

# CURRICULUM VITAE OF PETER B. REICH

May 2022

## EDUCATION

Ph.D. (1983) Department of Natural Resources  
Cornell University, Ithaca, New York  
Major in environmental biology and plant ecology

M.S. (1977) School of Forestry, Fisheries and Wildlife  
University of Missouri, Columbia, Missouri  
Major in forest ecology

B.A. (1974) Goddard College, Plainfield, Vermont  
Majors in creative writing and physics

## PROFESSIONAL EXPERIENCE (post-Ph.D.)

Director, Institute for Global Change Biology, University of Michigan (2021- present)  
Professor and F.B. Hubachek, Sr. Chair, University of Minnesota (1991- present)  
Foundation Director (2011-13), Chief Scientist (2013- present), Hawkesbury Institute for the Environment,  
Western Sydney University, Richmond, NSW, Australia (joint affiliation)  
Member, Graduate Faculties: Ecology, Evolution and Behavior; Forest Ecology and Management; Plant  
Biological Sciences; and Conservation Biology Programs; University of Minnesota (1991- present)  
Visiting Research Fellow, Laboratorio Ecotono, Universidad Nacional de Comahue, Bariloche, Argentina, 2005  
Distinguished Visiting Fellow, Dept. Biological Sciences, Macquarie University, Sydney, Australia, (1998-99)  
Associate Professor (1989-91), Assistant Professor (1985-89)  
Department of Forestry, University of Wisconsin, Madison, WI  
Postdoctoral Associate (1983-85), Boyce Thompson Institute; Cornell University, Ithaca, NY

## HONORS AND PROFESSIONAL RECOGNITION (selected)

W.S. Cooper Prize, Ecological Society of America (2021, shared with Rachel Putnam)  
National Academy of Sciences of the United States, member (elected 2018)  
Polish Academy of Sciences, foreign member (elected 2018)  
PLUS Award (Polish – United States Science Award), American Association for the Advancement of Science and  
the Polish Foundation of Science (selected 2018, shared with Jacek Oleksyn)  
Fellow, Ecological Society of America (elected 2017)  
American Academy of Arts and Sciences, member (elected 2011)  
BBVA Prize Laureate (BBVA Foundation Frontiers of Knowledge Award in Ecology and Conservation Biology;  
Madrid, selected June 2010)  
Citation Indices: Google Scholar curated profile (1 Feb, 2021); total  $\approx$  117,600 from >660 articles,  $\approx$  64,500  
citations since 2015; h-index = 164  
Distinguished Visiting Fellow, Macquarie University, Sydney, Australia, 1998-99  
Pound Award for Excellence in Research, University of Wisconsin, 1989  
Presidential Young Investigator Award, National Science Foundation (USA), 1988-1993

## SYNERGISTIC ACTIVITIES AND SERVICE (selected)

Scientific Advisory Board, RESTOR, 2020- present  
Board of Directors, Minnesota Center for Environmental Advocacy, 2011-2020  
Scientific Advisory Board, Minnesota Center for Environmental Advocacy, 2019- present  
Organized and coordinated international on-line weekly symposia “Pop-Up Global Symposia about Life &  
Ecology for You [PUGSLEY], March 2020 – December 2021 (>530 individuals in network,  $\approx$ 1,500  
participants total, 25 sessions)  
Invited speaker, plenary and keynote addresses, >200 national/international symposium, research conferences,  
government, agency, and university seminars; e.g., selected, Australian National Univ. (2011); Association of

Applied Biologists and the University of Birmingham (UK) ‘Trees for the Future’ Conference (2021); Universitat Autònoma de Barcelona (2007); Berkeley National Laboratory Distinguished Lecture (2018), BIOGEMON 2014 International Conference, Keynote Speaker, Univ. of Bayreuth, Germany (2014), Carleton College (2014), Centre d'étude de la forêt, Annual Conference, Keynote Address, Port Orford, Quebec, March (2010); Chicago Botanic Garden (2012); Univ. of Colorado (2001); Colorado State University Distinguished Ecologist (2022); Univ. of Connecticut (2010), Univ. of Copenhagen Annual Phd Bio Day (2021), Cornell Univ. (1997, 2006); DOE Terrestrial Ecosystem Science Annual Meeting, Potomac, MD (2014); DOE Office of Biological and Environmental Research Workshop, “Trait Methods for Representing Ecosystem Change”, Rockville, MD (2015); Duke Univ. (1999, 2003, 2008); Univ. ETH Zurich, Zurich, Switzerland (2018); Fundación BBVA, Biodiversity and Global Change Lecture Series, Madrid and Barcelona, Spain (2007); iFAST (International Forum on Advanced Environmental Sciences and Technology) (2020); Univ. of Georgia (2008); Gordon Research Conference, Metabolic Basis of Ecology (2004, 2006); Harvard Univ., Biodiversity, Ecology, and Global Change Lecture Series (2007); Harvard Univ. 6<sup>th</sup> Symposium on Plant Biology (2010); Hawkesbury Institute of the Environment, Western Sydney University (2011, 2014, 2018); Hokkaido Univ. (1993); Univ. of Illinois (2001); Indiana Univ. (2009); Kyoto Univ. (1993); IUFRO Conference on Forest Regeneration in a Changing Climate, Keynote Speaker, Corvallis, OR (2017); Korea University and Korea National Institute of Forest Science (2016); Lakehead Univ., Ontario, Canada (2010); Lanzhou Univ., (2014); Macquarie Univ., Sydney, Australia (1999, 2007, 2013); Univ. of Massachusetts Symposium on Plant Biology (2004); Mayo Clinic Melanoma Program (2021); McGill Univ., Montreal, Canada (1999, 2005, 2007); Univ. of Melbourne, Melbourne, Australia (2013), Univ. of Michigan, School for Environment and Sustainability (2020), Univ. of Minnesota, Department of Geography (2017), Statistics and Data Science for Earth Systems: IRSA 2018 Annual Conference, University of Minnesota (2018); Univ. of Missouri (2008); University of Montana, Missoula MT (2016); Nanjing Univ., China (2014); Nanjing Univ. of Information, Science and Technology, China (2014); Univ. of Nebraska (2012); U. of Nevada (2009); Institute on the Environment (2010, 2014); 39<sup>th</sup> New Phytologist Symposium – Trait covariation: structural and functional relationships in plant ecology, Keynote Speaker, Exeter, England (2017); Northern Arizona U. (2010); 24<sup>th</sup> New Phytologist Symposium – Plant respiration and Climate Change, Oxford Univ., England (2010); Peking Univ. (2014); Pennsylvania State Univ., Invited Speaker, 7<sup>th</sup> Plant Biology Symposium (2009); Plant Biology Europe 2018, Copenhagen, Denmark (Plenary Speaker, 2018); Polish Academy of Sciences Institute of Dendrology 85<sup>th</sup> Anniversary Conference, Poznan, Poland (Keynote Speaker, 2018); Princeton Univ. (The John Bonner Lecture)(2006); Purdue University (2019), l'Université du Québec en Montreal (2011); l'Université du Québec en Outaouais, Institut des Sciences de la Forêt Tempérée (2017); Stanford Univ. (Inaugural Global Change Series, 2004); SUNY-ESF (2012); SUNY Stony Brook (2006); Swedish Oikos Society Annual Meeting, Keynote Speaker (2021); Texas A& M Univ. (2004, 2008); University of Utah (2018); Vrije Universiteit, Amsterdam (2014); Washington Univ. (2003); Univ. of Washington (1988, 2019); West Virginia U (2012); Univ. of Wisconsin-Madison (2013); Univ. of Wisconsin-Milwaukee (2013); University of Zurich (Zurich, Switzerland, 2018).

