

JEFFREY M. WARREN

Plant Ecophysiology

Environmental Sciences Division & Climate Change Science Institute

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RESEARCH EXPERIENCE

- 2021- Senior Staff Scientist, Oak Ridge National Laboratory
- 2012-2020 Staff Scientist, Oak Ridge National Laboratory
- 2010-2011 Associate Scientist, Oak Ridge National Laboratory
 - Response of terrestrial ecosystems to climate change.
- 2007-2009 Research Associate, Oak Ridge National Laboratory
 - Sweetgum tree ecophysiology under Free-air CO₂ enrichment (FACE) treatments.
- 2002-2007 Postdoctoral Research Forester, USDA Forest Service PNW Research Station
 - Soil, plant, ecosystem water relations in temperate forests
- 1999-2002 Graduate Fellow, US EPA Science to Achieve Results Program
 - UV-B radiation impacts on tree ecophysiology.
- 2001-2002 Research Technician, Washington State University
 - Analytical plant biochemistry
- 1997-2002 IT Systems Administrator, Washington State University
 - Lead systems administrator of CAHE computer teaching labs
- 1994-1996 Research Assistant, NC State University Forest Nutrition Cooperative
 - Ecophysiology, growth-differentiation balance.

EDUCATION

- 2002 Ph.D. Washington State University (*Tree Physiology*)
- 1996 M.S. North Carolina State University (*Forest Science/Ecology*)
- 1991 B.S. Miami University (*Engineering Physics*)

PROFESSIONAL ACTIVITIES & RECOGNITION

Funding and Awards

- 2021- ORNL Laboratory Directed Research and Development Program: “Elucidating biosystem resilience mechanisms through gene-to-trait-to-spectra capabilities,” with D. Weston, P. Bingham, J. Restrepo
- 2021- US DOE BER “Urban Interface Climate linkages to Ecohydrology,” with M. Mayes
- 2009- US DOE BER TES SFA SPRUCE Project - Spruce and Peatland Responses Under Climatic and Environmental Change - lead investigator for plant C and water relations.
- 2010- ORNL High Flux Isotope Reactor or SNS Neutron Beam Time awarded (ongoing).
- 2014- US DOE BER TES SFA Root Functioning Project – Evaluation and improvement of representation of dynamic root functioning in earth system models
- 2015- US DOE BER Next Generation Ecosystem Experiments - Tropics (NGEE-T) Project – Measurement and modeling response of tropical evapotranspiration to drought – Phase 2 Work Package Lead Research Focus Area 1 – Plant Water Sourcing
- 2018- US DOE BER – “Accounting for carbon and energy edge effects in forest boundaries: A collaboration with ORNL, NIST, and Boston University,” with M. Mayes

- 2018-20 ORNL Laboratory Directed Research and Development Program: “Co-evolving plant traits and hydrologic environment within watershed models,” with E. Coon, S. Painter, A. Walker.
- 2016-18 ORNL Laboratory Directed Research and Development Program: “Impact of extreme weather events on plant species, competition and ecological function,” with L. Gu, D. Ricciuto, S. Wullschleger and H. Bilheux.
- 2016 CCSI funding awarded for exploring development of a “Remote Ecosystem Robotic Sampler,” with V. Varma, R. Norby and A. Aaron.
- 2015 ORNL Significant Event Award for contributions to the deployment of DOE’s SPRUCE Project (Spruce and Peatland Responses under Climatic and Environmental Change)
- 2015 ORNL Environmental Sciences Division Requisition of extreme walk-in growth chamber
- 2015 ORNL Significant Event Award for contributions to the successful NGEE-T proposal.
- 2014 Stanley I. Auerbach Award Recipient for Excellence in Environmental Sciences, Environmental Sciences Division, Oak Ridge National Laboratory
- 2014-16 ORNL Laboratory Directed Research and Development Program: “A genome-enabled approach for predicting plant functional traits in dynamic vegetation models,” with D. Weston, W. Muchero, L. Gu, S. Wullschleger, A. Walker, G. Tuskan, P. Ranjan.
- 2014 ORNL Performance Reward for successful publication of high impact *Tansley* review on root function in models.
- 2013-15 ORNL Laboratory Directed Research and Development Program, “New measurement technology for physical and biological characterization of fundamental carbon cycle processes in the subsurface environment,” with T. McIntyre, P. Fuhr, P. Hanson, R. Kisner, C. Schadt.
- 2010-15 US DOE TES PiTS Project - Partitioning in Trees and Soils: Field research facilities for evaluating dynamic carbon partitioning representations in global models.
- 2010-12 ORNL Laboratory Directed Research and Development Program & UT-Knoxville Joint Directed Research and Development Program, “Neutron imaging of fluids within plant soil-groundwater systems,” with H. Bilheux, J. Horita and E. Perfect.
- 2009 ORNL Capital Funds Requisition of Picarro water isotope analyzer
- 2008 ORNL Performance Award for successful completion and final harvest of the long-term Free-Air CO₂ Enrichment (FACE) study
- 2008 ORNL Seed Money Proposal, “*In situ* neutron imaging of soil-plant water flux,” with S. Wullschleger and H. Bilheux
- 2003 Dissertations Initiative for the Advancement of Climate Change Symposium I Scholar
- 1999 EPA Science to Achieve Results Graduate Fellowship Recipient
- 1999 Washington State University Competitive Summer Stipend Recipient
- 1995 North Carolina Wildlife Federation Scholarship Recipient

