

**Monthly Newsletter for the
Biosciences & Environmental Sciences Divisions (B&ESD)
January 2013**

Pubs and Products

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Notable Achievements

The Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC) Geographic Information Systems (GIS) Developer, Yaxing Wei, participated in the Web Services Pilot Stakeholders telecon hosted by the Land Processes (LP) DAAC. Yaxing Wei serves as a working group member providing feedback and guidance on the implementation of a LPDAAC Thematic Realtime Environmental Distributed Data Services (THREDDS)/Hyrax data server to serve their data holdings.

During January 7th-9th Boualem Hadjerioua traveled to Denver, CO, to discuss the “Integrated system-wide modeling framework for transporting dangerous goods (TDG) spill Management” project.

ORNL DAAC Project Manager, Sue Heinz, participated in the Earth Science Information Partners (ESIP) Winter 2013 Meeting, January 8th-10th in Washington, DC.

The Carbon Dioxide Information Analysis Center (CDIAC) has updated the Advanced Global Atmospheric Gases Experiment (AGAGE) database on radiatively active ("greenhouse") gases and ozone-depleting gases in the atmosphere through March 2012.

Brennan Smith attended the Vision Project meeting Washington, DC, during January 9th – 11th.

The DOE Systems Biology Knowledgebase (KBase) project exhibited at the Plant & Animal Genome XXI (PAG) Conference during January 12th-16th in San Diego, CA, and distributed information and many brochures. KBase shared the booth with their sponsor, the DOE Biological and Environmental Research (BER) program and with the Joint Genome Institute (JGI). Priya Ranjan also gave a well-received computer demo on KBase.

Wellington Muchero presented a talk titled “The Physcomitrella Illumina Infinium SNP Array: Informing Genetics and Genomics in Mosses” at PAG in San Diego, CA.

The ORNL DAAC shipped offsite backup tapes of its core data holdings to LPDAAC on January 15th 2013.

On January 15th Amy Wolfe participated in a day-long strategic planning meeting with her DOE-Energy Efficiency and Renewable Energy (EERE) Federal Energy Management Program (FEMP) Institutional Change sponsor and teammates (from Lawrence Berkeley and Pacific Northwest National Laboratories) in Washington, DC, focusing on the second half of FY13 and future years.

On January 15th Bruce Tonn, Erin Rose and Beth Hawkins traveled to Bellingham, WA, to facilitate and participate in a meeting with the Opportunity Council. They discussed details on a special study on which they are partnering with the Opportunity Council to conduct field observations.

The methodology report of the New Stream-reach Development Potential Resource Assessment (funded by the DOE Water Power Program) has been released. Preliminary findings at two pilot hydrologic subregions, Alabama-Coosa-Tallapoosa (ACT) and Apalachicola-Chattahoochee-Flint (ACF), are presented. The report, data, and map can be accessed through <http://nhaap.ornl.gov/nsd>.

During January 16th-17th Keith Kline gave a presentation on “Bioenergy Sustainability: Addressing the Science and the Need” at the University of Queensland and then led a workshop on this topic.

The Young Evolving Scientists Seminar Series (YESSS) held its monthly meeting on January 17th. A research presentation entitled “Improving biological conversion of lignocellulosic biomass to biofuels” was given by Sonya Clarkson on her work with the BioEnergy Science Center. YESSS is a professional support group for early career science professionals (at all levels) within BESD research programs. The meetings are held the 3rd Thursday of each month at noon in Building 1505, Room 189. Please visit the YESSS website for more information and to join the email list: <http://home.ornl.gov/general/yesss>.

The ORNL DAAC held a telecon with Elsevier on January 18th to discuss details of an ORNL DAAC data citation web service. The web service allows users to access relevant ORNL DAAC data sets for a given journal publication directly from Elsevier's web portal.

On January 18th Esther Parish and Virginia Dale delivered a Quarter 1 milestone report on the "Assessment of Spatially Explicit Multivariate Analysis Tools to Evaluate Indicators of Bioenergy Sustainability" to Kristen Johnson of the DOE EERE Biomass Technologies Office.

