

## David J. Weston

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### Education

Postdoctoral Fellow Oak Ridge National Laboratory, 2006-2009

PhD, Plant & Environmental Science, Clemson University, 2006

MS, Plant Science, Cornell University, 2001

BS, Plant Science, Cornell University, 1998

### Professional positions held

Joint Faculty, Department of Biology, Duke University, 2014 - current

Adjunct Professor, University of Tennessee, Ecology and Evolutionary Biology, 2012-current

Staff Scientist, Oak Ridge National Laboratory 2009 - current

Assistant Professor, Department of Plant Science, State University of NY, Cobleskill 2001-2002

Visiting Professor, Department of Plant Science, State University of NY, Cobleskill 2000

### Recent and previous research funding

#### Current

Developing a genomic resource for peatland carbon cycling: *Sphangum magellanicum*  
Joint Genome Institute, PI Shaw and Weston

DOE JGI CSP: The role of the Sphagnum microbiome in carbon and nutrient cycling in peatlands. PI Joel E. Kostka

DOE-Sustainability Call DE-FOA-0001207: Integrative Study of Poplar Immunity: Genetic Resistance and Microbiomes. PI George Newcombe

A genome-enabled approach for predicting plant functional traits in dynamic vegetation models.  
DOE LDRD Fund. PI Weston

Functional manipulation of root endophyte populations for feedstock improvement.  
DOE BER University Call. PI Jeff Dangl

SPRUCE: Spruce and peatland responses under climatic and environmental change  
DOE BER. PI Paul Hanson

NGEE tropics: Next generation Ecosystem Experiments SFA  
DOE BER. PI Jeff Chambers

Plant-Microbe Interaction SFA  
DOE BER PI Mitch Dotycz

Engineering CAM Photosynthetic Machinery into Bioenergy Crops for Biofuels Production in  
Marginal Environments  
DOE BER & USDA, PI John Cushman

KBase: An Integrated Knowledgebase for Predictive Biology SFA.  
DOE BER, PI Adam Arkin

#### Previous

Model-Inspired science priorities for evaluating tropical ecosystem response to climate change  
DOE LDRD, PI Lianhong Gu

*Assembly of functional microbial communities*  
DOE LDRD fund, PI Dale Pelletier

A fast neutron strategy for creating deletion mutant populations of Sphagnum spp.  
DOE LDRD fund, PI Weston

Developing a systems biology approach for linking genetic and environmental constraints to  
primary productivity in model and non-model species.  
PI Weston

linking genetic and environmental constraints to primary productivity – can patterns scale to the  
field?”  
JDRD University of Tennessee, PI Aimee Classen

Unraveling the regulatory and biosynthetic genes that control cellulose production in the model  
bioenergy crop, *Populus*.  
DOE LDRD Co-PI

## Peer-reviewed publications

Weston DJ, Timm CM, Walker AP, Gu L, Muchero W., Schmutz J, Shaw AJ, Tuskan GA, Warren JM, Wullschlegel SD. 2015. Sphagnum physiology in the context of changing climate: Emergent influences of genomics, modeling and host-microbiome interactions on understanding ecosystem function. *Plant Cell & Environment*, 38(9): 1737-51

Weston DJ, Rogers A, Tschaplinski T, Gunter L, Jawdy S, Engle N, Tuskan G, Wullschlegel S, 2015. Scaling nitrogen and carbon interactions: What are the consequences of biological buffering? *Ecology and Evolution*, 5(14) 2839-2850

Wulschleger SD, Breen AL, Iversen CM, Olson MS, Näsholm T, Ganeteg U, Wallenstein MD, Weston DJ. 2015. Genomics in a changing arctic: critical questions await the molecular ecologist, *Molecular Ecology* 24(10) 2301-2309

Yang Y, Cushman JC, Borland AM, Edwards EJ, Wulschleger SD, Tuskan GA, Owen NA, Griffiths H, Smith JAC, Weston DJ, De Paoli, HC, et al. 2015. A roadmap for research on crassulacean acid metabolism (CAM) to enhance, *New Phytologist* 207(3): 491-504

