



# ALABAMAVIEW REMOTE SENSING ACTIVITIES 2014 - 2015



## URBAN HEAT ISLAND EDUCATIONAL MODULES

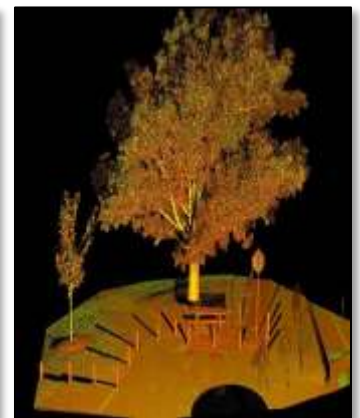


*Summer workshop with middle school teachers who are using infrared light sensors and hygrometers to understand temperature variations between different surfaces*

AlabamaView compared satellite-collected global temperature data to corresponding data collected on the ground acquired from a combination of automated sensors and manual measurements. This comparison was used for developing materials and curricula programs, workshops, meetings, and seminars conducted by a number of educational and training organizations. This effort ultimately promotes technology transfer and outreach activities, and becomes the basis for education modules for middle and high school students that introduce using remote sensing for understanding temperature differences on the Earth, encouraging awareness of the environment. Of the three components of this educational module, two rely upon Landsat 8 OLI (Operational Land Imager) and TIRS (Thermal Infrared Sensor) data to show relationships between land cover and land surface temperatures. Infrared (IR) imagery taken with a hand-held IR camera, compared with a similar scale visible image, shows relationships at micro scale between varying land surface cover and temperatures. A new module component, from NASA's Earth Observations website, <http://neo.sci.gsfc.nasa.gov>, guides comparison at a global scale. Students benefit by learning about the usefulness of remotely sensed images in earth science applications.

## URBAN TREE COVER USING LIDAR & GEOBIA

AlabamaView continued to build on efforts from previous years regarding the processing of statewide airborne LiDAR (light distance and ranging) products. Those products from previous years were incorporated into a follow-on project in partnership with the Southern Research Station of the US Forest Service. Together, the process of mapping urban tree canopy in Alabama began, which is to be incorporated into a new product that Forest Service employees will utilize and share for promoting and maintaining urban forests. This multi-year effort is critical to the state of Alabama as urban trees and forests provide essential ecological, economic, and social benefits to a large part of the population. A graduate student, partially funded by AlabamaView, used these LiDAR and CIR (color infrared) data to map urban tree cover using Geographic Object Based Image Analysis (GeOBIA) methods. This, in combination with Landsat 8 leaf-off imagery, distinguished and separated deciduous and coniferous tree cover. The end product will be GIS datasets of Alabama forest trees and canopy, then made available to the public and Forest Service users alike. These databases and derivative products will provide urban foresters and city managers with estimates of urban canopy cover using existing and usually publically available data.



*Shown above is an example of an urban tree canopy (left) dataset generated using both LiDAR and GeOBIA methods. Also shown is a rendering of a typical urban tree (right) using ground-based LiDAR laser scanning technology. These data are used in conjunction with airborne data for urban tree canopy identification and mapping.*

AlabamaView 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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## BENEFITS TO ALABAMAVIEW

- Training workshops held, and classroom lessons prepared and delivered, with evaluations completed by participants and/or teachers. Participants in these programs then train other teachers.
- Creating methodologies for mapping urban tree landscapes.
- Distributing urban tree canopy data, which are used by local managers in decision-making for ecological, economical, and social benefits.
- Involving graduate and undergraduate students in examining new and traditional remote sensing techniques.
- Developing modules for grades 6-8 in earth sciences for better understanding climatology.
- Using the “Five E’s: Engage, Explore, Explain, Extend, Evaluate,” procedures for effectively training students
- Aligning modules with Course of Study and National Science Education Standards



*Auburn University undergraduate students taking measurements of urban tree study specimens with an Auburn University researcher (Credit: Art Chappelka)*

## ALABAMAVIEW CONSORTIUM MEMBERSHIP



*Federal consortium members identified above do not receive funding from AmericaView.*

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