

# Matthew Haffner

ASSISTANT PROFESSOR · DEPARTMENT OF GEOGRAPHY AND ANTHROPOLOGY · UNIVERSITY OF WISCONSIN - EAU CLAIRE

Phillips Science Hall 257, 101 Roosevelt Blvd, Eau Claire, Wisconsin 54701

✉ haffnerm@uwec.edu | 🏠 geohaff.com | 📧 mhaffner | 📷 mhaffner | 🐦 @geo\_haffner

*Academic interests: Spatial Data Science, Geocomputation, Urban Analytics*

## Professional Employment

<b>Assistant Professor</b> , Dept. of Geography and Anthropology, University of Wisconsin - Eau Claire	2018+
<b>Research Affiliate</b> , Mayo Clinic	2023+
<b>Graduate Research Assistant</b> , Dept. of Geography, Oklahoma State University	2016-2018
<b>Programmer</b> , Dept. of Plant and Soil Sciences, Oklahoma State University	2015
<b>Graduate Teaching Assistant</b> , Dept. of Geography, Oklahoma State University	2012-2016
<b>Transportation Intern</b> , Association of Central Oklahoma Governments	2013

## Education

### Oklahoma State University

DOCTOR OF PHILOSOPHY IN GEOGRAPHY

*Stillwater, Oklahoma*

*Aug. 2014 - May 2018*

- Dissertation: Assessing the validity of location-based social media in the study of spatial processes
- Comprehensive exam areas: GIScience, Urban Geography, the GeoWeb
- Co-advisors: G. Allen Finchum, Adam J. Mathews

### Oklahoma State University

MASTER OF SCIENCE IN GEOGRAPHY

*Stillwater, Oklahoma*

*Aug. 2012 - July 2014*

- Thesis: Measuring social interaction potential in Oklahoma City and Tulsa
- Advisor: Hongbo Yu

### Pittsburg State University

BACHELOR OF SCIENCE IN SECONDARY EDUCATION

*Pittsburg, Kansas*

*Aug. 2007 - May 2012*

- Majors: Geography and Mathematics

## Publications

### MANUSCRIPTS UNDER REVIEW

- **Haffner, M.** Replicable Spatial Data Acquisition. *Under review, submitted August 2023.*
- **Haffner, M.**, N. Walker, S. Grunzke, and M. St. Ores. A spatial and demographic analysis of cycling safety perceptions: A case study in Eau Claire, Wisconsin. *Under review, submitted January 2023.*

### PEER-REVIEWED JOURNAL ARTICLES AND CONFERENCE PROCEEDINGS

- **Haffner, M.**, M. Dewitte, P. Rozario, and G. Ovando-Montejo. A neural network-based landscape search engine: LSE Wisconsin. *Applied Sciences*. **2023.**
- **Haffner, M.**, P. Hagge, C. Brown, R. Heyrman, and C. Perkins. Fusing machine learning with place-based survey methods: Revisiting questions surrounding perceptual regions. *International Journal of Geographical Information Science* 36 (11): 2226-2247. <https://doi.org/10.1080/13658816.2022.2097683>. **2022.**

- **Haffner, M.** A framework for place-based survey implementation. *Spatial Cognition XII. Spatial Cognition 2020. Lecture Notes in Computer Science*, vol. 12162. Eds. J. Škilters, N. S. Newcombe, and D. Uttal. 88-94. [https://link.springer.com/chapter/10.1007/978-3-030-57983-8\\_7](https://link.springer.com/chapter/10.1007/978-3-030-57983-8_7). August **2020**.
- **Haffner, M.** and J. C. Comer. An interactive point pattern analysis web application and teaching exercise. *Journal of Geography in Higher Education* 43 (4): 568-581. <https://doi.org/10.1080/03098265.2019.1660866>. **2019**.
- Ochsner, T., E. Linde, **M. Haffner**, and J. Dong. Mesoscale soil moisture patterns revealed using a sparse in situ network and regression kriging. *Water Resources Research* 55(6): 4785-4800. <https://doi.org/10.1029/2018WR024535>. **2019**.
- Fekete, E. and **M. Haffner**. Twitter and academic geography through the lens of #AAG2018. *Professional Geographer* 71(4): 751-761. <https://doi.org/10.1080/00330124.2019.1622428>. **2019**.
- **Haffner, M.** A place-based analysis of #BlackLivesMatter and counter-protest content on Twitter. *GeoJournal* 84(5): 1257-1280. <https://doi.org/10.1007/s10708-018-9919-7>. **2018**.
- **Haffner, M.** A spatial analysis of non-English Twitter activity in Houston, TX. *Transactions in GIS* 22(4): 913-929. <https://onlinelibrary.wiley.com/doi/abs/10.1111/tgis.12335>. **2018**.
- **Haffner, M.**, A. J. Mathews., E. Fekete, and G. A. Finchum. Location-based social media behavior and perception: Views of university students. *Geographical Review* 108(2):203-224. 913-929. <https://doi.org/10.1111/gere.12250>. **2018**.
- Mathews, A. J., **M. Haffner**, and E. Ellis. GIS-based modeling of tornado siren sound propagation: Refining spatial extent and coverage estimations. *International Journal of Disaster Risk Reduction* 23:36-44. <https://doi.org/10.1016/j.ijdr.2017.04.004>. **2018**.

