

EXHIBIT 19

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NORTH DAKOTA**

CHARLES WALEN, an individual, et al.,

Plaintiffs,

v.

Civil No. 1:22-cv-00031

DOUG BURGUM, in his official capacity as
Governor of the State of North Dakota, et al.,

Defendants,

and

MANDAN, HIDATSA AND ARIKARA NATION, et
al.,

Intervenor-
Defendants.

DECLARATION TO ACCOMPANY THE EXPERT REPORT OF KATE MAGARGAL

Pursuant to 28 U.S.C. § 1746, I, Kate Magargal, declare that:

My name is Kate Magargal. I am an expert witness designated by Intervenor-Defendants in the above referenced case now pending in the United States District Court for the District of North Dakota.

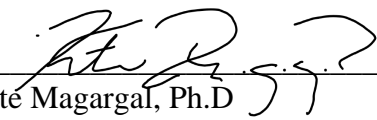
A true and correct copy of my curriculum vitae is attached hereto as a part of my report. The following report, a true and correct copy of which is attached and incorporated herein for all purposes, is a summary of my opinions and conclusions. The materials I relied upon to develop my analyses and opinions are cited therein and/or produced herewith for all counsel.

The court testimony and publications I am required to disclose are described in my attached report and/or curriculum vitae.

My reasonable and necessary hourly rate for my time in this case is \$200.

I declare under penalty of perjury that the foregoing is true and correct.

Signed this 17th day of January, 2023



Kate Magargal, Ph.D

Expert Witness Report

In the case of

Walen & Henderson v. Burgum & Jaeger

U.S. District Court for the District of North Dakota, Eastern Division

prepared by:

Kate Magargal, Ph.D.

Department of Environmental and Sustainability Studies

University of Utah

January 2023

OUTLINE OF THE REPORT

Summary of Findings

I. Introduction

1. Qualifications

2. Quantitative Socioeconomic Methods

II. The Senate Factors Applied to North Dakota

3. The extent to which minority group members bear the effects of discrimination which hinder their ability to participate effectively in the political process, by county

a. Income

b. Poverty

c. Educational Attainment

d. Computer Ownership and Internet Access

e. Home Ownership

f. Health Insurance Coverage

g. Employment

III. Conclusion

Summary of Findings:

Eight socioeconomic variables were selected for this analysis: income, poverty, educational attainment, computer ownership and internet access, home ownership, health insurance coverage, and employment (see results in Table 1). The data for these variables were compared for: (1) AIAN residents of Dunn County versus White residents of Dunn County, (2) AIAN residents of McLean County versus White residents of McLean County, (3) AIAN residents of McKenzie County versus White residents of McKenzie County, and

(4) AIAN residents of Mountrail County versus White residents of Mountrail County for a total 32 separate quantitative socioeconomic tests. Figure 1 shows the geographic extent of this analysis.

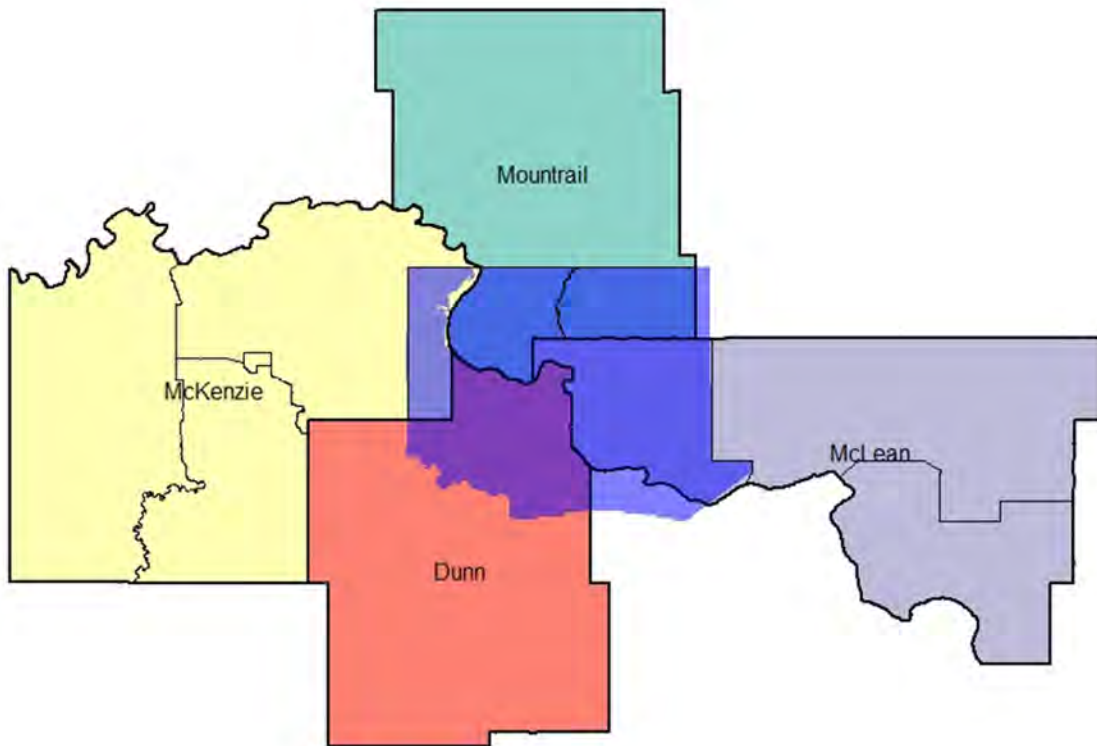


Figure 1: The geographical extent of this analysis includes the four counties that overlap significantly with the Ft. Berthold reservation (shaded dark blue). These four counties are Dunn, McLean, McKenzie, and Mountrail. County boundaries are drawn in bold black lines and represent the units of analysis in this report. Gray lines indicate US Census tracts.

In most cases where statistics were compiled, the AIAN population is at a statistically significant disadvantage when compared to Whites. This includes all statistics examined for McKenzie and Mountrail Counties, and the majority of statistics examined in Dunn and McLean Counties. Overall, AIAN residents earn substantially less household income compared to Whites, are significantly more likely to earn an income under the poverty line compared to Whites, have lower levels of educational attainment, have less access to broadband internet at home compared to Whites, are less likely to own their home, less likely to have health insurance coverage, and more likely to be unemployed. These race-based disparities are, in a word, systemic. AIAN populations are systemically and

significantly at a socioeconomic disadvantage compared to their White neighbors, which hinders their ability to participate in the political process (Senate Report 1982).

I. INTRODUCTION

1. Qualifications

I am a Postdoctoral Research Associate in the Environmental Studies & Sustainability Program at the University of Utah. My formal education includes a BS (2004) in Anthropology from the University of Arizona, an MS in Anthropology from the University of Utah, and a Ph.D in Anthropology from the University of Utah.

I have extensive experience in quantitative methods, including spatial, environmental, socioeconomic, demographic, and statistical modeling including the use of geospatial (GIS) methods. My formal research program focuses on investigating the relationship between changing social and environmental conditions and human decision making, particularly as it relates to traditional landscape uses, diets, and energy. My primary research program has produced 5 published articles in the following major peer reviewed scientific journals; *The Journal of Human Evolution*, *The Journal of Archaeological Science*, *Environmental Archaeology*, *Frontiers in Earth Science*, and the *American Journal of Human Biology*. All of my publications involve social, demographic, and/or spatial modeling. I use publicly available data from the Census in analyses for my work as well, which is included in a forthcoming paper in the journal *Human Ecology*. I also taught quantitative methods at a university level to both undergraduate and graduate students, including the methods used in this report. I have been hired by the plaintiffs for this case and I am compensated at the rate of \$200/hour. The results and conclusions I reach in this report are mine alone, are not related to or endorsed by the University where I have an appointment and were reached through an independent process of research and inquiry.

