

## CURRICULUM VITA

### **Daniel Markewitz**

Associate Professor  
Warnell School of Forestry and Natural Resources  
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#### **1. Academic and Professional History**

##### **a. Education**

Ph.D., Department of Environment, Duke University, May, 1996.

Dissertation title: Soil acidification, soil potassium availability, and biogeochemistry of aluminum and silicon in a 34-year-old loblolly pine (*Pinus taeda* L.) ecosystem in the Calhoun Experimental Forest, South Carolina.

M.E.M., School of Forestry and Environmental Studies, Duke University, 1991.

Thesis title: Chemical patterns in snowpack, soil solution, and streamwater in a subalpine ecosystem of the Fraser Experimental Forest, Colorado.

B.S., School of Natural Resources, University of Michigan, Ann Arbor, 1986.

##### **b. Professional Experience (University of Georgia):**

Professor of Soil/site productivity. Warnell School of Forestry and Natural Resource, The University of Georgia, Athens, GA. July 2011 – present (80 % Research/20% teaching)

Associate Professor of Soil/site productivity. Warnell School of Forestry and Natural Resource, The University of Georgia, Athens, GA. July 2003 – 2010 (80 % Research/20% teaching)

Assistant Professor of Soil/site productivity. Warnell School of Forest Resource, The University of Georgia, Athens, GA. March, 1998 – June, 2003

##### **c. Professional Experience (Other):**

Postdoctoral Research Fellow. The Woods Hole Research Center, Woods Hole, MA.  
November 1995 – February, 1998

Graduate Research and Teaching Assistant. Department of Environment, Duke University, Durham, NC. January 1991 to October 1995

Research Assistant. Fraser Experimental Forest, U.S. Forest Service, Fraser, CO.  
June, 1989 to Dec. 1990

Environmental Scientist. Camp Dresser and McKee, New York, NY.  
May – August, 1987

Interpreter/Naturalist. Sequoia National Park, Sequoia Natural History Association.  
May – Sept. 1986

Student Conservation Association Research Technician. Bureau of Land Management,  
Coos Bay, OR. June-July, 1985

**d. Honors and Awards:**

President, Soil Science Society of Georgia, 2012-2013.

Invited speaker, Special Session: Southern Forest Science in Support of a Low Carbon  
economy. Biennial Southern Silvicultural Research Conference, Charleston, SC,  
February, 2011.

Presentation Award Soil Science Society of America, S7 Division, Annual Meeting, Nov.  
2010.

Invited speaker, Synthesis of Major LBA Research Results, Meeting of the Americas,  
American Geophysical Union, Foz do Iguassu, Brazil, August, 2010.

Invited workshop participant, Tropical Hydrology Symposium, Panama City, Panama  
March, 2009.

Chair, Forest, Range, and Wildlands Soils Division, Soil Science Society of America,  
2008.

Presentation Award Soil Science Society of America, S7 Division, Annual Meeting, Oct.  
2008.

Invited speaker, World Soil Congress, Philadelphia, PA. July 2006.

Invited speaker, 7th International Symposium on the Geochemistry of the Earth's  
Surface, Aix-en-Provence, France, August 2005.

Invited speaker, 31<sup>st</sup> International Geological Conference, Rio de Janeiro, Brazil. Aug.  
2000.

Presentation Award Soil Science Society of America, S7 Division, Annual Meeting, Nov.  
1997.

Awarded National Research Council Postdoctoral Fellowship, November 1995 (declined award)

Presentation Award Soil Science Society

pollution on southern pine forests. Ecological Studies Series, Vol. 118. Springer-Verlag, NY. \*\*,\*

Richter, D.D. and Markewitz, D. 1996. Carbon changes during the growth of loblolly pine on formerly cultivated soil: The Calhoun Experimental Forest, USA. P. 397-407. *In* Powlson, D.S., Smith, P. and Smith, J.U. (eds.), Evaluation of soil organic matter models: Using existing long-term datasets. NATO Advanced Science Series 1, Global Environmental Change Vol. 38, Springer-Verlag, Berlin. \*\*, \*

