

Deborah A. McGrath

Professor of Biology

Carl Biehl Professor of International Studies

University of the South, Sewanee, TN

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Education

Ph.D. Forest Ecology, focus: Biogeochemistry, University of Florida, Gainesville, FL	1998
M.S. Forest Resources and Conservation, University of Florida, Gainesville, FL	1993
B.A. International Relations, Economics, University of Wisconsin, Madison, WI	1986

Current research: Impact of regenerative agriculture on small farm soil carbon; carbon sequestration in agroforests. Making carbon credits work for small and poor farmers; micro wetlands for carbon storage and water pollution mitigation in small rural communities.

Foreign Languages: Fluency in French, Portuguese, Haitian Creole, study of Mandarin Chinese

Administration

Assistant Dean, Sewanee Integrated Program in the Environment	2019 - present
Chair, Environment and Sustainability Steering Committee	2018 - 2022
Director, Sewanee-UGA-SUD Constructed Wetlands Research Collaborative	2014 - present
Co-Director, Haiti Institute at Sewanee, Sewanee the University of the South	2014 - present
Director, First Year Program, Sewanee the University of the South	2012 – 2017
Chair, Department of Biology, Sewanee the University of the South	2009 - 2014

Appointments

Global Professor, University of Arizona Environmental Science Dual Enrollment program Northwest Agriculture and Forestry University, Yangling, Shaanxi Province, China	2023
Carl Gustav Biehl Jr. Professor of International Studies, University of the South	2017
Professor of Biology, Sewanee: University of the South, Sewanee, TN	2014
Associate Professor of Biology, Sewanee: University of the South, Sewanee, TN	2007 - 2014
Associate Scientist, New Mexico Forest & Watershed Restoration Institute, Department of Natural Sciences, New Mexico Highlands University, Las Vegas, NM	2007 - 2008
Assistant Professor, Department of Biology, University of the South, Sewanee, TN	2001 – 2006
Adjunct Assistant Professor of Forestry, University of the South, Sewanee, TN	1998 -2001
Research Fellow, NASA Large Scale Biosphere in Amazonia (LBA) project	1997 - 1998
United States Peace Corps (Benin and Guinea, West Africa)	1986- 1989

Courses Taught

People and the Environment (Biol 115); First-Year Seminar Ecology of Place (FYRP 104); A Seminar in Environmental Studies (Enst 101); Field Investigations in Biology (Biol 130); Ecology (Biol 210); Environmental Plant Physiology (Biol 221); Environmental Public Health (Biol 231); Human Health and the Environment (Biol 232); Ecosystems and Global Change (Biol 330); Ecological Integrity of Agriculture (Enst 305): Agroecology and Sustainable Food Systems (Biol 306); BIOL 424 Senior Capstone. ENVS 310 Environmental Health and Justice. Island Ecology Program.

Grants, Awards and Gifts (since 2015)

Alderson-Tillinghast and Faculty Development Award to fund soil carbon research on Southeastern TN farms (\$7,385)	2022
Sommer Award to Sewanee Haiti Institute to support Zanmi Kafe Community Engaged Research on Carbon Sequestration in Haiti (\$30,000 annually).	2016 - 2021
McCrickard Faculty Development Fund: Cultural Ecosystem Services as Drivers of Environmental Quality: Does sense of place influence land cover and water quality through political activism in China? (\$27,080 over two years)	2019
Alderson-Tillinghast Award to fund water analysis equipment for China research (\$2,985)	2019
McCrickard Faculty Development Fund: Strengthening and Expanding Inter-Institutional Collaborations in Water and Wastewater Research: Investigation of Mechanistic Foundations (Sewanee-UGA wetland research \$14,055)	2018
Sewanee Headwaters Initiative to fund post bac fellow for constructed wetland (\$5,000)	2018
Alderson-Tillinghast Award to fund training of research student in China (\$2,177)	2018
ASIANetwork Faculty Fellow: Water pollution research in Jiangsu Province China (\$30,000)	2018
McCrickard Faculty Development Fund: Collaborations in water and wastewater (\$17,700)	2017
Riverview Foundation (Sewanee UGA SUD CW collaborative \$70,000)	2015

Scholarship:

McGrath, Deborah, Alex French, Reginald Cean⁴ and Keri Watson⁵. *In preparation*. Academic Institutions as Collaborators in Effective Carbon Offset programs. International Journal of Sustainability in Higher Education.

