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**Current Objectives and Position**

**Professional Objectives**

My professional objective is to teach and conduct research in the field of forest soil science or environmental science.

**Current Affiliation**

Department of Forestry, 228 Cheatham Hall  
College of Natural Resources  
Virginia Polytechnic and State University  
Blacksburg, VA 24061

**Academic Rank**

Ph.D. Candidate in Forestry (in progress)

**Education**

Ph.D. Forestry	2007*	Virginia Polytechnic Institute and State University, Blacksburg <i>Concentration: Forest Soils</i> *expected completion date
M.S. Forestry	2002	Virginia Polytechnic Institute and State University, Blacksburg <i>Concentration: Forest Soils</i>
B.S. Soil Science	1990	California Polytechnic and State University, San Luis Obispo

**Employment**

- 2002-Present *Graduate Research Assistant*, Forestry Department, Virginia Polytechnic Institute and State University, Blacksburg, VA
- 1999-2002 *Co-Owner, Blue Ridge Tennis Company*, Bent Mountain, VA
- 1999 *Forestry Technician (Subcontractor)*, United States Forest Service, George Washington-Jefferson National Forest, Roanoke, VA.  
(Three-month subcontract)
- 1996 -1998 *Graduate Research Assistant*, Forestry Department, Virginia Polytechnic Institute and State University, Blacksburg, VA
- 1990 - 1995 *Soil Scientist*, United States Forest Service, Pacific Southwest Research Station, Redding CA
- 1989 *Forestry Technician (Soils)*, United States Forest Service, Sierra National Forest, Clovis, CA
- 1989 *Research Assistant*, California Polytechnic and State University, San Luis Obispo, CA

**Publications and Presentations****Refereed Publications:**

- Copenheaver, C.A., S.P. Prisley, J.R. Pittman, M.E. Yonce, C.M. Issem, and K.A. Jensen. 2007. The geography of grist, flour, and saw mills: Indicators of land-use history in Virginia. *Southeastern Geographer* (in press).
- Siegel-Issem, C.M., J.A. Burger, R.F. Powers, F. Ponder, and S.C. Patterson. 2005. Seedling root growth as a function of soil density and water content. *Soil Sci. Soc. Am. J.* 69:215-226.
- Siegel-Issem, C.M., J.A. Burger, R.F. Powers, F. Ponder, and S.C. Patterson. 2005. Physical Characterization of four compacted forest soils for root growth potential. *Soil Tillage and Res.* (in review)
- Kelting, D.L., C.M. Siegel, and J.A. Burger. 1997. Value of commercial forestry as a post-mining land use. p. 344-348. *In*: J. E. Brandt (ed.). *Proc.*, 14<sup>th</sup> Ann. Mtg., Am. Soc. for Surface Mining and Reclamation, Austin, TX.

**Non-Refereed Publications:**

- Siegel-Issem, C.M. 2002. Forest productivity as a function of root growth opportunity. M.S. Thesis. Virginia Polytechnic Institute and State University, Blacksburg, VA.
- Siegel, C.M. 1991. Soil and foliar nitrogen characteristics of a ponderosa pine plantation on contrasting soils. Senior Thesis. California Polytechnic and State University, San Luis Obispo, CA.

**Published Abstracts:**

- Siegel-Issem, C.M., D.A. Scott and J.A. Burger. 2004. Spatial heterogeneity of soil strength, bulk density and tree volume response in compacted loblolly pine plantations. *In* 2004 Agronomy Abstracts. ASA, Madison, WI.
- Siegel, C.M., and J.A. Burger. 2001. Tree seedling response to least limiting water range across a range of forest soils. *In* 2001 Agronomy Abstracts. ASA, Madison, WI.
- Siegel, C.M., J.A. Burger, and R.F. Powers. 1998. Root growth opportunity as a function of soil strength and moisture for several forest soils and tree species. p. 301. *In* 1998 Agronomy Abstracts. ASA, Madison, WI.

- Siegel, C.M., W.M. Aust, and J.A. Burger. 1996. Restoration of forested wetlands disturbed by trafficking. p. 301. *In* 1996 Agronomy Abstracts. ASA, Madison, WI.
- Siegel, C.M., R.F. Powers, and T.H. Spear. 1994. Compaction and weed competition affect soil strength, moisture availability and growth of young conifers on contrasting soils. p. 381. *In* 1994 Agronomy Abstracts. ASA, Madison, WI.

