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[John M. Galbraith](#)**I. Executive Summary****John M. Galbraith****Awards**

- Harry A. McDonald Award for Excellence in Teaching, Dept. Soil, Crop, and Atmospheric Sciences, Cornell University. 1997.

Education

- Ph. D. Cornell University 1997 Soil Science, Agronomy, Geomorphology
- M.S. Texas Tech University 1983 Range Science
- B.S. Texas Tech University 1978 Range and Wildlife Management

Research (35%) and teaching (65%) interests

- Research - Soil carbon sequestration; mined-land reclamation; urban and wetland soils; GIS; remote sensing and landscape modeling for soil inventory and land-use support; and decision-support software development
- Teaching - Wetland soils, soil survey and taxonomy, soil description and interpretation, geomorphology, and GIS applications

Professional appointments

- Associate Professor, Crop and Soil Environmental Sciences, Virginia Tech, Blacksburg, VA, 2005-present
- Assistant Professor, Crop and Soil Environmental Sciences, Virginia Tech, Blacksburg, VA, 1999-2005
- Post-Doctoral Associate, Soil and Water Science, University of Florida, Gainesville, FL, 1998-1999
- Post- Doctoral Associate, Crop, Soil, and Atmospheric Science, Cornell University, Ithaca, NY, 1997-1998
- Research Support Specialist, Crop, Soil, and Atmospheric Science, Cornell University, Ithaca, NY, 1990-1997
- Supervisory Soil Scientist, USDA-SCS, Havre, MT, 1987-1990
- Soil Scientist, USDA-SCS, Pearsall and Kenedy, TX, 1983-1987
- Range Conservationist, USDA-SCS, Menard and Andrews, TX, 1977-1979

Publications (refereed journal articles since 2004) * indicates student author

- Showalter, J.M., J.A. Burger, C.E. Zipper, J.M;Galbraith, and P.F. Donovan. 2007. Influence of Mine Soil Properties on White Oak Seedling Growth: A Proposed Mine Soil Classification Model. Southern J. Appl. Forestry, 2007, vol. 31, no. 2, pp. 99-107.
- Galang*, J., C.Zipper, S. Prisley, J. Galbraith, and P. Donovan. 2006. Evaluating Terrestrial Carbon Sequestration Options for Virginia. Env. Mngmnt. 39(2):139-150
- Casselman*, C.N., T.R. Fox, Burger, J.A., Jones, A.T., and J.M. Galbraith. 2006. Effects of silvicultural treatments on survival and growth of trees planted on reclaimed mine lands in the Appalachians. For. Ecol. and Mngmnt. 223:403-414.
- Burdt*, A.C., J.M. Galbraith, and J.P. Megonigal. 2006. CO₂ efflux rates by land-use treatment in wet flats of Southeast Virginia. Wetl. Ecol. and Mngmnt. 14(2):133-145.
- Burdt*, A.C., J.M. Galbraith, and W.L. Daniels. 2005. Land-Use Effects on Growing Season Length Indicators in Southeastern Virginia Wet Flats. Soil Sci. Soc. Am. J. 69:1551-1558.
- Ward*, D.J., J.A. Spotila, G.S. Hancock, and J.M. Galbraith. 2005. New constraints on the late Cenozoic incision history of the New River, Virginia. Geomorphology. 72:54-72.

