

CHARLES EDWARD UMBANHOWAR JR.

Departments of Biology and Environmental Studies
St. Olaf College
Northfield, Minnesota 55057
ceumb@stolaf.edu

EDUCATION

University of Wisconsin-Madison	Ph.D., Botany minor, Entomology	1989
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Dissertation: "Aspects of patch dynamics and disturbance in a northern mixed prairie." Mixed prairie is subject to many patch forming events thought to be important for the reproduction of many species. This thesis provided the first comparison of different kinds of patches occurring at the same prairie site, taking both an experimental and descriptive approach to understanding patch colonization and composition. Under direction of E.W. Beals.

Carleton College, Northfield, MN	B.A., Biology	1985
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POSITIONS HELD

Professor of Biology	St. Olaf College	2004-Present
Associate Professor of Biology	St. Olaf College	1997-2004
Assistant Professor of Biology	St. Olaf College	1991-1997
Botany Research Specialist	ND Natural Heritage Inventory	1990-1991
Research on the Federally Threatened Western Prairie Fringed Orchid (<i>Platanthera praeclara</i>). Research included landscape scale distribution patterns, pollination and disturbance ecology. Did field surveys and was responsible for data management for selected rare species in ND.		
Research Associate	University of Wisconsin-Madison	1990
Computerized and reanalyzed the data set that formed the basis for historic Vegetation of Wisconsin .		
Teaching Assistant	University of Wisconsin-Madison	1985-1989
Introductory Botany for majors and non-majors. Ecology for majors and non-majors and graduate course in multivariate statistics and community analysis.		

TEACHING INTERESTS AND COURSES TAUGHT

Plant Morphology and Systematics, Ecological Principles, Environmental Studies, Introductory Biology. Remote Sensing and GIS, Environmental History and Sediment Chemistry, Organismic Biology, Plants and People, Biostats (team-taught), Winter Ecology, Biology and Politics (team-taught), Environmental Studies Capstone Seminar (team taught and individually) .

RESEARCH INTERESTS

Fire and climate interactions in Mongolia, Fire history of Big Woods and Great Plains and Manitoba, Prairie community ecology, Insect herbivory and plant-insect interactions, Multivariate statistical methods, Prairie and oak savanna restoration.

PUBLICATIONS (names of undergraduate authors underlined)