Co-founder, Writer, Editor, MinuteEarth <https://www.youtube.com/user/minuteearth>; YouTube (and Facebook, iTunes, Vessel platforms, also translated into Portuguese, Spanish) video channel dedicated to advancing scientific understanding and interest in earth and environmental science, global change science, and ecology (>180 videos released; >2.5 million subscribers and > 350 million views across platforms, since March 2013).

Editorial Board, Topics in Statistical Ecology, Springer (2011- 2018)

Co-chair, Physiological Ecology Section, Faculty of 1000 (2010- )

Scientific Advisory Board, FunDivEUROPE (FUNctional significance of forest □iodiversity in EUROPE) Project, 2010 – 2017

Climate Science Rapid Response Team (charter member, 2010- ), scientist network providing rapid, high-quality information to media and government

Minnesota Forest Resources Council, Research Advisory Committee (2008- present)

Commissioner, Mahtomedi City Environmental Commission (2007-2010)

Commencement Speaker, Univ. of Minnesota Graduate School commencement, “Dancing on Thin Ice”, May 9, 2008

Co-initiator of the “Minnesota 2050: Pathways to a Sustainable Future” Project, partnership with >100 citizens from multiple stake-holder groups, working towards a public policy and education-relevant vision of an environmentally and economically sustainable regional future.

Founding Member, Mahtomedi Area Green Initiative (2007), Mahtomedi, MN

U.S. GAO/National Academy of Sciences Workshop on Climate Change Effects on Federal Lands, November 2006, Washington, D.C.  
 The ARC-NZ Research Network for Vegetation Function, 2005-2010, M. Westoby, I. Wright, co-conveners (Reich is a Core Participant)  
 Department of Energy, National Institute on Climate Change Research, Midwestern Regional Panel, 2006-07  
*Australian Journal of Botany*, Editorial Board 2006-2015  
*Oecologia*, Editorial Board, 2006 – 2013  
*Australian Journal of Botany*, Editorial Advisory Committee, 2003- 2006  
 Faculty of 1000 Biology, 2006-  
*Tree Physiology*, Editorial Review Board, 2004-2007  
*Eurasian Journal of Forest Research*, Editorial Advisory Board, 2004 – 2012  
 National Science Foundation (USA), Biocomplexity and the Environment Program, Coupled Biogeochemical Cycles Panel Member, 2004  
 Distinguished Ecologist Lecture, Michigan Technological Univ., 2003  
 Chair of External Review Committee, for the Intercollegiate Ecology Graduate Program at Penn State Univ., University Park, PA, 2003  
 Lecturer, Intensive International Graduate Student Course, Functional Diversity in Ecosystems, University of Chile and University of Concepción; Concepción Chile, January 2001  
 Organizer, North American Forest Ecology Workshop, 2001, Duluth, MN  
 Environment 2000 Lecture, University of Illinois, Champaign-Urbana, 2000  
 Barnett Endowed Lecture, University of Michigan Biological Station, 1999  
 Distinguished Lectureship, University of Western Australia, Perth, Australia, 1999  
 Distinguished Visiting Fellow, Macquarie University, Sydney, Australia, 1998-99  
 Subject Editor, *Ecology* and *Ecological Monographs*, 1995-98  
 National Science Foundation (USA), Ecological and Evolutionary Physiology Panel Member, 1994-97  
 National Science Foundation (USA), LTER Program Coordinating Committee 1994-96  
 Associate Editor, *Canadian Journal of Forest Research* (Forestry Canada), 1992- 98  
 Member, Editorial Board, *Trees* (Springer-Verlag), 1991-1996  
 National Research Council Panel, NAS; Future of Atmospheric Chemistry Research, August 1995  
 Japan Science Board, Visiting Professor Research Exchange Fellowship, 1993  
 National Academy of Science Scientific Exchange Award, 1991  
 Member, Editorial Review Board *Tree Physiology* (Heron Publishing), 1987-88, 1993-95  
 USDA National Research Initiative Grants Program, Plant Response to the Environment Panel member, Washington, D.C., 1991  
 USDA Competitive Grants Program, Forest Biology Panel member, Washington, D.C., July 1990  
 Center for Forest Environment Studies, U.S. Forest Service, Macon, GA, member of Technical Steering Committee, 1990-1994  
 U.S. Forest Service, Forest Response Program – Served on Review Panel for Southern Commercial Forest Response Cooperative Research Program, Raleigh, NC, March 1986  
 Andrew D. White Fellowship, Cornell University, Ithaca, NY, 1978-1981