2. Quantitative Socioeconomic Methods

All data used for the quantitative socioeconomic analysis were collected from the 2017-2021 five-year American Community Survey (ACS) for North Dakota by accessing data tables on the Census Bureau website (data.census.gov). Supplementary data is presented from the 2020 redistricting file dataset (generated via Public Law 94-171) and the Kaiser Family Foundation's State Health Facts Report (for the healthcare avoidance

due to cost variable). The two latter datasets are drawn on to provide context to the quantitative analyses. ACS racial variables in the socioeconomic analysis are American Indian and Alaskan Native-alone (henceforth, AIAN) and non-Hispanic White-alone (henceforth, White). Estimates in this analysis incorporate the margin of errors (MOE) given in the ACS detailed tables. All variable estimates include the MOE by listing the upper and lower estimates, the MOE range, and the differences in the MOE ranges between AIAN and White estimates. This “MOE difference” variable compares errors between AIAN and White estimates to determine whether the comparative errors wash out. All statistical analyses were conducted in the R programming environment (R Core Team 2020), which is an open-source programming language used as a statistical software and data analysis tool.

The quantitative methods in this report rely on descriptive and inferential statistics to present data findings and assess whether observed differences in socioeconomic factors are statistically significant and not due to the vagaries of data sampling or random error. The descriptive and inferential statistics used here are standard practice in quantitative analysis and common in every introductory statistics course.

Statistical tests are warranted for the socioeconomic analysis because they evaluate whether the census survey data (samples) are representative of the population at large – the demographic we are interested in evaluating. Without statistical tests we cannot determine whether the observed differences or similarities between the sampled data are representative of some characteristic of the population as a whole and not due to sampling error. Statistical significance is defined here using the established social science alpha parameter of $\alpha < 0.05$ (McKillup 2006). In other words, for a test to be considered statistically significant it must have less than a 5% probability that the observed effect is the result of sampling error. When a statistical test used in this report yields a p-value (the probability of attaining the observed results) of < 0.05 , we can conclude that the observed effect is representative of the population as a whole and reject the null hypothesis. For each of the tests in this report, the null hypothesis is that there are no differences in the socioeconomic variables based on race.

In the analyses, I use a single inferential statistical test: The Chi Squared Test of Independence, which produces a statistic that measures the difference between the observed and expected frequencies of an outcome for a set of variables to determine whether they are independent of one another. For example, if a county consists of 50

White residents and 50 AIAN residents, and unemployment is 50%, we expect 25 White residents (50%) and 25 AIAN residents (50%) to be unemployed, these are our “expected” values. If in fact only 10 White residents (10%) are unemployed while 40 AIAN residents (80%) are unemployed (or vice-versa), we can see that the “observed” values do not match our expected values. The Chi Square Test of Independence tests whether the differences between expected and observed values are statistically significantly different, and what the probability is that the difference is due to sampling error.

II. THE FIFTH SENATE FACTOR APPLIED TO NORTH DAKOTA

3. Socioeconomic Analysis

3.1. Dunn County

Eight variables are evaluated in this socioeconomic analysis for Dunn County. As the MOE difference between AIAN population and the Dunn County White population is small for each of the eight analyses (Table 1), we conduct statistical tests only on the primary variable estimates, rather than the lower and upper estimates.

The total estimated population of Dunn County is 4,195. There are 458 AIAN residents and 3,515 White residents (Figure 1).



Figure 1. A Census Tract map of the 2021 5-year ACS racial distribution of AIAN and White population in Dunn County, North Dakota. The map includes the Ft. Berthold Reservation population.

3.1a. Median Household Income

The median income for AIAN households in Dunn County is \$53,149, while median household income for Whites is \$87,250. These data show a large race-based discrepancy in income, with White households earning substantially more than AIAN households.

3.1b. Poverty

In Dunn County, 14.3% of AIAN households are below the poverty line compared to 6.2% of White households. This difference is statistically significant ($X^2 = 40.164$, p-value <0.001), with AIAN households significantly overrepresented below the poverty line compared to Whites. Put another way, we have greater than 99.9% confidence that that the sample of income data is representative of the population as a whole and that the null hypothesis (no relationship between race and poverty) can be rejected. A similar degree of confidence is present in all subsequent statistical tests.

3.1c. Educational Attainment

For the AIAN population, 37.9% of adults 25-years and older have a high school diploma or less as the highest level of educational attainment, compared to 44.9% of Whites. 33.9% of the AIAN population attended some college, and 27.9% finished a college degree. This is compared to 35.2% of Whites who attended some college and 19.9% who finished a college degree. There are statistically significant differences in educational attainment by race, with the AIAN population significantly ($X^2 = 19.582$, p-value <0.001) overrepresented in lower educational attainment categories although similar in higher educational attainment categories when compared to Whites.

3.1d. Computer Ownership and Broadband Internet Access

In the AIAN community, 95.7% of households own a computer, while 86% of households have broadband internet. For Dunn White households, 97.5% own a computer and 92.6% have broadband internet. Both differences are statistically significant (computer ownership

$X^2 = 4.5932$, $p\text{-value} = <.05$; Internet Access $X^2 = 20.834$, $p\text{-value} <0.001$), with AIAN households having reduced access to computers and the internet compared to Whites.

3.1e. Home Ownership, Value and Rent Payments

Home ownership in Dunn county does not show substantial bias, as 79.6%% of the AIAN population owns a home and 78.2% of the White population. There is no statistical difference ($X^2 = 0.0795$, $p\text{-value} >.05$).

3.1f. Health Insurance Coverage

In Dunn County, 39.4% of AIAN residents do not have health insurance coverage, compared to 17.1% of Whites in Dunn County. This difference is statistically significant ($X^2 = 125.35$, $p\text{-value} <0.001$), with AIAN residents significantly less likely to have health insurance coverage relative to Whites. Native Americans can also access free or reduced cost healthcare without health insurance through Indian Health Service (IHS) programs. But statewide data from North Dakota suggest that IHS is not making up for disparate access to health insurance coverage among Native Americans and Whites. Despite access to IHS services, AIAN in North Dakota, who are over nearly four times more likely than whites to be uninsured, are also over three times more likely than whites to report that they avoided care due to cost, with 3.9% of Whites reporting not seeing a doctor because of cost, compared to 13.9% of AIAN according to the Kaiser Family Foundation's State Health Facts report (KFF 2022). While these are state-wide data, they are the best available data on health care avoidance due to cost.

3.1g. Employment

Of those in the labor pool, 9.2% of AIAN population is unemployed compared to .5% of the Dunn County White population. This difference is statistically significant ($X^2 = 143.05$, $p\text{-value} <0.001$), with AIAN residents more likely to be unemployed relative to the White population. This difference is especially salient given the lack of difference between AIAN and White education levels.

3.2. McLean County

Eight variables are evaluated in this socioeconomic analysis for McLean County. As the MOE difference between AIAN population and the McLean County White population is

small for each of the eight analyses (Table 1), we conduct statistical tests only on the primary variable estimates, rather than the lower and upper estimates.

The total estimated population of McLean County is 9,788. There are 679 AIAN residents and 8,608 White residents (Figure 1).



Figure 1. A Census Tract map of the 2021 5-year ACS racial distribution of AIAN and White population in McLean County, North Dakota. The map includes the Ft. Berthold Reservation population.

3.2a. Median Household Income

The median income for AIAN households in McLean County is \$58,625, while median household income for Whites is \$72,526. These data show a large race-based discrepancy in income, with White households earning substantially more than AIAN households.

3.2b. Poverty

In McLean County, 8.5% of AIAN households are below the poverty line compared to 7.6% of White households. This difference is not statistically significant ($X^2 = 0.576$, p -value $> .05$). AIAN and White households do not experience different levels of poverty in McLean County.

3.2c. Educational Attainment

For the AIAN population, 36.7% of adults 25-years and older have a high school diploma or less as the highest level of educational attainment, compared to 40.1% of Whites. 55% of the AIAN population attended some college, and 45% finished a college degree.

This is compared to 39.1% of Whites who attended some college and 20.7% who finished a college degree. There are statistically significant differences in educational attainment by race ($X^2 = 14.172$, $p\text{-value} < 0.05$). Both populations have similar attainment of primary education and AIAN is overrepresented in higher educational attainment categories when compared to Whites.

3.2d. Computer Ownership and Broadband Internet Access

In the AIAN community, 96.4% of households own a computer, while 71.2% of households have access to broadband internet. For McLean White households, 96% own a computer and 86.9% have access to broadband internet. Computer ownership is equivalent between the two groups ($X^2 = 0.2996$, $p\text{-value} = >.05$). Access to internet at home, however, is significantly different ($X^2 = 193.54$, $p\text{-value} < 0.001$), with AIAN households having reduced access to the internet compared to Whites.

