

CURRICULUM VITAE

[Lucas Emil Nave, Ph.D.](#)

Research Associate Professor
Michigan Technological University
Northern Institute of Applied Climate Science
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EDUCATION

<u>Institution</u>	<u>Major / Topic</u>	<u>Degree / Date</u>
Michigan Technological University	Postdoctoral research in soil organic matter dynamics (advisor: C. Swanston)	2010-2012
University of Michigan Biological Station	Postdoctoral research in forest ecology and biogeochemistry (advisor: K. Nadelhoffer)	2008-2012
Ohio State University	Postdoctoral research in forest ecology and management (advisor: P. Curtis)	2007-2009
Ohio State University	Evolution, Ecology, and Organismal Biology (advisor: P. Curtis)	Ph.D., 2007
Wittenberg University	Biology (dept. honors; <i>cum laude</i> advisor: R. deLanglade)	B.A., 2002

SCIENTIFIC INTERESTS

Forest ecology and management, forest soils, biogeochemistry, field botany and mycology, global change biology, isotopic techniques, data synthesis and meta-analysis

PROFESSIONAL APPOINTMENTS AND EXPERIENCE

2022 – present	-- -- --	Research Associate Professor, Michigan Technological University, College of Forest Resources and Environmental Science
2018 – 2022	-- -- --	Associate Research Scientist, University of Michigan, Biol. Station (UMBS) and Dept. of Ecol. and Evol. Biology
2012 – 2018	-- -- --	Assistant Research Scientist, University of Michigan, Biol. Station and Dept. of Ecol. and Evol. Biology
2010 – present	-- -- --	Scientist, Northern Institute of Applied Climate Science
2010 – 2017	-- -- --	Coordinator, International Soil Carbon Network
2008 – 2009	-- -- --	Adjunct Instructor, North Central Michigan College
2008 – 2012	-- -- --	Research Fellow, University of Michigan Biol. Station
2007 – 2009	-- -- --	Postdoctoral Researcher, Ohio State University
2002 – 2007	-- -- --	NSF-IGERT Ph.D. Fellow, Research Assistant, Teaching Assistant, Ohio State University and University of Michigan Biological Station
2001	-- -- --	Seasonal Technician, USDA Forest Service, Huron-Manistee National Forest, Mio, MI
1999 – 2002	-- -- --	Student Manager, Wittenberg University greenhouse and herbarium facilities, Springfield, OH
1996 – 1998	-- -- --	Farmhand, Rothlisberger Dairy, Upper Sandusky, OH

PEER-REVIEWED PUBLICATIONS

([†]denotes coauthorship by undergraduate researcher)

59. **Nave L.E.**, DeLyser K.D., Domke G.M., Holub S.M., Janowiak M.K., Keller A.B., Peters M.P., Solarik K.A., Walters B.F., Swanston C.W. 2024. Land use change and forest management effects on soil carbon stocks in the Northeast U.S. *Carbon Balance and Management* 19:5. DOI: 10.1186/s13021-024-00251-7.
58. Boyle G.J. [†], Kane E.S., **Nave L.E.**, Heckman K.A., Jurgensen M.F. 2024. Refinement of the carbon to loss on ignition relationship in forest soils. *Canadian Journal of Soil Science*. (accepted 2 January 2024).
57. Lawrence G., Fernandez I., Bailey S., Beier C., Contosta A., Lane E., Murdoch P., **Nave L.**, Quintana A., Ross D., White A. 2023. Forming regional soil carbon networks to support effective climate change solutions. *Soil Science Society of America Journal* 87:755-766. DOI: 10.1002/saj2.20551.
56. Heckman K.A., Possinger A.R., Badgley B., Bowman M., Gallo A.C., Hatten J.A., **Nave L.E.**, SanClements M.D., Swanston C.W., Weiglein T.L., Wieder W.R., Strahm, B.D. 2023. Moisture-driven divergence in mineral-associated soil carbon persistence. *Proceedings of the National Academy of Sciences of the United States* 120, e2210044120. DOI: 10.1073/pnas.2210044120.
55. Hickey L.J., Gough C.M., Clay C.C., Marini A.I., **Nave L.E.**, Nadelhoffer K.J. 2022. Mechanistically-grounded pathways connect remotely sensed canopy structure to soil respiration. *Science of the Total Environment* 851, 158267. DOI: 10.1016/j.scitotenv.2022.158267.
54. Gough C.M., Atkins J.W., Fahey R.T., Curtis P.S., Bohrer G., Hardiman B.S., Hickey L.J., **Nave L.E.**, Niedermaier K.M., Clay C.C., Tallant J.M., Bond-Lamberty B. 2022. Disturbance has variable effects on the structural complexity of a temperate forest landscape. *Ecological Indicators* 140, 109004. DOI: 10.1016/j.ecolind.2022.109004.
53. Possinger A.R., Heckman K.A., Bowman M.M., Gallo A.C., Hatten J.A., Matosziuk L.M., **Nave L.E.**, SanClements M.D., Swanston C.W., Weiglein T.W., Strahm B.D. 2022. Lignin and fungal abundance modify manganese effects on soil organic carbon persistence at the continental scale. *Geoderma* 425, 116070. DOI: 10.1016/j.geoderma.2022.116070
52. **Nave L.E.**, DeLyser K.D., Domke G.M., Holub S.M., Janowiak M.J., Ontl T.A., Sprague E., Viau N.R., Walters B.F., Swanston, C.W. 2022. Soil carbon in the South Atlantic United States: land use change, forest management, and physiographic context. *Forest Ecology and Management* 520, 120410. DOI: 10.1016/j.foreco.2022.120410.
51. Todd-Brown K., Abramoff R., Beem-Miller J., Blair H., Earl S., Frederick K., Fuka D., Guevara M., Harden J., Heckman K., Heran L., Holmquist J., Hoyt A., Klinges D., LeBauer D., Malhotra A., McClelland S., **Nave L.**, Rocci K., Schaeffer S., Stoner S., von Fromm S., van Gestel N., Younger M. 2022. The promise of big soil data: moving current practices towards future potential. *Biogeosciences* 19, 3505-3522. DOI: 10.5194/bg-2021-323
50. Clay C., **Nave L.**, Nadelhoffer K., Vogel C., Propson B. [†], Den Uyl J., Hickey L., Gough C. 2022. Fire after clear-cut harvesting minimally affects the recovery of ecosystem carbon pools and fluxes in a Great Lakes forest. *Forest Ecology and Management* 519, 120301. DOI: 10.1016/j.foreco.2022.120301.
49. **Nave L.E.**, DeLyser K., Domke G.M., Holub S.M., Janowiak M.K., Kittler B., Ontl T.A., Sprague E., Sucre E.B., Walters B.F., Swanston C.W. 2022. Disturbance and management effects on forest soil organic C stocks in the Pacific Northwest. *Ecological Applications* 32, e2611. DOI: 10.1002/eap.2611.
48. Weiglein T.L., Strahm B.D., Bowman M.M., Gallo A.C., Hatten J.A., Heckman K.A., Matosziuk L.M., **Nave L.E.**, Possinger A.R., SanClements M.D., Swanston C.W. 2022. Key predictors of

