
Natalie G. Mueller

Curriculum Vitae

DEPARTMENT OF ANTHROPOLOGY
MCMILLAN HALL, 121
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PROFILE

I am an archaeologist and paleoethnobotanist who specializes in the historical ecology of North America and eastern Africa. By integrating morphometric, molecular, ecological, and experimental data, I study the domestication of plants and the subsequent evolution of agrobiodiversity throughout the Holocene. My research also concerns the development and spread of social institutions related to food production and food security.

APPOINTMENTS

Assistant Professor of Anthropology, Washington University in St. Louis	2019-
Postdoctoral Researcher, Cornell University School of Integrative Plant Science	2017-2019
Adjunct Professor of Anthropology, University College, Washington University in St. Louis	2015-2017

EDUCATION

Ph.D., Anthropology, Washington University in St. Louis	2017
M.A., Anthropology, Washington University in St. Louis	2012
B.A., <i>Summa cum laude</i> , International Affairs and Archaeology, The George Washington University	2009

GRANTS (*PI or co-PI*)

National Science Foundation, Collaborative Research Grant, #2243593: <i>Reassessing plants and pastoral foodways in ancient eastern Africa</i> , \$374,292. Co-PIs Mary Prendergast, Katherine Grillo, Audax Mabulla, and Agness Gidna.	2023-2026
National Science Foundation Collaborative Research Grant #2114296: <i>Using herbivorous insect genomes for crop tracking</i> , \$220,786. Co-PIs Andrew Kitchen and Andrew Forbes.	2021-2024
Haus der Kulturen der Welt and Max Planck Institute's Anthropocene Curriculum Research Grant: <i>Ancient Bison Herds of the American Midwest and the Domestication of the Lost Crops</i> , \$8,000. Co-PI Robert Spengler.	2019-2020
National Museum of Natural History Research Grant Program for Science: <i>The palette for selection: Growing and sequencing lost crops to understand the role of plasticity in plant domestication</i> , \$118,034. Co-PI: Logan Kistler.	2018-2020
National Science Foundation Research Experiences for Undergraduates #1460787: <i>"Long-term Perspectives on Human-River Dynamics at the Confluence of the Illinois and Mississippi Rivers: Interdisciplinary Research for Students in Ecology and Archeology,"</i> \$275, 111. Co-PI: Jane Buikstra	2018-2019
National Science Foundation Social and Behavioral Sciences Postdoctoral Research Allowance # 1714462: <i>Growing lost crops: Variation under cultivation in the Eastern Agricultural Complex</i> , \$30,000	2017-2019
George R. Throop Endowment Grant: <i>Survey for lost crops of eastern North America</i> , \$1,200	2016
National Science Foundation Dissertation Improvement Grant # BCS-1360868: <i>A case study in agricultural practice and domestication: Knotweed in eastern North America</i> , \$19,076	2014-2016

Wenner-Gren Dissertation Field Work Grant: <i>A case study in agricultural practice and domestication: Knotweed in eastern North America: Preliminary DNA work</i> \$7,808	2015-2016
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FELLOWSHIPS

National Science Foundation Social and Behavioral Sciences Postdoctoral Research Fellowship	2017-2019
Washington University in St. Louis Graduate School Dissertation Fellowship	2016-2017
Lynne Cooper Harvey Fellowship in American Culture Studies	2010-2015

AWARDS

Patty Jo Watson Award for Best Article or Book Chapter, Southeastern Archaeological Conference	2017
Student Paper Award, Society for American Archaeology	2016
Phi Beta Kappa, George Washington University	2009
Jane Hart Award for Outstanding Achievement in Archaeology, George Washington University	2009