#### BOOK CHAPTERS

- **Haffner, M.** Twitter. In *Geographies of the Internet*, B. Warf (ed.). Cheltenham, UK: Routledge. 277-291. **2020**.

#### MAPS

- **Haffner, M.** Location of Greenwood Historic District within Tulsa's contemporary food desert. In *Resilience, Environmental Justice, and the City*. Eds. B. H. Caniglia, M. Vallee, and B. Frank. pp. 84. **2017**.

## Professional Presentations

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- **Haffner, M.\***, P. Hagge, C. Brown, R. Heyrman, and C. Perkins. Fusing machine learning with place-based survey methods: Revisiting questions surrounding perceptual regions. *West Lakes Division of the American Association of Geographers Annual Meeting*.. Chicago, Illinois. October **2023**.
- A. Bast, C. Seager, R. Weichelt\*, **Haffner, M.\***, and M. Goettl\*. A spatial analysis of cellular signal strength in Western Wisconsin. *Transforming Community & Rural Healthcare: Digital Health and Workforce Innovation*. Rochester, Minnesota. September **2023**.

- M. Guetschow\*, A. DeRosa, **Haffner, M.** Tying object detection to location: A case study using GPS video data and the R Project for Statistical Computing. *National Conference on Undergraduate Research*. Eau Claire, Wisconsin. Poster presentation. May **2023**.
- **Haffner, M.\*** The Development of a Wisconsin Landscape Search Engine. *Wisconsin Land Information Association*. Eau Claire, Wisconsin. Session. May **2023**.
- **Haffner, M.\*** Feature engineering for spatial data with R. *Twin Cities R User Group*. Minneapolis, Minnesota. Virtual talk. August **2021**.
- **Haffner, M.\*** Casting a vision for Libre Geo: A framework for collaborative, open-access, and interactive GIS educational resources. *Free and Open Source for Geoospatial (FOSS4G)*. Bucharest, Romania. Talk. August **2019**.
- **Haffner, M.\*** A place-based analysis of #BlackLivesMatter and counter-protest content on Twitter. *American Association of Geographers Annual Meeting*. Washington, D.C. Paper presentation. April **2019**.
- **Haffner, M.\*** and J. C. Comer. An interactive point pattern analysis web application and teaching exercise. *West Lakes Division of the American Association of Geographers Annual Meeting*. La Crosse, Wisconsin. Poster presentation. November **2018**.
- Comer, J. C.\* and **M. Haffner** An interactive point pattern analysis web application and teaching exercise. *Southwest American Association of Geographers Annual Meeting*. Manhattan, Kansas. Paper presentation. October **2018**.
- **Haffner, M.\*** A spatial analysis of non-English Twitter activity in Houston, Texas. *American Association of Geographers Annual Meeting*. New Orleans, Louisiana. Paper presentation. April **2018**.
- Finchum, G. A.\* and **M. Haffner** How good is Twitter data: Comparing phone usage patterns using social media vs. calculated home location. *American Association of Geographers Annual Meeting*. New Orleans, Louisiana. Poster presentation. April **2018**.
- **Haffner, M.\***, A. J. Mathews, E. Fekete, and G. A. Finchum. Location-based social media behavior and perception: Views of university students. *Southwest American Association of Geographers Annual Meeting*. Huntsville, Texas. Paper presentation. November **2017**.
- **Haffner, M.\*** The development of shp2nosql: Command line tools for spatial data and NoSQL databases. *American Association of Geographers Annual Meeting*. Boston, Massachusetts. Paper presentation. April **2017**.
- **Haffner, M.\***, A. J. Mathews., and E. Ellis. GIS-based modeling of tornado siren sound propagation in Stillwater, Oklahoma. *Southwest American Association of Geographers Annual Meeting*. Denton, Texas. Poster presentation. November **2016**.
- **Haffner, M.\*** and A. J. Mathews. A multi-dimensional topology for crowd-sourced geographic information. *NSF Workshop on Geospatial Data Science in the Era of Big Data and CyberGIS*. Urbana, Illinois. Paper presentation. July **2016**.
- G. A. Finchum\*, **M. Haffner**, A. J. Mathews, and E. Fekete. Analyzing smartphone usage patterns at colleges with strong gender differences using social media. *Association of American Geographers Annual Meeting*. San Francisco, California. Poster presentation. April **2016**.