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- Showalter*, J.M., J.A. Burger, C.E. Zipper, and J.M. Galbraith. 2005. Influence of physical, chemical, and biological mine soil properties on white oak growth. Submitted to Annual Meeting of the 26th West Virginia Surface Mine Drainage Task Force and 22st Am. Soc. of Mining and Reclamation. June, 19-23 2005. Breckenridge, CO.
- Orndorff, Z.W., W.L. Daniels, and J.M. Galbraith. 2005. Morphology and properties of mineral sands mine soils in southeastern Virginia. Proceedings of Annual Meetings of the 26th West Virginia Surface Mine Drainage Task Force and 22st Am. Soc. of Mining and Reclamation. June, 19-23 2005. Breckenridge, CO. Published by ASMR, 3134 Montavesta Rd., Lexington, KY 40502.
- Jones*, A.T., J.M. Galbraith, and J.A. Burger. 2005. Development of a forest site quality classification model for mine soils in the Appalachian coalfield region. Proceedings of Annual Meetings of the 26th West Virginia Surface Mine Drainage Task Force and 22st Am. Soc. of Mining and Reclamation. June, 19-23 2005. Breckenridge, CO. pp. 523-539.
- Haering, K.C., W.L. Daniels, and J.M. Galbraith. 2005. Mapping and classification of Southwest Virginia mine soils. *Soil Sci. Soc. Am. J.* 69:463-472.
- Haering, K.C., W.L. Daniels, and J.M. Galbraith. 2004. Appalachian mine soil morphology and properties: Effects of weathering and mining method. *Soil Sci. Soc. Am. J.* 68:1315-1325.
- Galbraith, J.M., N.D. Stone, G.E. Groover, F.A. Bruce, Jr., and G.B. Benson. 2004. Training professionals in use of Pasture Land Management System (PLMS) decision support system. *J. Extension* 11 p. Vol. 42, article 5.
- Miller*, J.O., J.M. Galbraith, and W.L. Daniels. 2004. Organic carbon content and variability in frigid Southwest Virginia mountain soils. *Soil Sci. Soc. Am. J.* 68:194-203.
- Amichev*, B.Y., and J.M. Galbraith. 2004. A revised methodology for estimation of forest soil carbon from spatial soils and forest inventory datasets. *Envir. Mgmt.* Vol. 33, Supplement 1. pp. S74-S86.

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- 17 refereed journal articles
- Six edited book chapters
- Seven refereed conference proceeding articles
- 12 papers in editor-reviewed journals and conference proceedings
- Three USDA-NRCS-reviewed soil surveys

Competitive grants

- Davis, A., J. Galbraith, S. Klopfer, and J. Waldon; 20%; US-EPA; \$200,000 (\$160,000 plus \$40,000 match); 11/01/07 to 10/30/10; Enhancement of the National Wetlands Mapper
- Fike, J., J. Galbraith, C. Teutsch, D. Parrish, and C. Zipper; 20%; Powell River Project; \$10,514; 7/1/07 to 6/30/10; Herbaceous Crops for a Biofuels/Bioproducts Industry on Reclaimed Mine Lands
- Waldon, J., S. Klopfer, J. Galbraith, L. Marr, and S. Schoenholtz; 20%; USDI-NPS; \$126,495 (\$7,532); 6/1/07 to 3/31/09; Assess. Nat. Res. and Watershed Cond. for Four NPS Units in the SE Coastal Network of Parks
- Havens, Kirk, Carl Hershner, Donna Marie Bilkovic, and J. Galbraith; 10%; US-EPA through (VA DEQ) through VIMS; \$173,877 (\$14,500); 10/1/07 to 12/31/08; Ongoing Development of Nontidal Wetland Inventory and Monitoring Strategy for Virginia
- Galbraith, J.; 100%; U. Idaho (USDA-NRCS); \$18,000; 9/25/07 to 9/30/08; Entering Soil Pedon Descriptions and Lab Data into NRCS Databases

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- Galbraith, J.; 100%; Hartwick College (CSREES-NRI); \$23,541; 9/12/07 to 9/12/08; Analysis of Soil Properties under Curl-leaf Mountain Mahogany
- Parrish, D., J. Cutliff, J. Fike, J. Galbraith, and C. Teutsch; 20%; Virginia Ag. Council; \$6,711; 7/1/07 to 6/30/08; Herbaceous Crops for a Virginia Biofuels/Bioproductions Industry
- Galbraith, J. and R. Wynne; 30%; USDA-NRCS; \$46,589; 9/20/07 to 9/30/08; Digital Soil Mapping Operational Initiative - Mojave Desert Region
- W.L. Daniels and J. Galbraith; 50%; USDA-USFS; \$10,000; 10/01/05 to 9/30/08; Asses. of Long-term Acidification and Nutrient Depletion due to Atmos. Deposition
- Galbraith, J., and W.L. Daniels; 75%; USDA-NRCS; \$10,000; 10/01/05 to 9/30/08; Properties/Hydrology of Selected Appalachian Mine Soils

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- Principal- or co-investigator on 4 grants totaling \$74,700 since arriving at Virginia Tech.

