

## **Above Ground Biomass Estimation in Forested Land Using Landsat Enhanced Thematic Mapper Plus Image with Supervised Regression Analysis**

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Because of the carbon budget trading framework in the Kyoto Protocol, techniques for cost- and time-efficient above ground biomass (AGB) estimation on forest lands are required. Using a remotely sensed image, such as a Landsat Enhanced Thematic Mapper Plus (ETM+) image, it should be possible to estimate AGB with satisfactory accuracy, compared to AGB estimation through conventional field measurements. The proposed research will focus on two major objectives regarding AGB estimation using a ETM+ image of the Whitehall Forest in Athens, Georgia. Results of this analysis that are completed by the time of the conference will be presented. First, the research will focus on the establishment of the relationships between spectral reflectance values in radiometric wavelengths extracted from a ETM+ image and actual AGB through conventional field measurements using supervised regression analysis as an image classification method. The accuracy level of AGB estimation models derived through supervised regression analysis will be evaluated using the coefficient of determination with the root mean square error between estimated and actual AGB. Although supervised regression analysis requires a minimal number of actual AGB sample points from the research area, few studies have intensively examined the relationship between required numbers of AGB training data and accuracy levels in AGB estimation. Therefore, in the second phases, this research will assess how many AGB training data are needed to derive a certain accuracy level in AGB estimation using a single ETM+ image. We will suggest future work during the presentation as well.

*Keywords:* Remote sensing, biomass estimation, sampling techniques

**5th Southern Forestry and Natural Resources GIS Conference  
June 12-14, 2006  
Asheville, NC**