- **Haffner, M.\*** Conquering big spatial data: Towards a new philosophy in geographic information science. *Oklahoma State University Research Symposium*. Poster presentation. February **2016**.
- Ochsner, T. E.\*, J. Dong, **M. Haffner**, A. Patrignani, J. C. Patton. Developing an operational system for daily 800-m resolution soil moisture estimates across Oklahoma. *American Geophysical Union Fall Meeting*. San Francisco, California. Paper presentation. December **2015**.
- Patton, J. C.\*, T. E. Ochsner, A. Patrignani, J. Dong, **M. Haffner**. Towards a high resolution soil moisture map of Oklahoma. *American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America Annual Meeting*. Minneapolis, Minnesota. Poster presentation. November **2015**.
- **Haffner, M.\***, H. Yu. Measuring social interaction potential in Oklahoma City and Tulsa. *Association of American Geographers Annual Meeting*. Chicago, Illinois. Paper presentation. April **2015**.
- Finchum, G. A.\*, **M. Haffner**. Using Twitter data to analyze mobile device usage patterns in urban areas. *Association of American Geographers Annual Meeting*. Chicago, Illinois. Poster presentation. April **2015**.
- **Haffner, M.\*** Using ArcGIS, Python, and R to measure social interaction potential in Tulsa and Oklahoma City. *Oklahoma South Central Arc User Group Meeting*. Moore, Oklahoma. Technical presentation. September **2014**.
- **Haffner, M.\*** Measuring social interaction potential in Tulsa and Oklahoma City: A case study. *Oklahoma State University Research Symposium*. Stillwater, Oklahoma. Paper presentation. April **2014**.

\* Presenting author(s)

## Teaching Experience

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### COURSES TAUGHT AS INSTRUCTOR OF RECORD

#### University of Wisconsin - Eau Claire

*Eau Claire, Wisconsin*

*June 2018 - present*

- **GEOG-499** *Independent Study*
- **GEOG-498** *Geography Internship*
- **GEOG-399** *Directed Study*
- **GEOG-368** *Geography Field Seminar* (taught as *Geography of Oregon*)
- **GEOG-435** *Geographic Information Systems III*
- **GEOG-337** *Geographic Information Systems II*
- **GEOG-335** *Geographic Information Systems I* (online)
- **GEOG-335** *Geographic Information Systems I*
- **GEOG-370** *Quantitative Methods in Geography*
- **GEOG-270** *Introduction to Urban and Regional Planning*
- **GEOG-111** *Planet Earth: Human Geography*
- **IDIS-187** *Integrative Seminar*

#### Oklahoma State University

*Stillwater, Oklahoma*

*Aug. 2012 - Dec. 2015*

- **GEOG-1113** *Introduction to Cultural Geography* (lecture)
- **GEOG-1114** *Introduction to Physical Geography* (lecture)
- **GEOG-1114** *Introduction to Physical Geography* (laboratory)

#### Neosho County Community College

*Pittsburg, Kansas*

*Aug. 2011 - Dec. 2011*

- **MATH-112** *Intermediate Algebra*

## COURSES TAUGHT AS TEMPORARY INSTRUCTOR

### Oklahoma State University

Stillwater, Oklahoma

Multiple dates

- **GEOG-4383** *Introduction to GIS Programming*
- **GEOG-3333** *Spatial Analysis*
- **GEOG-3123** *Urban Geography*
- **GEOG-2344** *Digital Tools for Environmental Exploration*
- **GEOG-5343** *Advanced GIS: Resource Management Applications*