PEER-REVIEWED PUBLICATIONS

M.E. Belcher, D. Williams, and N.G. Mueller . "Turning over a new leaf: Experimental investigations into the role of developmental plasticity in the domestication of goosefoot (<i>Chenopodium berlandieri</i>) in eastern North America." <i>American Antiquity</i> .	2023
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N.G. Mueller , E.T. Horton, M.E. Belcher, and L. Kistler. "The taming of the weed: developmental plasticity facilitated plant domestication." <i>Plos One</i> 18(4): e0284136	2023
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N.G. Mueller . "Indigenous people prevented climate-induced ecological change for millennia: evidence from the Prairie Peninsula and fire-loving forests of eastern North America." In <i>Climate and ecological change for in the Americas: A perspective from Historical Ecology</i> . Eds. J.A. Whitaker, C.G. Armstrong, and G. Odone. Routledge, New York.	2023
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N.G. Mueller . "The Broad-Spectrum Revolution at 50: Increasing dietary diversity reflects the heterogeneity of domesticated landscapes." <i>Journal of Anthropological Archaeology</i> . 68.	2022
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N.G. Mueller and A. Flachs. "Domestication, crop breeding, and genetic modification are fundamentally different processes: implications for seed sovereignty and agrobiodiversity." <i>Agriculture and Human Values</i> . 39 (1):455-472.	2022
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M.F. Simon, J.M.M. Flores, H. Liu, M.L.L. Martins, S.V. Drovetski, N.A.S. Przelomska, H. Loiselle, T.B. Cavalcanti, P.W. Inglis, N.G. Mueller , R.G. Allaby, F. de Oliveira Freitas, L. Kistler. "Phylogenomic analysis points to a South American origin of <i>Manihot</i> and illuminates the primary gene pool of cassava." <i>New Phytologist</i> . 233:534-545.	2022
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N.G. Mueller , S.T. Goldstein, D.A. Odeny, and N. Boivin. "Variability and preservation biases in the archaeobotanical record of <i>Eleusine coracana</i> (finger millet): evidence from Iron Age Kenya." <i>Vegetation History and Archaeobotany</i> . 31(3), 279-290.	2022
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A. Bogaard, R.Allaby, B. Arbuckle, R. Bendrey, S.Crowley, T. Cucchi, T. Denham, L. Frantz, D.Fuller, T. Gilbert, E. Karlsson, A. Manin, F. Marshall, N.G. Mueller , J. Peters, C. Stépanoff, A. Weide, G. Larson. "Reconsidering domestication from a process archaeology perspective." <i>World Archaeology</i> . 53:56-77.	2021
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R.N. Spengler, M. Petraglia, P. Roberts, K. Ashastina, L. Kistler, N.G. Mueller , and N. Boivin. "Exaptation traits for megafaunal mutualisms as a factor in plant domestication." <i>Frontiers in Plant Science</i> . 12:1-14.	2021
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- E.R. Henry, **N.G. Mueller**, and M.B. Jones. "Ritual dispositions, enclosures, and the passing of time: A biographical perspective on the Winchester Farm earthwork in Central Kentucky, USA." *Journal of Anthropological Archaeology*. 62:1-25. 2021
- Mueller, N.G.**, R.N. Spengler, A. Glenn, and K. Lama. "Bison, anthropogenic fire, and the origins of agriculture in eastern North America." *The Anthropocene Review*. 8(2):141-158. 2021
- Mueller, N.G.** A.White, and P. Szilagyi. "Experimental cultivation of eastern North America's lost crops: Preliminary insights into agricultural practice and yield potential." *Journal of Ethnobiology*. 2019
- Spengler, R.N., and **N.G. Mueller**. "Grazing animals drive domestication of grain crops." *Nature: Plants*. 5:656-662. 2019
- Mueller, N.G.** "Documenting the evolution of agrobiodiversity in the archaeological record: Landraces of a newly described domesticate (*Polygonum erectum*) in North America." *Journal of Archaeological Method and Theory*. 26(1): 313-343. 2019
- Mueller, N.G.** "The earliest occurrence of a newly described domesticate in eastern North America: Adena/Hopewell communities and agricultural innovation." *Journal of Anthropological Archaeology*. 49: 39-50. 2018
- Mueller, N.G.**, Gayle J. Fritz, Paul Patton, Stephen Carmody, and Elizabeth Horton. "Growing lost crops: New directions in the study of eastern North America's original agricultural system." *Nature: Plants*. 3: 1-5. 2017
- Mueller, N.G.** "Carbonization, differential preservation, and sampling biases in domestication studies: An erect knotweed (*Polygonum erectum* L.) case study." *Journal of Archaeological Science: Reports* 13: 303-311. 2017
- Mueller, N.G.** "Evolutionary bet-hedgers under cultivation: Investigating the domestication of erect knotweed (*Polygonum erectum* L.) using growth experiments." *Human Ecology* 45(2):189-203. 2017
- Mueller, N.G.** "Documenting domestication in a lost crop (*Polygonum Erectum* L.): Evolutionary bet-hedgers under cultivation." *Vegetation History and Archaeobotany* 26(3):313-327. 2017
- Mueller, N.G.** "An extinct domesticated subspecies of erect knotweed in eastern North America: *Polygonum erectum* L. subsp. *watsoniae* (Polygonaceae)." *Novon* 25(2). 2017
- Mueller, N.G.** and G.J. Fritz. "Women as symbols and actors in the Mississippi Valley: Evidence from female flint-clay statues and effigy vessels." In *Native American Landscapes: An Engendered Perspective*, ed. Cheryl Claassen. Pp. 109-150. University of Tennessee Press, Knoxville, TN. 2016
- Ramsay, J. and **N.G Mueller**. "Telling seeds: Archaeobotanical investigations at Tell al-'Umayri, Jordan." In *Annual of the American Schools of Oriental Research 69: The Archaeology of Agro-Pastoralist Economies in Jordan*, ed. Kevin M. McGeough. Pp. 1-16. The American Schools of Oriental Research: Boston, MA. 2016
- Langlie, B.S., **N.G. Mueller**, R.N. Spengler III, and G.J. Fritz. "Agricultural origins from the ground up: Archaeological perspectives on plant domestication." *American Journal of Botany* 101(10):1601-1617. 2014
- Mueller, N.G.** *Mound Centers and Seed Security: A Comparative Analysis of Botanical Assemblages from the Lower Illinois Valley*. Springer: New York, NY. 2013

