

2006. Cipollini, Martin L., Amy Huber, Amy Gaskell, Melanie Belk, and Carly Donahue. Estimation of Carbon Storage and Dynamics in a Mountain Longleaf Pine Ecosystem Undergoing Restoration. *Abstracts of The Ecological Society of America 91<sup>st</sup> Annual Meeting, August 6-11, 2006, Memphis, Tennessee*: 74-75. (Abstract)

Abstract: In response to concerns about increases in global CO<sub>2</sub>, there is renewed interest in estimating carbon storage of forests. At the same time, much interest has gathered concerning the restoration of southeastern U.S. Longleaf Pine (*Pinus palustris*) ecosystems that have been degraded largely as a result of long-term fire suppression. Longleaf pines have high wood densities, long lives, and are thus able to sequester more carbon than other southern U.S. pines. But, in order to restore longleaf pine ecosystems, the use of prescribed fire (which seems antithetical to developing carbon stores) is necessary. The goal of this project was to estimate total carbon reserves and changes in response to the reintroduction of fire in five relict, fire-suppressed Mountain Longleaf Pine stands in northwestern Georgia. Because standard methods for estimating forest biomass have not been developed for Mountain Longleaf Pine forests, it was necessary to correct existing methods. Biomass estimates were made using a standard plane intercept method for all biomass classes except downed wood material and trees >3.05 m tall. For downed wood biomass, a correction factor was established by comparing results obtained with a plane intercept method to those obtained by weighing material for fixed area plots. For trees >3.05 m tall, published species allometric equations were used to estimate biomass from diameter-at-breast height data taken using the point-centered quarter sampling method. These results were combined to estimate the total biomass for the study areas. In some study areas, we were able to estimate biomass before and following restoration burns or were able to compare adjacent burned and unburned areas. Total dry biomass, which was dominated by trees >3.05 m tall, and litter and duff classes ranged from 72 t ac<sup>-1</sup> (161 tn ha<sup>-1</sup>) in a recently burned stand to 176 t ac<sup>-1</sup> (394 tn ha<sup>-1</sup>) in a relict stand with no record of recent fire.