Scholarly achievements

- Omicron Delta Kappa - The National Leadership Honor Society Since 1977
- Phi Kappa Phi - Academic Honorary Society Since 1978
- Gamma Sigma Delta - Honor Society of Agriculture Since 2002
- Sigma Xi - The Research Society of North America Since 2004
- Phi Beta Delta - Honor society recognizing scholarly achievement in international education Since 2004

Professional Certifications

- Virginia Certified Professional Soil Scientist Since 2004
- Virginia Professional Wetland Delineator Since 2005

Invited talks (summary)

1. Invited speaker for Oral Symposium 1.0B - Soil Change in Anthropocene. 18th World Congress of Soil Science. Victor Targulian and Hari Eswaran, convenors. Philadelphia, PA. 2006.
2. Keynote speaker – 2nd International Conference for Soil Classification, Petrozavodsk, Karelia, Russia. 2004
3. Opening speaker – Special session on urban soil management at the American Society of Agronomy national meeting in Denver, CO. 2003

Courses taught (100% involvement unless otherwise indicated)

- Soil Description and Interpretation
- Soil Interpretation Using GIS and DSS
- Soil Survey and Taxonomy
- Wetland Soils and Mitigation (co-instructor, 33%)
- Advanced Wetland Soils and Mitigation (co-instructor, 33%)
- Advanced Soil Interpretation Using GIS and DSS

Student advising (summary)

- On three doctoral and eight master's committees
- Currently the major advisor for one doctoral and two master's degree candidates
- Advisor to 15 undergraduates
- On advisory committee to two successful master's degree candidates and one successful doctoral degree candidate

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- Six of eight graduate student advisees have been female
- About 50% of the Soil Judging Team members have been female
- Advised CSES African-American student Crystal Lamb on selection of her Ronald E. McNair Scholars Program project for financially disadvantaged, first-generation college students of any race or ethnicity

Outreach and professional service (summary, arranged by date)

- Member of one international, four national, four regional, five state, one university, and two departmental committees 1998-present
- Nine outreach-related publications and nine outreach-related websites 1999-present
- Associate Editor for Divisions S-10 and S-5. Soil Sci. Soc. Am. J. 2005-2007
- Associate Editor for the Southern Region. Soil Survey Horizons (published by the American Society of Agronomy) 2002-2006

Associations and society memberships (arranged alphabetically, appointed positions indicated)

- Affiliated Faculty – Conservation Management Institute, Center for Geospatial Information Technologies, and Center for Environmental Applications of Remote Sensing 2006 -present.
- Association of Women Soil Scientists – Appointed Mentor 2008-present
- International Union of Soil Scientists (formerly ISSS) 1977-present
- North American Colleges and Teachers of Agriculture 1999-present
- Soil Science Society of America 1977-present
 - Elected Chair, Div. S-5 (Pedology) 2006-2007
 - Southeast Region representative - Soil Judging Committee 1999-2002
 - Soil Judging Committee 1999-2002
 - Soil Geomorphology Committee 2002-present
 - Northeast Region - Research Needs Committee 2000-present
 - Northeast Region – Standards and Procedures/Soil Tax. Committee 1996-present
- Society of Wetland Scientists 2000-present
- Virginia Association of Professional Soil Scientists 1999-present
 - Appointed by the Virginia Governor's Office for the Board for Professional Soil Scientists and Wetland Professionals 2004-2007
- Virginia Association of Wetland Professionals 2000-present

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II. Candidate's Statement

Prior to returning to school for my doctorate degree, I worked for eight years as a field soil scientist in seven states. Working with soils across many geologic and climatic zones has given me a valuable set of experiences to incorporate into my teaching and research. In 1995 I was appointed director of the first Natural resources Conservation Service (NRCS) soil survey program for New York City, where I gained unique experience in working with urban soils and developing new methods for improved land use planning. There I identified human-altered soils and began the process of creating unique taxonomic groups for soils derived by extensive landscape modification and human-created materials. I also provided technical expertise for making some of the first geographic information systems (GIS) and digital soil survey maps produced in the United States. My Ph.D. work at Cornell developed the first expert system to assist soil scientists in classifying soils according to the U.S. Department of Agriculture (USDA) Soil Taxonomy, the classification system now used in 90 countries. A postdoctoral position in Florida expanded my experience base.