#### UNIVERSITY COURSES TAUGHT

Forest Ecology	Tree Physiology
Plant Physiological Ecology	Tropical Forest Ecology
Dynamics of Global Change: Plant Ecology	Plant Nutrition, Species Ecology and Nutrient Cycling
Plant Responses to Air Pollution	Patch Dynamics
Climate Change Seminar	Ecophysiology of Managed & Natural Ecosystems
Scaling Seminar	Policy & Science of Global Environmental Change
Landscape Ecology	Climate Change Impacts on Minnesota, the World, and You

#### MENTORING

Formal advisor (\*co-advised) of ~80 graduate students and postdocs (named below); and unofficial mentor to an additional ~50 scientists (grad students/postdocs/junior faculty) from ~20 countries (names not shown).

PhD: Dyonishia Nieves (TBD), \*Diele Lobo (TBD), Samuel Reed (TBD), Artur Stefanski (2021), \*Rachel King (2020), \*Melissa Pastore (2020), Tarciso Leao (2018), \*Laura Williams (2018), \*Eli Anoszko (2017), \*Clare Kazanski (2017), \*Chanda Trivedi (2017), \*Rachel Putnam (2015), \*Alex Roth (2015), Alexandra Lodge (2015), \*Kerrie Sendall (2012), \*Nick Fisichelli (2012), \*Christel Kern (2011), \*Kris Johnson (2010), \*Nick Danz (2008), Mark Norris (2007), Ann Pierce (2006), \*Andy Holdsworth (2006), Kathleen Knight (2006), \*Roy Rich (2005), \*Cindy Hale (2003), Kim Chapman (2001), \*Martin Dovciak (2001), Steve Friedman (2001), Tali Lee (2001), Mike Tobin (2001), \*Meredith Cornett (2000), Jose-Luis Machado (1999), David Peterson (1998), Mark Tjoelker (1997), Dirk Vanderklein (1995), Mike Walters (1994), John Volin (1993), Eric Kruger (1992) David Ellsworth (1991)

MS: \*Terry Serres (TBD), \*Chris Pinahs (2012), \*Brian Pelc (2008), Autumn Sabo (2003), Daren Carlson (2001), \*Scott Weyenberg (2001), \*Meredith Cornett (1996), Janet Eckhoff (1994), Leonora Ko (1989)

Postdoctoral Research Associates: \*Adair C, \*Aspinwall M, Bermudez-Villanueva R, Boyden S, Butler E, Chen M, \*Dee L, \*Delgado-Baquerizo M, Dickie I, \*Dijkstra F, \*Drake J, Eisenhauer N, \*Fernandez C, \*Flores-Moreno H, Frelich L, \*Heskel M, \*Lebrija E, Lee T, Milla R, Montgomery R, \*Mueller K, Oecheltree T, Oleksyn J, Peters E, \*Pfausch S, Rich R, Schnitzer S, \*Schrodt F, Schuster M, Sendall K, Stefanski A, Strengbom J, Tjoelker M, \*West J, Whitfield T, Williams L, Wragg P, \*Zanne A

Research Staff: Anderson A, Bahaudin D, Barrott, S, Buschena C, Gogh J, Prugh L, Trost J, Worm K

#### **GRANTS RECEIVED** (since 1986)

National Science Foundation (USA), Biology Integration Institutes Program, 2020-2025, “The causes and consequences of plant biodiversity across scales in a rapidly changing world”, [J Cavender-Bares, P Reich, P Townsend, Pis], \$12.5 million.

Australia Research Council, “Multitrophic interactions drive diversity-ecosystem function relationships”, 2021-2024, [B Singh, N Eisenhauer & PB Reich -](\$AU 555,000)

Minnesota Invasive Terrestrial Plants and Pests Center, “Managing buckthorn with trees: diversity, density, and practicality”, 2020-2023, [P Reich, PI], \$499,734

Australia Research Council, “Pushing the envelope: does range size limit eucalypt tolerance to warming?”, 2020-2023, [M Tjoelker, PI; R Gallagher, K Crouse, J Drake, P. Reich, co-Pis), \$AU 423,000

National Science Foundation (USA), Long-Term Ecological Research Program, “LTER: Multi-decadal responses of prairie, savanna, and forest ecosystems to interacting environmental changes: insights from experiments, observations, and models”, 2019-2024 [E Seabloom/S Hobbie, Pis; E Borer, J Cavender-Bares, F Isbell, P Kennedy, L Kinkel, J Knops, R Montgomery, P Reich, D Tilman; Co-Pis and Senior Personnel], \$6,762,000.