- Umbanhowar Jr, C. E., P. Camill, M. B. Edlund, C. Geiss, P. Henneghan, and K. Passow. 2014. Lake-landscape connections at the forest – tundra transition of northern Manitoba. *Inland Waters* 5:57-74.
- Umbanhowar Jr., CE. 2014. Charles A. Geyer *Agricultural Botanical Survey* of 1838-1839 and comparison of composition of prairies of western Minnesota then and now. *Ecological Restoration* 32: 16-27.
- Umbanhowar Jr., CE, P. Camill, , M.B. Edlund, C. Geiss, W. Durham, D. Kreger, W. Molano, C. Raskob, M. Stocker, A. Tvera, J. Williams. 2013. Contrasting changes in surface waters and barrens over the past 60 years for a subarctic forest-tundra site in northern Manitoba based on remote sensing imagery. *Canadian Journal of Earth Sciences* 50: 967-977.
- Camill, P., C.E. Umbanhowar Jr, C.E. Geiss, W.O. Hobbs, M.B. Edlund, A.L.C. Shinneman, J.A. Dorale, and J. Lynch. 2012. Holocene climate change and landscape development from a low-Arctic tundra lake in the western Hudson Bay region of Manitoba, Canada. *Journal of Paleolimnology*, 48: 175-192.
- Umbanhowar, C.E., P. Camill, and J. Dorale. 2011. Regional heterogeneity and the effects of land use and climate on 20 lakes in the big woods region of Minnesota. *Journal of Paleolimnology* 45: 151-166.
- Shinneman A.L.C., C.E. Umbanhowar, M.B. Edlund and N. Soninkhishig 2010. Late-Holocene moisture balance inferred from diatom and lake sediment records in western Mongolia. *The Holocene* 20: 123-128.
- Marlon, J. R., P. Bartlein, J. M. K. Walsh, S. P. Harrison, K. J. Brown, M. E. Edwards, P. E. Higuera, M. J. Power, R. S. Anderson, C. Briles, A. Brunelle, C. Carcaillet, M. Daniels, F. S. Hu, M. Lavoie, C. Long, T. Minckley, P. J. H. Richard, A. C. Scott, D. S. Shafer, W. Tinner, C. E. Umbanhowar Jr, and C. Whitlock. 2009. Wildfire responses to abrupt climate change in North America. *Proceedings of the National Academy of Science* 106: 2519-2524.
- Shinneman, A.L.C., J. E. Almendinger, C.E. Umbanhowar, M.B. Edlund, S.Nergui. 2009. Paleolimnologic evidence for recent eutrophication in the Valley of the Great Lakes (Mongolia). *Ecosystems* 12: 944-960.
- Teed, R., C. E. Umbanhowar, and P. Camill. 2009. Multiproxy lake sediment records at the northern and southern boundaries of the Aspen Parkland region of Manitoba, Canada. *The Holocene* 19:937-948.
- Umbanhowar, C.E. Jr., A.L.C. Shinneman, G. Tserenkhand, E. R. Hammon, P. Lor, K. Nail. 2009. Regional fire history of western Mongolia since AD 800, based on charcoal analysis of sediments of nine lakes. *The Holocene*. 19: 611-624.
- Umbanhowar, C.E. Jr., Lambert, A.M. and L. VanDelinder. 2008. Effects of freezing on the flexural stiffness of winter twigs of coniferous and deciduous trees and shrubs. *Canadian Journal of Forest Research* 38: 394-399.
- Power, M.J., Marlon, J., Ortiz, N., Bartlein, P.J., Harrison, S.P., Mayle, F.E., Ballouche, A., Bradshaw, R.H.W., Carcaillet, C., Cordova, C., Mooney, S., Moreno, P.I., Prentice, I.C., Thonicke, K., Tinner, W., Whitlock, C., Zhang, Y., Zhao, Y., Ali, A.A., Anderson, R.S., Beer, R., Behling, H., Briles, C., Brown, K.J., Brunelle A, Bush, M., Camill, P, Chu, G.Q., Clark, J., Colombaroli, D., Connor, S., Daniau, A.-L., Daniels, M., Dodson, J., Doughty, E., Edwards, M.E., Finsinger, W., Foster, D., Frechette J., Gaillard, M.-J., Gavin, D.G., Gobet, E., Haberle, S., Hallett, D.J., Higuera, P., Hope, G., Horn, S., Inoue, J., Kaltenrieder, P., Kennedy, L., Kong, Z.C., Larsen, C., Long, C.J., Lynch, J., Lynch, E.A., McGlone, M., Meeks, S., Mensing, S., Meyer, G., Minckley, T., Mohr, J, Nelson, D.M., New, J., Newnham, R., Noti, R., Oswald, W., Pierce, J., Richard, P.J.H., Rowe, C., Sanchez Goñi, M.F., Shuman, B.J., Takahara, H., Toney, J., Turney, C., Urrego-Sanchez, D.H., Umbanhowar, C., Vandergoes, M., Vanniere, B., Vescovi, E., Walsh, M., Wang, X., Williams, N., Wilmshurst, J., Zhang, J.H. 2008. Changes in fire regimes since the Last Glacial Maximum: an assessment based on a global synthesis and analysis of charcoal data. *Climate Dynamics* 30: 887-907.