McGrath, Deborah, Kaitlin Baker², Cal Oakley³, Reginald Cean⁴ and Keri Watson⁵. *In Review*. Payment for carbon sequestration improves incomes, promotes agroforestry and recarbonizes degraded lands in Haiti. Submitted to Journal for Environmental Management.

Zeitler, E., K. Cecala, and D. McGrath. 2021. Carryover effects minimized the positive effects of treated wastewater on anuran development. *Journal of Environmental Management* 289: 112571

Hopson, M., McGrath, D., Torreano, S., Smith, M. & Black, M. 2018. Removal of Emerging Contaminants and Conventional Pollutants by a Constructed Wetland During the First Year of Establishment. E-proceedings from the 5th International Conference on Decentralized Water and Wastewater Treatment Plants (SWAT 2018). Thessaloniki, August 26-29, pp 272-279. ISBN: 978-960-243-710-0

Zeitler, E., K. Cecala, and D. McGrath. 2018. Tertiary wastewater treatment wetlands provide suitable habitat for anurans. *Journal of Freshwater Ecology* 33(1):475-488. DOI: 10.1080/02705060.2018.1524334

C. K. Smith, E. Landreaux, H. Steinmann, **D. McGrath**, C. Hayes, & R. Hayes, 2016. Redbay Survival Eleven Years after

Infection with an Exotic Disease on St. Catherine's Island, Georgia, USA. *Environment and Natural Resources* Vol 6(1): 27-34, URL: <http://dx.doi.org/10.5539/enrr.v6n1p27>.

McGrath, D. 2014. Partners in Coffee: Integrating international outreach into sustainability education. *College Planning and Management* (Jan 2014); 82.

McGrath, D. and T. Greenwalt. 2013. Valuation and Payment for Ecosystem Services as Tools to Improve Ecosystem Management. Pp 283-297 in *The Laws of Nature: Reflections on the Evolution of Ecosystem Management Law and Policy*. Kalyani Robbins (ed) The University of Akron Press.

Smith, C. Ken and **D.A. McGrath**. 2011. The Alteration of Soil Chemistry through Shell Deposition on a Georgia (USA) Barrier Island. *Journal of Coastal Research* 27(1): 103-109.

Greenwalt, T. and **D. McGrath**. 2009. Protecting the City's Water. Designing a Payment for Ecosystem Services (PES) Program. *Natural Resources & Environment* 24(1): 9-13.

McGrath, D.A., and M.A. Binkley. 2009. *Microstegium vimineum* (Trin.) A. Camus (Japanese Stiltgrass) Invasion Changes Soil Chemistry and Microarthropod Communities in Cumberland Plateau Forests. *Southeastern Naturalist* 8 (1): 141-156.

Derr, T., **D. McGrath**, V. Estrada, E. Krasilovsky and A. Evans. 2008. Monitoring the Long Term Ecological Impact of New Mexico's Collaborative Forest Restoration Program. New Mexico Forest Restoration Series Working Paper 5. New Mexico Forest and Watershed Restoration Institute, New Mexico Highlands University, <http://www.nmfwri.org/restoration-papers>

McGrath, D. and T. Greenwalt. 2008. Protecting the City's Water: Designing a Payment for Ecosystem Services (PES) Program for the Santa Fe Municipal Watershed. New Mexico Forest Restoration Series Working Paper 4 New Mexico Forest and Watershed Restoration Institute, New Mexico Highlands University. <http://www.nmfwri.org/restoration-papers>

McGrath, D.A. and C.K. Smith. 2006. The Sweet Earth: A Biogeochemistry Perspective on Tropical Deforestation. In: *Exploring Environmental Challenges: A Multidisciplinary Approach*. S. L. Spray and M. D. Moran (eds), Acada Books.

McGrath, D.A., J.P. Evans, C.K. Smith, D.G. Haskell, N.W. Pelkey, R.R. Gottfried, C.D. Brockett, M.D. Lane, E. D. Williams. 2004. Mapping land-use change and monitoring the impacts of hardwood-to-pine conversion on the southern Cumberland Plateau in Tennessee. *Earth Interactions* 8 (9): 1-23.

McGrath, D.A., C.K. Smith, H. Gholz, and F. Oliveira. 2001. Effects of land-use change on soil nutrient dynamics in Amazônia. *Ecosystems* 4: 625-645.

McGrath, D., M. Duryea and W. P. Cropper. 2001. Phosphorus availability and fine root proliferation in Amazonian agroforests six years following native forest conversion. *Agriculture, Ecosystems & Environment* 83: 271-284.

