# CHEYENNE I. LEI

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**Postdoctoral Research Scholar**
Iowa Institute of Hydraulic Research (IIHR) — Hydroscience & Engineering &
Department of Geographical and Sustainability Sciences
The University of Iowa

## EDUCATION

*Summary: My interests are interdisciplinary, with specializations in Agricultural Ecology, Global Change Biology, Remote Sensing, and Instrument Design and Implementation. I also have strong expertise in Physical Geography, and Human-Land-Atmospheric interactions on the environment and Earth's energy balance.*

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|---|---|---|
| Michigan State University | Geography | Ph.D. 2022 |
| Western Michigan University | Geography - Environmental & Resource Analysis | M.A. 2016 |
| Northern Michigan University | Earth Science w/ Geomatics minor | B.S. 2014 |

*Certificates:*

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|---|---|---|
| University of Michigan | College Teaching in Science, Technology, Engineering and Mathematics (STEM) | April 2023 |
| Western Michigan University | Geographical Information Science | May 2016 |

## APPOINTMENTS

**Postdoctoral Research Scholar** 2024 - Present
IIHR— Hydroscience and Engineering &
Department of Geographical and Sustainability Sciences
The University of Iowa

**Postdoctoral Research Fellow** 2022 - 2024
Institute for Global Change Biology, School for Environment and Sustainability
University of Michigan

**Consultant - Research Technician** 2022 – 2023, 2025 - Present
**Doctoral Graduate Student** 2016 - 2022
Landscape Ecology & Ecosystem Science Lab
Department of Geography, Environment, and Spatial Sciences
Michigan State University

**Masters Graduate Student** 2014 - 2016
School of Environment, Geography, and Sustainability
Western Michigan University

## PUBLICATIONS

*Summary: Fifteen (15) peer reviewed publications in well-respected journals (Nature Communications, Global Change Biology: Bioenergy, Environmental Research Letters), with four (4) as first author and ten (10) having a significant leadership role.*

*Published:*

1. Falvo, G., Zhang, Y., Abraha, M., Mosier, S., Su, Y., **Lei, C.,** Chen, J., Cotrufo, M. F., Robertson, G.P. (2025). Combining eddy covariance towers, field measurements, and the MEMS 2 ecosystem model improves confidence in the climate impacts of bioenergy with carbon capture and storage. *Global Change Biology: Bioenergy*. DOI.

2. Reed, D. E., **Lei, C.,** Baule, W., Shirkey, G., Chen, J., Czajkowski, K. P., & Ouyang, Z. (2024). Impacts of an urban density gradient on land-atmosphere thermodynamic fluxes across seasonal timescales. *Theoretical and Applied Climatology*, DOI.

3. Chen, J., **Lei, C.,** Chu, H., Li, X., Torn, M., Wang, Y., Sciusco, P., & Robertson, G. P. (2024). Overlooked cooling effects of albedo in terrestrial ecosystems. *Environmental Research Letters*. DOI.

4. **Lei, C.,** Chen, J., Ibanez, I., Sciusco, P., Shirkey, G., Lei, M., ... & Robertson, G. P. (2024). Albedo of crops as a nature-based climate solution to global warming. *Environmental Research Letters*. DOI.

5. Li, Y., Fang, L., Cao, G., Mi, W., Zhu, K., **Lei, C.,** & Bi, Y. (2024). Reservoir regulation-induced variations in water level impacts cyanobacterial bloom by the changing physiochemical conditions. *Water Research*, 121836. DOI.

6. **Lei, C.,** Chen, J., & Robertston, G. P. (2023). Climate cooling benefits of cellulosic bioenergy crops due to elevated albedo. *Global Change Biology: Bioenergy*. DOI.

7. Shirkey, G., John, R., Chen, J., Dahlin, K., Abraha, M., Sciusco, P., **Lei, C.,** & Reed, D. E. (2022). Fine resolution remote sensing spectra improves estimates of gross primary production of croplands. *Agricultural and Forest Meteorology*, 326, 109175. DOI.

8. Ouyang, Z., Sciusco, P., Jiao, T., Feron, S., **Lei, C.,** Li, F., ... & Chen, J. (2022). Albedo changes caused by future urbanization contribute to global warming. *Nature Communications*, 13(1), 1-9. DOI.

9. Sciusco, P., Chen, J., Giannico, V., Robertson, G.P., Abraha, M., **Lei, C.**, Shirkey, G., Yuan, J. (2022). Albedo-induced global warming impact (GWI Δα) of an Upper Midwest USA watershed — A significantly undermined regulator in climate mitigations. *Land*, 11(2), 283. DOI.

10. **Lei, C.,** Abraha, M., Chen, J., & Su, YJ. (2021). Long term variability of root production in bioenergy systems using ingrowth cores and eddy covariance. *Journal of Plant Ecology.* DOI.

11. Abraha, M., Chen, J., Hamilton, S. K., Sciusco, P., **Lei, C.,** Shirkey, G., Yuan, J., Hamilton, S.K., & Robertson, G. P. (2021). Albedo-induced global warming impact of Conservation Reserve Program grasslands converted to annual and perennial bioenergy crops. *Environmental Research Letters*, *16*(8), 084059. DOI.

12. Chen, J., **Lei, C.,** & Sciusco, P. (2021). Modeling Ecosystem Global Warming Potentials. In Chen J. (Author), *Biophysical Models and Applications in Ecosystem Analysis* (pp. 119-150). East Lansing: Michigan State University Press. DOI.

13. Dahlin, K. M., Akanga, D., Lombardozzi, D. L., Reed, D. E., Shirkey, G., **Lei, C.,** Abraha, M. & Chen, J. (2020). Challenging a global land surface model in a local socio-environmental system. *Land*, 9(10), 398. DOI.