Canada NSERC Strategic Partnership Grants, “Integrating acclimation capacity of tree species into assessments of climate change impacts on Canada’s boreal forest productivity”, 2019-2021, [D. Way, University of Western Ontario, PI; M Huner, J Metsaranta, M Girardin, P Reich, co-Pis] \$CA 637,720

Minnesota Invasive Terrestrial Plants and Pests Center, “Using plants to control buckthorn: an expanded approach”, 2019-2022, [P Reich, PI], \$560,000

National Science Foundation (USA), Long-Term Research in Environmental Biology: “LTREB: Testing Paradigms About Plant Functional Responses to Global Change”, 2018-2023, [S. Hobbie, P. Reich, F. Isbell, Pis], \$398,760

National Science Foundation (USA), Division of Biological Systems, “MRI: Acquisition of an Enhanced Climate Change Simulator”, 2017-2020 [P Reich, PI, F Isbell, S Hobbie, co-Pis]], \$572,640

Minnesota Invasive Terrestrial Plants and Pests Center, “Will Future Weather Favor Minnesota’s Woody Invaders?”, 2017-2021, [P Reich, PI, R Montgomery co-PI], \$526,000

Australia Research Council, “Do microbial and plant diversity interact to regulate multi-functionality?”, 2017-2020, [B. Singh, PI; P. Reich, co-PI), \$AU 396,000

National Science Foundation (USA), Computer Science Program, “Mapping plant metabolic traits across the globe”, 2016-2019 [A Banerjee and PB Reich], \$1,080,000

U.S. Department of Energy Program for Ecosystem Research. “Warming-induced biome change at the temperate-boreal ecotone: an experimental test of key regeneration processes”, August 1, 2011-July 31, 2018 [P Reich, PI; R Montgomery, S Hobbie, R Rich, co-Pis], \$2,520,000

Minnesota Invasive Terrestrial Plants and Pests Center, Cover It Up! Using Plants to control Buckthorn”, 2016-2018, \$327,000

- Department of Energy, Earth System Modeling Program, “Global land model development: time to shift from a plant functional type to a plant functional trait approach”, 2014-2018 [P Reich PI, A Banerjee co-PI], \$1,347,500
- Australia Research Council, “Is physiological flexibility of forest trees constrained by home climate in a rapidly warming world?”, 2014-2017 [M Tjoelker, PI, O Ghannoum, J Drake, D Tissue, P Reich, co-Pis], \$AU 315,000
- National Science Foundation (USA), Long-Term Ecological Research Program, “LTER: Biodiversity, multiple drivers of environmental change, and ecosystem functioning at the prairie forest border”, 2013-2018 [D Tilman, S Hobbie, P Reich, E Seabloom], \$5,880,000.
- Australia Research Council, “Can ecological theory help to unravel microbial regulation of soil functions?”, 2013-2016, [B. Singh, PI; P. Reich, co-PI], \$AU 310,000
- National Science Foundation (USA), Long-Term Research in Environmental Biology: “LTREB: Longterm Interactions among Biodiversity, CO<sub>2</sub>, and N in a Perennial Grassland Ecosystem”, 2012-2017, [P. Reich, S. Hobbie, T. Lee, Pis], \$450,000
- Institute on the Environment, University of Minnesota, The Boreal Forest and Community Resilience Project, 2009-2018 [P. Reich, PI], \$800,000
- National Science Foundation (USA), Ecosystem Studies Program, “The Complexity of Global Change – Interactive Effects of Warming, Water Availability, CO<sub>2</sub> and N on Grassland Ecosystem Function”, 2011-2015 [P. Reich, PI; R Montgomery, S Hobbie, co-Pis], \$985,000.
- USDA AFRI, “Climate warming of the southern boreal forest: consequences for tree-insect interactions”, University of Wisconsin-Madison and University of Minnesota, 2011-2014 [R. Lindroth, K Raffa, P Reich, Pis], \$500,000
- Institute on the Environment, University of Minnesota, Transformational Steps in Synthesis Science, 2011-2018 [P. Reich, PI], \$300,000
- DOE NICCR, “Experimental warming effects on soil organic matter dynamics at the temperate-boreal forest ecotone”, 2010-2011 [S Hobbie, PB Reich, R Montgomery, Pis] \$117,500
- U.S. Department of Energy Program for Ecosystem Research. “Warming-induced biome change at the temperate-boreal ecotone: an experimental test of key regeneration processes”, 2010-2011 [P Reich, PI; R Rich, S Hobbie, R Montgomery, J Oleksyn, co-Pis], \$278,000
- Minnesota LCCMR (Legislative and Citizens Commission for Minnesota Resources), “Healthy Forests to Resist Invasion”, 2010-2013 [P. Reich, PI; A. Pierce, co-PI], \$359,000
- Minnesota LCCMR (Legislative and Citizens Commission for Minnesota Resources), “Adaptive management of black ash in light of emerald ash borer invasion”, 2010-2012 [A. D’Amato, PI; P. Reich, and others, co-Pis], \$650,000
- Wilderness Research Foundation, “Ecological Health and Change in Quetico-Superior forests”, 2007-2013 [P. Reich, PI], \$690,000.
- Minnesota LCCMR (Legislative and Citizens Commission for Minnesota Resources), Projecting Environmental Trajectories for Energy-Water-Habitat Planning, 2009-2011 [P. Reich, PI; C Lehman, and others, co-Pis], \$180,000
- Minnesota Department of Natural Resources, Will an exotic woody invader be more aggressive under climate warming? 2008-2010, [P. Reich, PI], \$75,000
- Department of Energy (USA), Sustainable pathways to achieving biofuel policy goals, 2008-2010, [S. Suh, PI; S Taff, P Reich, co-Pis], \$715,340
- National Science Foundation (USA), Advancing Theory in Biology: “Combining Theories for Plant Architecture, Allometry, and Traits to Develop the Next Generation of Scaling Theory”, 2008-2010, [B. Enquist, P. Reich, V. Savage, J. Sperry, Pis], \$737,521
- MN Power, Assessment of carbon flows associated with forest management and biomass procurement for the Laskin biomass facility. [A.R. Ek, D.R. Becker, C.R. Blinn, D. Current, T.E. Burk, A.W. D’Amato, M.A. Kilgore, H.M. Hoganson, PB Reich, G.M. Domke, and S. Suh, Pis], 4/2008-12/2008, \$49,428
- Minnesota LCCMR (Legislative and Citizens Commission for Minnesota Resources), Climate change and CO<sub>2</sub> affect prairie/forest production, 2008-2010 [P. Reich, PI; C Lehman, and others, co-Pis], \$330,000, 2008-2010
- Minnesota LCCMR (Legislative and Citizens Commission for Minnesota Resources), Future of Minnesota’s Energy and Water Resources, 2008-2010 [S. Suh, PI; P Reich, A Kapuscinski, and others, co-Pis], \$270,000, 2008-2010

