

Kenneth Blake Vernon

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Professional Appointments

One-U Responsible AI Postdoctoral Fellow | 2025-Present

Scientific Computing and Imaging Institute

School of Environment, Society, and Sustainability

University of Utah

Post-Doctoral Associate | 2022-2024

Center for Collaborative Synthesis in Archaeology, CU Boulder

Assistant Director | 2018-2022

University of Utah Archaeological Center

Education

University of Utah | Salt Lake City, UT | PhD in Anthropology, 2022

Northern Illinois University | DeKalb, IL | MA in Philosophy, 2009

University of Central Arkansas | Conway, AR | BA in History and Philosophy, 2006


Publications


Peer-reviewed journal articles

2025

Modeling the rise and demise of Classic Maya cities: Climate, conflict, and economies of scale

Proceedings of the National Academy of Sciences 122 (42): e2512325122 (2025)

 Weston C. McCool, Brian F. Coddling, Bridgette Degnan, Claire E. Ebert, Emily S. Johnson, Kenneth Blake Vernon, Kurt M. Wilson, Timothy Beach, Keith M. Prufer, Douglas J. Kennett

 10.1073/pnas.2512325122

Environmental drivers of wealth inequality among Ancestral Puebloan farmers in Bears Ears National Monument

American Antiquity: 1-7 (2025)

✉ Roxanne Lois F. Lamson, Kurt M. Wilson, Hayley T. Kievman, Kenneth Blake Vernon, Peter M. Yaworsky, Brian F. Coddling

[doi](https://doi.org/10.1017/aaq.2025.8) 10.1017/aaq.2025.8

2024

Trade-off between market and ecosystem services drives settlement decisions among smallholder ranchers in Baja California Sur, Mexico

Sustainability Science 19 (4): 1377-1390 (2024)

✉ Kenneth B. Vernon, Brian F. Coddling, Simon C. Brewer, Shane J. Macfarlan

[doi](https://doi.org/10.1007/s11625-024-01491-9) 10.1007/s11625-024-01491-9

The Fremont frontier: Living at the margins of maize farming

American Antiquity 89 (3): 440-458 (2024)

✉ Kenneth B. Vernon, Peter M. Yaworsky, Weston McCool, Jerry D. Spangler, Simon Brewer, Brian F. Coddling

[doi](https://doi.org/10.1017/aaq.2024.22) 10.1017/aaq.2024.22

A method for defining dispersed community territories

Journal of Archaeological Science 170: 106048 (2024)

✉ Kenneth B. Vernon, Scott G. Ortman

[doi](https://doi.org/10.1016/j.jas.2024.106048) 10.1016/j.jas.2024.106048

The Goldilocks Zone for maize agriculture and the settlement and abandonment of the West Tavaputs Plateau

Quaternary International 689-690: 30-42 (2024)

✉ Peter M. Yaworsky, Kenneth B. Vernon, Weston C. McCool, Isaac A. Hart, Jerry Spangler, Brian F. Coddling

[doi](https://doi.org/10.1016/j.quaint.2023.12.003) 10.1016/j.quaint.2023.12.003

Can we reliably detect adaptive responses of hunter-gatherers to past climate change? Examining the impact of Mid-Holocene drought on Archaic settlement in the Basin-Plateau Region of North America

Quaternary International 689-690: 5-15 (2024)

✉ Brian F. Coddling, Heidi Roberts, William Eckerle, Simon C. Brewer, Ishmael D. Medina, Kenneth B. Vernon, Jerry S. Spangler

[doi](https://doi.org/10.1016/j.quaint.2023.06.014) 10.1016/j.quaint.2023.06.014

2022

Ecological constraints on violence avoidance tactics in the Prehispanic Central Andes

Environmental Archaeology 1-14 (2022)

✉ Weston C. McCool, Kurt M. Wilson, Kenneth B. Vernon

[doi](https://doi.org/10.1080/14614103.2022.2137652) 10.1080/14614103.2022.2137652