**Volunteered Presentations:**

- Siegel, C.M., D. A. Scott, and J.A. Burger. 2004. Spatial heterogeneity of soil strength, bulk density and tree volume response in compacted loblolly pine plantations. Soil Science Society of America Annual Meeting, Seattle, WA, Nov., 2004 (International Group of Scientists).
- Siegel, C.M., J.A. Burger. 2001. Tree seedling response to least limiting water range across a range of forest soils. Soil Science Society of America Annual Meeting, Charlotte, NC, Nov., 2001 (International Group of Scientists).
- Siegel, C.M. and J.A. Burger. 2001. Root growth opportunity as a function of soil strength and moisture for several forest soils and tree species. USDA-USFS Long-Term Soil Productivity Annual Meeting, Atlantic Beach, NC, Oct., 2001 (Group of Forest Service Scientists).
- Siegel, C.M., J.A. Burger, and R.F. Powers. 1998. Root growth opportunity as a function of soil strength and moisture for several forest soils and tree species. Soil Science Society of America Annual Meeting, Baltimore, MD, Oct. 18-22, 1998 (International Group of Scientists).
- Siegel, C.M., W.M. Aust, and J.A. Burger. 1996. Restoration of forested wetlands disturbed by trafficking. Soil Science Society of America Annual Meeting, Indianapolis, IN, Nov. 3-8, 1996 (International Group of Scientists).
- Siegel, C.M. and R.F. Powers. 1995. The long-term soil productivity study: An overview and recent findings. USFS, Region 5 – North Zone, Annual Cultivist Workshop, Reno, NV. (Forest Service forestry professionals)
- Siegel, C.M., R.F. Powers, and T.H. Spear. 1994. Compaction and weed competition affect soil strength, moisture availability and growth of young conifers on contrasting soils. Soil Science Society of America Annual Meeting, Seattle, WA, Oct. 18-22, 1998 (International Group of Scientists).
- Siegel, C.M. 1993. Effects of tillage on soil strength. California Forest Soils Council Annual Field Tour. (Forestry and natural resource professionals)

- Siegel, C.M. 1991. Impacts of mechanized thinning on soil strength, erosion rate, and soil productivity. California Forest Soils Council Annual Field Tour. (Forestry and natural resource professionals)
- Siegel, C.M. and R.F. Powers. 1991. Black Mountain windrow respreading study: Soil characteristics. USFS, Region 5 Annual Silviculture workshop, Alturas, CA. (Forest Service forestry professionals and technicians)

### **Research Activities**

- “*Forest Productivity as a function of root growth opportunity-Phase I*” - A greenhouse experiment was conducted on several soil types and pine species to better understand soil compaction effects on seedling growth. Models describing root growth as a function of soil bulk density and water content were developed for each soil species combination. The effects of soil compaction on key soil physical properties were evaluated.
- “*Forest Productivity as a function of root growth opportunity-Phase II*” – Phase II is a field trial to test the efficacy of growth models developed in phase I. Field sites are located in California, Mississippi and Missouri. Net primary productivity based on root growth, shoot growth and litterfall will be analyzed as a function of soil water content, density and strength for one growing season. Additional soil properties will be analyzed to determine main factors contributing to soil compactibility.

### **Other Research:**

#### *Virginia Tech Projects:*

- “White Pine Study” - Soil characterization, stand measurements and thinning of an experimental commercial white pine plantation on reclaimed mined land.
- “Effects of Site Preparation on Loblolly Pine Productivity and Soil Properties” – Field measurements, data analyses and presentation preparation.

#### *Forest Service Projects:*

- Long Term Soil Productivity Study –*This project is part of a nationwide research effort assessing the effects of soil compaction and organic matter removal on long-term soil productivity. Duties-* Field plot location, pre-and post harvest site and soil characterization, plot installation, soil and plant measurements and analyses, lab analyses, data analysis, plant and soil water relations (1990-1995)
- “Garden of Eden Study” – *This study was designed to evaluate the effectiveness of competition, nutrient, and insect control in promoting growth and to understand*

*how treatments affect tree physiology and site processes on a range of sites located throughout California. Duties- Soil chemical and physical analyses, tree physiological and growth measurements, fertilization (1990 – 1995)*