- soil organic matter vulnerability to mineralization differ with depth at a continental scale. *Biogeochemistry*, DOI: 10.1007/s10533-021-00856-x.
47. Heckman K.A., Swanston C.W., Torn M., Hanson P.J., **Nave L.E.**, Porras R.C., Stanovick J.S., Mishra U., Bill M. 2021. Soil organic matter is principally root derived in an Ultisol under oak forest. *Geoderma* 403, 115385. DOI: 10.1016/j.geoderma.2021.115385.
 46. Possinger A.R., Weiglein T.L., Bowman M.M., Gallo A.C., Hatten J.A., Heckman K.A., Matosziuk L.M., **Nave L.E.**, SanClements M.D., Swanston C.W. 2021. Climate effects on subsoil carbon loss mediated by soil chemistry. *Environmental Science and Technology*, DOI: 10.1021/acs.est.1c04909.
 45. Lal R., Monger C., **Nave L.**, Smith, P. 2021. The role of soil in regulation of climate. *Philosophical Transactions of the Royal Society B*, DOI: 10.1098/rstb.2021.0084.
 44. Gough C.M., Bohrer G., Hardiman B.S., **Nave L.E.**, Vogel C.S., Atkins J., Bond-Lamberty B., Fahey R.T., Fotis A.T., Grigri M.S., Haber L.T., Yang J., Kleinke C.L., Mathes K.C., Nadelhoffer K.J., Stuart-Haëntjens E., Curtis P.S. 2021. Disturbance-accelerated succession increases the production of a temperate forest. *Ecological Applications* 31, DOI: <https://doi.org/10.1002/eap.2417>.
 43. **Nave L.E.**, DeLyser K., Domke G.M., Janowiak M.K., Ontl T.A., Sprague E., Walters B.F., Swanston C.W. 2021. Land use and management effects on soil carbon in the Lake States, with emphasis on forestry, fire, and reforestation. *Ecological Applications* 31, e02356. DOI: 10.1002/eap.2356. [Selected as a 2021 USDA-Forest Service Northern Research Station Director's Choice Research Highlight](#).
 42. **Nave L.E.**, Bowman M., Gallo A., Hatten J.A., Heckman K.A., Matosziuk L., Possinger A.R., SanClements M., Sanderman J., Strahm B.D., Weiglein T.L., Swanston C.W. 2021. Patterns and predictors of soil organic carbon storage across a continental-scale network. *Biogeochemistry*. DOI: 10.1007/s10533-020-00745-9.
 41. Heckman K.A., **Nave L.E.**, Bowman M., Gallo A., Hatten J.A., Matosziuk L., Possinger A.R., SanClements M., Strahm B.D., Weiglein T.L., Rasmussen C., Swanston C.W. 2021. Divergent controls on carbon concentration and persistence between forests and grasslands of the conterminous U.S. *Biogeochemistry*. DOI: 10.1007/s10533-020-00725-z.
 40. Mishra U., Hugelius G., Shelef E., Yang Y., Strauss J., Lupachev A., Harden J.W., Jastrow J.D., Ping C., Riley W.J., Schuur E.A.G., Matamala R., Siewert M., **Nave L.E.**, Koven C.D., Fuchs M., Palmtag J., Kuhry P., Treat C.C., Zubrzycki S., Hoffman F., Elberling B., Camill P., Veremeeva A., Orr A. 2021. Spatial heterogeneity and environmental predictors of permafrost region soil organic carbon stocks. *Science Advances* 7: eaaz5236. DOI: 10.1126/sciadv.aaz5236.
 39. Sulman B., Harden J., He Y., Treat C., Koven C., Mishra U., O'Donnell J., **Nave L.** 2020. Land use and land cover affect the depth distribution of soil carbon: insights from a large database of soil profiles. *Frontiers in Environmental Science*. DOI: 10.3389/fenvs.2020.00146
 38. **Nave L.E.**, Swanston C.W. 2020. Midwest Regional Appendix. In: Forest and rangeland soils of the United States under changing conditions: a comprehensive science synthesis. Pouyat R., Page-Dumroese D., Patel-Weynand T., Geiser L., eds. Springer International Publishing. DOI: doi.org/10.1007/978-3-030-45216-2
 37. Guevara M., Arroyo C., Brunzell N., Cruz C., Domke G., Equihua J., Etchevers J., Hayes D., Hengl T., Ibelles A., Johnson K., de Jong B., Libohova Z., Llamas R., **Nave L.**, Ornelas J., Paz F., Ressler R., Schwartz A., Victoria A., Wills S., Vargas R. 2020. Soil organic carbon across Mexico and the conterminous United States (1991-2010). *Global Biogeochemical Cycles* 34: e2019GB006219. DOI: 10.1029/2019GB006219

36. Wales S.B., Kreider M.R., Atkins J., Holshof C.M., Fahey R.T., **Nave L.E.**, Nadelhoffer K.J., Gough C.M. 2020. Stand age, disturbance history, and the temporal stability of forest production. *Forest Ecology and Management* 460: 117865. DOI: 10.1016/j.foreco.2020.117865
35. **Nave L.E.**, Marín-Spiotta E., Ontl T.A., Peters M.P., Swanston C.W. 2019. Soil Carbon Management. Chapter 17 in: *Global Change and Forest Soils: Cultivating Stewardship of a Finite Natural Resource*. Busse M., Giardina C., Morris D., Page-Dumroese D., eds. Volume 36 in the Developments in Soil Science Series, 544pp. Elsevier Science Publishing, Amsterdam. ISBN: 9780444639981
34. Fahey R.T., Atkins J.W., Gough C.M., Hardiman B.S., **Nave L.E.**, Tallant J.M., Nadelhoffer K.J., Vogel C.S., Sheuermann C.M., Stuart-Haentjens E.J., Haber L.T., Fotis A.T., Curtis P.S. 2019. Defining a spectrum of integrative trait-based canopy structural types. *Ecology Letters* 22:2049-2059. DOI: 10.1111/ele.13388
33. Malhotra A., Todd-Brown K., **Nave L.E.**, Batjes N.H., Holmquist J.R., Hoyt A.M., Iversen C.M., Jackson R.B., Lajtha K., Lawrence C., Vinduskova O., Wieder W., Williams M., Hugelius G., Harden J. 2019. The landscape of soil carbon data: emerging questions, synergies, and databases. *Progress in Physical Geography: Earth and Environment* 1-13. DOI: 10.1177/0309133319873309.
32. **Nave L.E.**, DeLyser K., Butler-Leopold P.R., Sprague E., Daley J., Swanston C.W. 2019. Effects of land use and forest management on soil carbon in the ecoregions of Maryland and adjacent eastern United States. *Forest Ecology and Management* 448: 34-47. DOI: 10.1016/j.foreco.2019.05.072.
31. Hofmeister K.L., **Nave L.E.**, Drevnick P.E., Veverica T.J., Knudstrup R.V., Heckman K.A., Riha S.J., Schneider R.L., Walter M.T. 2019. Seasonal dynamics and exports of elements from a first-order stream to a large inland lake in Michigan. *Hydrological Processes* 33: 1476-1491. DOI: 10.1002/hyp.13416.
30. **Nave L.E.**, Gough C.M., Le Moine J., Nadelhoffer K.J. Multi-decadal trajectories of soil chemistry and nutrient availability following cutting vs. burning disturbances in upper Great Lakes forests. 2019. *Canadian Journal of Forest Research* 49: 731-742. DOI: 10.1139/cjfr-2018-0211.
29. **Nave L.E.**, Covarrubias Ornelas A. †, Drevnick P.E., Gallo A., Hatten J.A., Heckman K.A., Matosziuk L., Sanclements M., Strahm B.D., Veverica T.J., Weiglein T.L., Swanston C.W. 2019. Carbon-mercury interactions in Spodosols assessed through density fractionation, radiocarbon analysis, and soil survey information. *Soil Science Society of America Journal* 83: 190-202. DOI: 10.2136/sssaj2018.06.0227.
28. Zak D., Pellitier P., Argiroff W., Castillo B., James T., **Nave L.**, Averill C., Beidler K., Talbot J., Blesh J., Classen A., Craig M., Fernandez C., Gundersen P., Johansen R., Koide R., Lilleskov E., Lindahl B., Nadelhoffer K., Phillips R., Tunlid A. 2019. Exploring the role of ectomycorrhizal fungi in soil organic matter dynamics. *New Phytologist* 223: 33-39. DOI: 10.1111/nph.15679.
27. Hofmeister K.L., **Nave L.E.**, Riha S.J., Schneider R.L., Walter M.T. 2019. A Test of Two Spatial Frameworks for Representing Spatial Patterns of Wetness in a Glacial Drift Watershed. *Vadose Zone Journal* 18: 180054. DOI: 10.2136/vzj2018.03.0054.
26. Dumroese R.K., Balloffet N., Crockett J.W., Stanturf J.A., **Nave L.E.** 2019. A national approach to leverage the benefits of tree planting on public lands. *New Forests* 50: 1-9. DOI: 10.1007/s11056-019-09703-2.
25. **Nave L.E.**, Walters B.F., Hofmeister K.L., Perry C.H., Mishra U., Domke G.M., Swanston C.W. 2019. The role of reforestation in carbon sequestration. *New Forests* 50: 115-137. DOI: 10.1007/s11056-018-9655-3.