Socioecological dynamics structuring the spread of farming in the North American basin-plateau region

Environmental Archaeology 27 (4): 434-446 (2022)

✉ Brian F. Coddling, Joan Brenner Coltrain, Lisbeth Louderback, Kenneth Blake Vernon, Kate E. Magargal, Peter M. Yaworsky, Erick Robinson, Simon C. Brewer, Jerry D. Spangler

[doi](https://doi.org/10.1080/14614103.2021.1927480) 10.1080/14614103.2021.1927480

Decomposing habitat suitability across the forager to farmer transition

Environmental Archaeology 27 (4): 420-433 (2022)

✉ Kenneth B. Vernon, Peter M. Yaworsky, Jerry Spangler, Simon Brewer, Brian F. Coddling

[doi](https://doi.org/10.1080/14614103.2020.1746880) 10.1080/14614103.2020.1746880

Subsistence strategy mediates ecological drivers of human violence

PLOS ONE 17 (5): e0268257 (2022)

✉ Weston C. McCool, Kenneth B. Vernon, Peter M. Yaworsky, Brian F. Coddling

[doi](https://doi.org/10.1371/journal.pone.0268257) 10.1371/journal.pone.0268257

Climate change–induced population pressure drives high rates of lethal violence in the Prehispanic central Andes

Proceedings of the National Academy of Sciences 119 (17): e2117556119 (2022)

✉ Weston C. McCool, Brian F. Coddling, Kenneth B. Vernon, Kurt M. Wilson, Peter M. Yaworsky, Norbert Marwan, Douglas J. Kennett

[doi](https://doi.org/10.1073/pnas.2117556119) 10.1073/pnas.2117556119

2021

Plant species richness at archaeological sites suggests ecological legacy of Indigenous subsistence on the Colorado Plateau

Proceedings of the National Academy of Sciences 118 (21): e2025047118 (2021)

✉ Bruce M. Pavlik, Lisbeth A. Louderback, Kenneth B. Vernon, Peter M. Yaworsky, Cynthia Wilson, Arnold Clifford, Brian F. Coddling

[doi](https://doi.org/10.1073/pnas.2025047118) 10.1073/pnas.2025047118

2020

Marriage dynamics in old Lower California: Ecological constraints and reproductive value in an arid peninsular frontier

Biodemography and Social Biology 65 (2): 156-171 (2020)

✉ Shane J. Macfarlan, Ryan Schacht, Caroline Foley, Sydney Cahoon, Grace Osusky, Kenneth B. Vernon, Evan Tayler, Celeste Henrickson, Eric Schniter

[doi](https://doi.org/10.1080/19485565.2020.1728685) 10.1080/19485565.2020.1728685

Advancing predictive modeling in archaeology: An evaluation of regression and machine learning methods on the Grand Staircase-Escalante National Monument

PLOS ONE 15 (10): e0239424 (2020)

✉ Peter M. Yaworsky, Kenneth B. Vernon, Jerry D. Spangler, Simon C. Brewer, Brian F. Coddling

[doi](https://doi.org/10.1371/journal.pone.0239424) 10.1371/journal.pone.0239424

2017

The ecology of population dispersal: Modeling alternative Basin-Plateau foraging strategies to explain the Numic expansion

American Journal of Human Biology 29 (4): e23000 (2017)

✉ Kate E. Magargal, Ashley K. Parker, Kenneth Blake Vernon, Will Rath, Brian F. Coddling

[doi](https://doi.org/10.1002/ajhb.23000) 10.1002/ajhb.23000

Manuscripts

2025

Predicting PHT archaeology on the northwest Colorado Plateau: A predictive model for determining targeted survey areas

Journal of Archaeological Science: Reports (in prep)

✉ Abby S. Baka, Kenneth B. Vernon, Simon C. Brewer, Brian F. Coddling, Jerry D. Spangler, Alexandra M. Greenwald

Targeted explorations of Pleistocene-Holocene transition archaeology on the Colorado Plateau in southern Utah