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Teaching - When I arrived at Virginia Tech, the courses I assumed trained students to produce soil surveys using traditional methods. Since those methods are no longer being used, I redesigned the curriculum to provide students with skills that better fit the job market. My first course change trains students to understand the factors that influence where and how soils form. This enables students to better predict and survey soil resources. A second key course improvement was to train students to describe and relate soil properties to the suitability of that soil for multiple uses. Such uses include traditional agriculture and forestry but also more intensive uses such as wetlands restoration and on-site septic system design that require on-site soil investigations. A third key curricular change trained students in the advanced use of GIS and its application to spatial studies of soils.

To accomplish these curricular changes, I combined two older courses into *Soil Description and Interpretation*, which emphasizes detailed descriptions of soil, hydrologic, and geologic features. Soil interpretation implies an advanced understanding of the importance of soil features and relates those features to soil behavior and proper use. I also added significant sections on geology and soil formation to the *Soil Survey and Taxonomy* course and require the students to produce a detailed soil survey report as produced by consultants. *Wetland Soils* is a new course that I co-developed with a colleague in response to high demand by students across campus. Our initial offering of the course used distance education technology and included an adjunct faculty member from N.C. State University. Another new course, *Soil Interpretation Using GIS and Decision Support Systems*, integrates the use of electronic imagery and environmental data, location devices, and sophisticated software to enable more consistent decision-making. In this class, students identify a basic land-use problem and compile soil and other data to test a solution to that problem. I have also taught a version of this course with a field project for gifted high school students each summer of the Governor's School for Agriculture. Students participating in this GIS project took first place in the intramural project competition, and I published the results of that experience as a model of effective methods for teaching gifted high school students. I

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have also authored a proposal for a new campus-wide graduate certificate program in Geospatial Information Technology, which is awaiting final approval by the graduate school.

I am pleased to be coaching Virginia Tech's soil judging team. The team describes and relates soil properties to geology and soil behavior at a 12-team regional contest each year, with the top four or five teams qualifying for the national contest round. Under my direction, the team qualified six straight years for the national contest round. In 2004 we finished second in the region with five team members placing in the top ten (80 competitors), including the top two individuals. We have finished in the top 10 of 20 or more teams each year that we have competed at national contests across the country, proving that our students know how to apply what they learn in the classroom in unstructured settings and unfamiliar environments.

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Research - Soils information is the foundation of intelligent land-use planning, because soil properties underlie and influence human activities in many ways. An important part of making soil-based information readily available to fellow scientists and decision makers is expressing soil information in a form that is easily understood, regardless of the user's scientific background. Accordingly, my research program focuses on important soil-related agricultural, environmental, and urban/suburban development issues and presents solutions to the public in simple and meaningful ways. A few examples of my research and outreach efforts follow.

Wetlands provide unique habitat for rare plants and wildlife and perform many valuable environmental functions such as pollutant removal, carbon storage, and flood control. However, wetlands have been drained and filled at an alarming rate. A key component of wetland protection is an improved, simplified method for identifying wetland sites. A significant portion of my research has aimed at improving definitions of the relationships among land-use, hydrology, soil temperature, and soil features because current methods and definitions grossly underestimate the extent of the wetlands. I have also documented unique functional wetlands types in flood plains of the Piedmont, and red-soil wetlands that are not described by current wetland definitions. These unique wetlands are found in areas facing heavy development pressure. I am a member of a regional wetland soil committee, and my research and the guidebooks we published are widely used. For example, my colleagues and I published a paper using high-technology methods to markedly improve detection of wetland sites and to reduce field verification time by as much as 80%.

Pastures support over 1.8 million beef cattle in Virginia and represent a major land use in our region. Rotational grazing systems provide benefits to the farmer, the vegetation, the animals, and to soil and water quality. Yet many farmers have not adopted this practice because of the complex planning requirements and initial investment risks. In response, I joined an intercollegiate team to develop the soil-based decision-support software called *Pasture Land Management Systems* (PLMS) to assist farmers, Extension agents and government personnel in assessing the economic potential of adopting improved grazing management systems.

Earth-moving activities, such as mining and large-scale construction, usually involve removal of vegetation and dramatic mixing of naturally occurring soil layers with underlying materials. For example, modern surface mining replaces fertile natural soil with crushed rock and soil mixtures that are very unsuitable for native plant growth. Reforestation of mined land has positive

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environmental impacts and provides income opportunities but is rarely practiced during reclamation because it is expensive and unlikely to succeed on many sites. In cooperation with colleagues, I have developed and published new criteria and terminology to describe and classify soils on drastically altered sites and to evaluate their economic return and physical potential to support various types of trees.