- Australia Research Council, Plant ecological strategies across species and an evolutionary-ecology vegetation model, 2008-2010, [M. Westoby, PI; U. Dieckmann, C. Prentice, P. Reich, cooperating investigators), \$AU 968,000
- Australia Research Council, The physiological ecology of forest succession: explaining shade tolerance variation in evergreen and deciduous trees, 2008-2010, [C. Lusk, U. Niinemets, P. Reich, Pis], \$AU 180,000
- National Science Foundation (USA), Long-Term Ecological Research Program, “Biodiversity, Environmental Change and Ecosystem Functioning at the Prairie-Forest Border”, 2007-2012 [D. Tilman, P. Reich and other co-Pis], \$4,920,000.
- U.S. Department of Agriculture. Microbial Observatory: A Genomics-enabled FACE Microbial Observatory: Changes in Microbial Diversity and Functions in responding to elevated CO<sub>2</sub>, Nitrogen Deposition and Plant Diversity, \$859,000, 2008-2010 [J. Zhou, L. Kellogg, Z. He, Pis, U. of Oklahoma; Reich is a collaborator and sub-contractor]
- U.S. Department of Energy Program for Ecosystem Research. “Warming-induced biome change at the temperate-boreal ecotone: an experimental test of key regeneration processes”, 2007-2011 [P Reich, PI; R Rich, S Hobbie, R Montgomery, J Oleksyn, co-Pis], \$1,806,000
- National Science Foundation (USA), Long-Term Research in Environmental Biology: “LTREB: Longterm Interactions among Biodiversity, CO<sub>2</sub>, and N in a Perennial Grassland Ecosystem”, 2007-2012, [P. Reich, S. Hobbie, T. Lee, Pis], \$450,000
- National Institute for Climate Change Research, “Interactions of water, CO<sub>2</sub> and N in an experimental model system”, 2006-11 [P. Reich PI], \$620,000.
- College of Food, Agricultural, and Natural Resources Sciences, University of Minnesota, “An Integrated Initiative on Climate Change in Northern Forests”, 2007-2009, [P. Reich, R. Rich, R. Montgomery, S. Hobbie, T. Lee, and others Pis], \$200,000
- National Science Foundation (USA), TraitNet: Research Coordination Network for Species Traits, 2007-2012 [S. Naeem, D. Bunker, lead Pis] (Reich is a Core Participant), \$500,000.
- National Science Foundation (USA), LTER (\$10,000) and NESCent-NCEAS Working Group, pending (\$20,000), Synthesis Working Group: “Linking phylogenetic history, plant traits, and environmental gradients to understand community organization at local and continental scales”, [J. Cavender-Bares, D. Ackerly, G. Burleigh, M. Mack, R. Ree, P. Reich, Pis]
- USDA National Research Institute, “Managing for complex structure and wood productivity in Great Lakes pine ecosystems”, 2006-2009 [B. Palik, P. Reich, R. Montgomery, Pis], \$400,000.
- USDA Forest Service, “Climate change and forest productivity in the Lakes States”, 2006-2008 [P. Reich, PI], \$50,000.
- ARC Discovery Australia Research Council. Plant species economics and strategy-dimensions of plant ecology, 2006-2007, [M. Westoby, D. Ackerly, H Corneliussen, S Diaz, D Ellsworth, P. Reich, Pis), \$AU 400,000
- Bush Foundation, “University of Minnesota Ecosystem Science and Sustainability Initiative”, 2006-2008 [A. Kapuscinski, P. Reich, D. Tilman, Pis], (\$600,000)
- National Science Foundation (USA), Biocomplexity Program, “Interacting responses of C and N cycles to altered biodiversity, elevated CO<sub>2</sub>, and N enrichment”, 2003-2007 [P. Reich, S. Hobbie and others], \$1,800,000.
- U.S. Forest Service, “Functional responses to overstory retention and understory competition in red pine ecosystems”, 2003-2007 [P. Reich], \$169,000.
- National Science Foundation (USA), Ecological and Evolutionary Physiology Program, “Natural Selection and Evolutionary Constraints in an Elevated CO<sub>2</sub> Environment”, 2004-2006 [P. Tiffin, P. Reich, R. Shaw, Pis], \$237,000.
- National Science Foundation (USA), Major Research Instrumentation Program, “Development of the Minnesota Terrestrial Integrated Mesocosms for Biophysical and Ecophysiological Research,” 2004-2006 [T.J. Griffis, J.M. Cavender-Bares, J.Y. King, M.P. Russelle, PB Reich, Pis] \$927,418.
- Bush Foundation, “University of Minnesota Ecosystem Science and Sustainability Initiative”, 2004-2006 [A. Kapuscinski, P. Reich, D. Tilman, Pis], \$300,000
- National Science Foundation (USA), Ecosystem Program, “Linking leaf and root traits to ecosystem structure and function in a common garden study of 14 temperate tree species”, 2002-2007 [P. Reich, D. Eissenstat, S. Hobbie and others], \$1,080,000.
- National Science Foundation (USA), Long-Term Ecological Research Program, “Biodiversity, disturbance and ecosystem functioning at the prairie-forest border”, 2000-2006 [D. Tilman, P. Reich and other co-Pis], \$4,200,000.