### St. Mary's Colgan High School

Pittsburg, Kansas

Jan. 2011 - May. 2011

- *Algebra II (as student teacher)*
- *Geometry (as student teacher)*
- *Algebra III (as substitute)*
- *Calculus (as substitute)*

## Invited Lectures & Workshops

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- An introduction to R for data analysis (one hour workshop). *International Association of Crime Analysts*. Online webinar. June **2022**.
- An introduction to R for geovisualization, web mapping, and web applications (half-day workshop). *Wisconsin Land Information Association Annual Conference*. Elkhart, Lake, Wisconsin. February **2022**.
- An introduction to R for geovisualization, web mapping, and spatial analysis (half-day workshop). *Minnesota GIS/LIS Consortium Annual Conference*. St. Cloud, Minnesota. October **2021**.
- Replicable and extensible spatial data acquisition. *South Dakota State Geography Convention*. South Dakota State University. March **2021**.
- Reproducible data acquisition. *Faculty/Academic Staff Forum*. University of Wisconsin - Eau Claire Office of Research and Sponsored Programs. March **2021**.
- The changing landscape of GIS, GIScience, and Spatial Data Science. *Archaeology Brown Bag - Department of Anthropology*. University of Wisconsin - Madison. September **2020**.
- GIS Programming with R (half-day workshop). *Wisconsin Land Information Association Annual Conference*. Middleton, Wisconsin. February **2020**.
- GIS Programming with R (half-day workshop). *Minnesota GIS/LIS Consortium Annual Conference*. St. Cloud, Minnesota. October **2019**.
- GIS Programming with R (half-day workshop). *Wisconsin Land Information Association Annual Conference*. Appleton, Wisconsin. February **2019**.
- Maintaining graduate student life. In *GEOG-5001 - Professional Development in Geography*. Oklahoma State University. November **2017**, November **2016**.
- Big data, spatial data science, and volunteered geographic information. In *GEOG-2344 - Digital Tools for Environmental Exploration*. Oklahoma State University. September **2017**.
- High performance computing in the social sciences. In *MATH-2910 - High Performance Computing*. Oklahoma State University. March **2016**.

- The emergence of urban segregation in the United States. In *GEOG-1113 - Introduction to Cultural Geography*. Oklahoma State University. March **2016**.
- GIS programming with PostgreSQL and PostGIS. In *GEOG-4383 - Introduction to GIS Programming*. Oklahoma State University. March **2016**.
- Volunteered geographic information, Twitter, and big data. In *GEOG-2344 - Digital Tools for Environmental Exploration*. Oklahoma State University. January **2016**, November **2015**.

## Honors & Awards

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2024	Research and Innovation Council Grant: A Spatial Analysis of Cellular Signal Strength in Western Wisconsin - Phase II (CO-PI; \$81,654)	Mayo Clinic / UWEC
2024	Hessen Incentive Grant: Urban Analytics in German Cities (\$5000)	Office of Academic and Student Affairs, Universities of Wisconsin
2024	Summer Research Experiences for Undergraduates Grant (\$6963)	Office of Research and Sponsored Programs, UWEC
2022	Research and Innovation Council Grant: Impact of Rural Clinic Closures (CO-PI; \$40,178)	Mayo Clinic / UWEC
2022	Research and Innovation Council Grant: A Spatial Analysis of Cellular Signal Strength in Western Wisconsin (CO-PI; \$65,000)	Mayo Clinic / UWEC
2022	Summer Research Experiences for Undergraduates Grant (\$7500)	Office of Research and Sponsored Programs, UWEC
2021	Summer Research Experiences for Undergraduates Grant (\$7304)	Office of Research and Sponsored Programs, UWEC
2019	Fall Research Experiences for Undergraduates Grant (\$2400)	Office of Research and Sponsored Programs, UWEC
2019	Summer Research Experiences for Undergraduates Grant (\$6900)	Office of Research and Sponsored Programs, UWEC
2019	Workshops and Special Travel Grant (\$1550)	Office of Research and Sponsored Programs, UWEC
2017	Norris Conference Travel Scholarship (\$550)	Department of Geography, OSU
2017	Jerry Croft Award in Geography Education (\$1500)	Department of Geography, OSU