Amy Wolfe participated in the development of an online training module on Sustainable Institutional Change for Federal Facility Managers. Along with Jerry Dion, Rick Diamond, Elizabeth Malone, Christopher Payne, and Thomas Sanquist, Amy created the course that provides federal facility managers with practical information and action-based strategies to change individual and organizational behavior in support of energy efficiency and strategic sustainability goals. While advanced technologies are increasingly effective at reducing energy and resource intensity in buildings and facilities, optimal results cannot occur unless multiple strategies are employed to change individual and organizational behavior. This course emphasizes the link between individual behavior and institutional change. It introduces the framework of "rules, roles, and tools" to guide the systematic design, development, implementation, and evaluation of multiple strategies to achieve-and maintain over the long term-individual and institutional change. The training is available online at available at http://apps1.eere.energy.gov/femp/training/course_detail_ondemand.cfm/CourseId=142.

The ORNL DAAC has released the winter 2013 issue of the ORNL DAAC Newsletter. Along with the announcement of 27 newly published data sets, this special "Tools Issue" highlights some of the ORNL DAAC's tools and services, including the Spatial Data Access Tool (SDAT), Moderate Resolution Imaging Spectroradiometer (MODIS) Land Product Subsets, and WebGIS. Read it online at http://daac.ornl.gov/news/DAAC_newsletter_Winter13.pdf.

On January 30th Matthew Langholtz and Esther Parish met with visiting professor, Rudolf Thauer (Max Planck Institute for Terrestrial Microbiology in Marburg Germany), to discuss the sustainability perspective of the biomass supply chain.

During January 21st-25th Keith Kline and Maggie Davis participated in the International Organization for Standardization (ISO) PC248 plenary meetings in Australia for the draft standard on Sustainability Criteria for Bioenergy (ISO 13065). Keith continues to serve as leader of the Editing Committee and contributed in parallel sessions for WG1-crosscutting issues, WG2 greenhouse gas (GHG) emissions, and joint meetings on contentious issues. Maggie presented a work group 4 (indirect effects) report and contributed to parallel meetings of WG3 sub-groups working on environmental, social, and economic indicators.

ORNL DAAC Chief Scientist, Bob Cook, and ORNL GIS Developer, Yaxing Wei, attended the DataONE Exploration Visualization and Analysis (EVA) Working Group Meeting, during January 22nd and 23rd, in Brooklyn, NY.

Jim Elkins was appointed to the scientific advisory board for Oberon FMR Inc. in Aurora, Colorado. Oberon produces sustainable fish meal protein replacements from high biochemical oxygen demand (BOD) wastewater generated by the food and beverage industry.

Shahab Sokhansanj participated in the final review of the FDCE high tonnage project. The review took place on January 22nd and 23rd in Oskaloosa, IA, and included face to face meeting with

project partners, Fred Circle (FDC Enterprises) PI, Gary Kelderman (Kelderman Manufacturing of Oskaloosa, IA), Jay Van Roekel (Vermeer Manufacturing of Pella), Jeff Rink (Allied Steel Manufacturing of Portland), Kevin Comer, Bill Belden, Tim Clark (Antares Group of Virginia), Steve Thomas, Sam Tagore (DOE Bioenergy Technologies Office [BTO]), and Shahab Sokhansanj (ORNL). The meeting was dedicated to discussion of original project objectives, performance against objectives, lessons learned, suggestions for future work, and discussion of Integrated Biomass Supply Analysis and Logistics (IBSAL) modeling. The meeting also included a visit of the Kelderman Manufacturing facilities where self-propelled baler, bale pick up truck, and self-loading truck were designed and manufactured.

On January 23rd Virginia Dale and Debo Oladosu delivered comments to the U.S. Department of Energy, Policy and International Affairs on a report on “Biofuels and Food Security V0 Draft” developed by a High Level Panel of Experts (HLPE) on Food Security and Nutrition to fulfill the request by the United Nations Committee on World Food Security (CFS) to “conduct a science-based comparative literature analysis.”

Jessy Labbé was recently awarded a grant from the Permanent Commission of the Lorraine Regional Council in France to continue his international scientific collaboration between the Plant Microbe Interfaces (PMI) Science Focus Area (SFA) project and the French National Institute for Agricultural Research (INRA) in Nancy, France. This award was given for his exemplary work in this collaboration, with the challenge to continue to enlarge it. In addition to this, the Department of Forest Ecology, Prairies and Aquatic Circles has awarded a grant to INRA that will support a Ph.D. student for Jessy in his ongoing PMI SFA work at ORNL.