14. Sciusco, P., Chen, J., Abraha, M., **Lei, C.**, Robertson, G.P., Lafortezza, R., Shirkey, G., Ouyang, Z., Zhang, R., & John, R. (2020). Spatiotemporal variations of albedo in managed agricultural landscapes: inferences to global warming impacts (GWI). *Landscape Ecology*, 35(6), 1385-1402. DOI.

15. **Lei, C.,** & Zhu, L. (2018). Spatio-temporal variability of land use/land cover change (LULCC) within the Huron River: Effects on stream flows. *Climate Risk Management*, 19, 35-47. DOI.

16. Scott-Smith, C., Oh, J.S., & **Lei, C.** (2015). Exploring the equity dimensions of US bicycle sharing systems (No. TRCLC 14-01). Western Michigan University. Transportation Research Center for Livable Communities. DOI.

*Publications under review (available upon request):*

17. Li, Y., Reich, P., **Lei, C.,** Michalak, A.M., Li, L., Ombadi, M., Zhu, K., & Bi, Y. (Jan 2025). Seasonal shifts in climate influence the spatial distribution of nutrients in inland waters. *Submitted to Communications: Earth and Environment.*

18. Dai, J., Chen. J., **Lei, C.,** Falvo, G., Robertson, G.P. (Jan 2025). Landsat retrieved values underestimate the albedo of crop and grassland fields in a mixed-use landscape of the Upper Midwest, USA. *Submitted to Environmental Research Letters.*

*Publications with full working draft in preparation (available upon request):*

19. **Lei, C.,** Sciusco, P., Chen, J., Robertson, G. P., Lindback, E., Lei, M., Shirkey, G., & Arrocha, I. (Final preparation). Temporal variations of albedo on bioenergy crops: Effects on global warming potential during three cultivation seasons.

20. Dai, J., Chen. J., **Lei, C.,** Robertson, G.P. (Final Preparation). Estimating daily mean albedo of crop and grassland fields from the harmonized Landsat and Sentinel-2 data.

21. **Lei, C.,** Raubenheimer, S., Falvo, G. (Draft manuscript). Estimating Surface Albedo within Burned Successional Plots at Kreuger State Park, South Africa.

22. **Lei, C.,** Falvo, G. Ibanez, I., Chen, J. (Draft manuscript). An Evaluation of Surface Albedo Change Driven by Land Use.

## RESEARCH

*Summary: My research focuses on investigating the practical applications of the drivers of climate change, with a particular focus on the intersection of agriculture, surface reflectivity, and climate warming/cooling. I am well versed in within the interdisciplinary science of landscape ecology, physical geography, atmospheric physics, quantitative tools from including machine learning, and data manipulation from field observations, remote sensing, and modeling, with eddy covariance and micrometeorological towers experiments spanning multiple spatial scales and ecosystem types (e.g., croplands, forests, grasslands, urban ecosystems).*

**Research Scholar**
*University of Iowa; Department of Geographical and Sustainability Sciences*
Advisor: Silvia Secchi

- Model alternative landscapes in the Corn Belt region based on existing productivity patterns, land characteristics and infrastructure.

- Evaluate the impact of weather, soil, and agricultural practices across Iowa, Indiana and Illinois on agricultural commodities and landscapes.
- Integrate farmer surveys, focus groups and stakeholders to research economic and social barriers to change along the current dominant corn-soybean system.
- Connect landscape scenarios to water and air quality models, to help identify potential policies alternatives to the current dominant paradigm in Midwestern agriculture.
- Provide leadership, scientific expertise and mentorship to undergraduate students, teams, and interns in field surveying, modeling and research design.

**Research Fellow**
*University of Michigan; School for Environment and Sustainability*
*Institute for Global Change Biology*
Advisors: Peter Reich; Ines Ibanez

- Develop and implement analysis techniques and methods undergoing a synthesis on integrating the effects of surface reflectivity over multiple scales, landscape dynamics, and agronomic practices for terrestrial sustainability and management.
- Investigation into biogeochemical and physical plant responses to changing environment and climate.
- Use of instrument testing and precision for measuring radiative forcing effects of global warming potential over agricultural, forest, wetland and suburban ecosystems using field, laboratory, and remote sensing instrumentation.
- Collaboration with multiple stockholders at university, farmer, scientific and educational positions to publish journal articles from field scale (i.e., eddy covariance, meteorological) to remotely sensed (i.e., Landsat, MODIS, Venus) applications of surface reflectivity.
- Provide leadership, scientific expertise and mentorship to undergraduate students, teams, and interns in field surveying, modeling and research design.

**Graduate Research Assistant**
*Michigan State University; Department of Geography, Environment & Spatial Sciences*
*Landscape Ecology & Ecosystem Science Lab (LEES)*
Advisor: Jiquan Chen

- Assess global warming impact of biofuel crops using surface-induced reflectance and climate modelling.
- Construct and maintain tower networks at multiple biofuel cropping, grassland and forest ecosystems for the monitoring and analysis of surface reflectivity, climate, and soil dynamics.
- Deployment and maintenance of remote sensing instruments including NVDI, solar and infrared radiation.
- Interdisciplinary collaboration to publish peer reviewed manuscripts in carbon dioxide fluxes, solar/infrared radiation, atmosphere, and climate change.
- Performed supervisory and mentorship duties for multiple undergraduate interns during field research, and project management.