Richter, D.D., D. Markewitz, C.G. Wells, H.L. Allen, J. Dunscomb, K. Harrison, P.R. Heine, A. Stuanes, B. Urrego, and G. Bonani. 1995. Carbon cycling in an old-field pine forest: Implications for the missing carbon sink and the concept of soil. p. 233-252. *In* W. McFee and J.M. Kelly (eds.), Carbon forms and functions in forest soils. Soil Science Society of America Publishers, Madison, WI. \*

#### **Journal Articles:**

Williams, T.D., R Moore, and D Markewitz. Evaluating content- and presentation-related characteristics of media coverage of environmental issues with significant public debate. *Applied Environmental Education and Communication. In press.*

Markewitz, D., R. de O. Figueiredo, C.J. de Carvalho, and E.A. Davidson. 2012. Tree growth and soil response to P fertilization in a 24-year-old tropical forest on an Oxisol. *Biology and Fertility of Soil*. DOI 10.1007/s00374-011-0659-9.

Worsham, L, D Markewitz, N Nibbelink, and L West. 2012. A comparison of three landscape sampling methods to estimate soil carbon content. *Forest Science*, DOI 10.5849/forsci.11-084.

Richter, DD, AR Bacon, ML Mobley, CJ Richardson, SS Andrews, L West, S Wills, S Billings, CA Cambardella, N Cavallaro, JE DeMeester, AJ Fransluebbers, AS Grandy, S Grunwald, J Gruver, AS Hartshorn, H Janzen, MG Kramer, JK Ladha, K Lajtha, GC Liles, D Markewitz, PJ Megonigal, AR Mermut, C Rasmussen, DA Robinson, P Smith, CA Stilles, RL Tate, A Thompson, AJ Tugel, H van Es, D Yaalon, TM Zobeck. 2011. Human-Soil Relations are Changing Rapidly: Proposals from SSSA's Cross-Divisional Soil Change Working Group. *Sil Sci. Soc. Am. J.* 75: 1-6. DOI: 10-2136/sssaj2011.0124.

Markewitz, D., E.C. Lamon III, MMC Bustamante, J. Chavez, R.O. Figueiredo, M. Johnson, A. Krusche, C. Neill, and JSO Silva. 2011. Discharge-calcium concentration relationships in streams of the Amazon and Cerrado of Brazil: Soil or land use controlled. *Biogeochemistry* 105:19-35. DOI: 10.1007/s10533-011-9574-2.

- Neill, C, JE Chaves, T Biggs, LA Deegan, H Elsenbeer, RO Figueiredo, S Germer, MS Johnson, J Lehman, and D Markewitz. 2011. Runoff sources and land cover change in the Amazon: An end member mixing analysis from small watersheds. *Biogeochemistry* 105:7-18. DOI: 10.1007/s10533-011-9597-8.
- Resende, J, D Markewitz, CA Klink, MM Bustamante, and EA Davidson. 2011. Phosphorus cycling in a small watershed in the Brazilian Cerrado: impacts of frequent burning. *Biogeochemistry* 105:105-118. DOI: 10-1007/s10533-010-9531-5.
- Silva, JSO, MMC Bustamante, D Markewitz, AV Krusche, and LG Ferreira. 2011. Effects of land cover on chemical characteristics of streams in the Cerrado region of Brazil. *Biogeochemistry*. 105: 75-88. DOI: 10.1007/s10533-010-9557-8.
- Parron, LM, MMC Bustamante, and D. Markewitz. 2011. Fluxes of nitrogen and phosphorus in a gallery forest in the cerrados of central Brazil: Effects of the topographical gradient. *Biogeochemistry*. 105:89-104. DOI: 10.1007/s10533-010-9537-z.
- Devine, S. D. Markewitz. P. Hendrix, and D. Coleman. 2011. Soil carbon change through two meters during forest succession alongside a 30-yr agroecosystem experiment. *Forest Science* 57(1): 36-50. §
- Joslin, AH, D Markewitz, LA Morris, F de A Oliveira, R de O Figueireido and OR Kato. 2011. Five native tree species and manioc under slash-and-mulch agroforestry in the eastern Amazon, Brazil: Plant growth and soil responses. *Agroforestry Systems*. 81(1): 1-14. §
- Davidson, E.A., R.O. Figueiredo, D. Markewitz, and A. Aufdenkampe. 2010. Dissolved CO<sub>2</sub> in small catchment streams of Eastern Amazonia: A minor pathway of terrestrial carbon loss. *Journal of Geophysical Research* 115, G04005, doi:10.1029/2009JG001202.
- Figueiredo, RO., D. Markewitz, E.A. Davidson, A.E. Schuler, O.S. Watrin, and P.S. Silva. 2010. Land-use affects on the chemical attributes of low-order streams in the eastern Amazon. *Journal of Geophysical Research* 115, G04004, doi:10.1029/2009JG001200.
- Markewitz, D., S. Devine, E.A. Davidson, P. Brando, and D. Nepstad. 2010. Soil moisture depletion under simulated drought in the Amazon: Impacts on deep root uptake. *New Phytologist*, 187:592-607.
- Rifai, S., D. Markewitz, and B. Borders. 2010. Twenty years of intensive fertilization and competing vegetation suppression in loblolly pine plantations: Impacts on soil C, N, and microbial biomass. *Soil Biology and Biochemistry*, 42:713-723. §