Professional Involvement

- 2022 Organizing Committee and Working Group Chair, Neutron Scattering Workshop: Role of Neutron Scattering in Complex Biological and Environmental System Science. Oak Ridge, TN (Virtual), June 2022
- 2021 Volunteer Scientist for AGU outreach program Thriving Earth Exchange – focused on invasive canopy species and forest health with town of Berwyn Heights, MD
<https://thrivingearthexchange.org/project/berwyn-heights-md/>
- 2021 Development team for new neutron beamline, CUPI2D: Complex, Unique and Powerful Imaging Instrument for Dynamics. 2021. Adrian Brügger, Hassina Bilheux, et al.
- 2021 ORNL Educational Programs Review Committee
- 2021 ESA Physiological Ecology Section annual meeting abstract reviewer
- 2021 Organizer – Oral session. “Plant water relations under increasing VPD – linkages and gaps from soil to atmosphere,” 2021 ESA Annual Meeting (Virtual), August 1-6, 2021.

- 2019 Co-leader – Environmental System Science Sessions - Neutron Scattering Workshop: Role of Neutron Scattering in Complex Biological and Environmental System Science, Oak Ridge, TN, August 28-29, 2019.
- 2019-2018-2018 ORNL SNS Second Target Station Biological and Environmental Systems Development Team ORNL Mentoring Program
- 2018 ORNL Management Boot Camp – six-day course on leadership, performance management, finance, networking, ORNL policies, procedures and support resources.
- 2018 Co-Organizer – Oral session. “Seeing is Believing: Advances in Understanding of Root-Rhizosphere Dynamics,” at 2018 AGU Annual Meeting – Washington, DC.
- 2018 Co-Organizer – Oral session. “Ecophysiological Responses to Experimental Warming in Vascular Plants,” 2018 ESA Annual Meeting – New Orleans, August 5-10, 2018.
- 2017 ORNL Initiative Review Committee (IRC) member on the Integrated Studies of Complex Biological Systems initiative for the Laboratory Directed Research & Development (LDRD) Director's R&D Fund
- 2017 Organizer – Oral session. “Extreme Weather Events and Ecosystem Function - Using Experiments and Modeling to Provide Ecological Foresight,” 2017 AGU Annual Meeting – New Orleans, December 11-15, 2017.
- 2017 Co-Organizer – Oral session. “Plant-Soil Interactions in the Rhizosphere: Experimental and Computational Advances,” 2017 AGU Annual Meeting – New Orleans, December 11-15, 2017.
- 2016 ORNL Professional Development Class: ‘Seven Habits of Highly Effective People’
- 2016 Served on expert panel for a workshop focused on “Adaptive Silviculture for Climate Change” (ASCC) at the J.W. Jones Ecological Research Center January 12-14, 2016
- 2015-17 ORNL Environmental Sciences Division Annual Awards Committee
- 2014 Co-organizer – Oral session. “A Path Forward for Improved Representation of Fine Roots in Large-Scale Models: Linking Models, Data, and Experiments,” 2014 ESA Annual Meeting – Sacramento, August 10-15, 2014.
- 2014 ORNL Professional Development: One-on-One Coaching - Advanced Presentation Skills
- 2014 Organizing Committee for the International Symposium on Evapotranspiration: Challenges in measurement and modeling from leaf to the landscape scale, Raleigh, NC, April 7-11
- 2013 Scientific Committee for the 9th International workshop on Sap Flow, Ghent, Belgium, June 4-7
- 2011 Technical Program Committee for the Future of Instrumentation International Workshop, ORNL, Oak Ridge, TN, November 7-8.
- 2010-12 ORNL Seed Money Review Committee member for the Laboratory Directed Research & Development (LDRD) program
- 2008-2008 Member – Instrument Development Team of proposed new neutron research beam line at ORNL: Versatile Neutron Imaging Instrument at the Spallation Neutron Source (*VENUS*)