3.2e. Home Ownership, Value and Rent Payments

57% of the AIAN population owns a home compared with 84.6% of the White population. Home ownership is statistically different between the two groups ($X^2 = 130.5$, $p\text{-value} < .001$), with a significant lower portion of AIAN renting rather than owning their home.

3.2f. Health Insurance Coverage

In McLean County, 6.2% of AIAN residents do not have health insurance coverage, compared to 4.7% of Whites. There is no statistically significant difference between AIAN and White levels of health insurance coverage in McLean County. ($X^2 = 3.1355$, $p\text{-value} > 0.05$).

3.2g. Employment

Of those in the labor pool, 3% of AIAN population is unemployed compared to .8% of the McLean County White population. This difference is statistically significant ($X^2 = 29.564$, $p\text{-value} < 0.001$), with AIAN residents more likely to be unemployed relative to the White population. This difference is especially salient given the lack of difference between AIAN and White education levels.

3.3. McKenzie County

Eight variables are evaluated in this socioeconomic analysis for McKenzie County. As the MOE difference between AIAN population and the McLean County White population is small for each of the eight analyses (Table 1), we conduct statistical tests only on the primary variable estimates, rather than the lower and upper estimates.

The total estimated population of McKenzie County is 14,704. There are 1,894 AIAN residents (12.9% of the total population) and 10638 White residents (72.4% of the total population, see Figure 4).



Figure 4. A Census Tract map of the 2021 5-year ACS racial distribution of AIAN and White population in McKenzie County, North Dakota. The map includes the Ft. Berthold Reservation population.

3.3a. Median Household Income

The median income for AIAN households in McKenzie County is \$76,607, while median household income for Whites is \$81,538. These data show a large race-based discrepancy in income, with White households earning substantially more than AIAN households.

3.3b. Poverty

In McKenzie County, 31% of AIAN households are below the poverty line compared to 7.5% of White households. This difference is statistically significant ($X^2 = 758.43$, $p\text{-value} < .001$) with AIAN households experiencing higher levels of poverty than White households.

3.3c. Educational Attainment

For the AIAN population, 13.7% of adults 25-years and older have a high school diploma or less as the highest level of educational attainment, compared to 5.7% of Whites. 49% of the AIAN population attended some college, and 20% finished a college degree. This is compared to 34.4% of Whites who attended some college and 27.4% who finished a college degree. There are statistically significant differences in educational attainment by race ($X^2 = 152.95$, p-value <0.001). AIAN have lower educational attainment than Whites.

3.3d. Computer Ownership and Broadband Internet Access

In the AIAN community, 98.3% of households own a computer, while 86.7% of households have access to broadband internet. For McKenzie White households, 96% own a computer and 92.1% have access to broadband internet. Computer ownership is statistically higher among AIAN ($X^2 = 17.994$, p-value = $<.001$), however access to internet at home, significantly lower for AIAN than Whites ($X^2 = 151.32$, p-value <0.001).

3.3e. Home Ownership, Value and Rent Payments

36.3% of the AIAN population owns a home compared with 66.8% of the White population. Home ownership is statistically different between the two groups ($X^2 = 138.5$, p-value $<.001$), with home ownership significantly lower among AIAN compared to Whites.

3.3f. Health Insurance Coverage

In McKenzie County, 44.4% of AIAN residents do not have health insurance coverage, compared to 13.2% of Whites. A statistically significant portion of AIAN in McKenzie County lack health insurance coverage as compared to Whites ($X^2 = 887.53$, p-value $<.001$).

3.3g. Employment

Of those in the labor pool, 5% of AIAN population is unemployed compared to .6% of the McKenzie County White population. This difference is statistically significant ($X^2 = 155.44$, p-value <0.001), with AIAN residents more likely to be unemployed relative to the White

population.

3.4. Mountrail County

Eight variables are evaluated in this socioeconomic analysis for Mountrail County. As the MOE difference between AIAN population and the Mountrail County White population is small for each of the eight analyses (Table 1), we conduct statistical tests only on the primary variable estimates, rather than the lower and upper estimates.

The total estimated population of Mountrail County is 9,809. There are 2,840 AIAN residents (29% of the total population) and 5,706 White residents (58% of the total population, see Figure 5).

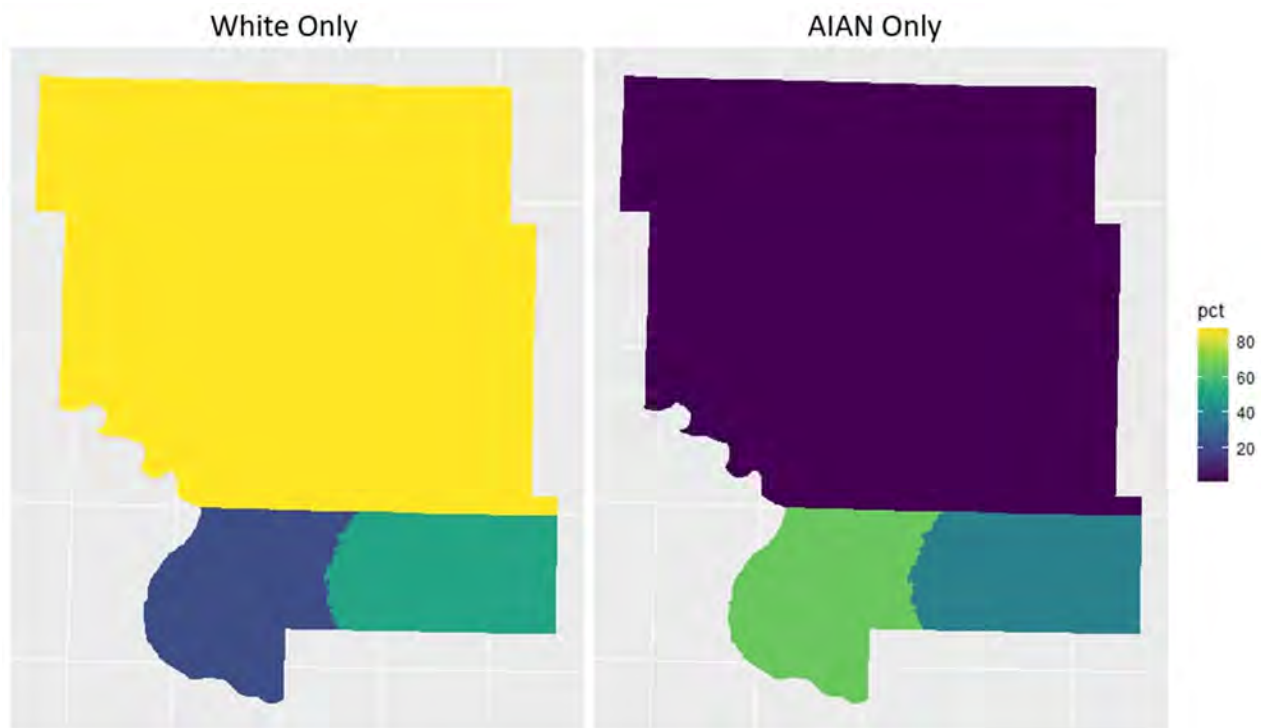


Figure 5. A Census Tract map of the 2021 5-year ACS racial distribution of AIAN and White population in McKenzie County, North Dakota. The map includes the Ft. Berthold Reservation population.

3.4a. Median Household Income

The median income for AIAN households in Mountrail County is \$54,271, while median household income for Whites is \$89,677. These data show a large race-based discrepancy in income, with White households earning substantially more than AIAN

households.

3.4b. Poverty

In Mountrail County, 26.8% of AIAN households are below the poverty line compared to 6.7% of White households. This difference is statistically significant ($X^2 = 656.81$, p-value $<.001$) with AIAN households experiencing higher levels of poverty than White households.

3.4c. Educational Attainment

For the AIAN population, 44.5% of adults 25-years and older have a high school diploma or less as the highest level of educational attainment, compared to 40.1% of Whites. 35.4% of the AIAN population attended some college, and 20.1% finished a college degree. This is compared to 36.9% of Whites who attended some college and 23% who finished a college degree. There are statistically significant differences in educational attainment by race ($X^2 = 1224.5$, p-value <0.001). AIAN have lower educational attainment than Whites.