- Galang, MA, D Markewitz, and LA Morris. 2010. Soil P transformations under prescribed burning and simulated heat treatment conditions. *Geoderma*: 155:401-408. §
- Galang, MA, L Morris, D Markewitz, CR Jackson, and EA Carter. 2010. Prescribed burning effects on the hydrologic behavior of gullies in the South Carolina Piedmont. *Forest Ecology and Management*. 259:1959-1970. §
- Worsham, L, D Markewitz, and N Nibbelink. 2010. Incorporating spatial dependence into estimates of soil carbon contents under different landcovers. *Soil Science Society of America Journal*. 74(2): 635-646.
- Belk, E, D Markewitz, TC Rasmussen, EJ Maklouf Carvalho, DC Nepstad, and EA Davidson. 2007. Modelling the effects of throughfall reduction on soil water content in a Brazilian Oxisol under a moist tropical forest. *Water Resources Research*, vol. 43: W08432 doi:10.1029/2006WR005493. \* §
- Lincoln, M. Chad, Rodney E. Will, Lawrence A. Morris, Emily A. Carter, Daniel Markewitz, John R. Britt, Ben Cazell, and Vic Ford. 2007. Soil change and loblolly pine (*Pinus taeda*) seedling growth following site preparation tillage in the Upper Coastal Plain of the southeastern United States. *Forest Ecology and Management*, 242:558-568. \*
- Sartori, F, D. Markewitz, and B.E. Borders. 2007. Soil carbon storage and nitrogen and phosphorus availability in loblolly pine plantations over 4 to 16 years of herbicide and fertilizer treatments. *Biogeochemistry*, 84:13-30 \*, §
- Galang, Marco A., D. Markewitz, L.A. Morris, and P. Bussel. 2007. Land use change and gully erosion in the Piedmont region of South Carolina, USA. *Journal of Soil and Water Conservation*, 62(3):130-137 \*, §
- Markewitz, D. 2006. Fossil fuel carbon emissions from silviculture: Impacts on net carbon sequestration in forests. *Forest Ecology and Management*, 236:153-161. \*
- Markewitz, D., Julio C.F. Resende, Lucilia Parron, Mercedes Bustamante, Carlos A. Klink, Ricardo de O. Figueiredo, and EA Davidson. 2006. Dissolved rainfall inputs and streamwater outputs in an undisturbed watershed on highly weathered soils in the Brazilian cerrado. *Hydrological Processes* 20 (12): 2615-2639. \*
- Neill, C., Helmut Elsenbeer, Alex V. Krusche, Johannes Lehmann, Daniel Markewitz, and Ricardo de O. Figueiredo 2006. Hydrological and biogeochemical processes in a changing Amazon: results from small watershed studies and the large-scale biosphere-atmosphere experiment. *Hydrological Processes* 20 (12): 2467-2476. \*

