Leaves OF Change

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Technology

iTree and Air Pollution in Desoto County, Mississippi

ACROSS THE SOUTH, rapid urbanization is transforming previously rural areas and creating new environmental challenges. Desoto County sits in the northwestern corner of Mississippi, across the state line from the city of Memphis. Since 1970, the county has experienced an increase in population of 430 percent, growing from 36,000 people in 1970 to 159,000 in 2010. Along with the population growth, urban development, roads, and traffic have increased tremendously and introduced serious air and water quality problems to the traditionally agricultural county.

The Environmental Protection Agency (EPA) has included Desoto County with Memphis in an ozone "non-attainment" area, meaning that ozone emissions are above allowable limits set by federal regulation. Ground level ozone, the main ingredient in smog, can trigger asthma attacks and causes lung damage. The ruling will likely mean that the state will have to take expensive actions to reduce pollution emissions from cars and commercial/industrial sources.

One group, led by the county extension director, Joy Anderson, is hoping that the urban tree canopy can play a part in the solution,

Mississippi State University students help collect data for the iTree analyses conducted in DeSoto County.

Photo courtesy of: Eric Kuehler

and return Desoto County to attainment status. Working with **Eric Kuehler**, technology transfer specialist for Urban Forestry South, Desoto County conducted a series of iTree analyses including iTree Eco, Canopy and Vue. Using local volunteers and forestry students from Mississippi State University to collect the data, the county assessed over 250, 1/10th acre plots randomly located within five land class categories. The data allowed for an assessment of the structure, function, and value of the urban forest in terms of size and make-up of the urban canopy and its role in removing air pollution and sequestering carbon.

"We wanted to establish some baseline numbers for assessing the tree cover in Desoto County," says Joy Anderson. "But we also wanted to provide policymakers with a quantified description of the ecosystem services that trees are providing."

The analysis in Desoto County found that Desoto County had over 19 million trees and that the overall canopy covered 27 percent of the county. The study also found that impervious surface (roads, structures, parking lots) had expanded greatly from 2001 to 2010, a factor which may explain the increase in stormwater runoff and soil erosion over the same period.

In relation to the county's current air quality problems, the analysis estimated that trees in Desoto County currently remove 5,560 tons of air pollution (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulates) per year, at an estimated value of $40.5 million per year. Interestingly, the iTree study also showed that *Liquidambar styraciflua* (sweetgum) was the most common tree species making up almost 19 percent of the forest. Although trees filter the air of pollutants and are generally a benefit to our cities, some trees can emit certain chemicals (such as terpenes and isoprenes) that contribute to tropospheric ozone formation. Sweetgum is one such species that emits these biogenic volatile organic compounds (VOC). However, the benefits that these high-VOC-emitting trees provide, by helping to lower ambient air temperature and intercepting the solar energy needed for ozone formation, far exceed their liability.

Eric Kuehler says that the value of iTree is that it describes the value of urban forests in terms that policymakers can understand. "It provides good science-based information on the function and value of trees," says Kuehler. "In this tough budgetary environment, counties are closely assessing how they allocate their scarce resources. If we can show the value that trees have in terms of pollution removal, reduction in stormwater runoff and erosion, and energy savings, local officials will look more closely at the value that urban forestry programs can contribute."

Joy Anderson agrees, but says even with the clear information provided by iTree it is difficult to get local policymakers to engage and understand the value of the ecosystem services provided by urban forests.

"Right now, people aren't looking at trees as part of the solution on air pollution, but really expanding and improving green infrastructure in the county is the best, most efficient long-term solution to staying in attainment. We will keep trying to put this on the front burner."

Anderson and Kuehler plan to continue presenting the information from the iTree analyses to local policymakers, including the Ozone Action Committee that is charged with developing a plan to meet the air pollution standards established by the EPA. Anderson hopes that the EPA ruling on ozone nonattainment may provide extra impetus for officials to consider any and every means to improve local environmental quality.

As Desoto County transitions from its traditional agricultural roots to an emerging urban area, local officials can expect more environmental challenges. However, the county can take significant steps to mitigate those problems by developing policies that restrict impervious surface cover development, reduce significant land changes from agriculture to urban, and increase tree canopy cover with low-VOC-emitting tree species in developed areas to help alleviate the heat island effect and ultimately reduce pollution levels.

For more information about i-Tree visit: **www.itreetools.org.**

Mississippi State University students setting up the field plots for the iTree analyses.