Increasing levels of atmospheric carbon dioxide is cited as a key element in global warming. Decision makers seeking to reduce greenhouse gases in the atmosphere must know the current and potential carbon storage capacity of the soil and vegetation. My colleagues and I have published new geospatial methods to inventory existing soil carbon stores, to identify sites with high potential for carbon storage, and to extrapolate local soil carbon values to regional or national scale maps. Land managers who reforest mined lands as we recommend will transfer some of the excess atmospheric carbon dioxide to the trees and soil.

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Outreach, International Activities, and Service - Human-altered soils are dominant in mining, urban and suburban areas. For many years, routine soil maps have either omitted or ignored such areas or identified their properties simply as “variable.” Such maps provide little useful information to planners, who rely on the recommendations of soil scientists to avoid costly or inappropriate land use. Using methods developed with colleagues, we provided the Town of Blacksburg with a new GIS soil map. We reclassified areas formerly designated as “Urban Land” and developed new urban land-use suggestions. This new soil map has become part of the Town’s Comprehensive Plan and was used to produce the Significant Open Space map that shows areas that Town regulations recommend be left as part of the Town’s greenway resources. The soil map and septic system suitability map for the Tom’s Creek basin was used in planning the sewer service for that part of Town. In addition, the Town has a new regulation for building weight that uses the soil map to identify areas that require an on-site investigation.

A GIS project was developed for the College of Agriculture and Life Sciences to document the soils, resources, and current land use at its research and farm facilities. This software is being used to manage the College’s land resources. The inventory and land-use records communicate potential development impacts on the research, teaching, and extension missions of the College to those who are developing the Campus Master Plan. A similar product was developed for the Agricultural Research and Extension Center in Blackstone to assist station staff in integrating management and development plans for their overall research and extension programs.

I am affiliated with the Center for Geospatial Information Technology, Conservation Management Institute, and the Center for Environmental Applications of Remote Sensing. These two Centers bring industry, institutions, and agencies together to solve a wide array of environmental problems. My research programs facilitate numerous opportunities to serve the public and provide training outside the university setting. I serve on a state-level certification Board of Soil Scientists and Wetland Professionals and have taught short courses and continuing education sessions for over 300 wetland professionals, state agency employees, and consultants. In addition, I serve as Associate Editor of the Soil Science Society America Journal, as a regional and national reviewer for the USDA Soil Taxonomy system, and as Chair of the International Committee for Anthropogenic Soils (ICOMANTH), which develops new methods to describe

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and classify these unique soils. In 2004 I was invited to lecture at the Second International Conference on Soil Classification in Petrozavodsk, Russia, a meeting of soil scientists from 27 countries. I will be presenting one invited paper and five posters and leading a field tour at the 18th World Congress of Soil Science Meeting in July, 2006.

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III. Impacts

A. **Best Practices For Turfgrass Establishment And Maintenance On Constructed Soils.**

Constructed soils result from filling or cut-and-fill operations during construction or reconstruction of root zone profiles especially in urban housing developments and recreational facilities such as playing fields, parks, golf courses. An estimated 1.4 million acres per year of lands in the US fell to such urban developments from 1982 to 1992. This figure increased to 2.2 million acres per year between 1992 and 1997. Constructed profile horizons are different from naturally developed profiles in many measurable physico-chemical characteristics such as their weight-volume relationships; surface and sub-surface hydraulics; capacity to buffer, degrade, immobilize, and detoxify pollutants; engineering properties; capacity to store and supply plant nutrient. Persaud, Naraine; Goatley, Mike; Galbraith, John; Zobel, Rich; Haas, Amir.