**Flux Tower Technician**
*Michigan State University*
*Landscape Ecology & Ecosystem Science Lab (LEES)*

- Implemented new methodologies of research through the construction and maintenance of eddy covariance and meteorological tower networks at multiple ecosystems (i.e., urban, agricultural, and forest) for the monitoring and analysis of albedo, climate, and soil.
- Quality controlled and analyzed large spatial and temporal data at the plot scale (i.e., field survey instrumentation), field scale (i.e., eddy covariance, meteorological), local scale (i.e., UAV) and regional scale (i.e., Landsat, MODIS, Venμs).

**Graduate Research Assistant**
*Western Michigan University, Department of Geography*
*W.E. Upjohn Center for the Study of Geographical Change*
*United States DOT: Geography & Engineering Collaboration*

Advisors: Laiyin Zhu; Scott C. Smith

- Provided remote sensing support and cartographic design at the W.E. Upjohn Center for the Study of Geographical Change for GIScience applications.
- Imported raw map data, prepared master indices, verified data integrity by pairing aerial imagery with legacy topographic maps for the entire United States.
- Created and published high resolution hybrid aerial and topographic maps distributed by Avenza Systems Inc.

## PRESENTATIONS

*Summary: Participation in seminars as educational outreach and research at high schools, community stakeholders, universities, annual science meetings and conferences including American Association of Geographers and Ecological Society of America.*

*Invited research talks:*

**Lei, C.** Secchi, S. (2025). 100 years of land use cropping consolidation in Iowa: Can we reverse this trend? Diverse Corn Belt Annual Science Meeting. May 21st, 2025. Davenport, IA.

**Lei, C.** (2025). The role of albedo in climate and agriculture. Department of Geographical and Sustainability Sciences Colloquium. September 13th, 2024. University of Iowa, Iowa City, IA.

**Lei, C.** (2024). The role of albedo in Geography and climate. Department of History & Anthropology talk. March 21, 2024. Monmouth University, West Long Branch, NJ.

**Lei, C.** (2024). Connecting climate change to conservation & biodiversity. Department of Biology & Chemistry talk. Feb 7, 2024. Queens University of Charlotte, Charlotte, NC.

**Lei, C.** (2023). Understanding Albedo: What is it? How can it affect climate change? School of Environment, Geography, and Sustainability 2023 Distinguished Alumni talk. October 27, 2023. Western Michigan University, Kalamazoo, MI.

**Lei, C.** (2023). Climate change impacts on agriculture and food supply. Knox College Environmental Studies talk. August 6, 2023. Knox College, Galesburg, IL.

**Lei, C.** (2023). Understanding Albedo: What is it? How can it affect climate change? 4th Annual High School Climate Change Symposium. March 1, 2023. Battle Creek Area Math and Science Center, Battle Creek, MI.

**Lei, C.,** Sciusco, P., Chen, J., Robertson, G. P., Lindback, E., Lei, M., Shirkey, G., & Arrocha, I. (2022). Land Cover and Climate alters surface albedo during cultivation seasons. United States-China Carbon Consortium. October 28-30, 2022. China University of Geosciences, Wuhan, China. Hybrid Meeting.

Chen, C., **Lei. C.,** Abraha, M., Robertson, G.P., Hamilton, S., Sciusco, P. (2020). Long-term changes in ecosystem carbon production and the role of albedo in regulating climate. GLBRC Virtual Sustainability Meeting. October 7-9, 2020, Virtual Conference.

Reed, D., **Lei, C.,** Baule, W.J., and Shirkey, G. (2019). Impacts of an urban density gradient on land-surface thermodynamic fluxes. February 2019, Wayne State University, MI.

**Stewart, C.** (2016). Spatial, temporal variability & trends within the tributaries of the Huron River: Effects on the frequency of flooding. Landscape Ecology & Ecosystem Science Lab & Center for Global Change and Earth Observations, March 2016, Michigan State University, East Lansing, MI.

*Oral presentations:*

**Lei C.,** Secchi, S. (2025). 100 years of land use cropping consolidation in Iowa: Can we reverse this trend? Advancing agricultural monitoring through remote sensing III. American Association of Geographers, March 24-28. Detroit, MI.

**Lei, C.,** Ibanez, I., Chen, J., Reich, P., Robertson, G. P., Sciusco, P., Lei, M., & Shirkey, G. (2023). Evaluating Surface Reflectivity of Crops as Contribution to a Nature-Based Climate Solution. Ecological Society of America Conference, August 6–13. Portland, OR.

Chen, J., **Lei. C.,** Robertson. G.P. (2023). Likely undervalued climate benefits of radiative forcing from altered land surface albedo during land conversions. The National Aeronautics and Space Administration 2023 AMS Annual Meeting. May 8-12. Virtual.

**Lei. C.,** Chen, J., Robertson. G.P. (2022). Land cover and climate alters surface albedo during cultivation season. Great Lakes Bioenergy Research Center Annual Science Meeting. May 17–19, Lake Geneva, WI.

**Lei. C.,** Chen, J., Robertson. G.P. (2021). Global warming impacts of converting forest into bioenergy croplands: Case study at the Kellogg Biological Station. KBS-LTER Annual Science Meeting. September 23, Hickory Corners, MI.

**Lei. C.,** Chen, J., Robertson. G.P. (2020). The climate cooling impact of albedo in perennial bioenergy croplands. KBS-LTER Midterm Meeting. September 9-11. Virtual Conference.

**Lei. C.,** Chen, J., Robertson. G.P. (2020). The climate cool impact of albedo in perennial bioenergy croplands. Ecological Society of America Conference, August 3–8, Virtual Conference. https://eco.confex.com/eco/2020/meetingapp.cgi/Paper/84459

**Lei, C.** (2019). Albedo induced global warming potential in bioenergy cropping systems. 9th Annual Geography Graduate Student Presentation Competition. March 29, Geography Department, East Lansing, MI.