- “Black Mountain Windrow Respreading Study” – *Previously windrowed ponderosa pine plantations had windrows respread to determine the effect on nutrient availability, soil physical properties and pine growth. Duties -Tree growth measurements, soil physical and chemical characterization, mineralizable nitrogen measures (1990 – 1993)*
- Wilderness Soil Survey – Surveyed soils located in several Sierra Nevada Wilderness areas as part of the team producing a Soil Survey Manual for the U.S. Forest Service (1989)

*Undergraduate:*

- Senior Project - Soil and foliar nitrogen in relation to ponderosa pine growth

**Teaching Experience**

**Teaching Assistant Experience:**

<u>Course Title</u>	<u>Involvement</u>	<u>Academic Year</u>	<u>Class Level</u>	<u>No. Students</u>	<u>Student Eval. (max. = 4.0)</u>
Forested Wetlands	Teaching Assistant	2007	Undergraduate/ Graduate	19	NA
Forest Biology	Teaching Assistant	2006	Undergraduate	43	NA
Adv. Forest Soils Lab	Lab Instructor	2006	Graduate	10	3.8
Adv. Forest Soils Lab	Co-Lab Instructor	2005	Graduate	9	3.8
Adv. Forest Soils Lab	Lab Instructor	2004	Graduate	6	4.0
Adv. Forest Soils Lab	Lab Instructor	2002	Graduate	10	4.0
Adv. Forest Soils Lab	Lab Instructor	2001	Graduate	3	4.0
Forest Ecology and Management	Co-Lab Instructor	1999	Undergraduate	19	3.5

Dendrology Lab	Lab Instructor	1996	Undergraduate	45	3.3
Soil Physics	Lab Instructor	1989	Undergraduate/ Graduate	20	NA
Forest and Range Soils	Lab Instructor	1989	Undergraduate/ Graduate	10	NA
Soil Fertility	Grader	1988	Undergraduate	25	NA
Soils	Assistant	1986-1988	Undergraduate	30	NA

**Additional Teaching Experience:**

- Substitute lecturer for:
  - Advanced Forest Soils*  
Topic: Forest site classification
  - Topic: Introduction to forest soils and history of forest soil science
  - Forest Soils and Hydrology*  
Topic: Soil Taxonomy and Profile Description
  - Soil Taxonomy (as undergraduate)*  
Topic: Gypsic and Calcic Horizons
- Augusta Springs Environmental Education Project, Augusta County, VA, Spring 2006:
  - Taught outdoor, hands-on programs for 2<sup>nd</sup> and 3<sup>rd</sup> graders at Augusta Springs Wetlands and developed web-based instructional material for the joint U.S. Forest Service and Headwaters Soil and Water Conservation District environmental education program.
- Developed and taught two programs for the biology class at Mountain Community High School, Newport, VA:
  - Program 1 – Field trip and dendrology lesson related to a biology class project
  - Program 2 – Lesson and mini-research project on photosynthesis. We worked in a research greenhouse using CO<sub>2</sub> gas analyzers and pressure bombs to assess the effects of drought on seedling health.
- College Teaching class – Virginia Tech, Fall 1997 (3 credits)  
Teaching demonstration on the topic of clearcutting
- Graduate Teaching Assistant Workshop, Virginia Tech 1996

- Active Learning Workshop, Virginia Tech Center for Excellence in Undergraduate Teaching, Fall 1997

**Public Service and Professional Development****Public Service and Involvement:**

- 2007: Serving as Graduate Student Honor System panelist, Virginia Tech
- 2005: Served on the Forestry Department Graduate Affairs Committee, Virginia Tech
- 2005: Mentored a student from the Multicultural Academic Opportunity Program, Virginia Tech
- 2004: Developed and presented a half-day hands-on soils activity for a group of 4-6 year olds to celebrate Earth Day, Community School, Roanoke, VA
- 2003-2004: Board member for the Healing Harvest Forest Foundation, Copper Hill, VA
- 2003: Developed and presented a soils and forestry learning module to a group of 4<sup>th</sup> graders from Jefferson Academy, Giles County, VA.
- 1998: Volunteered for the Giles County 4-H Forestry and Fisheries Day. Introduced groups of FFA students to soils and forestry principles through fun, field experiments and demonstrations, Blacksburg, VA
- 1993: SAF - Forest Conservation Days program, Saratoga, CA  
Volunteered during the week long program during which 3500 inner-city school children and their teachers learned about forest resources through displays and activities.

