

Bioenergy, Sustainability, and Land-Use Change Report Oak Ridge National Laboratory (ORNL) June 2015

Publications

- Dale VH, Kline KL, Marland G, Miner RA. In press. Ecological objectives can be achieved with wood-derived bioenergy. *Frontiers in Ecology and the Environment*.
- Kline KL, Mayer AL, Martinelli FS, Medeiros R, Oliveira COF, Sparovek G, Walter A, Venier L, 2015. Bioenergy and Biodiversity: Key Lessons from the Pan American Region. Part of Special Issue on Biofuels in the Americas, *Environmental Management*
<http://link.springer.com/article/10.1007/s00267-015-0559-0>
- Jager, HI, LM Baskaran, PE Schweizer, A Turhollow, CC Brandt, and R Srinivasan. 2015. Forecasting changes in water quality in rivers associated with growing biofuels in the Arkansas-White-Red river drainage, USA. *Global Change Biology: Bioenergy* 7(4): 774-784.

ORNL Presentations



June 1-2: Joe Pomerening and Leslie Ovard from the BETO visited ORNL in order to create a film illustrating progress toward bioenergy sustainability. They filmed at the Oak Ridge Forest on the University of Tennessee – Forest Resources AgResearch and Education Center, which is directed by Kevin Hoyt (on far right in photo), as well as in switchgrass fields around Vonore, Tennessee at the Color Well Farm. The film was shown at the Bioenergy 2015 conference mentioned below. The segment for East Tennessee features Sam Jackson of Genera and Esther Parish and Virginia Dale from ORNL. Filming assistance was provided by Jason Richards and Kase Clapp from ORNL.

June 4-6: Nate Pollesch gave a poster presentation entitled "Towards a Sustainability Assessment Tool for Bioenergy (STAT-B): Key Components and Requirement Specification" at Howard University for the Mathematics for Planet Earth 2013+: Management of Natural Resources workshop.

June 15-17: Virginia Dale gave a talk on "Approach for sustainability assessment of southeast pellet production" at the Forestry Technical Session at the 2015 Southern Regional Meeting of the National Council for Air and Stream Improvement (NCASI) in Greenville, SC

June 17: Erin Webb and summer students Kirk Copley, Steven Gail, Johnson Luma, Oluwafemi Oyedeji, and Emma Tobin toured the UT Center for Renewable Carbon.

June 18: Esther Parish and summer student Emma Tobin met with Sam Lambert at the USFS Southern Research Station in Knoxville in order to discuss obtaining additional Forest Inventory Analysis (FIA) data for ORNL's sustainability analysis of Southeastern U.S. Wood pellet exports.



June 23-24: Tim Theiss, Virginia Dale, Yetta Jager, Matt Langholtz, and Abhijeet Borole attended the “DOE Bioenergy 2015: Opportunities in a Changing Energy Landscape” conference in Washington, DC. Virginia had lots of engagement on an interactive poster on “Incorporating Bioenergy into Sustainable Landscape Designs Informs Opportunities, Barriers, and Paths Forward” coauthored by Keith L Kline, Timothy A. Volk, C. Tattersall Smith, and Inge Stupak. Yetta presented a poster entitled “Sustainable Bioenergy Production Can Enhance Water Quality” with coauthors Latha M. Baskaran, Gangsheng Wang, Jasmine Kreig, and Nate Sutton. Abhijeet participated in a panel discussion on “New/Emerging Pathways.”

June 24: Keith Kline gave an invited presentation to the ASTM International Committee E48 titled: *Thirty years later: Reflections on the past and future of biomass utilization*, in Fort Lauderdale, FL

CBES Forum



The CBES forums for June consisted of three separate events:

The first speaker was Amy Fletcher, an Associate Professor of Political Science and Public Policy from the University of Canterbury in Christchurch, New Zealand. Dr. Fletcher’s topic was titled **Engaging Extinction: De-Extinction, Sustainability and Society**. De-extinction is a new and controversial approach to sustainability that foresees using advanced biotechnologies to reverse the biodiversity crisis and perhaps even to resurrect extinct species.

Chris Lituma was the second speaker at the CBES Forum in June. Chris is a Postdoctoral Research Associate in the Center for Native Grasslands Management, Department of Forestry, Wildlife and Fisheries at the University of Tennessee, Knoxville. His talk is titled **Multi-scale Assessment of Wildlife Sustainability in Switchgrass Biofuel Feedstock Production**.