3.4d. Computer Ownership and Broadband Internet Access

In the AIAN community, 93.8% of households own a computer, while 74.1% of households have access to broadband internet. For Mountrail White households, 96.4% own a computer and 88.1% have access to broadband internet. Both computer ownership ($X^2 = 30.718$, p-value = $<.001$) and access to internet at home ($X^2 = 259.03$, p-value <0.001) are statistically lower among AIAN than Whites. AIAN in Mountrail county have lower access to computers and internet at home.

3.4e. Home Ownership, Value and Rent Payments

51.9% of the AIAN population owns a home compared with 67.9% of the White population. Home ownership is statistically different between the two groups ($X^2 = 64.555$, p-value $<.001$), with home ownership significantly lower among AIAN compared to Whites.

3.4f. Health Insurance Coverage

In Mountrail County, 29.1% of AIAN residents do not have health insurance coverage,

compared to 12.5% of Whites. A statistically significant portion of AIAN in Mountrail County lack health insurance coverage as compared to Whites ($X^2 = 320.79$, p-value $<.001$).

3.4g. Employment

Of those in the labor pool, 4% of AIAN population is unemployed compared to 1.9% of the Mountrail County White population. This difference is statistically significant ($X^2 = 46.4$, p-value <0.001), with AIAN residents more likely to be unemployed relative to the White population.

III. CONCLUSION

For the majority of analyses (24 out of 28), there is race-based bias that disadvantages the AIAN population when compared to Whites. Table one provides a complete overview of the descriptive and inferential statistics for more quantitative context. These disparities are systemic – meaning they reach into multiple aspects of day-to-day life – and hinder the ability of AIAN tribal members to participate effectively in the North Dakota political process (Senate Report 1982).

13

REFERENCES

McKillup, S. (2011). *Statistics explained: An introductory guide for life scientists*. Cambridge University Press.

Kaiser Family Foundation (2022). *State Health Facts*. <https://Kff.org/statedata>

R Core Team, (2020). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria.

Senate Report (1982), No. 97-417, accompanying the Voting Rights Act Amendments of 1982.

County: Dunn										
Variable	AIAN	upper estimate	lower estimate	MOE range	White	upper estimate	lower estimate	MOE range	MOE difference	p-value
Total population	11.2				80					
Median household income (\$)	53149	54114	52184	965	87250	96857	77643	9607	-8642	
Below Poverty Line (%)	14.4	20.7	8	12.7	6.2	8.6	3.8	4.8	7.9	<.001
Education: lower than High school (%)	12.1	21.8	2.3	19.5	8.7	12.6	4.9	7.7	11.8	<.001
Education: High School (%)	25.8	39.6	12.1	27.5	36.2	43.4	29	14.4	13.1	
Education: Some College (%)	33.9	46.3	21.5	24.8	35.2	41.5	28.8	12.6	12.2	
Education: College degree (%)	27.9	40.3	15.4	24.8	19.9	25.2	14.6	10.6	14.3	
Owns a computer (%)	95.7	104.5	86.9	17.7	97.5	100	95	5	12.7	<.05
Broadband internet (%)	86	97.5	74.5	23	92.6	95.9	89.4	6.5	16.5	<.001
Owns a home (%)	79.6	99.3	59.9	39.5	78.2	86.5	69.9	16.6	22.9	>.05
No health insurance (%)	39.4	55.4	23.4	32	17.1	22.8	11.3	11.5	20.6	<.001
Unemployed (%)	9.2	23.7	-5.3	29	0.5	1.5	-0.5	2	26.9	<.001

County: McLean										
Variable	AIAN	upper estimate	lower estimate	MOE range	White	upper estimate	lower estimate	MOE range	MOE difference	p-value
Total population	8.3				86					
Median household income (\$)	58625	79026	38224	20401	72526	77460	67592	4934	15467	
Below Poverty Line (%)	8.5	14.3	2.7	11.6	7.6	9.2	6.1	3	8.5	>.05
Education: lower than High school (%)	10.8	18.8	2.8	16	7.3	9.4	5.3	4.1	11.9	<.01
Education: High School (%)	25.9	38.9	13	25.9	32.8	36.4	29.2	7.2	18.7	
Education: Some College (%)	42.1	54	30.2	23.8	39.1	42.7	35.6	7.1	16.7	
Education: College degree (%)	21.2	30.9	11.4	19.4	20.8	23.5	18.1	5.3	14.1	
Owns a computer (%)	96.4	108.6	84.1	24.5	95.9	96.9	94.9	2	22.5	>.05
Broadband internet (%)	71.2	84.6	57.7	27	86.9	89	84.7	4.3	22.7	<.001
Owns a home (%)	57	71.3	42.6	28.7	84.6	87.6	81.6	5.9	22.8	<.001
No health insurance (%)	6.2	12.3	0.1	12.2	4.7	6.6	2.8	3.9	8.3	>.05
Unemployed (%)	3	12.1	-6.1	18.2	0.8	1.7	0	1.7	16.5	<.001

County:

McKenzie

Variable	AIAN	upper estimate	lower estimate	MOE range	White	upper estimate	lower estimate	MOE range	MOE difference	p- value
Total population	12.9				72.3					
Median household income (\$)	76607	106420	46794	29813	81538	97786	65290	16248	13565	
Below Poverty Line (%)	31	44.3	17.8	26.5	7.5	11	4	7.1	19.4	<.001
Education: lower than High school (%)	13.7	25	2.4	22.6	5.7	8.5	2.9	5.7	16.9	<.001
Education: High School (%)	16.8	25.6	7.9	17.7	32.5	37.9	27.1	10.8	6.9	
Education: Some College (%)	48.9	67.5	30.2	37.3	34.4	39.9	28.8	11.1	26.2	
Education: College degree (%)	20.6	32.4	8.9	23.5	27.4	33.4	21.5	11.9	11.6	
Owns a computer (%)	98.3	113.2	83.4	29.8	96	97.7	94.3	3.4	26.4	<.001
Broadband internet (%)	86.7	103.3	70.2	33.1	92.1	94.4	89.8	4.7	28.4	<.001
Owns a home (%)	36.3	51.1	21.6	29.5	66.8	71.9	61.7	10.2	19.3	<.001
No health insurance (%)	44.4	62.2	26.6	35.7	13.2	18.3	8.1	10.2	25.5	<.001
Unemployed (%)	5	13.7	-3.8	17.4	0.6	1.5	-0.4	1.9	15.5	<.001

County: Mountrail										
Variable	AIAN	upper estimate	lower estimate	MOE range	White	upper estimate	lower estimate	MOE range	MOE difference	p- value
Total population	29				58.2					
Median household income (\$)	54271	68845	39697	14574	89677	100794	78560	11117	3457	
Below Poverty Line (%)	26.8	33.7	19.8	13.9	6.7	9.2	4.1	5.1	8.8	<.001
Education: lower than High school (%)	18.5	26.2	10.9	15.4	5.8	7.5	4	3.5	11.9	<.001
Education: High School (%)	26	33.8	18.3	15.5	34.3	39.6	29	10.6	4.9	
Education: Some College (%)	35.4	43.7	27	16.6	36.9	42.5	31.4	11.1	5.6	
Education: College degree (%)	20.1	26.6	13.5	13.1	23	28.4	17.7	10.7	2.4	
Owns a computer (%)	93.8	98.9	88.7	10.2	96.4	97.7	95.2	2.5	7.7	<.001
Broadband internet (%)	74.1	82.3	65.9	16.4	88.1	90.7	85.6	5.1	11.3	<.001
Owns a home (%)	51.9	60.7	43.1	17.6	67.9	73.1	62.6	10.5	7.1	<.001
No health insurance (%)	29.1	35.5	22.7	12.7	12.5	17.1	7.9	9.2	3.5	<.001
Unemployed (%)	4	8	-0.1	8.1	1.9	4.4	-0.6	5	3	<.001

Table 1. Descriptive and inferential statistics for all eight socioeconomic variables including primary estimates and margin of errors (MOE) for the three counties.