- B. **Stormwater Capture for Irrigation.** Capturing and retaining stormwater as an on-site irrigation source for a land development project (such as golf courses, sports facilities, housing and commercial complexes, community open space, and cemeteries) can provide several economic and environmental benefits. From an economic viewpoint recycling stormwater saves potable water that would otherwise be required for irrigation. Under current USEPA Phase II MS4 (municipal separate storm sewer system) regulations such facilities greater than 1 acre require a post-construction stormwater pollution prevention plan (SWPPP). When stormwater is re-circulated, pollutant bio-degradation is increased (vis-à-vis a wet detention pond) and loading to surface streams is decreased. There are few reports on the design, effectiveness, cost, or operational requirements of this technology since this MS4 compliance approach is untested. This case study provided preliminary science-based answers on the design aspects of this compliance approach for the proposed Pinecrest baseball complex, Beaver, West Virginia. Specifically: a. How much stormwater storage is needed to assure a reliable water supply to meet the irrigation needs over time for the proposed facility? b. How much runoff over time can be expected to feed the retention pond under the prevailing meteorological and hydrological conditions at the site? c. Can the potential stormwater runoff from the site generate the estimated desired volume of irrigation water that will match the estimated requirements over time? Walker, Sarah; Persaud, Naraine; Galbraith, John; Goatley, Mike.

C. **Teaching/Learning: On-line Masters in Agricultural and Life Sciences Program.**

Relevance: There is a need to foster educational development for place-bound learners in Virginia and elsewhere. Current economic conditions require greater levels of education, but many citizens find it impractical or impossible to take months or years away from their jobs or families in order to pursue an graduate degree. Response: We created an on-line Masters in Agricultural and Life Sciences curriculum to meet this need. There are currently 28 courses offered, entirely at distance. Results: We more than met the first year enrollment target with SCHEV (10 students) by enrolling 23 students. This is a very diverse student body, composed of high school teachers, VCE agents, food

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company quality control officers, company/university environmental/safety managers, PPQ/Homeland Security personnel, two farm managers, a pesticide company tech rep, and a Commonwealths attorney. Collaborators: The team involved with this program includes 26 faculty in the College of Agriculture and Life Sciences. Contact: Doug Pfeiffer, Professor, Entomology, dgpfeiff@vt.edu, 540-231-4183.

- D. **Developing the Piedmont Wetlands Research Program.** There are no readily available funds for supporting basic and applied research in mitigation wetlands, other than for assessment and monitoring. Lee Daniels, Tess Wynn and I met with Wetland Studies and Solutions, Inc. of Gainesville, VA and advised them with ideas to help them develop the Piedmont Wetlands Research Program that will fund research to study applied wetland mitigation site problems. Lee Daniels had extensive comments to advise them on the economic and scientific requirements. We provided important input into the development of the structure and function of the program. They had contacted US-ACOE and US-EPA and VA DEQ and procured use of money left over after three large mitigation banks in Northern Virginia had been released from bond and approved as being fully functional. This program will provide up to three million dollars of research for wetlands in VA to a select group of researchers, of which we are part and likely to be funded on several projects. Galbraith, John; Daniels, W. Lee; Wynn, Theresa.
- E. **Committee for Update of the Coastal Plains Region of the 1987 Wetlands Delineation Manual.** The 1987 US-Army Corps of Engrs. Wetlands delineation Manual is badly out of date. It has been edited so many times there is no more than a shell left, especially in the hydric soils section. Wetlands are not being identified or delineated correctly in the United States, resulting in a continuing net loss. One major complaint by the public of the 1987 Manual is that the manual was too comprehensive and thus did not speak in adequate detail to the soils, hydrology, or vegetation differences of any one of physiographic provinces of the US. I served as scientific adviser on wetland soils and hydrology to US-Army Corps of Engrs. on updates for the 1987 Manual for the Coastal Plains Region, which takes in the entire Coastal Plain plus some of the Piedmont and the entire Mississippi Delta and Floodplains region. We sent final edits to update the Coastal Plains section of the revised 1987 Wetlands Delineation Manual. I was a major contributor, especially on hydric soil indicators and wetland hydrology indicators. This update of the 1987 Manual will affect every wetland determination in the Coastal plains and part of the Piedmont and the Mississippi Delta and Floodplains Regions of the United States. Millions of acres of wetlands will be better protected by jurisdiction and their ecosystem functions and services preserved. Water quality will be improved and species diversity and rare habitats preserved. Galbraith, John.
- F. **Formation of a new SSSA Working Group called “Digital Detection, Interpretation, and Mapping of Soil and Landscape Properties Working Group”.** There have been many advances in the digital processing of terrain and other natural resource data. This technology and data are not being used to full extent by USDA-NRCS mapping parties because of the learning curve requirements and lack of time for training. The creation of digital pre-mapping products will allow USDA-NRCS to meet their mandated 2010 soil survey completion deadlines, even with dwindling staff. The pre-mapping should increase the speed, accuracy and consistency of mapping with an extensive ground-truthing effort. I proposed formation of new SSSA Working Group “Digital Soil Mapping” and will serve as co-leader with Jon Hempel and Amanda Moore of USDA-