- 2008 Organizer – Oral session. “Ecohydrology: Integrating Current Knowledge of Water Flux along the Soil-Plant-Atmosphere Continuum.” *ESA Annual Meeting – Milwaukee.*
- 2005- Various Media & Outreach activities including Centennial Open House “Exploring tree canopies,” College of Forestry, Oregon State University; Tree-mendous technology, Ball State University electronic field trip program (Grades 3-8); “Timber,” Discovery Channel documentary, Knoxville News Sentinel story on ORNL FACE harvest, WBIR local news feature on SPRUCE project, National Geographic JASON project on PITS project, Ark Media climate change documentary, ORNL News Release to PhysOrg on Carbon Tracking and Climate Models: <https://phys.org/news/2012-11-carbon-tracking-climate-deciduous-trees.html>, ClimateWire story on SPRUCE project, Medill Reports story on HFIR neutron imaging of root water flux, ORNL News story on fast neutron computed tomography: <https://neutrons.ornl.gov/content/secret-lives-corn-plants->

[caught-%E2%80%98-camera%E2%80%99](#), Knoxville Mercury story on Climate Change and Extreme Events, ORNL News story on extreme heat wave impacts on trees: <https://www.ornl.gov/news/plants-surviving-heat>, Presentations of ORNL’s terrestrial ecosystem science research and Tours of ORNL’s ecological research sites, including a virtual tour of the SPRUCE climate change experiment in Minnesota: <https://www.youtube.com/watch?v=D7uhm6MRn90>, Bearden Middle School science class presentation, contribution to Scientific American textbook: Environmental Science for a Changing World, Minnesota CBS news feature on Marcell peatlands and SPRUCE for Earth Day 2022

- 2001- Peer Review: ANR (French National Research Agency), DFG (German Research Foundation), US DOE (TES Panels), US DOE (DOE SBIR/STTR), US EPA, FWO (Research Foundation – Flanders, Belgium), IMMAQ (Institute for Multidisciplinary Research in Quantitative Modelling and Analysis – Belgium), US NASA (ROSES), NWO (Netherlands Organization for Scientific Research), US NSF, ORNL LDRD/SEED, ORNL Plant-Microbe Interactions (PMI) SFA Science Proposal, ORNL Neutron Scattering Science Program
- 2013- Editorial Positions: Associate Editor for *Frontiers in Forests and Global Change - Forest Ecophysiology*, *Frontiers in Plant Science* (Guest Editor for special issues on 1) ‘Extreme Events’ and 2) ‘Water Use Efficiency’), *Frontiers in Plant Science – Biophysics & Modeling* (Editorial Board), *Rhizosphere* (Editorial Board)
- 2001- Ad Hoc Reviewer (10-20 per year) for journals including: *Acta Horticulturae*, *Acta Physiologia Plantarum*, *Agricultural and Forest Meteorology*, *AoB Plants*, *CRC Press*, *Ecohydrology*, *Ecological Applications*, *Environmental Research Letters*, *Forest Ecology & Management*, *Forest Science*, *Frontiers in Zoology*, *Fungal Ecology*, *Global Change Biology*, *Hydrological Processes*, *Isotopes in Environmental & Health Studies*, *J. Arid Environments*, *J. Applied Ecology*, *J. Environmental Quality*, *J. of Plant Research*, *Land Degradation and Development*, *Mycorrhiza*, *Nature Climate Change*, *Neutron Imaging & Applications* (book), *New Phytologist*, *Northwest Science*, *Oecologia*, *Plant and Soil* (top reviewer 2013), *PLOS1*, *Rhizosphere*, *Science of the Total Environment*, *Sensors*, *Soil & Tillage Research*, *South African J. Botany*, *Tree Physiology*, *Water Resources Research*.
- 1993- Member: *American Association for the Advancement of Science*, *American Geophysical Union*, *Ecological Society of America*, *Geochemical Society*; past memberships: *Phi Kappa Phi*, *Society of American Foresters*, *Soil Science Society of America*, *Xi Sigma Pi*