Borland AM, Wulschleger SD, Weston DJ, Hartwell J, Tuskan GA, Yang X, Cushman JC. 2015. Climate-resilient agroforestry: physiological responses to climate change and engineering of crassulacean acid metabolism (CAM) as a mitigation strategy. *Plant, Cell & Environment* 38(9): 1833-49

Appel H. M., Fescemyer H, Ehlting J, Weston DJ, Rehrig E, Joshi T, Xu D, Bohlmann J, Schultz J. November 2014. Transcriptional responses of *Arabidopsis thaliana* to chewing and sucking insect herbivores. *Frontiers in plant science*: <http://dx.doi.org/10.3389/fpls.2014.00565>

Labbé JL, Weston DJ, Dunkirk N, Pelletier DA, Tuskan GA. October 2014. Newly identified helper bacteria stimulate ectomycorrhizal formation in *Populus*, *Frontiers in Plant Science*. <http://dx.doi.org/10.3389/fpls.2014.00579>

Borland AM, Hartwell J, Weston DJ, Schlauch KA, Tschaplinski TJ, Tuskan GA, Yang X, Cushman JC. 2014. Engineering crassulacean acid metabolism to improve water-use efficiency. *Trends in Plant Science* 19:327-338

P Szövényi, Devos N, Weston DJ, Yang X, Hock Z, Shaw JA, Shimizu KK, McDaniel SF, Wagner A. 2014. Efficient purging of deleterious mutations in plants with haploid selfing. *Genome Biology and Evolution* evu099

Yin H, Chen CJ, Yang J, Weston DJ, Chen JG, Muchero W, Ye N, Tschaplinski TJ, Wulschleger SD, Cheng ZM, Tuskan GA, Yang X. 2014. Functional genomics of drought tolerance in bioenergy crops. *Critical Review in Plant Science* 33: 205-224

Sun Y, Gu L, Dickenson RE, Pallardy SG, Baker J, Cao Y, Damatta FM, Dong X, Ellsworth D, van Goethem D, Jensen AM, Law BE, Loos R, Martins S, Norby RJ, Warren J, Weston D, Winter K. 2013. Asymmetrical effects of mesophyll conductance on fundamental photosynthetic parameters and their relationships estimated from leaf gas exchange measurements. *Plant Cell & Environment* 37: 978-994

Busby PE, Zimmerman N, Weston DJ, Jawdy SS, Houbraken J, Newcombe G. 2013. Leaf endophytes and *Populus* genotype affect severity of damage from the necrotrophic leaf pathogen, *Drepanopeziza populi*. *Ecosphere* 4:10

Weston DJ, Wulschleger SD, Tuskn GA. 2013. Extending the *Arabidopsis* flowering paradigm to a mass flowering phenomenon in the tropics. *Molecular Ecology* 22(18): 4603-4605

Wulschleger SD, Weston DJ, DiFazio SP, Tuskan GA. 2013. Revisiting the sequencing of the first tree genome: *Populus trichocarpa*. *Tree Physiology*, 33 357-364

Czarnecki O, Yang J, Weston DJ, Tuskan GA, Chen JG. 2013. A dual role of Strigolactones in Phosphate acquisition and utilization in plants. *International J. of Molecular Sciences* 14(4),

7681-7701

Ye C-Y, Li T, Yin H, Weston DJ, Tuskan GA, Tschaplinski TJ, Yang X. 2013. Evolutionary analyses of non-family genes in plants. *The Plant Journal* 73:788-97

Karve AA, Jawdy SS, Gunter LE, Allen SM, Yang X, Tuskan GA, Wulschleger SD, Weston DJ. 2012. Initial characterization of shade avoidance response suggests functional diversity between *Populus* phytochrome B genes. *New Phytologist* 196: 726-737