**Lei, C**. (2017). Analysis of ingrowth cores and flux variables on the variability of root production within agricultural regions. Association of American Geographers Conference, April 4–9, Boston, MA.

**Lei, C.** (2017). Analysis of ingrowth cores and flux variables on the variability of root production within agricultural regions. 7th Annual Geography Graduate Student Presentation Competition, March 31, Michigan State University, East Lansing, MI.

**Lei, C.** (2016). Spatial, temporal variability & trends within the tributaries of the Huron River: Effects on the frequency of flooding. American Association of Geographers: East Lakes & West Lakes Geography Conference, October 13–15, Marquette, MI.

**Stewart, C.** (2016). Spatial, temporal variability & trends within the tributaries of the Huron River: Effects on the frequency of flooding. Association of American Geographers Conference, March 30–April 3, San Francisco, CA.

*Poster presentations:*

****** *indicates student-mentored*

Falvo, G., **Lei, C.,** Chen, J., Robertson, G.P. (2023). Radiative forcing from deforestation is partially offset by soil conservation, surface albedo modification, and ecosystem restoration. American Geophysical Union Conference, Dec 11-15, San Francisco, CA.

**Lei, C.**, Reich, P., Ibanez, I., Chen, J., Robertson, G. P., Sciusco, P., Lei, M., & Shirkey, G. (2023). Evaluating surface reflectivity of crops as contribution to a nature-based climate solution. LICOR Connect 2023 Conference. November 7, Atlanta, GA.

**Lei, C.**, Reich, P., Ibanez, I., Chen, J., Robertson, G. P., Sciusco, P., Lei, M., & Shirkey, G. (2023). Evaluating surface reflectivity of crops as contribution to a nature-based climate solution. University of Michigan Institute for Global Change Biology Mini Symposium. October 26, Ann Arbor, MI.

******Kenney, R., **Lei, C.** (2023). Investigation of albedo through varying degrees of tillage and fertilization in order to reflect on their effects on warming or cooling based on radiative forcing. Kellogg Biological Station Annual Symposium, August 1, Kellogg Biological Station, MI.

**Lei C.,** Reich, P., Ibanez, I., Chen, J., Sciusco, P., Shirkey, G., Lei, M. (2023). Evaluating surface reflectivity of crops as contribution to a nature-based climate solution. 2023 Great Lakes Bioenergy Research Center Annual Science Meeting. May 15–17, Lake Geneva, WI.

**Lei. C.,** Chen, J., Robertson. G.P. (2022). Global warming potential of modelling the conversion of forest into bioenergy croplands: Case study at the Kellogg Biological Station. 2022 Great Lakes Bioenergy Research Center Annual Science Meeting. May 17–19, Lake Geneva, WI.

**Lei. C.,** Chen, J., Robertson. G.P. (2022). Global warming impacts of converting forest into bioenergy croplands: Case study at the Kellogg Biological Station. 2022 Great Lakes Bioenergy Research Center Sustainability Meeting. Feb 14–16. Virtual Conference.

**Lei, C.**, Chen, J., Robertson, P. (2022). Long-term variability of root production in bioenergy crops from ingrowth core measurements. Department of Energy Annual Review, Jan 19–21. Virtual Conference.

**Lei, C.,** Chen, J., Robertson. G.P. (2021). Global warming impacts of converting forest into bioenergy croplands: Case study at the Kellogg Biological Station. KBS-LTER All-Scientist Meeting. September 23, Kellogg Biological Station, MI.

**Lei, C.,** Chen, J., Robertson. G.P. (2021). Temporal variations of albedo on bioenergy crops: Effects of agronomic practices during three cultivation seasons. Great Lakes Bioenergy Research Center Annual Science Meeting. May 6-10. Virtual Conference.

**Lei, C.,** Chen, J., Robertson, P. (2020). Spatiotemporal variability in albedo of biofuel cropping systems. Department of Energy Annual Review, Jan 14t–16, Madison, WI.

**Lei, C.,** Chen, J., Robertson, P. (2019). Albedo induced global warming potential in bioenergy cropping systems. Great Lakes Bioenergy Research Center Annual Science Meeting Poster Session, May 21– 23, Lake Geneva, WI.

**Lei, C.,** Chen, J., Robertson, P. (2019). Albedo induced global warming potential in bioenergy cropping systems. Department of Energy Annual Review, Jan 22– 24, Madison, WI.

******Arrocha, I., **Lei, C.,** & Chen, J. (2019). Albedo on perennial versus annual biofuel croplands. Poster Presentation. Mid-Michigan Symposium for Undergraduate Research Experiences, July 24, Michigan State University, East Lansing, MI.

****** Lindback, E., Abraha, M., Kahmark, K., **Lei, C.,** & Chen, J., Robertson, G.P. (2018). Albedo, foliar nitrogen, and global warming potential of fertilized and unfertilized biofuel croplands. Poster Presentation. Kellogg Biological Station Annual Symposium, August 1, Kellogg Biological Station, MI.

Shirkey, G., Sciusco, P., John, R., Reed, R., O'Brien, K., **Lei, C.,** Cooper, L., Chen, J., Dahlin, K. (2018). Integrating historical land cover and land management in Michigan's Kalamazoo Watershed: A story of carbon flux impact. Great Lakes Bioenergy Research Center Annual Science Meeting Poster Session, May 7– 9, Lake Geneva, WI.

**Lei, C.,** Abraha, M., Kahmark, K., Chen, J. Robertson, P., Hamilton, S. (2018). Spatiotemporal variability of albedo in diverse biofuel cropping systems. Great Lakes Bioenergy Research Center Annual Science Meeting Poster Session, May 7–9, Lake Geneva, WI.

