Maggie R. Davis

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Primary Interests: Forest and agricultural economics, data science applications for efficient resource management. **Objective:** Use novel approaches for extracting information from data and key innovations in data visualization and computational capabilities to enhance growth in domestic clean-energy industries.

Current programs and expertise: My interdisciplinary skills and experience has focused on bioenergy industry barriers to commercialization: A) supply forecasts (i.e. POLYSYS agricultural model – programming and module development, foundational agricultural chapter in Billion Ton Report 2016); B) land use change and food/fuel research: modeling and scenario analyses; C) standards: taking a lead role in ASTM and ISO standard development with global collaborations (i.e., secretariat for ILUC and food/fuel working groups). My previous experience includes GIS (i.e. ARCGIS) and developing skillset includes model management (i.e. git, GitHub/Lab) and data visualization (i.e. Excel & introductory Tableau and R/RStudio).

Education and Training

2011 University of Tennessee, Forestry Wildlife and Fisheries Sciences, M.S.
2007 University of Tennessee, Economics and Geography, B.A.

Ongoing University of Tennessee & independent: quantitative and statistical training including data visualization, linear regression (i.e. POLYSYS programming in FORTRAN for a new and innovative biofuel trade module).

Peer reviewed publications

1. Kline, K.L., **M.R. Davis**, J. Dunn, L. Eaton, R.A. Efroymson, 2017. *Land, crops, and land-management: Understanding potential direct and indirect "land-use change" (LUC) under BT16 simulations*. 2016 Billion-Ton Report: Advancing Domestic Resources for a Thriving Bioeconomy, Volume 2: Environmental Sustainability Effects of Select Scenarios from Volume 1. doi: 10.2172/1338837
2. Brandt C., M. Langholtz, **M**. **Davis**, Bryce Stokes, Chad Hellwinckel, Keith Kline, and Laurence Eaton, 2017. Chapter 2 – BT16 Feedstock Assessment Methods and Focal Scenarios U.S. Department of Energy. Appearing in Volume 2: Environmental Sustainability Effects of Select Scenarios from Volume 1 (2016 Billion-Ton Report: Advancing Domestic Resources for a Thriving Bioeconomy). doi 10.2172/1338837
3. **Davis, M.R.**, L.M. Eaton, M.H. Langholtz, A. Turhollow, C. Brandt, and M.H. Hillard, 2016. *Agricultural residues and biomass crops at the farmgate*. U.S. Department of Energy. 2016. 2016 Billion-Ton Report: Advancing Domestic Resources for a Thriving Bioeconomy, Volume 1: Economic Availability of Feedstocks. doi: 10.2172/1271651.
4. Dale V.H., Efroymson R.A., Kline K.L., Langholtz M.H., Leiby P.N., Oladosu G.A., **Davis M.R**., Downing M.E., Hilliard M.R. (2013). *Indicators for assessing socioeconomic sustainability of bioenergy systems: A short list of practical measures*. Ecological Indicators 26: 87-102. http://dx.doi.org/10.1016/j.ecolind.2012.10.014
5. Oladosu G, Kline K, Leiby P, Uria-Martinez R, **Davis M**, Downing M and Eaton L. 2012. *Global economic effects of US biofuel policy and the potential contribution from advanced biofuels*. Future Science – Biofuels 3(6):703-723.
6. J. Peine, B. Jacobs, K. Franzreb, **M. Stevens**, 2011. *Ecosystem Management - The Law and Politics of Sustainability*, Berkshire Encyclopedia of Sustainability.
7. Slayton, J.D., **M.R. Stevens**, H.D. Grissino-Mayer, and C.H. Faulkner, 2009. The Historical Dendroarchaeology of Two Log Structures At the Marble Springs Historic Site, Knox County, Tennessee, U.S.A Tree-Ring Research 65(1):23-36. 2009. doi: http://dx.doi.org/10.3959/2007-5.1

Standards and reports

8. International standard: ASTM E3066, 2017. ASTM E3066: Standard Practice for Evaluating

Relative Sustainability Involving Energy or Chemicals from Biomass. Available at: https://www.astm.org/Standards/E3066.htm **(direct involvement in development)**