**Member Professional, Scientific and Honor Society Organizations:**

- Soil Science Society of America (1994-present)
- Society of American Foresters (1996-present)
- Association of Women Soil Scientists (2004-present)
- Gamma Sigma Delta Honor Society of Agriculture (2006 to present)

**Awards and Recognition:**

- WPI Fellowship, Virginia Tech (2006-2007)
- Best Paper of Session, Division S07, Soil Science Society of America Annual Meetings, Charlotte, NC (2001)
- Civil Rights Award, USFS. \$1000 cash award for outstanding efforts as the Chairperson of the Federal Women's Program for the Pacific Southwest Research Station, CA (1991)
- Logan S. Carter Award for Outstanding Student of the Soil Science Department, Cal Poly San Luis Obispo (1989)
- Deans Honor List, Cal Poly San Luis Obispo (1989)

**Other Professional Development:**

*Attended the following symposiums/conferences:*

- American Society for Surface Mining and Reclamation Meeting, Knoxville, TN (May, 1996)
- Appalachian Mountain Forest Decline: Science Meets the Grass Roots. Symposium sponsored by the Lucy Braun Assoc. and the USFS, Charleston, WV (Mar., 1996)
- Leadership Development for Women in Science. Association for Women in Science (AWIS) Regional Conference, Davis, CA (Mar., 1994)
- Decomposed Granitic Soils: Problems and Solutions. Symposium sponsored by the Univ. of California, Davis. Redding, CA (Oct., 1992)
- Forest Fertilization: Sustaining and Improving Nutrition and Growth of Western Forests. Sponsored by the University of Washington, Seattle. Seattle, Washington (Feb., 1991)
- Forest Soils and "New Forestry" Symposium. Annual Meeting of the CFSC, Sacramento, CA (Mar., 1991)
- Forest Health: A Conference and Field Trip on Fire Rehabilitation and Reforestation. Jointly sponsored by: CFSC, Calif. Pest Council, USFS, UC Extension, Ca. Dept. of For., and California Licensed Foresters Assoc. Sonoma, CA (May 1992)

- The Role of Organic Matter in Maintaining Long-Term Forest Soil Productivity. Annual meeting of the CFSC with CLFA, Sacramento, CA (Feb., 1990)
- Soil Science Society of America Annual Meeting. Anaheim, CA, (Oct., 1988)

**Related Activities:**

- Soil Judging Team, Cal Poly San Luis Obispo, 1987-1990.
  - 1990 Western Regional Collegiate Competition, San Luis Obispo, CA
  - 1990 National Soil Judging Competition, Purdue, IN
  - 1989 Western Regional Soil Judging Competition, Mendocino, CA
  - 1989 National Soil Judging Competition, Stephenville, TX

**Selected Course Work**

Summary of specialized course work taken during B.S., M.S. and Ph.D. programs:

\* Denotes graduate level course

<p><u>Soil Science:</u>                  Intro to Soil Science                  Soil Management                  Soil Fertility                  Fertilizers                  Soil Microbiology                  Soil Materials                  Soil Chemistry                  Soil Morphology                  Soil Taxonomy                  Soil Conservation                  Soil Judging                  Forest and Range Soils                  *Soil Physics                  *Advanced Soil Chemistry                  *Advanced Forest Soils                  *Soil-Plant Relations                  *Advanced Land Management                  *Clay Mineralogy</p>	<p><u>Physical and Biological Sciences:</u>                  Hydrology                  Physics                  Physical Geology                  General Chemistry (I,II,III)                  Organic Chemistry                  Biochemistry                  Quantitative Analysis                  Bacteriology                  General Botany                  Plant Taxonomy                  *Plant-Water Relations</p>
<p><u>Forestry and Natural Resources:</u>                  Dendrology                  Forest Resources                  Resource Ecology                  Parks and Recreation                  Fisheries and Wildlife Management                  Aerial Photogrammetry                  World Forestry                  Forest Measurements                  Applied Forest Engineering                  *Forest Resource Management                  *Advanced Silviculture                  *Advanced Forest Ecology                  *Ecosystem Dynamics                  *Environmentally Sensitive Harvesting                  *Ecology and Silviculture of Appalachian                  Hardwood Forests</p>	<p><u>Statistics:</u>                  Probability Statistics                  *Statistics in Research (I and II)                  *Experimental Design</p> <p><u>Instruction:</u>                  *College Teaching                  *Graduate Teaching Assistant                  Workshop</p>