**Lei, C.** (2017). Analysis of ingrowth cores and flux variables on the variability of net ecosystem exchange and root production within ecosystem regions. Council of Graduate Students Academic Conference, February 25, Michigan State University, East Lansing, MI.

Scott-Smith, C., Oh, J.S., **Stewart, C.** (2015). Explorations into the equitable performance of U.S. bicycle sharing systems. Association of American Geographers Conference, April 21–25, Chicago, IL.

## TEACHING ACTIVITES

*Summary: I have instructed courses at the undergraduate level in Climatology and Ecology, and guest lectured at many high schools, symposiums and universities in global climate change, remote sensing, micrometeorological instrumentation, and environmental sustainability. Some of my work has also been applied to Grab-and-Go Outreach activities featuring research developed into an activity by GLBRC Education and catered to elementary and middle school educational application. Within the community, I am an active Instructor at multiple community colleges in professional learning and community engagement.*

*Instructor Led:*

**Adjunct Instructor** Summer 2025
*IIHR — Hydroscience & Engineering*
*Blank Summer Institute for the Arts & Sciences*
University of Iowa
- Course: Field Science: Application of Meteorology in Field Ecology

**Instructor of Record** Summer 2024
*Michigan Math and Science Scholars*
University of Michigan College of Literature, Science, & the Arts
- Course: An Introduction to Ecological & Micrometeorological Instrumentation

**Graduate Teaching Assistant** Summer 2018
*W.K. Kellogg Biological Station*
- Course: Integrative Biology (IBIO) 355 – Ecology
- Semester of junior and senior undergraduates at the W.K. Kellogg Biological Station in evolutionary and community ecology, environmental studies, and climate change.

**Workshop** Nov 2021
*East China Normal University, Shanghai, China.*
Short-Term Postgraduate Course
- Title: “Biophysical Models and Applications in Ecosystem Analysis” *(Virtual)*

### Other:

**Adjunct Instructor** July 2023-Present
***United States Motorcycle Safety Foundation - Certified Riding Instructor***
*Washtenaw Community College, Ann Arbor, MI*
Department of Personal Enrichment

*Schoolcraft College, Livonia, MI*
Department of Personal & Professional Learning

*Lansing Community College, Lansing, MI*
Department of Community Engagement & Adult Enrichment

*Eastern Iowa Community Colleges, Bettendorf, IA*
Continuing Education

*Kirkwood Community College, Cedar Rapids & Coralville campuses, IA*
Continuing Education – Driving & Transportation

*Guest Lectures:*

**Guest Lecturer** Apr 2025
*University of Iowa, Iowa City, IA*
Geography (GEOG) 2050 - Foundations of GIS
• Title: “Career into GIS”

**Guest Lecturer** Mar 2024
*Monmouth University, West Long Branch, NJ*
• Title: “What’s in a Map?”

**Guest Lecturer** Feb 2024
*Queens University of Charlotte, Charlotte, NC*
• Title: “Connecting Climate Change to Conservation & Biodiversity”

**University of Michigan Young Science Innovators (U-MYScI) Guest Lecturer** Dec 2023
*Eastern Washtenaw Multicultural Academy, Ann Arbor, MI*
• Title: “Grade 9-12 Class: Photosynthesis”

**Guest Lecturer** Dec 2020
*Beijing Normal University, Beijing, China*
• Title: “Understanding Global Warming Impact” (Virtual)

**Guest Lecturer** Feb 2020
*Michigan State University, East Lansing, MI.*
Integrative Biology (IBIO) 357 - Global Change Biology
• Title: “Albedo and eddy covariance: Effects on climate & land use change”

**Co-Guest Lecturer** Oct 2019
*Great Lakes Bioenergy Research Center (GLBRC) Environmental Sustainability Meeting*
*Hickory Corners, MI.*
• Title: Great Lakes Bioenergy Research Center Biofuel Cropping System Experiment: Albedo

**Guest Lecturer** Sept 2019
*W.K. Kellogg Biological Station LTER All Scientist Meeting*
*Hickory Corners, MI.*
• Title: “Surface reflectivity: Spatiotemporal variability of albedo in bioenergy cropping systems”

**Guest Lecturer** June 2019
*GLBRC REUs from MSU Main Campus & UW, W.K. Kellogg Biological Station*
*Hickory Corners, MI.*
• Title: “Albedo in bioenergy cropping ecosystems”

**Guest Lecturer** Fall 2017
*Michigan State University, East Lansing, MI.*
Geography (GEO) 892 – Micrometeorological Instrumentation & Measurements
• Provided hands-on experience in sensor and weather tower construction, how to wire, write and process data from popular data-loggers, instruction on using LoggerNet.

*Educational Research, Teaching & Outreach:*

**Teaching Facilitator** 2023-Present
*Center for Research on Learning and Teaching*
University of Michigan
- Facilitator for practice teaching sessions for incoming graduate student instructors and instructional aide teaching orientations

**Grab-and-Go Exploration Station** July 2023
*GLBRC Outreach & GLBRC Education*
Exploring Albedo: Exploration Station Activity Guide
• Overview: "Exploring Albedo" is an activity designed to introduce learners to the concept of albedo. Visitors will learn about the albedo of different surfaces, form a hypothesis about the connection between land use, temperature, and albedo, and test their predictions using laser temperature sensors!

**Keynote Speaker** Mar 2023
*Battle Creek Area Math and Science Center, Battle Creek, MI.*
4th Annual High School Climate Change Symposium
• Title: "Understanding Albedo: What is it? How can it affect climate change?"