OTHER WRITING

Lost crops cultivation guides: sites.wustl.edu/lostcrops/lost-crops-cultivation-guides	2021-
Research blog: ngmueller.net	2017-
Book review: "From colonization to domestication: Population, environment, and the origins of agriculture in eastern North America," by D. Shane Miller. <i>Midcontinental Journal of Archaeology</i> . In press.	2018
Editor and regular contributor. <i>Forage!</i> Blog of the Society for Ethnobiology, published bi-weekly. https://ethnobiology.org/forage/blog	2017-2019
Book review: "Tikal: Paleoecology of an Ancient Maya City," by D.L. Lentz et al. <i>Economic Botany</i> 69:4.	2015

COURSES TAUGHT

Professionalization for anthropologists	2023
Culture and the Environment	2015-2022
Domestication: The Evolution of Our Multispecies Family	2022
Caring for Country: Hunter-Gatherer Ecologies	2021
Ten Thousand Years on Turtle Island: A Deep History of North America	2014, 2020
Plants and People	2019, 2022
Introduction to Cultural Anthropology	2018
Introduction to Archaeology	2016, 2017

Field work instructor

Rice and Florida University NSF REU: Plants and Pastoralist Foodways, Tanzania	2023
Nairobi University Archaeological Field School, Kenya	2020
Washington University NSF REU: Tyson Research Center, De-extinction/Re-domestication Project	2020
Center for American Archeology NSF-REU: Long-term Perspectives on Human-River Dynamics	2018-2019
Washington University Field School, the Dzungar Mountains Archaeological Project, Kazakhstan	2012
State University of New York at Brockport Field School, the Donnan Site Project, NY	2011