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NRCS and Jim Thompson of WV Univ. and NGDC in Morgantown, WV, and Brian Slater of The Ohio State Univ. Nov. 2007. This follows meetings in CA and WV that started a Digital Soil Mapping group. We have set up a share site on the Internet to share information and data. The group will meet each year at ASA meetings and then move to become a permanent committee of SSSA sponsored by Division S-5. The group is involved in multiple research projects. Virginia Tech (Galbraith, Wynne, and post-doc Christine Blinn) are providing the technical lead on the first funded project to train soil scientists in CA to conduct digital pre-mapping using GIS and remote sensing in the Mojave Desert. Galbraith, John; Moore, Amanda; Blinn, Christine; Wynne, Randolph; Hempel, Jon; Thompson, James, Slater, Brain.

- G. Bioenergy Crops Must be Studied in a Systems Context.** Biofuels have some potential to reduce fossil fuel consumption, but the value of bioenergy crops must be based not only on an individual crop's production potential but also how it fits in an overall system. This past year I and colleagues Parrish, Alwang, and Cundiff considered the systematic constraints for biofuel systems in the US. In addition, we and colleagues Galbraith, Teutsch, Wright, Starner, Rockett, Zipper, and Tracy planted several species of potential biofuel crops at multiple locations and, in partnership with a local coop have begun to prepare for feedstock system testing of the biomass crops of interest. We have already generated important data regarding the ease of establishment for several of these crops. Fike, John and one dozen others.

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IV. National and Regional Research Collaborations

- a. Joined with David Weindorf of LSU and Christine Morgan of Texas A&M in a hydrocarbon detection proposal to the Louisiana Applied Oil Spill Research Program. 2008.
- b. Joined with VIMS and Penn State Coop. Wetlands center on a proposal to find wetlands in the mountains of VA. Funded by DEQ with pass-through from EPA. 2007. Research began 2008.
- c. Proposed formation of new SSSA Working Group "Digital Soil Mapping" and serve as co-leader with Jon Hempel and Amanda Moore of USDA-NRCS and Jim Thompson of WV Univ. and NGDC in Morgantown, WV, and Brian Slater of The Ohio State Univ. Nov. 2007. Accepted Jan. 2008. Elected Chair.
- d. Joined with researchers from Virginia Tech, CSES and BSE Dept., Mississippi State University, Clemson University, and Piedmont Bioproducts, LLC. on CSREES-NRI proposal Bioenergy feedstocks: Energy system-, ecosystem-, and economic goodness of fit. Subm. Dec. 2007.
- e. Principal Investigator for Multi-State Hatch Project NE-1021. Hydropedology: Genesis, properties, and distribution of hydromorphic soils. October 2004 to September 30, 2009.
- f. Joined in MOU with Dr. Charles M. Bachmann of the Naval Research Laboratory and Barry Truitt of The Nature Conservancy to conduct long-term research at the VA Coastal Reserve LTER as part of the COMPARES research consortium. Members from six federal agencies and NGO. 2006.

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- g. Visited the new USDA-NRCS Regional Office in Greensboro, NC along with David Lindbo of NCSU to introduce Virginia Tech's research programs in wetlands. June, 2006.
- h. Hosted Sharon Waltman and Jon Hempel of the new USDA-NRCS Nat. Geospatial Dev. Center (NGDC) at Morgantown, WV (partner with West Virginia University) and gave tour of Virginia Tech GIS community and Centers. Invited them for university-wide seminar. April 3, 2006.
- i. Joined Mid-Atl. Wetlands Workgroup (MAWWG) funded by EPA grant. Since April 2006.
- j. Submitted two pre-proposals with Dr. Christine Morgan from Texas A&M. April 2006.
- k. Submitted one proposal with adjunct faculty Dr. Ralph W. Tiner from F&WS and Dr. Jim Perry from VIMS. April 2006.

Affiliated Faculty for Research Centers at Virginia Tech

- a. Conservation Management Institute. 2006-present.
- b. Center for Environmental Applications of Remote Sensing. 2006-present.
- c. Center for Geospatial Information Technologies. 2004-present.

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