- Wilderness Research Foundation, “Ecological Health and Change in Quetico-Superior forests”, 2002-2007 [P. Reich, PI], \$530,000.
- National Science Foundation (USA), Ecology Program, “Ecological Consequences of Exotic Invaders: Interactions Involving European Earthworms and Native Plant Communities in Hardwood Forests”, 2000-2004 [L. Frelich, P. Reich, Pis], \$318,000.
- National Science Foundation (USA), Long-Term Ecological Research Program, “Schoolyard LTER Program”, 1999-2004 [P. Reich and other co-Pis], \$60,000.
- Department of Energy, Terrestrial Ecology Program, “Interaction of biodiversity, CO<sub>2</sub> and soil nitrogen on ecosystem functioning”, 2002-2003 [P. Reich, D. Tilman, Pis], \$228,000.
- U.S. Forest Service, “Links between multiple disturbance events: blow-down and fire interactions”, 2001-2002 [P. Reich, L. Frelich, R. Rich, Pis] \$20,000.
- Wilderness Research Foundation, “Ecological Health and Change in Quetico-Superior forests”, 1999-2002 [P. Reich, PI], \$325,000.
- National Science Foundation (USA), Ecology Program, “Temperature acclimation and adaptation of respiration in eastern deciduous forests”, 1998-2001 [P. Bolstad, P. Reich, J. Vose, Pis], \$375,000.
- National Science Foundation (USA), Ecosystem Program, “Biodiversity and the Productivity, Stability and Sustainability of Prairie Ecosystems”, 1996- 2001 [D. Tilman, P. Reich, J. Knops, Pis], \$507,000.
- Minnesota Department of Natural Resources, “Natural Regeneration of White Pine”, 1999-2002 [L. Frelich, P. Reich, Pis], \$120,000.
- NASA, “Bigfoot: An Approach to Validation of EOS NPP Products”, 1998-2001, [W. Cohen, T. Gower, P. Reich, D. Turner, Pis], \$1,500,000 (\$230,000 Minnesota portion of budget).
- Department of Energy, Terrestrial Ecology Program, “Interaction of biodiversity, CO<sub>2</sub> and soil nitrogen on ecosystem functioning”, 1999-2002 (P. Reich, D. Tilman, Pis), \$1,596,000.
- USDA McIntire-Stennis, Agricultural Experiment Station, “Forest Response to Environmental Change”, 2000-2004 [P. Reich, PI], \$80,000.
- National Science Foundation (USA), Ecosystem Program, “Linking leaf and root traits to ecosystem structure and function in a common garden study of 14 temperate tree species”, 2001-2002 [P. Reich, J. Oleksyn, D. Eissenstat, S. Hobbie, Pis], \$49,000.
- National Science Foundation (USA), Doctoral Dissertation Improvement Grants Program, “Restoration of upland white cedar in northeastern Minnesota, 1996-1998 [P. Reich, M. Cornett, L. Frelich, Pis], \$9,500.
- NASA, “Local Validation of Global Estimates of Biosphere Properties: A Synthesis of Scaling Methods and Results Across Several Major Biomes”, 1996-97 [a multiple site/investigator project, P. Reich, P. Bolstad, Pis for Minnesota site], \$27,500 (Minnesota portion of budget).
- Department of Energy, Terrestrial Ecology and Global Change Program, “Interaction of biodiversity, CO<sub>2</sub> and soil nitrogen on ecosystem functioning”, 1996-1999 (P. Reich, D. Tilman, S. Naeem, J Knops, Pis), \$1,560,000.
- Minnesota Department of Natural Resources, “Natural Regeneration of White Pine”, 1997-1999 [L. Frelich, P. Reich, Pis], \$80,000.
- Wilderness Research Foundation, “Ecological Health and Change in Quetico-Superior forests”, 1996-1999 [P. Reich, PI], \$255,000.
- National Institute for Global Environmental Change, “Measuring and Modeling Component and Whole-system CO<sub>2</sub> Flux at Local to Regional Scales”, 1997-2000 [P. Bolstad, P. Reich, K. Davis], \$390,000.
- National Science Foundation (USA), Ecological and Evolutionary Physiology Program, “Biogeographic adaptation to temperature, photoperiod and CO<sub>2</sub> in boreal conifers”, 1996-2001 [P. Reich, J. Oleksyn, M. Tjoelker, Pis], \$316,000.
- National Science Foundation (USA), International Programs, “Convergence and divergence in leaf traits”, 1999-2000 [P. Reich, PI], \$29,700.
- National Council for Air and Stream Improvement, “Ecosystem management of Minnesota forests: a stand-to-landscape approach to sustainability and biodiversity in harvested and undisturbed forests”, 1995-2000 [P. Reich, D. Grigal, L. Frelich, M. Bauer, Pis], \$200,000.
- National Science Foundation (USA), Long-Term Ecological Research Program, “Succession, biodiversity and ecosystem functioning at the prairie-forest border”, 1994-2000 [D. Tilman, P. Reich and other co-Pis], \$3,380,000.