Weston DJ, Pelletier DA, Morrell-Falvey JL, Tschaplinski TJ, Jawdy SA, Lu TY, Allen SM, Karve A, Melton SJ, Martin MZ, Schadt CW, Chen JG, Yang X, Doktycz MJ, Tuskan G. 2012. *Pseudomonas fluorescens* induces strain-dependent and strain-independent host plant responses in defense networks, primary metabolism, photosynthesis and fitness. *Molecular Plant Microbe Interactions* 25: 765-778

Warren JM, Iversen CM, Garten Jr CT, Norby RJ, Childs J, Brice D, Evans RM, Gu L, Thornton P, Weston DJ. 2011. Timing and magnitude of C partitioning through a young loblolly pine (*Pinus taeda* L.) stand using <sup>13</sup>C labeling and shade treatments. *Tree Physiology* 32: 799-813

Wulschleger SD, Weston DJ. 2012. Modeling the molecular and climatic controls on flowering. *New Phytologist* 194: 599-601

Weston DJ, Hanson PJ, Norby RJ, Gerald A. Tuskan GA, Wulschleger SD. 2012. From systems biology to photosynthesis and whole-plant physiology: a conceptual model for integrating multi-scale networks. *Plant Signaling & Behavior* 7(2)

Souza L, Weston DJ, Sanders NJ, Karve A, Crutsinger GM, and Classen AT. 2011. Variation from individuals to ecosystems in the response to climatic warming: a test with *Solidago altissima*. *Ecosphere* 2(12)

Weston DJ, Karve AA, Gunter LE, Jawdy SA, Yang X, Allen SM, Wulschleger SD. 2011. Comparative physiology and transcriptional networks underlying the heat shock response in *Populus trichocarpa*, *Arabidopsis thaliana* and *Glycine max*. *Plant Cell & Environment*. 34: 1488-1506

Guo J, Yang X, Weston DJ, Chen J. 2011. ABA receptors: past, present and future. *Journal of Integrative Plant Biology* 53: 469-479

Guo J, Wang S, Valerius O, Hall H, Zeng Q, Li J, Weston DJ, Ellis BE, Chen J. 2011. Involvement of *Arabidopsis* RACK1 in protein translation and its regulation by abscisic acid. *Plant Physiol.* 155: 370-383

Wulschleger SD, Weston DJ, Davis JM. 2009. *Populus* responses to edaphic and climatic cues: Emerging evidence from systems biology research. *Critical Reviews in Plant Science* 28: 368-374

Leakey ADB, Ainsworth EA, Bernard SM, Markelz CR, Ort DR, Placella SA, Rogers A, Smith MD, Sudderth EA, Weston DJ, Wulschleger SD, Yuan S. 2009. Gene expression profiling – opening the black box of plant ecosystem responses to global. *Global Change Biology* 15: 1201-1213

Yang X, Kalluri UC, Jawdy S, Gunter LE, Tongming Y, Tschaplinski T, Weston DJ, Priya R, Tuskan GA. 2008. F-box gene family is expanded in herbaceous annual plants *Arabidopsis* and Rice relative to woody perennial plant *Populus*. *Plant Physiology* 148: 1189-1200

Weston DJ, Gunter LE, Rogers, A. Wulschleger SD. 2008. Connecting genes, coexpression modules, and molecular signatures to environmental stress phenotypes in plants. *BMC Systems Biology* 2:16

Weston, DJ and Bauerle WL. 2007. Inhibition and acclimation of C<sub>3</sub> photosynthesis to moderate heat: A perspective from thermally contrasting genotypes of *Acer rubrum* L. *Tree Physiology*, 27: 1083-1092

Weston DJ, Bauerle WL, Swire-Clarke GA, Moore BD, Baird WV. 2007. Characterization of Rubisco activase from thermally contrasting genotypes of *Acer rubrum* L. *The American Journal of Botany*, 94: 926-934