CONFERENCE PRESENTATIONS

"Plants as people in the process of domestication." Paper presented at the Joint Meetings of the Society for Economic Botany and the Society of Ethnobiology, Atlanta, GA.	2023
"There's no such thing as a wild ancestor: Notes on feral and free-living crop relatives." Paper presented at the Annual Meeting of the Society for Applied Anthropology, Salt Lake City, Utah.	2022
"Archaeobotanical remains from Kakapel rockshelter, western Kenya." Paper presented at the Annual Meeting of the Society for American Archaeology, Chicago, Illinois.	2022
"Domestication and the extended evolutionary synthesis." Paper presented at the Annual Meeting of the Society for American Archaeology, Albuquerque, NM.	2019
"Growing lost crops: New insights into labor, scheduling, and yields in the Eastern Agricultural Complex. Paper presented at the Southeastern Archaeological Conference, Augusta, GA.	2019
"Growing the past: Prehistoric food production as a model for resilience in a changing climate." Paper presented at the Annual Meeting of the European Association of Archaeologists, Barcelona, Spain.	2018

- “Survey for lost crops: The historical ecology of eastern North American crop progenitors.” Paper presented at the Joint Annual Meetings of the Society for Economic Botany and the Society of Ethnobiology, Madison, WI. 2018
- “New Directions in Ozark Bluff Shelters Paleoethnobotany.” Paper presented at the Annual Meetings of the Southeastern Archaeological Conference, Tulsa, OK. (with Logan Kistler) 2017
- “Agricultural Communities and the Rise of Cahokia: Evidence from Seeds.” Paper presented at the Annual Meetings of the Society of Ethnobiology, Montreal, Québec. 2017
- “The Role of Ritual in Early Food Producing Economies: Seed Keepers and Seed Exchange in Ethnography and in the Archaeological Record of Eastern North American.” Paper presented at The Annual Meetings of the Society for American Archaeology, Vancouver, BC. 2017
- “Understanding Crop Plasticity through Experimental Cultivation.” Paper presented in *Symposium: Growing Lost Crops: Insights into the Eastern Agricultural Complex* (co-organizer), at the Annual Meetings of the Southeastern Archaeological Conference, Athens, GA. 2016
- “Mississippian Agricultural Communities of Practice.” Paper presented at The Mississippian Conference, Cahokia Mounds State Historic Site, IL. 2016
- “Seeds as artifacts: Investigating the Spread of Agroecological Knowledge in Eastern North America, c. 1000 BCE-1300 CE.” Paper presented at the Annual Meetings of the Society for American Archaeology, Orlando, FL. 2016
- “Bet-Hedgers Under Cultivation: Insights into the Domestication of Erect Knotweed (*Polygonum erectum* L.) from the Field and Greenhouse.” Paper presented at the Annual Meetings of the Society for Ethnobiology, Tucson, AZ. 2016
- “Documenting Knotweed Domestication: Preliminary Results.” Paper presented at the Annual Meetings of the Midwest Archaeological Conference, Champaign-Urbana, IL. 2014
- “Developing Domestication Criteria for Crops with Knotty Morphologies: *Polygonum* in the Eastern Woodlands.” Poster presented at the Annual Meetings for the Society for American Archaeology, Austin, TX. 2014
- “Women as Symbols and Actors in Mississippian Ceremonialism.” Paper presented at the Annual Meetings of the Southeastern Archaeological Conference, Tampa, FL. 2013
- “Mound Centers and Seed Security in Middle Woodland Illinois.” Paper presented at the Annual Meetings of the Society for Economic Botany, Frostburg, MD. 2012
- “Plant Use and Community Organization in the Lower Illinois Valley.” Paper presented at the Annual Meetings of the Southeastern Archaeological Conference, Jacksonville, FL. (with Jane Buikstra and Jason King) 2011
- “Telling Seeds: Paleoethnobotanical Investigations at Tell al-‘Umayri Jordan.” Paper presented at the Annual Meeting of the American Schools of Oriental Archaeology, Atlanta, GA. (with Jennifer Ramsay) 2010

