

Proceedings of the
5th Southern Forestry and Natural Resources
GIS Conference

Asheville, North Carolina
June 12-14, 2006



EDITORS

STEVE PRISLEY
PETE BETTINGER
I-KUAI HUNG
JOHN KUSHLA



Warnell School of Forestry and Natural Resources
University of Georgia
Athens, GA

December 2006

PREFACE

The 5th Southern Forestry and Natural Resources GIS Conference provided ample illustration of the continuing widespread application of geospatial information technologies in the monitoring and management of the forests of the southern United States. Beginning with the keynote address, describing how GIS has become part of a statewide enterprise information system, to the posters and papers presented, we can see the crucial role that these information technologies play in understanding, measuring, monitoring, and managing a wide array of natural resources.

Sessions on remote sensing, and global positioning systems illustrated the applications and ongoing development of these core technologies. Sessions on GIS systems and geospatial service systems focused on the management and delivery of geospatial information. Other sessions provided examples of applications in the areas of aquatic resources, forest and land inventory, habitat modeling, disturbance modeling, and broad-scale analyses.

For the first time, this conference was held in Asheville, amid the mountains and forests of western North Carolina. But as in past conferences in this series, it was attended by an array of natural resource professionals from federal and state governments, universities, consulting firms, forest industries, and non-governmental organizations.

The conference was sponsored and supported by the Southern Regional Extension Forester, the Warnell School of Forestry and Natural Resources, the Center for Forest Business, and the Center for Continuing Education at the University of Georgia. In addition, the conference coordinating team was supported by the Arthur Temple College of Forestry and Agriculture at Stephen F. Austin State University, the Department of Forestry at Virginia Tech, and Mississippi State University. The support of numerous other organizations, including vendors and exhibitors, is gratefully acknowledged.

Pete Bettinger served as conference chair, I-Kuai Hung was the program chair and developed the conference logo, Steve Prisley was the proceedings chair, and John Kushla served on the planning committee and assisted in editing the proceedings. Finally, the editors wish to express their appreciation to several individuals who helped to make the conference successful, including Ben Jackson and Holly Blanchard (Georgia Center for Continuing Education), and Bill Hubbard (Southern Region Extension Forester). The proceedings cover was designed by Ana Constantinescu of the Virginia Tech Center for Geospatial Information Technologies.

S.P.

Proceedings of the 5th Southern Forestry and Natural Resources GIS Conference

TABLE OF CONTENTS

KEYNOTE ADDRESS

- The Map is the Business: Enterprise GIS for a State Forestry Agency 1
John Scrivani

GLOBAL POSITIONING SYSTEMS

- Accuracies of Various GPS Antennas under Forested Conditions 2
B.H. Holley and M.D. Yawn

- Assessing GPS Accuracy, WAAS, and a Choke Ring Antenna Solution
in a Southern Hardwood Forest 10
S.D. Danskin, P. Bettinger, and T.R. Jordan

- Increased Precision in Estimating Forest Inventory Parameters
Based on Canopy Sampling 19
K. Livengood

SPATIAL ANALYSIS

- Spatial Analysis of Potential Impacts of Local Forestry Ordinances 27
D.R. Daversa, S.P. Prisley, and M.J. Mortimer

- A Spatial Analysis of 20th Century East Texas Sawmills: From Trams to Electrons 36
D.L. McDonald and D.L. Kulhavy

- Spatial Analysis of the Change in Land Cover and Human Well-being
in the Black-Belt Counties of Alabama 37
B.R. Gyawali, R.F. Fraser, Y. Wang, W. Tadesse, J. Bukenya, and J. Schelhas

REMOTE SENSING

- Estimation of Southern Pine and Hardwood Forest Canopy Structure
Using Small Footprint Lidar 50
C. Listopad, J. Drake, R. Masters, and J. Noble

- Using Geospatial Methods for Derivation of Fine Spatial Resolution Forest Inventory
from Ground Inventory Data and Landsat Imagery 51
Q. Meng, C.J. Cieszewski, and R. Lowe

Above-Ground Biomass Estimation in Forestland Using A Landsat Thematic Mapper Image with Supervised Regression Analysis	63
<i>R. Hayashi and P. Bettinger</i>	

