

CATHY LYNN WHITLOCK

Professor of Earth Sciences
Fellow of the Montana Institute on Ecosystems
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EDUCATION

B.A. 1975 Colorado College, (Geology, magna cum laude)
M.S. 1979 University of Washington (Geological Sciences)
Ph.D. 1983 University of Washington (Geological Sciences)
NATO Postdoctoral Research Fellow
1983-84 Trinity College Dublin (Botany)

RESEARCH INTERESTS

Quaternary environmental change and Quaternary paleoecology
Vegetation, fire, and climate history of the western U.S. and southern South America
Climatic variability through the Cenozoic
Data-model comparison of past climatic change

TEACHING INTERESTS

Paleoecology and Paleoclimatology
Quaternary pollen and plant macrofossil analysis
Biogeography, plant geography
Cenozoic vegetation history, environments, and climates

ACADEMIC AND PROFESSIONAL POSITIONS

Current Professor, Dept of Earth Sciences, Montana State University (since Aug 2004)
Fellow, Montana Institute on Ecosystems (since Sept 2017)
Director, MSU Paleoecology Laboratory
MSU co-PI for Montana Experimental Program to Stimulate Competitive Research EPSCoR RII (Track 1) project
Project Director and Lead PI, WildFIRE Partnership in Research and Education project

2011-2017 MSU Director, Montana Institute on Ecosystems

2007-2011 Director for Interdisciplinary Research Initiatives, Office of the Vice President for Research, Montana State University

1990-2007 Associate Professor (1990-1995), Professor (1995-2005), Courtesy Faculty (2006-2008), Department of Geography; Adjunct Professor (1990-2004), Department of Geological Sciences, University of Oregon

2000-2004 Department Head, Department of Geography, University of Oregon

1998-2000 Consultant, Conservation Biology Institute, Corvallis

- 1996-1997 Fellow, Center for Environmental Change, Visiting Scientist, College of Oceanic and Atmospheric Sciences, Oregon State University and USDA Forest Service, Pacific Northwest Station, Corvallis
- 1993-1995 Consultant, Golder Associates, Inc., Seattle
- 1988-1990 Assistant Professor, Department of Geology and Planetary Sciences, University of Pittsburgh; Associate Curator in Charge of Paleobotany (with tenure), Carnegie Museum of Paleontology
- 1987 Adjunct Assistant Professor, Department of Geology and Planetary Sciences, University of Pittsburgh
- Visiting Scientist, Academia Sinica Institute of Vertebrate Paleontology and Paleoanthropology, Beijing
- Consultant, BWIP paleoclimate evaluation of the Columbia Basin, Rockwell Hanford Operation, Richland
- 1984-1988 Assistant Curator-in-Charge, Section of Paleobotany, Carnegie Museum of Natural History, Pittsburgh
- 1983-1984 Visiting Research Fellow, Department of Botany, Trinity College, Dublin
- 1981-1982 Research Assistant, Limnological Research Center, University of Minnesota
- 1980-1981 Research Assistant, Quaternary Research Center, University of Washington
- Consultant, pollen biostratigraphy of Jackson Hole, Wyoming. U.S. Bureau of Reclamation
- 1979-1980 Teaching Assistant, Dept of Geological Sciences, University of Washington
- 1978-1983 Graduate Research Fellow, National Science Foundation
- 1978 Consultant, peat stratigraphy of the Puget Lowland. Roger Lowe & Assoc.,
- 1977 Field Assistant, Conservation Division, U.S. Geological Survey
- 1976 Thomas J. Watson Fellow
- 1975 Field Assistant, Geological Division, U.S. Geological Survey
- 1974 Laboratory Assistant, Pollen Laboratory, U.S. Geological Survey

GRANTS AND CONTRACTS

- Current National Science Foundation (Partnerships in International Research and Education; \$3.95 million, 7 years, starting 9/1/10): Feedbacks and consequences of altered fire regimes in the face of climate and land-use change in Tasmania, New Zealand, and the western U.S. (lead PI, with 11 co-PIs/Sr Personnel)
- National Science Foundation (Integrated Earth Systems; \$243,101, 4 years, starting 7/22/15): Collaborative Research: The Response of Continental Hydrothermal Systems to Tectonic, Magmatic and Climatic Forcing

- National Science Foundation (Geography and Regional Science; \$375,000, 3 years, starting 4/1/15): Understanding Fire-Human Dynamics Along a Forest-Steppe Ecotone (co-PI with Benjamin Poulter)
- National Science Foundation EPSCoR RII Track 1 (Experimental Program to Stimulate Competitive Research; \$20 million, 6 years, starting 9/1/11): Co-PI representing Montana State University
- 2010-2014 National Science Foundation (Geography and Regional Science; \$274,789, 3 years plus no-cost extension, starting 9/1/10): Ecosystem resilience to human impacts; ecological consequences of early human-set fires, New Zealand (co-PI with David McWethy)
- USDA Forest Service (Pacific Southwest Research Station, \$144,000, 5 years, starting 9/1/11): Species responses to past climate change: A closer look at the histories of Douglas-fir and mountain hemlock in northern California
- Yellowstone Park Association (\$65,000; 5 years, starting 9/1/12): The last 2000 years of ecohydrology in Yellowstone National Park (funded by Canon Foundation)
- 2013 National Science Foundation EPSCoR RII Track 2 (Experimental Program to Stimulate Competitive Research; \$6 million, 4 years): Science co-PI and Lead at Montana State University in this year
- 2009-2013 National Science Foundation (Sedimentary Geology & Paleobiology; \$260,000, 3 years): Collaborative Research: Controls of ecosystem development during rapid environmental change: Yellowstone in the late-glacial and early-Holocene periods (Lead PI)
- 2008-2012 National Science Foundation (Atmospheric Sciences; \$290,289, 3 years): Collaborative Research: Holocene fire-climate linkages in Southern South America: explaining regional responses to large-scale climate forcing (Lead PI)
- 2007-2011 National Science Foundation (Geography and Regional Science, \$275,000, 3 years): Māori transformation of the New Zealand landscape through the use of fire: a case study from south-central South Island
- 2007-2009 DOE Inland Water Research Alliance (\$61,000, 2 years): Long-term ecohydrologic variability in the Sawtooth region of central Idaho
- 2006-2007 National Park Service Cooperative Agreement (\$25,000, 2 years): Mammoth Crystal Springs sediment core collection and analysis, Sylvan Pass, Yellowstone National Park
- USDA Forest Service (Sawtooth National Forest (\$10,000, 2 years)): Investigation of insect remains in lake-sediments for developing a record of past insect

- 2006-2009 NASA Internship Program (\$15,000, 3 years): Beyond Hayden: Exploration, Inspiration, and Education in Yellowstone (collaborator on grant awarded to Yellowstone Ecological Research Center, Bozeman MT)
Marsden Fund Fellowship, New Zealand: The paradox of Māori settlement and widespread forest clearance (Associate investigator with Matt McGlone, LandCare Research)
- 2005-2006 University of Wyoming-National Park Research Center Grant (\$5000, 2 years)
- 2006 InterAmerica Institute Director's Grant (\$7500, 1 year): Training Latin American students in charcoal techniques
- 2005-2008 USDA Forest Service (Pacific Southwest Lab, \$65,000, 3 years): Sensitivity of Klamath Forests to long-term changes in climate and disturbance regime
National Park Service Cooperative Agreement (\$5000, 3 years): Fire and vegetation history of Jackson Hole, Wyoming
- 2004-2007 Joint Fire Sciences Program: Historical fire regimes of the Willamette Valley, Oregon: providing a long-term regional context for fire and fuels management
- 2003-2008 Yellowstone National Park: Research investigation of Crevice Lake
U.S. Geological Survey: Charcoal analysis of Crevice Lake
- 2003 NOAA ESDIM: Fire history database (PI: Connie Woodhouse)
- 2002-2005 USDA Forest Service (Pacific Southwest Research Lab): Holocene fire history of the Klamath, Warner, and Siskiyou mountains of Northern California
- 2001-2006 National Science Foundation (Earth Systems History): Holocene fire-climate-vegetation linkages in the western mid-latitude forests of North and South America (co-PI: P. Bartlein).
- 2001 IGBP Pages Program; National Science Foundation; National Oceanic and Atmospheric Administration; and the Joint Fire Sciences Program: support for an international workshop on Fire-climate linkages in western temperate forests (to be held in Tucson 2002; T.W. Swetnam, co-convenor)
- 1999-2003 National Science Foundation (Earth Systems History): Early- versus late-Holocene drought variation in the Northern Rocky Mountains (co-PIs: L. Stevens and S. Fritz)
- 1999-2004 USDA Forest Service: Sensitivity of Klamath forests to climate change
- 1998-2003 USDA Forest Service: Vegetation and fire history of the Cascade Range
- 1997-2001 National Science Foundation (Geography): Climate-fire-ecosystem linkages on decadal-to-millennial time scales in the Northern Rocky Mountains (co-PIs: T. Swetnam and P. Morgan)