**Keynote Speaker** Oct 2022
*China University of Geosciences, Wuhan, China.*
United States-China Carbon Consortium
• Title: "Understanding Global Warming Potential"

**Educational Outreach - Interactive Science Exploration** Apr 2019
*University of Wisconsin - Madison*
University of Wisconsin Science Expeditions: Destination for Exploration
- Collaboration with Wisconsin Energy Institute outreach team on helping develop an interactive educational activity on land-use/albedo research.

**Watershed Management**
*Alger County Conservation District, Alger, MI.* Summer 2013
*Huron River Watershed Council, Ann Arbor, MI.* *2013 - 2014*
- Collaboration with multiple watershed councils within Michigan in hydrology, performing water quality monitoring, stream assessment, and recording of water chemistry within urban rivers, remote rivers, and streams.
- Educational outreach to community, stakeholders and high schools on environmental sustainability and science education.
- Monitored invasive plant species, and removed them with mechanical and herbicidal methods.
- Collected water quality data (i.e., stream depth, stream width, water temperature, water conductivity) and inventoried micro invertebrate in streams.

## ADVISING & MENTORSHIP

*Summary: Fourteen (14) undergraduate students and two (2) graduate student mentored, many of which have gone onto master's programs, become research scientists, and hired at engineering firms.*

Abigail Bielecki Jan 2025 - Present
Department of Geographical and Sustainability Sciences
*Current position: Senior undergraduate student, University of Iowa*

Finley, Bickford Jan 2025 – May 2025
Department of Geographical and Sustainability Sciences
*Current position: Senior undergraduate student, University of Iowa*

Bethany Richardson Jan 2025 – May 2025
Department of Geographical and Sustainability Sciences
*Current position: Senior undergraduate student, University of Iowa*

Sylvie Heard Jan 2025 – May 2025
Department of Geographical and Sustainability Sciences
*Current position: Senior undergraduate student, University of Iowa*

Caleb Jelsma-Cale June 2024 – July 2024
School for Environment & Sustainability, University of Michigan
*Current position: Teaching Assistant, 2nd year Masters student, University of Michigan*

Rose Lizzo Oct 2023 – May 2024
University of Wisconsin-Madison, Great Lakes Bioenergy Research Center (GLBRC) / Wisconsin Energy Institute (WEI) Mentorship Program.
*Current position: 2nd year PhD student, Kiley Lab, UW-Madison*

Julia Seay May 2023 – Aug 2023
Environmental Studies and Earth & Environmental Geoscience, Washington and Lee University, VA.
*Current position: Senior undergraduate, Washington and Lee University.*

Renae Kenney May 2023 – Aug 2023
College of Engineering, Michigan State University, East Lansing, MI.
*Current position: Senior undergraduate, Michigan State University*

Michael Collins May 2022 – Aug 2022
Department of Environment and Sustainability, Michigan State University, East Lansing, MI.

Maximilian Mihaylov June 2019 – Aug 2019
Interdisciplinary Studies in Social Science, Michigan State University, East Lansing, MI

Ezequiel Mussambe June 2019 – Aug 2019
Department of Geography, Environment & Spatial Sciences, Michigan State University, East Lansing, MI.
*Current position: GIS Developer & Analyst, Hydrosimulatics, Haslett, MI*

Isabel Arrocha June 2019 – Aug 2019
Department of Biological and Agricultural Engineering, University of Arkansas, Fayetteville, AR.
*Current position: Junior Engineer, Malone/Wheeler Inc.*

Emily Lindback May 2018 – Aug 2018
Department of Earth and the Environment, Franklin & Marshall College, Lancaster, PA
*Current position: Agricultural Stewardship Specialist, Cornell Cooperative Extension of Suffolk County.*

Pedro Kuyenga May 2018 – July 2018
Department of Geography, Environment & Spatial Sciences, Michigan State University, East Lansing, MI.
*Current position: Geospatial Data Analyst, Infrastructure Planning & Facilities, Michigan State Univ.*

Kaylee Peterson Apr 2018 – July 2019
Department of Community Sustainability, Michigan State University, East Lansing, MI.
*Current position: Community Outreach Coordinator, Friends of the Detroit River.*

Kaitlyn O'Brien Apr 2017 – May 2018
Department of Community Sustainability, Michigan State University, East Lansing, MI.

## FUNDING, AWARDS & SCHOLARSHIPS

*Awards:*

School of Environment, Geography & Sustainability Distinguished Alumnus Achievement Award, Western Michigan University 2023
- https://wmich.edu/arts-sciences/alumni/alumni-awards

UMPDA Conference Award, University of Michigan Postdoctoral Association 2023
Jennifer L. Reed Award in Bioenergy Science, Great Lakes Bioenergy Research Center 2023
- https://www.glbrc.org/research/reed-bioenergy-award

Research Fellow, Institute for Global Change Biology, University of Michigan 2022
Department of Energy Research Publication Highlight, Great Lakes Bioenergy Research Center Year 4 Narrative 2021
BFSAA Historical and Emerging Leaders Nomination, Black Faculty, Staff and Administrators Association (BFSAA), Michigan State University 2021
GLBRC Early Career Women in Bioenergy Science Nomination, W.K. Kellogg Bio. Station 2020
Research Scholars Award, College of Social Science, Michigan State University 2018 & 2019
W.K. Kellogg Biological Station Fellowship, W.K. Kellogg Biological Station 2018
Academic Achievement Graduate Assistantship Award, Michigan State University 2017

*Submitted grants:*

American Association for the Advancement of Science (AAAS) L'Oréal USA For Women in Science Fellowship. PI: **Lei, C**. $60,000. *Rejected September 2024.*