24. Scheuermann C.J., **Nave L.E.**, Fahey R.T., Nadelhoffer K.J., Gough C.M. 2018. Effects of canopy structure and species diversity on primary production in upper Great Lakes forests. *Oecologia* 188: 405-414.
23. **Nave L.E.**, Domke G.M., Hofmeister K.L., Mishra U., Perry C.H., Walters B.F., Swanston C.W. 2018. Reforestation can sequester two petagrams of carbon in U.S. topsoils in a century. *Proceedings of the National Academy of Sciences of the United States* 115: 2776-2781. ([Link to UM press release](#))
22. Castillo B.T., Le Moine J., **Nave L.E.**, James T.Y., Nadelhoffer K.J. 2018. Impacts of experimentally accelerated forest succession on belowground plant and fungal communities. *Soil Biology and Biochemistry* 125: 44-53.
21. Harden J.W., Hugelius G., Ahlström A., Blankinship J.C., Bond-Lamberty B., Lawrence C.R., Loisel J., Malhotra A., Jackson R.B., Ogle S., Phillips C., Ryals, R., Todd-Brown K., Vargas R., Vergara S.E., Cotrufo F., Keiluweit M., Heckman K.A., Crow S.E., Silver W.L., DeLonge M., **Nave L.E.** 2018. Networking our science to characterize the state, vulnerabilities, and management opportunities of soil organic matter. *Global Change Biology* 24: e705-e718. ([Link to UM press release](#)). (**Web of Science highly cited paper**).
20. **Nave L.E.**, Heckman K.A., Muñoz A.B.[†], Swanston C.W. 2017. Radiocarbon suggests the hemiparasitic annual *Melampyrum lineare* Desr. may acquire carbon from stressed hosts. *Radiocarbon* 60: 269-281.
19. **Nave L.E.**, Drevnick P.E., Heckman K.A., Hofmeister K.L., Veverica T.J., Swanston, C.W. 2017. Soil hydrology, physical and chemical properties and the distribution of carbon and mercury in a postglacial lake-plain wetland. *Geoderma* 305: 40-52.
18. **Nave L.E.**, Gough C.M., Perry C.H., Hofmeister K.L., Le Moine J., Domke G.M., Swanston, C.W., Nadelhoffer K.J. 2017. Physiographic factors underlie rates of biomass production during succession in Great Lakes forest landscapes. *Forest Ecology and Management* 397: 157-173.
17. Domke G.M., Perry C.H., Walters B.F., **Nave L.E.**, Woodall C.W., Swanston C.W. 2017. Toward inventory-based estimates of soil organic carbon in forests of the United States. *Ecological Applications* 27: 1223-1235.
16. Liebman E.[†], Yang J.[†], **Nave L.E.**, Nadelhoffer K.J., Gough C.M. 2017. Soil respiration in Upper Great Lakes old-growth forest ecosystems. *BIOS* 88: 105-115.
15. **Nave L.E.**, Sparks J.P., Le Moine J., Hardiman B.S., Nadelhoffer K.J., Tallant J.M., Vogel C.S., Strahm B.D., Curtis P.S. 2014. Changes in soil nitrogen cycling in a northern temperate forest ecosystem during succession. *Biogeochemistry* 121: 471-488.
14. McLauchlan K., Higuera P.E., Gavin D.G., Perakis S.S., Mack M.C., Alexander H., Battles J., Biondi F., Buma B., Colombaroli D., Enders S., Engstrom D.R., Hu F.S., Marlon J.R., Marshall J., McGlone M., Morris J.L., **Nave L.E.**, Shuman B.N., Smithwick E., Urrego D.H., Wardle D.A., Williams C.J., Williams J.J. 2014. Reconstructing disturbances and their biogeochemical consequences over multiple timescales. *BioScience* 64: 105-116.
13. Gough C.M., Hardiman B.S., **Nave L.E.**, Bohrer G., Maurer K.D., Vogel C.S., Nadelhoffer K.J., Curtis P.S. 2013. Sustained carbon uptake and storage following moderate disturbance in a Great Lakes forest. *Ecological Applications* 23:1202-1215.
12. Hardiman B.S., Gough C.M., Halperin A.[†], Hofmeister K.L.[†], **Nave L.E.**, Bohrer G., Curtis P.S. 2013. Maintaining high rates of carbon storage in old forests: A mechanism linking canopy structure to forest function. *Forest Ecology and Management* 298: 111-119.
11. **Nave L.E.**, Nadelhoffer K.J., Le Moine J., van Diepen L.T.A., Cooch J.K.[†], van Dyke N.J.[†] 2013. Nitrogen uptake by trees and mycorrhizal fungi in a successional northern temperate forest: insights from multiple isotopic methods. *Ecosystems* 16: 590-603.

10. **Nave L.E.**, Swanston C.W., Mishra U., Nadelhoffer K.J. 2013. Afforestation effects on soil carbon storage in the United States: a synthesis. *Soil Science Society of America Journal* 77: 1035-1047. ([Link to press release](#) that appeared in >15 outlets).
9. **Nave L.E.**, Gough C.M., Maurer K.D., Bohrer G., Hardiman B.S. Le Moine J., Muñoz A.B[†], Nadelhoffer K.J., Sparks J.P., Strahm B.D., Vogel C.S., Curtis P.S. 2011. Disturbance and the resilience of coupled carbon and nitrogen cycling in a northern temperate forest. *Journal of Geophysical Research- Biogeosciences* 116, G04016.
8. **Nave L.E.**, Curtis P.S. 2011. Uptake and partitioning of simulated atmospheric N inputs in *Populus tremuloides* – *Pinus strobus* forest mesocosms. *Botany* 89: 379-386.
7. **Nave L.E.**, Vance E.D., Swanston C.W., Curtis P.S. 2011. Fire effects on temperate forest soil C and N storage. *Ecological Applications* 21: 1189-1201.
6. **Nave L.E.**, Vance E.D., Swanston C.W., Curtis P.S. 2010. Harvest impacts on soil carbon storage in temperate forests. *Forest Ecology and Management* 259: 857-866. (**Web of Science highly cited paper**)
5. **Nave L.E.**, Vance E.D., Swanston C.W., Curtis P.S. 2009. Impacts of elevated N inputs on north temperate forest soil C storage, C/N, and net N-mineralization. *Geoderma* 153: 231-240.
4. **Nave L.E.**, Vogel C.S., Gough C.M., Curtis P.S. 2009. The contribution of atmospheric nitrogen deposition to net primary productivity in a northern hardwood forest. *Canadian Journal of Forest Research* 39: 1108-1118.
3. **Nave L.E.** 2007. Nitrogen cycling in the northern hardwood forest: soil, plant, and atmospheric processes. Dissertation, 102 pp.
2. **Nave L.E.**, Gough C.M. 2006. Quantifying ecological change using stable isotopes: digging deep into the past to predict the future. *New Phytologist* 171: 3-5.
1. Averett J.M., Klips R.A., **Nave L.E.**, Frey S.D., Curtis P.S. 2004. The effects of soil carbon amendment on nitrogen availability and plant growth in an experimental tallgrass prairie restoration. *Restoration Ecology* 12:567-573.

