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A BRIEF OVERVIEW OF THE 9^{TH} SOUTHERN FORESTRY AND NATURAL RESOURCES GIS CONFERENCE

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Abstract. This short summary represents the introduction and overview of a special section of two papers that arose from the 2013 (9^{th}) Southern Forestry and Natural Resources GIS Conference (SOFOR GIS). The conference held its ninth meeting in Athens, Georgia (USA) on December 9-10, 2013.

Keywords: Symposium Proceedings, SOFOR GIS, Geographic Information Systems, Spatial Information Technologies

1 Introduction

For the last 20 years, the *Southern Forestry and Natural Resources GIS Conference* (SOFOR GIS) has been offered by the University of Georgia as a venue for practitioners, researchers, and others to learn about new developments and applications of GIS technology. The conference is now held biannually. It began in 1996 as the *Southern Forestry GIS Conference*, but was rebranded in 2004 to reflect the broader range of participants and audience for which it serves (Bettinger and Hubbard 2010). The conference proceedings have historically been peer-edited, yet in 2010 a small set of selected papers were also peer-reviewed and simultaneously published in *Mathematical and Computational Forestry and Natural-Resource Sciences*.

The 9^{th} SOFOR GIS Conference, as with prior conferences in this series, contained a diverse program of presentations that spanned a number of natural resource management fields. Dr. Songlin Fei organized a set of presentations on spatial analysis of invasive species issues of the southern United States, in conjunction with a National Science Foundation program. In combination with this, Sandy Liebhold of the U.S. Forest Service provided the introductory keynote address of the conference, in which he discussed patterns of insect and disease infestation across the country. Concurrent sessions during the first morning of the conference included eight other presentations on the subject of invasive species, along with presentations that addressed forest inventory and mapping developments and other new technologies. These latter groups included presentations on unmanned aircraft, transportation analytics, and the use of Pictometry, among others. The afternoon sessions of the first day of the conference centered on ecological applications of GIS, image classification, biomass estimation, and again, unmanned aircrafts. Twelve presentations comprised the ecological applications sessions. These ranged from the development of spatial prediction models for fuel accumulation and breeding bird richness to estimation of the vulnerability of land to sea level rise. Image classification presentations centered on the use of new methods for allocating land areas to land classes based on spectral reflectance values, to the detection of specific landscape features through high-resolution imagery. Bioenergy and unmanned aircrafts are emerging areas of interest that are relevant in the GIS discipline; and therefore several presentations provided overviews of new developments in these areas.

The second day of the conference consisted of concurrent sessions on GPS and LiDAR technologies, and forest health issues. The GPS and LiDAR session included presentations on recent results of GPS accuracy studies, and advances in the use of LiDAR for extracting forest information of value to land managers. The forest health session included, among other topics, southern pine beetle (*Dendroctonus frontalis*) spread and hardwood mortality trends.

The closing session included presentations on new developments from ESRI, a leading developer of GIS technology, forest change detection, visualization technology, and database development. Dr. Marguerite Madden presented the concluding keynote presentation, which consisted of an overview of remote sensing technology and its value to natural resource management.

The planning committee for the 2013 (9^{th}) Southern Forestry and Natural Resources GIS Conference consisted of the following people:

- Pete Bettinger, Conference Chair (University of Georgia)
- Krista Merry, Proceedings Chair (University of Georgia)
- Tyler Brown (National Wild Turkey Federation)
- Chris Cieszewski (University of Georgia)
- Joseph Fan (Mississippi State University)
- Songlin Fei (Purdue University)
- Bill Hubbard (South. Regional Extension Forestry)
- I-Kuai Hung (Stephen F. Austin State University)
- Tommy Jordan (University of Georgia)
- Tripp Lowe (University of Georgia)
- Qingmin Meng (Mississippi State University)
- Jacek Siry (University of Georgia)

The SOFOR GIS conferences have served several purposes over the years, from providing a venue where GIS users, developers, researchers, and practitioners can intermingle and share ideas to providing a source of new information for foresters, loggers, and other professionals seeking continuing education experiences. The proceedings (Merry et al. 2014) are peer-edited, and can be found at the Internet site http://soforgis.net. These materials have served to inform the public of advances in GIS technology, research and application, and have incrementally advanced the sciences associated with GIS.

2 Contents of the Special Section

This special section of *Mathematical and Computational Forestry & Natural-Resource Sciences* (MCFNS) contains two papers that were presented at the 9^{th} SOFOR GIS conference. In one of the papers, Roger Lowe and Chris Cieszewski delve into the issue of determining the appropriate nearest-neighbor value for *kNN* approaches to broad-scale landscape inventory development. *kNN* approaches are essentially image classification processes that are applied to remotely sensed imagery. The goal with these approaches is to not only classify an image, but to also assign a tree list to the individual units (grid cells, pixels) within the image. This then facilitates estimates of volume, basal area, and other forest characteristics of interest to managers and policy makers. Lowe and Cieszewski (2014) describe the issues one may encounter when a process optimizes the number of nearest neighbors (k) by minimizing a fitness statistic, and the possible effects on the range of forest characteristic estimates and the ability to emulate other broad-scale inventory estimates developed from continuous forest inventories.

The other paper included in this special section describes the processes that were employed by Williams et al. (2014) to create the spatial information that described the behavior of a large and devastating 1894 wildfire situated in Wisconsin. Historical maps and first-hand accounts from witnesses were used to create the information necessary to calibrate and run FARSITE (Finney 2004). Wind speed and direction, and fuel model spread rates were adjusted in a way that the outcomes of the spatial analysis (flame front location and time of impact) matched eyewitness statements during the period of most intense fire activity. Increasing the rate of spread within the FARSITE model allowed it to account for spot fires, atmospheric interaction, and merging fires that were thought to play role in the development of this natural disaster.

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