- Umbanhowar, C.E. Jr., P. Camill, C. E. Geiss, R. Teed. 2006. Asymmetric vegetation responses to the onset and termination of mid-Holocene aridity at the prairie–forest ecotone in south-central Minnesota. *Quaternary Research* 66: 53-66.
- Umbanhowar, Jr., C. E. 2004. Interaction of fire, climate, and vegetation change at a large landscape scale in the Big Woods of Minnesota, USA. *The Holocene* 14:661-676
- Umbanhowar, Jr. C.E. 2004. Interactions of climate and fire at two sites in the northern Great Plains, USA. *Paleogeography, Paleolimnology, Paleocology* 208:141-152.
- Geiss, C.E., S.K. Banerjee, P. Camill, and C.E. Umbanhowar Jr. 2004. Sediment-Magnetic Signature of Land-use and Drought as Recorded in lake Sediment from South-Central Minnesota, U.S.A. *Quaternary Research* 62: 117-125.
- Umbanhowar, Jr. C.E., D.R. Engstrom, and E.K. Bergman. 2003. Reconstructing eutrophication and phosphorus loading for Lake Volney, Minnesota: combining lake sediments and land-use history to establish ‘natural’ baselines for management and restoration. *Lake and Reservoir Management* 19: 364-372.
- Camill, P. C. E. Umbanhowar, Jr., R. Teed, C. E. Geiss, J. Aldinger, L. Dvorak, J. Kenning, J. Limmer, and K. Walkup. 2003. Late glacial and Holocene climatic effects on fire and vegetation dynamics at the prairie-forest ecotone in south-central Minnesota. *Journal of Ecology* 91:822-836.
- Geiss, C.E., Umbanhowar, C.E. Jr., Camill, P., and Banerjee, S.K. 2003. Sediment magnetic properties reveal Holocene climate change along the Minnesota prairie-forest ecotone. *Journal of Paleolimnology* 30:151-166.
- Umbanhowar Jr., C.E. and M. J. McGrath. 1998. Experimental production and analysis of microscopic charcoal from wood, leaves, and grass. *The Holocene* 8:341-346.
- Estrella, D. and C. Umbanhowar Jr., C. 1997. Sexual allocation in *Carex stricta*: a monoecious, perennial, tussock-forming sedge. *Prairie Naturalist* 29:16-24.
- Umbanhowar Jr., C.E. 1996. Recent fire history of the Northern Great Plains. *American Midland Naturalist* 135:115-121.
- Umbanhowar Jr., C.E. 1995. Revegetation of earthen mounds along a topographic-productivity gradient in a northern mixed prairie. *Journal of Vegetation Science* 6:637 - 646.
- Preuninger, J.E. and C.E. Umbanhowar Jr. 1994. Effects of burning, cutting and spraying on reed canary grass studied. *Restoration and Management Notes* 12:207.
- Umbanhowar Jr., C.E. 1993. The dynamic prairie. *North Dakota Outdoors* 56: 17-20.
- Umbanhowar Jr., C.E. 1992. Abundance, vegetation and environment of four patch-types in a northern mixed prairie. *Canadian Journal of Botany* 70:277-284.
- Umbanhowar Jr., C.E. 1992. Early patterns of revegetation of artificial earthen mounds in a northern mixed prairie. *Canadian Journal of Botany* 70:145-150.
- Umbanhowar Jr., C.E. 1992. Reanalysis of the Wisconsin prairie continuum. *American Midland Naturalist* 127:268-275.
- Umbanhowar Jr., C. 1986. Restoration of an overgrown oak opening. *Restoration and Management Notes* 4:24.

INVITED PAPER

- Umbanhowar Jr., C.E. 1993. Reclassification of Wisconsin prairies. pp. 289-303 in J.S. Fralish, R.P. McIntosh, and O.L. Loucks (eds.) *John T. Curtis: Fifty years of Wisconsin plant ecology*. Wisconsin Academy of Sciences, Arts & Letters. Madison.