ORAL PRESENTATIONS (1st author only)

(* denotes invited presentation)

42. ***Nave, L.E.** Climate change and forest carbon: a long-term perspective on management. Seminar Series Presentation to the College of Forest Resources and Environmental Science, Michigan Technological University. 16 March 2023.
41. ***Nave, L.E.** Climate change and forest carbon: a long-term perspective on management. Presentation to the Climate, People, and the Environment Program, Center for Climatic Research, Nelson Institute for Environmental Studies, University of Wisconsin- Madison. 7 March 2023. <https://www.youtube.com/watch?v=04aTwAzCuio>
40. ***Nave L.E.**, Connolly S.J., Hagarty B. Soil carbon and climate change. Module 8 (of 8 total) in National Soils NEPA Training, 31 January – 2 February and 7 February – 9 February 2023.
39. ***Nave L.E.**, DeLyser K.D., Domke G.M., Holub S.M., Janowiak M.J., Kittler B., Leopold P.R., Ontl T.A., Peters M.P., Solarik K., Sprague E., Sucre E.B., Viau N.R., Walters B.F., Swanston C.W. From data to decision support: research and tools supporting soil carbon management. Forest Inventory and Analysis (FIA) Annual Science Stakeholder Meeting, 17 November 2022. (Virtual)
38. **Nave L.E.**, DeLyser K.D., Domke G.M., Holub S.M., Janowiak M.J., Ontl T.A., Sprague E., Viau N.R., Walters B.F., Swanston, C.W. Land use and management effects on soil carbon stocks in the South Atlantic States. ASA-CSSA-SSSA International Annual Meeting, Baltimore, MD, 8 November 2022.

37. *Nave L.E., Swanston C.W. Fifteen years of meta-analysis in forest soils: assessing impacts of management on soil carbon across spatial scales. RUBISCO Soil Carbon Working Group monthly webinar, 27 April 2022.
36. *Nave L.E., Swanston C.W. Fifteen years of meta-analysis in forest soils: assessing impacts of management on soil carbon across spatial scales. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, 7 November 2021.
35. Nave L.E., DeLyser K. Lake States Forest Soil Carbon Management Tools. Webinar for policy and management professionals. 30 June 2021.
34. *Nave L.E., DeLyser K. Forest Soil Carbon Partnership: Assessing Management Impacts, Vulnerability, and Policy Implications. Webinar for the USDA-Forest Service First Friday All Climate Change Talks (FFACCTs), 2 October 2020.
33. *Nave L.E., DeLyser K. Carbon trends and management. National Council for Air and Stream Improvement, Climate Change Webinar, 11 August 2020.
32. Nave L.E., DeLyser K., Butler-Leopold P.R., Sprague E., Daley J., Swanston C.W. Quantifying forest management impacts on soil carbon using meta-analysis, data synthesis, and remote sensing. American Geophysical Union Fall Meeting, San Francisco, 10 December 2019.
31. *Nave L.E., DeLyser K. Forest soil carbon: management, policy implications, vulnerability. Webinar for the Forest-Climate Working Group Learning Exchange Series, 2 October 2019.
30. *Nave L.E. Soil carbon management. Webinar for the annual meeting of the Forest Climate Working Group, Washington, D.C., 25 October 2018.
29. *Nave L.E. Global change meets local landscapes: research on problems and solutions at the University of Michigan Biological Station. Presentation to the Michigan Alumni Spirit Group of Little Traverse Bay, Petoskey, MI, 8 August 2018.
28. *Nave L.E. Soil Carbon Management. Enhancing Long-term Soil C Sequestration by Ectomycorrhizal Fungi: a workshop at the University of Michigan, 21-22 May 2018.
27. *Nave L.E., Walters B.F., Perry C.H., Domke G.M., Hofmeister K.L., Swanston C.W. The role of reforestation in carbon sequestration. Reforestation Matters: A summit on the scientific basis for reforestation planning by the USDA-Forest Service. Portland, OR, 13-14 April 2017.
26. *Nave L.E. International Soil Carbon Network: Data, training and synthesis at the North American level. **Plenary presentation** to the 2017 Joint AmeriFlux and North American Carbon Program Principal Investigators Meeting. Bethesda, MD, 28 March 2017.
25. *Nave L.E. Physiographic factors control carbon distribution and biogeochemical cycling in a glaciated northern forest landscape. University of Michigan, Department of Ecology and Evolutionary Biology Seminar Series. Ann Arbor, MI, 22 September 2016.
24. *Nave L.E. New ecosystem and soil biogeochemistry research at UMBS: status and research opportunities. UMBS Winter Research Meeting. Ann Arbor, MI, 20 February 2015.
23. *Nave L.E., Hatten J., Strahm B., SanClements M., Heckman K., Swanston C., McKnight D. A continental-scale assessment of linkages between soil organic matter stabilization mechanisms, controls and vulnerability. ASA-CSSA-SSSA International Annual Meeting, Long Beach, CA. 3 November 2014.
22. *Nave L.E. Soil and belowground process changes during the first four years of the Forest Accelerated Succession Experiment. UMBS Winter Research Meeting. Ann Arbor, MI, 21 February 2014.
21. *Nave L.E., Le Moine J., Hardiman B.S., Sparks J.P., Strahm B.D., Vogel C.S., Nadelhoffer K.J., Curtis P.S. Belowground processes regulate ecosystem nitrogen retention during a multi-year