Kate Magargal

Curriculum Vitae

Environmental Studies & Sustainability
University of Utah
260 S. Central Campus Drive, RM 4540
Salt Lake City, UT 84112

Email: kate.magargal@utah.edu
Phone: 435-491-0036
Web: <http://faculty.utah.edu/~kmagargal>
ORCID: 0000-0002-7444-7847

I am an environmental anthropologist focused on human ecology in western North America with expertise in ethnography, archaeology, botany, mathematical modeling, and inter- and trans- disciplinary approaches to teaching. My goal is to produce research and train students to understand the past in a way that addresses contemporary social and environmental issues with a focus on current and ancient land management and Traditional Ecological Knowledge.

Appointments

Associate Instructor Environmental & Sustainability Studies, UU. August 2022 - present.

Associate Instructor Honors College, UU. August 2022 - present.

Postdoctoral Research Associate Environmental and Sustainability Studies, University of Utah (UU), Salt Lake City (SLC), UT. July 2022 - present.

Postdoctoral Research Associate Department of Anthropology, UU. February 2019 - June 2022.

Associate Instructor City and Metropolitan Planning, UU. January 2020-May 2022.

Associate Instructor Department of Anthropology, UU. January 2020 - May 2022.

Assistant Director UU Archaeological Center, UU. August 2015-May 2016.

Education

Ph.D. Anthropology, UU, 2019, Salt Lake City, UT. Thesis: *Subsistence Fires Mediate Human Ecological Relationships*; Committee: Brian Coddling (chair), Duncan Metcalfe, James F. O'Connell, Lisbeth Louderback, Andrea Brunelle, Joan Brenner-Coltrain.

M.S. Anthropology, UU, 2014, Salt Lake City, UT

B.A. Anthropology, University of Arizona, 2004, Tucson, AZ

Summary

Teaching/Mentoring: 2 M.S./M.A., and 13 B.S./B.A. students since 2015 (students noted with * below).

Courses: 7 courses taught, incl. topics in basic science, community engaged approaches, and synthetic approaches to scientific themes.

Publications: 7 published peer-reviewed articles, 3 in prep, 2 technical reports.

Citations: 39 citations, h-index of 3, i10-index of 1 (Google Scholar, accessed 11/9/22).

Field Experience: >2 years working, directing, and teaching field methods in Utah, Nevada, and California.

External Funding: Staff on 2 federal research grants, 2 private foundation grants, and 1 teaching fellowship totaling >\$2 million since 2012.

Internal Funding: PI/Staff on 8 research grants and 2 fellowships totaling >\$100,000 since 2012.

Teaching

Teaching Interests: Community engaged learning, applied behavioral and ecological sciences, quantitative data analysis and research methods, human ecology, Native North America (ethnography and archaeology), cultural resource management, Pleistocene and Holocene archaeology of the world, conservation & sustainability, ethnoarchaeology, GIS/spatial analysis, teaching in non-conventional environments such as in the field.

Courses as Instructor/TA

Instructor, ENVST5000 Undergraduate Research (Independent Study). UU Environmental Studies & Sustainability.

Instructor, HONOR2285 Energy. UU Honors College.

Instructor, ENVST2100 Introduction to Environment & Sustainability. UU Environmental Studies & Sustainability.

Instructor, ANTH1030 Prehistoric Archaeology. Spring 2022. UU Anthropology.

Instructor, CMP3851 Nightscapes. Spring 2022. UU City & Metropolitan Planning.

Co-Instructor, ANTH1030 World Prehistory. Fall 2021. UU Anthropology.

Co-Instructor, CMP3851 Nightscapes. Spring 2021. UU City & Metropolitan Planning.

Instructor, ANTH5850 Quantitative Analysis of Archaeological Data. Spring 2020. UU Anthropology.

Co-Instructor, CMP3851 Nightscapes. Spring 2020. UU City & Metropolitan Planning.

Co-Instructor, ANTH4341 Fundamentals of Archaeology. Fall 2016. UU Anthropology.

Instructor, ANTH 1030-009 World Prehistory: An Introduction (online section of the course). Spring 2016. UU Anthropology.

Teaching assistant, ANTH 1030-001 World Prehistory: And Introduction. Spring 2016. UU Anthropology. Supervisor: Brian Codding 801-581-8663

Instructor, ANTH 5711, Student Individual Research Group (guiding undergraduates in the compilation of data and report writing of an archaeological field project). Fall 2015. UU Anthropology.

Guest Lecturer

Guest Lecturer & course co-developer, CMP 3850 Dark Sky Studies 1: Lightscapes. Fall 2019 & Fall 2020. UU City and Metropolitan Planning. Instructor: Vellachi

Ganesan 801-696-6108.

Guest Lecturer, UU School of Architecture Design Build Bluff Program, Fall 2019 and Spring 2020.

Guest Lecturer, ENVST 3365 Environmental Justice. Fall 2018, 2020. UU Environmental and Sustainability Studies. Instructor: Adreinne Cachelin 801-213-1013.

Pedagogical Training/Experiences

Trainee, UU Undergraduate Mentoring Program, Spring 2020. Instructor: Elizabeth Archuleta 801-581-5499.

Project Mentor, ENVST 3365 Environmental Justice. Fall 2017 - present. UU Environmental and Sustainability Studies. Instructor: Adrienne Cachelin 801-213-1013

Lecturer and Field Guide, Bonderman Field Station at Rio Mesa, Fall 2012-Spring 2019. UU Office of the Vice President of Research. *Developed and conducted on-site field experiences in archaeology and astronomy for a variety of visiting student groups.* Director: Zach Lundeen 801-585-3177.

Course development team member, Fall 2019 - present. UU Honors College. *Work with a team of instructors to develop new tracks of study and courses for honors students.* Supervisor: Sylvia Torti, 801-581-7383.

Dark Sky Scholar, Spring 2018-present. UU School of City and Metropolitan Planning. *Develop curricula and associated outreach efforts as part team of new Minor in Dark Sky Studies (approved by the UU Academic Senate in Spring 2020).* PI: Stacy Harwood, 801-581-8255.

Student, CTLE 6000 Teaching in Higher Education. Spring 2017. UU Center for Teaching & Learning Excellence. *A course focused on implementing pedagogy in college courses.*

Teaching Assistant. UU Wasatch Experience 2016-2017. *A year-long workshop seminar focused on incorporating topics of sustainability into teaching content and practices.*

Fellow, "Think Globally, Learn Locally" NSF-GK12 Fellowship. 2012-2014. *Classroom Science Mentor in AP Environmental Science and 8th Grade Integrated Science.* Supervisor: Holly Godsey, 801-587-7865.

Wilderness Field Instructor, 2009-2010. Aspen Achievement Academy, Loa, UT. *Teach high school curricula to teenage clients of an at-risk youth program in the outdoors.*

Publications

Published peer-reviewed works

Magargal, K. (2022). The cost of cooking for foragers. *Journal of Human Evolution*, 162, 103091. <https://doi.org/10.1016/j.jhevol.2021.103091>

L. Brock James*, Kaley Joyce*, **Kate Magargal**, Brian Coddington. (2022). A stone in the hand is worth how many in the bush? Applying the Marginal Value Theorem to understand optimal toolstone transportation, processing, and discard decisions. *Journal of Archaeological Science*. <https://doi.org/10.1016/j.jas.2021.105518>

Brian F. Coddington, Joan Brenner Coltrain, Lisbeth Louderback, Kenneth Blake Vernon, **Kate E. Magargal**, Peter M. Yaworsky, Erick Robinson, Simon C. Brewer, and Jerry D. Spangler. (2021). Socioecological Dynamics Structuring the Spread of Farming in the North American Basin-Plateau Region. *Environmental Archaeology*. <https://doi.org/10.1080/14614103.2021.1927480>

Matthew N. Goodell*, Takara E. Truong*, Stephanie R. Marston*, Brett J. Smiley*, Elliot R. Befus*, Alex Bingham*, Kent Allen*, Joseph R. Bourne*, Yi Wei, **Kate E. Magargal**, Vellachi Ganesan, Daniel L. Mendoza, Anil C. Seth, Stacy A. Harwood, Marc Bodson, Tucker Hermans, and Kam K. Leang. (2020). Autonomous light assessment drone for dark skies studies. Paper accepted to *Proceedings of Dynamic Systems and Control Conference 2020*, American Society of Mechanical Engineers. <https://doi.org/10.1115/DSCC2020-3205>

Power, M. J., Coddington, B. F., Taylor, A. H., Swetnam, T. W., **Magargal, K.E.**, Bird, D. W., & O'Connell, J. F. (2018). Human Legacies on Ecological Landscapes. *Frontiers in Earth Science*, 6, 151. <https://doi.org/10.3389/feart.2018.00151>

Magargal, K.E., Parker, A.K., Vernon, K.B., Rath, W*, and B.F. Coddington. (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. <https://doi.org/10.1002/ajhb.23000>

Holberg, J.B., **Magargal, K.** and P. Bergeron. (2003) Finding the Cool Companions to the DA White Dwarfs in the Palomar-Green Survey. American Astronomical Society Meeting 203, #54.06; *Bulletin of the American Astronomical Society*, Vol. 35, p.1294. <https://ui.adsabs.harvard.edu/abs/2005ASPC..334..419H/abstract>

Articles under review

Kate Magargal, Jonah Yellowman, Shaniah Morning Star Chee*, Molly Wabel*, Shane Macfarlan, Brian Coddington. Firewood and energy sovereignty on Navajo Nation. Targeted for *Under review at Human Ecology*.