During January 23rd-24th Matt Langholtz and Natalie Griffiths traveled to Savannah River Site (SRS) to meet with Kristen Johnson. With collaborators from the United States Department of Agriculture Forest Service at Savannah River (USFS-SR) and the University of Georgia (UGA), we provided a tour of the field sites and discussed our project’s progress.

On January 24th Rebecca Efrogmson led a webinar on sustainability implications of using algae for biofuel.

Amy Wolfe has accepted an invitation from the Council of the American Association for the Advancement of Science (AAAS) to serve on the Association’s Committee on Scientific Freedom and Responsibility (CSFR). The term will be for three years, effective after the February 2013 AAAS annual meeting.

On January 24th Esther Parish met with Karen Seto from the Yale School of Forestry to discuss her recent work on land use change modeling and global sustainability.

The first of a series of publications resulting from the "Advanced Self-Potential Inversion: Development and Use for Investigating Natural Recharge Processes at the ORNL IFRC" project has been released. “Petrophysical properties of saprolites from the Oak Ridge Integrated Field Research Challenge site, Tennessee” was published in *Geophysics* in January. Coauthors are André Revil, Magnus Skold, Susan Hubbard, Yuxin Wu, Dave Watson, and Marios Karaoulis. Read the article online at <http://library.seg.org/doi/full/10.1190/geo2012-0176.1>.

Also on January 24th Laurence Eaton, Esther Parish and Suresh SanthanaVannan met with Jessica McCord, Tim Rials and Mladen Grbovic of the University of Tennessee’s Institute of Agriculture (UTIA) to discuss finalization of an online Southeastern Biomass Atlas funded through the Sun Grant Initiative. UTIA plans to present the online atlas at the Regional Biomass Feedstock

Partnership Meeting in Tunica, MS, on February 13th.

ORNL DAAC Chief Scientist, Bob Cook, attended the DataONE Planning Meeting, January 28th-30th in Santa Fe, NM.

Brennan Smith attended briefings in Washington, DC, during January 29th-31st.

During January 30th-February 2nd Bo Saulsbury attended the Deschutes Basin-Scale Assessment Stakeholders Workshop in Bend, OR, and gave a presentation entitled “Technical and Economic Feasibility Assessment of Small Hydropower Development in the Deschutes River Basin.”

On January 31st Keith Kline led a webinar on “Bioenergy policy and land use change” from The University of New England in Armidale, New South Wales, Australia.

BESD New Arrivals

Bruce Bellamy arrived in January to work as a postdoctoral research associate with Wilson McGinn. Bruce will manage the hardware, software and networking of a Beowulf computer cluster, perform radiation transport calculations related to tissue dosimetry, and participate in the development and maintenance of dosimetry software packages. He will also participate in preparation of research proposals, presentation of research at national and international meetings, and publication of papers.

Anthony Bryan, a postdoctoral Research Associate, has joined the PMI SFA. He will be working with Jay Chen and Wellington Muchero on characterizing genes selected from Populus genome-wide association studies that regulate plant-microbe interactions. Anthony received his PhD degree in molecular and cellular biology from the University of Arizona (Tucson) in 2011.

Alisha Campbell arrived in January to begin work as a postdoctoral research associate with Dale Pelletier. Alisha will perform experiments to elucidate genetic and molecular factors that are important to establishing and maintaining microbe-microbe and microbe-host interactions.

Guangsheng Chen arrived in January to work as a postdoctoral research associate with Daniel Hayes. Guangsheng will study high latitude ecosystem dynamics related to global environmental change at broad scales. A key component of this project requires a focused effort on regionalization and scaling issues, including multi-scale mapping of spatial environmental correlates.

Henrique Cestari De Paoli arrived in January to work as postdoctoral research associate with Xiaohang Yang. Henrique will work on identification of key genes in the Crassulacean acid metabolism (CAM) pathway using genomics approach, development of a new genome engineering method for transferring CAM genes into the Arabidopsis and Populus genome, functional analysis of CAM genes using molecular biology and genetics approach, and assessment of CAM module design using transient expression.

Jeremiah Henning, a Ph.D. candidate at the University of Tennessee, has recently joined the labs of David Weston and Jessy Labbé. He will be working on PMI Task 2.4: Constructed Communities.

Yang Jiao arrived in January to work as a postdoctoral research associate with Baohua Gu. Yang will work with a multi-disciplinary team on studies of contaminant detection and transformation and the novel application of surface enhanced Raman scattering (SERS) spectroscopy in environmental analysis and biological detection.