- 1997-1998 Inter-American Institute Phase I: Fire and climate linkages in the Americas (T.T. Veblen, PI).
- 1997 National Science Foundation (Climate Dynamics) and Inter-American Institute: Workshop on Charcoal Methods to Reconstruct Past Fires (Eugene, Oregon, 1-8 June)
- 1996-2001 National Science Foundation (Climate Dynamics): Heinrich-scale climate events in western North America and the Northeast Pacific? Testing Possible Mechanisms
- 1996-1999 U.S. Geological Survey: Modern pollen rain studies in the Pacific Northwest
- 1996-1997 University of Wyoming-National Park Service Research Center: Fire history of Trail Lake, southeastern Yellowstone National Park
- 1995-1999 USDA Forest Service: Fire history of the Klamath Mountains, northern California
- 1994-1997 National Science Foundation (Climate Dynamics): Response of the Pacific Northwest to large-scale changes in climate during the last 150,000 years.
- 1993-1998 USDA Forest Service: Long-term fire history of the Oregon Coast Range
- 1993-1997 National Park Service: Paleoecology of the Yellowstone Lake basin.
- 1995-1996 State of Montana Historical Society: Environmental history of the Flying D Ranch, Montana
- 1993-1994 National Science Foundation (Geography): Dissertation Improvement Grant for Sarah Millspaugh; postglacial fire history in Yellowstone National Park
- 1992-1993 National Science Foundation (Systematic Biology): A multidisciplinary study of evolution of the diatom *Stephanodiscus yellowstonensis*: paleontology, molecular biology, experimental morphology (E.C. Theriot, PI)
- National Institute for Global Environmental Change (Western Regional Center): Potential magnitude and rate of future vegetation change in the western United States in response to global warming [co-PI: P. Bartlein]
- 1991-1993 Golder Associates, Inc.: Paleoclimatic history of Carp Lake Washington
- 1990-1994 UW-NPS Research Grant: Postglacial fire frequency and its relation to long-term vegetational and climatic changes in Yellowstone Park
- 1989-1992 National Science Foundation (Climate Dynamics): Regional climatic response in the northwestern U.S. to changing boundary conditions during deglaciation
- 1988-1989 UW-NPS Research Grant, National Park Service: Late Quaternary vegetational and climatic history of the Yellowstone/Grand Teton region
- M. Graham Netting Research Grant, Carnegie Museum of Natural History: Postglacial fire frequency and its relation to long-term vegetational and climatic changes in Yellowstone Park

- 1988 National Science Foundation (Climate Dynamics): COHMAP--Cooperative Holocene Mapping Project
National Science Foundation Grant (Systematic Biology): Barstovian mammals in the Rocky Mountains and mid-Miocene biogeography: Case study from Chalk Cliffs, Montana (PI: A.D. Barnosky)
Pennsylvania Historical and Museum Commission: Development of exhibit-related educational programs and publications.
- 1987-1988 National Science Foundation Grant (Ecology): Collaborative research on the postglacial history of the northern Great Plains
- 1986-1987 National Science Foundation Grant (Earth Science Equipment): Acquisition of Computerized Image Analysis System (co-PI: M.R. Dawson and J.L. Carter)
UW-NPS Research Grant, National Park Service: Postglacial vegetation and climate of Grand Teton National Park and vicinity
UW-NPS Research Grant, National Park Service: The relationship between climate and sedimentation rates in small lakes and ponds (co-PIs: H.E. Wright, Jr., D.R. Engstrom, and S.C. Fritz)
Pennsylvania Historical and Museum Commission: Renovation of Paleobotany exhibits and collections
M. Graham Netting Research Grant, Carnegie Museum of Natural History: Paleoecology of the American West
- 1985 UW-NPS Research Grant, National Park Service: Postglacial vegetation and climate of Jackson Hole and the Pinyon Peak Highlands, Wyoming
Pennsylvania Historical and Museum Commission: Renovation and Curation of Paleobotany Collections
M. Graham Netting Research Grant, Carnegie Museum of Natural History: Late Quaternary paleoecology of the American West
- 1984 M. Graham Netting Research Grant, Carnegie Museum of Natural History: Middle to late Quaternary biota from the Trout Cave area, Pendleton Co., West Virginia (with A.D. Barnosky)
National Science Foundation grant (Ecology): Postglacial vegetation and climate of the northern Great Plains (with H.E. Wright, Jr.)
- 1983 NATO Postdoctoral Fellowship, Trinity College, Dublin
- 1982 Travel grants to XI INQUA Congress, Moscow. National Research Council and University of Washington
- 1981 National Science Foundation Dissertation Improvement Grant: Vegetation and climate history of southwestern Washington
Sigma Xi, grant in aid
Geological Society of America, grant in aid

- 1978-83 National Science Foundation Graduate Fellowship
1977-82 Corporation Fund Grant, Department of Geological Sciences, University of Washington
1977 National Science Foundation Graduate Fellowship, honorable mention

HONORS, AWARDS AND SCHOLARSHIPS

- 2018 Elected member, National Academy of Sciences
Selected as an Extraordinary Ordinary Woman of MSU
- 2017 Fellow, Geological Society of America
Distinguished Career Award, American Quaternary Association
- 2016 Visiting Fellow, Swiss Federal Research Institute WSL
Visiting Scientist, Oeschger Centre for Climate Research, Universität Bern
Hans Sigrist Fellowship, Universität Bern
- 2015 Professional Excellence Award in Academic/Research, Association of Women Geoscientists
- 2014 Edmund O Wilson Biodiversity Technology Pioneer Award
MSU Provost's Distinguished Lecturer
Most Valuable Professor of the (Football) Game, September 27
- 2011 Fellow, American Association for the Advancement of Science
- 2009 Charles and Nora Wiley Faculty Award for Meritorious Research, Montana State University
- 2003-04 David and Nancy Petrone Faculty Fellow, University of Oregon
- 1983-04 NATO Postdoctoral Fellow, Trinity College, Dublin
- 1982 Robert K. Fahnestock Award in Geomorphology, Geological Society of America
- 1980 Scholarship, English-Speaking Union
- 1977-83 NSF Graduate Research Fellow
- 1976 Thomas J. Watson Fellow
- 1975 Outstanding senior in the Rocky Mountain region, Rocky Mountain Association of Geologists
Phi Beta Kappa
- 1972-75 Dean's List, Colorado College
- 1971 National Merit Award of Commendation

PROFESSIONAL SOCIETY MEMBERSHIPS

Phi Beta Kappa
Sigma Xi
Geological Society of America
American Quaternary Association
American Association of Stratigraphic Palynologists
Association of American Geographers
American Association for the Advancement of Science
American Geophysical Union
Ecological Society of America

PROFESSIONAL SERVICE

Current/ongoing

Editorial Board, *Quaternary Research* (2002-)
Editorial Board, *Review of Palaeobotany and Palynology* (1992-)
Editorial Board, *The Holocene* (2017-)
Editorial Board, *The Quaternary* (2017-)
Committee Member, Review of the draft Fourth National Climate Assessment, National Academies of Sciences, Engineering and Medicine (2017-2018)
Planning Committee Member, California Energy Commission workshop, National Academies of Sciences, Engineering and Medicine.
Future Earth, Past Global Changes Program, Global Palaeofire Working Group, Science Advisory Committee member
Member, Climate change subcommittee, Greater Yellowstone Coordinating Committee (representing all federal agencies of the region)