Articles in prep

Kate Magargal, Mickey Campbell, Phil Dennison, William Anderegg, Brian F. Coddling. (in prep) How far to go for the good stuff? Trade-offs between travel cost and biomass availability for Diné woodhaulers. Targeted for *Nature Climate Change*

Kate Magargal, Shaniah Chee*, Jonah Yellowman, Brian Coddling, Adrienne Cachelin. The impacts of climate change, energy policy, and traditional ecological practices on firewood availability for Diné (Navajo) People. Targeted for *Philosophical Transactions of the Royal Society B*.

Other written works

Magargal, Kate. (2021) Review of *Spirit Lands of the Eagle and Bear: Numic Archaeology and Ethnohistory in the Rocky Mountains and Borderlands*. Robert H. Brunswig, ed. Louisville: University Press of Colorado, 2020. *Journal of Archaeological Research* 77(4). <https://doi.org/10.1086/716755>

Coddling, Brian F., **Kate E. Magargal**, Kenneth Blake Vernon, Paul E. Allgaier, Jesse Valdez, and Ron Goode (2018) *Preliminary Archaeological Investigations at the Jack Kirk Site, Mariposa Creek, California*. Submitted to the North Fork Mono Tribe.

Louderback, L., Herzog, N., Baker, M., **Magargal, K.**, and B. Pavlik. (2016) *Archaeobotany of the Sigurd to Red Butte Data Recovery Project, Utah*. Report prepared for SWCA Environmental Consultants.

Conference presentations

Papers

- 2022 **Kate Magargal** & Brian Coddling. (2022, September). Indigenous Woodland Management and Energy Sovereignty on Cedar Mesa, Utah. 16th Biennial Conference of Science & Management on the Colorado Plateau & Southwest Region, Flagstaff, AZ.
- 2022 **Kate Magargal** & Brian Coddling. (2022, March). Political Ecology of Energy Sovereignty on Navajo Nation. 82nd Annual Meeting of the Society for Applied Anthropology, Salt Lake City, UT.
- 2021 **Magargal, K.E.** (2021, April). Seasonality and a risk trade-off in the firewood harvest on northern Navajo Nation, Utah. Paper presented at the 86th Annual Meeting of the Society for American Archaeology, held virtually.
- 2021 **Magargal, K.E.** (2021, March). Forests of Fuel: Firewood harvest as a driver of social and ecological change. Paper presented at the 2021 Society of California Archaeology Annual Meeting, held virtually.

- 2020 **Magargal, K.E.** (2020, October). *Forests of fuel: Firewood harvest as a driver of social and ecological change*. Paper presented at the 2020 Society of California Archaeology Data Sharing Meeting, held virtually.
- 2019 **Magargal, K.E.** (2019, April). *How Firewood Access Structures Settlement Patterns*. Paper presented at the 84th Annual Meeting of the Society for American Archaeology, Albuquerque, New Mexico
- 2018 **Magargal, K.E.** (2018, October). *Variation in Numic adaptations across the Great Basin*. Paper presented at the Great Basin Archaeological Conference, Salt Lake City, UT.
- Magargal, K.E.** (2018, April). *The ecology of cooking with firewood*. Paper presented at the 83rd Annual Meeting of the Society for American Archaeology, Washington D.C.
- Parker, Ashley, Lisa Johnson, **Kate Magargal**, Marianna Di Paolo and Brian F. Coddling (2018, April) When Is a Horse Not a Horse? It Depends on Your Local Ecology. Paper Presented at the 83rd Annual Meeting of the Society for American Archaeology, Washington D.C.
- 2016 Coddling, Brian F., Rebecca Bliege Bird, **Kate E. Magargal** and Douglas W. Bird (2016, December). *Modeling Country: How economic decisions by Aboriginal foragers produce complex emergent phenomena*. Presented at the 115th Annual Meeting of the American Anthropological Association, Minneapolis, Minnesota.
- Coddling, Brian F. and **Kate E. Magargal**. (2016, May) *Numic Fires: Ethnography, Biogeography, and Archaeology of Anthropogenic Disturbance in the Intermountain West*. Paper presented at the Human Ecological Dynamics Workshop, SMU in Taos, New Mexico, USA

Posters

- 2018 **Magargal, K.E.**, and Brian F. Coddling. (2018, October). *Foraging for energy in the forest : Modeling ecosystem dynamics between firewood economics and woodland health*. Poster presented at Northwest Evolution Ecology and Human Behavior 5th Annual Symposium, October 19-21, 2018, Boise, ID.
- Vernon, Kenneth Blake, **Kate Magargal**, D. Craig Young, David Zeanah and Brian F. Coddling (2018, April) Prearchaic Land Use in Grass Valley, NV: A Novel Statistical Implementation of Optimal Distribution Models. Poster Presented at the 83rd Annual Meeting of the Society for American Archaeology, April 11-15, Washington D.C., USA.
- 2017 **Magargal, K.E.** (2017, February). *Did prehistoric people affect fire regimes in southern Utah?* Poster presented at Global Change and Sustainability Annual Research Symposium, University of Utah, Salt Lake City.

2016 **Magargal, K.E.**, Parker, A.K., Vernon, K.B., Rath, W.*, & B.F. Coddling. (2016, October). *Food, Fire, and Free Space: New Tests of the Numic Expansion*. Poster presented at the Great Basin Anthropological Conference, Reno, Nevada.

Parker, A. K., Johnson L., **Magargal K. E.**, Rath, W.*, Di Paolo M., & Coddling, B. F. (2016, October). *When is a horse not a horse? It depends on your local ecology*. Poster presented at the Great Basin Anthropological Conference, Reno, Nevada.

Magargal, Kate E., Ashley K. Parker, Will Rath*, Kenneth B. Vernon, and Brian F. Coddling (2016, April) *Food, fire, and free space: New tests of the Numic Expansion*. Poster presented at the 85th Annual Meeting of the American Association of Physical Anthropologists, Atlanta, GA.

Magargal, Kate E., Ashley K. Parker, Will Rath*, Kenneth B. Vernon, and Brian F. Coddling (2016, February) *Numic Fires: Modelling the Effects of Anthropogenic Fire on Foraging Decisions in the Great Basin*. Poster presentation at the Global Change and Sustainability Center Symposium, SLC, UT.

Agardy, Savanna*, Brock James*, Anna Roberts*, Anastasia Rath*, Will Rath*, Kate E. Magargal, Tom Flanigan, & Brian F. Coddling (2016) Archaeological Investigations of Red Butte Canyon. Poster presented at the Environment and Sustainability Interdisciplinary Research Symposium, February 2, University of Utah; also presented at the Utah Professional Archaeological Council (Student Poster Award Winner), March 4-5, Rio Grande, Utah Division of State History; the University of Utah Undergraduate Research Symposium, April 12, Olpin Union; and the College of Social and Behavioral Science Student Research Day, April 22, Orson Spencer Hall, University of Utah, UT, USA.