University/Student Involvement

- 2021- ORNL Student Programs Review Committee for internships and related opportunities
- 2019- Adjunct Associate Professor – Department of Forestry, Wildlife and Fisheries, UT-Knoxville.
- 2010- Adjunct Assistant Professor – Department of Forestry, Wildlife and Fisheries, UT-Knoxville.
- 2008- Application Review Committee – *Dissertations Initiative for the Advancement of Climate Change Research Symposium* (DISCCRS)
- 2002- Supervised, advised or hosted undergraduate or post-baccalaureate interns (39), MS (8) and PhD (8) graduate students, postdocs (8), lab technicians (4), served as MS/PhD thesis advisor and external reviewer for student theses and faculty proposals.
- 2005- Guest Lecturer/Seminars/Field Trips – University Program in Ecology - Duke University, Nicholas School of the Environment – Duke University, Bordeaux Sciences Agro, France; Department of Forestry, Wildlife and Fisheries, University of Tennessee; Department of Forest Science, Oregon State University; Department of Natural Resources and Environmental Sciences, Alabama A&M University; Department of Soil Science, University of Saskatchewan, National Institute of Amazonian Research (INPA – Brazil), ORISE DOE student interns, DOE Science Undergraduate Laboratory

- Internship (SULI) and Higher Education Research Experience (HERE) Programs,
 Bioenergy Educator Training Course, middle and elementary school science classes.
- 1998 Silviculture Instructor – Dept. of Natural Resource Sciences, Washington State University
 1997-99 Teaching Assistant – Dept. of Natural Resource Sciences, Washington State University
 1993-96 Teaching Assistant & Tutor – Dept. of Forest Resources, North Carolina State University