- forest dieback event. ASA-CSSA-SSSA International Annual Meeting, Tampa, FL. 5 November 2013.
20. ***Nave L.E.** Forest Succession at the University of Michigan Biological Station. Presentation to the Petoskey Regional Audubon Society. Petoskey, MI, 8 October 2013.
 19. ***Nave L.E.** Forest Succession at the University of Michigan Biological Station. Presentation to the UMBS Garden Party. Ann Arbor, MI, 23 February 2013.
 18. ***Nave L.E.**, Le Moine J., Nadelhoffer K.J., van Diepen L.T.A., Cooch J.K.†, Van Dyke N.J.† Recent changes in belowground processes in the Forest Accelerated Succession Experiment (FASET). UMBS Winter Research Meeting. Ann Arbor, MI, 22 February 2013.
 17. **Nave L.E.**, Sparks J.P., Le Moine J., Hardiman B.S., Nadelhoffer K.J., Strahm B.D., Curtis P.S. Soil inorganic nitrogen cycling during successional change in a northern temperate forest. American Geophysical Union Fall Meeting, San Francisco, 5 December 2012.
 16. ***Nave L.E.** Forest Succession at the University of Michigan Biological Station. Invited presentation to the Straits Area Audubon Society, Cheboygan, MI, 12 September 2012.
 15. ***Nave L.E.**, Muñoz A.B.† Biogeochemistry of hemiparasitism in the herbaceous annual *Melampyrum lineare*. UMBS Winter Research Meeting. Ann Arbor, MI, 9 March 2012.
 14. ***Nave L.E.**, Gough C.M., Maurer K.D., Bohrer G., Hardiman B.S., Le Moine J., Muñoz A.B.†, Nadelhoffer K.J., Sparks J.P., Strahm, B.D., Vogel C.S., Curtis P.S. Biogeochemical changes during large-scale aspen dieback at the University of Michigan Biological Station. University of Michigan, Department of Ecology and Evolutionary Biology lunch seminar series. Ann Arbor, MI, 6 March 2012.
 13. **Nave L.E.**, Vance E.D., Swanston C.W., Curtis P.S. Fire effects on temperate forest soil carbon and nitrogen storage. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX. 17 October 2011.
 12. Nave L.E., **Nadelhoffer K.J.**, Le Moine J., Hardiman B.S., Sparks J.P., Strahm B.D., Munoz A.B.†, Gough C.M., Vogel C.S., Curtis P.S. Disturbance and decoupling of belowground carbon and nitrogen cycles in a northern temperate forest. 96th Ecological Society of America Annual Meeting, Austin, TX. 10 August 2011.
 11. ***Nave L.E.**, Nadelhoffer K.J., Le Moine J., Hardiman B.S., Sparks J.P., Strahm B.D., Munoz A.B.†, Gough C.M., Vogel C.S., Curtis P.S. Disturbance, decoupling and resilience of belowground carbon and nitrogen cycles in a northern temperate forest. North American Forest Ecology Workshop, Roanoke VA. 21 June 2011.
 10. ***Nave L.E.** The potential for soil carbon sequestration. In: Forest and Grassland Carbon in North America: A Short Course for Land Managers. Swanston C., Furniss M., Schmitt K., Guntle J., Janowiak M., Hines S. General Technical Report NRS-93. Newtown Square, PA: USDA-Forest Service, Northern Research Station. 29 March 2011.
 9. **Nave L.E.**, Johnson K.D., Harden J.A., Swanston, C.W. National Soil Carbon Network database development. American Geophysical Union Fall Meeting, San Francisco, CA. 16 December 2010 (Town Hall Meeting).
 8. **Nave L.E.**, Swanston C.W. Big data for big questions: Global soil change and the National Soil Carbon Network. American Geophysical Union Fall Meeting, San Francisco, CA. 15 December 2010.
 7. **Nave L.E.**, Nadelhoffer K.J., Le Moine J., Smith M. Variation in soil nitrogen availability and substrate use affect the ¹⁵N signatures of trees, saprotrophic and ectomycorrhizal fungi. Ecological Society of America Annual Meeting, Pittsburgh, PA. 4 August 2010.

6. *Curtis P.S., **Nave L.E.** Carbon sequestration and aging forests. Stewardship Network Webcast. 11 November 2009.
5. **Nave L.E.**, Vance E.D., Swanston C.W., Curtis P.S. The effects of forest harvesting on soil carbon storage: a meta-analysis. ASA-CSSA-SSSA International Annual Meeting, Pittsburgh, PA. 3 November 2009 (**Best Paper Award**, Measuring and Accounting for Soil Carbon Pools Session).
4. ***Nave L.E.** Nitrogen availability and acquisition by forest trees at UMBS. UMBS Summer Seminar Series. 15 July 2009.
3. ***Nave L.E.**, Vance E.D., Swanston C.W., Curtis P.S. The effects of forest harvesting on soil C storage: a meta-analysis. Carbon in Northern Forests Conference, Traverse City, MI. 11 June 2009.
2. **Nave L.E.** Nitrogen cycling in the northern hardwood forest: Soil, plant, and atmospheric processes. Ph.D. Seminar, Ohio State University, Columbus. 9 November 2007.
1. **Nave L.E.**, Curtis P.S., Friend A.L., Vance E.D. Quantifying the effects of forest management on soil carbon and nitrogen cycling. ASA-CSSA-SSSA International Annual Meeting, New Orleans, LA. 6 November 2007.

1st AUTHOR POSTERS & NON-PEER REVIEWED PUBLICATIONS

(*denotes invited presentation or publication)

16. **Nave L.E.**, DeLyser K., Domke G.M., Holub S.M., Sucre E., Walters B.F., Swanston C.W. Impacts of land use and forest management on soil organic carbon stocks at ecoregional to landscape levels: case studies from three ecoregions of the U.S. ASA-CSSA-SSSA International Annual Meeting (virtual). 9-13 November 2020.
15. **Nave L.E.**, Domke G.M., Hofmeister K.L., Mishra U., Perry C.H., Walters B.F., Swanston C.W. The role of reforestation in carbon sequestration. American Geophysical Union Fall Meeting, New Orleans, 12 December 2017.
14. **Nave L.E.**, Gough C.M., Le Moine J., Nadelhoffer K.J. 2016. Landform and soils control successional trajectories of forest composition and biomass accumulation in a north-temperate forest landscape. American Geophysical Union Fall Meeting, San Francisco, 13 December 2016.
13. Domke G.M., Perry C.H., Walters B.F., Woodall C.W., **Nave L.E.**, Swanston C.W. 2015. Estimating carbon in forest soils of the United States using the national forest inventory. In: Stanton, Sharon M.; Christensen, Glenn A., comps. 2015. Pushing boundaries: new directions in inventory techniques and applications: Forest Inventory and Analysis (FIA) Symposium, Portland, OR, 8-10 December 2015. Gen. Tech. Rep. PNW-GTR-931. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 361pp.
12. **Nave L.E.** Carbon-bulk density relationships for highly weathered soils of the Americas. American Geophysical Union Fall Meeting, San Francisco, 16 December 2014.
11. *McFarlane K., Finzi A., **Nave L.**, Tang J. 2014. Recommendations for belowground carbon data and measurements for the AmeriFlux Network. An invited white paper prepared for the U.S. Department of Energy AmeriFlux Network Program.
10. **Nave L.E.**, Swanston C.W., Mishra U., Nadelhoffer K.J. Afforestation effects on soil carbon storage in the United States: meta-analysis, stable isotopes, and a geospatial soil carbon database. ASA-CSSA-SSSA International Annual Meeting, Cincinnati, 22-24 October 2012.
9. **Nave L.E.**, Mishra U., Nadelhoffer K.J., Swanston C.W. Afforestation effects on soil carbon storage: An assessment for the United States based on meta-analysis, stable isotopes, and a

- geospatial soil carbon database. BIOGEOMON 2012: 7th International Symposium on Ecosystem Behaviour, Northport, ME. 15-20 July 2012.
8. *Nave L.E., Swanston C.W., Johnson K.D., Harden J.A., Agarwal D.A., Humphrey M., Van Ingen C. The National Soil Carbon Network: Advancing carbon cycle science through data synthesis. 3rd North American Carbon Program All-investigators meeting, 3 February 2011.
 7. Nave L.E., Nadelhoffer K.J., Le Moine J., Hardiman B.S., Sparks J.P., Strahm B.D., Muñoz A.B.[†], Gough C.M., Vogel C.S., Curtis P.S. Disturbance and decoupling of belowground carbon and nitrogen cycles in a northern temperate forest. American Geophysical Union Fall Meeting, San Francisco. 7 December 2011.
 6. *Gough C.M., Nave L.E. 2011. Biogeochemical cycles in future forests: Linking structure and function with multiple research approaches at the University of Michigan Biological Station. FluxLetter, newsletter of the FLUXNET Network (October 2011).
 5. Nave L.E., Vance E.D., Swanston C.W., and Curtis P.S. A meta-analysis of timber harvest and site preparation effects on soil carbon storage. American Geophysical Union Fall Meeting, San Francisco. 14 December 2008.
 4. Nave L.E., Vogel C.S., Gough C.M., and Curtis P.S. The nitrogen budget of a northern hardwood forest: Sources and net primary productivity requirements. American Geophysical Union Fall Meeting, San Francisco. 12 December 2006.
 3. Nave L.E. The fate of wet nitrogen deposition within forest mesocosms. SIBAE-BASIN conference: Stable Isotopes as Tracers of Ecological Change, Tomar, Portugal. 14 March 2006.
 2. Nave L.E. 2005. The nitrogen budget of a northern hardwood forest: Annual requirements and atmospheric inputs. Biosphere-Atmosphere Research and Training Spring Conference, University of Michigan Biological Station. 10-12 May 2005.
 1. Nave L.E. The nitrogen budget of a northern hardwood forest: annual requirements and atmospheric inputs. Midwest Ecology and Evolution Conference, Carbondale, IL. 14 March 2005.