PRESENTATIONS AND POSTERS

- Umbanhowar Jr, C. E., P. Camill, E. Voldal, J. Gatlin, and E. Butka. 2015. An 8000 year history of fire and productivity in a nutrient-poor boreal landscape reconstructed from two lakes in central Labrador. *American Geophysical Union Meetings*. San Francisco, CA.
- Umbanhowar Jr, C. E., E. Larson, W. Hobbs, M. B. Edlund, P. Camill, C. E. Geiss. 2014. Multi-scale responses to changing climate in lake and terrestrial ecosystems over the past 200 years at treeline in northern Manitoba. *American Geophysical Union Meetings*. San Francisco, CA.

- Umbanhowar, Jr. C.E. 2013. Out of the shadows of the Pleistocene: our changing landscape since the Ice Age. Briar Cliff University, Sioux City, IA.
- Umbanhowar, Jr. C.E. 2012. Western Mongolian Steppe and the historic absence of fire: paleoecology, people, and poop. UW-Madison Biology Colloquium, Madison.
- Umbanhowar, Jr. C.E. 2012. The J.N. Nicollet Northwest Expeditions of 1838-1839: Rogue botany to restoration Rosetta. Smithsonian Institution. Washington, D.C.
- Umbanhowar, Jr. C.E., P. Henneghan, K. Passow, E. Emmons, M. Kubis, P. Camil, C.E. Geiss, M. Edlund. 2010. Distribution of carbon and cations across aquatic and terrestrial ecosystems of the western Hudson Bay low arctic, Manitoba, Canada. American Geophysical Union Meetings. San Francisco, CA.
- Umbanhowar, Jr. C.E. 2009. Landscape Influences on Dissolved Organic Carbon, pH, Fe, and Ca in 37 Lakes in the Forest-Tundra of Northern Manitoba, Canada. American Geophysical Union Meetings. San Francisco, CA.
- Umbanhowar, Jr. C.E. 2009. Between the Mississippi and the Missouri, 1838-1839: A new look at the botany of Charles Geyer. MN Native Plant Society, St. Paul.
- Umbanhowar, Jr. C.E. 2007. Exploring Fire, Climate, and Culture: Reconstructing the Past and Present from Lake Sediments in Western Mongolia. Linda Hall Library, Kansas City, MO.
- Molhoek, E. (Presenter), S.J. Fowell, J. A. Peck, C. Umbanhowar, P. Khosbayar, M.J. Wooller, A. Krumhardt, and A. Brennan. 2006. Records of Holocene humidity from Mongolian Lake Terhiyn-Tsagaan: in sych with the waxing and waning of the monsoon. Geological Society of America. Geological Society of America Annual Meeting. Philadelphia, PA.
- Umbanhowar, Jr. C.E., J.E. Almendinger (presenter), E.R. Johnson. 2006. Reconstruction of productivity changes in western Mongolian lakes using biogenic silica and phosphorus extracted from sediments. 10th International Paleolimnology Symposium. Duluth, MN.
- Umbanhowar, Jr. C.E. 2005. Regional lake ecosystem responses to climatic and anthropogenic change over the past 2000 years based on biogenic silica and phosphorus from sediments of 18 lakes in southern Minnesota. 39th North Central Geological Society of America Meeting. Minneapolis, MN.
- Umbanhowar, Jr. C.E. E.R. Johnson, and G. Tserenkhand. 2005. Regional reconstruction of fire regimes and climate in western Mongolia over the past 2000 Years. American Geophysical Union Meetings. San Francisco, CA.
- Umbanhowar, Jr. C.E. 2003. Responses of fire to changes in climate and vegetation at varying temporal and spatial scales in the Big Woods of Minnesota Quaternary Paleorecords (QP) seminar series
- Umbanhowar, Jr. C.E. 2003. Paleoecology and the interaction of fire, climate and vegetation along the prairie-forest border of Minnesota. University of Minnesota-Morris.
- Umbanhowar, Jr. C.E. 2002. Blue skies and green lakes: reconstructing the impacts of land-use changes on lake productivity. Minnesota Academy of Sciences, St. Peter, MN.
- Umbanhowar, Jr. C.E. and C.E. Geiss. 2002. Impacts of climate change and Euroamerican agriculture on magnetic properties of sediments from 17 lakes in southern Minnesota. American Geophysical Union Meetings, San Francisco, CA.
- Umbanhowar, Jr. C.E., P. Camill, R. Teed, C.E. Geiss, L. Dvorak, J. Kenning, J. Limmer, and K. Walkup. 2002. Climate, fire, and vegetation change over the past 10000 years at two sites along the prairie-forest border in south central Minnesota. Ecol. Soc. Amer. Meetings. Tucson, AZ.
- Geiss, C.E., C.E. Umbanhowar Jr., P. Camill, and S. Banerjee. 2001. Multi proxy study of lake sediments reveals high resolution record of Mid-Holocene aridity. Geological Society of America Meetings. Boston, Mass.
- Umbanhowar, Jr. C.E. and B. Werner. 2001. Simulation of the impact of fire on the location and Structure of the Prairie-Forest border in Minnesota. Ecol. Soc. Amer. Meetings. Madison, WI.
- Umbanhowar Jr., C.E., D.R. Engstrom, and E. Bergman. 2000. Reconstruction of whole-lake phosphorus loading related to land-use history based on analysis of sediment phosphorus for Lake Volney,