Presentations (by Coauthors) >275

Presentations (by Warren) – Invited Talks & Posters

- (1) Warren, JM. 2000. “Effects of enhanced UV-B radiation on tree biochemistry and herbivory.” *Poster*, EPA STAR Graduate Fellowship Conference, Washington, D.C.
- (2) Warren, JM. 2001. “Alteration of foliar flavonoid composition induced by enhanced UV-B radiation in field-grown *Pinus ponderosa*, *Quercus rubra* and *Pseudotsuga menziesii*.” *Poster*, William R. Wiley Research Exposition, WSU, Pullman, WA.
- (3) Warren, JM. 2003. “UV-B radiation, Trees, and Herbivory.” *Oral*, Dissertations Initiative for Climate Change Research Symposium, Guanica, Puerto Rico.
- (4) Warren, JM. 2005. “Tree response to environment: radiation, nutrients and water.” *Oral*, Department of Forestry and Environmental Resources, North Carolina State University, Raleigh, NC.
- (5) Warren, JM. 2006. “Hydro-physiology in Pacific NW conifers - from fungi to foliage.” *Oral*, USDA, Agricultural Research Service, Crops Pathology/Genetics Research Unit Special Seminar, UC Davis, Davis, CA.
- (6) Warren, JM. 2006. “Plant Response to Environment - growth vs. defense.” *Oral*, USDA, ARS, Tree Fruit Research Laboratory, Wenatchee, WA.
- (7) Warren, JM. 2007. “Hydro-physiology in Pacific NW conifers - from fungi to foliage.” *Oral*, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN.
- (8) Warren, JM. 2008. “Ecohydrology in a changing world.” *Oral*, Dept. of Natural Resources and Environmental Sciences, Alabama A&M University, Normal, AL.
- (9) Warren, JM. 2008. “Hydro-physiological response to drought by trees developed under elevated CO₂.” *Oral*, Young Evolving Scientist’s Seminar Series, Oak Ridge National Laboratory, Oak Ridge, TN.
- (10) Warren, JM, RJ Norby & SD Wullschleger. 2008. “Extreme climatic events drive ecosystem water flux under elevated CO₂ in a temperate forest.” *Poster*, Joint BSD-ESD Advisory Committee Meeting Reception, Oak Ridge National Laboratory, Oak Ridge, TN.
- (11) Warren, JM. 2008. “Physiological and environmental controls of tree water use.” *Oral*, Annual Meeting of the Ecological Society of America, Milwaukee, WI.
- (12) Warren, JM, H. Bilheux, S. Wullschleger. 2009. “Neutron imaging of plant-soil systems at Oak Ridge National Lab.” *Poster*, Office of the Laboratory Director LDRD annual poster session, Oak Ridge National Laboratory, Oak Ridge, TN.
- (13) Warren, JM. 2009. “FACE Drought or Die - Climate Change and Terrestrial Plant Water Relations.” *Oral*, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN.
- (14) Warren, JM. 2010. “Terrestrial water relations and climate change.” *Oral*, Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville, TN.
- (15) Warren, JM, P Hanson, C Iversen, J Mao, R Norby, D Ricciuto, P Thornton, S Wullschleger. 2012. “Root Function – toward a better model representation of root functional control of C uptake.” *Oral*, DOE-BER Terrestrial Ecosystem Science PI Meeting, Washington, DC.
- (16) Warren, JM. 2012. “New advances in root imaging – in situ flux of water.” *Oral*, Fall meeting of the American Geophysical Union, San Francisco, CA.
- (17) Warren, JM. 2013. “Refining Climate Models.” *Oral*, DOE ORISE Student Intern Program, Oak Ridge, TN.

- (18) Warren, JM, H Bilheux, M Kang, S Voisin, C-L Cheng, J Horita, E Perfect. 2013. "Roots revealed – neutron imaging insight of spatial distribution, morphology, growth and function." *Oral*, Meeting of the Americas (AGU), Cancun, Mexico.