DATA PRODUCTS

5. Nave L., Gough C., Nadelhoffer K. 2024. Forest tree, woody debris, root ingrowth, soil respiration and characterization data from long-term research plots for LTREB at the University of Michigan Biological Station. Version 9. Environmental Data Initiative. <https://doi.org/10.6073/pasta/b47e7e6f05d6fcd7136c1e28f23e5217> Link last verified 15 February 2024.
4. Nave L.E., Heckman K.A., Bowman M., Gallo A.C., Hatten J.A., Matosziuk L., Possinger A.R., SanClements M., Strahm B., Weiglein T.L., Swanston, C.W. 2021. Soil Organic Matter Mechanisms of Stabilization (SOMMOS) - enhanced soil characterization data from 40 National Ecological Observatory Network (NEON) sites ver 2. Environmental Data Initiative. <https://doi.org/10.6073/pasta/4d5f03a4619e834c031ab4a6a121de12> Link last verified 6 December 2021.
3. Nave L.E., DeLyser K., Domke G.M., Janowiak M.K., Ontl T.A., Peters M.P., Sprague E., Walters B.F., Swanston C.W. 2021. Decision support tools for soil carbon management in the Lake States. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2021-0017> Link last verified 15 October 2021.
2. Nave L., Johnson K., van Ingen C., Agarwal D., Humphrey M., Beekwilder N. 2017. International Soil Carbon Network (ISCN) Database, Version 3-1. DOI: 10.17040/ISCN/1305039. Database Report: ISCN_SOC-DATA_PROFILE_1-1. <ftp://ftp.fluxdata.org/.deba/ISCN/SOC->

DATA/ISCN_SOC-DATA_PROFILE_1-1.xlsx. Link last verified 8 July 2019. (Many similar products available at <iscn.fluxdata.org>).

1. International Soil Carbon Network. 2012. ISCN Database: Profile Carbon to 1m Depth. <http://bwc.lbl.gov/StaticReports/ISCN/Carbonto1M_LATEST.xls>. Link last verified 8 July 2019. (Many similar products available at <iscn.fluxdata.org>).

WORKSHOPS AND CONFERENCE SESSIONS

21. Co-chair of oral and poster sessions at the ASA-CSSA- SSSA International Annual Meeting, 31 October 2023. Forest, Range, and Wildland Soils. Over 50 participants.
20. Co-organizer of the NEON Great Lakes User Group 2023 workshop. Worked as part of a 7-member planning committee to organize and implement workshop activities and logistics for 28 participants to tour NEON field sites in northern Wisconsin and discuss projects and collaboration opportunities. Woodruff, WI, 27-30 September 2023.
19. Co-facilitator (with other NIACS staff) of the workshop “Carbon Stewardship in Southeastern Wisconsin: Integrating carbon into natural resource management.” Organized breakout groups and discussions, answered technical questions related to carbon management and climate adaptation for 25 assembled professionals from land management organizations including Federal, State, and local governments, nonprofit conservancies, and private contractors. East Troy, WI, 12 September 2023.
18. Co-chair of an oral session at the ASA-CSSA- SSSA International Annual Meeting, 8 November 2022. Forest, Range, and Wildland Soils. Over 50 participants.
17. Organizer of a poster session, and co-chair of an oral symposium at the ASA-CSSA- SSSA International Annual Meeting, 7-10 November 2021. Soil in the Era of Big Data: Meta-analyses, Syntheses, and Databases. Over 100 participants.
16. Organizer and chair of a breakout session at the 2017 Joint AmeriFlux and North American Carbon Program Principal Investigators Meeting. Title: Soil carbon science and data support carbon cycle management and policy. Bethesda, MD, 28 March 2017. Twenty-five participants.
15. Organizer and co-chair of oral (B31L, B32E) and poster (B21I) sessions at the 2016 American Geophysical Union Fall Meeting (12-16 December 2016). Soil carbon dynamics: Soil carbon change across scales. Over 200 attended to view 36 presentations.
14. Organizer and co-chair of oral (B31F) and poster (B43I) sessions at the 2015 American Geophysical Union Fall Meeting (16 and 17 December). Soil carbon stocks, fluxes, and vulnerability at large spatial scales. Over 100 participants attended.
13. *Invited participant in an NSF-supported undergraduate curriculum development workshop. Project EDDIE: Environmental Data-Driven Inquiry and Exploration. 26-28 June 2015.
12. Organizer and co-chair of a breakout session at the 2015 North American Carbon Program Principal Investigators Meeting, 28 January 2015. Large stocks, larger uncertainties: The role of soils in the North American Carbon Cycle. Panel discussion featuring presentations by scientists from Natural Resources Canada (NRCAN), the U.S. Department of Energy (DOE), and Colegio de Postgraduados (COLPOS). Sixty participants convened to discuss ongoing projects and collaboration opportunities.
11. Organizer and co-chair of a Town Hall meeting at the American Geophysical Union Fall Meeting (18 December 2014). International Soil Carbon Network: Data and collaboration in support of carbon cycle science. Forty participants convened to share information about and discuss active projects, data synthesis, and continued collaboration.

10. Organizer and co-chair of oral and poster sessions at the American Geophysical Union Fall Meeting, 15-17 December 2014. Soil organic matter dynamics: novel techniques, big data, and functional models. Over 500 participants attended to view 63 presentations.
9. Organizer and co-chair of an oral symposium at the ASA-CSSA-SSSA International Annual Meeting, 3 November 2014. Evolution of forest soil science: perspectives and prospects. Over 100 participants attended the symposium.
8. *Invited participant in an NSF Critical Zone Exploration Network workshop. EarthCube Domain Workshop on Big Data. 21-23 January 2013.
7. *Invited participant in an NSF science synthesis workshop. Novus Research Coordination Network: Paleo Reconstructions of Biogeochemical Environments. 19-21 April 2012.
6. Organizer of a Town Hall Meeting and oral presentations describing applications of the International Soil Carbon Network Database. American Geophysical Union Fall Meeting, 5 December 2012. (30 participants).
5. Organizer of oral and poster sessions on forest soil carbon at BIOGEOMON 2012: 7th International Symposium on Ecosystem Behavior. Northport, ME. 17 July 2012. (100 participants).
4. Organizer and co-chair of oral (B24A) and poster (B31A) sessions at the American Geophysical Union Fall Meeting focusing on the use of ¹⁴C methods in terrestrial C cycle research, 6-7 December 2011. (250 participants.)
3. Co-organizer of an international workshop to initiate data sharing and synthesis work among a group of 23 scientists utilizing radiocarbon techniques. Berkeley, CA, DOE Lawrence Berkeley National Lab, 20-21 July 2011.
2. Organizer of a Town Hall meeting and oral presentations to promote soil carbon data synthesis at the American Geophysical Union Fall Meeting. 16 December 2010. (20 participants).
1. Organizer of a workshop to develop K-12 outreach materials from NSF-funded research at UMBS (8 participants), 6-8 July 2010.