2016	Norris Conference Travel Scholarship (\$350)	Department of Geography, OSU
2016	Spring Featured Researcher	High Performance Computing Center, OSU
2015	Research Materials Grant (\$200)	GPSGA, OSU
2015	Most Outstanding First Year PhD Student (\$2000)	Department of Geography, OSU
2015	Susan Shaull Medal for Excellence in Teaching (\$500)	Department of Geography, OSU
2015	Top Tier Graduate Fellowship (\$7500)	Graduate College, OSU
2014	SCAUG Regional Scholarship (\$1500)	South Central Arc User Group
2014	Norris Conference Travel Scholarship (\$500)	Department of Geography, OSU
2013	OKSCAUG Scholarship (\$500)	Oklahoma South Central Arc User Group
2013	Three Minute Thesis Competition Finalist	Graduate College, OSU
2013	Most Outstanding First Year Master's Student (\$1000)	Department of Geography, OSU

## Professional Memberships

American Association of Geographers	Nov. 2014 - Present
Minnesota GIS/LIS Consortium	Sept. 2019 - Present
Wisconsin Land Information Association	April 2021 - Present
Gamma Theta Upsilon (Geography Honor Society)	May 2013 - Present
American Geographical Society	Apr. 2017 - Dec. 2019
OSU Forum of Geography Graduate Students	Aug. 2012 - May 2018
Fellowship of Christian Graduate Students	Aug. 2013 - May 2015

## Professional Service

- **External Program Review.** *Anthropology and Geography major.* Arkansas Tech University. **2024**
- **Manuscript Reviewer.**
  - *Cartography and Geographic Information Science* (2023)
  - *ISPRS Journal of Photogrammetry and Remote Sensing* (2022 [2])
  - *International Journal of Geo-Information* (2022 [3])
  - *International Journal of Applied Geospatial Research* (2022, 2021 [2], 2018)
  - *GeoJournal* (2021, 2020, 2019)
  - *Urban Policy and Research* (2020)
  - *Journal of Transport Geography* (2020)
  - *Geographic Information Science & Technology Body of Knowledge* (2020)
  - *Geographical Review* (2020, 2018)
  - *Professional Geographer* (2019, 2018)
- **Grant Application Reviewer.**
  - *Taylor Geospatial Institute Seed Grant Program to Stimulate Collaborative Research (GISCoR)* (2023 [7])

- **Faculty Mentor for Undeclared Students.** *College of Arts and Sciences.* University of Wisconsin - Eau Claire. September **2022** - present.
- **Curriculum Committee Chair.** *Department of Geography and Anthropology Curriculum Committee.* University of Wisconsin - Eau Claire . September **2022** - present.
- **Internship Director.** *Department of Geography and Anthropology.* University of Wisconsin - Eau Claire. **2021** - present.
- **Curriculum Committee Member.** *Department of Geography and Anthropology Curriculum Committee.* University of Wisconsin - Eau Claire . September **2021** - present.
- **Participant and Lead Coordinator.** *Academic Strategic Plan Summer Project: Course-embedded Undergraduate Research, Scholarship, and Creative Activity (URSCA) for the Department of Geography & Anthropology.* Office of Research and Sponsored Programs, University of Wisconsin - Eau Claire. Summer **2021**.
- **Scholarship Selection Committee Member.** *Department of Geography and Anthropology.* University of Wisconsin - Eau Claire. Spring **2021**
- **McNair Scholar Mentor.** *The Division of Equity, Diversity, Inclusion and Student Affairs (EDISA).* University of Wisconsin - Eau Claire. August **2020** - **2021**
- **Geospatial Board Chair.** *Department of Geography and Anthropology.* University of Wisconsin - Eau Claire. August **2020** - July **2021**.
- **Curriculum Committee Member.** *College of Arts and Sciences Curriculum Committee.* University of Wisconsin - Eau Claire . August **2019** - present.
- **Search Committee Member.** *Critical nature - society geographer position.* University of Wisconsin - Eau Claire. September - December **2018**.
- **Alternate Member.** *OSU Student University Technology Services Fee Committee (UTSF).* Oklahoma State University. November **2017** - present.
- **Secretary.** *Gamma Theta Upsilon (Geography Honor Society).* Oklahoma State University. August **2017** - July **2018**.
- **President.** *Forum of Geography Graduate Students.* Oklahoma State University. August **2016** - February **2018**.
- **Co-organizer.** *Forum of Geography Graduate Students invited colloquium presentations.* Stillwater, Oklahoma. Department of Geography Colloquia. August **2016** - present.
- **Co-organizer.** *Open source software in geography: Theories, developments, and pathways toward openness.* AAG Annual Meeting. Boston, Massachusetts. Paper Session. April **2017**.
- **Co-organizer.** *Open source software in geography: Theories, developments, and pathways toward openness.* AAG Annual Meeting. Boston, Massachusetts. Panel Session. April **2017**.
- **Co-organizer.** *Securing positions in academia.* Forum of Geography Graduate Students Special Sessions. Stillwater, Oklahoma. Three Part Lecture Series. January **2017**.



