

Bioenergy, Sustainability, and Land-Use Change Report Oak Ridge National Laboratory (ORNL) May 2012

ORNL Publications

Wright LL, Eaton LM, Perlack RD, and Stokes BJ (2012) Woody Biomass. In: Sayigh A, (ed.) Comprehensive Renewable Energy, Vol 5, pp. 263–291. Oxford: Elsevier.

Efroymson RA, VH Dale, Y Jager, KL Kline, ES Parish, L Baskaran (2012) Targets for Sustainability Indicators for Biofuels: A report developed to help the DOE national laboratories make progress on the Joule 4 Milestone.

Parish ES, RA Efroymson, VH Dale, KL Kline, AC McBride, T Johnson, MR Hilliard, JM Bielicki (In review) A multi-scale comparison of environmental effects from gasoline and ethanol production. Environmental Management. Request for minor revision by journal.

ORNL Presentations

May 1-2: Keith Kline made the opening presentation on "The Importance of Sustainability" as an invited speaker in the "Sustainable Energy Symposium" hosted by Kansas State University. He also served on an international panel discussion of ISO and other initiatives to develop standards for bioenergy sustainability. Symposium participants included private industry leaders, faculty and graduate students participating in an NSF-Integrative Graduate Education and Research Training (IGERT) "I-STAR Bioenergy" Program (integrating Socioeconomic, Technical and Agricultural Aspects of Bioenergy).

May 8: Social Aspects of Bioenergy Sustainability Webinar. ORNL developed a set of 16 socioeconomic sustainability indicators that were the centerpiece for the DOE workshop Social Aspects of Bioenergy Sustainability on April 24 in Washington, DC, and a subsequent webinar on May 8. The workshop identified knowledge gaps and implementation challenges, as well as R&D recommendations, for the suite of proposed indicators. In the webinar, Virginia Dale reviewed the proposed indicators of: social well-being (employment, work lost due to injury, household income, and food security), social acceptability (public opinion, transparency, effective stakeholder participation, and risk of catastrophe), and trade (energy security premium, fuel supply stability, terms of trade, trade volume). Rebecca Efroymson presented a summary of recommendations of the social acceptability subgroup at the workshop and webinar

May 14-15 – Keith Kline presented "Indicators to support sustainability assessment of energy systems and biodiversity" as an invited speaker at the World Renewable Energy Forum (WREF) (www.ases.org/conference/) in Denver, CO. He participated in the session titled, "Impacts of Renewable Fuels: Environmental, Social and Economic Sustainability" and contributed to a lively debate on issues surrounding land-use change estimation. Virginia Dale, Rebecca Efroymson and Latha Baskaran contributed to the talk.

May 25 - Debo Oladosu, Maggie Davis, and Keith Kline helped Department of Energy's Biomass Program (OBP) to organize and facilitate a webinar discussion on "Land-Use Change: Current

Research, Practices, and Processes for Sustainable Bioenergy Production.” The webinar included presentations by Oladosu on improvements to the ORNL GTAP model and by ICONE's Moreira on the Brazil Land Use Model. The researchers from ORNL, ANL, INL, PNL, and NREL and OBP discussed input parameters and assumptions that influence LUC modeling results to identify options that can address differences and overcome a DOE Sustainability barrier on the “Representation of Land Use (data and model limitations)”.

May 28-31 - Keith Kline and Virginia Dale attended the Pan American Research Coordination Network (RCN) for Biofuels and Bioenergy Sustainability in Merida, Mexico. Keith chaired a session on the Water-Energy Nexus and made an oral presentation on ORNL research related to land-use change analysis. Virginia gave a presentation on sustainability indicators. Six ORNL posters were presented at the meeting and research collaboration linkages were strengthened. This meeting represented the kick-off of a four year RCN project led by Michigan Technological University and funded by the National Science Foundation.

ORNL CBES Forum

May 17 – Charles Kwit (UT) presented “Gene Flow Matters in Switchgrass (*Panicum virgatum* L.), A Potential Widespread Biofuel Feedstock Study”. This presentation can be accessed at the CBES website under forums: <http://www.ornl.gov/sci/ees/cbes/forums.shtml>

May 21 – ORNL hosted Marcelo Moreira, a representative from the Brazilian Institute for International Trade Negotiations (ICONE), to compare parameters of ORNL GTAP-DEPS and ICONE BLUM models for improved LUC modeling and analysis. Marcelo gave an introductory presentation titled, “Coupling GIS and economic data into land use models: The Brazilian Land Use Model experience”, to ORNL and UT participants at a special CBES forum. His presentation can be accessed at the CBES website (forums): <http://www.ornl.gov/sci/ees/cbes/forums.shtml>

Other ORNL Activities

May 3, 14 - Maggie Davis participated in ISO PC248 Expert Work Group 4 meetings to develop a work plan for WG4 under the updated mandate, "to inform the PC at the next plenary on new scientific research including issues surrounding definitions, system boundaries and responsibilities relevant to the issue of indirect effects". Seven webinars are planned from June to December 2012 to update the 60 page Annotated Bibliography with critical assessments related to indirect effects.