Photo courtesy of: Eric Kuehler

Recommended Resource

The Urban Forest Management Plan Writing Tool

Urban Forestry South recently developed the interactive, web-based Urban Forest Management Plan Writing Tool to help newly-formed tree boards and/ or municipalities new to urban forest management evaluate their urban forest program and develop a workable plan. The tool provides an explanation of all the components necessary for plan development and a variety of questions to help users think through the process of developing a workable plan. Additionally, the tool provides links to urban forest management resources and allows users to develop a customizable hard copy of the plan. To view this tool visit: **www.urbanforestrysouth.org/projects/ management-plan-tool.**

Changing Roles Webinar Series Focuses on Emerging Issues in the Interface

The 4th Changing Roles webinar series was recently completed and covered several of the topics from the new Changing Roles module on emerging issues in the interface. The first webinar covered recreational firewood transport and the spread of pests and was presented by USDA Forest Service research ecologist Frank Koch. The second webinar covered various facets of environmental justice, particularly socially vulnerable and Latino communities, and was presented by USDA Forest Service research social scientist **Cassandra Johnson Gaither** and conservation education specialist Tamberly Conway. The final webinar covered the role of the natural resource professional in succession planning and was presented by Chris Demers, forest stewardship coordinator with the University of Florida. For more information about these webinars visit: **http://www.interfacesouth.org/ products/changing-roles/webinar.**

To view the new Changing Roles module materials visit: **http://www.interfacesouth.org/products/changing-roles/ changing-roles-notebook**.

Encouraging More Kids in the Woods in Gainesville, Florida

InterfaceSouth's **Annie Hermansen-Báez** and project intern, **Jordan Sonaglia**, participated in Gainesville's 11th Annual Downtown Latino Festival on September 15th, 2012, in celebration of National Hispanic Heritage Month. The informational booth included handouts and fact sheets about the benefits of getting kids outdoors and suggestions for where to go and what to do outside, as well as firewise landscaping information, in both English and Spanish. Kids also participated in a "Passport to the Outdoors" activity in which they received stamps in nature passports for answering questions about what they like to do outdoors, where they like to go, and how they can find more time to get outside. About 2,000 people attended the event. In addition to informational booths, a variety of cultural events and regional food and music were offered. **Annie Hermansen-Báez** and **Wayne Zipperer** also participated in the Florida Museum of Natural History's ButterflyFest, October 13-14, 2012 with an informational booth. This festival attracted over 3,800 people and included information about conservation, backyard wildlife, butterfly gardening, and more.

Urban Forest Management Planning Workshops in Florida and Alabama

Urban Forestry South's **Eric Kuehler** held an urban forest management planning workshop on October 29, 2012, in Ocala, Florida. This workshop covered the importance of urban forest planning and demonstrated the use of the on-line, interactive Urban Forest Management Plan Writing Tool. Personnel from the Florida Forest Service and local municipal public works, landscape services, and planning

departments attended the workshop. A similar workshop is scheduled for February 13, 2013, in northeastern Alabama.

Urban Forestry South Technology Transfer Activities

Some current and upcoming Urban Forestry South activities include: (1) standardizing Urban Tree Canopy request for proposal guidelines and remote sensing accuracy standards and assessment techniques in collaboration with the Arkansas Forestry Commission, Kentucky Division of Forestry, Tennessee Division of Forestry, and Mississippi Forestry Commission; (2) participating in the definition of a Framework for Ecosystem Analyses in the South (FEAS), which is a remote sensing based approach to defining the interactions between grey and green infrastructure; and (3)coordinating the judging for the *Georgia Urban Forestry Innovation Award* at the 65th Georgia Science and Engineering Fair in Athens, Georgia, March 21-23, 2013. This award is sponsored through a partnership between the Georgia Forestry Commission's Sustainable Communities Program, the Georgia Urban Forest Council, and the USDA Forest Service Region 8 Urban & Community Forestry Program. **www.georgiacenter.uga.edu/gsef.**

Photo courtesy of: Jordan Sonaglia

InterfaceSouth's booth at the 11th Annual Downtown Latino Festival in Gainesville, Florida.

In Our Next Issue

We will highlight one of our partners, the Texas A&M Forest Service Outreach Team. We will describe the team's challenges and successes with reaching a diverse population, as well as highlight their partnerships with state, federal, private, and non-profit organizations.

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Upcoming Events

Date	Description	Location	Contact
February 7-9, 2013	**12th Annual New Partners for Smart Growth Conference**	Kansas City, Missouri	www.newpartners.org
February 13, 2013	**Urban Forest Management Planning Workshop**	Scottsboro, Alabama	Eric Kuehler, ekuehler@fs.fed.us
March 23, 2013	**Texas Wildlife & Woodland EXPO 2013**	Conroe, Texas	http://expo.tamu.edu/
March 23-26, 2013	**Joint International Society of Arboriculture Southern Chapter and Utility Arborists Association Conference**	Memphis, Tennessee	www.isasouthern.org/annualconference.htm