Markewitz, D, R.O. Figueiredo, and E.A. Davidson. 2006. CO<sub>2</sub> driven cation leaching after tropical forest clearing. *Journal of Geochemical Explorations*, 88:214-219. \*\*, \*

Richter, DD, H. Lee Allen, Jianwei Li, D Markewitz, and Jane Raikes. 2006. Bioavailability of slowly cycling soil phosphorus: major restructuring of soil P fractions over four decades in an aggrading forest. *Oecologia* 150 (2): 259-271. \*

Will, RE, D Markewitz, RL Hendrick, DF Meason, TR Crocker, and BE Borders. 2006. Nitrogen and phosphorus dynamics for 13-year-old loblolly pine stands receiving complete competition control and annual N fertilizer. *Forest Ecology and Management* 227 (1-2): 155-168. \*

Meason, D, D Markewitz, and RE Will. 2004.

- Nepstad, D.C., P. Moutinho, M.B. Dias-Filho, E.A. Davidson, G. Cardinot, D. Markewitz, R. Figueiredo, N. Viana, J. Chambers, D. Ray, J.B. Guerreiros, P. Lefebvre, L. Sternberg, M. Moreira, L. Barros, F.Y. Ishida, I. Tohlover, E. Belk, K. Kaliff, and K. Schwalbe. 2002. The effects of partial throughfall exclusion on canopy processes, aboveground production, and biogeochemistry of an Amazon forest. *Journal of Geophysical Research*. 107, D20, 8085. \*\*, \*
- Will, R.E., M.J. Wheeler, D. Markewitz, M.A. Jacobson, and A.M. Shirley. 2002. II. Early loblolly pine stand response to tillage on the Piedmont and Upper Coastal Plain of Georgia: Tree allometry, foliar nitrogen concentration, soil bulk density, soil moisture, and soil nitrogen status. *Southern Journal of Applied Forestry*. 26(4):190-196.\*
- Wheeler, M.J., R.E. Will, D. Markewitz, M.A. Jacobson, and A.M. Shirley. 2002. I. Early loblolly pine stand response to tillage on the Piedmont and Upper Coastal Plain of Georgia: Mortality, stand uniformity, and second and third year growth. *Southern Journal of Applied Forestry*. 26(4):181-189.\*
- Markewitz, D., E.A. Davidson, R. de O. Figueiredo, R.L. Victoria, & A.V. Krusche. 2001. Control of cation concentrations in stream waters by surface soil processes in an Amazonian watershed. *Nature* 410:802-805. \*
- Gaudinski, J.B., S.E. Trumbore, E.A. Davidson, A.C. Cook, D. Markewitz, and D.D. Richter. 2001. The age of fine-root carbon in three forests of the eastern United States measured by radiocarbon. *Oecologia* 129:420-429. \*
- Johnson, K.H., D. Wear, R. Oren, R.O. Teskey, F. Sanchez, R.E. Will, J. Butnor, D. Markewitz, D.D. Richter, T. Rials, H.L. Allen, J. Seiler, D. Ellsworth, C. Maier, G. Katul, and P.M. Dougherty. 2001. Meeting global policy commitments: Carbon sequestration and southern pine forests. *J. Forestry* 99:14-21. \*
- Markewitz, D. and D.D. Richter. 2000. Long-term soil potassium availability from a Kanhapludult to an aggrading loblolly pine ecosystem. *Forest Ecology Management* 130:109-129.\*
- Richter, D.D., D. Markewitz, P.R. Heine, V. Jin, J.A. Raikes, K. Tian, and C.G. Wells. 2000. Legacies of agriculture and forest regrowth in the nitrogen of old-field soils. *Forest Ecology and Management* 138:233-248. \*
- Richter, D.D., D. Markewitz, S.E. Trumbore, and C.G. Wells. 1999. Accumulation and turnover of radio- and organic carbon in soil of an aggrading forest. *Nature* 400:56-58. \*