- **President.** *OSU Fellowship of Christian Graduate Students.* Oklahoma State University. August **2013** - May **2015**.
- **Treasurer.** *Forum of Geography Graduate Students.* Oklahoma State University. August **2012** - July **2013**.

## Technical Skills

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<b>Spatial analysis/GIS</b>	R, Python, PostGIS, QGIS, GeoDa, MATLAB Mapping Toolbox, ArcGIS
<b>Databases/NoSQL</b>	ElasticSearch, PostgreSQL, MongoDB, MS SQL Server
<b>Languages</b>	R, Python, Bash, Emacs Lisp, LaTeX, MATLAB, SQL, C#, HTML, CSS, SAS
<b>Operating systems</b>	Manjaro, Debian, CentOS, Raspbian, Ubuntu, macOS, Windows Server
<b>Web Frameworks</b>	Shiny, Hugo, Jekyll, Microsoft .NET
<b>Editors/IDEs</b>	Emacs (Spacemacs), Vim, RStudio, PyCharm, Spyder, Microsoft Visual Studio
<b>DevOps</b>	Docker, AWS Lightsail & S3, Linode, RStudio Server, Shiny Server, GitLab CI/CD
<b>Presentation software</b>	xaringan, remark.js, reveal.js
<b>Certifications</b>	Base SAS Programming for SAS 9
<b>Report generation</b>	R Markdown, Org mode for Emacs, Jupyter Notebook
<b>Web scraping</b>	R packages: RSelenium, rvest
<b>Unit testing</b>	R package: testthat
<b>Visualization</b>	R packages: ggplot2, leaflet, leaflet.extras, openlayers, rgl, rayshader
<b>Miscellaneous</b>	Git, ShinyProxy, Netlify, High Performance Computing, Inkscape

## Software Projects & Consulting

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### PROJECTS

<b>Lead developer</b>	<i>mapsurveyTemplates: R package for place-based survey implementation, UWEC-funded research project</i>	<a href="https://gitlab.com/mapsurvey/mapsurveyTemplates">https://gitlab.com/mapsurvey/mapsurveyTemplates</a>
<b>Lead developer</b>	<i>sfe: R package for spatial feature engineering, UWEC-funded research project</i>	<a href="https://gitlab.com/mapsurvey/sfe">https://gitlab.com/mapsurvey/sfe</a>
<b>Sole developer</b>	<i>examgen: An R package for creating randomized exam questions and response options, Independent project</i>	<a href="https://gitlab.com/mhaffner/examgen">https://gitlab.com/mhaffner/examgen</a>
<b>Sole developer</b>	<i>ispat: Interactive spatial analysis tool, Independent project</i>	<a href="http://geohaff.com/ispat">http://geohaff.com/ispat</a>
<b>Lead developer</b>	<i>Libregeo: A framework for collaborative, open-access, and interactive education resources for GIS&amp;T courses, Independent project</i>	<a href="https://libregeo.com">https://libregeo.com</a>

<b>Sole developer</b>	<i>shp2nosql: Command line tools for spatial data and NoSQL systems,</i> Independent project	<a href="https://github.com/mhaffner/shp2nosql">https://github.com/mhaffner/shp2nosql</a>
<b>Consultant</b>	<i>Database maintenance and enhancement project,</i> State Historic Preservation Office of Oklahoma	<a href="http://nr2_shpo.okstate.edu">http://nr2_shpo.okstate.edu</a>
<b>GIS Programmer</b>	<i>Soil Moisture Mapping Project,</i> Department of Plant and Soil Sciences, Oklahoma State University	<a href="http://soilmoisture.okstate.edu">http://soilmoisture.okstate.edu</a>

### CONSULTING CLIENTS

Premium Farms, LLC	<i>2021 - present</i>
Minnesota GIS/LIS Consortium	<i>2019 - present</i>
State Historic Preservation Office of Oklahoma City	<i>2018 - present</i>
Ministry of Natural Resources, Kurdistan Regional Government	<i>2017</i>