- (19) Warren, JM, J Childs, P Hanson, A Jensen, S Wullschleger. 2013. "Sap flow and water relations in an ombrotrophic *Picea mariana* – *Sphagnum* bog subject to climate change treatments." *Oral*, 9th International Workshop on Sap flow, Ghent, Belgium.
- (20) Warren, JM. 2013. "Carbon allocation and partitioning" *Oral*, Guest lecture Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville, TN.
- (21) Warren, JM. 2014. "Roots, Root Function and Models." *Oral*, ORNL Plant Microbe Interfaces Program, Oak Ridge, TN.
- (22) Warren, JM. 2014. "Assessment of root water dynamics in situ and leveraging mechanistic knowledge of root function into terrestrial biosphere models." *Oral*, Rhizosphere Imaging and Genomics Seminar Series, Department of Soil Science, University of Saskatchewan, Saskatoon, SK.
- (23) Warren, JM. 2015. "Spruce and Peatland Responses Under Climatic and Environmental Change." *Oral*, Featured speaker for meeting of the Smoky Mountain chapter of the American Meteorological Society. University of Tennessee, Knoxville, TN.
- (24) Warren, JM. 2015. "Neutron Imaging of Plant and Soil Water." *Oral*, Invited speaker to visiting researchers from the International Maize and Wheat Improvement Center (CIMMYT), ORNL, Oak Ridge, TN.
- (25) Warren, JM. 2015. "Spruce and Peatland Responses Under Climatic and Environmental Change." *Oral*, Guest lecture Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville, TN.
- (26) Warren, JM. 2015. "SPRUCE – A new large-scale whole ecosystem climate change experiment." *Oral*, Invited speaker to visiting Brevard College Physics, Biology, and Geology faculty and students, ORNL, Oak Ridge, TN.
- (27) Warren, JM. 2016. "Carbon Partitioning from Foliage to Fungi - a Model-Experiment Case Study." *Oral*, Invited speaker for session on *Recent Advances in Belowground Ecology* at the annual DOE TES PI Meeting, Potomac, MD.
- (28) Warren, JM. 2016. "Leveraging Root Mechanistic Function into Terrestrial Biosphere Models." *Oral*, Invited class lecture for 'Functional Ecology of Trees' course, Nicholas School of the Environment, Duke University, Durham, NC.
- (29) Warren, JM. 2016. "Ecophysiology at Oak Ridge – Use of Experimental Systems and Improved Mechanistic Understanding to Refine Climate Models." *Oral*, Invited speaker for the University Program In Ecology (UIC) in the Nicholas School of the Environment, Duke University, Durham, NC.
- (30) Warren, JM. 2016. "Diurnal patterns of stem diameter and sap flow – correlation with capacitance and hydraulic strategy." *Poster*, NGEE-Tropics ENSO Research Meeting, San Francisco, CA.
- (31) Warren, JM. 2017. "Predicting impacts of climate change on terrestrial ecosystems – state of the science." *Oral and field tour*, Bioenergy Educator Training Course: mitigating harmful emissions & SPRUCE tour. Oak Ridge, TN
- (32) Warren, JM. 2017. "Application of neutron radiography to explore soil-rhizosphere-root water dynamics in situ." *Oral*, Copenhagen Plant Science Center / PlantLink Joint MaxIV and European Spallation Source Workshop, Lund, Sweden.
- (33) Warren, JM. 2017. "Relationships and communications between trees via mycorrhizae." *Oral*, Led discussion on 'Intelligent Trees' documentary for graduate class at Bordeaux Sciences Agro, Gradignan Cedex – France. (via videoconference)
- (34) Warren, JM. 2017. "Integrated measurements of plant and soil water relations – a case study from Oregon USA to be applied at ZF2." *Oral*, INPA - National Institute of Amazon Research, Manaus, Brazil.

