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# Natalie G. Mueller

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Department of Anthropology  
Washington University in St. Louis

## PROFILE

I am an archaeologist and paleoethnobotanist who specializes in the historical ecology of North America and the origins of agriculture. 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

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

## EDUCATION

### Washington University in St. Louis

*PhD, Anthropology with a certificate in American Culture Studies and a Teaching Citation* 2017  
Dissertation: "Seeds as Artifacts of Communities of Practice: The Domestication of Erect Knotweed in Eastern North America"

### MA, Anthropology

Thesis: "Mound Centers and Seed Security: A Comparative Analysis of Botanical Assemblages from the Lower Illinois Valley" 2012

### The George Washington University

*BA, International Affairs and Archaeology* 2009  
*Summa cum laude*  
Thesis: "Settling the Painful Disagreement: Archaeology and National Narratives in Israel"

## GRANTS (PI or co-PI)

Haus der Kulturen der Welt and Max Planck Institute's Anthropocene Curriculum Research Grant: *Ancient Bison Herds of the American Midwest and the Domestication of the Lost Crops*, \$8,000. 2019-2020  
Co-PI Robert Spengler.

National Museum of Natural History Research Grant Program for Science: *The palette for selection: Growing and sequencing lost crops to understand the role of plasticity in plant domestication*, \$118,034. Co-PI: Logan Kistler. 2018-2020

National Science Foundation Research Experiences for Undergraduates #1460787: "*Long-term Perspectives on Human-River Dynamics at the Confluence of the Illinois and Mississippi Rivers: Interdisciplinary Research for Students in Ecology and Archeology*," \$275, 111. Co-PI: Jane Buikstra 2018-2019

National Science Foundation Social and Behavioral Sciences Postdoctoral Research # 1714462: *Growing lost crops: Variation under cultivation in the Eastern Agricultural Complex*, \$138,000 2017-2019

George R. Throop Endowment Grant: *Survey for lost crops of eastern North America*, \$1,200 2016

National Science Foundation Dissertation Improvement Grant # BCS-1360868: *A case study in agricultural practice and domestication: Knotweed in eastern North America*, \$19,076 2014-2016

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

### FELLOWSHIPS

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

Spengler, R.N., and **N.G. Mueller**. "Grazing animals drive domestication of grain crops." *Nature: Plants*. 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. 2018

**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

Book review: "From colonization to domestication: Population, environment, and the origins of agriculture in eastern North America," by D. Shane Miller. *Midcontinental Journal of Archaeology*. In press. 2018

Editor and regular contributor. *Forage!* Blog of the Society for Ethnobiology, published bi-weekly. <https://ethnobiology.org/forage/blog> 2017-

Research blog. [ngmueller.net](http://ngmueller.net) 2017

Book review: "Tikal: Paleoecology of an Ancient Maya City," by D.L. Lentz et al. *Economic Botany* 69:4. 2015

### TEACHING EXPERIENCE

\*Original course development

#### Instructor of record

\*NSF-REU: Long-term Perspectives on Human-River Dynamics 2018  
 \*Introduction to Cultural Anthropology (*Asynchronous online seminar*) 2016, 2017  
 Culture and the Environment (*Upper level, political ecology*) 2015-2017  
 Introduction to Archaeology 2015  
 \*Ten Thousand Years on Turtle Island: A Deep History of North America 2014  
 (*Upper level, multidisciplinary methods for exploring the pre-Columbian past*)

#### Lab instructor

Introduction to Archaeology 2013  
 Plants and People: Ethnobotany and Paleoethnobotany 2013

#### Field work instructor

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

#### Teaching Assistant

Brave New Crops (*Political Economy of Genetically Modified Plants*) 2016  
 Ancient Maya Archaeology and History 2015  
 Introduction to Cultural Anthropology 2015  
 Introduction to Archaeology 2012  
 World Archaeology 2012  
 Culture and the Environment 2011

### PROFESSIONAL PRESENTATIONS

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

#### INVITED PUBLIC TALKS

- “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 *Food for Thought* Series at Ohio University, Athens, OH. February 22. 2017
- “Lost Crops, Agricultural Diversity, and Native American Nutrition.” With Gayle J. Fritz. Presented at the *Indigenous Rights and Environmental Justice Symposium: From Standing Rock to St. Louis* 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