2003-2018 Editorial Board, *Palaeoclimatology, Palaeogeography, and Palaeoecology*
2016-17 Reviewer, USDA Forest Service, Northwest Forest Plan Science Synthesis, Ecological Society of America
2014-2017 Lead author and Editor for Montana Climate Assessment
2014 Co-chair, 12th Biennial Yellowstone Science Conference Program Committee
Contributing member, USDA National Forest-Drought Assessment
2013 Excursion Leader, 37th Annual International Moor Field Excursion in Greater Yellowstone

- 2012 National Science Foundation Geography and Spatial Sciences Program, Review Panelist (2011-2012)
- Planning Committee member, USNC-INQUA/AMQUA/NSF DLESE workshop “Teaching Climate Change: Records from Large Lakes”, University of Minnesota June 2012
- Co-host and co-chair, 11th Biennial Yellowstone Science Conference, Yellowstone National Park
- Co-convener, PIRE/PAGES workshop on paleofire, Venice
- 2011 Chair, National Research Council of the National Academy of Sciences, U.S. Committee to the International Quaternary Association (2005-2011)
- Science Steering & Executive Committee member, International Geosphere-Biosphere Project, Past Global Changes Program (PAGES) (2005-2011)
- Guest Lecturer, Yellowstone National Park Interpretative Staff training workshop
- Science Steering Committee; International Geosphere-Biosphere Programme, Global Palaeofire Working Group (2010- 2013)
- Key Contributing Scientist, NEON RFI proposal for Northern Rocky Mountains Core Wildland site
- 2010 Expert Panel member to develop Geological Society of America Position Statement on Climate Change (Ruddiman, 2010, GSA Today commentary, July issue, p. 40-41)
- Chair, External Site Evaluation Committee, Northern Arizona University Geology Program
- 2008 Senior Scientist, AIMES Young Scholars’ Network Workshop: Cultural Uses and Impacts of Fire: Past, Present, and Future. July 14-18, Boulder CO
- National Science Foundation Review Panelist, Paleoperspectives on Climate Change Program
- Lecturer, Yellowstone National Park Interpretative Staff training workshop
- 2006 Science Advisory Board member, Centro de Estudios del Cuaternario de Fuego-Patagonia y Antartica, Universidad de Magallanes, Punta Arenas Chile (2006-2008)
- Local Organizing Committee member, 2006 AMQUA biennial meeting, Bozeman MT
- Organizing Committee member, USNC-INQUA/AMQUA/NSF DLESE workshop “Teaching Climate Change: Lessons from the Past”, August 2006
- 2005 Co-organizer, Fire history and climate synthesis in western North America, Northern Arizona University

- Professional Development leader, National Parks Ecological Research Fellowship Meeting, Bozeman
- Steering committee for paleofire; IGBP Fast-track Initiative: Fire in the Earth System
- 2004 Past President, American Quaternary Association (2002-2004)
- NOAA World Data Center for Paleoclimatology, Advisory Board member for the International Multiproxy Paleofire Database (2000-) and the North American Pollen Database (2000-2004)
- 2003 National Science Foundation Research Planning Participant: Earth Systems History, Abrupt Climate Change workshop
- National Science Foundation Review Panel: Science and Technology Centers Scientific Advisory
- 2001-2001 Science Advisory Committee, NSF Earth Systems History Program
- 2000-2002 President, American Quaternary Association
- 1999-2002 Editorial Board, *Geology*
- 1999-2000 Scientific Review Panel on Status of Mountain Goats in Olympic National Park, Conservation Biology Institute
- 1998-2000 Vice-President, President-elect, American Quaternary Association
- 1998-1999 Scientific Review Panel on Status of Mountain Goats in Olympic National Park, Conservation Biology Institute
- 1997-1998 PEP1: Paleoclimates of the Americas Program Committee
- 1996-2001 Executive Committee, American Association for the Advancement of Science, Pacific Division
- 1996-1998 Board Member of the Biogeography Specialty Group, Association of American Geographers
- Organizer and Judge, AAG Biogeography Specialty Group, Student Paper Competition
- Steering Committee, Bioregional Atlas Series of the Pacific Northwest, Ecotrust
- 1996 AMIGO participant (America's Interhemisphere Geo-Biosphere Organization), Paleocology and Fire History
- 1995-1998 Steering Committee, IGBP PAGES project, PEP I initiative; Western North America
- 1995 Participant, Past Global Changes, PEP I workshop; La Paz
- 1994-1998 Participant in International Geosphere Biosphere Project, Biome 6000
- 1994 Program Co-chair, Biennial meeting of the American Quaternary Association

- 1993-1995 Review Panel, National Science Foundation Geologic Record of Global Change Program
Western North American Coordinator for the NOAA National Geophysical Data Center, Global Paleovegetation Data Base
- 1991-1996 Advisory Board, North American Pollen Data Base
Advisory Board, Denver Natural History Museum
Holocene Commission, International Quaternary Union
- 1990-1994 Elected Councilor, American Quaternary Association

PUBLICATIONS IN JOURNALS, PROCEEDINGS, AND BOOKS (~200 published or in press)

In press

Whitlock, C., Hostetler, S. Past warm periods provide vital benchmarks for understanding the future of the Greater Yellowstone Ecosystem. *Yellowstone Science*.

Submitted

Fletcher, M-S, Benson, A, Bowman, DMJS, Heijnis, H, Hopf, F., Stahle, L, Whitlock, C, Zawadzki, A. Rain forest dynamics within a topographic fire refugia. *Quaternary Science Reviews*.

Gillson, L., Whitlock, C., Humphrey, G. Resilience and fire management in the Anthropocene. *Ecology and Society*.

Benes, J.V., Iglesias, V., Whitlock, C. Postglacial vegetation dynamics at high elevation in the northern Greater Yellowstone Ecosystem, Montana, USA. *Quaternary Research*.

Nanavati, W., Whitlock, C., Iglesias, V, de Porras, E. Postglacial vegetation, fire, and climate history along the eastern Andes, Argentina and Chile (lat. 38-56°S). *Quaternary Science Reviews*.

- 2018 Fletcher, M.-S., Bowman, D.M.J.S., Whitlock, C., Mariana, M., Stahle, L. The changing role of conifer-dominated temperate rainforest through the last 14,000 years. *Quaternary Science Reviews* 182, 181-192.

Iglesias, V., Whitlock, C., Krause, T.R, Baker R.G. Reconstructing past ecosystem dynamics in the Greater Yellowstone Ecosystem region based on modern pollen-vegetation relationships. *Journal of Biogeography*. doi: 10.1111/jbl.13364. [selected as Editor's Choice, *Science* 361 (6405), 889]