- Le Sueur Co., Minnesota. Ecol. Soc. Amer. Meetings. Snowbird, Utah.
- Umbanhowar, Jr., C.E. 1999. Fire history of the Big Woods. Presentation Nov. 11, Grinnell College.
- Umbanhowar Jr., C.E. 1999. Fire history of the Big Woods based on microscopic charcoal: A test of ideas and methods. Ecol. Soc. Amer. Meetings. Spokane, Washington.
- Umbanhowar Jr., C.E. 1999. Teaching biology students about the Big Woods: how to run GIS on a MacIntosh. Presentation at LMIC EPIC Conference, Earle Brown Center Oct. 25-26.
- Umbanhowar Jr., C.E. 1996. Recent Fire History of the Northern Great Plains. Presentation at Duke Department of Botany.
- Umbanhowar Jr., C.E. 1994. Recent fire history of the Northern Great Plains based on charcoal inputs to five lakes. Poster at 79th Ann. Ecol. Soc. Amer. meetings at Knoxville, Tennessee.
- Umbanhowar Jr., C.E., C.A. Bezanson, and J.A. Zischke. 1993. Composition and richness of wetland vascular plant communities. Poster at 78th Ann. Ecol. Soc. Amer. meetings at Madison, Wisconsin.
- Umbanhowar Jr., C.E. 1991. The dynamic prairie: disturbance and diversity. Presentation to Minnesota Native Plant Society. November 6.
- Umbanhowar Jr., C.E. 1991. Colonization of artificial earthen mounds in a northern mixed prairie: the first four years. Poster at 76th Ann. Ecol. Soc. of Amer. meetings in San Antonio, Texas.
- Umbanhowar Jr., C.E. 1990. Another look at the Vegetation of Wisconsin prairie continuum. Poster at 75th Ann. Ecol. Soc. Amer. meetings at Snowbird, Utah.
- Umbanhowar Jr., C.E. 1990. Distribution of Flodman's thistle and its response to different disturbances. pp. 193-195 in T. Bragg and J. Stubbendieck (eds.) Proceedings of the Eleventh N.A. Prairie Conference.
- Umbanhowar Jr., C.E. 1989. A comparison of the vegetation on four different patch-types in a northern mixed prairie. Talk at 74th Ecol. Soc. of Amer. meeting in Toronto, Canada.
- Umbanhowar Jr., C.E. 1988. The response of *Cirsium flodmani* to different disturbances in northern mixed prairie. Talk at Eleventh N.A. Prairie Conf.
- Umbanhowar Jr., C. and P. Jensen. 1984. Tasting behavior of *Formica obscuripes* Forel, the western thatching ant. Presentation at the Ninth North American Prairie Conference.