2015 **Magargal, Kate E.** (2015, April) *Fetching Firewood: Access to fuels as a constraint for prehistoric settlement*. Poster presentation at the Society for American Archaeology 80th Annual Meeting, San Francisco, CA.

Magargal, Kate E. (2015, March) *A Fire History of Upper Valley near Escalante, Utah*. Poster presentation at the 27th Pacific Climate Workshop. Pacific Grove, CA.

Magargal, Kate E. (2015, February) *Fetching Firewood: Access to fuels as a constraint for prehistoric settlement*. Poster presentation at the Global Change and Sustainability Center Symposium, SLC, UT.

Parker, Ashley, Kate E. Magargal, & Brian F. Coddling (2015) Numic Fires: Biogeography of Foragers and Fire in the Great Basin. Poster presented at the 80th Annual Meeting of the Society for American Archaeology, San Francisco, CA, USA.

Vernon, Kenneth B., Kate E. Magargal, Ashley Parker, Will Rath*, & Brian F. Coddling (2015) Numic Fires: Modeling the Effects of Anthropogenic Fire on Foraging Decisions in the Great Basin. Poster presented at the 80th Annual Meeting of the Society for American Archaeology, San Francisco, CA, USA.

Parker, A. K., **Magargal, K. E.**, & Coddington, B. F. (2016, February). *Burning the West: Biogeography of Foragers and Fire in the Great Basin*. Poster presented at the Global Change and Sustainability Center Symposium, Salt Lake City, Utah. And presented at (2015) the College of Social and Behavioral Science Student Research Day, Salt Lake City, Utah. And presented at (2015) the Society for American Archaeology Annual Meeting, San Francisco, California. And presented at (2014) the Great Basin Anthropological Conference, Boise, Idaho.

2014 **Magargal, Kate E.** (2014, April) *Fetching Firewood: Exploring the Relationship Between Site Locations and Fuel Sources*. Poster presentation at the Society for American Archaeology 79th Annual Meeting, Austin, TX.

Magargal, Kate E. *Firewood Collecting and Diet Breadth*. (2014, March) Poster presentation at the Northwest Evolution, Ecology, and Human Behavior Symposium, Boise State University.

2007 Moore, Chad, Dan Duriscoe and **Kate Magargal**. (2007, March) *A Ground-Based Photometric System of Detecting Artificial Light*. National Park Service Night Sky Team Methods and Results exhibit at the International Dark Sky Association General Meeting, Tucson, AZ.

Grants & Awards

- 2020 Bureau of Land Management Award L20AC00267. “Archaeological Survey of Cottonwood Wash, San Rafael Desert, Emery County, Utah”. Brian F. Coddington (PI), Jerry Spangler (Co-PI), **Kate Magargal (Post-Doc Researcher)**, Kenneth B. Vernon (PhD Researcher), Peter M. Yaworsky (PhD Researcher), Paul E. Allgaier (PhD Researcher), Kurt M. Wilson (PhD Researcher), Louis Brock James (MS Researcher), Roxanne-Lois Lamson (MS Researcher) (\$18,698)
- 2018 Keck Foundation. “Illuminating Dark Sky Studies’: A transdisciplinary focus on the disappearing dark.” Stephen Goldsmith (PI, UU City & Metropolitan Planning), Bryan Boulanger (Senior Personnel [SP], UU Civil and Environmental Engineering), Cord Bowen (SP, UU Multi-disciplinary Design Program), Kelly S. Bricker (SP, UU Department of Parks, Recreation, and Tourism), Amy Bronson (SP, UU Film and Media Arts), Erin Carraher (SP, UU Architecture), Katharine Coles (SP, UU English), David Kieda (SP, UU Physics & Astronomy), **Kate Magargal (SP, UU Anthropology)**, Daniel Mendoza (SP, UU Atmospheric Sciences), Anil Chandra Seth (SP, UU Physics & Astronomy), Amanda Smith (SP, UU Mechanical Engineering), Gregory Smoak (SP, UU History), Elpitha Tsoutsounakis (SP, UU Multidisciplinary Design), Jim Vanderslice (SP, UU Family and Preventive Medicine). (\$450,000)
- 2017 National Science Foundation, “CNH-L: Dynamic Impacts of Environmental Change and Biomass Harvesting on Woodland Ecosystems and Traditional Livelihoods”,

- Dynamics of Coupled Natural and Human Systems, DEB-1714972. Brian F. Coddington (PI, UU Anthropology), William Anderegg (Co-PI, UU Biology), Courtenay Strong (Co-PI, UU Atmospheric Sciences), Philip E. Dennison (Co-PI, UU Geography), Simon Brewer (SP, UU Geography), Shane Macfarlan (SP, UU Anthropology), **Kate Magargal (Postdoc, UU Anthropology)**, in collaboration with Ramesh Shrestha (PI, University of Houston, National Center for Airborne Laser Mapping), and Gavin Noyes (PI, Utah Diné Bikéyah) (\$1,470,534)
- 2017 Resources Legacy Fund. “Firewood Research in Bears Ears National Monument”, collaboration between Utah Diné Bikéyah (UDB) staff Gavin Noyes (Executive Director), Kevin Madalena, Woody Lee, Nizhone Meza, Cynthia Wilson, and UU researchers **Kate Magargal (PhD Student, UU Anthropology)**, and Brian F. Coddington (Faculty, UU Anthropology) (\$40,000)
- 2017 Society, Water, and Climate Seed Funding Program, UU, “Can we predict the next Syria: Quantifying the climate-agriculture-conflict nexus”, William Anderegg (PI, Biology), Brian F. Coddington (Co-PI, Anthropology), Courtenay Strong (Co-PI, Atmospheric Sciences), Shane Mcfarlan (Co-PI, Anthropology), Adrian Bell (Co-PI, Anthropology), and **Kate Magargal (PhD Researcher)** (\$5,000, plus \$4,000 matching funds from the College of Science and Department of Biology)
- 2016 Global Change and Sustainability Center Graduate Research Grant. *People and Fire in Prehistory in the Upper Escalante Watershed, Utah*. Brian F. Coddington (Faculty Sponsor), **Kate Magargal (PhD Researcher, Project Supervisor)**(\$2500)
- 2015 CSBS Herbert W. Gustafson Graduate Fellowship, UU. (\$7,000)
- 2015 Global Change & Sustainability Center and the Friends of Red Butte Creek, UU, “Archaeology and Prehistoric Human Ecology of Red Butte Creek”. Tom Flanagan (Co-PI), **Kate Magargal (Field Director)** and Brian F. Coddington (PI) (\$5,000)
- 2015/16 Don Currey Research Grant, UU Geography. *Bramble Valley Fire History*. (\$950, \$450)
- 2015 Global Change and Sustainability Center Travel Grant, UU. (\$500 x 2)
- 2014 Funding Incentive Seed Grant, UU Research Foundation, *Burning the Basin: Ethnoecology and Paleoecology of Anthropogenic Fire in the Intermountain West*. Brian F. Coddington (PI), **Kate Magargal (PhD Researcher)** (\$33,000)
- 2014 Global Change and Sustainability Center Graduate Research Grant. UU. *Fetching Firewood: Access to fuels as a constraint for prehistoric settlement*. Brian F. Coddington (Faculty Sponsor), **Kate Magargal (PhD Researcher, Project Supervisor)**(\$2500)
- 2014 Rio Mesa Young Scholar Grant, UU Bonderman Field Station at Rio Mesa. *Fetch-*

ing Firewood: Access to fuels as a constraint for prehistoric settlement. Brian F. Coddling (Faculty Sponsor), **Kate Magargal (PhD Researcher, Project Supervisor)**(\$2500)

- 2012/13 *Think Globally, Learn Locally* NSF-GK12 Fellowship. UU. (\$30,000x2)
- 2003 President's Award for Undergraduate Research. University of Arizona. (\$500)
- 2003 1st Place Award for Student Research in Agriculture. University of Arizona. (\$200)
- 2003 Janet Upjohn Stearns Foundation Scholarship. University of Arizona.
- 2003 Honors College Undergraduate Research Grant. University of Arizona. (\$1000)