- (35) Warren, JM, S Bellaire, A Guha, E Ward. 2018. Morphological shifts in foliar traits and branch display for boreal tree and shrub species exposed to elevated temperature and CO₂.” *Oral*, Annual Meeting of the Ecological Society of America, New Orleans, LA.
- (36) Warren, JM, H Bilheux, P Bingham, A Johs, E Pierce, K Tobin, K DeCarlo, E Perfect. 2019. “Opportunities in neutron imaging of plants and soils.” *Keynote Oral*, Workshop on X-ray and Neutron Imaging Applications in Soil Sciences. Biology Department and Lund Institute of Advanced Neutron and X-ray Science (LINXS) at Lund University, Lund, Sweden.
- (37) Warren, JM. 2019. “Neutron imaging of soil, rhizosphere & root water dynamics.” *Oral*, Workshop for Neutron Scattering Applications in the Biological and Environmental System Sciences at ORNL, Oak Ridge, TN.
- (38) Warren, JM. 2019. “NGEE-Tropics - Linking tree traits, topography and soils to seasonal patterns of water use in the Central Amazon.” *Oral*, INPA - National Institute of Amazon Research, Manaus, Brazil.
- (39) Warren, JM. 2019. “Neutron imaging of soil, rhizosphere & root water dynamics.” *Oral*, Biochemistry & Cellular and Molecular Biology Department, University of Tennessee Knoxville, TN.
- (40) Warren, JM. 2019. “Beneath the Tip of the Iceberg - Roots, mechanistic functions & models.” *Oral*, Invited class lecture for ‘Root Ecology’ course, Nicholas School of the Environment, Duke University, Durham, NC.
- (41) Petridis L, Johs A, Warren JM. 2019. “Neutron Science for Biological and Environmental Systems.” *Poster*, EESD’s Scientific Advisory Committee Member Meeting, Oak Ridge.
- (42) Warren, JM, HZ Bilheux, E Perfect, K Decarlo, K Marcacci, J-C Bilheux. 2020. “Neutron Imaging of Soil Rhizosphere & Root Water Dynamics.” *Oral*, Goldschmidt (Virtual), Honolulu, HA.
- (43) Warren, JM, H Bilheux, JC Bilheux, A Johs, E Pierce. 2021. “Opportunities in neutron imaging of plants and soils.” *Oral*, 11th Symposium of the International Society of Root Research and ROOTING 2021 Joint Meeting (Virtual) – hosted by University of Missouri, Columbia MI
- (44) Warren, JM. 2021. “The impacts of extreme warming on plant physiology.” *Oral*, Breakout session – Long-term press events and short-term pulse events as agents of global change: What do experimental manipulations and models tell us? DOE ESS PI Meeting (Virtual)
- (45) Mayes, MA and Warren, JM. 2021. “Carbon cycling at the edge: How urban forest edges are distinct from interior forests.” *Oral (Mayes)*, DOE ESS PI Meeting (Virtual)
- (46) Warren JM. 2021. “Climate change, roots & neutrons, what’s the link?” *Oral*, ORNL Neutron Scattering Division Large Scale Structure Section Seminar Series.
- (47) Warren JM. 2021. “Climate change, roots & neutrons, what’s the link?” *Oral*, ESS - MAX IV Science Colloquia (Virtual)