TECHNICAL REPORTS AND LETTERS

- Umbanhowar Jr., C.E. and M. McKone. 2000. Report on Rice County roadside prairie remnants. Final Report to Rice County Integrated Roadside Committee
- Umbanhowar Jr., C.E. and M. Olsen. 1997. Soils and classification of dry prairies in SE Minnesota. Preliminary report to the MN County Biological Survey.
- Umbanhowar Jr., C.E. 1993. Letter to the Editor. Bull. Ecol. Soc. of Am. 74:362-363
- Umbanhowar Jr., C.E., J. Zischke, and C. Bezanson. 1993. Vascular plant and aquatic invertebrate inventory of Rice County wetlands: final report to the Cannon River Watershed Partnership.
- Umbanhowar Jr., C.E.. 1991. Preliminary observations on fruit set of Platanthera praeclara Sheviak and Bowles on the Sheyenne National Grassland, ND. Section 6 Report to USFWS.
- Umbanhowar Jr., C.E. 1990. Regional lists of prairie herbs and forest trees for highway rights-of- way restoration and management: extracted from the Wisconsin Plant Ecology Laboratory files. Final Report to Wisconsin Dept. of Trans. (Proj. No. 0072-07-10).

AWARDS AND HONORS

Election to PKAL FACULTY 21		1993
Davis Summer Fellowship	UW Dept. of Botany	1987
NSF Graduate Fellowship - Honorable Mention		1985
B.A. magna cum laude	Carleton College	1985
Distinction on Senior Thesis	Carleton College	1985
Election to Phi Beta Kappa	Carleton College	1985
Election to Sigma XI	Carleton College	1985

ACADEMIC, PROFESSIONAL, AND COMMUNITY SERVICE

HHMI Project Director	St. Olaf College	2011-Pres.
Chair of Biology Dept	St. Olaf College	2009-2011
Program Director and Chair of Env. Studies	St. Olaf College	2003-2008
Campus Sustainability Task Force	St. Olaf College	2003-2004
Summer Research Director	St. Olaf College	2000-2004
Science Symposium Planning Committee	St. Olaf College	2002-2003
Review and Planning Committee (Secretary)	St. Olaf College	2002-2003
Chair of Green Task Force, Science Facilities	St. Olaf College	2002-2007
Science Facilities Design Team	St. Olaf College	2002-2008
Acting Chair, Biology Dept.	St. Olaf College	2002-2003
Campus Environmental Concerns Committee	St. Olaf College	2001-2002
Udall Scholarship Faculty Representative	St. Olaf College	2000-2007
FNSM Nominating Committee	St. Olaf College	2000-2001
Chair, Campus Classroom Council	St. Olaf College	1999-2001
Acting Program Director, Env. Studies	St. Olaf College	1999-2000
Science Facility Feasibility Taskforce	St. Olaf College	1998-2000
Academic Appeals Board	St. Olaf College	1995-1996
Human Subjects Committee	St. Olaf College	1994-1995
Campus Safety Committee	St. Olaf College	1994-1995
PBK Election Committee	St. Olaf College	1994-1996
Local Site Committee, F21 National Mtg of Project Kaleidoscope		1995
President and Cofounder of Owatonna Youth Curling		2002- 2003
Board Member of Owatonna Curling Club		1999-2002
Web Master for Minnesota Native Plant Society		1998-2004
President and Cofounder Friends of the Cannon River Wild. Area		1995- pres.
President of Minnesota Native Plant Society		1995-1998
Oversee Herbarium and Greenhouse	St. Olaf College	1992- pres.

MEMBERSHIPS

American Geophysical Union	Ecological Society of America
Ecological Society of America	Minnesota Native Plant Society
Phi Beta Kappa	Project Kaleidoscope Faculty 21
Sigma XI	