AQUATICS

Geospatial Modeling of Forest Road Networks and Their Effects on Stream Macroinvertebrate Communities	70
<i>A.M. Bernard, S.P. Prisley, W.M. Aust and C.D. Heatwole</i>	

The Personal Geodatabase as a BMP for Stormwater Management	82
<i>C.T. Smith and H.A. Devine</i>	

Adding Value to Historical Research - Developing a GIS Database of Aquatic Species.....	91
<i>L. Teeter, M. Polyakov, and S. Glover</i>	

GIS / INVENTORY

Temporal Analysis of Landsat Satellite Imagery for Land Cover Change Tracking in Southeastern Georgia	92
<i>R. Lowe and C. Cieszewski</i>	

A GIS Sampling Assistant Program for Forest Inventory Point/Plot Schemes	93
<i>D.J. Lipscomb, D.J. Nowak, J.T. Walton, and C. Post</i>	

Analysis of Fiber Supply Sustainability in Different Procurement Areas in Georgia.....	103
<i>C.J. Cieszewski, R. Lowe, and S. Liu</i>	

GIS SYSTEMS

The Google API - A Forestry GIS Data Distribution Platform	104
<i>C. Neese</i>	

Status of GIS Databases and Analyses for the Chattahoochee National Forest	105
<i>E. Mavity</i>	

Forest Land Classification Using Isocustering Procedure: An Exploratory Analysis.....	106
<i>Y. Wang, S. Parajuli, D. Lemke, X. Chen, W. Tadesse, C. Schweitzer, and G. Smalley</i>	

NATURAL DISTURBANCE MODELING

Managing Hurricane Impacts on Wild Fire Fuel Loads in Southern US Forests	115
<i>J. Moore Myers, S. McNulty, and S. Strickland</i>	

Mapping Forest Hurricane Damage Using Automated Feature Extraction..... 116
J.M. Shedd, H. Devine, and D. Hulbert

Evaluation of Ikonos Satellite Imagery for Detecting Ice Storm Damage
to Oak Forests in Eastern Kentucky..... 128
W.H. McNab, T. Roof, and J.F. Lewis

WILDLIFE HABITAT MODELING

A GIS Tool for Evaluating the Impact of Proposed Cuts on Red-cockaded
Woodpecker Habitat 139
D.J. Lipscomb and T.M. Williams

Evaluating Population-Habitat Relationships of Forest Breeding Birds at
Multiple Scales Using Forest Inventory and Analysis Data 148
T.M. Fearer, D.F. Stauffer, S.P. Prisley, and P.D. Keyser

GIS for Planning and Management at Merritt Island National Wildlife Refuge
Complex or GIS for the Funding Impaired..... 149
F.W. Adrian and C.M. Ehrhardt

BROAD SCALE ANALYSES

Correlation Between Pollen Dispersion and Forest Spatial Distribution Patterns
In the Southeastern United States 159
P.P. Siska, I-K. Hung, and V.M. Bryant, Jr.

An Overview of Methodologies for Mapping Ecological Systems Vegetation Classes
for the Piedmont Region of the Southeastern US 172
J. Lee, K. Samples, and L. Kramer

GEOSPATIAL SERVICE SYSTEMS

The Columbia Regional Geospatial Service Center System: A Model for Rural
Geospatial Support for the Nation 173
J.C. Kroll, D. McDonald, and P.R. Blackwell

LANDFIRE: What is it; Where is it; Is it Different; How Might it Be Used? 174
J.L. Smith

OTHER

Factors Affecting Site Productivity of Loblolly Pine Plantations Across the
Southeastern United States 175
C.L. VanderSchaaf and S.P. Prisley

POSTERS

Using Remotely Sensed Data to Quantify the Spatial Extent and Acreage of Contaminated Brine Sites in Southwest Texas.....	188
<i>C. Bowes and D.R. Unger</i>	
Comparing the Accuracy of Multi-Source Data Integration for Two Supervised Image Classification Methods: Maximum Likelihood and Artificial Neural Network	189
<i>D.R. Unger and H. Tribby</i>	
Historic Visualization: Sabine River Crossings of Texas.....	191
<i>J.M. Williams</i>	