MEASURING CARBON POOLS: METHODS FOR SITE-LEVEL ASSESSMENT OF CARBON BALANCE IN FREQUENTLY BURNED FORESTS

Jesse K. Kreye

School of Forest Resources and Conservation, University of Florida, Gainesville, FL

ABSTRACT

With growing recognition of the role of atmospheric carbon in global climate change, mitigation efforts to reduce anthropogenic carbon emissions and increase carbon sequestration are important. The ability to estimate carbon pools and understand the carbon balance is not only important at the ecosystem scale, but also at the site level for land managers. With the use of prescribed burning in the management of fire-dependent ecosystems, there is a need to fully understand the balance of fire-induced carbon emission and long-term carbon sequestration in these systems. A small-scale preliminary study was conducted in a pine upland and a hardwood hammock in northern Florida to describe methods used to estimate carbon pools. Biomass was estimated in understory plants, litter, woody debris, roots, and soil. Carbon concentration was estimated in the litter, woody debris, root, and soil pools by measuring the carbon concentration in a homogenized subsample using laboratory techniques. Carbon concentration was also compared across decay categories of coarse woody debris as well as across specific gravity. Carbon concentration in understory plant biomass was assumed to be 50%. Carbon concentration was slightly higher in the coarse woody debris, litter, and root pools of the pine upland compared with the hardwood hammock while root carbon concentrations were similar. A trend of lower carbon concentration with higher decay class as well as lower specific gravity was also found. Measuring pre- and post-prescribed burning carbon pools may be used to estimate fire-induced carbon emissions and to assess sequestration for future carbon trading economies. While carbon dynamics studies at the ecosystem level rarely include coarse woody debris in analysis, a better understanding of this carbon pool may be important in understanding the carbon balance in frequently burned forest ecosystems.

Keywords: carbon balance, carbon sequestration, coarse woody debris, fire effects.

Citation: Kreye, J.K. 2010. Measuring carbon pools: methods for site-level assessment of carbon balance in frequently burned forests [abstract]. Page 100 *in* K.M. Robertson, K.E.M. Galley, and R.E. Masters (eds.). Proceedings of the 24th Tall Timbers Fire Ecology Conference: The Future of Prescribed Fire: Public Awareness, Health, and Safety. Tall Timbers Research Station, Tallahassee, Florida, USA.