

Bioenergy, Sustainability, and Land-Use Change Report Oak Ridge National Laboratory (ORNL) December 2016

Publications

- Dale, V.H., Kline, K.L. (In press) Interactive Posters: A valuable means for enhancing communication and learning about productive paths toward sustainable bioenergy. *Biofuels, Bioprod. Bioref.*
- Newby, D.T., Mathews T.J., Pate, R.C., Hueseman, M.H., Lane, T.W., Wahlen, B.D., Mandal, S., Engler, R.K., Feris, K.P., Shurin, J.B. (2016) Assessing the potential of polyculture to accelerate algal biofuel production. *Algal Research* 19: 264-277.
- Parish, E.S., Herzeberger, A.J., Phifer, C.C., Dale, V.H. (submitted) Telecoupled Transatlantic Wood Pellet Trade Provides Benefits in Both the Sending and Receiving Systems. *Ecology and Society* special feature on "Telecoupling: A New Frontier for Global Sustainability."
- Koponen K, Soimakallio S, Kline KL, Cowie A, Brandão M (submitted) Quantifying the climate effects of bioenergy - choice of reference system. *Global Change Biology-Bioenergy*.
- Jager, H.I. and R.A. Efroymsen. (submitted revision) Bioenergy Mediates the Flow of Ecosystem Goods and Services. Special Issue: *Biofuels and ES Biomass and Bioenergy*.
- Jager, H.I. and coauthors (submitted) Understanding how spatial decisions influence co-production of bioenergy feedstocks and biodiversity: a synthesis. *Land Use Policy*.

CBES Forum

Dec. 16: CBES Forum entitled "Lessons from the Alan Alda Center for Communicating Science Workshop" by Terry Mathews and Virginia Dale of ORNL.



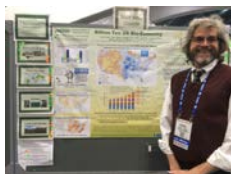
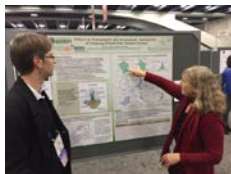
Dec. 20: CBES Forum on "Bioenergy Solutions to Gulf Hypoxia" by Yetta Jager, Matt Langholtz, and Virginia Dale of ORNL.

Presentations

Dec. 7: Keith Kline gave an invited presentation titled, "ASTM E-48 Celebrating thirty-one years: Biomass past and future" for the ASTM International Meeting, Committee E-48, session on Sustainability Standards, in Lake Buena Vista, Florida



Dec. 12-16: Several ORNL scientists participated in American Geophysical Union (AGU) Fall Meeting in San Francisco: <https://fallmeeting.agu.org/2016/>



- Virginia Dale, Keith Kline, and Latha Baskaran contributed to the session titled "Biofuel-induced land use change impacts on hydrology, water quality, and carbon and evapotranspiration dynamics."
 - Virginia presented on "Effects on Environmental and Socioeconomic Sustainability of Producing Ethanol from Perennial Grasses."
 - Keith presented on "Land-Use Change and the Billion Ton 2016 Resource Assessment: Understanding the Effects of Land Management on Environmental Indicators."
 - Latha presented on "Exploring the Potential for Sustainable Future Bioenergy Production in the Arkansas-White-Red River Basin."

- Nagendra Singh spoke on “Use of Dynamic Time Warping and Network Based Techniques for Mapping Trends and Patterns in Vegetation Using MODIS Data.”

Other ORNL Activities

Dec. 2: Virginia Dale met with Taylor Eighmy, Vice Chancellor for Research & Engagement at The University of Tennessee, to discuss ideas for Science City Adventure, a means for east Tennessee institutions to enhance education of science and technology by offering hands-on opportunities for exploring ramifications of energy, health care, transportation, and other technology choices.

Dec. 6: Virginia Dale joined the webinar introducing the Northwest Forest Plan Science Synthesis, on which she is a reviewer of the chapter on “Climate, disturbance, and vulnerability to vegetation change in the Northwest Forest Plan area.” The review is coordinated by the Ecological Society of America.

Dec. 6-8: Kline and Davis (remotely) participated in ASTM International Committee E-48 (Bioenergy and Industrial Chemicals from Biomass) meetings in Lake Buena Vista, Florida. Comments were resolved and a final vote held on ASTM E3066-2016 “Practice for Assessing Relative Sustainability Involving Energy or Chemicals from Biomass” (approved), and a plan was developed for next steps and potential case-study applications of ASTM E3066-2016.

Dec. 7-8: Paul Leiby discussed future research ideas with DOE/EPSCA staff Andy Stocking, regarding energy security, and Sarah Garman, EPSCA, regarding possible National LCFS study.

Dec. 8: Kristen Johnson of the DOE Bioenergy Technologies Office briefed Reuben Sarkar, Deputy Assistant Secretary for Transportation, on the 2016 Billion-Ton Report Volume II: Environmental Sustainability Effects of Select Scenarios from Volume 1. Rebecca Efrogmson is the project leader for the report and coauthored the presentation. Matt Langholtz is PI of the project. Additional authors from ORNL are leading chapters of the report: Craig Brandt, Keith Kline, Yetta Jager, and many additional ORNL staff, other national laboratory staff, and USDA Forest Service staff are participating.