King AW, Gunderson CA, Post WM, Weston DJ, Wulschleger SD. 2006. Plant Respiration in a Warmer World. *Science*. 312: 536-537

Bauerle WL, Weston DJ, Bowden JD, Dudley JB, Toler JE. 2004. Leaf absorptance of photosynthetically active radiation in relation to chlorophyll meter estimates among woody plant species. *Scientia Horticulturae*, 101: 169-178

## Other publications

Yang X, Li T, Weston DJ, Karve A, Labbe J, Gunter LE, Sukumar P, Borland A, Chen J, Wulschleger SD, Tschaplinski T, Tuskan GA. Book chapter in Biofuels. *Innovative Biological Solutions to Challenges in Sustainable Biofuels Production*, 2011

Wulschleger, SD, DJ Weston. book chapter box in Resource Conservation and Management. *Microarrays and molecular phenotypes*, 2010

## Invited Seminars

Invited Talk Virginia Tech. U.: The role of natural genetic variation in the biodesign of plant productivity. March 2015

Plant and Animal Genome Conference: The Sphagnum genome project. Jan. 2015

Plant and Animal Genome Conference: Joint KBase and JGI workshop. Jan. 2015

Plant and Animal Genome Conference: On the transition from genome sequence to models in the plant sciences. Jan. 2015

DOE Genomic Sciences Contractors meeting, 2014

DOE Terrestrial Ecosystem Science PI meeting, 2014

University of Tennessee, November, 2013

Joint Genome Institute, Extending plant genomics to climate, April 2013

Joint Genome Institute, KBase introduction, April 2013

DOE Genomic Sciences Contractors meeting, KBase workshop, Feb. 2013

U. Missouri, Plant Physiology in the omics era symposium, May 2012

DOE Contractors meeting, KBase workshop, Feb. 2012

Bowling Green State University, October 2011

Gordon Research Conference, Plant-Insect Interactions meeting, February 2010

University of Missouri, Interdisciplinary Plant Biology group, May 2009  
UCLA Medical Genomics Group, July 2009  
iPlant, Plant Adaptation, October 2008  
University of Connecticut, Plant Science group, November 2007  
Ecological Society of America, San Jose, CA, 2007

## Professional activities and outreach

### National agency review panels

DOE Knowledge Base and Systems Biology initiative, NSF Science and technology Centers

### Workshops:

Scaling the Evolution of ecosystem relevant traits in peatmosses. Funded by the New Phytologist Trust (Weston, Shaw, Turestky) 2015  
Workshop proposal: Scaling Genomes to Ecosystem Function. funded by the National Evolutionary Synthesis Center at Duke U. (Weston, Shaw, Turestky) 2015  
St. Clair, S. and DJ Weston. 2007. Co-organizer for: Mechanistic underpinnings of ecological processes: scaling from genes to ecosystems. *Ecological Society of America*, San Jose, CA, August 5-10

### Review for journals

Plant Cell & Environment, New Phytologist, Global Change Biology, Journal of Experimental Botany, Tree Physiology, Plant Physiology, Journal of Ecology, Ecology letters, PLoS One, Functional Ecology, Proceedings of the Royal Society of London B.

### Outreach

Siemens Teachers as Researchers Mentor (2010, 2011, 2012); State of Tennessee Science Festival Participants (2010, 2011, 2012); Historically Black Colleges and Universities and Minority Education Institutions Summer Faculty Research Program host (2012); Appointed member of the Environmental Quality and Advisory Board for the city of Oak Ridge TN (2010-2012); Member of the Institutional Biosafety Committee for Oak Ridge National Lab (2009-2012).

