

CHANG CAI

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EDUCATION Ph.D., Agricultural and Applied Economics, University of Illinois at Urbana-Champaign, 2022 (expected)
Dissertation: *Three Essays on Climate Change, Wildfires and Outdoor Recreation*
Committee: Benjamin M. Gramig (Chair), Amy W. Ando, Peter Christensen, and Carena J. van Riper

M.S., Applied Statistics, University of Illinois at Urbana-Champaign, 2022 (expected)
M.S., Policy Economics, University of Illinois at Urbana-Champaign, 2013
B.A., International Business, Huazhong University of Science and Technology, 2012

FIELDS OF INTEREST Environmental and Natural Resource Economics, Regional Economics

PUBLICATIONS Cai, C. and Dall’Erba, S. (2021). “On the Evaluation of Heterogeneous Climate Change Impacts on US Agriculture: Does Group Membership Matter?” *Climatic Change*, 167(1)
Media coverage: “Study Proposes New Ways to Estimate Climate Change Impacts on Agriculture” in Phys.org, Herald News and Latestly, August 2021

WORKING PAPERS “Wildfire and Visitation in U.S. National Parks” [**Job Market Paper**, [link](#)]
“Integrating social values with GPS tracks through Denali National Park and Preserve” (with Carena Van Riper, Dana Johnson, Christopher Raymond, William Stewart, Riley Andrade, and Devin Goodson)
“Revisiting the Impact of Climate Change on Agriculture through Spatially-varying and Place-tailored Ricardian Estimates” (with Noe J Nava, Sandy Dall’Erba and Stewart Fotheringham)

WORKS IN PROGRESS "Temporal Disaggregation of Visitation Time Series in U.S. National Parks Using Mobile Phone GPS data" (with Zhangliang Chen)

RELEVANT EXPERIENCE **Research Assistant**
Department of Agricultural and Consumer Economics, UIUC Jan 2016 - Aug 2018
National Center for Supercomputing Applications, UIUC Jan 2021 - Aug 2021
• Collected and processed large-scale spatio-temporal datasets related to weather (PRISM), soil quality (gSSURGO), wildfires (USFS FPA, NOAA HMS), air pollution (EPA AQS), future climate projections based on multiple GCMs and RCMs, farm economy (USDA Quick Stat), Input-Output coefficient matrices (BEA), etc.

- Conducted data analysis using causal inference, spatial econometrics, statistical learning techniques such as Ridge, LASSO, random forest, etc. Implemented newly developed machine learning algorithm based on authors' source code on Github.
- Collaborated with faculty and other graduate students, created visualizations, wrote research papers, and presented findings at multiple high-end academic conferences.

Actuarial Lead Intern

May 2020 - Aug 2020

Property & Casualty Actuarial Department, State Farm Research & Development Center

- Led a 4-member team of both undergrad and graduate students studying dangerous driving behaviors, led daily discussions with team members, organized and hosted weekly progress updates with supervisor, tutored team members in R and Git.
- Implemented machine learning algorithms, LASSO and Random Forest to select the most predictive driving behavior variables on claimed loss events.
- Developed an interactive R-shiny dashboard of Drive Safe & Save program to help users explore the spatial pattern of dangerous driving behaviors and loss experience.

Teaching Assistant

- ACE 100: Introduction to Applied Microeconomics, Lead weekly discussion section (2018F, 2019S, 2019F, 2020F, 2021F)
- ACE 264: Applied Statistical Methods & Data Analytics 2, Grader (2021S)
- ACE 449: Retirement & Benefit Planning, Grader (2020S)

OTHER EXPERIENCE

Administrative Assistant supporting the faculty members organizing the program in Environmental and Resource Economics (pERE) weekly seminar series, UIUC; Summer Intern supporting the Audit team, Crowe Horwath Beijing

SELECTED PRESENTATIONS

Paper presented: *"Wildfire and Visitation in U.S. National Parks"*
Camp Resources XXVII, Asheville, NC, 2021.
Southern Economic Association Annual Meeting, Virtual, 2020.