Quaternary International (accepted)

✉ Abby S. Baka, Kenneth B. Vernon, Madeline E. Mackie, Simon C. Brewer, Jerry D. Spangler, Brian F. Coddling, Lisbeth Louderback, Thomas Flanigan, Alexandra M. Greenwald

Indirect dating with mixture density networks

Journal of Archaeological Science (in prep)

✉ Kenneth B. Vernon, Brian F. Coddling, Simon C. Brewer

A reconstruction of the Indigenous maize farming niche of Utah

Journal of Archaeological Science: Reports (under review)

✉ Ishmael D. Medina, Kenneth B. Vernon, Weston C. McCool, Jerry D. Spangler, Brian F. Coddling

The impact of subsistence change on demography: Theory-informed Approximate Bayesian Computation reveals 4-fold increase in carrying capacity following economic intensification

Journal of Archaeological Science (under review)

✉ Kurt M. Wilson, Brian F. Coddling, Weston C. McCool, Ishmael Medina, Kenneth B. Vernon, Simon C. Brewer

The evolution of a labor market

(in prep)

✉ Kenneth B. Vernon

Socio-economic status before we measured it: A machine learning approach to imputing income and education in the US Census before 1950

(in prep)

✉ Kelsey Carlston, Kenneth B. Vernon

Responsible artificial intelligence and the science of human-environment interactions

Environmental Data Science (in prep)

✉ Kenneth B. Vernon, Brian F. Coddling, Simon C. Brewer

Explaining PaleoIndian settlement in the Intermountain West

American Antiquity (in prep)

✉ Kenneth B. Vernon, Kate E. Magargal, David Zeanah, D. Craig Young, Robert G. Elston, Simon C. Brewer, Brian F. Coddling

Migration and environmental learning in interstitial areas: An example from the Northern Rio Puerco Valley, New Mexico

Open Archaeology (under review)

✉ Kenneth B. Vernon, Scott G. Ortman, Donald A. Shiffler

Book reviews

2020

Review of Oshara Revisited: The Archaic Period in Northern New Mexico by Nicholas Chapin

Journal of Anthropological Research 76 (1): 138–140 (2020)

✉ Kenneth B. Vernon, Brian F. Coddling

[doi](https://doi.org/10.1086/706946) 10.1086/706946

Technical reports

2022

Archaeological Survey of Cottonwood Wash, San Rafael Desert, Emery County, Utah

Report submitted to the Bureau of Land Management, Price Field Office, Price, Utah; and State of Utah School and Institutional Trust Lands Administration, Salt Lake City, Utah. Prepared by the University of Utah Archaeological Center and the Colorado Plateau Archaeological Alliance. BLM Cooperative Agreement L20AC00267. United States Department of Interior Permit No. 21UT85115. State of Utah Antiquities Project No. U22UA031. University of Utah Archaeological Center Project No. UUAC22052.

✉ Ishmael Medina, Kenneth B. Vernon, Kate E. Magargal, Weston C. McCool, Jerry D. Spangler, Brian F. Coddling

2021

Limited Test Excavations at Red Reef Shelter (42WS519), Red Cliffs National Conservation Area, Washington County, Utah

Report submitted to the Bureau of Land Management, St. George, Utah.

✉ Jerry D. Spangler, Matthew Zweifel, Heidi Roberts, Kenneth B. Vernon, Isaac Hart, Brian F. Coddling, Anne Lawlor

2019

Hisatsinom of the high plateaus: a Class I overview of prehistoric cultural resources in Grand Staircase-Escalante National Monument

Report submitted to the Bureau of Land Management, Salt Lake City, Utah.

✉ Jerry D. Spangler, Peter M. Yaworsky, Kenneth B. Vernon, Brian F. Coddling

2018

Preliminary Archaeological Investigations at the Jack Kirk Site, Mariposa Creek, California

Report submitted to the North Fork Mono Tribe, Mariposa Creek, California.