- Markewitz, D., D.D. Richter, H. L. Allen and J.B. Urrego. 1998. Thirty years of observed forest soil acidification in the Calhoun Experimental Forest: Has acid rain made a difference? *Soil Science Society of America Journal* 62:1428-1439. \*
- Markewitz, D. and D.D. Richter. 1998. The *bio* in Al and Si geochemistry. *Biogeochemistry* 42:225-252. \*
- Stottlemeyer, R., C. Troendle, and D. Markewitz. 1997. Change in snowpack, soil water, and streamwater chemistry with elevation during 1990, Fraser Experimental Forest, Colorado. *Journal of Hydrology* 195:114-136. \*
- Richter, D.D. and D. Markewitz. 1995. How deep is soil? *BioScience* 45:600-609. \*
- Richter, D.D., D. Markewitz, C.G. Wells, H.L. Allen, R. April, P.R. Heine, and B. Urrego. 1994. Soil chemical change during three decades in a loblolly pine ecosystem. *Ecology* 75:1463-1473. \*

**Proceedings:**

- Markewitz, D., C.R. Jackson, N. Fraser, and D. Radcliffe. 2011. Stream water dissolved organic carbon and total dissolved nitrogen: Effects of timber harvest in the Georgia Piedmont. *In* Carroll, GD (ed) *Proceedings of the 2011 Georgia Water Resources Conference*. April 11-13, 2011, University of Georgia Press, Athens, GA, ISBN: 0-9794100-2-9.
- Markewitz, D. and Rebekah Glazer. 2009. Use of polyacrylamide (PAM) for controlling soil erosion on steep slopes in the piedmont of Georgia. *Proceedings of the 2009 Georgia Water Resources Conference*.
- Cieszewski, CJ, RC Low, S Liu, I Elle, and D Markewitz. 2009. New functions and programs in hypermap software development for internet-based displaying of FIA data. *In* McRoberts, RE, GA Reams, PC Van Deusen, and WH McWilliams (eds) *Proceedings of the 8<sup>th</sup> FIA symposium* Oct. 16-19, 2006, Monterey, CA. Gen. Tech. Report WO-79 Pp. 375-392
- Galang, M.A., C.R. Jackson, L.A. Morris, D. Markewitz, and E.A. Carter. 2007. Hydrological behavior of gullies in the South Carolina Piedmont, *In* *Proceedings of the 2007 Georgia Water Resources Conference*, Athens, GA. \*, §
- Venturieri, A., R.O. Figueiredo, O.S. Watrin, and D. Markewitz. 2005. Utilização de imagens Landsat e CBERS na avaliação da mudança do uso e cobertura da terra e seus reflexos na qualidade da água em microbacia hidrográfica do município de Paragominas, Pará. *In* *Anais XII Simpósio Brasileiro de Sensoriamento Remoto*, Goiânia, Brasil. 16-21 Abril, INPE, p. 1127-1134.\*

Bradshaw, J Kenneth, D Radcliffe, K Lichtenstein, M Risse, M Bakker, R Jackson and D Markewitz. 2005. Land use effects on water quality in six small Georgia watersheds. In Hatcher, J (ed.) Proceedings of the 2005 Georgia Water Resources Conference. \*

Figueiredo, R.O., K.A. Sousa, D. Markewitz, and EA Davidson. 2003. Alterações nas concentrações de ortofosfato em amostras de chuva, throughfall e litter leachate armazenadas em coletores instalados em área experimental na Floresta Nacional do Tapajós.. In: VI Congresso de Ecologia da Brasil, 2003, Fortaleza. VI Congresso de Ecologia da Brasil - Anais de Trabalhos Completos. Fortaleza : Editora da Universidade Federal do Ceará, 2003. p. 676-678.

Glazer, R. and D. Markewitz. 2001. A field trial using low application rates of polyacrylamide (PAM) to reduce soil erosion from disturbed piedmont soils. Pp 736-739. *In* Proceedings of the 2001 Georgia Water Resources Conference, Athens, GA. \*, §

**Bulletins:**

Borders, B.E., R. Will, R.L. Hendrick, D. Markewitz, T.B. Harrington, R.O. Teskey, and A. Clark. 2002. Consortium for accelerated pine production studies (CAPPS): Long-term trends in loblolly pine stand productivity and characteristics in Georgia. General Technical Report SRS-48. Asheville, NC. Pp. 591-592.