DE-FOA-0002849 – Synthesis Research for Transferable Insights.
Dilemma of Global Terrestrial Ecosystems: An Undervalued Forcing in Climate Change Science, Department of Energy: Biological and Environmental Research, Earth, and Environmental Systems Sciences. Chen, J. (PI), Chu, H. (DOE PI), Robertson, G.P. (COI), Torn, M.S. (COI), Collaborators: Keenan, T., Papale, D., Reichstein, M., Wang, Y., Roy, D., **Lei, C.,** Scott, R.S., Loescher, H.W., Metzger, S., McNulty, S. $400,000. *Rejected February 2023, but reviewed as High Priority.*

National Academy of Sciences, Engineering and Medicine Ford Foundation Dissertation Fellowship. PI: **Lei, C**. $28,000. *Rejected March 2020.*

*Funding:*

University of Iowa Blank Summer Institute Summer 2025 Program 2025
University of Iowa College of Education: **$4,000**

Michigan Math and Science Scholars Summer 2024 Program 2023
University of Michigan College of Literature, Science, and the Arts: **$11,000**

The University of Michigan Postdoctoral Association Conference Travel Award 2023
University of Michigan Postdoctoral Association, University of Michigan: **$500**

Dissertation Completion Fellowship 2020
Graduate College, College of Social Science, Michigan State University: **$7,500**

Graduate Office Fellowship 2020
Graduate College, Michigan State University: **$1,200**

The Charles P. and Linda A. Thompson Endowment for Social Science Research 2019
College of Social Science, Michigan State University: **$1,000**

Research Scholars Award 2019
College of Social Science, Michigan State University: **$3,367**

W.K. Kellogg Biological Station LTER Fall 2019 Fellowship 2019
National Science Foundation & Michigan State University: **$6,500**

Graduate Office Fellowship 2019
Graduate College, Michigan State University: **$550**

W.K. Kellogg Biological Station Graduate Teaching Assistantship 2018
W.K. Kellogg Biological Station: **$9,000**

Graduate Office Fellowship 2018
Graduate College, Michigan State University: **$1,000**

Research Scholars Award 2018
College of Social Science, Michigan State University: **$5,814**

Kenneth E. and Marie J. Corey Research Endowment Fund 2018
College of Social Science, Michigan State University: **$1,000**

W.K. Kellogg Biological Station Summer Fellowship 2018
W.K. Kellogg Biological Station & Michigan State University: **$2,500**

Academic Achievement Graduate Assistantship Award 2017
Graduate College, Michigan State University: **$8,000**

Geography Scholarship 2017
Department of Geography, Michigan State University: **$250**

Department of Geography Travel Fund 2017
Department of Geography, Michigan State University: **$400**

Graduate Student Affairs Travel Fund 2017
Associate Dean, Michigan State University: **$300**

Graduate College Travel Fellowship 2017
Graduate College, Michigan State University: **$200**

Lucius Harrison Geography Travel Fund 2016
Department of Geography, Western Michigan University: **$1,000**

Michigan Department of Transportation Grant Travel Fund 2015
College of Engineering, Western Michigan University: **$750**

Scholarship 2012-2014
Track & Field, Northern Michigan University: **$60,000**

Scholarship 2010-2011
Track & Field, Missouri State University**: $36,000**

## SERVICE

*Invited Panels:*

Great Lakes Bioenergy Research Center / Wisconsin Energy Institute Mentorship Networking Event – Postdoctoral Panelist — Nov 2023

Michigan State University Geography Club – Graduate Student Panelist — Nov 2022

Great Lakes Bioenergy Research Center (GLBRC) – Graduate School Panelist — July 2022

Great Lakes Bioenergy Research Center (GLBRC) National Clean Energy Week 2021 – Panelist — Sept 2021
• https://energy.wisc.edu/events/power-plants-how-bioenergy-benefits-world

Kellogg Biological Station Undergraduate Career Panel – Panelist — July 2018

*University Service:*

**Mentor**

*Faculty mentor in multiple programs for students interested in research opportunities, laboratory, and field research.*

Great Lakes Bioenergy Research Center / Wisconsin Energy Institute Mentorship Program — 2023-2024
University of Michigan Young Science Innovators (U-MYScI) — 2023 - 2024
*Outreach program fostering science and innovation in middle school students*
National Science Foundation Research Experiences for Undergraduates — 2018, 2019, 2022
Long-term Ecological Research (LTER) Program Research Experiences for Undergraduates, W.K. Kellogg Biological Station — 2022, 2023
GLBRC's Summer Undergraduate Research Program (SURP), Michigan State University — 2019, 2023

**LTER Grad-Postdoc Leadership Council** — Mar 2023 - Present
*W.K. Kellogg Biological Station Long Term Ecological Research Network*
• Co-chair of executive committee aimed to provide community, professional development and networking for graduate students and research fellows at Michigan State, University of Michigan, and Kellogg Biological Station.

**Rapporteur** — Apr 2020
*LTAR Annual Science Meeting Program*
• Title: “Great Plains and Florida Rangelands”
• Title: “Ecosystem Exchanges of Carbon, Water, and Energy across Diverse Agricultural Systems”

**Evaluator**
*Mid-Michigan Symposium for Undergraduate Research Experiences Conference* — *July 2019*
*Michigan State University, University Undergraduate Research and Arts Forum (UURAF)* — *Apr 2018*

**Vice President** — June 2019 – Dec 2019
*Geography Graduate Group*
Michigan State University Department of Geography, Environment & Spatial Sciences

**Chairperson** — 2018 - 2019
*Geography Graduate Group Colloquium Committee*
Michigan State University Department of Geography, Environment & Spatial Sciences
• Develop an annual seminar series for hosting professionals from multiple disciplines to promote professional connections for undergraduates, graduates and faculty.