- Argiriadis, E., Battistel, D., McWethy, D.B., Vecchiato, M., Kirchgeorg, T., Kehrwald, N.M., Whitlock, C., Wilmshurst, J.M., Barbante, C. Lake sediment fecal and biomass burning biomarkers provide direct evidence for prehistoric human-lit fires in New Zealand. *Nature Scientific Reports* 8:12113. doi: 10.1038/s41598-018-30606-3.
- Whitlock, C., Colombaroli, D., Conedera, M., Tinner, W. Land-use history as a guide for forest conservation and management. *Conservation Biology* 32, 84-97. doi 10.1111/cobi.12960.
- Alt, M., McWethy D.B., Everett, R., Whitlock, C. Millennial scale climate-fire-vegetation interactions in a low-elevation mixed coniferous forest, Mission Range, northwestern Montana. *Quaternary Research* 90, 66-82. doi: 10.1017/qua.2018.25
- Iglesias, V., Haberle, S., Holz, A., Whitlock, C. Holocene dynamics of temperate rainforests in west-central Patagonia. *Frontiers in Ecology and Evolution*, section Paleoecology. doi:10.3389/fevo2017.0017
- Skinner, C.N., Taylor, A.H., Agee, J.K., Briles, C.E., Whitlock, C. Klamath Mountains Bioregion (Chapter 11). *Fire in California's Ecosystems* (eds. N.G. Sugihara, J. van Wagondonk, K.E. Shaffer, J. Fites-Kaufman, A.E. Thode, J.K. Agee). University of California Press. (ISBN: 9780520286832)
- Spanbower, T.L., Brown, S.R., Cartier, R., Conley, D.J., Fritz, S.C., Schiller, C.M., Theriot, E.C., Whitlock, C., Zahajska, P. Yellowstone Lake coring projects: Research with a history. *Limnology and Oceanography Bulletin*. DOI: 10.1002/lob.10229.
- 2017 Whitlock, C., Cross, W., Maxwell, B., Silverman, N. Wade, A.A. 2017 Montana Climate Assessment. Bozeman and Missoula MT: Montana State University and University of Montana, Montana Institute on Ecosystems. 318 p. doi:10.15788/m2ww8w. (www.montanaclimate.org).
- Colombaroli, D., Whitlock, C., Tinner, W., Conedera M. Paleo records as a guide for ecosystem management and biodiversity conservation. Special Issue: Sustaining Earth's Biodiversity (Gillson, L, Gell P, and von Gunten L, eds). *Future Earth PAGES (Past Global Change Program) News* 25(2), 78-79. Doi: 10.22498/pages.25.2.
- Conedera, M., Colombaroli, D., Tinner, W., Krebs, P., Whitlock, C. Insights about past forest vulnerability to assess present forest dynamics in Switzerland. *Forest Ecology and Management* 388: 100-112.
- Goñi, M.F.S. et al. The ACER pollen and charcoal database: a global resource to document vegetation fire response to abrupt climate changes during the last glacial period. *Earth System Science Data*. doi 10.5194/essd-2017-4.
- Krause, T.R., Whitlock, C. Climatic and nonclimatic controls shaping early postglacial conifer history in the northern Greater Yellowstone Ecosystem, USA. *Journal of*

Quaternary Science 32, 1022-1036.

Kulakowski, D., Seidl, R., Holeska, J., Nagel, T.A., Panayotov, M., Svobada, M., Thorn, S., Vacciano, G., Whitlock, C., Wohlgemuth, T., Bebi, P. A walk on the wild side: disturbance ecology, conservation and management of European mountain forest ecosystems. *Forest Ecology and Management* 388: 120-131.

Lu, Y., Fritz, S.C., Stone, J.R., Krause, T.R., Whitlock, C., Brown, E.T., Benes, J.V. Trends in catchment processes and lake evolution during the late-glacial and early- to mid-Holocene inferred from high-resolution XRF data in the Yellowstone region. *Journal of Limnology* 58, 551-559.

Morris, J.L., P.E. Higuera, S. Haberle, and C. Whitlock. 2017. Modern pollen from small hollows reflects *Athrotaxis cupressoides* density across a wildfire gradient in subalpine forests of the Central Plateau, Tasmania, Australia. *The Holocene* 27, 1781-1788.

Schoennagel, T., Balch, J. Brenkert-Smith, H., Dennison, P., Harvey, B., Krawchuk, M., Morgan, P., Moritz, M., Rasker, R., Turner, G.G., Whitlock, C. Adapt to more wildfires in western North American forests as climate changes. *Proceedings of the National Academy of Sciences* 114, 4582-4590.
<http://www.pnas.org/content/114/18/4582>.

Stahle, L.N., Chin, H., Haberle, S., Whitlock, C. Postglacial record of fire and vegetation from Cradle Mountain National Park, Tasmania, Australia. *Quaternary Science Reviews* 177, 57-77.

Taylor, K.T., Maxwell, B.D., McWethy, D.B., Pauchard, A., Nunez, M.A., Whitlock, C. *Pinus contorta* invasions increase wildfire fuel loads and may create a positive feedback with fire. *Ecology* 98, 678-687.

2016 Whitlock, C., Stein, J., Fritz, S. In Memorium: Herbert E. Wright, Jr. 1917-2015. *Quaternary Research* 85: 1-3.

Whitlock, C. Voices in the Wind: Views on the Anthropocene. *Mountain Views Chronicle* 10, spring issue: 61:
<http://www.fs.fed.us/psw/cirmount/publications/mtnviews.shtml>

Hoogakker, B.A.A., Smith, R.S., Singarayer, J.S., Marchant, R., Prentice, L.C., Allen, J.R.M., Anderson, R.S., Bhagwat, S.A., Behling, H., Borisova, O., Bush, M., Correa-Metrio, A., de Vernal, A., Finch, J.M., Frechette, B., Lozano-Garcia, S., Gosling, W.D., Granoszewski, W., Grimm, E.C., Gruger, E., Hanselman, J., Harrison, S.P., Hill, T.R., Huntley, B., Jimenez-Moreno, G., Kershaw, P., Ledru, M.-P., Magri, D., McKenzie, M., Müller, U., Nakagawa, T., Novenko, E., Penny, D., Sadori, L., Scott, L., Stevenson, J., Valdes, P.J., Vandergoes, M., Velichko, A., Whitlock C., and Tzedakis, C. Terrestrial biosphere changes over the last 120 kyr and their impact on ocean $d^{13}C$. *Climates of*

the Past 12, 51-73, doi:10.5194/cp-12-51-2016.

Hendy, I., Minckley, T.A., Whitlock, C. Eastern Tropical Pacific vegetation response to rapid climate change and sea level rise: A new pollen record from the Gulf of Tehuantepec, southern Mexico. *Quaternary Science Reviews* 145: 152-160.

Iglesias, V., Whitlock, C., Bianchi, M.M., Outes, V., Villarosa, G. Analizando el pasado entender el futuro. *Macroscopia* (a science publication of Argentine national parks) 05: 21-25 (http://www.nahuelhuapi.gov.ar/multimedios/macroscopia_05.pdf).

Iglesias, V.I., Markgraf, V., Whitlock, C. 17,000 years of vegetation, fire and climate change in the eastern foothills of the Andes (lat. 44°S). *Palaeoclimatology, Palaeogeography, Palaeoecology* 457: 195-208.

Iglesias, V., Quintana, F., Nanavati, W., Whitlock, C. Interpreting modern and fossil pollen data along a steppe environmental gradient in northern Patagonia. *The Holocene* 22, 1283-1295. DOI: 10.1177/0959683616678467

Kulakowski, D., Seidl, R., Holeska, J., Nagel, T.A., Panayotov, M., Svobada, M., Thorn, S., Vacciano, G., Whitlock, C., Wohlgemuth, T., Bebi, P. A walk on the wild side: disturbance ecology, conservation and management of European mountain forest ecosystems. *Forest Ecology and Management*.
dx.doi.org/10.1016/j.foreco.2016.07.037

Leopold, E.B., Dunwiddie, P.D., Whitlock, C., Nickmann, R., Watts, W.A. Postglacial vegetation history of Orcas Island, northwestern Washington. *Quaternary Research* 85: 380-390.

Schoennagel, T., Morgan, P., Balch, J., Dennison, P., Harvey, B., Hutto, R., Krawchuk, M., Moritz, M., Rasker, R., Whitlock, C. Insights from wildfire science: a resource for fire policy discussions. <http://headwaterseconomics.org/wildfire/insights>.

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Prior to 1990, I published under my then-married name, Cathy Barnosky

- 1989 Barnosky, C.W. Postglacial vegetation and climate in the northwestern Great Plains of Montana. *Quaternary Research* 31: 57-73.

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- 1988 Barnosky, C.W. A late-glacial and postglacial pollen record from the Dingle Peninsula, County Kerry, southwestern Ireland. *Proceedings of the Royal Irish Academy*, 88B: 23-27.