INVITED PUBLIC TALKS

We are family: orphan crops and the socioecological context of domestication. Presented at the Corteva-Plant Breeding, Genetics, and Biotechnology Symposium, Michigan State University, December 9, via Zoom.	2021
Experimental and Ecological Approaches to Plant Domestication. Presented to the Oxford Archaeology Discussion Group, August 17, and the University of Wisconsin Plant Breeding and Genetics Seminar, November 20, via Zoom.	2020
“Domestication: It doesn’t really matter.” Presented at the Re-evaluating the Origins and Trajectories of Domestication Conference, Santa Fe Institute. March 9	2020
“Lost crops and ancient landraces: Deep histories of communities and their crops.” Presented at the Smithsonian Botanical Symposium, Washington, DC. May 17.	2019
“Experimental insights into plant domestication and Indigenous societies in eastern North America.” Presented at the Native Culture of the Americas Seminar, Harvard University, Boston, MA. December 4.	2018
“Growing the lost crops of eastern North America: Developmental plasticity in plant domestication.” Presented at the School of Integrated Plant Science Horticulture Seminar Series at Cornell University, Ithaca NY on September 24, and at the Max Planck Institute for Plant Breeding Research on December 19.	2018
“Lessons from the lost crops of eastern North America’s oldest agricultural system.” Presented at the Cornell Cooperative Extension Leadership Conference in Ithaca, NY, June 13.	2018
“Agrobiodiversity in the archaeological record: Deep histories of communities and their crops.” Presented at the Max Planck Institute for the Science of Human History in Jena, Germany, March 5.	2018
“Growing Lost Crops, Reconstructing Ancient Knowledge System.” Keynote address presented at the 7th International Conference on Reconstructive and Experimental Archaeology in Colonial Williamsburg, VA. November 17.	2017
“Rediscovering North America’s Lost Crops.” Presented in the <i>Food for Thought</i> Series at Ohio University, Athens, OH. February 22.	2017
“Lost Crops, Agricultural Diversity, and Native American Nutrition.” With Gayle J. Fritz. Presented at the <i>Indigenous Rights and Environmental Justice Symposium: From Standing Rock to St. Louis</i> at the Kathryn M. Buder Center for American Indian Studies at Washington University in St. Louis, MO. January 6.	2017
“Seeds as Artifacts: The Spread of Agricultural Knowledge in Eastern North America, c. 2500-800 BP.” Presented to the Cahokia Archaeological Society at Cahokia Mounds Visitor Center, IL. May 19.	2016
“Erect Knotweed Domestication.” Presented to the Missouri Archaeological Society: Three Rivers Chapter at Mastodon State Historic Site, MO. Oct 12.	2015

MEDIA COVERAGE

“ What America’s ‘lost crops’ tell us about food in the age of climate change. ” Interview with St. Louis Public Radio’s St. Louis on the Air. May 15.	2023
“ America’s Lost Crops Rewrite the History of Farming. ” By Sarah Laskow for The Atlantic, October 1.	2022

- [“The Promise and Perils of Resurrecting Native Americans’ Lost Crops.”](#) By Reina Gattuso for *Gastro Obscura*, April 4. 2019
- [“Paleoethnobotanist Natalie Mueller on lost crops of North America.”](#) Interview with Ithaca Community Radio’s *Locally Sourced Science*. May 27. 2018
- [“On a hunt for North America’s indigenous crops.”](#) Interview with Canadian Broadcasting Corporation’s *Quirks and Quarks*, March 30. 2018
- [“Searching for Crops Long Forgotten.”](#) Interview on Wisconsin Public Radio, March 13. 2018
- [“Why you don’t see ‘goosefoot’ on your Thanksgiving dinner table.”](#) Annalee Newitz speaking on National Public Radio’s *Science Friday*, February 23. 2018
- [“Hunting for the ancient lost farms of North America.”](#) by Annalee Newitz for *Ars Technica*, January 26. 2018

SERVICE

- Organizer, Friday Archaeology Seminar Series 2023-
- Panelist, National Science Foundation Social and Behavioral Sciences Postdoctoral Fellowship 2023
- Associate editor and reviewer, *Journal of Ethnobiology*
- Reviewer, *American Antiquity* 2018-
- Reviewer, *Vegetation History and Archaeobotany* 2021-
- Reviewer, *Human Ecology* 2017-
- School of Integrative Plant Sciences Postdoctoral Association Vice Chair 2017-
- Washington University Graduate Council Student Representative for Anthropology 2017-2019
- Graduate Leadership Committee of the Department of Anthropology 2015-2016
- Friday Archaeology Weekly Seminar Series Coordinator 2014-2015
- 2011-2013