## RESEARCH APPOINTMENTS & FIELD WORK

- Co-PI** Ancient Bison Herds of the American Midwest and the Domestication of the Lost Crops  
Collaborators: Robert Spengler (Max Planck Institute for the Science of Human History), Ashley Glenn (Missouri Botanical Garden), Robert Hamilton (Nature Conservancy) 2019-
- Project Paleoethnobotanist**, the Kakapel Site, Western Kenya 2018-  
Collaborators: Steven Goldstein (Max Planck Institute for the Science of Human History), Emmanuel Ndiema (National Museums of Kenya)
- Co-PI**: The palette for selection: Growing and sequencing lost crops to understand the role of plasticity in plant domestication 2018-  
Collaborators: Logan Kistler, Vanessa Gonzalez (National Museum of Natural History), Elizabeth Horton (Arkansas Archaeological Survey), Paul Patton, Daniel Williams (Ohio U.), Benjamin Blackman (U. California, Berkeley)

<b>Co-PI and Instructor:</b> Long-term Perspectives on Human-River Dynamics at the Confluence of the Illinois and Mississippi Rivers: Interdisciplinary Research for Students in Ecology and Archeology Collaborators: Jane Buikstra (Arizona State U.) Jason King (Center for American Archeology)	2018-
<b>Project Paleoethnobotanist:</b> the White Springs site, NY Collaborators: Kurt Jordan (Cornell U.), Paula Turkon (Ithaca College)	2017-2019
<b>PI:</b> Growing lost crops: Variation under cultivation in the Eastern Agricultural Complex & Survey for Lost Crops Collaborators: Jane Mt. Pleasant (Cornell U.)	2017-2019
<b>Co-PI:</b> Lost Crops Garden Network (lostcrops.org) Collaborators: Elizabeth Horton, Paul Patton	2014-
<b>Project Paleoethnobotanist:</b> the Winchester Farm site, KY Collaborators: Edward Henry (Colorado State U.), Mica Jones (Washington U. in St. Louis)	2014-2016
<b>Field crew:</b> Golden Eagle site, IL, Geophysical survey Collaborators: Center for American Archeology	2014
<b>PI:</b> A Case Study in Agricultural Practice and Domestication: Knotweed in Eastern North America	2010-2013
<b>Project Paleoethnobotanist:</b> the Mound House Site, IL Collaborators: Center for American Archeology	2011-2012
<b>Project Paleoethnobotanist:</b> the Donnan Site, NY Collaborator: Beth Ryan (Cornell U.)	2011
<b>Paleoethnobotanist-in- training:</b> Tall al'Umayri, Jordan Collaborator: Jennifer Ramsay (State U. of New York at Brockport)	2010
<b>MEDIA COVERAGE</b>	
<a href="#">"The Promise and Perils of Resurrecting Native Americans' Lost Crops."</a> By Reina Gattuso for <i>Gastro Obscura</i> , April 4.	2019
<a href="#">"Paleoethnobotanist Natalie Mueller on lost crops of North America."</a> Interview with Ithaca Community Radio's <i>Locally Sourced Science</i> . May 27.	2018
<a href="#">"On a hunt for North America's indigenous crops."</a> Interview with Canadian Broadcasting Corporation's <i>Quirks and Quarks</i> , March 30.	2018
<a href="#">"Searching for Crops Long Forgotten."</a> Interview on Wisconsin Public Radio, March 13.	2018
<a href="#">"Why you don't see 'goosefoot' on your Thanksgiving dinner table."</a> Annalee Newitz speaking on National Public Radio's <i>Science Friday</i> , February 23.	2018
<a href="#">"Hunting for the ancient lost farms of North America."</a> by Annalee Newitz for <i>Ars Technica</i> , January 26.	2018
<b>OTHER RELEVANT EXPERIENCE AND TRAINING</b>	
Blackboard Consultant, The Teaching Center, Washington University in St. Louis	2015-2016
Online Course Development Seminar, University College, Washington University in St. Louis	2016

Royal Microscopical Society Summer Light Microscopy School, York, United Kingdom	2014
Angiosperm Plant Taxonomy Laboratory Course, University of Missouri, St. Louis	2013
Oregon State University Geoarchaeology Field School, Corvallis, OR	2009
Tel Megiddo Archaeological Field School, Megiddo, Israel	2008

**SERVICE**

Associate editor and reviewer, Journal of Ethnobiology	2018-
Reviewer, Vegetation History and Archaeobotany	2017-
School of Integrated Plant Sciences Postdoctoral Association Vice Chair	2017-2019
Washington University Graduate Council Student Representative for Anthropology	2015-2016
Graduate Leadership Committee of the Department of Anthropology	2014-2015
Friday Archaeology Weekly Seminar Series Coordinator	2011-2013