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- 1985 Barnosky, C.W. Late-Quaternary vegetation history near Battle Ground Lake, southern Puget Trough, Washington. *Geological Society of America Bulletin* 96: 263-271.
- Barnosky, C.W. A record of late-Quaternary vegetation from the southwestern Columbia Basin, Washington. *Quaternary Research* 23: 109-122.
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- Janssens, J.A., and Barnosky, C.W. Late-Pleistocene and early-Holocene bryophytes from Battle Ground Lake, Washington, U.S.A. *Review of Palaeobotany and Palynology* 46: 97-116.
- 1984 Barnosky, C.W. Late Miocene vegetational and climatic variations inferred from a pollen record in northwest Wyoming. *Science* 223: 49-51.
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- Dean, W.E., Bradbury, J.P., Anderson, R.Y. and Barnosky, C.W. The variability of Holocene climate change: evidence from varved lake sediments. *Science* 226: 1191-1194.
- 1983 Barnosky, C.W. Late-Quaternary vegetational and climatic history of southwestern Washington. Ph.D. Dissertation, University of Washington.

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- 1981 Barnosky, C.W. A record of late Quaternary vegetation from Davis Lake, southern Puget Lowland, Washington. *Quaternary Research* 16: 221-239.
- 1979 Barnosky, C.W. Late Quaternary vegetation history of the southern Puget Lowland: a long record from Davis Lake, Washington. M.S. thesis, Department of Geological Sciences, University of Washington.
- 1978 Edson, G.M., and Barnosky, C.W. Lithologic and geophysical logs of holes drilled in the Willow Springs Quadrangle, Emery and Sevier counties, Utah. U.S. Geological survey Open-file Report 77-866.

SELECTED INVITED PRESENTATIONS (since 2000)

- 2018 Montana's Changing Climate: The Montana Climate Assessment. Public talks in Red Lodge, Bozeman, Columbus, Billings, Helena, MT and to the Governor's Advisory Committee.
- 2017 Jackson Hole Geologists: A long-term perspective on climate change in the Greater Yellowstone Ecosystem, Jackson WY, February 21

Future Earth Past Global Changes Open Science Meeting: Holocene climate-vegetation-fire linkages in the mid-latitudes of western Argentina and Tasmania, Zaragoza Spain May 10-13.

A long perspective on climate change in Montana. Yellowstone-Bighorn Research Association, Red Lodge MT, August 15.

Paleoecology of the Sawtooth Mountains. Rocky Mountain Friends of Pleistocene Field Trip, Stanley ID, Sept 9.

The Role of Climate Change and People in Shaping Vegetation and Fire History. Ecology, Evolution and Behavior Graduate Program, Boise State University, Boise, Oct 19

How EPSCoR made a difference in Montana. National EPSCoR meeting, Missoula MT, Nov. 7.

Yellowstone's Ecological History. Wanderlust Lecture, Bozeman MT, Nov 13.

Developing a Climate Change Boundary Organization: the Montana Adaptation Knowledge Exchange. American Geophysical Union Fall Meeting, Dec. 13.

The Montana Climate Assessment. Face the State, A Weekly public affairs program seen on the Montana Television Network

- 2016 Geological Society of America (annual meeting) Herbert E. Wright symposia: Understanding Holocene fire-vegetation linkages and the role of humans and climate
- Universität Bern, Plant Sciences Institute: *Holocene fire and vegetation history: influences of climate and people in the western U.S. and beyond*
- Université Franche Comte, Besaçon: *Research on fire history*
- Future Earth Past Global Changes Symposium, Cluj-Napoca, Romania: *Advances in fire history research and their application for ecosystem management and conservation*
- Yellowstone Biennial Science Conference, Jackson WY: *A long-term perspective on fire and ecological change in the Greater Yellowstone region*
- 2015 Salish Kootenai College: *Why paleo matters: history of whites in Greater Yellowstone*
- AGU PACLIM Workshop: *Look to the past to understand future conifer responses in the Greater Yellowstone Ecosystem*
- Buffalo Bill Museum: *Yellowstone's Past, Yellowstone's Future*
- Utah State University: *Yellowstone's Past, Present & Future; Understanding people and climate in shaping Holocene fire regimes*
- 2014 Simon Fraser University: *A Long View of Fire, Climate and People*
- Colorado College Climate Change Forum: Past climate change and your future
- Montana State University Distinguished Provost Lecture: *Yellowstone through time: Change, stability and the future*
- Yellowstone National Park (Biennial Science meeting): *Are we underestimating the resilience of whitebark pine?*
- American Geophysical Union (Fall meeting): *Subalpine species response to past climate change and fire activity: Are we underestimating the biotic resilience?*
- 2013 Ecological Society of America (Minneapolis, MN): *Understanding the Past to Shape the Future. A Symposium Honoring the Contribution of Minnesota Ecologists Margaret Davis, Eville Gorham, and Herbert Wright: Why Fire History Matters*
- Southern Connections Congress (Dunedin NZ): *Human-caused and climate-driven thresholds in past fire activity: insights from paleoecological studies in temperate forests*
- University of Montana: *Climate, vegetation, fire history of the western U.S.*

- IGBP PAGES Open Science meeting (Goa India): *Assessing the importance of climate and human activity on past and present fire dynamics*
- IGBP PAGES Public Meeting on Climate Change (Goa India): *Expert panelist to discuss climate change science and implications*
- Café Scientifique, Bozeman: *Montana's Past and Future with Wildfires*
- 2012 Southern Illinois University: *Fire history in the western U.S.*
- University of Venice/Paleofire workshop: *Advances in fire history*
- University of Idaho: *Holocene fire-climate linkages in temperate forests*
- University of Nebraska: *Fire-climate dynamics during the last 20,000 years*
- Yellowstone Biennial Science Meeting: *The role of paleoecology in resource management*
- 2011 University of Tasmania: *Why fire history matters?*
- Australian National University: *WildFIRE PIRE and fire-climate-land-use linkages*
- USDA Forest Service Rocky Mountain Research Station: *Why fire history?*
- US Geological Survey Northern Rockies Science Center: *What's New in Paleo?*
- University of Maine ADVANCE speaker: *Fire and ecological change*
- International Quaternary Union, Bern Switzerland: *Advances in Paleoecology*
- University of Maine ADVANCE lecture series: *Environmental change in the western U.S.*
- Monash University: *Fire-climate-vegetation linkages in the western US and beyond*
- Blackfeet Community College: *Opportunities for interdisciplinary environmental research in Montana*
- AGU Fall meeting symposium (co-organizer): *Pyrogenic Carbon: Modern cycling and paleoenvironmental applications*
- 2010 PAGES Open Science meeting, Nagoya Japan: *Fire in the Earth System*
- Southern Connection meeting, Bariloche Argentina: *Fire history and past fire regimes in the southern hemisphere*
- Yellowstone Biennial Science meeting: *Understanding climate change impacts from a paleoperspective*
- 2009 Yellowstone National Park: *Climate change: Past, present, future*
- Big Sky Institute: *What climate change means for the Greater Yellowstone region*
- North America Forest Ecology Workshop (plenary speaker): *Why history matters?*
- 2008 University of Minnesota, Minneapolis; Paleoecology seminar: *New developments in fire history*
- International Wildland Fire Congress, Jackson Hole: *Why does fire history matter?*

- University of Wyoming, Dept. of Geosciences: *Fire and vegetation in the western Americas*
- University of Washington, Paleoecology Group: *Linking fire, vegetation, and climate change into ecosystem history*
- American Quaternary Association biennial meeting: *Human-fire interactions in New Zealand*
- IGBP Congress, Cape Town: *Fires in New Zealand with the arrival of humans*
- 2007 Oregon State University, Department of Forest Sciences: *Fire-vegetation-climate linkages in southern and northern South America*
- University of Arizona, Department of Geography: *Fire history and its relevance to forest management*
- La Serena, Chile, Reunion bi Nacional de Ecología, La Serena: *La relación fuego-clima en comparaciones locales y regionales durante el Holoceno en Patagonia*
- La Serena, Chile: Techniques in Paleoecology: a teaching workshop offered to South American graduate students
- Montana State University; ADVANCE annual meeting: *Future climate change and its implications*
- International Quaternary Congress, Cairns: organized special session on human-fire-climate linkages and presented overview
- 2006 Malargüe, Mendoza Argentina: Reconstructing past regional climate variations in South America over the late Holocene: *Holocene fire, climate, and vegetation linkages in southern South America--local and regional comparisons*
- Smith Lecture series, Department of Geological Sciences, University of Michigan: *Climate-fire-vegetation linkages in the western Americas during the Holocene*
- University of Utah, Department of Geography, seminar lecture: *Climate-fire-vegetation history in the western U.S. and southern South America*
- Montana State University, Department of Ecology seminar lecture: *Understanding the fire-climate-vegetation linkages in the western U.S.*
- Museum of the Rockies Annual Membership meeting: *Recent research in Yellowstone*
- AGU symposium: *Comparison of Holocene fire-climate linkages in the mid-latitudes of western North and South America*
- Aspen Pointe Lecture series: *Climate and fire history in the Greater Yellowstone region*
- 2005 AGU symposium: *Early Holocene climate-vegetation-fire linkages in the Americas*
- Fire history and Climate Syntheses in western North America Workshop, Northern Arizona University: co-organizer and synthesis speaker