- National Science Foundation (USA), Ecology Program, “Mechanisms of patch maintenance in old-growth hemlock-hardwood forest ecosystems”, 1995-98 [P. Reich, M. Walters, L. Frelich, K. Puettmann, Pis], \$297,000.
- USDA McIntire-Stennis, Agricultural Experiment Station, “Ecosystem management of Minnesota forests: an integrated stand-to-landscape approach to succession, biodiversity, structure and function in harvested and unharvested northern forests”, 1995-1999 [P. Reich, M. Bauer, D. Grigal, Pis], \$241,000.
- National Science Foundation (USA), Terrestrial Ecology and Global Change Program, “Forest change in a boreal transition region: productivity, nutrient cycling and biodiversity at multiple scales”, 1995-1998 [P. Reich, D. Grigal, P. Bolstad, M. Bauer, Pis], \$428,000.
- Minnesota Department of Natural Resources, “Restoration Ecology of White Cedar”, 1994-1998 [L. Frelich, P. Reich, Pis], \$40,000.
- Minnesota Legislative Commission on Minnesota Resources, “Developing Quality Hardwood Forests”, 1993-1995 [M. Baughman, T. Burk, P. Reich, co-Pis], \$210,000.
- National Academy of Sciences Scientific Exchange Program, “Air Pollution and Scots pine physiology”, 1993, [P. Reich, PI], \$12,100.
- Wilderness Research Foundation, “Ecological Health and Change in Quetico-Superior forests”, 1992-1996 [P. Reich, PI], \$172,000.
- National Science Foundation (USA), Presidential Young Investigator Award, “Plant ecophysiology of temperate and tropical forest systems”, 1988-1994 [P. Reich, PI], \$312,500.
- USDA Competitive Grants, Forest Biology Program, “Post-fire ecology of red oak and competing hardwood regeneration”, 1990-1993 [P. Reich, E. Kruger, S. Gower, M. Abrams, co-Pis], \$129,000.
- National Science Foundation (USA), “Synergistic effects of elevated CO<sub>2</sub> and O<sub>3</sub>: role of interspecific differences in stomatal conductance and photosynthetic pathway”, 1991-92 [P. Reich, T. Givnish, J. Volin, co-Pis], \$80,000.
- National Geographic Society, “Air Pollution in Eastern Europe: Problems and Perspectives,” 1991-1992 [P. Reich, J. Oleksyn co-Pis], \$24,150.
- National Science Foundation (USA), Ecology Program, “Production and resource use efficiency of larch and sympatric evergreen conifers,” 1991-1994 [S. Gower, P. Reich, co-Pis], \$200,000.
- USDA Competitive Grants, Forest Biology Program, “Seasonal carbon, water, and nitrogen relations in pine and oak forests”, 1986-1989 [P. Reich, J. Fownes, co-Pis], \$111,000.
- USDA Competitive Grants, Forest Biology Program, “Physiological responses of conifers to sawfly attack”, 1987-1990 [K. Raffa, P. Reich, co-Pis], \$150,894.
- National Science Foundation (USA), “Carbon and nutrient relations among oligotrophic forest communities in the north central Amazon basin”, 1989-1991 [P. Reich, C. Uhl, co-Pis], \$127,500.
- National Council of the Paper Industry for Air and Stream Improvement, “Integrated studies of the effects of ozone pollution on forests”, 1989-1993 [P. Reich, PI], \$112,500.
- McIntire-Stennis Program, USDA, “Effects of acid rain and heavy metal pollution on the physiology of north central forest tree species”, 1986-1990 [P. Reich, PI], \$77,000.
- Academy of Finland, National Research Council for Agriculture and Forestry, “Factors affecting cold hardiness in forest trees”, 1987-1989 [M. Sutinen, P. Reich, co-Pis], \$20,000.
- Graduate School, University of Wisconsin and C.W. Nave Fund for Latin American Research, “Rain forest ecophysiology in the northern Amazon Basin”, 1986-1988 [P. Reich, PI], \$20,465.
- University-Industry Research Program, University of Wisconsin, “Physiological response of red pine trees to fertilizer and sludge treatment”, 1986-1988 [P. Reich, PI], \$17,465.
- Graduate School, University of Wisconsin, “Photosynthesis, stomatal control of water loss, and water use efficiency during leaf aging in several tree species”, 1986-1987 [P. Reich, PI], \$14,682.

## REVIEWER FOR

### Agencies:

- Ministry of the Environment (Denmark)
- Environmental Protection Agency (USA)
- National Aeronautics and Space Administration (USA)
- Department of Energy- Terrestrial Ecology Program (USA)
- Department of Energy- Carbon Cycling Program (USA)
- NSF- Biocomplexity Program (USA)
- NSF- Ecology Program (USA)



NSF- Ecosystems Program (USA)  
 NSF- Ecological and Evolutionary Physiology Program (USA)  
 NSF- International Program (USA)  
 Natural Environment Research Council (UK)  
 Smithsonian Institution (USA)  
 USDA Competitive Grants Research- Forest Biology (USA)  
 USDA/NRI- Plant Response to the Environment (USA)  
 USDA/NRI- Ecosystems Program(USA)  
 U.S. Forest Service (USA)  
 U.S. National Park Service (USA)  
 Simbiota (International)  
 Wisconsin Department of Natural Resources (USA)

Journals (ad hoc referee):

Agronomy Journal; American Naturalist; American Journal of Botany; American Midland Naturalist; Annals of Botany; Biogeochemistry; Biotropica; Can Journal of Botany; Can J of Forest Research; Climatic Change; Crop Science; Ecological Applications; Ecological Monographs; Ecology; Ecology Letters; Ecosystems; Environmental Pollution; Forest Ecology and Management, Forest Science; Functional Ecology; Global Change Biology; HortScience; Journal of Ecology; Journal of Environmental Quality; J Experimental Biology; Nature; Nature Climate Change; Nature Geoscience; Nature Plants; New Phytologist; Oecologia; Oecologia Plantarum; Oikos; Physiologia Plantarum; Plant, Cell and Environment; Plant Ecology; Plant Physiology; Proc National Academy Sciences; PLOS Biology; Remote Sensing of Environment; Science; Tree Physiology; Trees; Trends in Ecology and Evolution; Water, Air, and Soil Pollution