FUNDING (\$5,573,838 cumulative total)

23. Other Senior Personnel of NSF-BIO award (DEB-2309678; \$18,354). Title: Conference: NEON Great Lakes User Group Workshop. (2023-2024).
22. PI of USDA-Forest Service, Northern Research Station award (22-CR-11242306-022; \$70,000). Title: Decision Support for Forest Soil Carbon Management (2022-2024).
21. PI of USDA-Forest Service, Northern Research Station award (18-CR-11242306-072; \$150,000). Title: Support of the Radiocarbon Collaborative (2018-2023; assumed PI / financial manager responsibilities after starting with MTU in 2022).
20. PI of an award from the National Council for Air and Stream Improvement (\$50,000). Title: Decision Support Tools to Sustain and Increase Soil Carbon through Forest Management in the Northeast U.S. (2022-2024).
19. Institutional PI of a multi-institutional collaborative award from U.S. Department of Energy (DE-AC02-05CH11231; \$837,302 institutional, \$1,234,236 total). Title: UM Biological Station AmeriFlux Core Site Project (2020-2024; relinquished PI / financial manager responsibilities with departure from UM in 2022).
18. PI of USDA-Forest Service, Northern Research Station award (19-CR-11242306-096; \$183,163). Title: Forest Soil Carbon Stewardship (2020-2023).

17. PI of Battelle Memorial Institute award (US001-0000757206; \$60,000). Title: Archival of National Ecological Observatory Network (NEON) Soils (2019-2020).
16. PI of NSF-BIO award (DEB-1856319; \$594,691). Title: LTREB Renewal: Drivers of forest carbon storage from canopy closure through successional time (2019-2024; transferred from UM to MTU in 2022 as DEB-2245670).
15. PI of USDA-Forest Service, Northern Research Station award (19-CR-11242306-007; \$21,978). Title: Forest Soil Carbon Partnership (2019).
14. PI of USDA-Forest Service, Northern Research Station award (17-CR-11242306-028; \$97,000). Title: Applied research to support forest carbon management. (2017-2022).
13. PI of NSF-BIO award (DBI-1624205; \$154,900). Title: FSML: Enhancing long-term research through improved sample archiving at the University of Michigan Biological Station. (2016-2018).
12. PI of USDA-Forest Service, Northern Research Station award (16-CR-11242306-071; \$82,638) Title: International Soil Carbon Network. (2016-2021).
11. PI on a grant from the Water Center at the University of Michigan, Graham Sustainability Institute (2015; \$8,805). Title: Advancing watershed research at the University of Michigan Biological Station.
10. Co-PI of USDA-NIFA, McIntire-Stennis Cooperative Forestry Research Program award (2014-32100-06099; \$55,000). Title: Small watershed studies to understand effects of anthropogenic and climatic forcings on forest ecosystem services (2014-2016).
9. Institutional PI of a multi-institutional collaborative award from NSF-Macrosystems Biology (DEB-1340681; \$350,382 institutional, \$1,781,236 total). Title: Collaborative Research: Determining how organic matter is stabilized using a unique set of soil samples from across the U.S. (2014-2020).
8. Co-PI of NSF-BIO award (DEB-1353908; \$448,585). Title: LTREB: Drivers of forest carbon storage from canopy closure through successional time (2014-2019).
7. PI of USDA-Forest Service, Northern Research Station award (13-CR-11242306-077, \$159,574). Title: Coordination and Support of the International Soil Carbon Network (2013-2017).
6. As a postdoc, developed and wrote a proposal to the USDA-Forest Service, Northern Research Station (10-CR-11243206-113; \$20,395) under PI Knute Nadelhoffer. Title: Literature synthesis and meta-analysis of soil carbon changes with afforestation (2010- 2011).
5. As a postdoc, developed and wrote a supplemental proposal for NSF-DEB-0947329 under PI Knute Nadelhoffer, funded to host outreach activities with high school science students and educators at UMBS (\$11,320; 2010-2013).
4. As a postdoc, contributed significantly to developing and writing a proposal to NSF-DEB (DEB-0947329; \$299,951) under PI Knute Nadelhoffer. Title: Combined use of ¹⁵N natural abundances and tracers to elucidate above- and belowground C and N cycle linkages (2009-2013).
3. Awarded a graduate student research grant from UMBS (2005; \$2,012).
2. Awarded two competitive Ohio State University Janice Carson Beatley Herbarium Fund grants (2004 & 2005; \$2,000 total) for graduate fieldwork expenses.
1. Secured an interdisciplinary NSF Ph.D. Fellowship (IGERT: Biosphere-Atmosphere Research and Training; 2004-2006), which provided a \$30,000 per annum stipend, \$5,000 for equipment, \$2,000 for supplies, and \$1,000 for conference travel.

TEACHING, TRAINING, MENTORING, AND EDUCATIONAL RESOURCE DEVELOPMENT

National Soils NEPA [National Environmental Policy Act] Training (2023): This 6-day online training intensive provided Soil Scientists and Hydrologists (137 total) from across the USDA-Forest Service, National Forest System with training on topics related to environmental assessment. I led the development of, and was lead presenter for Module #8 (of 8 total) on Soil Carbon and Climate Change. In addition to leading this module, I served on the Instructor Cadre with 15 USDA-FS technical and scientific staff, including my coauthors/co-presenters Stephanie Connolly and Brooke Hagarty. Collectively, our Cadre worked to facilitate breakout discussions, conduct question and answer sessions, and provide scientific and technical resources to the participants for developing and supporting Soils and Hydrology programs on their National Forests.

Guest Lectures and Labs (periodic, ongoing): At the invitation of colleagues, I give guest lectures, assist with labs, or participate in classroom discussions on topics related to climate adaptation, forest soil management, and carbon cycling. From 2018 to present I have engaged in such activities 1-4 times per year (a mix of virtual and in-person) in upper- and entry-level classes such as Introduction to Soil Science, Advanced Forest Soils, and Environmental Conservation, at Michigan Tech and the University of Wisconsin-Oshkosh.

Adaptation Planning and Practices for Forest Climate Adaptation (2022, 2023): This 8-week online training provided participants with applied science, tools and resources that facilitated their efforts to define climate adaptation and carbon management goals, objectives, strategies, approaches, and tactics for unique, place-based projects. Over two iterations reaching a total of 76 participants, I served as one of the primary instructors for the courses, whose participants included private landowners and forest managers from nonprofit, State, and Federal entities from 14 states.

Forest Carbon and Climate Adaptation: I was lead presenter for this educational video series, co-produced by Michigan State University's Forest Carbon and Climate Program (FCCP) and NIACS, which describes carbon trends and adaptation concepts through the lens of the forest landscapes of northern Lower Michigan. Videos for [this regional blended learning model](#) were recorded on-site at UMBS in 2021, and released via FCCP's [Open Resource Library](#) and [YouTube Channel](#) in 2023.

Belowground Carbon Methods Workshop (2013, 2014, 2015, 2016, 2017, 2019, 2021): Over the course of these annual workshops, I designed, implemented, and evolved this 10-day intensive course that provided a complete, immersive experience in methods of forest soil resource inventory and assessment. The primary objective of the course was to develop international capacity in soil carbon research and monitoring for nations throughout the Western Hemisphere. Working through interpreters and alongside other technical instructors, I gave lectures and hands-on training in experimental design, field methods, lab procedures, and data analysis. I collaborated with partners from federal agencies (Forest Service, NRCS, USAID) and universities to deliver wide-ranging perspectives and techniques during the six iterations of this event, which trained 82 scientists (from advanced undergraduates to resource professionals) from Belize, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, and Peru. In 2021, the workshop was adapted to a virtual format, which reached a total of >100 participants from these same countries.