## Selected honors & awards

Most Distinguished Post-Graduate Award, Oak Ridge National Laboratory 2009

Selected presenter and participant for the Frontiers in Biology Symposium: *National Academies of Science*, Washington D.C., 2007

NSF-funded Plant Microarray Short Course: "On Design and Analysis of Plant Microarray Experimentation" Boston MA 2006

Environmental Science Fellowship Award. 2002-2005. Clemson University \$25,000 for 3 years

Noer Foundation Award. 2000. Cornell University

Bayer Award. 1999. Cornell University

## Teaching

Lecture and Laboratory Instructor: Plant and Soil Diagnostics (AGRN 494) <i>State University of NY, Cobleskill,</i>	2001-2002
Laboratory Instructor: Botany I (BIOL 116) <i>State University of NY, Cobleskill</i>	2001-2002
Co-Lecture Instructor: Plant Physiology (AGRN 362) <i>State University of NY, Cobleskill</i>	2002
Lecture and Laboratory Instructor: Agricultural Chemicals (AGRN 335) <i>State University of NY, Cobleskill</i> *The course was modified to emphasize the maintenance and health of the entire agroecosystem and not to rely solely upon chemicals.	2001-2002
Lecture and Laboratory Instructor: Golf Course Management (RECM 245) <i>State University of NY, Cobleskill</i>	2001-2002
Lecture and Laboratory Instructor: Turfgrass Management I (RECM 222) <i>State University of NY, Cobleskill</i>	2001-2002
Teaching assistant: Woody Plant Identification (HORT 392). <i>Cornell University</i>	1999

## Mentoring and Advising

### Postdoctoral fellows

Alyssa Carrel (2015 – current), Collin Timm (2013-current), Abhijit Karve (2009-2012)

### Graduate Student (Note that graduate advising is through the newly developed Bredesen Center)

Kristine Cabugao (2015 – current).

### DOE Post-Baccalaureate interns

Kelsey Carter (2012-2015), Heather Tran (2012-2014), Nora Dunkirk (2011-2012); Sara Allen (2009-2011); Jessica Adams (2010-2011); Amy Wong (2009-2010); Maya Strahl (2008-2010); Peter Anthopolos (2008)

### Undergraduate advising

Advised 12 undergraduate students while a professor at SUNY Cobleskill from 2000-02

## Visiting faculty & technicians

Ning Ye (Nanjing University, current), Sara Jawdy (Technician 2009- current), Lee Gunter (Technician 2010 – current), Zach Moore (Greenhouse Technician part-time, 2011 – 2015)

## National grants and awards to advisees

Chinese Forestry Exchange Program (Ning Ye) 2012-2014  
Graduate Research Environmental Fellowships GREF (Posy Busby) 2010-2011

## Abstracts and contributed papers

American Society of Plant Biology (8), Ecological Society of America (6), Plant and Animal Genome Conference (3), International Poplar Symposium (1), American Geophysical Union (2), Genome Standards Consortium (1), Crop Society of America (3), American Society of Horticultural Sciences (2), Tri-Conference (2)

## **Collaborators and Co-editors last 48 months**

Jeff Dangl (U. North Carolina), Dale Pelletier (ORNL), Stan Wulfschleger (ORNL); Anthony King, (ORNL); Posy Busby (U. Washington), Steve DiFazio (U. West Virginia); Anne Borland (Newcastle, UK), John Cushman (U. Nevada at Reno), Xiaohan Yang, (ORNL); Jerry Tuskan, (ORNL); Priya Ranjan, (U. Tennessee); Alistair, Rogers, (Bookhaven National Lab); Aimee Classen (U. Tennessee); Nate Sanders (U. Tennessee); Lara Souza (U. Oklahoma); Doreen Ware (Cold Spring Harbor Lab); Adam Arkin (Lawrence Berkeley National Lab) Rick Stevens (Argonne National Lab), Jon Shaw (Duke U.).

## **Graduate and Postdoctoral Advisors**

Stan Wulfschleger, Postdoctoral Mentor, Oak Ridge National Laboratory  
Daniel J. Tennessen, MS advisor, Monsanto (Advisor while at Cornell University)  
William Bauerle, PhD advisor, Colorado State University  
Brandon D. Moore, PhD co-advisor, Clemson University