Research & Field Experience

- 2019-present Postdoctoral Research Associate. "Dynamic Impacts of Environmental Change and Biomass Harvesting on Woodland Ecosystems and Traditional Livelihoods." PI: Brian Coddling. (10 months of ethnographic fieldwork)
- 2017 Research Associate, Utah Diné Bikéyah. "Firewood Research in Bears Ears National Monument." Resources Legacy Fund Grant Award. (3 months of ethnographic fieldwork)
- 2015-2017 Archaeological Field Supervisor and Project Coordinator. Lower Dolores River Watershed Archaeology project. PI: Brian Coddling 801-581-8663 (4 weeks archaeological fieldwork)
- 2017 Archaeology Intern. Project: Archaeological Site Impact Assessment along Moab Travel Routes. Bureau of Land Management, Moab Field Office. PI: M. Jared Lundell 435-259-2137. (11 weeks archaeological fieldwork)
- 2017 Research Assistant, University of Utah Anthropology Department. "Can we predict the next Syria: Quantifying the climate-agriculture-conflict nexus." Funding Incentive Seed Grant, University of Utah Research Foundation. (4 weeks computational data analysis)
- 2017 Field Director. Grass Valley, NV. Project Title: "Prearchaic foraging adaptations in the convergence of women's and men's foraging decisions," University of Utah. (NSF #1632522) PI: Brian Coddling 801-581-8663 (10 days archaeological fieldwork)
- 2017 Research Assistant, University of Utah Anthropology Department. "Collaborative Research: Prearchaic foraging adaptations in the convergence of women's and men's foraging decisions." (NSF #1632522, 2 semesters)

- 2016 PhD Researcher, University of Utah Anthropology Department. Ethnographic and ecological data collection in collaboration with members of the Pyramid Lake Paiute Tribe quantifying piñon (*Pinus monophylla*) pine nut harvest yields relative to natural abundance as part of a long-term project coordinated with PI Brian Coddling (University of Utah) and PhD. researcher Ashley K. Parker (University of Utah), Toiyabe National Forest, Nevada. (4 days ethnographic fieldwork)
- 2015/16 Archaeological Technician. Preliminary Excavations at Grass Valley, NV. University of Utah. PI: Brian Coddling 801-581-8663 (3 weeks archaeological fieldwork)
- 2015 Research Assistant, University of Utah/Utah Museum of Natural History. *Archaeobotany of the Sigurd to Red Butte Data Recovery Project, Utah*. PI: Lisbeth Louderback 801-585-2634. (1 semester palynology lab work)
- 2015 Field Director, University of Utah Archaeological Center. “Archaeology and Prehistoric Human Ecology of Red Butte Creek.” Archaeological survey in Red Butte Canyon, Wasatch Front, Utah with Brian Coddling (PI, 801-581-8663) and Tom Flanigan (Co-PI, USFS & University of Utah). Pilot research project designed to provide graduate and undergraduate field experience and test feasibility for local, place-based archaeological education (1 week archaeological fieldwork)
- 2015 Archaeological Crew Lead. Cattle EIS Archaeological survey and revisit project. Grand Staircase-Escalante National Monument/Colorado Plateau Archaeological Alliance. PI: Matt Zweifel, mzweifel@blm.gov, 435-644-1218. (2.5 months archaeological fieldwork)
- 2015 Archaeological Technician. Excavation project at CA-SLO-51, Diablo Canyon Lands, San Luis Obispo County, California. California Polytechnic Field School. PI: Brian Coddling 801-581-8663 (1 week archaeological fieldwork)
- 2014/15 Research Assistant, University of Utah Anthropology Department. *Burning the Basin: Ethnoecology and Paleoecology of Anthropogenic Fire in the Intermountain West*. PI: Brian Coddling 801-581-8663. (2 semesters)
- 2014 PhD Researcher, University of Utah Anthropology Department. Pilot ethnographic work and outreach with Nevada Paiute and Shoshone Tribes (South Fork, Duck Valley, Duck Water, Yomba and Stillwater) in collaboration with Brian Coddling (PI, 801-581-8663) M. Di Paolo (Shoshoni Language Project PI, University of Utah), and Ashley K. Parker (PhD Student, University of Utah) (1 week ethnographic fieldwork)
- 2013 Archaeological Technician. Excavation project at CA-SLO-5, Diablo Canyon Lands, San Luis Obispo County, California. California Polytechnic Field School. PI: Brian Coddling 801-581-8663 (1 week archaeological fieldwork)

- 2013 Archaeological Technician, Red Canyon Survey Project, St. George, UT. Colorado Plateau Archaeological Alliance. 2529 Jackson Ave. Ogden, Utah 84401. Supervisor: Jerry Spangler 801-392-2646 (1 week archaeological fieldwork)
- 2013 Archaeological Technician, Johnson Canyon Survey Project, Colorado Plateau Archaeological Alliance. 2529 Jackson Ave. Ogden, Utah 84401. Supervisor: Jerry Spangler 801-392-2646 (1 week archaeological fieldwork)
- 2012 Archaeological Technician, Bureau of Land Management, Moab Field Office. 82 East Dogwood, Moab, Utah 84532. Supervisor: Don Montoya, dmontoya@blm.gov, 435-259-2149. (3 months archaeological fieldwork)
- 2010/11 Archaeological Technician, Capitol Reef National Park. HC 70 Box 15, Torrey, UT 84775. Supervisor: Dava McGahee (retired) (2 months archaeological fieldwork)
- 2006-2009 Physical Science Technician, National Park Service Night Sky Program. *Full time employment focused where primary duties were fieldwork planning for 4 person team and data management and analysis.*
- 2003 Undergraduate Research Experience and Primate Ecology at La Suerte Biological Research Station, Costa Rica. University of Arizona Anthropology Dept. Mentor: Dr. M.E. Morbeck (Emeritus), morbeck@email.arizona.edu (1 month primatological fieldwork)
- 2002-2005 Lab Aide, University of Arizona Lunar and Planetary Laboratory. *Part-time student position in data management and analysis.*

Service, Outreach, and Other Activities

- 2021 Co-chair of 86th Annual Meeting of the Society for American Archaeology, “Life is Risky: Human behavioral ecological approaches to variable outcomes”.
- 2019 Guest Lecturer, Four Corners Lecture Series, hosted by the Crow Canyon Archaeological Center, Cortez, CO.
- 2019 Guest Lecturer, Far Westerns Occasional Speaker Series, Davis, CA.
- 2018/19 Scientist Pen Pal. Letters to a Pre-Scientist. <http://www.prescientist.org/>.
- 2018/20 Article Referee, Journal of Hunter Gatherer Research.
- 2016/17 Education and Outreach specialist. Bonderman Field Station at Rio Mesa, UU. Supervisor: Zachary Lundeen: 801-585-3177
- 2016 Host, UU Archaeological Center, Archaeology Open House public outreach event, Utah Archaeology Week, Utah State History, May 7, 2016.

- 2016 Presenter with Brian Coddington, Savanna Agard* and Brock James* on “Engaging Students in Research on Human Ecosystem Dynamics”, UU College of Social and Behavioral Science Advancement Board Meeting, September 16.
- 2015 Host, UU Archaeological Center, Archaeology Open House public outreach event, Utah Archaeology Week, Utah State History, May 2, 2015.
Article Referee, Journal of Archaeological Science.
- 2014 Field Trip Guide, Salt Lake Center for Science Education, AP Environmental Science Fire Ecology Field Trip. October 23, 2014.
Host, UU Archaeological Center, Archaeology Open House public outreach event, Utah Archaeology Week, Utah State History, May 3, 2014.
Host, Outreach with Project Youth Day, hands-on tour of REDlab, sponsored by UU. April 10, 2014.
Host, Outreach with Bennion Elementary school students, hands-on tour of the Archaeological Center, Sponsored by the College of Social and Behavioral Sciences, UU, March 4, 2014.
- 2011–2019 Instructor, Astronomy and Archaeology, UU Bonderman Field Station at Rio Mesa.
- 2009–2013 Chapter Leader (Volunteer), International Dark Sky Association.

Professional Affiliations

- 2021-pres. Society for Applied Anthropology, Member.
- 2012-pres. Society for American Archaeology, Member
- 2018-2020 American Anthropological Association, Member
- 2017-2019 500 Women Scientists, Moab Pod Member.

Skills and Certificates

Programs and program languages: R and RStudio, ArcGIS, GitHub, NetLogo

FAA UAS (drone) Pilot certificate