counts vary in response to rainfall.

- An MSU graduate student evaluated the accuracy of high-resolution LiDAR data and a state-of-the-art tree segmentation algorithm for understanding overall carbon sink capacity.
  - The algorithm created detailed models that provide accurate estimations for parameters used to predict urban tree biomass, when compared to field measurements.
- An MSU graduate student investigated subsurface groundwater flow through the critical Edwards aquifer in central Texas.
  - The combination of LiDAR data and water infiltration monitoring within Natural Bridge Caverns is used to evaluate karst controls on subsurface water movement.
  - This is crucial for effective planning and development of water resource management policies for karst aquifers, which supply 55% of Texas' water supply.
- An MSU graduate student assessed high-resolution particulate matter (PM2.5) pollution driven by wildfire smoke aerosols in the western U.S., where increased wildfire activity has wiped out nearly one-half of the total air quality gains made from 2000 onwards.
  - Imagery from Landsat and MODIS satellites provide critical data input for air quality assessment.

TexasView 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 G23AP00683.

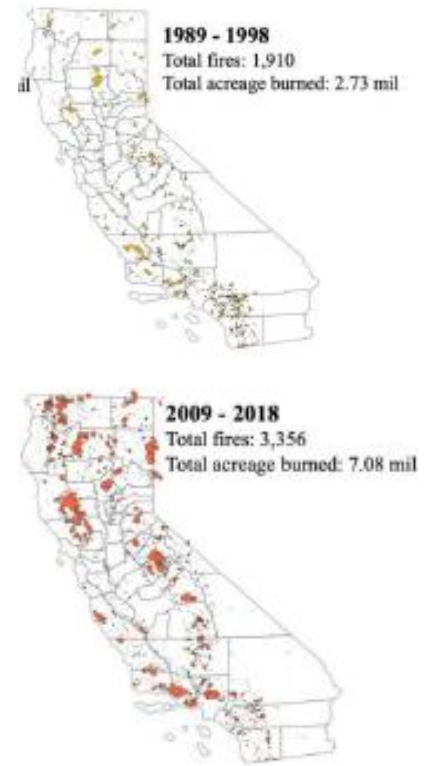
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## BENEFITS TO TEXAS

Support for student research has multiple benefits. Students address issues affecting the State of Texas and develop new workforce skills.

- *I continued to learn to troubleshoot LiDAR equipment and open-source algorithms. I have had many opportunities to travel to present and talk to other people who are researching similar topics. I enjoyed my time on this project. I have learned many practical skills and expanded my knowledge in this field. I am appreciative of this opportunity and truly enjoyed my time working on this project.*
- *The most challenging aspect of the project was working with the LiDAR data, which I had limited experience working with prior to starting this project. I was additionally able to use ArcGIS and its available toolsets to create a location map for the study area that incorporates the Edwards Balcones Fault Zone Aquifer, of which Natural Bridge caverns are located within the contributing zone. The ability to develop my own geographic data ensures that I am able to display only the information that is pertinent to my study site. This will also enhance my presentation at upcoming conferences including the National Association of Black Geoscientists (NABG) and Geological Society of America (GSA) annual conferences in September 2024.*
- *As a student with a background in geography, I love to learn and utilize Geographic Information Systems (GIS) techniques to deal with geospatial data. Overall, this opportunity benefited my understanding in geospatial technologies and further research in this field. I am grateful to TexasView for providing me this opportunity. I hope it will help me further excel my skills in accessing and analyzing geospatial data for air quality assessment.*



Georeferenced Fire Perimeters  
Data from Calfire.

## TEXASVIEW CONSORTIUM MEMBERSHIP

Established in 2002, the TexasView Remote Sensing Consortium consists of thirteen university partners distributed across the state. Members include universities large and small, public and private. TexasView members work closely with state, regional and local agencies to promote remote sensing at all levels.

TexasView is founded on the concept of free and public exchange among its members of data, information and knowledge concerning the Earth and its processes, as observed by remote sensing and GIS technologies, for education, research, and local government applications.



Midwestern State



The University of  
Texas at Austin



The University of  
North Texas



Sul Ross State  
University



Texas A&M



Texas Tech



University of Texas of  
the Permian Basin



Stephen F. Austin



Texas A&M at Corpus  
Christi



The University of  
Texas at El Paso



Texas State University



The University of  
Texas at San Antonio



University of  
Houston

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