- ICSU Dark Nature-IGCP 490 meeting, Mar Chiquita, Cordoba Argentina: *Holocene fire reconstructions in Patagonia and the western U.S.: providing a context for recent catastrophic fires in temperate forests*
- Chilean Quaternary Society international symposium on New Approaches to the Quaternary Sciences in Fuego-Patagonia, Puerto Natales Chile: *Holocene fire history records from Patagonia: climate and vegetation controls along a latitudinal gradient*
- European Science Foundation Research Conference on Polar Regions and Quaternary Climates in Acquafreddi Maratea, Italy: *Environmental history of southern South America during the last 21 kyr*
- IGBP QUEST Fire-climate workshop in Exeter, England: *Fire history records from southern S. America*
- Big Sky Institute Mountains and Minds Lecturer: *Fires in the western U.S.*
- 2004 University of Washington, Quaternary Research Center: *Climate, fire, and people: Influences on the Holocene vegetation history of the northwestern U.S.*
- AAG symposium on vegetation history: *Reconstructing fire history from lake-sediment records in the western U.S.*
- AGU symposium co-organizer: *Fire, climate, and ecosystems (Biogeosciences)*
- University of Utrecht: *Fire, vegetation, climate, and people in the prehistory of the Pacific Northwest*
- Montana State University, Department of Earth Sciences: *Holocene fire, vegetation, and climate history in the western U.S.*
- 2003 International Quaternary Congress, Reno: *Holocene climate, vegetation, and fire history* (symposium co-organizer and speaker)
- Universidad Austral de Chile, Valdivia: *Holocene fire-climate-vegetation relationships in temperate forest of North and South America* (keynote address)
- AGU Pacific Climate Workshop: *Climate, fire, and vegetation in the northwestern U.S.: exploring the linkages on multiple scales*
- Second Conference on Klamath-Siskiyou Ecology, Siskiyou Field Institute: *Fire, climate, and vegetation change in Oregon's forests: an examination on multiple time scales*
- AGU Fall Meeting: *Disturbance frequency changes in western North and South America during the Holocene*
- American Meteorological Society 5th Symposium on Fire and Forest Meteorology and 2nd International Wildland Fire Ecology and Fire Management Congress: *Holocene fire reconstructions from the northwestern U.S.: an examination at multiple time scales*
- 2002 University of Wisconsin, Trewartha Lecturer: *Environmental history of the western U.S.*

- Oregon Academy of Science Keynote Speaker: *Environmental history of the Pacific Northwest*
- IGBP, Past Global Changes Meeting, University of Arizona: *Reconstructing past fires from lake-sediment records (co-convenor)*
- USDA Forest Science Fire Research Lab: *Fire history in the Pacific Northwest*
- USDA Rocky Mountain Research Station: *Fire and aquatic ecosystems: Lessons from a long-term perspective on fire history*
- Montana State University, Earth Sciences: *Holocene fire and vegetation history of the western U.S.*
- Association of Forest Service Employees for Environmental Ethics, workshop to Develop a blueprint for a new Fire Management Plan: *Fire history on long time scales*
- IGBP, GAIM workshop in Isle sur la Sorgue: *Fire history records*
- AGU State-of-the-Art in Ecohydrology Symposium: *Hydrologic and climate changes in the northwestern U.S.*
- Portland State University (Geography): *Climate, vegetation, and people and their role in shaping Pacific Northwest fire regimes*
- 2001 American Association for the Advancement of Science-Annual National meeting, symposium: *Pre-European Landscapes of the American West: pristine or anthropogenic?*
- AGU Pacific Climate Workshop: *Holocene history of fire in the Pacific Northwest and its climatic controls*
- Yellowstone Biennial Science Conference: *Reading Yellowstone's history from lake-sediment records; keynote speaker*
- University of Washington, Denton Lecturer: *History matters: Environmental change in shaping the modern flora*
- Society for Conservation Biology meeting: *Ecological insights gained from a comparison of past and future fire-climate conditions*
- University of Oregon, Department of Geological Sciences: *Holocene fire records from the western U.S.*
- University of Oregon, Ecology & Evolution series: *The development of the PNW's vegetation*
- Kiwanis Club, Eugene: *Using the present to study the past*
- 2000 Association of American Geographers meeting, Wildfires in Wilderness symposium: *Prehistoric fires in the Pacific Northwest: natural or human caused*
- Washington State University public lecture series: *Natural catastrophe and environmental change in the PNW: lessons for the new millennium*

American Association for the Advancement of Science-Pacific Division symposium: *Fire in the Pacific Northwest: human and climate influences* (organizer and speaker)

US Forest Service-US Bureau of Land Management: *Oak history in the Pacific Northwest*

University of Washington Quaternary Research Center workshop: *Paleoclimate and paleohazards in the Pacific Northwest*

American Quaternary Association biennial meeting: *Landscape and biotic responses to climate variability: future impacts and past lesson*

American Geophysical Union symposium: *Paleoenvironmental evidence for prehistoric natural hazards and their impact on human societies*

Royal Irish Academy, Dublin symposium in Honor of William A. Watts: *Variations in Holocene fire regimes and the implications for paleoecology and conservation*

University of California Berkeley, Department of Geography symposium: *Long-term records of fire and climate change in the northwestern U.S. and their relevance for ecosystem management* (invited)

University of California Berkeley, Department of Environmental Science, Policy, and Management symposium: *A long-term perspective on ecosystem change* (invited talk)

OTHER PROFESSIONAL ACTIVITIES

Served on an external review committee for the Department of Geography, University of Utah; Department of Geosciences, Northern Arizona University
Served as external evaluator for tenure and promotion cases at University of Tennessee, University of Arizona, University of Wyoming, University of California at Los Angeles, Louisiana State University, Trinity College Dublin, St. Olaf's College, Northern Arizona University, Portland State University, University of West Virginia, Trinity College Dublin, University of Wisconsin

Reviewed manuscripts for *Nature*; *Science*; *Proceedings of the National Academy of Sciences*; *Quaternary Research*; *Geology*; *Geological Society of America Bulletin*; *Ecological Monographs*; *Ecology*; *Ecological Applications*; *Canadian Journal of Botany*; *Canadian Journal of Earth Sciences*; *Canadian Journal of Forest Research*; *Review of Palaeobotany and Palynology*; *Quaternary Science Reviews*; *Ecoscience*; *Arctic, Alpine, and Antarctic Research*; *The Holocene*; *Palaeogeography, Palaeoclimatology, and Palaeoecology*; *Fenn. Acta Botanika*; *Western North American Naturalist*.

Reviewed book proposals for Blackwell Scientific, Edward Arnold Publishing, University Press of Colorado, Island Press.

Reviewed grant proposals for various programs of the National Science Foundation, including Atmospheric Sciences, Ecosystems, Ecology, Earth Systems History,

Geology and Paleontology, Continental Drilling Program, Geography and Regional Studies; NOAA Paleoclimatology Program; National Geographic Society; National Science Research Council (Canada); National Environmental Research Council (Britain); National Science Foundation (Germany), and Idaho State Research Program.