9. International standard: ISO (The International Organization for Standardization). 2015. *13065:2015 - Sustainability criteria for bioenergy*. Paris, France: ISO. https://www.iso.org/obp/ui/#iso:std:iso:13065:ed-1:v1:en **(direct involvement in development)**
10. Report: "Bioenergy trade and Domestic Biomass Resource Implications – a Scenario Analysis" led by **M. Davis** and submitted to BETO in support of Multi Year Project Plan objectives.
11. Report: "Brief Perspectives on Expanding Advanced Energy Sources in Brazil: Part 1: Biofuels and Bioenergy" led by Brian Davison, with contributions by K. Kline and **M. Davis**, and submitted in January 2015 as requested by the office of intelligence and counterintelligence.
12. Oladosu, G., M.M.R. Moreira, K. Kline, **M. Davis**, W. Kmura, 2014. Comparison of Regions and Modeling of Land in the GTAP-DEPS and BLUM. Available from ICONE: http://www.iconebrasil.org.br/datafiles/publicacoes/estudos/2014/comparison_of_regions_and_modeling_of_land_in_the_gtap_deps_and_blum_1404.pdf

Papers in progress:

13. Soil Organic Carbon Measurement Protocols: a Brazil and US joint assessment (submitted)
14. Brazil's strategic role in the future of Biofuels: a joint assessment
15. Indirect Effects: state of science and suitability within international standards
16. Traditional uses: BT16 scenarios and implications for trade.
17. Extending the Planning Horizon for Agricultural Residues and Biomass Energy Crops in POLYSYS.

Research and Professional Experience

2014 – Present: R&D Associate Scientist, Oak Ridge National Laboratory, Environmental Sciences Division, Climate Change Science Institute & The Center for Bioenergy Sustainability. Projects listed above.

2011-2014: Post-masters Research Associate, Environmental Sciences Division, Oak Ridge National Laboratory. Projects: (1) Brazil Collaborations on Sustainable Production Pathways and Land-Use Change Analysis project, (2) International Standards and Global Issues affecting Sustainability of Biofuels: i) Official Secretariat for the ISO TC 248 ("sustainability criteria for bioenergy") Working Group 4 ("Indirect Effects"), ii) Contributing Expert to ISO TC 248 Working Group 3 ("Environmental, Economic, and Social Aspects")

Synergistic Activities:

1) Secretariat to Working Group 4 ("Indirect Effects") for the International Organization for Standardization (ISO) Project Committee 248 – Sustainability Criteria for Bioenergy
2) Served as an official US delegate to the international plenary meetings for ISO TC 248: ANL, Chicago IL (4/2012), Queensland Australia (1/2013), Stockholm Sweden (9/2013), Berlin Germany (2/2014 & 1/2015)
3) Contributing expert to negotiations with other nations to establish Environmental, Economic, and Social Indicators of bioenergy sustainability (ISO TC 248, 2012–2015): approximately 300 hours (on-site & remote)
4) Professional Exchanges in Argentina & Brazil with members of FAPESP, ICONE, CTBE, USP, IRAM, the Canadian Bioenergy Corporation, and others involved in developing a global bioeconomy
5) Formal presentations to international and professional conferences in Argentina and Brazil: BBEST 2014, RCN 2014, PIRE 2013 and 2014, IRAM 2012

Language: Portuguese: Immersion & work experience; Working knowledge of Spanish

Previous experience and recognition:

2010 Year-long study in Viçosa, Minas Gerais, Brazil: Researcher at Iracambi Atlantic Rainforest Research Center. Economic Study–Integrating Eucalyptus & Forest-Corridors, Land-Use Change Synergistic Activities: graduate study at The Federal University of Viçosa, Forestry Department

2006-2010 Research Specialist III - The University of Tennessee's Institute for a Secure & Sustainable Environment Projects: (1) ETN Teacher Excellence program- a NSF Math-Science Partnership program focused on STEM education, (2) Conservation Consciousness- an ALCOA funded project with monthly lectures focused on alternative energy, (3) Online Energy-Education Course- TVA