Kevin Comer and Tim Clark of the Antares Group were the third to give a talk in June. The title of the talk was **BALES Project Overview and Corn Stover Harvest Data Collection Progress, Plans, and Issues**. Antares Group plays a lead role in managing the team and activities associated with the BALES (Biomass Alliance for Logistics Efficiency and Specifications) project. Mr. Comer is a mechanical engineer specializing in energy and environmental systems. Mr. Clark is a Renewable Energy Specialist.

Other CBES Activities

June 24: A work session was organized and held with the American Society for Testing and Materials (ASTM) International, Committee E48, to begin development of a new “Standard Practice” to support consistent methods to assess relative sustainability. Contact Maggie Davis or Keith Kline for more information.

David Gorelick is summer student at ORNL with the HERE Program and attends the University of North Carolina at Chapel Hill. David works with Gangsheng Wang and Yetta Jager on the water quality data collection and preparation for the calibration of SWAT model in the Tennessee River Basin. The goal of this project is to understand how the spatial arrangement and management of bioenergy feedstocks (e.g., crops, residues) can lead to sustainable outcomes in terms of biomass yields and water quality.



H. Jager joined the editorial board of “Sustainability of Water Quality and Ecology” (2015-2018)

Nate Pollesch is Lead on a proposal to DIMACS (Center for Discrete Mathematics and Theoretical Computer Science) at Rutgers University entitled "From the Theoretical to the Actionable: A Proposal for Follow-up to Mathematics for Planet Earth Workshop Series" that is under consideration at DIMACS.

Upcoming ORNL Visits/Events:

July 5-11: Virginia Dale plans to attend the 9th International Association of Landscape Ecology (IALE) World Congress in Portland, Oregon, and will present an invited talk on “Ecological implications of energy use: a focus on scale” in the John A. Wiens Symposium on Spatial Scaling in Ecology. She will also tell her personal story in a public evening session as part of Springer Storytellers and Story Colliders: <http://www.beforetheabstract.com/events/springer-storytellers-iale-portland/>.

July 15: A poster titled Incorporating Bioenergy into Sustainable Landscape Designs Informs Opportunities, Barriers, and Paths Forward will be presented by Emma Tobin at the Committee For Women Celebration of Women in Science and Engineering Poster Session. Authors of the poster are: Virginia H Dale, Keith L Kline, Timothy A. Volk, C. Tattersall Smith, and Inge Stupak. Esther Parish will also present a poster at this conference titled “Assessing Multimetric Aspects of Sustainability: Application to a Bioenergy Crop Production System in East Tennessee.”

July 26-27: The CBES summer students will present the results of their summer research projects at a Southeastern Partnership for Integrated Bioenergy Supply Systems (IBSS) conference in New Orleans.

August 8-14: Virginia Dale plans to attend the 2015 Ecological Society of America (ESA) Annual Meeting and give an invited talk in a special session on "The role of long-term studies in advancing ecological understanding." Keith Kline will also present on "A landscape design approach for assessing trade-offs and sustainability of woody biomass production from forests in the Southeastern United States." This meeting is taking place in Baltimore, Maryland.

September 29-October 2: Rebecca Efroymsen plans to attend the 2015 Algae Biomass Summit in Washington, DC, and to present "Environmental and socioeconomic indicators for sustainable production of algal biofuels."

Sept 30-Oct 2: Esther Parish will present our multimetric sustainability case study assessment of the Vonore switchgrass-to-ethanol experiment at the Switchgrass III: Prairie and Native Grass International Conference in Knoxville.

October 21: ORNL will celebrate the 3rd National Bioenergy Day.

October 26-29: Virginia Dale and Keith Kline are invited to participate in the International Energy Agency (IEA) Bioenergy Conference 2015 in Berlin, Germany. Virginia will give a presentation titled "Integrating biomass supply systems into sustainable landscape designs" with coauthors Keith Kline and Esther Parish. Keith will give a poster on "Understanding Indirect Effects: Evaluating and Improving Science-based Practices for ILUC assessment" with coauthors Hans Langeveld, Virginia Dale and Rebecca Efroymsen.

November 2-6: Keith Kline and Maggie Davis plan to attend the Society of American Foresters annual convention and present on, "Bioenergy Trade and Sustainability Assessment: Science, Truth and Consequences" and "Indirect Effects of Bioenergy: International Standards and Science" in a special session on "Sustainability of International Trade in Bioenergy." Virginia Dale will also attend and will give a presentation on "Using landscape design to assess sustainability of wood biomass production from southeast US forests."

December 14-18: H. Jager and SWAT-modeling team invited to the 2015 AGU fall meeting to present at a Symposium on "Biofuel-induced land use / land cover change and associated biogeochemical and biophysical impacts". L. Baskaran will present our research on bioenergy effects on water quality and quantity in the Arkansas-White-Red and Tennessee River basins.