**Other:**

Dangerfield, CW, RL Izlar, RO Teskey, CJ Cieszewski, D Markewitz, RL Hendrick. 2004 Carbon Sequestration – A Georgia Fact Sheet. Center for Forest Business Technical Bulletin #13

Markewitz, D. 1997. Soil without life? Nature 389:435.

**b. Invited presentations at professional and learned societies**

Markewitz, D, L Worsham, and N Nibbelink. Estimating soil carbon contents across the landscape: a comparison of three sampling methods. Special Session: Southern Forest Science in Support of a Low Carbon economy. Biennial Southern Silvicultural Research Conference, Charleston, SC, February, 2011.

Markewitz, D et al., River corridors of the Amazon and their response to anthropogenic change: A look back and a glimpse forward. American Geophysical Union, Meeting of the Americas, Foz do Iguacu Brazil, August, 2010.

- Markewitz, D, RO Figueiredo, EA Davidson, MAE Schuler, and OS Watrin. Land use change: Impacts on stream water chemistry in mixed-use catchments in Eastern Amazonia. Tropical Hydrology Symposium, Panama City, Panama March 16-20, 2009.
- Markewitz, D. Carbon Allocation in Forested Ecosystems: Processes regulating carbon storage and turnover in forests. Southern Group of State Foresters Carbon Sequestration Workshop, Atlanta, GA Aug. 6-7, 2008.
- Morris, L, D Markewitz, L Ogden, and V Ford. The past and future role of mechanical site preparation. North American Forest Soils conference, Blacksburg, VA, June 22-26, 2008.
- Markewitz, D. 2007. Development of the Georgia Carbon Sequestration Registry. Grow Green Coalition and Georgia Urban Forest Council annual meeting. Athens, GA.
- Markewitz, D, and D.D. Richter. 2006. Chemical signatures of land use change. World Soil Congress, Philadelphia, PA. \*
- Markewitz, D. 2006. Properties and processes regulating carbon storage and turnover in soils. Southern Forest Research Partnership workshop. Asheville, NC.
- Markewitz, D. 2005. CO<sub>2</sub> driven cation leaching after tropical forest clearing. 7th International Symposium on the Geochemistry of the Earth's Surface, Aix-en-Provence, France.
- Markewitz, D., R.O. Figueiredo, E.A. Davidson, A.V. Krushe, R. Victoria, J.M. Moraes, A.E. Schuler, and T. Dunne. 2002. Control of stream water cations by surface soil processes and land use effects on the exchange of nutrients between terrestrial and aquatic ecosystems in the Eastern Amazonia. Largescale Biosphere Atmosphere II Scientific Conference, Manaus, Brazil.
- Richter, D.D., D. Markewitz, and K.H. Johnson. 2001. The importance of observing soil through time: The case of the Calhoun Experimental Forest. Soil Science Society of America Annual meeting, \*
- Markewitz, D., E.A. Davidson, P. Moutinho, D.C. Nepstad, and R. Figueiredo. 2000. Carbon cycling in a mixed land use watershed of the Eastern Amazon. 31<sup>st</sup> International Geological Conference, Rio de Janeiro, Brazil. \*

**c. Other creative contributions:**

*Website creation*

Carbon Trading <http://carbon.sref.info>

*Forest Assessment Tool*

Forest Ecosystem Rapid Assessment Scorecard. D. Markewitz, S. Madson, T. Hinckley. 50 p manual, training DVD, and flash media scorecard.

Developed online training module for FERAS on USDA CRESS website with Dr. Ben Jackson and Ms. Morgan Nolan (<http://www.forestandrange.org/>)

*Model development*

Developed {w/L. Morris(UGA-WSFR), D. Nute, and N. Ruston (UGA-Artificial Intelligence), and J. Vose (USDA-Forest Service)} a nitrogen based forest growth model to be used by landowners to help manage long-term forest productivity.