Presentations (by Warren) – Offered Papers & Posters

- (48) Warren, JM, HL Allen and FL Booker. 1996. “Mineral nutrition, resin flow and phloem phytochemistry in loblolly pine.” *Oral*, Annual meeting of the Ecological Society of America, Providence, RI.
- (49) Warren, JM, JH Bassman, DS Mattinson, JK Fellman, GE Edwards and R Robberecht. 2000. “Alteration of foliar flavonoid composition induced by enhanced UV-B radiation in *Pinus ponderosa*, *Quercus rubra* and *Pseudotsuga menziesii*.” *Poster*, Workshop on the Impacts of UV Radiation on Terrestrial and Aquatic Ecosystems, “Stratospheric Processes and their Role in Climate, World Climate Research Program,” Mar del Plata, Argentina.
- (50) Warren, JM. 2000. “UV-B radiation, poplar phytochemistry and herbivory.” *Oral*, 16th North American Forest Biology Workshop & the Western Forest Genetics Association Conference, “The Impact of Global Environmental Change on Forests, and Impacts of Forests on Global Environmental Change,” Merida, Mexico.

- (51) Warren, JM, JH Bassman and S Eigenbrode. 2001. "Phytochemical changes induced in *Populus trichocarpa* by UV-B radiation and effects on cottonwood leaf beetle behavior." *Poster*, IUFRO Forest Canopy Processes Traveling Workshop in Oregon and Washington.
- (52) Warren, JM, FC Meinzer, JR Brooks, J-C Domec, R Coulombe. 2003. "Soil H₂O dynamics and hydraulic redistribution at Wind River." *Oral*, Wind River Canopy Crane Research Facility annual meeting, Carson, WA.
- (53) Warren, JM, JR Brooks, FC Meinzer, J-C Domec, R Coulombe. 2003. "Similarities in hydraulic redistribution of soil water in dry and moist coniferous forests." *Oral*, 4th North American Forest Ecology Workshop, Corvallis, OR.
- (54) Warren, JM, FC Meinzer, J-C Domec and JR Brooks. 2003. "Initiation, control and magnitude of hydraulic redistribution." *Oral*, 3rd International Symposium on Dynamics of Physiological Processes in Woody Roots, Perth, Australia.
- (55) Warren, JM, FC Meinzer, JR Brooks and JC Domec. 2004. "Vertical stratification of soil water storage and release dynamics in Pacific Northwest coniferous forests." *Oral*, Annual meeting of the Ecological Society of America, Portland, OR.
- (56) Warren, JM, FC Meinzer, JR Brooks, J-C Domec, R Coulombe. 2004. Soil water hydraulic redistribution and release dynamics in Pacific Northwest coniferous forests. *Poster*, Wind River Canopy Crane Research Facility annual meeting, Stevenson, WA.
- (57) Warren, JM, JR Brooks, FC Meinzer. 2006. "Can mycorrhizal fungi transport water between trees?" *Oral*, Wind River Canopy Crane Research Facility annual meeting, Stevenson, WA.
- (58) Warren, JM, JR Brooks, FC Meinzer. 2006. "Hydraulic redistribution via mycorrhizal symbiots of pine." *Oral*, Annual meeting of the Ecological Society of America, Memphis, TN.
- (59) Meinzer, FC, JM Warren, JR. Brooks. 2006. "Partitioning of soil water resources in an old-growth Douglas-fir/western hemlock forest." *Poster*, Annual meeting of the Ecological Society of America, Memphis, TN.
- (60) Warren, JM, JR Brooks, MI Dragila, FC Meinzer. 2007. "Separating hydraulic redistribution from unsaturated liquid and vapor flow of soil water." *Poster*, Annual meeting of the Ecological Society of America, San Jose, CA.
- (61) Warren, JM, R Norby, S Wullschleger. 2007. "Do extreme climatic events drive ecosystem water flux under elevated CO₂ in a temperate forest?" *Poster*, Fall meeting of the American Geophysical Union, San Francisco, CA.
- (62) Warren, JM, C Iversen, J Ledford, RJ Norby. 2008. "Fine Root Dynamics Alter Biogeochemical Fluxes at Soil Depths up to 60 cm in a CO₂-Enriched Sweetgum Plantation." *Oral*, Joint annual meeting of GSA, SSSA-ASA-CSSA, Houston, TX.
- (63) Warren, JM, R Norby, S Wullschleger. 2009. "Elevated CO₂ reduces water use, and shifts extraction downward in sweetgum." *Oral*, Annual meeting of the Ecological Society of America, Albuquerque, NM. (presented by Norby)
- (64) Warren, JM, S Wullschleger, H Bilheux. 2009. "Neutron imaging of plant-soil systems at Oak Ridge National Lab." *Poster*, SSSA-ASA-CSSA International Annual Meetings, Pittsburgh, PA. (Nov 1-5).
- (65) Warren, JM, R Norby, S Wullschleger. 2009. "Elevated CO₂ reduces water use, and shifts extraction downward in sweetgum." *Oral*, Annual meeting of the Ecological Society of America, Albuquerque, NM. (presented by Norby)
- (66) Warren, JM, 2010. "Sweetgum plantation water use under elevated CO₂." *Oral*, A watershed perspective on bioenergy sustainability workshop, Oak Ridge, TN (Feb 3-4)
- (67) Warren, JM, RJ Norby, BE Medlyn. 2010. "Elevated CO₂ initially stimulates photosynthesis in sweetgum, but effects dissipate after a decade." *Poster*, Annual meeting of the Ecological Society of America, Pittsburgh, PA.
- (68) Warren, JM, J Childs, C Gunderson, P Hanson, S Wullschleger. 2011. "Ecophysiology of woody plants in an ombrotrophic spruce bog – potential impacts with climate change." *Oral*, Annual meeting of the Ecological Society of America, Austin, TX.

- (69) Warren, JM, H Bilheux, M Kang, S Voisin, C Cheng, J Horita, E Perfect, L Walker. 2011. "Neutron imaging reveals internal plant hydraulic dynamics." *Oral*, Fall Meeting of the American Geophysical Union, San Francisco, CA.
- (70) Warren, JM, CM Iversen, J Mao, RJ Norby, DM Ricciuto, PE Thornton. 2012. "PiTS – Partitioning in Trees and Soils - GPP field manipulations to interrogate model performance." *Poster*, DOE-BER Terrestrial Ecosystem Science PI Meeting, Washington, DC.
- (71) Warren, JM, S Wullschleger, J Childs, C Gunderson, P Hanson, R Kolka. 2012. "Physiological Response of a Boreal Forest to increased T and CO₂ - gas exchange and water relations at the SPRUCE project" *Poster*, DOE-BER Terrestrial Ecosystem Science PI Meeting, Washington, DC.
- (72) Warren, JM, CM Iversen, J Mao, RJ Norby, DM Ricciuto, PE Thornton. 2013. "Partitioning in Trees and Soils (PiTS): A field research facility for testing dynamic carbon partitioning representations within global models." *Poster*, Annual meeting of the Ecological Society of America, Minneapolis, MN.
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