COURSES TAUGHT AT MONTANA STATE UNIVERSITY

ERTH 212: Yellowstone: A Scientific Laboratory (2005-2018)
ERTH 582: Quaternary Paleoecology & Vegetation History (2005, 2007, 2009, 2012, 2014, 2017)
ERTH 583: Topics in Paleoecology (2005-2015)
ERTH 485/584: Quaternary Environments of the western US (2006, 2008, 2010, 2012, 2014, 2018)
ERTH 585: Advances in Geobiology (2006-2010)

COURSES TAUGHT AT UNIVERSITY OF OREGON

Geog. 101: The Natural Environment (1990- 1995, 1997)
Geog. 323: Biogeography (1991-1995, 1998- 2002)
Geog. 423, 523: Advanced Biogeography (1996, 1999; 2000, 2003; 2004)
Geog. 430, 530: Quaternary Environments (1990, 1992, 1993, 1994, 1995, 1996)
Geog. 431, 531: Quaternary Vegetation History (1991, 1993, 1995, 2000, 2003)
Geog. 607: Seminar: Quaternary of Pacific Northwest (1991, 1997, 2002)
Geog. 4/507, 607: Seminar: Disturbance History and Environmental Change (1994)
Geog. 607: Seminar: Biotic invasions, extinctions, and natural disturbance (2001)
Geog. 608: Seminar: Thesis Writing Workshop (2000, 2001, 2002, 2003)
Geog. 531: Progress in Physical Geography (every quarter prior to 2002)
Geog. 631: Progress in Physical Geography (every quarter since 2002)
Geog. 651: Advances in Paleoecology (2003)

Oregon State University: Course on Columbia Plateau (distance education) (2001)

MAJOR ADVISOR ON GRADUATE STUDENT COMMITTEES

M. Alt	M.S. (6/17), MSU Earth Sciences
J. Benes	M.S. (in progress), MSU Earth Sciences
L. Berkley	M.S. (12/00), UO Geography
M. Blinnikov	Ph.D. (8/99), UO Geography
C. Briles	M.S. (3/03), UO Geography; Ph.D. (6/08), Geography
A. Brunelle-Daines	Ph.D. (8/02), UO Geography
D. Firmage	M.S. (in progress), MSU Earth Sciences
H. Friefeld	Ph.D. (6/99), UO Geography
J. Gage	M.S. (12/08), MSU Earth Sciences
J. Gardner	M.A. (8/99), UO Geography
L. Grigg	M.A. (12/96), UO Geography; Ph.D. (12/00), Geography
K. Hakala	Ph.D. (12/99), University of Pittsburgh, Dept. of Earth & Planet. Sci.

M. Huerta	M.S. (12/07), MSU Earth Sciences
V. Iglesias	Ph.D. (12/12), MSU Ecology and Environmental Sciences
K. Jacobs	M.S. (5/07), MSU Earth Sciences
M. Knox	M.A. (9/01), UO Geography
T. Krause	Ph.D. (12/14), MSU Ecology and Environmental Sciences
C. Long	M.A. (3/96), UO Geography; Ph.D. (5/03), Geography
J. Marlon	M.A. (12/03), UO Geography
S. Millspaugh	M.S. (8/91), University of Pittsburgh, Dept. of Earth & Planet. Sciences Ph.D. (12/97), UO Geography
T. Minckley	M.A. (12/98), UO Geography; Ph.D. (6/03), Geography
J. Mohr	M.A. (12/97), UO Geography
S. Mumma	M.S. (12/09), MSU Earth Sciences
W. Nanavati	Ph.D. (in progress), MSU Earth Sciences
C. Pearl	M.A. (6/99), UO Environmental Studies
M. Power	Ph.D. (8/05), UO Geography
V. Rubinstein	M.S. (6/03), UO Geography
D. Sea	M.S. (12/93), UO Geological Sciences
C. Schiller	Ph.D. (in progress), MSU Earth Sciences
B. Sherrod	M.S. (12/90), University Pittsburgh, Dept. of Earth & Planet. Sciences
B. Swindell	M.S. (12/11), MSU Earth Sciences
L. Stahle	Ph.D. (in progress), MSU Earth Sciences
A. Tattersall	M.S. (6/99), UO Interdisciplinary Studies
B. Ulrich	M.S. (in progress), MSU Earth Sciences
M. Walsh	Ph.D. (12/08), UO Geography
A. White	M.S. (5/14), MSU Earth Sciences
M. Worona	M.S. (6/93), UO Geological Sciences

SUPERVISOR FOR POST-DOCTORAL FELLOWS

Christy Briles (2008-2009)
Andrea Brunelle (2002-2003)
Philip Higuera (2006-2009)
Virginia Iglesias (2013-2014, 2016-2017)
Colin Long (2004-2005)
Dave McWethy (2007-2010)
Gabriel Yospin (2012-)

ADVISOR ON OTHER GRADUATE STUDENT COMMITTEES

P. Armbruster	Ph.D. (6/97), UO Biology
M. Coble	M.A. (6/01), UO Environmental Studies
A. Bissel	Ph.D. (8/01), UO Biology
M. Brueckner	M.S. (6/07), MSU Earth Sciences
C. Florentine	M.S. (12/10), MSU Earth Sciences
K. Hakala	Ph.D. (4/00), Geology, University of Pittsburgh
S. Hendrickson	Ph.D. (12/02), UO Anthropology
U. Huber	Ph.D. (8/01), Geological Sciences, University of Colorado

R. Jensen	M.S. (in progress), MSU Earth Sciences
K. Johnson	Ph.D. (6/98), UO Biology
D. Keeling	Ph.D. (6/92), UO Geography
N. Kohler	Ph.D. (6/03), UO Geography
L. Kouwenberg	Ph.D. (2/04), University of Utrecht, Quaternary Studies
M. Knox	Ph.D. (12/05), UO Geography
J. Marlon	Ph.D. (6/07), UO Geography
R. McKeon	M.S. (12/06), MSU Earth Sciences
D. McWethy	Ph.D. (6/06), MSU Ecology
J. Miller	Ph.D. (6/04), UO Biology
C. Mock	Ph.D. (6/96, UO Geography)
D. Navarro	Ph.D. (12/10, Univ. Mar del Plata, Argentina, Biology)
T. Nadeau	Ph.D. (6/98), UO Biology
J. Oliphant	Ph.D. (6/97), Botany, Oregon State University
E. Perkins	Ph.D. (12/97), Biology, University of Perth, Australia
J. Polhemus	M.A. (12/01), UO Environmental Studies
T. Rick	Ph.D. (5/04), UO Anthropology
T. Taylor	M.A. (6/99), UO Environmental Studies
P. Santibanez	PhD (in progress), MSU Land Resources and Environmental Sciences
S. Shafer	Ph.D. (8/00), UO Geography
K. Taylor	PhD (5/16), MSU Land Resources and Environmental Sciences
S. Wathan	Ph.D. (12/06), Biology, University of California at Davis
M. Weingart	M.S. (in progress), MSU Earth Sciences

ADVISOR ON UNDERGRADUATE STUDENT THESIS COMMITTEES

I. Wick	B.A. (12/97) UO Honors College
H. Grant	B.A. (12/00) UO Environmental Studies Program
M. Moodhe	B.A. (12/01) UO Environmental Studies Program
J. Yale	B.S. (6/06), MSU Earth Sciences
M. Fernandez	B.S. (6/09), Columbia Univ. Environmental Studies

DEPARTMENTAL SERVICE

Current	MSU Earth Sciences Promotion and Tenure Committee MSU Earth Sciences Faculty Search Committees, including Department Head
2008-2010	MSU Earth Sciences Budget Committee
2006-2007	MSU Earth Sciences Five-Year Plan Committee
2004-2006	MSU Earth Sciences Executive Committee
2000-2004	UO Department Head
2003	UO Faculty Search Committee
2001	UO Department Seminar Series
1997-2000	UO Undergraduate Program Director UO Faculty Search Committee UO Graduate Admission Committee UO Department Seminar Series

	UO Tenure and Promotion Committee
1997-1998	UO Trussell Family Scholarship Committee
1993-1995	UO Graduate Program Director
1994-1995	UO Faculty Search Committee
1994	UO Department Seminar Series
1992-1993	UO Charitable Fund Drive Chair
1991-1993	UO Trussell Family Scholarship Committee Chair
1990-1993	UO Library Representative
1990-1991	UO Graduate Admissions Committee