Paper presented: *"On the Evaluation of Heterogeneous Climate Change Impacts on US Agriculture: Does Group Membership Matter?"*
Southern Economic Association Annual Meeting, Fort Lauderdale, FL, 2019
North American Regional Science Council Annual Conference, San Antonio, TX, 2018
Agricultural & Applied Economics Association Annual Meeting, Chicago, IL, 2017

AFFILIATIONS

Agricultural and Applied Economics Association (AAEA), Association of Environmental and Resource Economists (AERE)

PROGRAMMING

Proficient R, Python, Git, Stata, ArcGIS, Geoda, L^AT_EX
Familiar MATLAB, Mathematica, GAMS

LANGUAGES

English (fluent), Chinese (native)

REFERENCES

Benjamin M. Gramig, Ph.D

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Conservation & Environment Branch
Economic Research Service, USDA
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Carena J. van Riper, Ph.D

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“Wildfire and Visitation in U.S. National Parks.” Chang Cai. **[Job Market Paper]**

Abstract: Recent rapid increase in wildfire activity due to climate change poses unprecedented challenges to park managers working to mitigate fire risk using limited resources. This paper estimates the effect of wildfires on visitation to national parks across the western U.S. Using a comprehensive dataset on wildfire and smoke, I provide the first large-scale evidence of the negative relationship between wildfire activity and park visitation. I find that, on average, wildfires reduce national park visits by about 700,000 per year and this reduction is disproportionately larger for popular parks with a high level of fire activities. These effects can be explained by a lack of access due to emergency closures over the course of the season. I also investigate the global externalities associated with wildfire smoke and find that travelers are not responsive to the smoke from distant sources to a significant degree. These results demonstrate the importance of local adaptation efforts in mitigating economic loss in tourism arising from wildfire avoidance.

“On the Evaluation of Heterogeneous Climate Change Impacts on US Agriculture: Does Group Membership Matter?” Chang Cai and Sandy Dall’Erba (2021). *Climatic Change*. <https://doi.org/10.1007/s10584-021-03154-5>

Abstract: The Ricardian literature has only a handful of contributions addressing the presence of spatial heterogeneity in the marginal effects of climate change on agriculture. Although the majority of these studies offer models with group-specific slope parameters to account for spatial heterogeneity, large discrepancies on which grouping should be preferred still exist. This paper evaluates the extent to which expected future agricultural profits is sensitive to the four pre-determined groupings currently used in the literature. The results indicate that accounting for grouping uncertainty greatly increases the confidence interval around projected climate impacts. In addition, we do not find that one type of grouping is superior to any other. We suggest two potential solutions and emphasize the importance of explicitly controlling for grouping uncertainty in future studies.

“Integrating social values with GPS tracks through Denali National Park and Preserve” Chang Cai, Carena Van Riper, Dana Johnson, Christopher Raymond, William Stewart, Riley Andrade, and Devin Goodson.

Abstract: This study advances knowledge of the relationship between social values elicited during a participatory mapping exercise and on-ground travel patterns understood through GPS tracking of visitors to a protected area in Alaska. As one of the first studies to combine perceived social values and real-time use of a protected area landscape, we also showed the spatial relationships between these data in relation to environmental conditions. Contrary to previous research our comparison between social value and GPS tracking data illustrated differences hotspots defined by an abundance of point data suggesting visitors value areas that are not experienced first-hand. These relationships were analyzed in relation to backcountry units within the protected area to direct managerial attention to high and low priorities in relation to where and how visitor use is allocated. Spatial data reflecting use patterns and preferences among visitors were considered across three layers of ecological data. First, similar distributions were observed for elevation but dispersion of social values was greater than for GPS tracks. Second, average slope associ-

ated with social value points were significantly higher than with GPS tracks. Areas were difficult to experience and therefore limited to more experienced recreationists. Finally, an assessment of landcover showed broad similarities across the top 10 land cover types, but also important differences in snow-ice as well as bare ground.