**d. Research Grants Received**

*(Competitive)*

Southern Conifer Climate Change CAP. 2011-2015. \$20,000,000 total program (\$1.34 M to UGA) USDA-National Institute of Food and Agriculture. (Kane, Teskey, Hubbard, Markewitz, and Zhao)

High density southern pine feedstock production and carbon sequestration. 2011-2015. \$886,058. USDA-National Institute of Food and Agriculture. (Markewitz, Kane, Teskey, and Zhao)

Developing Biomass Harvesting Guidelines to Improve Sustainability of Harvesting Woody Biomass for Renewable Energy – Soil Change and Soil Quality Indicators, 2011-2013, \$178,000 NCASI. (Morris and Markewitz)

Rock Creek Dispersed Recreation Study, 2010-2012, \$79,000, USDA Forest Service, (Green, Nibbelink, and Markewitz)

Field based NIR and 3D electrical resistivity for quantifying spatial variability in soil processes and enhancing precision forest management. 2007-2009, \$142,000. Traditional Industries Program for Pulp and Paper Processing. {D. Markewitz, L. Schimleck, P. Bettinger}

Synthesis of Nutrient Interactions in Secondary Vegetation in Amazonia. 2006-2008. \$54,000 subcontract. NASA – Largescale Biosphere Atmosphere Project in Brazil. {E.A. Davidson with 7 other co-investigators}

Effect of tillage on soil physical properties and their relationship to early loblolly pine growth. 2004-2007. \$280,000. Traditional Industries Program for Pulp and Paper Processing. {R. Will, D. Markewitz, and L. Morris}

- Functional Indicators for Sustainable Forest Management: Synthesis and Experimental Evaluation. 2003-2007. \$240,000. National Commission on Science for Sustainable Forestry. {D Markewitz}
- Nutrient Cycling in Secondary Vegetation of Amazonia: Synthesis. 2006-2008. \$300,000. NASA – Largescale Biosphere Atmosphere Project in Brazil. {E.A. Davidson with 7 other co-investigators}
- Carbon Trading: A primer for landowners. 2006-2007. \$50,000. National Commission on Science for Sustainable Forestry. {D Markewitz}
- Initiating a Partnership Among University, Business and Non-Profit Organizations to Develop Working Forests in the Amazon. 2004. \$5,000. University of Georgia. Office of the Vice President for Public Service and Outreach, International Development Education Awards (IDEAS) Program {D Markewitz and L Morris}
- Dynamics of Biogeochemical Cycles in Secondary Vegetation of Amazonia. 2002-2005. \$300,000. NASA – Largescale Biosphere Atmosphere Project in Brazil. {E.A. Davidson with 7 other co-investigators}
- Effects of Land Use Changes on the Functioning of Soils and Watersheds of Central Brazil Savannas: impacts on nutrient and carbon cycles and trace gas exchange. 2002-2005. \$241,000. NASA – Largescale Biosphere Atmosphere Project in Brazil. {R. Zepp with five other co-investigators}
- Collaborative research: Drought effects on moist tropical forests: A throughfall reduction experiment in Amazonia. 2002-2007. \$1,184,000. National Science Foundation. {D.C. Nepstad, E.A. Davidson, and D Markewitz}
- Management of Soil Carbon Quantity and Quality in High Productivity Forest Plantations. 2000-2003. \$160,000. Traditional Industries Program for Pulp and Paper. {D Markewitz, L. Morris, R. Hendrick, L.Lucia, and A. Ragaskus}
- Quantifying relations of foliar chemistry and spectral reflectance: A future plan for improving fertilization efficiency of plantation forests from space. 2000-2002. \$18,444. Georgia Space Program {D. Markewitz and R.E. Will}.
- The effects of rainfall exclusion on an Amazon forest. 2000-2002. \$430,000 National Science Foundation Ecosystem Studies. {D.C. Nepstad with five other co-investigators}
- Collaborative research on biogeochemical transfers among terrestrial and aquatic biospheres and the atmosphere in forests and pastures of eastern Amazonia. 1998-

2001. \$280,000. NSF Program in Environmental Geochemistry and Biogeochemistry. {E.A. Davidson, D Markewitz, and T. Dunne}.

Can trees increase rates of soil nutrient supply?' 1998-2000. University of Georgia Research Foundation, \$6,000.