McGrath, D.A., N.B. Comerford, M.L. Duryea. 2000. Litter dynamics and monthly fluctuations in soil phosphorus availability in an Amazonian agroforest. *Forest Ecology and Management* 131: 167-184.

McGrath, D.A., M.L. Duryea, N.B. Comerford, and W.P. Cropper. 2000. Nitrogen and phosphorus cycling in an Amazonian agroforest nine years following forest conversion. *Ecological Applications* 10: 1633-1647.

Presentations since 2015 (italics indicate student co-presenters)

McGrath, Deborah, Kaitlin Baker², Cal Oakley³, Reginald Cean⁴ and Keri Watson⁵. 2022. Coffee, Carbon and Climate Justice: Results from a 10-year Payment for Ecosystem Services (PES) Project in Haiti. A Community for Ecosystem Services (ACES) Conference in Washington, D.C. December 2022.

McGrath, Deborah, C. Ken Smith and Reginald Cean. 2022. Payment for carbon sequestration improves incomes, promotes agroforestry and recarbonizes degraded lands in Haiti. International Symposium on Plateau Ecological Environment Protection and High-quality Development of the Yellow River Basin. International Conference on the Cooperation and Integration of Industry, Education Research and Application in Xi'an, China, sponsored by Education Department of Shaanxi Provincial Government, and the Northwest Agricultural and Forestry University (NWAUFU) November 2022.

McGrath, Deborah. [Carbon is the Cash Crop](#). TEDxUniversity of the South. March 16, 2021

McGrath, Deborah, Cean Reginald and Keri Watson. 2020. Payment for Ecosystem Services in Haiti's Central Plateau. Carbon, Coffee and Community Collaboration. International Conference on Research and Innovation in Haiti, March 10-11, 2020. Pétionville, Haiti.

Ngo, Crystal, Bernice Leveque and **Deborah McGrath**. 2020. The Impact of Carbon Payments to Small Household Haitian Farmers. Keough School of Global Affairs 2020 Human Development Conference. Feb 21-22, 2020, Notre Dame University, South Bend, Indiana.

McGrath, Deborah. 2019. Payments for carbon sequestration: a tool for alleviating poverty in the developing world? Invited presentation at the Guangdong Provincial Forestry Bureau and Guangdong Forestry Institute, Nov 12, 2019. Guangzhou, Guangdong Province, China.

Langmo, Jacqueline N., Anthony Wright, W. Matthew Henderson, Tanisha Ghosh, Scott Torreano, Marsha C. Black, **Deborah McGrath** and Franklin E. Leach III. 2019. Mass spectrometry-based investigations of phytoremediation and wastewater treatment in the Sewanee Constructed Research Wetland. ASMS Conference on Mass Spectrometry and Allied Topics, June 2 - 6, 2019. Atlanta, Georgia

McGrath, D. *I. Smith, A. Westmoreland, C. Wright*. 2019. Governmental Response to Water Pollution in Jiangsu Province, China: Observations downstream. Southeast Conference of the Association for Asian Studies (SECAAS). January 18-20, 2019 Memphis, TN.

McGrath, D. and *E. Zeitler*. 2018. The Sewanee-UGA Wastewater Treatment Research Wetland: Current collaborations and future partnerships. Invited seminar for the Environmental Health Science Department at the University of Georgia's College of Public Health. October 5, 2018.

McGrath, D., *Hopson, M.*, Torreano, S., *Smith, M.* & Black, M. (2018). Removal of Emerging Contaminants and Conventional Pollutants by a Constructed Wetland During the First Year of Establishment. Paper presented at 5th International Conference on Decentralized Water and Wastewater Treatment Plants, Ministry of Environment and Energy, Thessaloniki, August 26-29, 2018.

Smith, M. E. D. Brew, D. McGrath, S. Torreano and M. Black. 2017. Effectiveness of a Constructed Wetland in Removing Emerging Contaminants from Municipal Wastewater. Society for Ecological Toxicology and Chemistry (SETAC) 38th Annual meeting, 12-16 November 2017, Minneapolis, MN

Hopson, M. N., G. C. Konstam, S. J. Torreano, E.M. White and **D. A. McGrath**. 2017. Effectiveness of a Constructed Wetland for the Tertiary Treatment of Fecal Indicator Bacteria and Nutrients in Municipal Wastewater During the First Year of Establishment. Society for Ecological Toxicology and Chemistry (SETAC) 38th Annual meeting, 12-16

November 2017, Minneapolis, MN.