**PRESENTATIONS AT CONFERENCES, CONGRESSES, AND RELATED (as author or co-author)**

Approximately 380 (with published abstracts), 450 (in total), 1980-2020

**PUBLICATIONS** (Refereed, ≈690 total; ≈ 650 journal articles, ≈40 book chapters and other)

**2022 (in review, accepted, or submitted select examples)**

Anozko E, I Frelich, R Rich, PB Reich. 2022. Wind and fire: rapid shifts in community composition following multiple disturbances in the southern boreal forest. *Ecosphere* 13 (3), e3952

Avolio ML et al. 2022. Making sense of multivariate community responses in global change experiments. *Ecosphere* (accepted)

Butler EE, .....PB Reich. 2022. Increasing functional diversity in a global land surface model illustrates uncertainties related to parameter simplification. *Journal of Geophysical Research – Biogeosciences* (in press)

Cazzolla Gatti R, PB Reich, et al. 2022. The number of tree species on Earth PNAS (in press)

Cesarz S, et al. 2022. Biotic and abiotic drivers of soil microbial functions across tree diversity experiments. *Global Ecology and Biogeography* (in press)

Hong P, et al. 2022. Biodiversity promotes ecosystem functioning despite environmental change. *Ecology Letters*. 25:555–569.

Joswig, J.S., Wirth, C., Schuman, M.C. et al. Climatic and soil factors explain the two-dimensional spectrum of global plant trait variation. *Nat Ecol Evol* 6, 36–50 (2022). <https://doi.org/10.1038/s41559-021-01616-8>

Mason R et al. 2022. Mason RE, JM Craine, NK Lany, M Jonard, SV Ollinger, PM Groffman, RW Fulweiler, J Angerer, QD Read, PB Reich, PH Templer, AJ Elmore. 2022. Evidence, causes, and consequences of declining nitrogen availability in terrestrial ecosystems. *Science* (in press).

Messier, C., Bauhus, J., Sousa-Silva, R., Auge, H., Baeten, L., Barsoum, N., Bruelheide, H., Caldwell, B., Cavender-Bares, J., Dhiedt, E., Eisenhauer, N., Ganade, G., Gravel, D., Guillemot, J., Hall, J. S., Hector, A., Hérault, B., Jactel, H., Koricheva, J., Holger Kreft, Simone Mereu, Bart Muys, CA. Nock, A Paquette, JD Parker, M P. Perring, Q Ponette, C Potvin, PB Reich, M Scherer-Lorenzen, F Schnabel, K Verheyen, M Weih, M Wollni, DC Zemp. 2022. For the sake of resilience and multifunctionality, let's diversify planted forests! *Conservation Letters*. 2022;15:e12829.<https://doi.org/10.1111/conl.12829>

Pan Y, RB Jackson, DY Hollinger, OL Phillips, RS Nowak, RJ Norby, R Oren, PB Reich, A Lüscher, KE Mueller, C Owensby, R Birdsey, J Hom & Y Luo. 2022. Contrasting responses of woody and grassland ecosystems to increased CO<sub>2</sub> as water supply varies. *Nat Ecol Evol* (2022). <https://doi.org/10.1038/s41559-021-01642-6>

- Posch BC, D Zhai, O Coast, AP Scafaro, H Bramley, PB Reich, Y-L Ruan, R Trethowan, DA Way, OK Atkin. 2022. Wheat respiratory O<sub>2</sub> consumption falls with night warming alongside greater respiratory CO<sub>2</sub> loss and reduced biomass. *J Exp Bot* 73:915–926 erab454, <https://doi.org/10.1093/jxb/erab454>
- Reich, PB, R Bermudez, RA Montgomery, RL Rich, KE Rice, SE Hobbie, A Stefanski. Even modest climate change can be a tipping point for boreal forests. *Nature* (in press)
- Schuster M et al Patterns of belowground overyielding and fine-root biomass in native and exotic angiosperms and gymnosperms. *Oikos* (in press).
- Stefanski A, R Bermudez, KM Sendall, RA Montgomery, PB Reich. PCE submitted
- Urgoiti J, C Messier, WS Keeton, PB Reich, D Gravel, A Paquette. 2022. No complementarity no gain—Net diversity effects on tree productivity occur once complementarity emerges during early stand development. *Ecol Letters* (in press)
- Wang G, Q Gao, Y Yang, SE Hobbie, PB Reich, J Zhou. 2021/2022, Soil enzymes as indicators of soil function: a step toward greater realism in microbial ecological modeling. *GCB* (in press)
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## **2021**

- Avolio ML, KJ Komatsu, et al. 2021. Determinants of plant community compositional change are equally affected by global change. *Ecology Letters* 24:1892–1904
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- Butler EE, KR Wythers, H Flores-Moreno, M Chen, A Datta, DM Ricciuto, OK Atkin, J Kattge, PE Thornton, A Banerjee, PB Reich. 2021. Updated respiration routines alter spatio-temporal patterns of carbon cycling in a global land surface model. *Environ. Res. Lett.* 16, 104015
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- Frelich LE, RA Montgomery, PB Reich. 2021. Seven ways a warming climate can kill the southern boreal forest. *Forests* 12: 5 560 <https://doi.org/10.3390/f12050560>
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