May 9, 15, 22, and 24 - Maggie Davis participated in ISO PC248 Expert Work Group 3 webinars and contributed to efforts to resolve issues about "transparency", "confidentiality", "legality", "respect for international norms of behaviors", and "flexibility/relevance" and finalize principles, criteria, and indicators on social aspects of bioenergy sustainability.

May 15-16 - Esther Parish and Virginia Dale participated in a workshop that addressed modeling aspects of the 5-year Integrated Biomass Supply System (IBSS) Program. The workshop was sponsored by the Department of Agricultural & Resource Economics and the Center for Renewable Carbon at the University of Tennessee.

May 17 – Virginia Dale and Keith Kline discussed the Multiyear Program Plan (MYPP) of the Office of the Biomass Program (OBP) with Kristen Johnson and Ranyee Chiang and shared a written summary of key points from the discussion on May 25.

May 18 - Keith Kline participated in ISO PC248 Expert Work Group 2 webinar #10 (held 3AM-5 AM to enable participation of representatives from Australia, China and Pakistan) and contributed to efforts to resolve issues surrounding treatment of "waste" versus "residue," reference case and counterfactual scenarios, opportunity costs and rotation periods, as they affect GHG accounting for bioenergy. Kline also joined three separate webinars organized by Work Groups 1 and 2 to address a list of comments received on the draft Standard.

May 21-25 – ORNL hosted a visit from Marcello Moreira, from ICONE (Brazil) as described above.

May 24: Allen McBride and Keith Kline submitted peer review comments on the draft paper, "Indirect Impacts of biofuel production and the RSB Standard" (dated 13 April 2012) to the Roundtable on Sustainable Biofuels (RSB). The comments and feedback on the specific options proposed were also shared with OBP, ANL and NREL in preparation for a June RSB Chamber 7 meeting.

Upcoming ORNL Visits/Events

June 7-11: ORNL will host Ariel Rodriguez and Edgar Castillo from the Colombian Petroleum Institute, research arm of the National Petroleum Corporation of Colombia (EcoPetrol). A special CBES forum titled "Energy Diversification Program at EcoPetrol" will review "Advanced Biofuels, Heat and Power Generation from Biomass and Renewables (Proposal) and Energy Efficiency in upstream operations."

June 10-13 – Matt Langholtz and Laurence Eaton will present a poster titled "Integrating Microalgae Biofuel Production Potential into Biomass Resource Assessment" at the 2nd International Conference on Algal Biomass, Biofuels and Bioproducts in San Diego, CA.

June 20- Keith Kline will participate in a panel at the Bio International Convention (BIO 2012) as invited speaker on "Sustainability & GHG Certification Schemes – Key Industry Actions Towards a Level Playing Field" in Boston, MA. <http://convention.bio.org/>

June 21 – Virginia Dale, Latha Baskaran and Esther Parish will meet with colleagues from the University of Tennessee regarding proposed course plans for the Water-Energy Nexus and how SWAT can be used by IBSS (Integrated Biomass Supply System).

July 23-24 - Esther Parish will present a poster on "Designing Bioenergy Cropping Systems to Maximize Sustainability Objectives" to the upcoming workshop on "Visualization Technologies to Support Research on Environment Interactions" that will be held in Annapolis, Maryland by the National Socio-Environmental Synthesis Center (SESYNC). Esther's travel expenses will be paid by SESYNC through a grant from the National Science Foundation.

July 24 – ORNL will host Ghobah Rahrooh, Woody Keown, Robert Rohrbaugh, Rainer Cina, Phil Green and Ryan West from Proctor and Gamble to emphasize: Feedstock Assessment and Sustainability Metrics.

August 5-10, 2012 – Several ORNL staff will participate in the 2012 Ecological Society of America (ESA) Annual Meeting in Portland, Oregon.

- A Special Session, "A Debate on the Sustainability of Biomass Production for Energy", will focus on the proposition "Producing bioenergy can be sustainable for habitat availability and biodiversity, and can eschew the risk of new invaders." This formal debate will allow opening statements by each of six experts, followed by rebuttals, with audience questions entertained during the final 30 minutes. The audience will be polled before and after to determine the winners. H. Jager is an organizer and R. Efroymson will represent the "for" position.
- Virginia Dale will speak in the Symposium "Bioenergy and Biodiversity: Oxymoron or Opportunity?" on "Environmental and socioeconomic indicators of bioenergy sustainability."
- Keith Kline will speak on "Models, causal analysis and scientific methods for understanding land-use change (LUC) dynamics."

Aug 19-23 – Debo Oladosu will present "Evaluating the Economic Benefits of the Advanced Biofuels Targets under the RFS2" paper at the 244th ACS National Meeting in Philadelphia, PA.

October 2012 - Virginia Dale is serving as a member of the Conference Programming Committee for the "Science for Biomass Feedstock Production and Utilization National Conference" to be held in October 2012 in New Orleans and sponsored by the Sun Grant Initiative. <http://www.sungrant.org/News+and+Events/2012+National+Conference.htm>

November 5-8 – The 9th Biennial Short Rotation Woody Crops Operations Working Group will meet in Oak Ridge and Knoxville, Tennessee.

November 12-15 – Latha Baskaran will present "Modeling the effects of switchgrass management on aquatic macroinvertebrates" at the 2012 AWRA Annual Water Resources Conference in Jacksonville, FL.