Undergraduate teaching and mentoring (2003-2023): I have served as a one-on-one research mentor to over 60 undergraduate students involved in formal research experiences. These have included students enrolled in for-credit research experiences during the academic year, such as the Undergraduate Research Opportunity (UROP) or Michigan Science, Technology, Engineering and Mathematics (M-STEM) programs at the University of Michigan, students enrolled in Michigan Tech's Earn and Learn program, and undergraduates from a wide range of universities who have participated in NSF-supported Research Experience for Undergraduates (REU) programs during summers at UMBS. My role in the educational and scientific development of these students has been to teach each individual how to do research by cultivating her/his unique strengths and interests, while encouraging growth in new areas and exposing each student to a wide range of disciplines and approaches. I teach research as a defined process that includes learning how to search and read scientific literature, articulate questions, design studies, perform

techniques, analyze data, interpret results, and communicate inferences. All students involved in these programs have delivered final products (papers, theses, presentations), many for a grade, and some have coauthored publications with me (even years after their initial experience). In addition to these sustained mentoring relationships, I have taught hundreds more students through guest lectures and labs in UMBS-based and visiting undergraduate courses, mostly in the realm of forest ecology and soil science. In this capacity, I have designed and delivered self-contained learning exercises and labs that complement the goals of the broader course, always with a focus on the hands-on learning and data collection that characterizes coursework at UMBS.

Undergraduate curriculum development (2015): I served as an invited participant in a multi-year project to create, implement, and refine data-driven curriculum and educational resources for use in undergraduate environmental sciences courses. My direct role during a 3-day intensive workshop held as part of the EDDIE (Environmental Data-Driven Inquiry and Exploration) Project ([LINK](#)) was to create a module related to the terrestrial carbon cycle (soil respiration) and provide feedback on other modules; subsequently, I have served as a point person for instructors who have utilized the soil respiration module in their teaching.

Biosphere-Atmosphere Short Course (2009): As a postdoctoral researcher at the UMBS, I worked with senior faculty and other postdocs to design and implement a short course series that trained graduate students and research technicians enrolled in a later cohort of my interdisciplinary Ph.D. fellowship program. In the short course series, I served as a co-instructor of the forest ecophysiology section (10 students), for which I delivered lectures, designed and led field exercises to teach concepts and applications in forest nutrient cycling and tree physiology.

North Central Michigan College (2008-2009): Shortly after completing my Ph.D., I began an Adjunct Instructor affiliation in the Biology Department at NCMC, where I taught Introduction to Biology (BIO 101). Following consultation with the Department Chair to concur on expectations and ensure consistency with past versions of the course, I independently designed and discharged all course responsibilities including lectures, labs, and student assessment (22 students). I did not subsequently teach at NCMC due to the increasing demands of my research program.

University of Michigan Biological Station (2006, 2007): Teaching Assistant, General Ecology (EEB 381). During the latter two years of my Ph.D. research, during which I was based at UMBS year-round, I served as a TA for spring term General Ecology (20-25 students). My responsibilities included giving lectures, organizing and leading field trips, discussions, and labs, grading assignments and tests, and providing one-on-one and small group student mentoring on data analysis, lab reports, and presentations. I also closely advised student research groups (2 per year) in the design and execution of course-based research projects, which are required of all undergraduates enrolled at UMBS.

Ohio State University (2002-2004): Graduate Teaching Assistant, Evolution (EEOB 400), Introduction to Ecology (EEOB 413, twice), and Vertebrate Histology (EEOB 630). Before securing a Ph.D. fellowship that allowed me to focus on research, I was a TA for three upper-level courses for majors in my department. In these courses, I gave lab-based lectures, organized and led field trips, ran discussion and lab sections, and wrote and graded assignments, quizzes, and tests.

Wittenberg University (1999-2002): Lab Assistant, Our Natural World (Biology 100); Teaching Assistant, Morphology of Vascular Plants (Biology 205). As a sophomore, I set up microscopy and lab activities, graded assignments and quizzes for BIO 100. While serving as my major professor's student assistant as a junior and senior, I set up for and assisted during lab sessions, collected and preserved plant specimens, and graded assignments, quizzes, and tests for BIO 205.

PROFESSIONAL MEMBERSHIPS

- American Geophysical Union
- Soil Science Society of America

SERVICE AND AD HOC OUTREACH ACTIVITIES

- Soil Science Society of America, Forest, Range, and Wildland Soils Division: Chair-Elect (2023), Incoming Chair (2024), Chair (2025)
- National Ecological Observatory Network: I serve on two Technical Working Groups for NEON (Terrestrial Biogeochemistry, Plant Productivity); 2019-present.
- Committee Service: I have served on the Dean Search and Ford Forest Advisory committees for the College of Forest Resources and Environmental Science, Michigan Technological University. While with University of Michigan, I served on committees including the UMBS Facilities and Land Use Committee, UMBS Winter Research Meeting planning committee, and hiring committees for UMBS Analytical Chemist and Resident Biologist positions.
- Manuscript reviewer: I have served as a manuscript reviewer for *Agricultural and Forest Meteorology*, *Biogeochemistry*, *Biogeosciences*, *Canadian Journal of Forest Research*, *Castanea*, *Earth's Future*, *Ecological Applications*, *Ecology*, *Ecosphere*, *Ecosystems*, *European Journal of Forest Research*, *Forest Ecology and Management*, *Forests*, *Forest Science*, *Frontiers in Forests and Global Change*, *Geoderma*, *Geophysical Research Letters*, *Global Change Biology*, *Global Change Biology- Bioenergy*, *Invasive Plant Science and Management*, *Journal of Biogeography*, *Journal of Geophysical Research- Biogeosciences*, *Journal of Soils and Sediments*, *Journal of the Torrey Botanical Society*, *New Forests* (Guest Editor), *New Phytologist*, *Oecologia*, *Plant and Soil*, *Plant Biosystems Journal*, *Plant Ecology*, *PLOSOne*, *Proceedings of the National Academy of Sciences of the United States*, *Science*, *Scientific Reports*, *Soil Biology and Biochemistry*, *Soil Science*, *Soil Science Society of America Journal*, *Tree Physiology*, *Vadose Zone Journal*.
- Proposal reviewer: I have been an *ad hoc* proposal reviewer for NSF's Division of Environmental Biology, the DOE Office of Biological and Environmental Research, and the World Bank Forest Carbon Partnership Facility Carbon Fund.
- Preproposal and full proposal panelist: I have twice accepted invitations to serve on proposal review panels for NSF-BIO in the Division of Environmental Biology.
- Independent reviewer: I have reviewed book chapters for author F. M. Lappé, two technical reports and an editorial article for the USDA-Forest Service, a technical report for the State of California, and forest management plans for Michigan DNR.
- Volunteer consulting scientist: I have done rapid inventory of Threatened/Endangered plant species for Michigan DNR at an oil spill site along the Straits of Mackinac, and conducted bryophyte and vascular plant surveys for site biological inventories in Ohio and northern Michigan.
- Environmental outreach: I have worked in independent and collaborative capacities to develop and lead outreach workshops (4) for middle and high school students and tribal groups. Workshop topics included climate change, forest ecology, biodiversity, and ecosystem services. I have also organized and led 8 site tours and field events for other K-12, scouting, and community events. Over 250 people participated in these events from 2005 - present.
- Media outreach: I have provided interviews to writers for online outlets and podcasts including [Nature Change](#), [ClimateWire](#), [Environmental Monitor](#), *Science*, the [Wisconsin Forestry Center](#) ([alternate link](#)), and the University of Michigan News Service for stories ([1](#), [2](#)) about forest ecosystems and carbon sequestration. I have been interviewed by the Associated Press about the ecological consequences of cold winter weather (the resulting story was released through a variety of popular media outlets ranging from National Public Radio to the Weather Channel). Lastly, I have provided occasional interviews to newspapers (*e.g.*, Petoskey News-Review, St. Ignace News) on earth science topics.