Dec. 8: Nate Pollesch formally received his PhD at the hooding ceremony at the University of Tennessee. Lou Gross and Virginia Dale were pleased to celebrate this achievement with Nate.



Dec. 9: Rebecca Novello presented “Forest Thinning to Avert Wildfire, Produce Energy, and Save Salmon” to the Fishheads Brownbag. The talk, coauthored by Yetta Jager, describes a new project that uses Bayesian Belief Networks to model complex interactions in collaboration with Mark Wigmosta, PNNL, Paul Hessburg and Keith Reynolds, USFS R&D.

Dec. 12-14: The ORNL Strategic Petroleum Reserve (SPR) Team (Debo Oladosu, Rocío Uria, David Bowman and Paul Leiby) communicated with Fossil Energy (FE) SPR sponsor regarding urgent preparation of the Oil Valuation Model for upcoming use in supporting analysis around legislatively-mandated Strategic Petroleum Reserve Sales.

Dec. 12 and 16: Yetta Jager participated in two on-line working meetings with INL and ANL collaborators to finalize a report on Workshop, “Bioenergy Solutions to Gulf Hypoxia.”

Dec. 12-18: Virginia Dale joined a meeting of colleagues at the University of Tennessee Institute of Agriculture (UTIA) to discuss a proposal to the National Science Foundation for an Early-Concept Grant for Exploratory Research (EAGER) for a US-China Research Coordination Network (RCN).

Dec. 13: Yetta Jager and Latha Baskaran discussed plans for SWAT comparisons with new USGS loads data with Dale Robertson and obtained GIS data describing sites with available data.

Dec. 13-14: Paul Leiby participated in the Biomass Scenario Review Model External Review in Washington DC, with BETO sponsors A. Lindauer and Z. Haq, staff from the National Renewable Energy Laboratory (NREL), and other reviewers. Potential uses and extensions of the model and its public roll-out

were discussed.

Dec. 13-14: Visit by Bioenergy Technologies Office (BETO) Strategic Communications team (Sheila Dillard, Rhonda Jackson, Shannon Zaret, and Alexis Wolfe) focused on projects, “Educator Education” and “Addressing Stakeholder Issues to Inform Decision Making,” included a tour of ORNL capabilities (e.g., the Manufacturing Demonstration Facility: <http://web.ornl.gov/sci/manufacturing/mdf/>).

Dec. 14: Kristen Johnson of the DOE Bioenergy Technologies Office briefed Acting Assistant Secretary for the Office of Energy Efficiency and Renewable Energy, on the same report.

Dec. 19: Virginia Dale and Keith Kline had a conference call with the International Maize and Wheat Improvement Center (CIMMYT) regarding their new project on “From Sustainable Intensification of Cropping Systems to Sustainable Farming Systems and Landscapes.”

Dec. 20: Kristen Johnson of the DOE Bioenergy Technologies Office and Rebecca Efroymsen and Matt Langholtz of ORNL briefed staff from the White House Office of Management and Budget, Office of Science and Technology Policy and Council on Environmental Quality, on the 2016 Billion-Ton Volume II: Environmental Sustainability Effects of Select Scenarios from Volume I.

Dec. 20: Virginia Dale and Keith Kline contributed to the development of plans and deliverables related to IEA Bioenergy’s Inter-task effort, “**Measuring, governing and gaining support for sustainable bioenergy supply chains**” (see: <http://itp-sustainable.ieabioenergy.com/>).

Dec. 21: Virginia Dale organized a conference call with IBM scientists focused on precision agriculture, serious gaming, and use of sensors, to foster more sustainable agriculture.

Upcoming ORNL Visits/Events

Happy New Year 2017!

Jan. 23-24: Keith Kline is an invited speaker for plenary session of “**Fuels of the Future 2017**” in Berlin, Germany. This conference is jointly organized by five industry associations and is a “central forum for the European Union to debate current issues and challenges faced by policy-makers in the area of renewable mobility.”

Jan. 31- Feb. 1: Yetta Jager will attend a kick-off meeting for multi-lab project that will develop decision support tools for forest thinning to produce biofuels, reduce wildfires, and benefit salmon and other ESA-listed fishes.

Jan. 31 to Feb. 2: At the invitation of the International Maize and Wheat Improvement Center (CIMMYT), Virginia Dale, Sarah Eichler-Inwood, and Keith Kline are invited to participate in a Maize and Wheat Systems Analysis Workshop in Louvain-la-Neuve, Belgium.

Mar. 6-9: Many ORNL CBES team members will participate in DOE Bioenergy Technologies Office External Peer Review, in Denver, CO.

Apr. 2017: Esther Parish has been invited to present her research on wood pellet sustainability at the April 9-13 US IALE (US Regional Association of the International Association for Landscape Ecology) meeting in Baltimore, Maryland: <http://usiale.org/baltimore2017/>. Her presentation will be part of a symposium entitled “Telecoupling people and landscapes among distant places around the world.” Virginia Dale and Keith Kline also submitted abstract for the upcoming US IALE meeting.



TBD: Following up on the presentation by US Congressman Bruce Westerman (forester and engineer from Arkansas) on wood-based bioenergy at the US Industrial Pellet Association meeting, Virginia spoke with him and invited him to visit ORNL. That visit will likely be in early 2017.

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