The effects of fertilization and competition control on carbon and nutrient allocation and physiology in loblolly pine plantations. 1998-2001. \$268,000. (w/R. Hendrick (PI), R.O. Teskey, R.E. Will, T. Harrington, B. Borders {UGA}). *{I did not participate in the writing of this grant but took over responsibilities for the soil component of this research}*

*(Non-competitive)*

Soil carbon dynamics in longleaf pine ecosystems at the Jones Ecological Research Center. 2008-2010. Joseph Jones Ecological Research Center, \$24,706.

Life cycle analysis for woody biofuel production systems in Georgia. 2009-2010. State of Georgia. \$10,350.

Carbon sequestration in managed loblolly pine forests in the Southeastern United States. 1999-2003. Cooperative agreement with USDA Forest Service \$84,000. (w/R.O. Teskey (PI), R. Will, D. Daniels, L. Morris{UGA}).

An investigation of the effectiveness of silvicultural best management practices in protecting aquatic habitat in the state of Georgia. 2000-2002. \$450,000. US Congressional appropriation (w/R. Jackson (PI), L. Morris, D. Greene, D. Batzer, and T. Rasmussen{UGA}).

Integrated modeling of soil C, N, and P cycles under intensive forest management: Relations to long-term soil productivity. 2000-2001. \$15,000. USDA Forest Service Challenge Cost-share.

Polyacrylamide (PAM) as an effective treatment for minimizing erosion from disturbed piedmont soils. 2000-2001. \$9,000. SE Erosion Control Inc., Atlanta, GA.

Polyacrylamide (PAM) as an effective treatment for minimizing erosion from disturbed piedmont soils. \$19,988. Georgia Power.

The effects of competition control and fertilization on soil organic matter fractions and rates of net N-mineralization in a loblolly pine plantation. 1998-2000. \$30,000. USDA Forest Service Challenge Cost-share.

Nutrient cycling in the Brazilian Savanna on very highly weathered soils. 1998-2000. \$1,000,000. Mellon Foundation Grant to The Woods Hole Research Center with subcontract to UGA. (E.A. Davidson)

*(Industry cooperative)*

Consortium for Accelerated Pine Productivity Studies. ~\$100,000 annual budget. UGA-Warnell School of Forest Resources. (serve as co-PI)

*(Formula funding)*

The sustainability of soil productivity in intensively managed forest plantations. 1998-2001. \$70,000 USDA McIntire-Stennis.

### 3. Resident Instruction and Continuing Education:

#### a. Undergraduate Courses Taught:

##### Forest Ecology (FORS 3020/3020L)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Paticipation</u>
2000	Fall	4	24	100%
2001	Fall	4	15	90%
2002	Fall	4	28	90%
2003	Fall	4	22	100%
2006	Spr	4	35	90%
2007	Spr	4	23	80%

##### Ecology of Natural Resources (FANR 3200/3200L)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Paticipation</u>
2007	Fall	4	40	50%
2008	Spr	4	43	50%
2008	Fall	4	37	50%
2009	Spr	4	48	80%
2010	Spr	4	60	50%
2011	Spr	4	58	50%
2012	Spr	4	64	50%

##### Sustainable systems in Brazil (AESC 3150)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Paticipation</u>
2003	Sum	3	10	50%
2005	Sum	3-6	10	50%
2008	Sum	6	7	30%

##### Special problems (FORS 5920)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Paticipation</u>
2003	Spr	5	1	100%

Understanding your Carbon Footprint (FYOS 1001)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Participation</u>
2011	Fall	1	14	100%
2012	Fall	1	13	100%

**b. Graduate Courses Taught:**

Biogeochemistry: Analysis of Global Change

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Participation</u>
2010	Spring	4	12	50%
2012	Spring	4	18	50%

Science of Sustainability (FORS 7870)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Participation</u>
2006	Spr	2	7	100%
2008	Spr	2	7	100%
2011	Spr	2	4	100%

Special problems (FORS 7983)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Participation</u>
2000	Spr	1	1	100%
2000	Sum	3	1	100%

Directed research (FORS 8983)

<u>Year</u>	<u>Term</u>	<u>Credit hours</u>	<u>Enrollment</u>	<u>Participation</u>
2001	Spring	3	1	100%



*(Current)*