✉ Brian F. Coddling, Kate E. Magargal, Kenneth B. Vernon, Paul E. Allgaier, Jess Valdez, Ron Goode

The Archaeology of Molen Reef, Emery County, Utah

Report submitted to the Southern Utah Wilderness Alliance, Salt Lake City, Utah.

✉ Kenneth B. Vernon, Peter M. Yaworsky, Jerry D. Spangler

Grants, Fellowships, and Awards

2022

Archaeological Survey of Cottonwood Wash, San Rafael Desert, Emery County, Utah

Cooperative Agreement, Bureau of Land Management.

👤 Brian F. Coddington, Jerry D. Spangler

2020

Advancing Stewardship with Theory and Models

David C. Williams Memorial Graduate Fellowship, University of Utah College of Social and Behavioral Sciences.

👤 Kenneth B. Vernon

Developing a Modular Online Introduction to the R Environment

Cross-College Training Grant, University of Utah College of Social and Behavioral Sciences.

👤 Simon Brewer, Brian F. Coddington, Kenneth B. Vernon

2019

Advancing Stewardship with Theory and Models

David C. Williams Memorial Graduate Fellowship, University of Utah College of Social and Behavioral Sciences.

👤 Kenneth B. Vernon

Graduate Research

Earl and Elies Skidmore Endowed Graduate Fellowship, University of Utah College of Social and Behavioral Sciences.

👤 Kenneth B. Vernon

2018

Advancing Stewardship with Theory and Models

David C. Williams Memorial Graduate Fellowship, University of Utah College of Social and Behavioral Sciences.

👤 Kenneth B. Vernon

Why Were Prehistoric Agricultural Societies in Utah Unable to Adapt to the Medieval Megadroughts?

Interdisciplinary Faculty Research Seed Grant, University of Utah Global Change and Sustainability Center.

👤 Brian F. Coddington, Simon Brewer

2017

Archaeological Sites as Endangered Species: Using Next Generation Models to Predict and Protect Cultural Properties on the Grand Staircase-Escalante National Monument

Grand Staircase-Escalante National Monument Cooperative Agreement, Bureau of Land Management.

👤 Brian F. Coddling

Human Plant Use in Red Butte Canyon

Research Grant, University of Utah Global Change and Sustainability Center.

👤 Kenneth B. Vernon

Human Plant Use in Red Butte Canyon

Research Grant, Friends of Red Butte.

👤 Kenneth B. Vernon

Presentations

2025

Working with REST APIs to access spatial data

Spatial Utah Data Science (SUDS) Meeting, Salt Lake City, UT.

👤 Kenneth B. Vernon

Indirect dating with Mixture Density Networks

Utah Center for Data Science, Data Science & AI Lecture Series, Salt Lake City, UT.

👤 Kenneth B. Vernon, Brian F Coddling, Scott G. Ortman, Simon C. Brewer

Promoting water-use efficiency with responsible AI

One-U Responsible AI Annual Symposium, Salt Lake City, UT.

👤 Kenneth B. Vernon

Indirect dating with Mixture Density Networks

90th Annual Meeting of the Society for American Archaeology, Denver, CO.

👤 Kenneth B. Vernon, Brian F Coddling, Scott G. Ortman, Simon C. Brewer

2024

The network ecology of settlement persistence

30th Annual Meeting of the European Archaeological Association, Rome, Italy.

👤 Kenneth B. Vernon, Simon C. Brewer, Brian F. Coddling, Scott G. Ortman

The network ecology of settlement persistence

workshop 'Advances in modelling past human ecosystems', Cologne, Germany.

👤 Kenneth B. Vernon, Simon C. Brewer, Brian F. Coddling, Scott G. Ortman

The socio-ecology of community centers

89th Annual Meeting of the Society for American Archaeology, New Orleans, LA.

👤 Kenneth B. Vernon, Scott G. Ortman

2023

The ecology of agglomeration and the rise of Chaco Great Houses

88th Annual Meeting of the Society for American Archaeology, Portland, OR.