**Exam Proctor** Sept 2016 – Aug 2022
*Michigan State University*
Department of Geography, Environment & Spatial Sciences

*Peer Review:*
*Editorial Review Board:*
• The International Journal of Applied Geospatial Research Sept 2023

*Journal Reviewer:*
*Each line represents a unique reviewed journal submission. Multiple dates indicate acceptance to continue reviewing author resubmitted manuscripts.*

| | |
|---|---|
| • Climate Research | 06/2025 |
| • Nature Communications | 12/2024, 06/2025 |
| • Nature Communications | 12/2024 |
| • Ecological Processes | 11/2024 |
| • Agricultural & Forest Meteorology | 07/2024 |
| • Agricultural & Forest Meteorology | 08/2024 |
| • International Journal of Applied Geospatial Research | 09/2023 |
| • International Journal of Applied Geospatial Research | 02/2022 |
| • International Journal of Applied Geospatial Research | 07/2020 |
| • Ecological Indicators | 02/2020, 07/2020 |
| • The Journal of Mountain Science | 07/2019 |
| • The International Journal of River Basin Management | 02/2019, 04/2019, 07/2019 |
| • International Journal of Applied Geospatial Research | 02/2019, 12/2019 |
| • Environmental Systems Research | 02/2018 |
| • Journal of Geophysical Research – Biogeosciences (Group peer review) | 12/2017, 02/2018 |

*News:*
WILEY Global Change Biology: Bioenergy. “Congratulations, you are one of our most-cited authors published by the journal in 2023*: Climate cooling benefits of cellulosic bioenergy crops from elevated albedo”. March 2025.

GLBRC. “Cheyenne Lei wins GLBRC early career award”. May 2023, Great Lakes Bioenergy Research Center, (https://www.glbrc.org/news/cheyenne-lei-wins-glbrc-early-career-award)

GLBRC. “Jennifer L. Reed Bioenergy Science Award”. May 2023, Great Lakes Bioenergy Research Center, (https://www.glbrc.org/research/reed-bioenergy-award)

WEI. “Propelling Women in Power: Highlighting the stories of women in Research”. Wisconsin Energy Institute. October 2022, (https://energy.wisc.edu/news/podcast-breaking-barriers-building-bridges-cheyenne-lei)

GLBRC. “Bioenergy Crops Create Local Cooling That Can Increase Climate Benefit.” Great Lakes Bioenergy Research Center, Oct. 2021, (https://www.glbrc.org/research/highlights/bioenergy-crops-create-local-cooling-can-increase-climate-benefit)

WEI. “Power from Plants: How Bioenergy Benefits the World.” Wisconsin Energy Institute, 4 Aug. 2021, (https://energy.wisc.edu/events/power-plants-how-bioenergy-benefits-world)

Griffin, Mark E. “A Geographer's-Eye View with Cheyenne Lei.” Great Lakes Bioenergy Research Center, June. 2021, (https://www.glbrc.org/news/geographers-eye-view-cheyenne-lei)

*Other Service:*

**Cartographic design services**

Carneiro, P. A., Zimpel, C. K., Pasquatti, T. N., Silva-Pereira, T. T., Takatani, H., Silva, C. B., ... & Kaneene, J. B. (2021). Genetic Diversity and Potential Paths of Transmission of Mycobacterium bovis in the Amazon: The Discovery of M. bovis Lineage Lb1 Circulating in South America. *Frontiers in Veterinary Science*, 8. https://doi.org/10.3389/fvets.2021.630989

• Compiled geographic data, provided GIS support and cartographic design services for research.

**Special Events Support Services** Sept 2019- Aug 2022

*Michigan State University Police & Public Safety*

• Civilian law enforcement providing leadership and assistance, and assisting emergency personnel as needed during events and emergencies.

**Moderator** Apr 2020 – Oct 2021

*FunPlus Kings Group – State of Survival*

• Provide discussion topics, remove inappropriate content, answer questions, and update the platform for State of Survival official Discord consisting of 180,000 members.

**Canvasser** May 2016 - Aug 2016

*Clean Water Action*

• Mobilized the community to raise awareness on environmental and public health issues, through the use of public education and organizing.

## TECHNICAL EXPERIENCE

**Unmanned Aerial Systems**

*Department of Geography, Environment & Spatial Sciences, Michigan State University* 2017

• FAA Part 107 Drone Test Prep & Beyond (Specialization course) Remote Pilot Training Level 1 & 2: UAS components, multi-copter control, principles of flight and hands-on flight.

- FAA Part 107 Drone Test Prep & Beyond (Specialization course) Drone to GIS Level 1& 2: Multi-spectral processing using Pix4D, mobile GIS tools, drone data GIS processing.

**Languages**

**English**

- Conversational – Fluent
- Writing – Fluent

**Mandarin Chinese**

- Conversational – Beginner
- Writing – Beginne

**Software Proficiency**

ESRI: ArcGIS Pro, ArcMap, ArcCatalog
R Project for Statistical Computing: R, R Studio
Microsoft Office: Word, Excel, PowerPoint
MathWorks: MATLAB
NV5 Geospatial Solutions: Environment for Visualizing Images (ENVI)
Campbell Scientific Inc.: LoggerNet, ShortCut, CRBasics
Eddy Covariance: EdiRe Software for Micrometeorological Applications, EddyPro

## INTERESTS

I am an avid motorcyclist! As a certified United States Motorcycle Safety Foundation Instructor, I often teach and demonstrate the basics of motorcycle safety and riding to beginner and advanced riders. In my spare time, I love to ride, and have ridden the western Pacific coasts of Oregon and Washington, the natural beauty of the Midwestern states, to the twisty curves in North Carolina and Tennessee.