Pearce, D. and **D. McGrath**. 2017. Examining the Relationship between Household Health and Environmental Conditions in Haiti's Central Plateau. National Council for Science and the Environment (NCSE) 17th National Conference and Global Forum on Science Policy and the Environment: Integrating Environment and Health taking place January 24-26, 2017 Arlington, VA

McGrath, D.A. and K.L. Bryan. 2016. A New Approach for Using Payment for Ecosystem Services (PES) to Encourage Adoption of More Resilient Agroecosystems: A Case from Central Haiti. A Community on Ecosystem Services (ACES): Linking Science, Practice and Decision Making, 5-9 December 2014, Jacksonville, FL.

French, A., **D. McGrath**, Q. Newcomer, B. Pasinella and J. Pumillo. 2015. Developing and Implementing Carbon Mitigation Projects for Your Campus. Invited panelist for the Association for the Advancement of Sustainability in Higher Education (AASHE) 2015 conference, Oct 25-29 Minneapolis, MN.

Pearce, D., G. Fripp, and *D. McGrath*. 2015. Using payments for carbon sequestration to promote climate action on Sewanee's campus and more sustainable ecosystems on Haiti's Central Plateau. Poster session AASHE 2015 conference, Oct 25-29 Minneapolis, MN.

Summers, S., G. Fripp., B. McKenzie, P. Davis and **D. McGrath**. 2015. Zanmi Kafe: Using on-farm research to facilitate the adoption and management of more sustainable coffee-based agroecosystems in Haiti's Central Plateau. Poster session, AASHE 2015 conference, Oct 25-29 Minneapolis, MN.

Student research fellows supervised abroad since 2010 (major, class) Sean McKenzie Eco Bio 2011, Will Watson Natural Resources 2012, Keri Bryan Eco Bio 2013, Linnea Carver Eco Bio 2014, Ford Rushton Natural Resources 2014, Charlotte Henderson Eco Bio 2014, Jonathan Salazar Environmental Policy 2014, Elizabeth Segal Biology 2015, Geanina Fripp Eco Bio 2016, Scott Summers Eco Bio 2016, Duncan Pearce Biology 2017, Peter Davis Natural Resources 2017, Ben McKenzie Eco Bio 2017. Chris Hornsby Environmental Arts & Humanities 2019. Cal Oakley Biology 2019, Bre Ayala Eco Bio 2017, Crystal Nhu Ngo Environment & Sustainability and Economics 2020; Isabel Smith Chemistry 2020; Caroline Wright Biochemistry 2020; Bernice Leveque International Global Studies 2021; Anna Westmoreland Chemistry 2019, Wilder McCoy Natural Resources 2020; Erin Gill Biology 2019, George Buruss Eco Bio 2021, Marc Monteil International Global Studies 2021, Rebecca Wright Environment & Sustainability 2022, Waverly Wadsworth Biology 2022, Jonah Gier Biology 2023,

University Service (since 2015)

Curriculum Renewal and Innovation Strategic Planning Subcommittee (2021-2022); Environment & Sustainability Major Steering Committee (2018-present); Business working group (2018-2019); Provost's budget working group (2017); Budget Priorities Committee (2016-2019); Strategic Planning Committee (2015-2017); Watson Fellowship Committee (2004-2007, 2009-present)

Guest Editor for the journal Land Special Issue "Soil Legacies, Land Use Change and Forest and Grassland Restoration"

Invited Reviewer (40 manuscripts)

Agriculture, Ecosystems & Environment (2005, 2008, 2009)

Plant and Soil (2003, 2004, 2006, 2007, 2009, 2010, 2011, 2012, 2014)

Ecological Applications (2002, 2003, 2006)

Nutrient Cycling in Agroecosystems (2014, 2015, 2016)

American Midland Naturalist (2010)

Biotropica (2010, 2015)

Biogeochemistry (2007)

Ecology (2001)

Ecosystems (2005)

Ecosystem Services (2013)

Restoration Ecology (2008, 2018, 2019)

Archives of Agronomy and Soil Science (2018)

Pedosphere (2010, 2011, 2015)

Journal of Environmental Monitoring (2011, 2015)

Journal of Tropical Forest Science (2002)

Landscape Ecology (2012)

Geoderma (2002, 2014, 2018)

Global Change Biology (2003, 2009)

Interciencia (2002)