UNIVERSITY SERVICE

Current	MSU EPSCoR RII Track 1 project, Co-PI MSU, Director of Paleoecology Lab (since 2004) MSU, Planning Committee for Earth, Ecology & Environmental Sciences at MSU
2017	Chair, VPRED Committee on Centers/Institutes
2010-2014	MSU Research Council MSU P&T evaluations for departments
2013	MSU VPR Rapid Action Task Force
2011-2012	MSU EPSCoR Track 2 project, Science Leader and co-PI
2006-2011	MSU Director of Interdisciplinary Research Initiatives
2006-2011	MSU ADVANCE Leadership Grant Steering Committee
2010	MSU Provost Advisory Search Committee
2007-2009	MSU Committee on Tenure and Promotion Policies
2008	MSU Department of Ecology Search Committee
2001-2002	UO Deans Advisory Group
1990-2004	UO General Sciences Advisory Committee
2000-2004	UO Carroll Visiting Professorship Committee
1993-1999	UO Environmental Studies Advisory Committee
1998-99, 1994-97	UO University Senate
1997	UO Faculty Search Committee for Vice President for Academic Affairs
1991-1992	UO Strategic Plan Action Team on Infrastructure & Technical Support
1991-1992	UO Out-of-State Travel Committee (CAS)

RESEARCH CONTRIBUTIONS

I have two passions that motivate me as paleoecologist. The first is a lifelong curiosity to understand how, why and when ecosystems change. This interest has led to ~195 scientific publications, continuous grant funding since 1983, and successful training of 35 graduate students and seven post-docs over my career. Information on the past is critical for assessing the health of present-day forests as well as for predicting environmental responses in the future.

My scientific discoveries on past ecosystem dynamics have informed global change science, resource management decisions, and conservation efforts. To gain knowledge of these interactions over long time frames, my team analyzes the fossils (pollen, charcoal, and other plant remains) and other components (geochemical, lithological) preserved in the

sediments of lakes and wetlands. Lakes can be thousands of years old, and their sediments preserve a rich, and often untapped, reservoir of ecological information about a broader range of environmental conditions than we can observe today. Much of my research has drawn on these lake-sediment records to reconstruct the evolution of temperate forests in the western U.S., and comparable ecosystems in New Zealand, southern South America, Europe, and Australia. These forests are highly vulnerable to climate change, serving presently as both carbon sources and carbon sinks, through the alteration of fire and other biotic interactions. My studies in both the northern and southern hemispheres have traced vegetation dynamics in response to large-scale Earth processes, such as mountain building and glaciation on long time scales, as well as the influence of climate and people over shorter time spans. My students and I have described the connections between climate, disturbance, and vegetation change (most recently in Iglesias et al., 2015, 2018; Krause et al., 2015; Iglesias and Whitlock, 2015) and the vulnerability of temperate forest to human-set fires (most recently, Whitlock et al. 2015; McWethy et al. 2014). My research in Yellowstone National Park during the fires of 1988 has led to new methods for reconstructing long-term fire histories; these techniques are used around the world. Over the last 25 years, I have helped build a global paleofire science community, including creating an international database that makes fire-history information available to all.

My second passion is to integrate learning and discovery. My lab has always supported a lively group of post-docs, graduate students, and post-docs, and we regularly host visiting scientists from around the world. I pride myself on the fact that 22 of my 35 graduate students have been women and that my students have gone on to successful careers in academia, government, conservation organizations, and the private sector. Education for me also means reaching outside of the university to inform broader audiences about environmental change. In this regard, I am co-founding director of the Montana Institute on Ecosystems, a statewide institute that draws on the extraordinary landscapes of Montana and beyond to understand complex ecosystems including the interconnectedness of people and nature. In 2017, I lead a partnership of scientists, government agencies, local communities, and non-profit organizations to develop the first Montana climate assessment. This effort is part of long-term enterprise to provide Montana citizens with timely information that addresses real-world environmental challenges. Stakeholder-driven science requires public engagement, and I spend considerable time giving public lectures, fielding questions, engaging teachers and students, participating in resource management and conservation workshops, and providing commentary to the media. This broader engagement allows me to share my research with others as well as stimulate it.

Research discoveries that I have led or been actively involved in:

1. Insights on the evolution of modern forest ecosystems and their sensitivity to climate change and human influences
2. New methods for reconstructing past fire activity, which are now used around the world
3. Improved understanding of the vegetation and fire history of western North America, Ireland, southern South America, New Zealand and Australia based on pollen and high-resolution charcoal records

4. Information on ecological responses during past periods when the world was colder and warmer than at present to gain understanding of climate extremes
5. Evidence that climate is the primary driver of fire activity in most western U.S. forests, and not past forest management practices such as fire suppression
6. Unexpected similarities in the climate history of southern South America and northwestern North America indicating strong interhemispheric atmosphere-ocean connections
7. Documentation of past fires in New Zealand commencing with the arrival of the first people including innovative approaches to study how humans were able to transform vegetation in a matter of decades through deliberate burning
8. Reconstruction of dramatic changes in vegetation that occurred in the Rocky Mountains as a result of late Cenozoic mountain building and global cooling
9. Examination of the vegetation and fire patterns in the western U.S. during the last “interglacial” period as an analogue for future conditions
10. Identification of the complex responses of plants to projected future climate change in mountainous regions based on an understanding of paleoecological data and modeling

BRIEF BIOGRAPHY

I started my life in Washington DC and then upstate New York. My father was a medical school professor and much of my childhood was spent hanging out in research laboratories, helping feed experimental mice and rabbits, washing glassware, and dusting skeletons. My parents share a deep love for the outdoors that ranges from reciting 19th century nature poetry to collecting and mounting butterflies, and this passion was passed to my two brothers and me. At age 14, my family moved to Colorado where I was transformed by the opportunity to hike in spectacular mountains, enjoy fields of wildflowers and ski in deep powder. At that point, I knew that I would need to find a career that would involve both science and the outdoors.

At Colorado College, my first class was geology and it was a perfect fit for me. An inspiring professor taught us about the Earth by dragging us mountain cliffs where we were expected to “read” the rocks. Field trips to Dinosaur and Great Sand Dunes National monuments will stay with me forever as moments of awe, discovery and unforgettable camaraderie. During my senior year, I had the good fortune to work with Dr. Estella Leopold, the famous paleoecologist and daughter of Aldo Leopold, who was then at the US Geological Survey in Denver. Estella was the first women scientist that I had ever worked with, and for me, she was a force of nature. Her infectious enthusiasm for science was evident in the lab, and her passion for conservation was clear through her public advocacy. More than that, paleoecology was an exciting way to blend my interests in earth history and modern ecology. This interdisciplinary field of geology was a chance to understand the present by using the past as a guide.

In graduate school at the University of Washington, I continued my studies with Estella in her new position as Director of the Quaternary Research Center. I loved the opportunity to

combine the very best of graduate studies with research. My advisors encouraged me to submit my early discoveries to the journal *Science*, where it was published as a sole-authored paper and featured on the cover. What an introduction to academia! The training in graduate school and later as a postdoc at Trinity College Dublin taught me much about running a research program and mentoring students and early-career scientists. I have applied these skills in academic positions at Carnegie Museum of Natural History, University of Pittsburgh, University of Oregon, and now at Montana State University.

I am a Professor in Earth Sciences and Director of the MSU Paleoecology Laboratory. My lab group hosts international scientists interested in learning our techniques for reconstructing past climate, vegetation and fire. Yellowstone is in our backyard and offers an unparalleled scientific laboratory for us but my group works at field sites around the world. I was the founding co-Director of the Montana Institute on Ecosystems, the first statewide institute designed to promote interdisciplinary research on pressing environmental challenges, and lead author on the Montana Climate Assessment. In this capacity, I have been able to guide state, regional and national agendas on climate change and its impacts, hire new interdisciplinary faculty, and lead major research and education initiatives. I am an academic leader who truly believes in serving, and I use my passion for environmental science to inspire and encourage others.