👤 Kenneth B. Vernon, Weston C. McCool, Simon C. Brewer, Brian F. Coddling, Scott G. Ortman

Exploring the dynamics of late precontact obsidian procurement and exchange networks across the US Southwest and Northwest Mexico using cyberSW

The Southwest Symposium Archaeological Conference, Santa Fe, NM.

👤 Sarah Oas, Kenneth B. Vernon, Matthew A. Peeples, Barbara J. Mills, Joshua Watts, Jeffery J. Clark, Steven Shackley, Scott G. Ortman

How do I work this? this R project

Spatial Utah Data Science (SUDS) Meeting, Salt Lake City, UT.

👤 Kenneth B. Vernon

A core-periphery approach to defining community boundaries

29th Annual Meeting of the European Archaeological Association, Belfast, Northern Ireland.

👤 Kenneth B. Vernon, Scott G. Ortman

2022

The Fremont frontier: Living at the margins of maize farming

87th Annual Meeting of the Society for American Archaeology, Chicago, IL.

👤 Kenneth B. Vernon, Jerry D. Spangler, Weston C. McCool, Peter M. Yaworsky, Simon C. Brewer, Brian F. Coddling

2021

Explaining PaleoIndian settlement in the Intermountain West: A regression adjustment approach

86th Annual Meeting of the Society for American Archaeology, San Francisco, CA.

👤 Kenneth B. Vernon, David Zeanah, D. Craig Young, Robert G. Elston, Brian F. Coddling

2019

Decomposing habitat suitability with theory-driven machine-learning

84th Annual Meeting of the Society for American Archaeology, Albuquerque, NM.

👤 Kenneth B. Vernon, Peter M. Yaworsky, Brian F. Coddling

2018

Prearchaic land use in Grass Valley, Nevada: This time with Bayes

Bi-annual Great Basin Anthropological Conference, Salt Lake City, UT.

👤 Kenneth B. Vernon, Peter M. Yaworsky, Kate E. Magargal, D. Craig Young, David Zeanah, Brian F. Coddling

Prearchaic land use in Grass Valley, Nevada: A novel statistical implementation of optimal distribution modeling

83th Annual Meeting of the Society for American Archaeology, Washington D.C..

👤 Kenneth B. Vernon, Peter M. Yaworsky, Kate E. Magargal, D. Craig Young, David Zeanah, Brian F. Coddling

2015

Numic fires: Modeling the effects of anthropogenic fire on foraging decisions in the Great Basin

80th Annual Meeting of the Society for American Archaeology, San Francisco, CA.

👤 Kenneth B. Vernon, Kate E. Magargal, Ashley K. Parker, Will Rath, Brian F. Coddling

Teaching

Teaching interests. Behavioral Ecology, Urban Science, Environmental Data Science, Statistics, Geography, Conservation & Sustainability, Human Prehistory, North American Prehistory.

University of Utah

- ANTH 1010: Culture and the Human Experience
- ANTH 1030: Introduction to World Prehistory
- ANTH 5850: Quantitative Analysis of Archaeological Data

Professional Affiliations

Great Basin Anthropological Association | 2016-present


Society for American Archaeology | 2014-present

Coalition for Archaeological Synthesis | 2022-present


European Association of Archaeologists | 2023-present

Service, Outreach, and Other Activities

Studio Lab | University of Colorado, Boulder, 2022-2024.

 **Mentor.** Supporting undergraduate research.

Undergraduate Research Opportunities Program. | University of Utah, 2018-2022.

 **Mentor.** Supporting undergraduate research.

Journal Club: Problems in Evolutionary Anthropology | University of Utah, 2018-2022.

 **Organizer.**

Hopi Tribe v Donald J. Trump, Utah Diné Bikéyah v Donald J. Trump, Natural Resources Defense Council v Donald J. Trump | 2018.

Brief Amici Curiae of Archaeological Organizations in Support of Plaintiffs.

 **Contributor.**

References

Available upon request.